THE DRYING OF RYEGRASS SEEDS IN DEEP LAYERS

by

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Seed Statistics

TABLE 1.1

Quantities of herbage seed bought by consumers in 1966/67 and 1969/70, cwt x 10^3 (% in brackets)

Seed	1966/67[101]	1969/70[31]
Perennial ryegrass	241 (44.6)	272
Italian ryegrass	136 (25.1)	127
Other ryegrass	13 (2.4)	8
Cocksfoot	27 (5.0)	25
Timothy	45 (8.3)	47
Meadow fescue	15 (2.8)	15
Other	64 (11.8)	-

TABLE 1.2

Percentage of home grown perennial ryegrass seed grown as certified seed[101]

Year	59/60	60/61	61/62	62/63	63/64	64/65	65/66	66/67	68/70
% certified	23	24	20	37	42	56	59	76	83

APPENDIX TO SECTION 2.

RYEGRASS SEED - RELEVANT PROPERTIES.

Table 2.1

Properties of control samples

Tetraploid hybrids			
Date harvested	Moisture Content % w.b.	1000 seed weight g.	Germination %
SABRINA 1970			
26:6	54.9	2.83	64
29:6	52.4	3.39	70
1:7	51.2	3.88	79
2:7	51.4	3.52	75
3:7	50.3	3.91	81
6:7	47.3	4.46	80
7:7	43.2	4.83	79
8:7	42.7	4.47	86
9:7	43.4	4.37	87
10:7	45.0	4.56	83
11:7	44.9	4.52	85
13:7	39.2	5.00	87
15:7	40.6	4.33	82
16:7	41.6	4.83	86
17:7		5.00	86
SABEL 1971			
5:7	59.9	2.63	46
6:7	60.2	2.52	51
7:7	57.2	2.71	59
8:7	57.8	3.09	56
8:7	57.4	3.10	67
9:7	56.4	3.06	49
12:7	51.1	3.51	62
13:7	49.7	3.79	75
14:7	48.4	3.89	78
16:7	44.8	4.18	83
19:7	39.6	4.12	82
22.7	31.7	4.13	86
26:7	19.0	4.23	89
SABEL 1972			
11:7	60.0	3.21	58
12:7	55.4	3.39	70
13:7	52.1	3.72	81
14:7	50.5	3.59	78
17:7	46.1	3.74	83
17:7	45.1	3.87	78
18:7	44.4	4.02	80
20:7	39.4	4.06	82
20:7	39.1	4.00	86
25:7	31.9	3.90	84

Appendix 2

Table 2.1 Cont'd.....

Aberystwyth S.23			
Date harvested	Moisture Content % w.b.	1000 seed weight g.	Germination %.
1970			
21:7	52.8	1.56	73
22:7	53.1	1.53	77
25:7	41.1	1.43	88
27:7	42.6	1.56	94
29:7	48.2	1.61	88
30:7	45.2	1.73	89
31:7	47.9	1.68	88
1:8	43.4	1.88	96
3:8	36.5	1.72	94
9:8	35.8	1.78	94
14:8	31.6	1.77	94
1971			
29:7	45.6	1.31	92
30:7	43.1	1.44	93
4:8	40.0	1.50	94
9:8	40.9	1.55	95
16:8	23.7	1.56	97
1972			
26:7	51.5	1.20	67
31:7	42.9	1.30	87
3:8	42.9	1.40	93
8:8	34.8	1.51	89
10:8	26.7	1.53	93
10:8	26.5	1.62	97

Table 2.2

Analysis of control samples. Coefficients and standard errors in fit of equation 2.1 to control germinations, G.

$$G = a - b \exp (c\,Md)$$

Variety	Coefficients ± S.E.			Residual σ^2	d.f.
	a	b	c		
Tetraploids	94.90±6.23	3.336±2.92	0.0173±.0051	23.51	34
S.23	95.99±2.43	0.1588±0.273	0.0445±0.0148	15.10	19

Table 2.3

1000 seed weights of groups of 100 seeds used for measurement of principal dimensions

Crop	Sample	Sub-Sample No 1	2	3	4	5	6	7	8	9	10
S.23	1969	1.88	1.70	1.69	1.84	1.67	1.75	1.78	1.81	1.68	1.81
	1970	1.63	1.71	1.76	1.81	1.73	1.73	1.71	1.64	1.67	1.88
Sabrina	1969	4.12	4.09	4.08	4.53	4.34	4.15	4.56	4.66	4.14	4.00
	1970	3.68	3.78	3.99	4.00	4.05	4.00	3.80	4.06	4.30	4.15

Table 2.4

Length of individual seeds, mm

		Seeds	Samples									
			1	2	3	4	5	6	7	8	9	10
S23	1969	1	5.80	5.90	5.40	6.70	4.10	5.80	4.20	3.60	6.10	5.7
		2	6.80	4.10	4.60	5.00	4.70	6.30	4.20	6.50	5.90	5.5
		3	4.80	5.80	5.30	5.90	4.70	5.80	4.10	6.60	4.80	6.0
		4	4.50	5.50	6.10	6.30	5.70	5.00	4.30	4.20	4.00	5.7
		5	5.70	5.10	5.90	5.80	5.10	4.50	6.40	5.00	5.70	5.9
		6	6.00	5.90	6.10	6.00	4.70	4.30	4.60	4.80	5.10	5.5
		7	7.30	5.30	6.20	5.70	3.90	6.60	5.30	4.40	5.50	5.8
		8	6.40	5.60	5.50	5.10	4.90	5.10	4.50	5.80	5.50	6.9
		9	5.90	5.90	5.30	5.70	5.00	5.90	6.00	6.70	5.20	6.00
		10	6.10	5.10	5.80	6.50	4.60	5.40	6.10	3.80	4.60	6.50
	1970	1	6.70	4.30	4.70	5.90	5.00	6.40	5.80	4.70	4.90	5.20
		2	6.30	4.30	5.80	4.80	4.80	4.50	6.20	5.80	5.00	5.20
		3	4.60	6.20	5.20	5.60	5.70	5.90	4.80	5.20	5.30	4.80
		4	5.10	4.60	4.80	5.00	5.40	5.00	4.80	4.90	5.60	4.50
		5	4.40	5.00	5.10	5.20	4.80	4.70	6.80	5.00	5.70	5.00
		6	5.40	5.60	5.10	5.10	5.70	4.90	5.80	4.60	4.70	5.50
		7	5.60	4.90	4.90	4.10	4.60	5.50	5.00	5.80	5.10	6.00
		8	4.30	5.70	3.80	5.10	5.60	4.30	5.60	4.80	5.00	5.00
		9	4.90	5.20	4.90	6.00	4.20	5.10	4.30	4.90	5.20	5.50
		10	5.80	5.10	4.00	7.10	4.80	4.80	5.90	5.20	5.40	4.50
Sabrina	1969	1	7.90	5.80	7.00	6.00	5.60	8.30	7.40	7.40	7.00	7.6
		2	6.90	7.70	8.10	7.80	5.50	7.30	7.50	7.00	6.60	7.3
		3	7.80	7.30	7.40	7.50	6.80	7.20	5.80	6.80	6.50	7.4
		4	5.70	7.40	7.30	7.20	7.40	6.50	7.00	8.40	6.70	7.0
		5	7.40	7.20	7.80	5.70	7.40	7.80	8.50	7.50	8.00	7.9
		6	6.30	6.50	7.70	7.10	7.50	7.80	8.30	6.50	4.90	6.30
		7	7.40	5.30	6.10	5.70	6.60	6.70	7.30	7.90	8.50	7.20
		8	7.70	7.50	7.40	6.40	7.60	6.80	7.20	7.50	8.00	6.9
		9	7.20	7.10	7.60	7.10	7.30	7.50	7.00	7.30	5.30	6.7
		10	8.40	8.20	7.50	7.00	7.50	8.20	7.30	8.90	6.80	6.2
	1970	1	6.50	6.10	6.50	6.80	7.90	6.70	6.90	7.60	7.70	6.30
		2	7.20	7.70	6.40	7.20	7.20	6.40	5.30	6.40	6.20	6.90
		3	6.50	5.60	5.60	7.40	6.80	6.90	7.50	6.50	7.40	7.60
		4	7.00	6.20	6.60	6.90	6.50	5.90	6.00	7.60	6.60	7.60
		5	7.50	5.20	5.20	7.10	6.30	5.70	7.30	6.50	5.70	7.10
		6	7.10	6.40	6.90	7.10	7.10	5.90	6.30	7.50	5.20	6.00
		7	7.50	7.20	7.60	7.30	7.30	6.40	6.70	5.50	7.00	6.70
		8	7.20	7.20	7.50	7.50	6.50	7.20	5.70	7.80	7.00	7.40
		9	7.50	6.80	6.90	7.80	7.50	7.50	7.00	7.50	6.60	5.50
		10	7.70	5.90	6.90	6.80	6.20	6.10	8.30	7.00	6.50	6.10

Table 2.5

Width of individual seeds, mm.

		Seeds	Samples 1	2	3	4	5	6	7	8	9	10
S23	1969	1	1.30	1.30	1.50	1.30	1.30	1.10	1.10	1.00	1.40	1.50
		2	1.60	1.40	1.30	1.20	1.10	1.00	1.20	1.40	1.20	1.30
		3	1.00	1.20	1.10	1.30	1.10	1.20	1.10	1.60	1.30	1.40
		4	1.40	1.40	1.30	1.30	1.10	1.40	1.20	1.10	0.80	1.30
		5	1.20	1.30	1.20	1.20	1.10	1.20	1.30	1.10	1.40	1.50
		6	1.40	1.20	1.40	1.40	1.00	1.10	1.30	1.10	1.20	1.20
		7	1.50	1.30	1.30	1.30	1.10	1.30	1.40	1.10	1.30	1.40
		8	1.40	1.20	1.20	1.20	1.30	1.20	1.10	1.10	1.20	1.50
		9	1.50	1.30	1.20	1.10	1.30	1.30	1.50	1.40	1.20	1.30
		10	1.40	1.10	1.30	1.50	1.20	1.30	1.30	1.10	1.20	1.40
	1970	1	1.50	1.20	1.10	1.10	1.30	1.20	1.40	0.90	0.90	1.20
		2	1.20	1.20	1.20	1.00	1.20	1.20	1.20	1.20	1.20	1.20
		3	1.20	1.20	1.00	1.10	1.20	1.10	1.10	1.20	1.20	1.20
		4	1.20	1.00	1.30	1.30	1.10	1.20	1.30	1.10	1.30	1.20
		5	1.20	1.30	1.20	1.30	1.00	1.00	1.30	1.10	1.20	1.30
		6	1.30	1.10	1.10	1.00	1.40	1.10	1.20	1.00	1.20	1.30
		7	1.10	1.00	1.10	0.90	1.10	1.30	1.30	1.20	1.10	1.10
		8	1.20	1.10	1.00	0.90	1.10	0.90	1.20	1.10	1.40	1.10
		9	1.00	1.00	1.20	1.20	1.10	1.10	1.10	0.90	1.50	1.40
		10	1.20	1.10	1.20	1.00	1.20	1.10	1.20	1.40	1.00	1.10
Sabrina	1969	1	1.80	1.80	1.70	1.60	1.20	1.80	1.50	1.80	1.40	1.90
		2	1.40	1.60	1.80	1.70	1.30	1.70	1.70	1.60	1.70	1.70
		3	1.80	1.50	1.60	1.70	1.70	1.70	1.50	1.40	1.50	1.70
		4	1.50	1.60	1.50	1.40	1.60	1.70	1.70	1.80	1.70	1.80
		5	1.70	1.50	1.80	1.30	1.70	1.80	1.70	1.90	1.90	2.10
		6	1.30	1.40	1.70	1.80	1.80	1.80	1.70	1.30	1.10	1.40
		7	1.70	1.10	1.50	1.50	1.80	1.80	1.70	2.10	1.90	1.80
		8	1.80	1.70	1.80	1.70	1.80	2.00	1.50	1.90	1.90	1.20
		9	1.80	1.50	1.80	1.70	1.60	1.50	1.60	1.30	1.60	1.70
		10	1.50	1.60	1.90	1.60	1.80	1.70	1.60	1.90	1.70	1.30
	1970	1	1.70	1.50	1.30	1.60	1.70	1.60	1.80	1.60	1.60	1.80
		2	1.50	1.60	1.60	1.80	1.50	1.70	1.50	1.30	1.30	1.50
		3	1.50	1.30	1.10	1.70	1.70	1.30	1.50	1.40	1.50	1.70
		4	1.50	1.40	1.50	1.70	1.60	1.50	1.60	1.50	1.40	1.70
		5	1.70	1.40	1.10	1.40	1.60	1.30	1.70	1.40	1.30	1.80
		6	1.60	1.50	1.30	1.60	1.50	1.40	1.30	1.70	1.80	1.30
		7	1.60	1.60	1.40	1.40	1.60	1.20	1.60	1.30	1.60	1.70
		8	1.50	1.40	1.40	1.60	1.60	1.50	1.40	1.70	1.60	1.50
		9	1.50	1.70	1.50	1.80	1.60	1.40	1.60	1.50	1.50	1.40
		10	1.60	1.70	1.60	1.40	1.30	1.50	1.60	1.60	1.80	1.70

Table 2.6

Thickness of individual seeds, mm.

		Seeds	Samples 1	2	3	4	5	6	7	8	9	10
S23	1969	1	0.65	0.72	0.68	0.83	0.71	0.71	0.77	0.62	0.85	0.77
		2	0.80	0.48	0.88	0.80	0.85	0.81	0.75	1.00	0.74	0.86
		3	0.42	0.78	0.66	0.85	0.80	0.84	0.60	1.01	0.90	0.82
		4	0.72	0.83	0.68	0.81	0.65	0.75	0.68	0.74	0.64	0.89
		5	0.68	0.73	0.66	0.79	0.82	0.78	0.98	0.82	0.84	0.76
		6	0.68	0.68	0.68	0.79	0.68	0.74	0.75	0.83	0.60	0.70
		7	0.82	0.66	0.60	0.66	0.70	0.92	0.92	0.61	0.74	0.88
		8	0.63	0.71	0.66	0.66	0.89	0.66	0.56	0.83	0.82	0.93
		9	0.71	0.73	0.68	0.68	0.77	0.89	0.91	0.86	0.76	0.95
		10	0.84	0.60	0.73	0.94	0.67	0.84	0.86	0.70	0.75	0.90
	1970	1	0.93	0.85	0.74	0.89	0.80	0.84	0.73	1.10	0.72	0.84
		2	0.76	0.87	0.92	0.78	0.70	0.87	0.94	0.81	0.90	0.88
		3	0.91	0.94	0.78	0.79	0.90	0.98	0.70	0.84	0.86	0.69
		4	0.88	0.62	0.80	0.95	0.54	0.91	0.94	0.81	0.74	0.85
		5	0.83	0.83	0.76	0.87	0.69	0.63	0.79	0.75	0.76	0.70
		6	1.05	0.83	0.83	0.67	0.77	0.96	0.85	0.73	0.85	0.86
		7	0.72	0.80	0.61	0.61	0.73	0.83	0.83	0.86	0.90	0.93
		8	1.11	0.75	0.64	0.73	0.83	0.74	0.81	0.73	0.93	0.74
		9	0.73	0.75	0.82	0.86	0.74	0.74	1.10	0.64	0.80	0.84
		10	0.79	0.67	0.66	0.78	0.88	0.77	0.88	1.05	0.61	0.74
Sabrina	1969	1	1.09	1.10	1.06	1.21	0.89	1.15	1.11	1.34	1.12	1.38
		2	1.06	0.98	0.96	1.22	1.04	1.06	1.31	1.16	1.2.	1.17
		3	1.26	1.05	0.92	1.12	1.28	1.36	1.07	1.21	1.05	1.07
		4	1.04	1.28	1.06	1.08	1.36	1.16	0.92	1.21	1.58	1.30
		5	1.22	1.16	1.49	1.03	1.26	1.35	1.02	1.24	1.06	1.84
		6	0.30	1.04	1.16	1.18	1.15	1.17	1.25	1.19	1.02	1.18
		7	1.48	0.84	1.10	1.06	1.06	1.32	0.84	1.19	1.16	1.35
		8	1.22	1.14	1.24	1.11	1.31	1.30	1.10	1.36	1.40	1.07
		9	1.09	0.93	1.10	1.17	1.11	1.17	1.26	1.36	1.10	1.36
		10	1.11	1.09	1.31	1.15	1.45	1.31	1.25	1.32	1.10	1.01
	1970	1	1.25	0.75	1.08	1.11	1.06	1.03	1.04	1.16	1.07	0.97
		2	0.98	1.18	1.07	1.13	1.11	1.21	0.72	1.05	1.11	1.05
		3	0.36	0.74	0.77	1.19	1.06	1.09	0.95	1.20	0.87	0.98
		4	0.88	0.84	0.95	1.28	1.12	0.96	0.87	1.00	0.92	1.02
		5	1.02	0.96	0.69	1.04	1.09	0.92	1.31	0.78	0.96	1.22
		6	1.12	1.04	0.98	1.20	1.01	0.82	1.05	1.33	0.80	0.85
		7	1.14	0.95	0.89	1.12	1.07	0.88	1.12	0.75	1.11	1.09
		8	1.03	0.89	1.27	1.08	0.95	0.82	0.81	0.82	1.12	1.00
		9	1.15	0.81	1.25	1.10	1.05	0.64	0.84	1.04	1.04	0.94
		10	1.10	1.06	1.08	0.98	0.86	1.31	1.30	0.97	1.10	1.15

Table 2.7

Length : thickness for individual seeds, ratio

		Seeds	Samples 1	2	3	4	5	6	7	8	9	10
S23	1969	1	8.92	8.19	7.94	8.07	5.77	8.17	5.45	6.13	7.18	7.40
		2	8.50	8.54	5.23	6.25	5.53	7.78	5.60	6.50	7.97	6.40
		3	11.43	7.44	8.03	6.94	5.88	6.90	6.83	6.53	5.33	7.32
		4	6.25	6.63	8.97	7.78	8.77	6.67	6.32	5.68	6.25	6.40
		5	8.38	6.99	8.94	7.34	6.22	5.77	6.53	6.10	6.79	7.76
		6	8.82	8.68	8.97	7.59	6.91	5.81	6.13	5.78	8.50	7.86
		7	8.90	8.03	10.33	8.64	5.57	7.17	5.76	7.21	7.43	6.59
		8	10.16	7.85	8.33	7.73	5.51	7.73	8.04	6.99	6.71	7.42
		9	8.31	8.08	7.79	8.38	6.49	6.63	6.59	7.79	6.84	6.32
		10	7.26	8.50	7.95	6.91	6.87	6.43	7.09	5.43	6.13	7.22
	1970	1	7.20	5.06	6.35	6.63	6.25	7.62	7.95	4.27	6.81	6.19
		2	8.29	4.94	6.30	6.15	6.86	5.17	6.60	7.16	5.56	5.91
		3	5.05	6.60	6.67	7.09	6.33	6.02	6.86	6.19	6.16	6.96
		4	5.80	7.42	6.00	5.26	10.00	5.49	5.11	6.05	7.57	5.29
		5	5.30	6.02	6.71	5.98	6.96	7.46	8.61	6.67	7.50	7.14
		6	5.14	6.99	6.14	7.61	7.40	5.10	6.82	6.30	5.53	6.40
		7	7.78	6.12	8.03	6.72	6.30	6.63	6.02	6.74	5.67	6.45
		8	3.37	7.60	5.94	6.99	6.75	5.81	6.91	6.58	5.38	6.76
		9	6.71	6.93	5.98	6.98	5.68	6.89	3.91	7.66	6.50	6.55
		10	7.34	7.61	6.06	9.10	5.45	6.23	6.70	4.95	8.85	6.08
Sabrina	1969	1	7.25	5.27	6.60	4.96	6.29	7.22	6.67	5.52	6.25	5.51
		2	6.51	7.86	8.44	6.39	5.29	6.89	5.73	6.03	5.37	6.24
		3	6.19	6.95	8.04	6.70	5.31	5.29	5.42	5.62	6.19	6.92
		4	5.48	5.78	6.89	6.67	5.44	5.60	7.61	6.94	4.24	5.38
		5	6.07	6.21	5.23	5.53	5.87	5.78	8.33	6.05	7.55	4.29
		6	7.87	6.25	6.64	6.02	6.52	6.67	6.64	5.46	4.80	5.34
		7	5.00	6.31	5.55	5.38	6.23	5.08	8.69	6.64	7.33	5.33
		8	6.31	6.58	5.97	5.77	5.80	5.23	6.55	5.51	5.71	5.61
		9	6.61	7.63	6.91	6.07	6.56	6.41	5.56	5.37	4.82	4.93
		10	7.57	7.52	5.73	6.09	5.17	6.26	5.84	6.74	6.13	6.14
	1970	1	5.20	8.13	6.02	6.13	7.45	6.50	6.63	6.55	7.20	6.49
		2	7.35	6.53	5.98	6.37	6.49	5.29	7.36	6.10	5.59	6.57
		3	7.56	7.57	7.27	6.22	6.42	6.33	7.89	5.42	8.51	7.76
		4	7.95	7.38	6.95	5.39	5.80	6.15	6.90	7.60	7.17	7.45
		5	7.35	5.42	7.54	6.83	5.78	6.20	5.57	8.33	5.94	5.82
		6	6.34	6.15	7.04	5.92	7.03	7.20	6.00	5.64	10.25	7.06
		7	6.56	7.58	8.54	6.52	6.82	7.27	5.98	7.33	6.31	6.15
		8	6.99	8.09	5.91	6.94	6.84	8.78	7.04	9.51	6.25	7.40
		9	6.47	8.40	5.52	7.09	7.14	11.72	9.05	7.21	6.54	5.85
		10	7.00	5.57	6.39	6.94	7.21	4.66	6.38	7.22	5.91	5.30

Table 2.8

Length ÷ width for individual seeds, ratio

		Seeds	Samples 1	2	3	4	5	6	7	8	9	10
S23	1969	1	4.46	4.54	3.60	5.15	3.15	5.27	3.82	3.80	4.36	3.80
		2	4.25	2.93	3.54	4.17	4.27	6.30	3.50	4.64	4.92	4.23
		3	4.80	4.83	4.82	4.54	4.27	4.83	3.73	4.13	3.69	4.29
		4	3.21	3.93	4.69	4.85	5.18	3.57	3.58	3.82	5.00	4.38
		5	4.75	3.92	4.92	4.83	4.64	3.75	4.92	4.55	4.07	3.93
		6	4.29	4.92	4.36	4.29	4.70	3.91	3.54	4.36	4.25	4.58
		7	4.37	4.08	4.77	4.38	3.55	5.08	3.79	4.00	4.23	4.14
		8	4.57	4.67	4.58	4.25	3.77	4.25	4.09	5.27	4.58	4.60
		9	3.93	4.54	4.42	5.18	3.85	4.54	4.00	4.79	4.33	4.62
		10	4.36	4.64	4.46	4.33	3.83	4.15	4.69	3.45	3.83	4.64
	1970	1	4.47	3.58	4.27	5.36	3.85	5.33	4.14	5.22	5.44	4.33
		2	5.25	3.58	4.83	4.80	4.00	3.75	5.17	4.83	4.17	4.33
		3	3.83	5.17	5.20	5.09	4.75	5.36	4.36	4.33	4.42	4.00
		4	4.25	4.60	3.69	3.85	4.91	4.17	3.69	4.45	4.31	3.75
		5	3.67	3.85	4.25	4.00	4.80	4.70	5.23	4.55	4.75	3.85
		6	4.15	5.27	4.64	5.10	4.07	4.45	4.83	4.60	3.92	4.23
		7	5.09	4.90	4.45	4.56	4.18	4.23	3.85	4.83	4.64	5.45
		8	3.53	5.18	3.80	5.67	5.09	4.78	4.67	4.36	3.57	4.55
		9	4.90	5.20	4.08	5.00	3.82	4.64	3.91	5.44	3.47	3.93
		10	4.33	4.64	3.33	7.10	4.00	4.36	4.92	3.71	5.40	4.09
Sabrina	1969	1	4.39	3.22	4.12	3.75	4.67	4.61	4.93	4.11	5.00	4.00
		2	4.93	4.81	4.50	4.59	4.23	4.29	4.41	4.38	3.88	4.29
		3	4.33	4.87	4.63	4.41	4.00	4.24	3.87	4.86	4.33	4.35
		4	3.80	4.63	4.87	5.14	4.63	3.82	4.12	4.67	3.94	3.89
		5	4.35	4.80	4.33	4.38	4.35	4.33	5.00	3.95	4.21	3.76
		6	4.85	4.64	4.53	3.94	4.17	4.33	4.88	5.00	4.45	4.50
		7	4.35	4.82	4.07	3.80	3.67	3.72	4.29	3.76	4.47	4.00
		8	4.28	4.41	4.11	3.76	4.22	3.40	4.80	3.95	4.21	5.00
		9	4.00	4.73	4.22	4.18	4.56	5.00	4.38	5.62	3.31	3.94
		10	5.60	5.13	3.95	4.38	4.17	4.62	4.56	4.62	4.00	4.77
	1970	1	3.32	4.07	5.00	4.25	4.65	4.19	3.83	4.75	4.81	3.50
		2	4.80	4.81	4.00	4.00	4.80	3.76	3.53	4.92	4.77	4.60
		3	4.33	4.31	5.09	4.35	4.00	5.31	5.00	4.64	4.93	4.47
		4	4.67	4.43	4.40	4.06	4.06	3.93	3.75	5.07	4.71	4.47
		5	4.41	3.71	4.73	5.07	3.94	4.38	4.29	4.64	4.38	3.94
		6	4.44	4.27	5.31	4.44	4.73	4.21	4.85	4.41	4.56	4.62
		7	4.69	4.50	5.43	5.21	4.56	5.33	4.19	4.23	4.38	3.94
		8	4.80	5.14	5.36	4.69	4.06	4.80	4.07	4.59	4.38	4.93
		9	5.00	4.00	4.60	4.33	4.69	5.36	4.75	5.00	4.53	3.93
		10	4.31	3.47	4.31	4.86	4.77	4.07	5.19	4.38	3.61	3.59

Table 2.9

Width ÷ thickness for individual seeds

		Seeds	Samples									
			1	2	3	4	5	6	7	8	9	10
S23	1969	1	2.00	1.81	2.21	1.57	1.83	1.55	1.43	1.61	1.65	1.95
		2	2.00	2.92	1.48	1.50	1.29	1.23	1.60	1.40	1.62	1.51
		3	2.38	1.54	1.67	1.53	1.37	1.43	1.83	1.58	1.44	1.71
		4	1.94	1.69	1.91	1.60	1.69	1.87	1.76	1.49	1.25	1.46
		5	1.76	1.78	1.82	1.52	1.34	1.54	1.33	1.34	1.67	1.97
		6	2.06	1.76	2.06	1.77	1.47	1.49	1.73	1.33	2.00	1.71
		7	1.83	1.97	2.17	1.97	1.57	1.41	1.52	1.80	1.76	1.59
		8	2.22	1.69	1.82	1.82	1.46	1.82	1.96	1.33	1.46	1.61
		9	2.11	1.73	1.76	1.62	1.69	1.46	1.65	1.63	1.56	1.57
		10	1.67	1.83	1.78	1.60	1.79	1.55	1.51	1.57	1.60	1.56
	1970	1	1.61	1.41	1.49	1.24	1.62	1.43	1.92	0.82	1.25	1.43
		2	1.58	1.38	1.30	1.28	1.71	1.38	1.28	1.48	1.33	1.36
		3	1.32	1.28	1.28	1.39	1.33	1.12	1.57	1.43	1.40	1.74
		4	1.36	1.61	1.62	1.37	2.04	1.32	1.38	1.36	1.76	1.41
		5	1.45	1.57	1.58	1.49	1.45	1.59	1.65	1.47	1.58	1.85
		6	1.24	1.33	1.33	1.49	1.82	1.15	1.41	1.37	1.41	1.51
		7	1.53	1.25	1.80	1.48	1.51	1.57	1.57	1.40	1.22	1.13
		8	1.08	1.47	1.56	1.23	1.33	1.22	1.48	1.51	1.51	1.49
		9	1.37	1.33	1.46	1.40	1.49	1.49	1.00	1.41	1.57	1.57
		10	1.52	1.64	1.82	1.28	1.36	1.43	1.36	1.33	1.64	1.49
Sabrina	1969	1	1.65	1.64	1.60	1.32	1.35	1.57	1.35	1.34	1.25	1.36
		2	1.32	1.63	1.87	1.59	1.25	1.60	1.30	1.38	1.38	1.45
		3	1.43	1.43	1.74	1.52	1.33	1.25	1.40	1.16	1.43	1.59
		4	1.44	1.25	1.42	1.30	1.18	1.47	1.35	1.49	1.05	1.38
		5	1.39	1.29	1.21	1.26	1.35	1.33	1.67	1.53	1.79	1.14
		6	1.62	1.35	1.47	1.53	1.57	1.54	1.36	1.09	1.08	1.19
		7	1.15	1.31	1.36	1.42	1.70	1.36	2.02	1.76	1.64	1.33
		8	1.46	1.49	1.45	1.53	1.37	1.54	1.36	1.40	1.36	1.12
		9	1.65	1.61	1.64	1.45	1.44	1.28	1.27	0.96	1.45	1.25
		10	1.35	1.47	1.45	1.39	1.24	1.30	1.28	1.44	1.55	1.29
	1970	1	1.36	2.00	1.20	1.44	1.60	1.55	1.73	1.38	1.50	1.86
		2	1.53	1.36	1.50	1.59	1.55	1.40	2.06	1.24	1.17	1.43
		3	1.74	1.76	1.43	1.43	1.60	1.19	1.58	1.17	1.72	1.73
		4	1.70	1.67	1.58	1.33	1.43	1.56	1.64	1.50	1.52	1.67
		5	1.67	1.46	1.59	1.35	1.47	1.41	1.30	1.79	1.35	1.48
		6	1.43	1.44	1.33	1.33	1.49	1.71	1.24	1.28	2.25	1.53
		7	1.40	1.68	1.57	1.25	1.50	1.36	1.43	1.73	1.44	1.56
		8	1.46	1.57	1.10	1.48	1.68	1.83	1.73	2.07	1.43	1.50
		9	1.29	2.10	1.20	1.64	1.52	2.19	1.90	1.44	1.44	1.49
		10	1.45	1.60	1.48	1.43	1.51	1.15	1.23	1.65	1.64	1.48

Table 2.10

Sieve analysis: 1000 seed weights of S.23 seed remaining in 3 largest fractions

	Sieve	Sieve sample	Repeat counts 1	2	3	4
1969	14	a	2.27	2.10	2.13	2.18
		b	2.27	2.22	2.13	2.17
		c	2.31	2.22	2.23	2.29
		d	2.27	2.22	2.25	2.29
	16	a	1.67	1.64	1.58	1.55
		b	1.65	1.62	1.73	1.69
		c	1.68	1.66	1.68	1.74
		d	1.67	1.71	1.70	1.64
	18	a	1.17	1.20	1.17	1.16
		b	1.18	1.19	1.21	1.08
		c	1.16	1.13	1.16	1.06
		d	1.19	1.14	1.14	1.20
1970	14	a	2.31	2.31	2.30	2.34
		b	2.29	2.33	2.33	2.33
		c	2.26	2.35	2.36	2.28
		d	2.33	2.36	2.26	2.28
	16	a	1.80	1.92	1.85	1.83
		b	1.72	1.81	1.82	1.84
		c	1.84	1.81	1.81	1.74
		d	1.78	1.78	1.78	1.85
	18	a	1.31	1.24	1.29	1.25
		b	1.33	1.27	1.25	1.23
		c	1.27	1.33	1.22	1.22
		d	1.30	1.35	1.37	1.34

Table 2.11

Sieve analysis: 1000 seed weights of Sabrina seed remaining in 3 largest fractions

	Sieve	Sieve sample	Repeat counts 1	2	3	4
1969	10	a	6.15	6.25	5.87	6.20
		b	6.17	6.00	6.25	6.25
		c	6.13	6.22	6.33	6.35
		d	6.00	6.23	6.25	6.34
	12	a	4.75	4.58	4.81	4.55
		b	4.92	4.95	4.79	4.97
		c	4.84	4.78	4.68	4.58
		d	4.73	4.63	4.88	4.44
	14	a	3.19	3.33	3.36	3.22
		b	3.38	3.36	3.25	3.37
		c	3.32	3.49	3.30	3.34
		d	3.40	3.30	3.31	3.38
1970	10	a	5.21	5.69	5.94	5.44
		b	5.78	5.72	5.45	5.63
		c	5.86	5.39	5.56	5.89
		d	6.01	*	*	*
	12	a	4.85	5.22	4.97	4.62
		b	4.95	5.02	4.89	4.85
		c	5.06	5.13	4.97	4.69
		d	4.96	4.95	4.98	4.87
	14	a	3.51	2.97	3.27	3.32
		b	3.31	3.12	3.20	3.19
		c	3.50	3.42	3.23	3.12
		d	3.41	3.29	3.26	3.27

Table 2.12

Results of sieving analysis: Percentage by weight remaining on each sieve (= frequency f_i)

Crop	Sample	Test	B.S. Mesh size 7	10	12	14	16	18	22	25	30
S23	1969	a		0.02	0.90	46.0	36.4	13.0	2.6	0.2	0.02
		b		0.05	1.0	40.6	39.6	15.8	2.8	0.2	0.02
		c		0.01	1.0	36.5	42.3	16.0	3.0	0.2	0.01
		d		0.05	1.4	41.2	37.8	16.2	2.6	0.2	0.01
		Mean		0.03	1.1	41.1	39.0	15.3	2.8	0.20	0.01
	1970	a		0.76	1.78	23.48	49.36	19.80	3.26	1.72	0.10
		b		0.78	1.88	21.40	51.20	20.80	3.38	0.44	0.08
		c		0.74	1.80	21.28	49.60	22.16	3.90	0.46	0.16
		d		0.82	1.66	21.50	50.96	20.98	3.46	0.42	0.10
		Mean		0.78	1.78	21.92	50.28	20.9	3.50	0.76	0.11
Sabrina	1969	a	1.0	17.6	51.6	22.8	3.8	1.0	1.2		
		b	0.2	17.4	51.7	23.3	4.0	1.2	1.0		
		c	0.2	18.2	52.8	21.8	3.7	0.9	0.8		
		d	0.2	18.1	52.2	23.4	3.8	0.9	0.8		
		Mean	0.4	17.8	52.1	22.8	3.8	1.0	0.9		
	1970	a	0.02	5.36	55.26	32.76	5.02	1.12	0.30		
		b	0.06	5.24	55.06	32.86	4.98	1.40	0.22		
		c	0.10	4.22	55.50	34.24	4.40	1.20	0.28		
		d	0.02	4.94	52.72	33.78	5.74	1.82	0.64		
		Mean	0.05	4.94	54.64	33.41	5.04	1.39	0.36		

Table 2.13

Diameters (mm) derived from sieving results

	Geometric mean (± ln S.D.)		Volume surface mean	
	1969	1970	1969	1970
(a)	1.1543 (± .1392)	1.0962 (± 0.1631)	1.2049	1.1716
(b)	1.1386 (± .1425)	1.0978 (± 0.1516)	1.1917	1.1684
(c)	1.1289 (± .1405)	1.0918 (± 0.1153)	1.1815	1.1641
(d)	1.1413 (± .1434)	1.0967 (± 0.1524)	1.1957	1.1679
Mean	1.1408	1.0956	1.1935	1.1680
(a)	1.5207 (± .1894)	1.4445 (± 0.1393)	1.6734	1.5172
(b)	1.5100 (± .1817)	1.4429 (± 0.1401)	1.6454	1.5169
(c)	1.5205 (± .1771)	1.4402 (± 0.1347)	1.6552	1.5077
(d)	1.5221 (± .1782)	1.4273 (± 0.1483)	1.6510	1.5063
Mean	1.5183	1.4387	1.6563	1.5120

APPENDIX TO SECTION 3

DETERMINATION OF DRYING PROPERTIES
THIN-LAYER DRYING EXPERIMENTS

APPENDIX 3.1 DATA PROCESSING

3.1.1 Computer program DECODE for code-to-cycle conversion

DECODE performs the following operations.

1. Reads in the number of individual drying runs on the data tape and the run number, channel (or drier) number, starting time and final time of each run. (Both of the times in cycles from the beginning of the recording period i.e. the time when the logger was zeroed). This basic data is written out.

2. Reads a cycle time and checks its value. If it is negative the end of the data tape has been reached and the program jumps to 4.

   Otherwise the cycle time may have either incremented or decremented with respect to the previous time. A decrement denotes that the 4 decade counter in the data logger has exceeded 9999 (=11h) and restored from zero. All such decrements are noted and the current and subsequent cycle times adjusted accordingly. The program then proceeds to 3.

3. Reads the associated 8 digit code and identifies those channels on which weight additions have occurred. Updates counts for each channel and inserts current cycle time in lists for those channels. Program returns to 2 to read next cycle time.

4. The lists of cycle times on each channel are now complete but are not differentiated into individual runs. Each channel is searched and matched with the run data, to identify the runs on that channel and to produce lists of cycle times corrected to account for the stagger of the starts of the individual runs. The lists are printed out prefixed by the run and channel number and terminated by -1's.

In the ICL 470 implementation the cycle time lists are written to a private disc for subsequent editing (if necessary) and use as input to the processing programmes. An additional summary file is written onto a public storage disc for examination via the remote terminal.

Variables

IRUN (4, 24)	Array for storage of basic run data.
KOUNT (8)	Array for counting cycle times on each channel.
ICYCLE (8,200)	Array for storage of cycle times on each channel.
NRUN	Number of runs on data tape.
KN	Counter for number of times data logger counter exceeds 9999 (Counts in units of 10,000).
N	Cycle time as read.
NLAST	Previous cycle time as read.
NO	Correct cycle time = N + KN
MADD	8 digit code of weight additions.
J	Device for breaking code.
IPRINT	Current cycle time on specific channel and for specific run and corrected for starting time offset. A transient value within a treble loop. Written to line file.

Fortran listing of DECODE.

```
C       CODE TO CYCLE CONVERSION
        DIMENSION IRUN(4,24),KOUNT(8),ICYCLE(8,300)
        DATA KOUNT/8*0/
        READ(5,10) NRUN
 10     FORMAT(G0.0)
        WRITE (6,11)
 11     FORMAT ('1',5X,'CODE TO CYCLE CONVERSION',10X,'DATE.........'///3
       1X,'RUN NO.',3X,'BOX NO.'4X,'F.C.T.',4X,'OFFSET'//)
        DO 30 J=1,NRUN
        READ(5,12) (IRUN(K,J),K=1,4)
 12     FORMAT(4G0.0)
 30     WRITE(6,13) (IRUN(K,J),K=1,4)
 13     FORMAT (' ',4I10)
        KN=0
        N=0
 22     NLAST=N
        READ(5,14) N
 14     FORMAT(1X,I4)
        IF (N) 50,15,15
 15     IF (N-NLAST) 16,16,17
 16     KN=10000+KN
 17     NO=N+KN
        READ(5,19) MADD
 19     FORMAT(1X,I8)
        DO 20 I=1,8
        J=10000000/10**(I-1)
        IF (MADD-J) 20,21,21
 21     MADD=MADD-J
        KOUNT(I)=KOUNT(I)+1
        KW=KOUNT(I)
        ICYCLE(I,KW)=NO
 20     CONTINUE
        GO TO 22
 50     DO 51 I=1,8
        K=0
        DO 52 J=1,NRUN
        IF (IRUN(2,J).NE.I) GOTO 52
        WRITE (6,53) (IRUN(M,J),M=1,2)
        WRITE(8,57)(IRUN(M,J),M=1,2)
 53     FORMAT('0',1X,'RUN NO=',I5,3X,'BOX NO=',I3)
 57     FORMAT(' ',I3,1X,I3)
        JK=0
 54     K=K+1
        IF(K.GT.KOUNT(I)) GO TO 60
        IPRINT=ICYCLE(I,K)-IRUN(4,J)
        IF(IPRINT-IRUN(3,J))62,63,64
 55     FORMAT(' ',I6)
 62     WRITE(8,55)IPRINT
        JK=JK+1
        GO TO 54
 64     K=K-1
 63     WRITE(8,55)IRUN(3,J)
        WRITE(8,61)
        WRITE(6,56) JK
 56     FORMAT('0',I3,' WTS ADDED')
 52     CONTINUE
        GO TO 51
 60     IF(IPRINT.LT.IRUN(3,J)) WRITE(8,55)IRUN(3,J)
        WRITE(8,61)
        WRITE(6,56) JK
 61     FORMAT(' ',2X,'-1',1X)
 51     CONTINUE
        STOP
        END
```

3.1.2.1 2 term-exponential. Equation 3.10

The equation can be written as

$$y = ae^{bx}+ce^{dx}+g$$

where a, b, c, d and g are the constants to be found.

Expanding by Taylor's series about the point $(a_o b_o c_o d_o g_o)$ given by initial estimates, gives

$$y = f(a_o, b_o, c_o, d_o, g_o)+\Delta_a(e^{b_o x})+\Delta_b(a_o x e^{b_o x})+\Delta_c(e^{d_o x})+\Delta_d(c_o x e^{d_o x})+\Delta_g$$

and the function to be minimized is

$$\sum_{k=1}^{N} d_k^2 = \sum_{k=1}^{N} [Y_k - f(a_o, b_o, c_o, d_o, g_o) - \Delta_a . e^{b_o x_k} - \Delta_b . a_o x_k e^{b_o x_k} - \Delta_c . e^{d_o x_k} - \Delta_d . c_o x_k . e^{d_o x_k} - \Delta_g]^2$$

$$= h(a_o, b_o, c_o, d_o, g_o)^2$$

The partial derivatives to be set equal to 0 are

$$\frac{\delta h}{\delta \Delta_a} = -2\,\Sigma[h(a_o, b_o, c_o, d_o, g_o)]\, e^{b_o x_k} = 0$$

$$\frac{\delta h}{\delta \Delta_b} = -2\,\Sigma[h(a_o, b_o, c_o, d_o, g_o)]\, a_o . x_k . e^{b_o x_k} = 0$$

$$\frac{\delta h}{\delta \Delta_c} = -2\,\Sigma[h(a_o, b_o, c_o, d_o, g_o)]\, e^{d_o x_k} = 0$$

$$\frac{\delta h}{\delta \Delta_d} = -2\,\Sigma[h(a_o, b_o, c_o, d_o, g_o)]\, c_o x_k e^{d_o x_k} = 0$$

$$\frac{\delta h}{\delta \Delta_g} = -2\,\Sigma[h(a_o, b_o, c_o, d_o, g_o)]\, 1 = 0.$$

Letting $D_k = (Y_k - a_o c^{b_o x_k} - c_o e^{d_o x_k} - g_o)$

$$\Sigma D_k . e^{b_o x_k} = \Delta_a \Sigma e^{2 b_o x_k}+\Delta_b . a_o \Sigma x_k . e^{2 b_o x_k}+\Delta_c \Sigma e^{(b_o+d_o)x_k}+\Delta_d . c_o \Sigma x_k . e^{(b_o+d_o)x_k}+\Delta_g \Sigma e^{b_o x_k}$$

$$\Sigma D_k . x_k . e^{b_o x_k} = \Delta_a \Sigma e^{2 b_o x_k}+\Delta_b . a_o \Sigma x_k^2 . e^{2 b_o x_k}+\Delta_c \Sigma x_k . e^{(b_o+d_o)x_k}+\Delta_d . c_o \Sigma x_k^2 . e^{(b_o+d_o)x_k}+\Delta g \Sigma x_k . e^{b_o x_k}$$

$$\Sigma D_k e^{d_o x_k} = \Delta_a \Sigma e^{(b_o+d_o)x_k}+\Delta_b a_o \Sigma x_k . e^{(b_o+d_o)x_k}-\Delta_c \Sigma e^{2 d_o x_k}-\Delta_d . c_o \Sigma x_k . e^{2 d_o x_k}-\Delta_g \Sigma e^{d_o x_k}$$

$$\Sigma D_k . x_k . e^{d_o x_k} = \Delta_a \Sigma x_k . e^{(b_o+d_o)x_k}+\Delta_b . a_o \Sigma x_k^2 . e^{(b_o+d_o)x_k}+\Delta_c \Sigma x_k . e^{2 d_o x_k}+\Delta_d . c_o \Sigma x_k^2 . e^{2 d_o x_k}+\Delta_g \Sigma x_k . e^{d_o x_k}$$

$$\Sigma D_k = \Delta_a \Sigma e^{b_o x_k}+\Delta_b . a_o \Sigma x_k . e^{b_o x_k}+\Delta_c \Sigma e^{d_o x_k}+\Delta_d . c_o \Sigma x_k . e^{d_o x_k}+\Delta_g N.$$

and reduce to

$$Q_{11}\Delta a+Q_{12}\Delta b+Q_{13}\Delta c+Q_{14}\Delta d+Q_{15}\Delta g = P_1$$

$$Q_{21}\Delta a+Q_{22}\Delta b+Q_{23}\Delta c+Q_{24}\Delta d+Q_{25}\Delta g = P_2$$

$$Q_{31}\Delta a+Q_{32}\Delta b+Q_{33}\Delta c+Q_{34}\Delta d+Q_{35}\Delta g = P_3$$

$$Q_{41}\Delta a+Q_{42}\Delta b+Q_{43}\Delta c+Q_{44}\Delta d+Q_{45}\Delta g = P_4$$

$$Q_{51}\Delta a+Q_{52}\Delta b+Q_{53}\Delta c+Q_{54}\Delta d+Q_{55}\Delta g = P_5$$

where $P_1 = \Sigma D_k . e^{b_o x_k}$ $P_2 = \Sigma D_k . x_k . e^{b_o x_k}$ $P_3 = \Sigma D_k . e^{d_o x_k}$

$P_4 = \Sigma D_k . x_k . e^{d_o x_k}$ $P_5 = \Sigma D_k$ $Q_{11} = \Sigma e^{2 b_o x_k}$

$Q_{12} = a_o \Sigma x_k . e^{2 b_o x_k}$ $Q_{13} = \Sigma e^{(b_o+d_o)x_k}$ $Q_{14} = c_o \Sigma x_k . e^{(b_o+d_o)x_k}$

$Q_{15} = \Sigma e^{b_o x_k}$ $Q_{21} = \Sigma e^{2 b_o x_k}$ $Q_{22} = a_o \Sigma x_k^2 . e^{2 b_o x_k}$

$Q_{23} = \Sigma x_k . e^{(b_o+d_o)x_k}$ $Q_{24} = c_o \Sigma x_k^2 . e^{(b_o+d_o)x_k}$ $Q_{25} = \Sigma x_k . e^{b_o x_k}$

$Q_{31} = \Sigma e^{(b_o+d_o)x_k}$ $Q_{32} = a_o \Sigma x_k . e^{(b_o+d_o)x_k}$ $Q_{33} = \Sigma e^{2 d_o x_k}$

$Q_{34} = c_o \Sigma x_k . e^{2 d_o x_k}$ $Q_{35} = \Sigma e^{d_o x_k}$ $Q_{41} = \Sigma x_k . e^{(b_o+d_o)x_k}$

$Q_{42} = a_o \Sigma x_k^2 . e^{(b_o+d_o)x_k}$ $Q_{43} = \Sigma x_k . e^{2 d_o x_k}$ $Q_{44} = c_o \Sigma x_k^2 . e^{2 d_o x_k}$

$Q_{45} = \Sigma x_k . e^{d_o x_k}$ $Q_{51} = \Sigma e^{b_o x_k}$ $Q_{52} = a_o \Sigma x_k . e^{b_o x_k}$

$Q_{53} = \Sigma e^{d_o x_k}$ $Q_{54} = c_o \Sigma x_k . e^{d_o x_k}$ $Q_{55} = N$

3.1.2. (Cont'd)

3.1.2.2 Exponential series. Equations 3.38 and 3.39

Equation 3.38 can be rewritten as

$$y = A\left[\frac{6}{\pi^2}\sum_{n=1}^{\infty}\frac{1}{n^2}.\exp(-n^2.B.x)\right] + C$$

where A, B, and C are constants representing (Mo - Me), k, and Me respectively and the independent variable time is denoted by x, and the dependent variable moisture content by y.

From (1) $y = f(A,B,C)$

and if Ao, Bo and Co are initial estimates of the constants such that

$A = Ao + \Delta a$, $B = Bo + \Delta b$ and $C = Co + \Delta c$

then $y = f(A_o + \Delta_a, B_o + \Delta_b, C_o + \Delta_c)$

Expanding by one term in Taylor's series

$$y = f(A_o, B_o, C_o) + \Delta_a\left(\frac{\delta f}{\delta A}\right) + \Delta_b\left(\frac{\delta f}{\delta B}\right) + \Delta_c\left(\frac{\delta f}{\delta C}\right)$$

where

$$\frac{\delta f}{\delta A} = \frac{6}{\pi^2}\sum_{n=1}^{\infty}\frac{1}{n^2}.\exp(-n^2.B.x) = \frac{6}{\pi^2}.S_1$$

$$\frac{\delta f}{\delta B} = -A.\frac{6}{\pi^2}.x\sum_{n=1}^{\infty}\exp(-n^2.B.x) = -\frac{6}{\pi^2}.A.x.S_2$$

$$\frac{\delta f}{\delta C} = 1$$

$$S_1 = \sum_{n=1}^{\infty}\frac{1}{n^2}.\exp(-n^2.B.x) \qquad S_2 = \sum_{n=1}^{\infty}\exp(-n^2.B.x)$$

Thus for a series of observations, Y_k at a series of times, x_k, the least squares function to be minimised is

$$\sum_{k=1}^{N} d_k^2 = \sum_{k=1}^{N} \left[Y_k - f_k(A_o, B_o, C_o) - \Delta_a \left(\frac{6}{\pi^2} . S_1 \right) - \Delta_b \left(- \frac{6}{\pi^2} . A_o . x_k . S_2 \right) - \Delta_c \right]^2$$

$$= \left[h(A_o, B_o, C_o) \right]^2$$

and can be minimised by setting the partial derivatives to zero

$$\frac{\delta h}{\delta \Delta_a} = -2 \sum \left[h(A_o, B_o, C_o) \right] \frac{6}{\pi^2} . S_1 = 0$$

$$\frac{\delta h}{\delta \Delta_b} = -2 \sum \left[h(A_o, B_o, C_o) \right] - \frac{6}{\pi^2} . A_o . x_k . S_2 = 0$$

$$\frac{\delta h}{\delta \Delta_c} = -2 \sum \left[h(A_o, B_o, C_o) \right] 1 = 0$$

$$\text{If } D_k = Y_k - f_k(A_o, B_o, C_o) = Y_k - A_o . \frac{6}{\pi^2} . S_1 - C_o$$

then equations 10-12 reduce to

$$\Delta_a . \frac{6}{\pi^2} \sum (S_1)^2 + \Delta_b . \frac{6}{\pi^2} . A_o \sum (S_1)(- x_k . S_2) + \Delta_c \sum S_1 = \sum S_1 . D_k$$

$$\Delta_a . \frac{6}{\pi^2} \sum (S_1)(- x_k . S_2) + \Delta_b . \frac{6}{\pi^2} . A_o \sum (- x_k . S_2)^2 + \Delta_c \sum (- x_k . S_2)$$

$$= \sum (- x_k . S_2 . D_k)$$

$$\Delta_a . \sum (S_1) + \Delta_b . A_o \sum (- x_k . S_2) + \Delta_c . \frac{\pi^2}{6} . N = \frac{\pi^2}{6} . \sum (D_k)$$

which are simultaneous linear equations in the adjustments $\Delta a, \Delta b$ and Δc with coefficients defined as follows

$$\begin{aligned} Q_{11} . \Delta_a + Q_{12} . \Delta_b + Q_{13} . \Delta_c &= P_1 \\ Q_{21} . \Delta_a + Q_{22} . \Delta_b + Q_{23} . \Delta_c &= P_2 \\ Q_{31} . \Delta_a + Q_{32} . \Delta_b + Q_{33} . \Delta_c &= P_3 \end{aligned}$$

and

$$Q_{11} = \frac{6}{\pi^2}\sum(S_1)^2 \qquad Q_{12} = \frac{6}{\pi^2}\cdot A_0\sum(S_1)(-x_k.S_2) \qquad Q_{13} = \sum(S_1)$$

$$Q_{21} = \frac{6}{\pi^2}\sum(S_1)(-x_k.S_2) \qquad Q_{22} = \frac{6}{\pi^2}\cdot A_0.\sum(-x_k.S_2)^2 \qquad Q_{23} = \sum(-x_k.S_2)$$

$$Q_{31} = \sum(S_1) \qquad Q_{32} = A_0.\sum(-x_k.S_2) \qquad Q_{33} = \frac{\pi^2}{6}.N$$

$$P_1 = \sum(S_1.D_k) \qquad P_2 = \sum(-x_k.S_2.D_k) \qquad P_3 = \frac{\pi}{6}^2\sum D_k$$

$$Q_{13} = Q_{31} \qquad Q_{12} = Q_{21}.A_0 \qquad Q_{32} = Q_{23}.A_1$$

If $\frac{6}{\pi^2}$ is replaced by $\frac{8}{\pi^2}$ and n^2 is replaced by $(2n-1)^2$ then the same set of equations will fit equation 3.6.

3.1.3. Implementation of curve fitting procedures

Two examples of the curve-fitting programmes are listed in this section.

The first is basically that described by flow chart Fig.3.7 in section 3.3.2.1. of the main text. The weight loss data are read in as cycle times, subroutine MOTCON is used to generate moisture contents and to call subroutine DOUBEX fitting the 2 term-exponential, equation 3.10. Starting values are calculated by the subroutine. In the version listed, MOTCON also writes on a separate file (Dataset 9) lists of moisture content and drying times to be saved for input to the type of programme of which the second one listed in this section is an example. In this, the main programme is used to read in the drying curve data and a number of parameters which decide the course of action to be taken. These give flexibility. The user can choose to fit one, two or all of equations 3.1, 3.38, 3.39, to skip individual runs within a set from one original data tape and to either supply starting values or leave their estimation to the subroutines.

3.1.31. Main program + MOTCON + DOUBEX

Type convention obeyed, except where indicated.

Variables - Main programme

IMC — Initial moisture content, % d.b. (Real)

ML — Moisture loss - g (Real)

EA(9), E(J), EB(9), EK(9) - Arrays of error functions constants.

CYCLE (200) Drying times in minutes (Real)

TIME — Current drying time in cycles (Integer)

ICYCLE — Final drying time used in Function EFUNC (Real)

FCT — Final cycle time (Integer)

N — Has dual function

1) Initially as input variable specifying no. of sets of error correction function constants to be read.

2) Identifier of error function constants under the control of ID.

M — Number of sets of correction function constants - also used in conjunction with ID.

IR — Run number

IB — Box or channel number

TE — Temperature of drying air, °C

AF — Airflow, ft/min

FMC — Final moisture content, % w.b.

IWT — Initial sample weight, g (Real)

FWT — Final sample weight, g

NBA — Number of weights added

EC — End correction (0 EC 0.51), g.

IFCB — = 1 weight added at FCT.
= 0 no weight added at FCT

DM — Dry matter

WTM — Weight of moisture in sample

AWL — Apparent weight loss, g.

DIS — Discrepancy.

KRN — Run number on second data file.

KBN — Box or channel number on second data file.

ID — Device for controlling programme.

Input

Two input files are used. Basic information and controlling directives are read from device 5 and drying curve information from device 8. In ICL 470 terms, these are not I/O devices but 80 byte/line line files identified as datasets DSET5 and DSET8.

DSET5

N

EA(1) EJ(1) EB(1) EK(1)

EA(N) EJ(N) EB(N) EK(N)

IR, IB, TE, AF

FMC IWT FWT NBA EC FCT IFCB

ID

if ID = 0 all error functions are used

= 1-9 single error function corresponding to that number is used

= 10 next dataset read

= -1 program stops

DSET8

KRN KBN

TIME

TIME (= -1)

Repeats no of datasets in record with DSET5

Variables in subroutine MOTCON (+ function EFUNC)

J error function number

A,B,C,D error function constants

CYCLE(200) array of drying times

LAST size of array CYCLE

WTM

CDIS

DM

IFCB

EC

} as calling programme.

INCR fraction of CDIS to be added to current weight addition.

MC(200)	array of moisture contents.
ICYCLE	current drying time (real)
R (5)	constants in 2 term exponential equation
EFUNC	function to evaluate INCR

Variables in subroutine DOUBEX (+ function DESD)

N	Length of data array
X (N)	array of x variable = drying times
Y (N)	array of y variable = moisture contents, % d.b.
P (5)	coefficients in simultaneous equations
Q (5,5)	in adjustments to estimated constants.
C (5)	constants being adjusted
Z (200)	array used in deriving starting values.
T (5)	temporary array of constants being adjusted.
SD (3)	array of sums of squares of feviations.
NHX	half drying time for last $\frac{2}{3}$ of data.
HY	moisture content (interpolated) at half drying time for last $\frac{2}{3}$ of data.
IT	= iteration count.
DESD	Function to calculate sums of squares of deviations.
SDMIN	Estimated minimum sums of squares of deviation.
VMIND	Intermediate value in calculation of VMIN.
VMIN	Factor by which to multiply adjustments to arrive at new estimate of minimum sums of squares of the deviations.
YFIT	Fitted values.
RESID	Residual value.

```
C                          THIN-LAYER DATA ANALYSIS
C
C PROGRAMME TO CONVERT CYCLE TIMES INTO DRYING TIMES AND
C MOISTURE CONTENTS USING ONE OR MORE OF UP TO 10 ERROR FUNCTIONS
C  SUBROUTINE DOUBEX IS USED TO FIT A DOUBLE EXPONENTIAL BY
C  OBTAINING INITIAL ESTIMATES FROM LOGARITHMIC LEAST SQUARES FITS
C  AND MAKING SMALL ADJUSTMENTS BY ITERATION.
      REAL IWT,IMC,ML,EA(9),EJ(9),EB(9),EK(9),CYCLE(200),ICYCLE
      INTEGER FCT,TIME
      WRITE(6,10)
 10   FORMAT('0',5X,'ERROR FUNCTION CONSTANTS'/5X,
     1'Y=A*EXP(-J*X)+B*EXP(-K*X)'/1X,'ERROR FUNCTION NO.',5X,
     2'A',9X,'J',9X,'B',9X,'K')
C
C     READ ERROR FUNCTION CONSTANTS AND COPY ONTO OUTPUT DOCUMENT.
 3    READ(5,83) N
      IF (N.LT.0) GO TO 2
      M=N
      READ (5,81) EA(N),EJ(N),EB(N),EK(N)
      WRITE (6,11) N,EA(N),EJ(N),EB(N),EK(N)
 11   FORMAT (' ',I6,10X,4F10.6)
      GO TO 3
C
 2    READ(5,85) IR,IB,TE,AF
      WRITE(6,84) IR,IB,TE,AF
 84   FORMAT('1',5X,'RUN NO.=',I4,5X,'BOX NO.=',I4//5X,
     1'TEMPERATURE DEG C =',13X,F5.1/5X,'AIRFLOW,FT/MIN=',
     216X,F5.1/)
C     THE RUN DATA IS READ IN, THE DRY MATTER, INITIAL MOISTURE
C     CONTENT AND DISCREPANCY CALCULATED, THEN PRINTED.
C
C
      READ (5,82) FMC,IWT,FWT,NBA,EC,FCT,IFCB
      DM=FWT*(100-FMC)*0.01
      WTM=IWT-DM
      IMC=WTM*100/DM
      ML=IWT-FWT
      AWL=NBA*0.51+EC
      DIS=ML-AWL
      WRITE(6,12) IMC,FMC,DM,IWT,FWT,NBA,DIS
 12   FORMAT(' ',4X,'INITIAL MOISTURE CONTENT,% D.B.=',F5.1/
     15X,'FINAL MOISTURE CONTENT,% W.B.=',2X,F5.1/5X,
     2'DRY MATTER,G =',18X,F6.2/5X,'INITIAL WEIGHT,G=',15X,F6.2/
     35X,'FINAL WEIGHT,G=',17X,F6.2/5X,
     4'NUMBER OF WEIGHTS ADDED=',8X,I3/5X,
     5'WEIGHT LOSS DISCREPANCY,G=',6X,F6.2)
      WRITE(6,14) EC,FCT
 14   FORMAT(' ',4X,'END CORRECTION,G=',17X,F6.2/5X,
     1'FINAL CYCLE TIME,SEC*4=',13X,I6)
      READ(8,86) KRN,KBN
 86   FORMAT(2G0.0)
      IF(KRN.EQ.IR.AND.KBN.EQ.IB) GO TO 15
      WRITE(6,87)
 87   FORMAT(' ','***DATA SETS DO NOT MATCH***')
      GO TO 8
C
```

```
C       THE MOISTURE CONTENTS ARE CALCULATED USING THE ERROR FUNCTION(S)
C       INDICATED BY A DIRECTIVE READ AFTER THE FCT
C       READ TIME CYCLES
 15     CYCLE(1)=0.0
        L=1
 5      READ(8,83) TIME
        IF(TIME.LT.0) GO TO 16
        L=L+1
        CYCLE(L)=FLOAT(TIME)/15.0
        GO TO 5
    16 LAST=L
C
C       READ DIRECTIVE
  7     READ(5,83) ID
C
C       IF THE DIRECTIVE IS NEGATIVE THE PROGRAM WILL STOP
        IF (ID.LT.0) GO TO 8
C       IF THE DIRECTIVE IS ZERO ALL ERROR FUNCTIONS ARE USED ON THE DATA
        IF (ID.EQ.0) GO TO 9
C       IF THE DIRECTIVE LIES IN THE RANGE 1-9 THE ERROR FUNCTION
C       CORRESPONDING TO THAT NUMBER IS USED ON THE DATA. IF IT IS 10 OR
C       GREATER CALCULATIONS WILL BEGIN ON A NEW SET OF RUN DATA.
        IF (ID.GE.10) GO TO 2
        N=ID
        GO TO 50
     9  N=0
    51  N=N+1
    50  A=EA(N)
        B=EJ(N)
        C=ER(N)
        D=FK(N)
C       CALCULATE THE CORRECTED DISCREPANCY
        ICYCLE=CYCLE(LAST)
        CDIS=DIS/(1-EFUNC(ICYCLE,A,B,C,D))
C       CALCULATED MOISTURE CONTENTS USING ERROR FUNCTION N
        CALL MOTCON(N,A,B,C,D,CYCLE,LAST,WTM,CDIS,DM,IFCB,EC)
C       IF THE REQUIRED MOISTURE CONTENTS HAVE BEEN CALCULATED READ A NEW
C       DIRECTIVE
        IF (N.EQ.ID) GO TO 7
        IF (N.GE.M)  GO TO 7
        GO TO 51
  81    FORMAT(4G0.0)
  82    FORMAT(7G0.0)
  83    FORMAT(G0.0)
  85    FORMAT(4G0.0)
     8  STOP
        END
C
```

```
      SUBROUTINE MOTCON(J, A, B, C, D, CYCLE, LAST, WTM, CDIS, DM, IFCB, EC)
      REAL INCR, MC(200), T(3)
      REAL R(5), CYCLE(200), ICYCLE
      ER=1.0
      WRITE (6, 21) J
   21 FORMAT ('0', 10X, 'ERROR FUNCTION NUMBER.....', I1////)
      W=WTM
      MC(1)=WTM*100/DM
      CYCLE(1)=0.0
      L=1
   52 L=L+1
      ICYCLE=CYCLE(L)
      INCR=ER-EFUNC(ICYCLE, A, B, C, D)
      ER=ER-INCR
      IF (L.EQ.LAST) GO TO 53
      W=W-(0.51+CDIS*INCR)
      MC(L)=W*100/DM
      GO TO 52
   53 W=W-(0.51*IFCB+CDIS*INCR)
      W=W-EC
      MC(L)=W*100/DM
      WRITE(9, 24) (CYCLE(L), MC(L), L=1, LAST)
   24 FORMAT(' ', 2F15.5, 1X)
      WRITE(9, 25)
   25 FORMAT(' ', 6X, '-1', 6X, '-1', 2X)
      CALL DOUBEX(CYCLE, MC, LAST, R)
      WRITE(6, 27) R
   27 FORMAT(' ', 'A=', F10.3, 5X, 'J=', F10.6, 5X, 'B=', F10.3, 5X,
     1'K=', F10.6, 'C=', F10.3)
      RETURN
      END



      REAL FUNCTION EFUNC(TC, A, B, C, D)
      TC=TC*15.0
      P=0
      IF ((-B*TC).LT.(-10)) GO TO 101
      P=A*EXP(-B*TC)
  101 Q=0
      IF ((-D*TC).LT.(-10)) GO TO 102
      Q=C*EXP(-D*TC)
  102 EFUNC=P+Q
      RETURN
      END
C
```

```
  320
      SUBROUTINE DOUBEX(X,Y,N,C)
C
C     DOUBEX CALCULATES THE CONSTANTS IN THE FUNCTION
C                        Y=A*EXP(J*X)+B*EXP(K*X)+C
C     WHICH CORRESPOND TO A LEAST SQUARES FIT OF THF INPUT DATA
C
      REAL X(N),NHX
      REAL  SAVE(5)
      REAL Y(N),P(5),Q(5,5),C(5),Z(200),T(5),SD(3)
      DO 299  I=1,5
      P(I)=0.0
      DO 299 K=1,5
  299 Q(I,K)=0.0
C
C     CALCULATE STARTING VALUES OF A,J,B,K AND C
C
C     CALCULATE STARTING VALUES FOR B,K AND C BY FITTING A SINGLE EXP
C     TO THE LAST 2/3 RDS OF THE DATA BY LOG LEAST SQUARES
      M=N/3
      NHX=X(M)+((X(N)-X(M))/2)
      DO 300 K=M,N
      IF (X(K)-NHX) 300,301,303
  300 CONTINUE
  301 HY=Y(K)
      GO TO 302
  303 HY=Y(K)+((X(K)-NHX)*(Y(K-1)-Y(K)))/(X(K)-X(K-1))
  302 C(5)=((Y(M)*Y(N))-(HY**2))/(Y(M)+Y(N)-(2*HY))
      IF(C(5).GE.Y(N)) C(5)=Y(N)-0.25
      DO 304 K=M,N
  304 Z(K)=ALOG(Y(K)-C(5))
      J=N
  318 DO 305 K=M,J
      Q(1,2)=Q(1,2)+X(K)
      Q(2,2)=Q(2,2)+(X(K)**2)
      P(1)=P(1)+Z(K)
  305 P(2)=P(2)+Z(K)*X(K)
      Q(1,1)=J-M+1
      Q(2,1)=Q(1,2)
      D=Q(1,1)*Q(2,2)-(Q(1,2)**2)
      IF (M.EQ.1) GO TO 315
      WRITE (6,407) NHX,HY,(Q(I,1),Q(I,2),P(I),I=1,2)
      C(3)=(P(1)*Q(2,2)-Q(1,2)*P(2))/D
      C(4)=(Q(1,1)*P(2)-P(1)*Q(1,2))/D
      C(3)=EXP(C(3))
C
C     RESET P AND Q ARRAYS TO ZERO
C
      DO 316 K=1,2
      Q(1,K)=0.0
      Q(2,K)=0.0
  316 P(K)=0.0
C
C     CALCULATE THE COMPONENT OF Y DUE TO THE REMAINING EXPONENTIAL
C     HENCE OBTAIN A AND J BY LOG LEAST SQUARES
       DO 317 K=1,N
      CY=Y(K)-C(3)*EXP(C(4)*X(K))-C(5)
      IF (CY.LE.0.0) GOTO 331
  317 Z(K)=ALOG(CY)
  331 J=K-1
      IF (J.LE.1) GO TO 350
      M=1
      DO 332  ND=K,N
  332 Z(ND)=0.0
      GO TO 318
```

```
  315 C(1)=(Q(2,2)*P(1)-P(2)*Q(1,2))/D
      C(2)=  (( Q(1,1)*P(2))- (P(1)*Q(1,2)))/D
      C(1)=EXP(C(1))
      WRITE (6,401) (Q(I,1),Q(I,2),P(I),I=1,2),(C(K),K=1,5)
C
C     SET UP SIMULTANEOUS EQUATIONS THE SOLUTIONS OF WHICH GIVE
C     ADJUSTMENTS TO A,J,B,K AND C.
C
      IT=0
C     COUNT ITFRATIONS
  310 IT=IT+1
      SD(1)=0.0
      IF(C(2).GT.0.0.OR.C(4).GT.0.0) GO TO 351
C
C     RESET P AND Q ARRAYS TO ZERO
      DO 319 K=1,5
      SAVE(K) = C(K)
      P(K)=0.0
      DO 319 I=1,5
  319 Q(K,I)=0.0
      DO 306 K=1,N
      XPA=0.0
      IF   ((C(2)*X(K)) .LT.(-40))  GO TO 320
      XPA=EXP(C(2)*X(K))
  320 XPB=0
      IF  ( (C(4)*X(K)).LT.(-40))  GO TO 321
      XPB=EXP(C(4)*X(K))
  321 XPC=0.0
      IF  ((2*C(2)*X(K)).LT.(-40)) GO TO 322
      XPC=EXP(2*C(2)*X(K))
  322 XPD=0.0
      IF  ((2*C(4)*X(K)) .LT.(-40))  GO TO 323
      XPD=EXP(2*C(4)*X(K))
  323 XPE=0.0
      IF  (((C(2)+C(4))*X(K)) .LT.(-40))  GO TO 324
      XPE=EXP((C(2)+C(4))*X(K))
  324 Q(1,1)=Q(1,1)+XPC
      Q(1,2)=Q(1,2)+(X(K)*XPC)
      Q(1,3)=Q(1,3)+XPE
      Q(1,4)=Q(1,4)+(X(K)*XPE)
      Q(1,5)=Q(1,5)+XPA
      Q(2,2)=Q(2,2)+((X(K)**2)*XPC)
      Q(2,4)=Q(2,4)+((X(K)**2)*XPE)
      Q(2,5)=Q(2,5)+(X(K)*XPA )
      Q(3,3)=Q(3,3)+XPD
      Q(3,4)=Q(3,4)+(X(K)*XPD)
      Q(3,5)=Q(3,5)+XPB
      Q(4,4)=Q(4,4)+((X(K)**2)*XPD)
      Q(4,5)=Q(4,5)+(X(K)*XPB)
      D=Y(K) - (C(1)*XPA) - (C(3)*XPB) - C(5)
      SD(1)=SD(1)+D*D
      P(1)=P(1)+D*XPA
      P(2)=P(2)+D*X(K)*XPA
      P(3)=P(3)+D*XPB
      P(4)=P(4)+D*X(K)*XPB
  306 P(5)=P(5)+D
      Q(2,1)=Q(1,2)
      Q(2,3)=Q(1,4)
      Q(3,1)=Q(1,3)
      Q(3,2)=Q(1,4)
      Q(4,1)=Q(1,4)
      Q(4,2)=Q(2,4)
      Q(4,3)=Q(3,4)
```

```
      Q(5,1)=Q(1,5)
      Q(5,2)=Q(2,5)
      Q(5,3)=Q(3,5)
      Q(5,4)=Q(4,5)
      Q(5,5)=N
      DO 312 I=1,5
      Q(I,2)=C(1)*Q(I,2)
  312 Q(I,4)=C(3)*Q(I,4)
      WRITE (6,402) IT,((Q(I,J),J=1,5),P(I),I=1,5)
C
C     SOLVE SIMULTANEOUS EQUATIONS
      CALL MATINV(Q,5,P,DETERM,ID)
C
C     SET A,J,B,K AND C TO ADJUSTED VALUES
C
      WRITE(6,420) SD(1)
  420 FORMAT('    ***SUM OF SQUARES OF DEVIATIONS= ',E12.5/)
      WRITE(6,3000) P
 3000 FORMAT(' ','ADJUSTMENTS=',5(5X,E12.5))
      ND=0
      DO 307 I=1,5
  307 T(I)=C(I)+P(I)
      IF(T(2))1,2,2
    2 T(2)=C(2)
      P(2)=0.0
      WRITE (6,4)
    4 FORMAT(' ','*** POSITIVE EXPONENT,ADJUSTMENT SET TO ZERO')
    1 CONTINUE
      SD(3)=DESD(Y,X,N,T)
  506 DO 500 I=1,5
  500 T(I)=C(I)+P(I)*0.5
      SD(2)=DESD(Y,X,N,T)
      WRITE(6,1000) SD(3),SD(2)
 1000 FORMAT(' ',2(5X,E12.5))
C
      VMIND=(SD(3)-2.0*SD(2)+SD(1))
      IF(ABS(VMIND).LT.0.0000001) GO TO 503
      VMIN=0.5+0.25*(SD(1)-SD(3))/VMIND
C
      DO 501 I=1,5
  501 T(I)=C(I)+P(I)*VMIN
      SDMIN=DESD(Y,X,N,T)
      WRITE(6,600) VMIN,SDMIN,ND
  600 FORMAT('0',5X,'VMIN=',F10.5,5X,'SDMIN=',F12.5,5X,'ND=',I3)
      IF(SD(1)-SDMIN) 502,503,504
  502 SD(3)=SD(2)
      ND=ND+1
      DO 505 I=1,5
  505 P(I)=0.5*P(I)
      GOTO 506
C
  503 WRITE(6,601)
  601 FORMAT('0',10X,'***COMPLETE CONVERGENCE***')
      GO TO 311
C
  504 DO 507 I=1,5
  507 C(I)=T(I)
      IF((SD(1)-SDMIN)/SDMIN.GT.0.002) GO TO 308
      GO TO 311
C
C     MAXIMUM NUMBER OF ITERATIONS = 15
C
  308 IF (IT.LT.15) GO TO 310
      WRITE (6,403)
  403 FORMAT (' ','*******TOO MANY ITERATIONS*******')
```

```
C
C       CALCULATE EXPECTED VALUES AND RESIDUALS
C
  311 WRITE (6,405) IT
      DO 314 I=1,N
      XPA=0.0
      IF  ((C(2)*X(I)) .LT.(-40) )  GO TO 340
      XPA=EXP(C(2)*X(I))
  340 XPB=0.0
      IF  ((C(4)*X(I)) .LT.(-40)) GO TO 341
      XPB=EXP(C(4)*X(I))
  341 YFIT= (C(1)*XPA) + (C(3)*XPB) + C(5)
      RESID= Y(I) - YFIT
  314 WRITE (6,406) X(I),Y(I),YFIT,RESID,Z(I)
      SD(1)=SD(1)/N
      WRITE(6,700) SD(1),N
  700 FORMAT('0','VARIANCE=',F12.3,5X,'N=',I4)
  401 FORMAT (' ',3(3X,E11.4)/3(3X,E11.4)///' STARTING VALUES'/5(3X,E11.
     14))
  402 FORMAT (' ','ITERATION NUMBER.....',I2//(6(3X,E11.4)/))
  405 FORMAT ('0','FINAL ITERATION NUMBER.....',I2//5X,'TIME',6X,'M.C.'
     1,8X,'PREDICTED',7X,'Y-E(Y)',4X,'Z'/4X,'  MIN ',4X,'0/0 D.B.',10X,'
     2VALUE')
  406 FORMAT (' ',F10.2,F10.2,5X,F10.2,5X,F10.4,F10.4)
  407 FORMAT ('0',20X,'DOUBLE EXPONENTIAL FIT'//' CYCLE TIME AT THE MID-
     1POINT OF THE PERIOD COVERED BY THE LAST 2/3 RDS OF THE DATA',F10.
     22/'MOISTURE CONTENT AT THIS POINT',F6.2/(3(3X,E11.4)/))
      RETURN
  350 WRITE (6,408)
  408 FORMAT (' *** J=1 STARTING VALUE OF FIRST EXPONENTIAL TERM NOT FOU
     1ND')
      RETURN
  351 WRITE(6,409)
  409 FORMAT (' ***POSITIVE EXPONENT. CONTROL RETURNED TO MOTCON')
      RETURN
      END



      REAL FUNCTION DESD(Y,X,N,C)
      REAL Y(N),X(N),C(5)
      DESD=0.0
      DO 10 I=1,N
      XPA=0.0
      C1=C(2)*X(I)
      IF(C1.LT.(-40)) GO TO 1
      XPA=EXP(C1)
    1 XPB=0.0
      C2=C(4)*X(I)
      IF (C2.LT.(-40)) GO TO 2
      XPB=EXP(C2)
    2 D=Y(I)-(C(1)*XPA) - (C(3)*XPB) -C(5)
   10 DESD =DESD + D*D
      RETURN
      END
```

```
      SUBROUTINE MATINV(A,N,B,DETERM,ID)
C
C     MATRIX INVERSION WITH ACCOMPANYING SOLUTION OF LINEAR EQUATIONS
C
      DIMENSION A(5,5),B(5),INDEX(5,3)
      EQUIVALENCE (IROW,JROW), (ICOLUM,JCOLUM),(AMAX,T,SWAP)
C
C INITIALISATION
C
      DETERM = 1.0
      DO 20 J=1,N
   20 INDEX(J,3)=0
C
C SEARCH FOR PIVOT ELEMENT
C
      DO 550 I=1,N
      AMAX=0
      DO 105 J=1,N
      IF (INDEX(J,3)-1) 60,105,60
   60 DO 100 K=1,N
      IF(INDEX(K,3)-1) 80,100,715
   80 IF(AMAX - ABS(A(J,K))) 85,100,100
   85 IROW = J
      ICOLUM = K
      AMAX = ABS(A(J,K))
  100 CONTINUE
  105 CONTINUE
C
      INDEX(ICOLUM,3)   = INDEX(ICOLUM,3) +1
      INDEX(I,1) = IROW
      INDEX(I,2) = ICOLUM
C
C INTER CHANGE ROWS TO PUT PIVOT ELEMENT ON DIAGONAL
C
      IF (IROW.EQ.ICOLUM) GOTO 310
      DETERM = -DETERM
      DO 200 L=1,N
      SWAP= A(IROW,L)
      A(IROW,L) = A(ICOLUM,L)
  200 A(ICOLUM,L) = SWAP
C
C SWAP CONSTANTS
      SWAP = B(IROW)
      B(IROW) = B(ICOLUM)
      B(ICOLUM)= SWAP
C
C DIVIDE PIVOT ROW BY PIVOT ELEMENT
C
  310 PIVOT  =A(ICOLUM,ICOLUM)
      DETERM = DETERM*PIVOT
      A(ICOLUM,ICOLUM) = 1.0
      DO 350 L=1,N
  350 A(ICOLUM,L) = A(ICOLUM,L)/PIVOT
      B(ICOLUM) = B(ICOLUM)/PIVOT
C
C REDUCE NON-PIVOT ROWS
C
```

```
      DO 550 L1 =1,N
      IF (L1.EQ.ICOLUM) GO TO 550
      T = A(L1,ICOLUM)
      DO 450 L=1,N
  450 A(L1,L) = A(L1,L) - A(ICOLUM,L)*T
      B(L1) = B(L1) - B(ICOLUM)*T
  550 CONTINUE
C
C  INTERCHANGE COLUMNS
C
      DO 710  I =1,N
      L =N+1-I
      IF(INDEX(L,1).EQ.INDEX(L,2)) GOTO 710
      JROW =INDEX(L,1)
      JCOLUM = INDEX(L,2)
      DO 705 K=1,N
      SWAP = A(K,JROW)
      A(K,JROW) = A(K,JCOLUM)
      A(K,JCOLUM) = SWAP
  705 CONTINUE
  710 CONTINUE
C
      DO 730 K=1,N
      IF (INDEX(K,3).EQ.1) GO TO 730
      ID=2
      GO TO 740
  730 CONTINUE
      ID = 1
C
  740 RETURN
C
  715 ID=2
      GOTO 740
      END
```

```
 RUN NO.= 131     BOX NO.=   2

TEMPERATURE DEG C =                35.3
AIRFLOW,FT/MIN=                   20.6

INITIAL MOISTURE CONTENT,% D.B.= 66.6
FINAL MOISTURE CONTENT,% W.B.=    8.5
DRY MATTER,G =                   60.02
INITIAL WEIGHT,G=               100.00
FINAL WEIGHT,G=                  65.60
NUMBER OF WEIGHTS ADDED=         62
WEIGHT LOSS DISCREPANCY,G=        2.68
END CORRECTION,G=                   0.10
FINAL CYCLE TIME,SEC*4=              36113
        ERROR FUNCTION NUMBER.......1


                    DOUBLE EXPONENTIAL FIT

CYCLE TIME AT THE MID-POINT OF THE PERIOD COVERED BY THE LAST 2/3 RDS OF THE DATA   1240.53
MOISTURE CONTENT AT THIS POINT 10.28
   0.4400E 02    0.2018E 05    0.1078E 03

   0.2018E 05    0.1816E 08    0.2160E 05

    0.1700E 02    0.2188E 03    0.1262E 02
   0.2188E 03    0.6148E 04   -0.1034E 03


STARTING VALUES
   0.5868E 01   -0.7979E-01    0.4860E 02   -0.3127E-02    0.9275E 01
ITERATION NUMBER..... 1

   0.7148E 01    0.1033E 03    0.9159E 01    0.1988E 04    0.9290E 01    0.5367E 01

   0.1760E 02    0.8012E 03    0.4090E 02    0.3238E 05    0.4308E 02   -0.1245E 02

   0.9159E 01    0.2400E 03    0.2658E 02    0.9138E 05    0.3545E 02    0.2915E 01

   0.4090E 02    0.3909E 04    0.1880E 04    0.1956E 08    0.4286E 04    0.5132E 02

   0.9290E 01    0.2528E 03    0.3545E 02    0.2083E 06    0.6400E 02    0.3526E 01

  ***SUM OF SQUARES OF DEVIATIONS=  0.20063E 02

ADJUSTMENTS=      0.13465E 01    -0.50303E-01      0.70750E-01    -0.39746E-05      0.32099E-01
     0.70971E 01      0.11427E 02

    VMIN=   1.25260     SDMIN= 0.63005E 01     ND=  0
ITERATION NUMBER..... 2

   0.5616E 01    0.6511E 02    0.7401E 01    0.9578E 03    0.7464E 01   -0.7821E 00

   0.8619E 01    0.2811E 03    0.1967E 02    0.8190E 04    0.2021E 02   -0.5344E 01

   0.7401E 01    0.1486E 03    0.2657E 02    0.9135E 05    0.3543E 02   -0.2583E 01

   0.1967E 02    0.1271E 04    0.1876E 04    0.1953E 08    0.4279E 04   -0.9884E 02

   0.7464E 01    0.1527E 03    0.3543E 02    0.2084E 06    0.6400E 02   -0.3025E 01

  ***SUM OF SQUARES OF DEVIATIONS=  0.63005E 01

ADJUSTMENTS=      0.84665E-01    -0.24755E-01      0.14351E-01    -0.12552E-04      0.34848E-01
     0.52634E 01      0.56306E 01

    VMIN=   1.35661     SDMIN= 0.51466E 01     ND=  0
ITERATION NUMBER..... 3

   0.5109E 01    0.5085E 02    0.6821E 01    0.7416E 03    0.6870E 01    0.1565E 00

   0.6630E 01    0.1806E 03    0.1522E 02    0.5074E 04    0.1556E 02   -0.3702E 00

   0.6821E 01    0.1168E 03    0.2650E 02    0.9073E 05    0.3536E 02    0.3765E 00

   0.1522E 02    0.7989E 03    0.1863E 04    0.1932E 08    0.4256E 04    0.2506E 02

   0.6870E 01    0.1193E 03    0.3536E 02    0.2073E 06    0.6400E 02    0.5006E 00

  ***SUM OF SQUARES OF DEVIATIONS=  0.51466E 01

ADJUSTMENTS=      0.41194E-01    -0.75882E-02      0.35143E-01    -0.48804E-05      0.13940E-01
     0.50915E 01      0.51118E 01

    VMIN=   1.44937     SDMIN= 0.50857E 01     ND=  0
```

ITERATION NUMBER..... 4

0.4969E 01	0.4750E 02	0.6660E 01	0.6901E 03	0.6705E 01	-0.7625E-01
0.6145E 01	0.1597E 03	0.1415E 02	0.4438E 04	0.1444E 02	-0.1915E 00
0.6660E 01	0.1094E 03	0.2648E 02	0.9055E 05	0.3533E 02	-0.2054E 00
0.1415E 02	0.7034E 03	0.1857E 04	0.1925E 08	0.4246E 04	-0.1210E 02
0.6705E 01	0.1116E 03	0.3533E 02	0.2070E 06	0.6400E 02	-0.2632E 00

***SUM OF SQUARES OF DEVIATIONS= 0.50857E 01

ADJUSTMENTS= -0.60418E-02 -0.91978E-03 -0.26624E-02 -0.85269E-06 0.23533E-02
0.50832E 01 0.50839E 01

VMIN= 1.07290 SDMIN= 0.50832E 01 ND= 0

FINAL ITERATION NUMBER..... 4

TIME MIN	M.C. O/O D.B.	PREDICTED VALUE	Y-E(Y)	Z
0.00	66.62	65.87	0.7496	2.1678
0.33	65.76	65.35	0.4100	2.0705
0.53	64.90	65.05	-0.1475	1.9605
1.00	64.04	64.59	-0.3533	1.8418
1.60	63.17	63.61	-0.4473	1.7100
2.40	62.29	62.69	-0.4019	1.5632
3.13	61.42	61.95	-0.5298	1.3889
4.67	60.52	60.64	-0.1225	1.2063
6.47	59.61	59.44	0.1642	0.9941
8.73	58.69	58.31	0.3772	0.7502
11.00	57.74	57.20	0.5434	0.4848
16.27	56.76	56.07	0.6927	0.2540
21.20	55.76	55.13	0.6333	0.0030
25.07	54.78	54.38	0.4028	-0.3839
32.27	53.76	53.44	0.3209	-0.6028
38.13	52.76	52.62	0.1402	-1.0631
44.40	51.76	51.77	-0.0127	-1.7218
50.07	50.77	51.02	-0.2429	0.0000
58.20	49.74	49.96	-0.2184	0.0000
67.13	48.71	48.83	-0.1267	0.0000
73.53	47.73	48.04	-0.3138	0.0000
81.67	46.73	47.06	-0.3358	0.0000
89.60	45.74	46.13	-0.3934	0.0000
99.33	44.73	45.02	-0.2917	0.0000
107.00	43.75	44.08	-0.3320	0.0000
116.40	42.77	43.15	-0.3768	0.0000
126.40	41.79	42.10	-0.3120	0.0000
136.13	40.82	41.11	-0.2935	0.0000
146.27	39.85	40.11	-0.2621	0.0000
156.53	38.89	39.13	-0.2424	0.0000
166.67	37.94	38.20	-0.2566	0.0000
179.20	36.97	37.08	-0.1034	0.0000
189.93	36.03	36.16	-0.1205	0.0000
201.67	35.09	35.18	-0.0873	0.0000
213.80	34.16	34.21	-0.0532	0.0000
226.33	33.23	33.25	-0.0204	0.0000
241.53	32.29	32.13	0.1599	0.0000
254.33	31.37	31.23	0.1442	0.0000
266.73	30.47	30.39	0.0742	0.0000
280.87	29.56	29.48	0.0804	0.0000
296.13	28.65	28.53	0.1172	0.0000
314.67	27.73	27.44	0.2925	0.0000
328.00	26.84	26.70	0.1469	0.0000
344.53	25.95	25.82	0.1331	0.0000
365.73	25.05	24.75	0.2976	0.0000
380.87	24.17	24.04	0.1340	0.0000
404.40	23.28	22.99	0.2917	0.0000
422.33	22.40	22.24	0.1636	0.0000
443.33	21.52	21.41	0.1110	0.0000
469.53	20.65	20.46	0.1875	0.0000
494.60	19.77	19.62	0.1577	0.0000
523.53	18.90	18.72	0.1797	0.0000
552.60	18.04	17.90	0.1315	0.0000
584.53	17.17	17.09	0.0837	0.0000
621.00	16.31	16.25	0.0582	0.0000
661.47	15.45	15.43	0.0206	0.0000
705.67	14.59	14.64	-0.0511	0.0000
752.73	13.73	13.91	-0.1820	0.0000
822.60	12.88	13.02	-0.1417	0.0000
906.00	12.02	12.18	-0.1549	0.0000
1026.00	11.17	11.30	-0.1273	0.0000
1212.93	10.32	10.44	-0.1265	0.0000
1787.73	9.47	9.56	-0.0900	0.0000
2407.53	9.30	9.41	-0.1085	0.0000

VARIANCE= 0.079 N= 64
A= 7.723 J= -0.188371 B= 48.760 K= -0.003157C= 9.385

3.1.3.2 Main programme + subroutines SINGEX & SEREX

Subroutines LREG and MATINV are also used and are included in the program listing but the variables are not described. LREG is a simple linear regression procedure and is used in the derivation of starting values by SEREX.

Variables in the main programme

X (200)	Array of drying times, x
Y (200)	Array of moisture contents, y
C (3)	(a) On input = array of starting values or if C (1) = -ve starting values are to be calculated within relevant subroutine. If starting values are supplied, exponent C (2) may be entered as +ve or -ve but will be set -ve. (b) On output = final values of constants.
N	Identifies secondary input dataset 7 = DSET7 = 132 byte/line 8 = DSET8 = 80 byte/line
IR	Run number - if -ve program terminates
LAST	- length of current X and Y arrays.

NS = 3 = fit single exponential

= 2 = fit exponential series for plane sheet

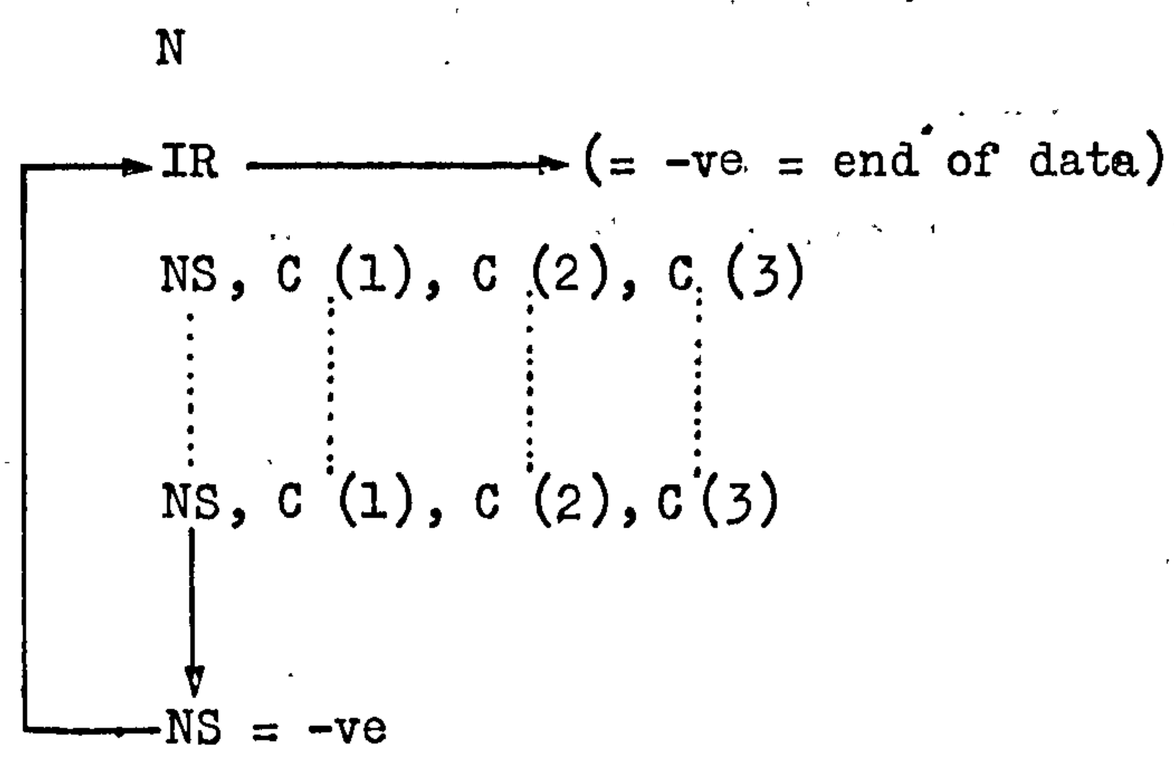
= 1 = fit exponential series for sphere

= -1 = next data set read

Input

Two input files are used. Controlling directions and starting values (if any) are read from DSET5 and drying curve information from DSET8 or DSET7.

DSET 5



Variables in subroutine SINGEX

N	length of drying curve arrays
X (N)	array of drying times, x
Y (N)	array of moisture contents, y
C (3)	(a) on input = array of starting values or if C (1) = -ve starting values are derived by programme.
	(b) on output = final values of constants.
P (3), Q (3,3)	Coefficients of simultaneous equations in adjustments to constants.
Z (200)	Array used in calculation of starting values.
SD (3)	Array of sums of squares of deviations of observed from predicted values of y.
T (3)	Array of temporarily adjusted constants in convergence loop.
NHX	Half final cycle time
HY	Moisture content at half-final cycle time.
AL, BL, CL	Saved starting values.
IT	Iteration count.
VMIND	intermediate value of VMIN
VMIN	factor for modifying adjustments
SDMIN	minimum value of sums of squares of deviations at each iteration.

YFIT	Predicted y value at given value of x after final convergence.
RESID	Deviation of observed from final predicted value of y at given value of x.
FITLOG	y value predicted by starting values at given value of x
DIFLOG	Deviation of observed values of y from value predicted by starting values at same value of x.
SSD	Function to calculate sum of squares of deviations.

Variables in subroutine SEREX

N	length of drying curve arrays
X (N)	array of drying times, x
Y (N)	array of moisture contents, y
C (3)	(a) on input = array of starting values or if C (1) = -ve starting values are derived by programme. (b) on output = final values of constants.
NS = 1	- fit sphere equation
= 2	- fit plane sheet equation
P (3), Q (3,3)	Coefficients of simultaneous equations in adjustments to constants.
YA (200)	Array used in calculating starting values (= ln (M - M_e))
SD (3)	Array of sums of squares of deviations of observed from predicted values of y.
T (3)	Array of temporarily adjusted contents in convergence loop.
PI =	$6/\pi^2$ or $8/\pi^2$ depending upon value of NS.
S1	S1 of equation 3.61 (page 310)
S2	(S2 of equation 3.62 (page 310)) $^{**}_k$

SA	function evaluating exponential series S1
SB	function evaluating differentiated exponential series S2
SESD	function to calculate sum of sequence of deviations.
IT	iteration count.
VMIND	intermediate value of VMIN
VMIN	factor for modifying adjustments.
SDMIN	minimum value of sums of squares of deviation at each iteration.
YFIT	Predicted value of y at given x after final convergence.
RESID	Deviation of observed from final predicted value of y at given value of x

Fortran listing of main programme ,SINGEX & SEREX.

```
C       PROGRAMME TO FIT SINGLE & SERIES EXPONENTIALS TO
C       DRYING CURVES READ FROM DSET8(80 BYTE) OR
C       DSET7(132 BYTE).
C      NS=3=SINGLE    =2=SERIES SLAB    =1=SERIES SPHERE
C       STARTING VALUES CALCULATED IF C(1).LT.0
C       EXPONENT C(2) MAY BE ENTERED +VE OR -VE
C       BUT WILL BE SET TO -VE
C       INDIVIDUAL DRYING RUNS CAN BE SKIPPED
        REAL X(200),Y(200),C(3)
C       READ DSET
        READ(5,1) N
 1      FORMAT(G0.0)
C       READ RUN NO.
 14     READ(5,1) IR
        IF(IR) 15,16,16
 16     J=0
 6      J=J+1
        IF(N.NE.7) GO TO 3
        READ(7,4) X(J),Y(J)
 4      FORMAT(2G0.0)
        GO TO 5
 3      READ(8,4) X(J),Y(J)
 5      IF(X(J)) 7,6,6
 7      LAST=J-1
C       READ STARTING VALUES
 13     READ(5,2) NS,C
 2      FORMAT(4G0.0)
        IF(NS.LT.0) GO TO 14
        IF(NS.NE.3) GO TO 8
        WRITE(6,9) IR
 9      FORMAT('1',20X,'RUN NO=',I4//
       110X,'SINGLE EXPONENTIAL FIT'//)
        IF(C(2).GT.0.0) C(2)=-C(2)
        CALL SINGEX(X,Y,LAST,C)
        GO TO 11
 8      WRITE(6,12) IR
 12     FORMAT('1',20X,'RUN NO=',I4//)
        IF(C(2).LT.0.0) C(2)=-C(2)
        CALL SEREX(X,Y,LAST,C,NS)
 11     WRITE(9,10) IR,C,NS
 10     FORMAT(' ','RUN',I4,F8.3,F10.6,F8.3,I5)
        GO TO 13
 15     WRITE(9,17)
 17     FORMAT('***STOP***')
        STOP
        END
```

```
      SUBROUTINE SEREX(X,Y,N,C,NS)
C     TO FIT DIFFUSION SERIES BY ITERATIVE LEAST SQUARES
      REAL Y(N),C(3),P(3),Q(3,3),X(N),SD(3),T(3),YA(200)
      PI=0.6077694
      IF(NS.EQ.2)PI=0.80991736
      IF(C(1).GT.0.0) GO TO 10
C     CALCULATE STARTING VALUES BY LOGARITHMIC LEAST SQUARES
C
      C(3)=Y(N)-0.5
C
      DO 30 K=1,N
   30 YA(K)=ALOG(Y(K)-C(3))
      CALL LREG(X,YA,N,B,A,R,VR,SDMIN,SEB,0)
C
      C(1)=EXP(A)
      C(2)=-B
   10 IF(NS.EQ.2) GO TO 11
      WRITE (6,31) C
   31 FORMAT(' ',10X,'EXPONENTIAL SERIES FIT- SPHERE'//
     15X,'STARTING VALUES C(1)=',F12.6,3X,'C(2)=',F12.6,
     2'C(3)=',F12.6//)
      GO TO 12
   11 WRITE(6,32) C
   32 FORMAT('1',10X,'EXPONENTIAL SERIES FIT - J=(2*N)-1'//
     15X,'STARTING VALUES C(1)=',F12.6,3X,'C(2)=',F12.6,
     2'C(3)=',F12.6//)
C
C     SET UP SIMULTANEOUS EQUATIONS IN ADJUSTMENTS TO THE CONSTANTS
C
   12 IT=0
   40 IT=IT+1
      IF (C(2).LT.0.0) GO TO 100
C     RESET P,Q AND SD ARRAYS TO ZERO
      DO 41 I=1,3
      P(I)=0.0
      SD(I)=0.0
      DO 41 L=1,3
   41 Q(I,L)=0.0
C
      DO 42 K=1,N
      S1=SA(C(2),X(K),NS)
      S2=SA(C(2),X(K),NS)*X(K)
      Q(1,3)=Q(1,3)+S1
      Q(1,1)=Q(1,1)+(S1**2)
      Q(2,1)=Q(2,1)+(S1*(-S2))
      Q(2,2)=Q(2,2)+((-S2)**2)
      Q(2,3)=Q(2,3)+S2
      DK=Y(K)-C(1)*PI*S1-C(3)
      P(1)=P(1)+S1*DK
      P(2)=P(2)+((-S2)*DK)
      P(3)=P(3)+DK
   42 SD(1)=SD(1)+(DK**2)
C
      Q(1,1)=Q(1,1)*PI
      Q(2,1)=Q(2,1)*PI
      Q(1,2)=Q(2,1)*C(1)
      Q(3,1)=Q(1,3)
      Q(3,2)=Q(2,3)*C(1)
      Q(2,2)=Q(2,2)*PI*C(1)
      Q(3,3)=FLOAT(N)/PI
      P(3)=P(3)/PI
C
```

```
      CALL MATINV(Q,3,P,DETERM,ID)
C
      WRITE(6,420) SD(1)
  420 FORMAT('    ***SUM OF SQUARES OF DEVIATIONS= ',E11.4/)
      WRITE(6,3000) P
 3000 FORMAT(' ','ADJUSTMENTS= ',3(5X,E12.5))
      ND=0
      DO 499 I=1,3
  499 T(I)=C(I)+P(I)
      SD(3)=SESD(Y,X,N,T,NS)
      WRITE (6,1000) SD(3)
 1000 FORMAT (' ',E11.4)
  506 DO 500 I=1,3
  500 T(I)=C(I)+P(I)*0.5
      SD(2)=SESD(Y,X,N,T,NS)
      WRITE (6,1000) SD(2)
C
      VMIND=(SD(3)-2.0*SD(2)+SD(1))
      IF(ABS(VMIND).LT.0.0000001) GO TO 503
      VMIN=0.5+0.25*(SD(1)-SD(3))/VMIND
C
      DO 501 I=1,3
  501 T(I)=C(I)+P(I)*VMIN
      SDMIN=SESD(Y,X,N,T,NS)
C
      WRITE(6,600) VMIN,SDMIN,ND
  600 FORMAT('0',5X,'VMIN=',F10.5,5X,'SDMIN=',E12.5,5X,'ND=',I3)
C
      IF(SD(1)-SDMIN) 502,503,504
  502 SD(3)=SD(2)
      ND=ND+1
      DO 505 I=1,3
  505 P(I)=0.5*P(I)
      GO TO 506
C
  503 WRITE(6,601)
  601 FORMAT('0',10X,'***COMPLETE CONVERGENCE***')
      GO TO 311
C
  504 DO 507 I=1,3
  507 C(I)=T(I)
      IF((SD(1)-SDMIN)/SDMIN.GT.0.002) GO TO 308
      GO TO 311
C
C MAXIMUM NUMBER OF ITERATIONS = 20
C
  308 IF(IT.LT.20) GO TO 40
      WRITE (6,403)
  403 FORMAT(' ','********TOO MANY ITERATIONS*******')
C
C CALCULATE EXPECTED VALUES AND RESIDUALS
C
  311 WRITE(6,405)IT
  405 FORMAT('0','***FINAL ITERATION NUMBER',I8//5X,'TIME',6X,'M.C.',8X,
     1'PREDICTED',7X,'Y-E(Y)'/4X,'MIN',4X,'% D.B.',10X,'VALUE'/)
C
```

```
C
      DO 314 I=1,N
      YFIT=(C(1)*PI*SA(C(2),X(I),NS)) + C(3)
      YA(I)=YFIT
      RESID =Y(I)-YFIT
  314 WRITE(6,406) X(I),Y(I),YFIT,RESID
  406 FORMAT(' ',F10.2,F10.2,5X,F10.2,5X,F10.4)
      SD(1)=SD(1)/N
      WRITE(6,700) C,SD(1),N
  700 FORMAT('0','MO-ME=',F10.3,'    K=',F10.6,'    ME=',F10.3,
     1'  VARIANCE=',F10.4,'  N=',I4)
      RETURN
C
  100 WRITE (6,101)
  101 FORMAT(' ***POSITIVE EXPONENT..CONTROL RETURNED TO MOTCON'/)
      WRITE (6,102)(X(I),Y(I),I=1,N)
  102 FORMAT(' ',2F10.2)
      RETURN
C
      END
C



      FUNCTION SA(B,THETA,NS)
C
      REAL KT
C     VALUE SET AT ZERO TIME SINCE THIS CANNOT BE EVALUATED NUMERICALLY
      SA=1.645361
      IF(NS.EQ.2) SA=1.2346939
      IF(THETA.LT.0.000001) GO TO 11
      SA=0.0
      TT=-(B*THETA)
C
      DO 10 J=1,150
      IF(NS.EQ.1) N=J
      IF(NS.EQ.2) N=(J*2)-1
      KT=TT*FLOAT(N**2)
      IF(KT.LT.-100.0) GO TO 11
      R=EXP(KT)*(1.0/FLOAT(N**2))
      SA=SA+R
      IF(R.LT.0.000000001) GO TO 11
   10 CONTINUE
   11 RETURN
      END
C
```

```
      FUNCTION SB(B, THETA, NS)
C
      REAL KT
      SB=0.0
      TT=-(B*THETA)
C
      DO 10 J=1,150
      IF(NS.EQ.1) N=J
      IF(NS.EQ.2) N =(J*2) - 1
      KT=TT*FLOAT(N**2)
      IF(KT.LT.-100.0) GO TO 11
      R=EXP(KT)
      SB=SB+R
      IF(R.LT.0.000000001) GO TO 11
   10 CONTINUE
   11 RETURN
      END
C


      FUNCTION SESD(Y,X,K,C,NS)
      REAL Y(K),X(K),C(3)
      SESD=0.0
      IF(NS.EQ.1) PI=0.6077694
      IF(NS.EQ.2) PI=0.80991736
      DO 10 I=1,K
      A=SA(C(2),X(I),NS)
      IF(ABS(X(I)).LT.0.00001) A=1.0/PI
      D=Y(I)-C(1)*PI*A-C(3)
   10 SESD=SESD+(D**2)
      RETURN
      END
C
C
```

```
 C
       SUBROUTINE SINGEX(X,Y,N,C)
C
C      SINGEX CALCULATES THE CONSTANTS IN THE FUNCTION  Y=A*EXP(K*X)+B
C      WHICH CORRESPOND TO A LEAST SQUARES FIT OF THE INPUT DATA
C
       REAL Y(N),C(3),P(3),Q(3,3),Z(200),X(N),NHX
       REAL SD(3)
       REAL T(3)
       DO 299  I=1,3
       P(I)=0.0
       DO 299 K=1,3
  299  Q(I,K)=0.0
C
       IF(C(1).GT.0.0) GO TO 10
C      CALCULATE STARTING VALUE OF B,THE ASYMPTOTIC VALUE
C
       NHX=X(N)/2
       DO 300 K=1,N
       IF (X(K)-NHX) 300,301,303
  300  CONTINUE
  301  HY=Y(K)
       GO TO 302
  303  HY=Y(K)+((X(K)-NHX)*(Y(K-1)-Y(K)))/(X(K)-X(K-1))
  302  C(3)=((Y(1)*Y(N))-(HY**2))/(Y(1)+Y(N)-(2*HY))
       IF(C(3).GE.Y(N))  C(3)=Y(N)-0.5
C
C      CALCULATE STARTING VALUES OF A AND K USING THE METHOD OF
C      LOGARITHMIC LEAST SQUARES
C
       DO 304 K=1,N
       Z(K)=ALOG(Y(K)-C(3))
       Q(1,2)=Q(1,2)+X(K)
       Q(2,2)=Q(2,2)+(X(K)**2)
       P(1)=P(1)+Z(K)
  304  P(2)=P(2)+Z(K)*X(K)
       Q(1,1)=N
       Q(2,1)=Q(1,2)
       WRITE (6,401) NHX,HY,(Q(I,1),Q(I,2),P(I),I=1,2)
       D=(N*Q(2,2))- (Q(1,2)**2)
       C(1)=(P(1)*Q(2,2)-Q(1,2)*P(2))/D
       C(2)=(N*P(2)-P(1)*Q(1,2))/D
       C(1)=EXP(C(1))
  10   WRITE(6,404)(C(K),K=1,3)
C
C            CONSTANTS SAVED FOR COMPARISON WITH ITERATED VALUES
C
       AL=C(1)
       BL=C(2)
       CL=C(3)
C
C      SET UP SIMULTANEOUS EQUATIONS THE SOLUTIONS OF WHICH GIVE
C      ADJUSTMENT TO A,B AND K
C
       IT=0
C      COUNT ITERATIONS
  310  IT=IT+1
       IF(C(2).GT.0.0)  GO TO 351
       SD(1)=0.0
C      RESET P AND Q ARRAYS TO ZERO
       DO 305 K=1,3
       P(K)=0.0
```

```
      DO 305 L=1,3
  305 Q(K,L)=0.0
      DO 306 K=1,N
      Q(1,1)=Q(1,1)+EXP(2*C(2)*X(K))
      Q(2,1)=Q(2,1)+X(K)*EXP(2*C(2)*X(K))
      Q(1,3)=Q(1,3)+EXP(C(2)*X(K))
      Q(2,2)=Q(2,2)+((X(K)**2)*EXP(2*C(2)*X(K)))
      Q(2,3)=Q(2,3)+X(K)*EXP(C(2)*X(K))
      D=Y(K)-C(1)*EXP(C(2)*X(K))-C(3)
      SD(1)=SD(1)+D*D
      P(1)=P(1)+D*EXP(C(2)*X(K))
      P(2)=P(2)+D*X(K)*EXP(C(2)*X(K))
  306 P(3)=P(3)+D
      Q(1,2)=C(1)*Q(2,1)
      Q(2,2)=C(1)*Q(2,2)
      Q(3,1)=Q(1,3)
      Q(3,2)=C(1)*Q(2,3)
      Q(3,3)=N
C
C     SOLVE SIMULTANEOUS EQUATIONS
C
      CALL MATINV(Q,3,P,DETERM,ID)
C
      WRITE(6,420) SD(1)
  420 FORMAT('   ***SUM OF SQUARES OF DEVIATIONS= ',E11.4/)
      ND=0
      DO 499 I=1,3
  499 T(I)=C(I)+P(I)
      SD(3)=SSD(Y,X,N,T)
  506 DO 500 I=1,3
  500 T(I)=C(I)+P(I)*0.5
      SD(2)=SSD(Y,X,N,T)
C
      VMIND=(SD(3)-2.0*SD(2)+SD(1))
      IF(ABS(VMIND).LT.0.0000001) GO TO 503
      VMIN=0.5+0.25*(SD(1)-SD(3))/VMIND
C
      DO 501 I=1,3
  501 T(I)=C(I)+P(I)*VMIN
      SDMIN=SSD(Y,X,N,T)
C
      WRITE(6,600) VMIN,SDMIN,ND
  600 FORMAT('0',5X,'VMIN=',F10.5,5X,'SDMIN=',E12.5,5X,'ND=',I3)
C
      IF(SD(1)-SDMIN) 502,503,504
  502 SD(3)=SD(2)
      ND=ND+1
      DO 505 I=1,3
  505 P(I)=0.5*P(I)
      GO TO 506
C
  503 WRITE(6,601)
  601 FORMAT('0',10X,'***COMPLETE CONVERGENCE***')
      GO TO 311
C
```

```
  504 DO 507 I=1,3
  507 C(I)=T(I)
      DO 508 I=1,3
      IF (ABS((P(I)*VMIN)/C(I)).GT.0.002) GOTO 308
  508 CONTINUE
      GO TO 311
C
C MAXIMUM NUMBER OF ITERATIONS = 20
C
  308 IF (IT.LT.20) GO TO 310
      WRITE (6,403)
  403 FORMAT(' ','********TOO MANY ITERATIONS*******')
C
C CALCULATE EXPECTED VALUES AND RESIDUALS
C
  311 WRITE (6,405) IT
  405 FORMAT ('0','***FINAL ITERATION NUMBER',I8//5X,'TIME',6X,'M.C.',8X
     1,'PREDICTED',7X,'Y-E(Y)',7X,'LOG.FIT',7X,'Y-LOG.FIT'/4X,' MIN ',4X
     2,'% D.B.',10X,'VALUE')
C
      DO 314 I=1,N
      YFIT =(C(1)*EXP(C(2)*X(I))) +C(3)
      Z(I)=YFIT
      RESID = Y(I) - YFIT
      FITLOG=(AL*EXP(BL*X(I)))+CL
      DIFLOG=Y(I)-FITLOG
  314 WRITE(6,406) X(I),Y(I),YFIT,RESID,FITLOG,DIFLOG
  406 FORMAT (' ',F10.2,F10.2,5X,F10.2,5X,F10.4,5X,F10.2,5X,F10.4)
      SD(1)=SD(1)/N
      WRITE(6,700) C,SD(1),N
  700 FORMAT('0','MO-ME=',F10.3,'    K=',F10.6,'    ME=',F10.3,
     1'  VARIANCE=',F10.4,'  N=',I4)
C
      RETURN
  351 WRITE(6,409)
  409 FORMAT (' ***POSITIVE EXPONENT. CONTROL RETURNED TO MOTCON')
      WRITE(6,410) (X(I),Y(I),I=1,N)
  410 FORMAT (' ',2F10.2)
      RETURN
C
  401 FORMAT (' ',20X,'SINGLE EXPONENTIAL FIT'//' HALF FINAL CYCLE TIME
     1=',F10.2/' M.C. AT HALF FCT. =',F7.4//3E15.4/3E15.4)
  407 FORMAT (' ','CONSTANT          ADJUSTMENT'/3(2E15.4/)//)
  404 FORMAT (' ','STARTING VALUES OF FUNCTION CONSTANTS....',3F10.6)
      END
C


C
      REAL FUNCTION SSD(Y,X,K,C)
      REAL Y(K),X(K),C(3)
      SSD=0.0
      DO 10 I=1,K
      D=Y(I)-C(1)*EXP(C(2)*X(I))-C(3)
   10 SSD=SSD+D*D
      RETURN
      END
C
```

```
      SUBROUTINE LREG(X,Y,N,B,A,R,VR,SDMIN,SEB,MP)
C
C  LINEAR REGRESSION. PRINTING OPTION SPECIFIED BY VALUE OF INTEGER MP
C
      DIMENSION  X(N),Y(N)
C
      SPXY=0.0
      SSX=0.0
      SSY=0.0
      SX=0.0
      SY=0.0
C
      DO  10  I=1,N
      SX=SX+X(I)
      SY=SY+Y(I)
      SSX=SSX+(X(I)*X(I))
      SSY=SSY+(Y(I)*Y(I))
   10 SPXY=SPXY+(X(I)*Y(I))
C
      SPXY=SPXY-(SX*SY/N)
      SSX=SSX-(SX*SX/N)
      SSY=SSY-(SY*SY/N)
      B=SPXY/SSX
      A=(SY/N)-B*(SX/N)
      R=SPXY/SQRT(SSX*SSY)
      VR=SSY*(1.0-R*R)/(N-2)
      SDMIN=SQRT(VR*(1+(1/N)))
      SEB=SQRT(VR/SSX)
      XAV=SX/FLOAT(N)
      YAV=SY/FLOAT(N)
      IF (MP.EQ.0) GO TO 11
      WRITE (6,12) B,A,R,VR,SDMIN,SEB,XAV,YAV
   12 FORMAT ('0'//3X,'LINEAR REGRESSION     SLOPE = ',E12.5,8X,'INTERCEP
     1T = ',E12.5,8X,'CORRELATION COEFF = ',E12.5//3X,'VARIANCE OF RESID
     2UAL = ',E12.5,8X,'MIN. S.D. OF PREDICTED VALUE = ',E12.5,8X,'S.E.
     30F SLOPE = ',E12.5//3X,'MEAN X =',F10.5,8X,'MEAN Y =',F10.5////)
C
      IF (MP.EQ.1) GO TO 11
      WRITE (6,13)
   13 FORMAT(' ',4X,'X',14X,'Y',14X,'E(Y)',9X,'Y-E(Y)'//)
      DO  14 I=1,N
      EY= A +(B*X(I))
      DIFF=Y(I)-EY
   14 WRITE (6,15) X(I),Y(I),EY,DIFF
   15 FORMAT(' ',F10.5,5X,F10.5,5X,F10.5,5X,F10.5)
   11 RETURN
      END
C
C
```

```
C
      SUBROUTINE MATINV(A,N,B,DETERM,ID)
C
C     MATRIX INVERSION WITH ACCOMPANYING SOLUTION OF LINEAR EQUATIONS
C
      DIMENSION A(3,3),B(3),INDEX(3,3)
      EQUIVALENCE (IROW,JROW), (ICOLUM,JCOLUM),(AMAX,T,SWAP)
C
C INITIALISATION
C
      DETERM = 1.0
      DO 20 J=1,N
   20 INDEX(J,3)=0
C
C SEARCH FOR PIVOT ELEMENT
C
      DO 550 I=1,N
      AMAX=0
      DO 105 J=1,N
      IF (INDEX(J,3)-1) 60,105,60
   60 DO 100 K=1,N
      IF(INDEX(K,3)-1) 80,100,715
   80 IF(AMAX - ABS(A(J,K))) 85,100,100
   85 IROW = J
      ICOLUM = K
      AMAX = ABS(A(J,K))
  100 CONTINUE
  105 CONTINUE
C
      INDEX(ICOLUM,3)  = INDEX(ICOLUM,3) +1
      INDEX(I,1) = IROW
      INDEX(I,2) = ICOLUM
C
C INTER CHANGE ROWS TO PUT PIVOT ELEMENT ON DIAGONAL
C
      IF (IROW.EQ.ICOLUM) GOTO 310
      DETERM = -DETERM
      DO 200 L=1,N
      SWAP= A(IROW,L)
      A(IROW,L) = A(ICOLUM,L)
  200 A(ICOLUM,L) = SWAP
C
C SWAP CONSTANTS
      SWAP = B(IROW)
      B(IROW) = B(ICOLUM)
      B(ICOLUM)= SWAP
C
C DIVIDE PIVOT ROW BY PIVOT ELEMENT
C
  310 PIVOT  =A(ICOLUM,ICOLUM)
      DETERM = DETERM*PIVOT
      A(ICOLUM,ICOLUM) = 1.0
      DO 350 L=1,N
  350 A(ICOLUM,L) = A(ICOLUM,L)/PIVOT
      B(ICOLUM) = B(ICOLUM)/PIVOT
C
```

```
 C
C REDUCE NON-PIVOT ROWS
C
      DO 550 L1 =1,N
      IF (L1.EQ.ICOLUM) GO TO 550
      T = A(L1,ICOLUM)
      DO 450 L=1,N
  450 A(L1,L) = A(L1,L) - A(ICOLUM,L)*T
      B(L1) = B(L1) - B(ICOLUM)*T
  550 CONTINUE
C
C  INTERCHANGE COLUMNS
C
      DO 710  I =1,N
      L =N+1-I
      IF(INDEX(L,1).EQ.INDEX(L,2)) GOTO 710
      JROW =INDEX(L,1)
      JCOLUM = INDEX(L,2)
      DO 705 K=1,N
      SWAP = A(K,JROW)
      A(K,JROW) = A(K,JCOLUM)
      A(K,JCOLUM) = SWAP
  705 CONTINUE
  710 CONTINUE
C
      DO 730 K=1,N
      IF (INDEX(K,3).EQ.1) GO TO 730
      ID=2
      GO TO 740
  730 CONTINUE
      ID = 1
C
  740 RETURN
C
  715 ID=2
      GOTO 740
      END
C
```

Example output from main programme, SINGEX & SEREX.

```
          EXPONENTIAL SERIES FIT - J=(2*M)-1
   STARTING VALUES C(1)=   57.520007    C(2)=    0.005160C(3)=    9.590000

  ***SUM OF SQUARES OF DEVIATIONS=  0.4470E 02

ADJUSTMENTS=       0.16769E 01       0.93179E-04      -0.62374E 00
 0.1094E 03
 0.7056E 02

     VMIN=  -0.72595      SDMIN= 0.30925E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.3093E 02

ADJUSTMENTS=       0.10709E 01       0.18757E-04      -0.20350E 00
 0.2502E 02
 0.2506E 02

     VMIN=   0.75339      SDMIN= 0.24317E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.2452E 02

ADJUSTMENTS=       0.79090E 00       0.38962E-04      -0.31877E 00
 0.3817E 02
 0.2984E 02

     VMIN=  -0.72970      SDMIN= 0.21302E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.2150E 02

ADJUSTMENTS=       0.49900E 00       0.47766E-05      -0.12333E 00
 0.1997E 02
 0.2008E 02

     VMIN=   0.79890      SDMIN= 0.19885E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1988E 02

ADJUSTMENTS=       0.38506E 00       0.15171E-04      -0.18143E 00
 0.2239E 02
 0.2106E 02

     VMIN=  -0.64633      SDMIN= 0.19333E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1933E 02

ADJUSTMENTS=       0.24223E 00       0.28644E-06      -0.96680E-01
 0.1900E 02
 0.1907E 02

     VMIN=   0.94276      SDMIN= 0.19001E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1900E 02

ADJUSTMENTS=       0.24417E 00       0.83357E-05      -0.14067E 00
 0.2023E 02
 0.1946E 02

     VMIN=  -0.48855      SDMIN= 0.18552E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1855E 02

ADJUSTMENTS=       0.15089E 00       0.44421E-06      -0.96023E-01
 0.1874E 02
 0.1875E 02

     VMIN=   0.81233      SDMIN= 0.18735E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1874E 02

ADJUSTMENTS=       0.22663E 00       0.73741E-05      -0.13402E 00
 0.1975E 02
 0.1911E 02

     VMIN=  -0.45396      SDMIN= 0.18533F 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1863E 02

ADJUSTMENTS=       0.14762E 00       0.82776E-06      -0.96985E-01
 0.1857E 02
 0.1856E 02

     VMIN=   0.66288      SDMIN= 0.18551E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1855E 02

ADJUSTMENTS=       0.21571E 00       0.66465E-05      -0.12903E 00
 0.1941E 02
 0.1886E 02

     VMIN=  -0.58090      SDMIN= 0.18479E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1848E 02

ADJUSTMENTS=       0.14973E 00       0.12048E-05      -0.98257E-01
 0.1847E 02
 0.1842E 02

     VMIN=   0.55522      SDMIN= 0.18425E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1842E 02
```

```
ADJUSTMENTS=       0.20707E 00       0.60320E-05      -0.12494E 00
 0.1917E 02
 0.1868E 02

     VMIN=  -0.53354      SDMIN= 0.18373E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1837E 02

ADJUSTMENTS=       0.15190E 00       0.14864E-05      -0.99255E-01
 0.1840E 02
 0.1835E 02

     VMIN=   0.44345      SDMIN= 0.18332E 02      ND=  0
  ***SUM OF SQUARES OF DEVIATIONS=  0.1833E 02

ADJUSTMENTS=       0.20097E 00       0.55943E-05      -0.12202E 00
 0.1899E 02
 0.1856E 02

     VMIN=  -0.29318      SDMIN= 0.18297E 02      ND=  0

***FINAL ITERATION NUMBER       15

     TIME          M.C.          PREDICTED        Y-E(Y)
     MIN      % D.B.             VALUE

      0.00       66.62             66.51          0.1036
      0.33       65.76             65.17          0.5880
      0.53       64.90             64.83          0.0756
      1.00       64.04             64.22         -0.1832
      1.60       63.17             63.62         -0.4571
      2.40       62.29             62.98         -0.6937
      3.13       61.42             62.49         -1.0706
      4.67       60.52             61.61         -1.0925
      6.47       59.61             60.75         -1.1392
      8.73       58.69             59.82         -1.1332
     11.80       57.74             58.74         -0.9985
     16.27       56.76             57.40         -0.6375
     21.20       55.76             56.11         -0.3459
     25.07       54.78             55.03         -0.2433
     32.27       53.76             53.69          0.0719
     38.13       52.76             52.58          0.1844
     44.40       51.76             51.48          0.2788
     50.07       50.77             50.55          0.2237
     58.20       49.74             49.31          0.4368
     67.13       48.71             48.04          0.6702
     73.53       47.73             47.18          0.5525
     81.67       46.73             46.14          0.5894
     89.60       45.74             45.17          0.5643
     99.33       44.73             44.05          0.6803
    107.80       43.75             43.11          0.6554
    116.40       42.77             42.20          0.5738
    126.40       41.79             41.18          0.6077
    136.13       40.82             40.23          0.5878
    146.27       39.85             39.28          0.5733
    156.53       38.89             38.35          0.5425
    166.67       37.94             37.46          0.4763
    179.20       36.97             36.41          0.5637
    189.93       36.03             35.54          0.4901
    201.67       35.09             34.63          0.4623
    213.80       34.16             33.72          0.4349
    226.33       33.23             32.82          0.4062
    241.53       32.29             31.78          0.5150
    254.33       31.37             30.93          0.4421
    266.73       30.47             30.15          0.3194
    280.87       29.56             29.29          0.2685
    296.13       28.65             28.40          0.2474
    314.67       27.73             27.38          0.3575
    328.00       26.84             26.68          0.1682
    344.53       25.95             25.85          0.1039
    365.73       25.05             24.84          0.2089
    380.87       24.17             24.16          0.0064
    404.40       23.28             23.17          0.1090
    422.33       22.40             22.46         -0.0571
    443.33       21.52             21.67         -0.1500
    469.53       20.65             20.76         -0.1182
    494.60       19.77             19.96         -0.1855
    523.53       18.90             19.10         -0.2009
    552.60       18.04             18.32         -0.2813
    584.53       17.17             17.53         -0.3590
    621.00       16.31             16.72         -0.4124
    661.47       15.45             15.92         -0.4744
    705.67       14.59             15.16         -0.5665
    752.73       13.73             14.45         -0.7130
    822.60       12.88             13.56         -0.6872
    906.00       12.02             12.73         -0.7079
   1026.00       11.17             11.85         -0.6797
   1212.93       10.32             10.98         -0.6663
   1787.73        9.47             10.06         -0.5895
   2407.53        9.30              9.89         -0.5922

VARIANCE=        0.286      N=  64
MO-ME= 56.65      K=   0.003061      ME=  9.86
```

3.1.3.3 Ancillary facilities

3.1.3.3(a) Plotting program PPLOT

This program plots all the drying curves from one data tape on one graph as continuous lines. The drying curve data are input on DSET7 or DSET8 from the line file of drying times and moisture contents output by MOTCON (Appendix 3.3.2.3.). Additional parameters supplied on DSET5 are the maximum values of time and moisture content and identification of the appropriate DSET. Subroutine XYSCAL is used to calculate appropriate x and y scales.

Variable list - Main programme

YAXIS	length of y axis
XAXIS	length of x axis
YMAX	maximum value of y
XMAX	maximum value of x
ISET	if = 7 = DSET7, if ≠ 7 = DSET8
YINCR	y increment/cm.
XINCR	x increment/cm.
PLOT	Plotting subroutine described in R.E.S.
PLOTS	Computer Department Guide, GSYS/11/2, 1972.
AXIS	(Facilities available for using the incremental plotters)
CURVE	

Variable list - subroutine XYSCAL

A	maximum value of y
B	maximum value of x
C	y increment
D	x increment
E	Intermediate values in calculation
F	of C and D.

```
      REAL X(150),Y(150)
      DATA YAXIS/28.0/,XAXIS/60.0/
      CALL PLOTS(0)
      CALL PLOT(0.0,0.0,999)
      CALL PLOT(0.0,-5.0,-3)
      CALL PLOT(0.0,1.3,-3)
      READ(5,1) XMAX,YMAX,ISET
1     FORMAT(3G0.0)
      CALL XYSCAL(YMAX,XMAX,YINCR,XINCR)
      CALL AXIS(0.0,0.0,YAXIS,90.0,0.0,YINCR,
     124HMOISTURE CONTENT, % D.B.,-24)
      CALL AXIS(0.0,0.0,XAXIS,0.0,0.0,XINCR,9HTIME, MIN,9)
2     I=0
3     I=I+1
      IF(ISET.EQ.7) GO TO 5
      READ(6,4,END=7) X(I),Y(I)
4     FORMAT(2G0.0)
      GO TO 6
5     READ(7,4,END=7) X(I),Y(I)
6     IF(X(I).GE.0.0) GO TO 3
      N=I-1
      CALL CURVE(X,Y,N,0,7,0.0,XINCR,0.0,YINCR)
      GO TO 2
7     CALL PLOT(0.0,0.0,1000)
      STOP
      END
      SUBROUTINE XYSCAL(A,B,C,D)
C     CALCULATES SUITABLE INCREMENTS OF X AND Y
C     FOR AXES OF 28 AND 60 CM. RESPECTIVELY.
C     MAX. VALUE FOR Y = 600
C     X SCALE IN MINS. BUT CONVENIENT FRACTIONS OF  1 HR.
      DO 4 I=1,22
      E=A/FLOAT(I)
      IF(E.LE.28.0) GO TO 3
      IF(I.NE.2) GO TO 4
      IF(A.LE.70.0) GO TO 5
4     CONTINUE
3     C=FLOAT(I)
      GO TO 6
5     C=2.5
6     F=0.0
8     F=F+5.0
9     E=B/F
      IF(E.LE.60.0) GO TO 7
      IF(F.LT.14.9) GO TO 8
      F=F*2.0
      GO TO 9
7     D=F
      RETURN
      END
```

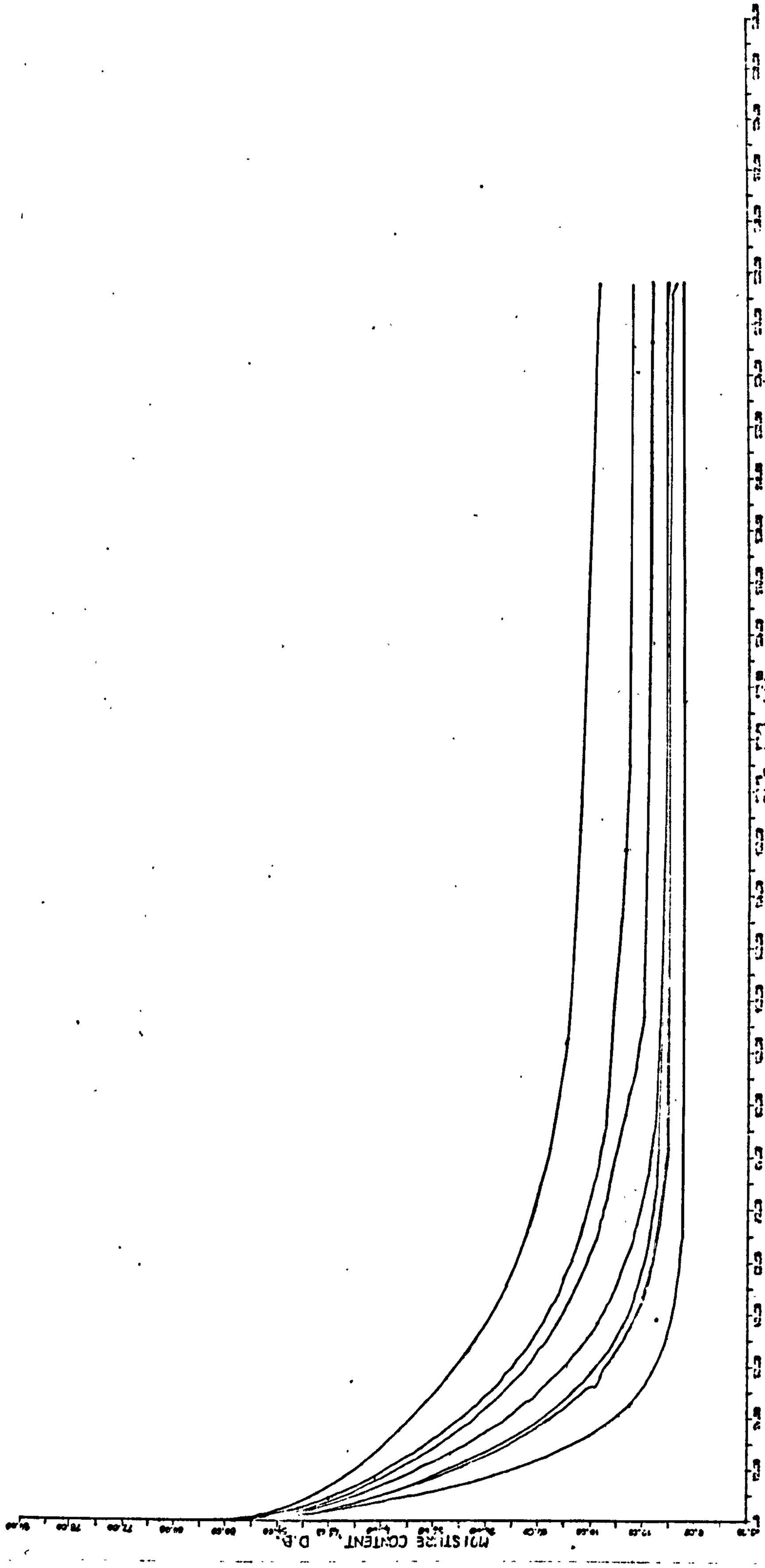


Fig. 3.1.1. Example output from PPLOT.

PAGE
MISSING
IN
ORIGINAL

```
C                    DRYING CURVE PLOTS
C     PLOTS EXP. DATA AS POINTS. READS CONSTANTS &
C     DRAWS FITTED CURVE
C     CONTROL INDEX, ID = 1 =DIFFUSION SERIES SPHERE
C                       =  2 =DIFFUSION SERIES SLAB
C                        = 3 =SINGLE EXPONENTIAL
C                        = 4 =DOUBLE EXPONENTIAL
C                        =10 =READ NEXT DATA SET
C                        =-1 =STOP
C     DSET5=CONTROL DATA  DSET7=DATA ARRAY
      REAL X(150),Y(150),EY(150),C(3),D(5)
      DATA YAXIS/28.0/,XAXIS/60.0/
      CALL PLOTS(0)
 5    READ(5,1) ID
 1    FORMAT(G0.0)
      IF(ID) 15,3,3
 3    IF(ID.NE.10) GO TO 4
C     ID=10 READ IN RUN NO, DATA POINTS AND PLOT
      READ(5,1) RUN
      I=0
 6    I=I+1
      READ(7,2) X(I),Y(I)
 2    FORMAT(2G0.0)
      IF(X(I).GE.0.0) GO TO 6
      N=I-1
      CALL XYSCAL(Y(1),X(N),YINCR,XINCR)
      CALL DCPLOT(X,Y,EY,N,XAXIS,XINCR,YAXIS,YINCR,RUN)
      GO TO 5
 4    IF(ID.EQ.4) GO TO 7
      READ(5,8) C
 8    FORMAT(3G0.0)
      DO 11 I=1,N
      IF(ID.NE.3) GO TO 10
      EY(I)=(C(1)*EXP(-C(2)*X(I))) + C(3)
      GO TO 11
 10   PI=0.6077694
      IF(ID.EQ.2) PI=0.80991736
      EY(I)=(C(1)*PI*SA(C(2),X(I),ID)) + C(3)
 11   CONTINUE
 14   CALL DC1(EY)
      GO TO 5
 7    READ(5,12) D
 12   FORMAT(5G0.0)
      D(2)=-D(2)
      D(4)=-D(4)
      DO 13 I=1,N
 13   EY(I)=(D(1)*EXP(D(2)*X(I)))+(D(3)*EXP(D(4)*X(I)))+D(5)
      GO TO 14
 15   CALL PLOT(0.0,0.0,1000)
      STOP
      END
C
```

```
351   SUBROUTINE DCPLOT(X,Y,EY,N,XAXIS,XINCR,YAXIS,YINCR,RUN)
      DIMENSION X(N),Y(N),EY(N)
      DATA IT/0/
      IF(IT.EQ.0) GO TO 4
      CALL PLOT(0.0,0.0,999)
      CALL PLOT(0.0,-5.0,-3)
      GO TO 5
 4    IT=1
C     ESTABLISH ORIGIN
 5    CALL PLOT(0.0,1.3,-3)
C     WRITE TITLE
      CALL SYMBOL(5.0,25.0,0.5,8HRUN NO.=,0.0,8)
      CALL NUMBER(9.5,25.0,0.5,RUN,0.0,-1)
C     UNDERLINE TITLE
      CALL PLOT(5.0,24.8,3)
      CALL PLOT(11.8,24.8,2)
      CALL AXIS(0.0,0.0,YAXIS,90.0,0.0,YINCR,
     *24HMOISTURE CONTENT, % D.B.,-24)
      CALL AXIS(0.0,0.0,XAXIS,0.0,0.0,XINCR,9HTIME, MIN,9)
C     PLOT DATA POINTS
      CALL CURVE(X,Y,N,-1,2,0.0,XINCR,0.0,YINCR)
      RETURN
C
      ENTRY DC1(EY)
C
C     PLOT CURVE
      CALL CURVE(X,EY,N,0,7,0.0,XINCR,0.0,YINCR)
      RETURN
      END
C
```

```
      SUBROUTINE XYSCAL(A,B,C,D)
C     CALCULATES SUITABLE INCREMENTS OF X AND Y
C     FOR AXES OF 28 AND 60 CM. RESPECTIVELY.
C     MAX. VALUE FOR Y = 600
C     X SCALE IN MINS. BUT CONVENIENT FRACTIONS OF  1 HR.
      DO 4 I=1,22
      E=A/FLOAT(I)
      IF(E.LE.28.0) GO TO 3
      IF(I.NE.2) GO TO 4
      IF(A.LE.70.0) GO TO 5
 4    CONTINUE
 3    C=FLOAT(I)
      GO TO 6
 5    C=2.5
 6    F=0.0
 8    F=F+5.0
 9    E=B/F
      IF(E.LE.60.0) GO TO 7
      IF(F.LT.14.9) GO TO 8
      F=F*2.0
      GO TO 9
 7    D=F
      RETURN
      END
```

```
      FUNCTION SA(B,THETA,NS)
      REAL KT
C     VALUE SET AT ZERO TIME SINCE THIS CAN'T BE
C     EVALUATED NUMERICALLY
      SA=1.645361
      IF(NS.EQ.2) SA=1.2346939
      IF(THETA.LT.0.000001) GO TO 11
      SA=0.0
      TT=-(B*THETA)
      DO 10 J=1,150
      IF(NS.EQ.1)N=J
      IF(NS.EQ.2)N=(J*2)-1
      KT=TT*FLOAT(N**2)
      IF(KT.LT.-100.0) GO TO 11
      R=EXP(KT)*(1.0/FLOAT(N**2))
      SA=SA+R
      IF(R.LT.0.000000001) GO TO 11
10    CONTINUE
11    RETURN
      END
```

3.1.4 Program to analyse thermocouple readings

The thermocouple readings, in millivolts x 10^2 may originate from up to 6 locations on each drier; a total of 48 thermocouples. The multiples of 8 can be scanned in any one serial combination of the six locations indicated by the brackets in the following list:-

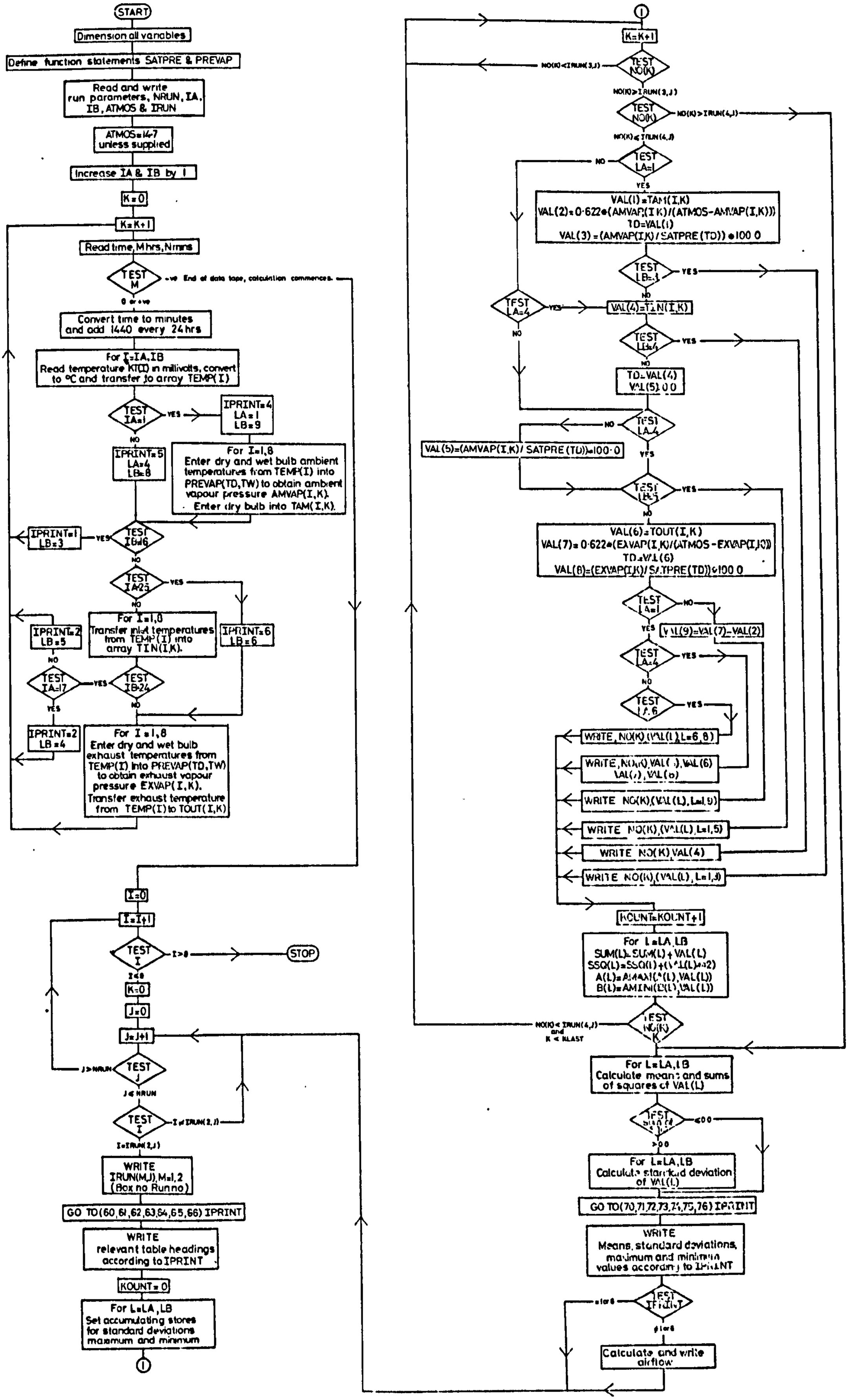
Thermocouple Nos.	Location	Acceptable Combinations
0-7	Ambient dry bulb	
8-15	Ambient wet bulb	
16-23	Inlet temperature	
24-31	Exhaust temperature	
32-39	Exhaust dry bulb	
40-47	Exhaust wet bulb	

The computer programme was written to accept any one of these combinations. On any one data tape there may be up to 3 runs per drier or channel and the final printout of the information was in ascending channel order. The action of the programme is fully detailed by the flow chart, Fig. 3.1.2. . Briefly its action was as follows. The readings were converted to degrees Celsius by calculation of the positive root of the equation.

$$M_V = 5.875T + 0.004416T^2 - 0.1836$$

where M_V = millivolts x 10^2, which described the response of chromel-constanton thermocouples. These temperatures were then used to calculate the appropriate absolute and relative humidities which were listed for each run with the temperatures and scan times. The psychrometric conversions were made using the equations of Brooker.[21] At the end of each list a summary consisting of means, standard deviations and maximum and minimum values are

Fig. 3.1.2. Flow chart for programme MENTEM.



calculated and printed. In addition if the differential pressures across the orifice plates are supplied, the airflows are calculated and printed.

Variable list

KT (I)	Array for temporary storage of temperature in millivolts
TEMP (I)	Array for temporary storage of temperature in ^{o}C
NO (K)	Time in minutes
TAM (I,K)	Ambient temperature
TIN (I,K)	Inlet temperature
TOUT (I,K)	Exhaust temperature
AMVAP (I,K)	Ambient vapour pressure psi
EXVAP (I,K)	Exhaust vapour pressure, psi
IRUN (K,I)	Run constants, K = 1, 4
When K = 1	Run number
K = 2	Box number
K = 3	Starting time cycle
K = 4	Finishing time cycle
DIFF (I)	Differential pressure, in w.g.
NRUN	Total number of runs
ATMOS	Barometric pressure, in Hg
VAL (L)	Array for accumulation of listed values
SUM (L)	Sum of VAL (L)
SSQ (L)	Sum of squares of VAL (L)
A (L)	Maximum value of VAL (L)
B (L)	Minimum value of VAL (L)
SD (L)	Standard deviation of VAL (L)
AVAL (L)	Mean of VAL (L)
LA	Number of first thermocouple location in scan
IB	Number of last thermocouple location in scan

LA, LB — Indexes used within the programme to control the number of variables (VAL (L) calculated and printed from the input data. LA and LB are determined by the value IPRINT and may range from 1 to 9.

IPRINT — A variable of value 1 to 6, which depends upon lA and lB, used to write headings and some results.

The relationship between the last 5 variables is as follows:-

IA	IB	IPRINT	LA	LB	Output
0	15	1	1	3	Ambient temp. and humidities
0	23	2	1	5	Ambient temp. and humidities; inlet temp. and humidity
16	23	3	4	4	Inlet temperature only
0	47	4	1	9	Ambient temp. and humidities; inlet temp. and humidities; and change between inlet and exhaust absolute humidity
16	47	5	4	8	Inlet temp. and exhaust temp. and humidities
23	47	6	6	8	Exhaust temp. and humidities

Data is input to the programme on DSET5 and has the following general form.

NRUN, IA, IB, ATMOS

IRUN (1,I), IRUN (2,I), IRUN (3,I), IRUN (4,I), DIFFP (I)

IRUN (1,NRUN), IRUN (2,NRUN), IRUN (3,NRUN), IRUN (4,NRUN), DIFFP (NRUN)

M, N

KT (1...n) where n = no. of thermocouples per scan read 8 per line.

-1 (terminates reading of data)

```
C PROGRAMME TO CONVERT TEMPERATURE TAPE TO INLET TEMPERATURE DEG.C.
C  AND HUMIDITIES
      DIMENSION SUM(9),SSQ(9),A(9),B(9),VAL(9),SD(9),AVAL(9),IRUN(4,24),
     1NO(100),TEMP(48),KT(48),TAM(8,100),TIN(8,100),TOUT(8,100),EXVAP(8,
     2100),AMVAP(8,100),DIFFP(24)
      SATPRE(X)=EXP(54.6329-6834.27/(X+273)
     1-5.16923*ALOG(1.8*(X+273)))
      PREVAP(TD,TW)=SATPRE(TW)+(0.6961*(SATPRE(TW)-14.6996)*(TD-TW)
     1/(1075.89-1.0257*TW)
      WRITE(6,2)
    2 FORMAT ('1',6X,' ANALYSIS OF TEMPERATURE TAPE     DATE........','//)
      READ (5,3) NRUN,IA,IB,ATMOS
    3 FORMAT(4G0.0)
      WRITE(6,5)
    5 FORMAT (' ',6X,'RUN NO     BOX NO      START    FINISH     DIFF.P.'/28
     1X,'TIME     TIME'/)
      DO 9 I=1,NRUN
      READ(5,4) (IRUN(K,I),K=1,4),DIFFP(I)
    4 FORMAT(5G0.0)
      IRUN(4,I)=IRUN(3,I)+IRUN(4,I)
      IRUN(3,I)=IRUN(3,I)/15
      IRUN(4,I)=IRUN(4,I)/15
    9 WRITE (6,6) (IRUN(K,I),K=1,4),DIFFP(I)
    6 FORMAT (' ',4I10,F10.2)
      IF(ATMOS.EQ.0)GO TO 10
      ATMOS = ATMOS/2.03602
      GO TO 11
   10 ATMOS=14.7
   11 IA=IA+1
      IB=IB+1
      KN=0
      NLAST=0
      K=0
   20 K=K+1
C READ TIME IN HOURS AND MINUTES
      READ (5,50)M,N
   50 FORMAT(I2,I2,1X)
      IF(M) 150,21,21
   21 N= M*60+N
      IF(N-NLAST) 23,22,22
   23 KN=KN+1440
   22 NLAST=N
      NO(K) = N+KN
C
C READ TEMPERATURES IN MILLIVOLTS*100
C
      READ(5,70) (KT(I),I=IA,IB)
   70 FORMAT(8(I5,1X))
      DO 42 I=IA,IB
   42 TEMP(I)=-606.84 +SQRT(368291.34+207.62*FLOAT(KT(I)))
      IF(IA.EQ.1) GO TO 31
      IPRINT= 5
      LA=4
      LB=8
      GO TO 40
   31 IPRINT =4
      LA=1
      LB=9
      DO 41 I=1,8
      TD=TEMP(I)
      TW=TEMP(I+8)
      AMVAP(I,K)=PREVAP(TD,TW)
   41 TAM(I,K)=TEMP(I)
```

```
300 KOUNT=0
    DO 210 L=LA,LB
    SUM(L)=0.0
    SSQ(L)=0.0
    A(L)=0.0
210 B(L)=100.0
180 K=K+1
    IF(NO(K).LT.IRUN(3,J)) GO TO 180
    IF(LA.NE.1)GO TO 310
    VAL(1)=TAM(I,K)
    VAL(2)=0.622*(AMVAP(I,K)/(ATMOS-AMVAP(I,K)))
    TD=VAL(1)
    VAL(3)=(AMVAP(I,K)/SATPRE(TD))*100.0
    IF(LB.EQ.3)GO TO 401
    GO TO 320
310 IF(LA.EQ.4)GO TO 320
    GO TO 340
320 VAL(4)=TIN(I,K)
    IF(LB.EQ.4)GO TO 403
    TD=VAL(4)
    VAL(5)=0.0
    IF(LA.NE.4) VAL(5)=(AMVAP(I,K)/SATPRE(TD))*100.0
    IF(LB.EQ.5)GO TO 402
340 VAL(6)=TOUT(I,K)
    VAL(7)=0.622*(EXVAP(I,K)/(ATMOS-EXVAP(I,K)))
    TD=VAL(6)
    VAL(8)=(EXVAP(I,K)/SATPRE(TD))*100.0
    IF(LA.EQ.1) VAL(9)=VAL(7)-VAL(2)
    IF(LA.EQ.1)GO TO 404
    IF(LA.EQ.4)GO TO 405
    IF(LA.EQ,6)GO TO 406
401 WRITE (6,501)  NO(K),(VAL(L),L=1,3)
501 FORMAT (' ',I6,F11.2,F13.6,F10.1)
    GO TO 600
402 WRITE (6,502)  NO(K),(VAL(L),L=1,5)
502 FORMAT (' ',I6,F11.2,F13.6,F10.1,F11.2,F10.1)
    GO TO 600
403 WRITE (6,503)  NO(K),VAL(4)
503 FORMAT (' ',I6,F11.2)
    GO TO 600
404 WRITE (6,504)  NO(K),(VAL(L),L=1,9)
504 FORMAT(' ',I6,F11.2,F13.6,F10.1,F11.2,F10.1,F11.2,F13.6,F10.1,F13.
   16)
    GO TO 600
405 WRITE (6,505) NO(K),VAL(4),VAL(6),VAL(7),VAL(8)
505 FORMAT(' ',I6,F11.2,10X,F11.2,F13.6,F10.1)
    GO TO 600
406 WRITE (6,506) NO(K),(VAL(L),L=6,8)
506 FORMAT (' ',I6,F11.2,F13.6,F10.1)
```

```
   40 IF(IB.EQ.16) GO TO 60
      IF(IA.EQ.25) GO TO 80
      DO 43  I=1,8
   43 TIN(I,K)=TEMP(I+16)
      IF(IB.EQ.24) GO TO 100
      GO TO 45
   80 IPRINT=6
      LA=6
   45 DO 48  I=1,8
      TOUT(I,K)=TEMP(I+24)
      TD=TEMP(I+32)
      TW=TEMP(I+40)
48    EXVAP(I,K)=PREVAP(TD,TW)
      GO TO 20
    60 IPRINT=1
       LB=3
       GO TO 20
   100 IF(IA.EQ.17) GO TO 120
       IPRINT=2
       LB=5
       GO TO 20
   120 IPRINT =3
       LB=4
       GO TO 20
C END OF DATA TAPE, PROCESSING OF TEMPERATURES COMMENCES
   150 KLAST=K-1
       DO 200 I=1,8
       K=0
       DO 200 J=1,NRUN
       IF(I.NE.IRUN(2,J)) GO TO 200
       WRITE(6,160) (IRUN(M,J),M=1,2)
160 FORMAT ('1',10X,'RUN NO.= ',I4,'    BOX NO.= ',I2//)
    GO TO (61,62,63,64,65,66),IPRINT
 61 WRITE (6,101)
101 FORMAT('0',17X,'AMBIENT  CONDITIONS'//2X,'TIME',3X,'TEMPERATURE',2
   1X,'HUMIDITY',5X,'R.H.%'/2X,'MIN.',5X,'DEG.C',7X,'KG/KG'//)
    GO TO 300
 62 WRITE (6,102)
102 FORMAT ('0',17X,'AMBIENT  CONDITIONS',8X,'INLET CONDITIONS'//2X,'T
   1IME',3X,'TEMPERATURE',2X,'HUMIDITY',5X,'R.H.%',3X,'TEMPERATURE',2X
   2,'R.H.%'/2X,'MIN.',5X,'DEG.C',7X,'KG/KG',17X,'DEG.C'//)
    GO TO 300
 63 WRITE (6,103)
103 FORMAT ('0',2X,'TIME',3X,'TEMPERATURE'/2X,'MIN.',5X,'DEG.C'//)
    GO TO 300
 64 WRITE (6,104)
104 FORMAT('0',17X,'AMBIENT  CONDITIONS',8X,'INLET CONDITIONS',12X,'EX
   1HAUST  CONDITIONS'//2X,'TIME',3X,'TEMPERATURE',2X,'HUMIDITY',5X,'R
   2.H.%',3X,'TEMPERATURE',2X,'R.H.%',3X,'TEMPERATURE .HUMIDITY',5X,'R
   3.H.%',5X,'H(OUT)-H(IN)'/2X,'MIN.',5X,'DEG.C',7X,'G7/KG',17X,'DEG.C
   4',16X,'DEG.C',7X,'KG/KG'//)
    GO TO 300
 65 WRITE (6,105)
105 FORMAT('0',11X,'INLET',23X,'EXHAUST  CONDITIONS'//2X,'TIME',3X,'TE
   1MPERATURE',12X,'TEMPERATURE  HUMIDITY',5X,'R.H.%'/2X,'MIN.',5X,'DE
   2G.C',16X,'DEG.C',7X,'KG/KG'//)
    GO TO 300
 66 WRITE (6,106)
106 FORMAT ('0',17X,'EXHAUST  CONDITIONS'//2X,'TIME',3X,'TEMPERATURE
   1HUMIDITY',5X,'R.H.%'/2X,'MIN.',5X,'DEG.C',7X,'KG/KG'//)
    GO TO 300
```

```
600 KOUNT=KOUNT+1
    DO 610 L=LA,LB
    SUM(L)=SUM(L)+VAL(L)
    SSQ(L)=SSQ(L)+((VAL(L))**2)
    A(L)=AMAX1(A(L),VAL(L))
610 B(L)=AMIN1(B(L),VAL(L))
    IF(NO(K).LT.IRUN(4,J).AND.K.LT.KLAST)GO TO 180
    DO 620 L=LA,LB
    AVAL(L)=SUM(L)/FLOAT(KOUNT)
    SD(L)=(SSQ(L)-((SUM(L)**2)/FLOAT(KOUNT)))
    IF(SD(L).LE.0.0)GO TO 2000
    SD(L)=SQRT(SD(L)/FLOAT(KOUNT-1))
620 CONTINUE
    GO TO 630
2000 WRITE(6,2001) L,SD(L)
2001 FORMAT(' ','******NEGATIVE SUMS OF SQUARES, L=',I4,5X,
   1'SD(L)=',E12.5)
    GO TO 620
630 GO TO (71,72,73,74,75,76),IPRINT
 71 WRITE(6,81)(AVAL(L),L=1,3),(SD(L),L=1,3),(A(L),L=1,3),(B(L),L=1,3)
 81 FORMAT('0',2X,'MEAN',F11.2,F13.6,F10.1/2X,'S.D.',F10.5,F13.6,F10.5
   1//3X,'MAX.',F10.2,F13.6,F10.1/3X,'MIN.',F10.2,F13.6,F10.1)
    GO TO 800
 72 WRITE(6,82)(AVAL(L),L=1,5),(SD(L),L=1,5),(A(L),L=1,5),(B(L),L=1,5)
 82 FORMAT('0',2X,'MEAN',F11.2,F13.6,F10.1,F11.2,F10.1/2X,'S.D.',F10.5
   1,F13.6,F10.5,F11.5,F10.5//3X,'MAX.',F10.2,F13.6,F10.1,F11.2,F10.1/
   23X,'MIN.',F10.2,F13.6,F10.1,F11.2,F10.1)
    GOTO 800
 73 WRITE(6,83) AVAL(4),SD(4),A(4),B(4)
 83 FORMAT('0',2X,'MEAN',F11.2/2X,'S.D.',F10.5//3X,'MAX.',F10.2/3X,'MI
   1N.',F10.2)
    GO TO 800
 74 WRITE(6,84)(AVAL(L),L=1,9),(SD(L),L=1,9),(A(L),L=1,9),(B(L),L=1,9)
 84 FORMAT('0',2X,'MEAN',F11.2,F13.6,F10.1,F11.2,F10.1,F11.2,F13.6,F10
   1.1,F13.6/2X,'S.D.',F10.5,F13.6,F10.5,F11.5,F10.5,F11.5,F13.6,F10.5
   2,F13.6//3X,'MAX.',F10.2,F13.6,F10.1,F11.2,F10.1,F11.2,F13.6,F10.1,
   3F13.6/3X,'MIN.',F10.2,F13.6,F10.1,F11.2,F10.1,F11.2,F13.6,F10.1,F1
   43.6)
    GO TO 800
 75 WRITE(6,85)AVAL(4),(AVAL(L),L=6,8),SD(4),(SD(L),L=6,8),A(4),(A(L),
   1L=6,8),B(4),(B(L),L=6,8)
 85 FORMAT('0',2X,'MEAN',F11.2,10X,F11.2,F13.6,F10.1/2X,'S.D.',F10.5,1
   10X,F11.5,F13.6,F10.5//3X,'MAX.',F10.2,10X,F11.2,F13.6,F10.1/3X,'S.
   2D.',F10.2,10X,F11.2,F13.6,F10.1)
    GO TO 800
 76 WRITE(6,86)(AVAL(L),L=6,8),(SD(L),L=6,8),(A(L),L=6,8),(B(L),L=6,8)
 86 FORMAT('0',2X,'MEAN',F11.2,F13.6,F10.1/2X,'S.D.',F10.5,F13.6,F10.5
   1//3X,'MAX.',F10.2,F13.6,F10.1/3X,'MIN.',F10.2,F13.6,F10.1)
800 IF(IPRINT.EQ.1.OR.IPRINT.EQ.6)GO TO 200
    FLF=2.52796*SQRT((1.8*AVAL(4)+492.0)*DIFFP(J))
    FLM=FLF*0.3048
    WRITE (6,700) FLF,FLM
700 FORMAT('0',2X,'AIRFLOW FT/MIN.=',F10.2/12X,'M/MIN.=',F10.2)
200 CONTINUE
    STOP
    END
```

Example output from MENTEM - a low humidity run using the condensing unit on drier 6.

RUN NO.= 209 BOX NO.= 6

	AMBIENT CONDITIONS			INLET CONDITIONS	
TIME MIN.	TEMPERATURE DEG.C	HUMIDITY KG/KG	R.H.%	TEMPERATURE DEG.C	R.H.%
0	8.86	0.006090	87.5	19.89	42.8
60	8.19	0.005935	89.3	19.89	41.7
120	8.19	0.005793	87.1	19.89	40.7
180	8.19	0.005652	85.0	20.06	39.3
240	7.51	0.005787	91.2	20.06	40.3
300	8.19	0.005793	87.1	19.89	40.7
360	7.68	0.005718	89.0	20.06	39.8
420	7.17	0.005646	91.0	19.89	39.7
480	7.34	0.005577	88.9	19.89	39.2
540	7.00	0.005576	91.0	19.89	39.2
600	7.34	0.005716	91.1	20.06	39.8
660	6.33	0.005578	95.3	19.89	39.2
720	7.00	0.005576	91.0	19.89	39.2
780	6.50	0.005509	93.1	19.89	38.8
840	7.34	0.005997	95.5	20.39	40.9
900	8.02	0.006291	95.6	20.72	42.0
960	8.19	0.006511	97.8	20.55	43.9
1020	8.52	0.006373	93.6	20.72	42.5
1080	8.69	0.006304	91.5	20.55	42.5
1140	8.35	0.006442	95.7	20.39	43.9
1200	9.20	0.006537	91.7	20.55	44.1
1260	9.20	0.006537	91.7	20.55	44.1
1320	9.53	0.006547	89.8	20.39	44.6
1380	9.70	0.006478	87.8	20.39	44.1
1440	9.20	0.006389	89.7	20.39	43.5
1500	8.86	0.006381	91.6	20.06	44.4
1560	8.69	0.006304	91.5	20.22	43.4
1620	8.35	0.006442	95.7	20.06	44.8
1680	7.68	0.006142	95.6	19.89	43.2
1740	8.02	0.006004	91.3	19.89	42.2
1800	8.02	0.006147	93.5	20.06	42.8
1860	8.02	0.005862	89.2	20.06	40.8
1920	7.68	0.005718	89.0	19.89	40.2
1980	7.68	0.005718	89.0	20.06	39.8
2040	7.68	0.005578	86.9	19.89	39.2
2100	7.00	0.005576	91.0	19.89	39.2
2160	6.67	0.005440	90.9	19.89	38.3
2220	7.00	0.005576	91.0	20.06	38.8
2280	7.51	0.005787	91.2	20.22	39.9
2340	8.02	0.006291	95.6	20.39	42.9
2400	8.19	0.006804	102.2	20.39	46.3
2460	8.52	0.006519	95.7	20.55	43.9
2520	8.52	0.006519	95.7	20.39	44.4
2580	8.86	0.006528	93.7	20.55	44.0
2640	9.37	0.006468	89.7	20.55	43.6
2700	9.37	0.006616	91.8	20.39	45.1
2760	9.53	0.006547	89.8	20.39	44.6
2820	9.37	0.006616	91.8	20.39	45.1
2880	9.20	0.006685	93.8	20.22	46.0
2940	9.03	0.006606	93.7	20.22	45.4
3000	8.52	0.006519	95.7	19.89	45.8
3060	8.35	0.006152	91.4	19.72	43.7
3120	8.02	0.006147	93.5	19.89	43.2
3180	8.35	0.006152	91.4	19.89	43.2
3240	7.34	0.006138	97.8	19.89	43.1
3300	8.02	0.006004	91.3	19.72	42.6
3360	7.68	0.006000	93.4	19.72	42.6
3420	7.68	0.006000	93.4	19.89	42.2
3480	7.68	0.005859	91.2	19.72	41.6
3540	7.51	0.006069	95.6	19.72	43.1
3600	7.34	0.005997	95.5	19.89	42.2
3660	7.17	0.005925	95.5	20.06	41.2
3720	8.02	0.006004	91.3	19.89	42.2
MEAN	8.09	0.006098	92.2	20.11	42.2
S.D.	0.80705	0.000371	3.13378	0.28773	2.12773
MAX.	9.70	0.006804	102.2	20.72	46.3
MIN.	6.33	0.005440	85.0	19.72	38.3

AIRFLOW FT/MIN.= 18.37
M/MIN.= 5.60

Example output from MENTEM - a high humidity run using the packed tower on drier 7.

RUN NO.= 210 BOX NO.= 7

TIME MIN.	AMBIENT CONDITIONS TEMPERATURE DEG.C	HUMIDITY KG/KG	R.H.%	INLET CONDITIONS TEMPERATURE DEG.C	R.H.%
60	19.72	0.014266	100.0	21.87	87.6
120	19.72	0.014266	100.0	21.71	88.5
180	19.56	0.014117	100.0	21.71	87.6
240	19.39	0.013969	100.0	21.87	85.8
300	19.39	0.013969	100.0	21.71	86.7
360	19.23	0.013822	100.0	21.54	86.7
420	19.06	0.013677	100.0	21.54	85.8
480	19.06	0.013463	98.5	21.71	83.6
540	18.90	0.013533	100.0	21.71	84.0
600	18.90	0.013533	100.0	21.54	84.9
660	18.90	0.013533	100.0	21.54	84.9
720	18.56	0.013249	100.0	21.54	83.1
780	18.56	0.013249	100.0	21.54	83.1
840	18.90	0.013533	100.0	22.04	82.4
900	19.56	0.014336	101.5	22.37	85.4
960	20.06	0.014793	101.5	22.53	87.2
1020	20.06	0.014793	101.5	22.70	86.3
1080	20.06	0.014793	101.5	22.70	86.3
1140	20.22	0.014948	101.5	22.53	88.1
1200	20.22	0.014948	101.5	22.53	88.1
1260	20.39	0.015104	101.5	22.53	89.0
1320	20.55	0.015035	100.0	22.70	87.7
1380	20.55	0.015035	100.0	22.53	88.6
1440	20.39	0.015104	101.5	22.37	89.9
1500	20.39	0.014878	100.0	22.20	89.4
1560	20.06	0.014793	101.5	22.20	88.9
1620	20.06	0.014348	98.5	22.04	87.2
1680	19.89	0.014417	100.0	22.04	87.6
1740	19.72	0.014266	100.0	21.87	87.6
1800	19.56	0.014117	100.0	21.87	86.7
1860	19.39	0.013969	100.0	21.87	85.8
1920	19.23	0.013822	100.0	21.71	85.8
1980	19.06	0.013677	100.0	21.54	85.8
2040	19.06	0.013677	100.0	21.71	84.9
2100	18.90	0.013533	100.0	21.54	84.9
2160	18.73	0.013390	100.0	21.54	84.0
2220	18.73	0.013390	100.0	21.38	84.9
2280	19.06	0.013677	100.0	21.71	84.9
2340	19.56	0.014117	100.0	22.20	85.0
2400	19.89	0.014639	101.5	22.20	88.0
2460	20.22	0.014723	100.0	22.53	86.8
2520	20.22	0.014723	100.0	22.53	86.8
2580	20.22	0.014948	101.5	22.37	89.0
2640	20.39	0.014878	100.0	22.37	88.6
2700	20.55	0.015035	100.0	22.37	89.5
2760	20.55	0.015262	101.5	22.53	89.9
2820	20.72	0.015193	100.0	22.53	89.5
2880	20.55	0.015035	100.0	22.53	88.6
2940	20.39	0.014878	100.0	22.04	90.3
3000	20.22	0.014723	100.0	22.04	89.4
3060	20.06	0.014569	100.0	22.04	88.5
3120	19.89	0.014417	100.0	21.71	89.4
3180	19.72	0.014266	100.0	22.04	86.7
3240	19.56	0.014117	100.0	21.71	87.6
3300	19.56	0.013900	98.5	21.71	86.3
3360	19.39	0.013969	100.0	21.54	87.6
3420	19.39	0.013753	98.5	21.71	85.4
3480	19.23	0.013822	100.0	21.54	86.7
3540	19.23	0.013607	98.5	21.54	85.3
3600	19.06	0.013677	100.0	21.54	85.8
3660	19.06	0.013677	100.0	21.87	84.1
3720	19.39	0.013753	98.5	21.87	84.5
MEAN	19.66	0.014237	100.1	21.99	86.7
S.D.	0.59670	0.000590	0.81356	0.39350	1.95623
MAX.	20.72	0.015262	101.5	22.70	90.3
MIN.	18.56	0.013249	98.5	21.38	82.4

AIRFLOW FT/MIN.= 18.43
M/MIN.= 5.62.

Table 3.2.1

Drying conditions for 1970 Runs 31-70, Sabrina

Run No.	Date	Moisture content % d.b. Initial*	Final	Drying air temperature °C	Air velocity m/min	Air Humidity ratio	Relative Humidity %
31	26/6	126.06	47.84	33	22.15	.00728	24
32		125.65	87.44	33	10.07		24
33		122.42	87.72	33.5	19.33		23
34	29/6	116.35	14.52	32	11.76	.00580	19.5
35		113.85	78.35	33.5	10.51		18.5
36		102.72	78.13	33	11.88		19
37	1/7	103.84	79.79	33	3.06	.00675	22
38		103.80	73.64	33	11.88		22
39		105.36	75.65	33	3.06		22
40		103.73	39.62	32.5	11.88		22.5
42	3/7	102.90	12.70	33.5	5.39	.00624	20
43		103.14	13.35	33	6.11		20.5
44	6/7	90.50	7.84	49.5	12.00	.01052	14
46		89.80	10.46	49.5	31.5		14
49	7/7	76.07	12.10	49.5	10.51	.01304	17.5
51	8/7	74.68	11.10	49.5	15.54	.01216	16.5
52		74.54	12.06	49	22.19		17
53		70.12	13.07	49.5	27.29		16.5
54	8/7	78.39	14.05	49.5	15.65	.01216	16.5
55		74.05	14.64	49.5	26.72		16.5
56	9/7	73.62	13.90	33.5	19.58	.00979	-
57		77.01	13.88	33.5	13.05		-
58		76.58	14.01	34	26.87		-
60	10/7	81.03	42.05	33.5	13.05	.00700	22.5
61		83.39	44.50	33.5	26.86		22.0
64	13/7	65.59	14.59	34	27.18	.00845	26
65		64.50	41.14	33.5	15.78		27
66		64.27	39.60	34	22.92		26
67	14/7	68.42	10.04	32.5	21.85	.00813	27
68		63.78	11.59	33.5	21.03		26
69		63.85	14.04	32	21.84		27.5
70	16/7	71.47	11.68	32	21.84	.00649	22

* Calculated from final m.c. and real weight loss.

Table 3.2.2

Drying conditions for 1970 runs 71-210, S.23

Run No.	Date	Moisture content % d.b. Initial*	Final	Drying air temperature °C	Air velocity m/min	Air Humidity kg/kg	Relative Humidity %
71		117.50	17.88	32	15.6		23
72	22/7	116.74	21.37	32	10 7	.006746	23
73		115.08	20.88	32	21.8		23
74		69.88	10.42	33	26.2		21.5
75	25/7	70.94	10.66	33.5	10.4	.006558	21
76		69.40	10.11	33.5	21.9		21
77		71.42	16.00	33.5	15.0		34.5
78	27/7	73.29	15.53	33.5	15.1	.010839	34.5
79		72.91	16.20	33.5	15.1		33.5
80		69.76	6.04	50	15.0		14
81	28/7	68.53	7.41	41	15.	.010712	22
82		68.73	12.60	33.5	15.2		34
83		93.92	5.36	50	15.1		12
84	29/7	91.26	7.04	41	15.2	.009195	19
85		93.19	19.01	33.5	15.4		29
86		84.04	5.52	49.5	15.1		11
87	30/7	84.26	7.85	41	15.0	.008188	17
88		84.40	19.86	32	15.3		27.5
89		92.39	5.94	46	25.9		12.5
90	31/7	93.66	7.03	41.5	21.5	.007874	16
91		93.33	26.69	32	26.5		26.5
92		71.77	5.64	49.5	10.3		12.5
93	1/8	74.97	8.13	41	10.7	.009321	19.5
94		74.66	22.26	32	10.2		31.5
95		70.78	5.37	50.5	10.7		13
96	2/8	73.69	7.17	41.5	10.4	.00995	20
97		73.57	14.73	33	10.4		32.5
98		57.44	5.80	49.5	11.2		14.5
99	3/8	56.06	9.55	41	10.4	.010712	22
100		56.64	21.55	32	10.7		36
101		53.52	5.62	49.5	10.5		16
102	4/8	53.06	8.21	41	10.4	.011855	24.5
103		52.58	13.52	32.5	10.4		39
104		55.76	5.30	50	10.5		14.5
105	5/8	56.34	7.87	41	10.4	.011092	23
106		55.05	15.51	33	10.5		36
107		55.68	5.09	52	10.5		13
108		53.72	6.53	49.5	10.5		16
109		54.15	8.21	41	10.2		24
110	6/8	53.84	13.07	33	10.7	.011727	38
111		54.05	5.83	52	10.5		13.5
112		54.41	5.62	49.5	10.5		16
113		54.26	5.21	52	10.5		13.5
114		55.35	5.02	58	10.5		10
115		54.11	7.41	40.5	10.2		21.5
116	7/8	54.47	6.43	49.5	10.5	.0114098	15.5
117		53.76	12.40	33	10 1		37
118		55.06	4.05	58.5	10.5		10
119		54.49	5.36	49.5	10.5		15.5

Table 3.2.2 Cont'd..... S.23

Run No.	Date	Moisture content % d.b. Initial*	Final	Drying air temperature °C	Air velocity m/min	Air Humidity ratio	Relative Humidity %
120		58.86	5.16	58	10.5		9
121		59.24	7.17	41	10.0		21.5
122	8/8	59.23	12.57	30	10.0	.010269	39.5
123		58.85	6.59	49.5	10.5		14
124		60.01	4.17	58.5	10.3		9
125		59.04	5.29	49.5	10.5		14
126		56.35	5.06	61	10.4		7
127		56.22	7.01	41	10.0		18.5
128	9/8	58.76	13.64	32	9.9	.009006	30.5
129		55.49	6.67	50	10.5		12
130		57.06	3.97	61	10.4		7
131		56.66	5.27	50	10.4		12
132		55.51	4.81	61	10.4		8.5
133		55.80	7.03	41	10.0		22.5
134	10/8	54.91	11.53	33	9.9	.010902	35.5
135		54.90	6.26	49.5	10.3		14.5
136		60.06	4.04	61	10.4		8.5
137		59.97	5.26	49.5	10.3		14.5
138		61.27	4.34	61.5	10.4		5
139		59.59	9.16	39	10.0		15.5
140		61.10	17.44	30	9.9		25.5
141	11/8	60.21	6.54	46	10.3	.006621	10.5
142		60.99	4.96	61.5	10.4		5
143		61.37	5.70	46	10.3		10.5
144		61.90	3.62	61.5	10.4		5
145		59.97	4.46	61.5	10.2		6.5
146		59.95	19.80	39	9.8		19.5
147	12/8	59.95	7.81	46	10.3	.008377	13.5
148		54.57	3.56	61.5	10.2		6.5
149		54.21	7.79	40.5	9.9		18
150		53.62	13.99	30	9.9		32
151		72.44	4.67	62	10.2		7
152		71.34	10.17	40.5	9.7		20.5
153		69.43	19.45	30.5	9.7		36.5
154		71.99	7.67	46.5	10.3		15
155	13/8	72.16	9.15	44	9.9	.009700	17.5
156		59.53	7.37	40	9.7		21.5
157		55.56	12.16	30	9.7		37
158		59.03	5.63	46	9.9		15.5
159		58.12	6.42	49	10.0		13.5
160		43.35	9.37	43.5	26.4		13.5
161		42.6	10.10	44	18.7		13
162		42.81	8.11	45	9.6		12
163		42.97	8.80	43.5	26.8		13.5
164		42.50	10.86	43.5	18.9		13.5
165	14/8	42.38	8.92	44.5	10.1	.007184	12.5
166		47.7	5.74	43.5	26.4		13.5
167		47.6	5.66	44	18.7		13
168		47.4	5.55	44.5	9.6		12.5

Table 3.2.2 Cont'd S.23

Run No.	Date	Moisture content % d.b. Initial*	Final	Drying air temperature °C	Air velocity m/min	Air Humidity ratio	Relative Humidity %
169	14/8	46.7	5.51	43.5	26.8	.007184	13.5
170		47.0	5.98	43.5	18.9		13.5
171		45.2	5.67	45	10.1		12
172		56.8	6.79	44	26.3		12.5
173		57.1	6.67	45	18.5		12
174		57.2	6.43	45	9.6		12
175		56.9	6.52	44.5	26.3		12
176		56.8	6.77	44.5	18.9		12.5
177	15/8	56.9	6.38	45.5	10.1	.007059	11.5
178		57.0	6.26	44	26.3		12.5
179		56.9	6.19	44.5	18.6		12.5
180		56.8	6.32	45	9.4		12
181		56.6	6.33	45	26.7		12
182		56.8	6.46	44.5	21.8		12.5
183		56.7	6.24	45.5	10.1		11.5
184		56.85	5.88	44	26.2		11
185		57.05	6.01	44.5	18.4		11
186	16/8	56.51	5.80	45	9.4	.006183	10.5
187		56.51	5.95	44.5	26.1		11
188		57.06	6.29	44	18.5		11
189		56.27	5.49	47	10		9.5
190		44.2	3.96	44	26.2		11.5
191		44.5	4.00	44	18.4		11.5
192	17/8	43.9	3.73	45	9.4	.006371	11
193		44.5	3.79	44.5	26.6		11
194		44.4	3.80	44.5	19.3		11
195		47.39	13.34	29.5	26.4		25
196	18/8	47.06	13.53	29.5	18.4	.006246	25
197		47.35	13.46	30	9.4		24
198		51.42	13.26	30	26.6		24
199		46.25	13.64	29	9.7		36
200		46.20	14.04	28	10.1		38
201	19/8	45.72	13.22	29	9.3	.008754	36
202		40.24	13.17	29	10.1		36
203		45.08	13.02	29.5	9.7		34.5
204		45.99	12.85	29.5	9.2		34.5
205		58.49	11.26	29	9.8		35.5
206		58.86	11.99	28	10.3		38
207	24/8	58.42	11.21	29	9.5	.008691	35.5
208		58.66	11.22	29	10.5		35.5
209		58.92	11.09	29.5	9.8		34.5
210		58.50	10.79	29.5	9.4		34.5

* Calculated from final m.c. and real weight loss.

Table 3.2.3

Constants in the single exponential equation 3.1 derived from the 1970 data

Run No.	Logarithmic fit			Direct fit		
	$M_o - M_e$ % d.b.	$-k$ min^{-1}	M_e % d.b.	$M_o - M_e$ % d.b.	$-k$ min^{-1}	M_e % d.b.
72	79.6	.001745	19.0	77.4	.002730	27.6
73	77.7	.001672	18.3	84.2	.002660	25.8
74	46.6	.003468	10.4	57.8	.004652	11.5
75	49.1	.002062	10.5	56.3	.002907	12.5
76	44.9	.002787	10.1	56.9	.003985	11.3
77	55.7	.003147	13.5	57.0	.003623	15.3
78	58.0	.003202	13.2	57.1	.003457	14.7
79	56.4	.003203	13.6	57.5	.003686	15.5
80	48.2	.009108	6.0	60.7	.014768	6.7
81	55.7	.005905	7.3	58.4	.006869	8.4
82	54.0	.003828	11.4	53.9	.004164	12.6
83	63.5	.007952	6.0	85.1	.012552	5.2
84	84.2	.004823	6.7	81.9	.004560	6.4
85	72.6	.001822	11.1	69.8	.002615	19.2
86	62.0	.009442	5.5	74.9	.002459	5.1
87	68.1	.003703	6.9	70.4	.004371	8.8
90	94.9	.005482	6.9	88.1	.004677	5.0
91	61.4	.003268	25.0	64.6	.003990	27.5
92	70.7	.015181	6.5	67.4	.011999	3.5
93	66.4	.004177	7.6	64.2	.003937	7.4
94	52.8	.002066	17.6	51.4	.002277	19.6
95	49.0	.009347	5.4	64.2	.01396	4.9
96	67.3	.005339	7.1	61.4	.004816	7.5
97	53.0	.002445	14.0	51.5	.002825	16.4
98	53.7	.01472	6.5	51.7	.011967	4.5
99	46.0	.004345	8.3	45.1	.004177	8.2
100	37.4	.002381	16.7	36.1	.00269	18.5
101	35.5	.008811	6.4	45.5	.014161	6.9
102	40.4	.004625	7.9	41.1	.005489	9.2
103	36.1	.00243	12.1	36.0	.003089	14.2
108	42.7	.015052	5.7	44.9	.01736	6.4
109	37.8	.004992	8.2	40.2	.006813	9.8
110	34.5	.002617	12.6	35.3	.003687	14.8
111	38.9	.016808	5.8	45.0	.023517	6.7
112	33.0	.008845	5.6	43.9	.01815	6.9
113	32.2	.009019	5.2	45.4	.021997	6.6
114	32.8	.01928	5.0	45.8	.04816	6.8
115	37.6	.004838	7.4	40.1	.007005	9.4
116	42.7	.016535	6.3	43.8	.018648	7.1
117	35.7	.003051	11.8	35.8	.003996	13.8
118	29.3	.00903	4.0	46.5	.043618	6.9
119	31.8	.00775	5.3	44.4	.01751	6.7
120	34.8	.01939	5.1	49.5	.04583	6.6
121	45.5	.00510	7.1	45.0	.00635	9.3
122	41.1	.00275	11.8	40.2	.00343	14.1
123	47.6	.01674	6.5	48.1	.01769	7.0
124	33.5	.011114	4.2	51.0	.04378	6.9
125	42.0	.011796	6.1	49.4	.01637	6.8
126	38.4	.01925	4.9	48.6	.03545	6.4

Table 3.2.3 cont'd.....

Run No.	Logarithmic fit			Direct fit		
	$M_o - M_e$ % d.b.	$-k$ min^{-1}	M_e % d.b.	$M_o - M_e$ % d.b.	$-k$ min^{-1}	M_e % d.b.
128	38.4	.002921	13.6	37.3	.003410	15.4
129	49.2	.016805	6.3	47.5	.014615	5.3
130	32.2	.01001	4.0	49.2	.03676	6.4
131	41.4	.010509	5.3	49.3	.014280	5.7
132	35.8	.024314	4.8	47.1	.04894	6.2
133	37.9	.004974	7.0	41.6	.007780	9.2
134	37.3	.003188	11.0	37.6	.004207	13.2
135	44.7	.01712	6.2	45.2	.018110	6.7
136	32.8	.008308	4.0	52.4	.041755	6.7
137	37.3	.01007	5.3	48.9	.01879	6.6
138	41.0	.02367	4.2	53.5	.04482	6.2
139	47.0	.004913	8.8	46.9	.005548	10.1
140	41.0	.002216	14.8	39.6	.002810	17.7
141	55.1	.01012	5.1	54.3	.008689	3.3
142	53.0	.03532	4.4	57.2	.04535	6.2
143	56.7	.01245	5.7	50.2	.01092	6.2
144	32.1	.010359	3.6	53.7	.055334	6.1
145	37.0	.02540	4.4	51.5	.06303	6.7
146	39.2	.007810	15.0	37.0	.009866	18.2
147	50.4	.01261	6.3	49.4	.01233	6.5
148	28.1	.010289	3.6	46.4	.06664	6.6
149	40.8	.00664	7.7	40.5	.007766	9.2
150	34.9	.003444	13.2	34.5	.004397	15.2
156	42.7	.006245	7.3	45.6	.008427	9.0
157	37.8	.003215	11.5	37.1	.004215	14.0
158	45.3	.010744	6.1	49.0	.013328	7.0
159	44.4	.007841	6.6	45.0	.009744	8.4
160	31.8	.01046	8.0	30.5	.01252	9.8
161	32.0	.009056	7.1	30.9	.01235	10.0
162	36.1	.008325	3.8	34.8	.009393	5.6
163	33.2	.00933	6.0	31.7	.011441	8.2
164	30.2	.009578	8.5	28.9	.011941	10.7
165	37.4	.00713	2.8	35.7	.008321	5.2
166	37.8	.00773	5.6	40.2	.009179	6.2
167	39.5	.007859	5.6	39.0	.008538	6.5
168	40.4	.009461	5.5	37.7	.009436	6.5
169	38.8	.008753	5.5	38.6	.009496	6.2
170	38.5	.007446	5.8	38.6	.008140	6.6
171	33.6	.007534	5.6	33.7	.01024	7.8
172	49.9	.008986	6.4	48.0	.009997	7.1
173	48.4	.010646	6.5	47.0	.010389	6.8
174	45.4	.010949	6.6	44.8	.012168	7.9
175	44.4	.008907	6.1	46.3	.011136	7.4
176	46.2	.008688	6.3	46.7	.009641	7.2
177	44.5	.01043	6.7	45.1	.012042	7.9
184	38.5	.00579	5.9	47.0	.010250	6.8
185	39.3	.00555	6.0	48.6	.00882	7.0
186	40.8	.008138	5.8	46.0	.01118	7.1
187	39.3	.00555	6.0	48.6	.00888	7.0
188	39.8	.00593	6.3	47.9	.00914	7.4
190	31.1	.004983	3.7	36.2	.009441	5.3
191	38.0	.009099	4.0	37.4	.008872	5.0
192	30.9	.005934	3.6	35.7	.009923	5.3
193	33.5	.007131	3.7	37.1	.010278	4.9

Table 3.2.3 Cont'd .....

Run No.	Logarithmic fit			Direct fit		
	$M_o - M_e$ % d.b.	- k min^{-1}	M_e % d.b.	$M_o - M_e$ % d.b.	-k min^{-1}	M_e % d.b.
194	36.0	.007707	3.8	36.2	.002142	5.0
195	27.7	.004016	13.2	30.7	.006424	14.6
196	29.4	.003743	13.3	30.1	.004920	14.8
197	29.1	.003763	13.3	29.4	.004926	14.8
198	33.7	.005494	13.2	34.7	.006946	14.3
199	27.4	.003082	13.7	27.9	.004279	15.4
200	27.0	.002572	13.4	27.3	.003816	15.5
201	27.6	.003378	13.0	28.0	.004695	14.6
202	23.2	.002919	12.8	22.9	.003743	14.1
203	26.4	.002736	12.6	27.3	.004112	14.5
204	27.7	.00320	12.6	29.2	.004586	14.2
205	40.3	.003485	11.1	39.7	.004475	13.4
206	39.6	.003331	11.8	38.8	.004322	14.2
207	42.0	.004323	11.2	40.0	.005024	13.1
208	41.2	.003769	11.1	40.4	.004649	13.2
209	41.1	.003605	11.0	40.2	.004532	13.2

Table 3.2.4

Constants in the 2 term exponential equation 3.10 derived from the 1970 data

$$y = A \exp(-k_1 \theta) + B \exp(-k_2 \theta) + C$$

Run No.	A	$-k_1$	B	$-k_2$	C
72	24.5	.03659	71.1	.001550	18.1
73	29.9	.007979	64.7	.001534	18.9
74	21.2	.007138	38.0	.003665	10.9
75	16.6	.00633	42.7	.002104	10.6
76	22.3	.005707	35.5	.003135	10.7
77	7.0	.006697	50.9	.003291	14.6
78	2.5	.01796	55.3	.003367	15.0
79	8.0	.010133	51.7	.002999	13.9
81	7.1	.012337	51.9	.006298	7.9
82	4.2	.016859	51.3	.003715	11.4
87	10.6	.015922	64.0	.003421	5.7
91	10.1	.010992	56.8	.003323	25.9
94	6.1	.040886	51.6	.001816	15.9
95	18.8	.019774	43.8	.01096	6.1
96	-	-	72.8	.005473	7.1
100	4.8	.02436	37.0	.001915	14.1
101	14.8	.01525	30.7	.01365	6.9
102	5.8	.034229	38.4	.004308	7.3
103	6.4	.01767	33.4	.002247	11.8
108	5.4	.059301	41.2	.014664	5.2
109	9.6	.034465	34.6	.004503	7.4
110	6.7	.05380	37.8	.002776	13.1
111	11.0	.043967	35.3	.018856	5.8
112	18.0	.032496	27.7	.011872	5.7
113	19.9	.03272	26.6	.01584	5.9
114	20.4	.07604	26.7	.03277	5.9
115	7.5	.2425	37.9	.005670	8.1
116	7.0	.1122	40.5	.01396	4.9
117	7.0	.23467	34.1	.003217	12.4
118	26.2	.023508	22.3	.016445	5.0
119	20.1	.029133	26.1	.011101	5.4
120	22.1	.0647	28.4	.03402	6.0
121	7.4	.2702	42.9	.005361	8.0
122	5.6	.1127	37.9	.00314	14.3
123	7.6	.21297	46.8	.01274	3.2
124	25.9	.064771	26.5	.02837	5.9
125	13.0	.027788	37.5	.013302	6.0
126	16.4	.04604	32.6	.03087	6.2
129	-	-	52.5	.01735	6.3
130	24.6	.052686	25.7	.025037	5.6
131	12.6	.018186	36.9	.013077	5.5
132	17.7	.06897	30.3	.03544	5.6
133	8.8	.08709	37.9	.005399	6.7
134	8.1	.04248	34.6	.002822	10.3
135	5.8	.17767	43.8	.01390	3.8
136	28.7	.05841	24.9	.027399	6.0
137	19.4	.035469	31.9	.012037	4.9
138	19.6	.05534	34.0	.04530	6.1
139	4.0	.06994	45.5	.004983	9.2

Table 3.2.4 Cont'd .....

Run No.	A	$-k_1$	B	$-k_2$	C
140	10.2	.011973	38.7	.001414	10.4
141	-	-	59.6	.010704	5.2
142	8.7	.02939	47.8	.04577	6.7
143	-	-	62.5	.012836	5.7
144	31.2	.075164	23.8	.035407	5.3
145	22.2	.08854	30.2	.048137	6.2
146	8.5	.33005	38.4	.006359	12.7
148	12.1	.2466	18.5	.05885	23.9
149	5.7	.399303	38.7	.007221	9.1
150	6.8	.08820	32.8	.003165	12.8
156	11.5	.04003	39.0	.005374	5.9
157	8.5	.060135	35.3	.002626	10.0
158	7.5	.044303	43.7	.010755	5.6
159	7.6	.31033	42.9	.008236	7.1
160	6.3	.305445	30.6	.008165	6.2
161	- 2.8	.17946	30.3	.014966	14.5
162	3.7	.218497	35.8	.007423	2.5
163	8.0	.036156	32.0	.006359	2.9
164	5.2	.395764	29.2	.008723	7.9
166	4.9	.03600	36.7	.007722	5.3
167	2.5	.1985	38.1.	.008447	6.7
169	1.3	3.7857	36.8	.01145	8.9
170	3.3	.044991	36.7	.007268	5.9
171	7.2	.92514	30.6	.007856	6.5
172	3.8	.041372	45.5	.008869	6.2
175	5.5	.091176	43.8	.008826	5.4
176	4.5	.064281	44.7	.008171	5.8
177	6.9	.11514	42.6	.009083	5.4
184	14.4	.021844	34.2	.007251	5.8
185	15.7	.013641	33.7	.007178	6.5
186	9.7	.03747	39.1	.008264	5.4
187	13.0	.024519	35.3	.007651	6.3
188	13.9	.015641	35.0	.007287	6.8
189	6.5	.099589	42.7	.009327	4.7
190	9.7	.031968	28.5	.006371	4.2
191	1.3	.198293	36.9	.008787	5.1
192	10.5	.03207	28.1	.006460	3.7
193	7.5	.043278	31.9	.007403	3.4
194	3.8	.315644	35.0	.007973	4.2
195	8.1	.02102	24.2	.004476	13.7
196	6.7	.022065	25.6	.003561	13.6
197	5.0	.13146	27.6	.004011	13.8
198	4.0	.1022	32.4	.005870	13.6
199	5.2	.086134	25.9	.003311	14.3
200	5.7	.07906	25.2	.002806	14.1
201	5.2	.0829	25.9	.003579	13.5
202	3.8	.221909	21.4	.003491	14.4
203	5.3	.124507	25.5	.003190	13.4
204	5.8	.031657	25.9	.003308	12.8

Table 3.2.5

Constants in the exponential series equations fitted to the 1970 data

Note The constants in this table were derived from starting values generated within the curve fitting subroutine SEREX and before the incorporation of the rapid convergence routine. Difficulties with fitting were encountered and in some cases resulted in negative asymptotic constants. Experience with the analysis of the 1971 data suggests that all these curves would have yielded reasonable constants had better starting values been supplied.

Run No.	Exponential Series					
	Sphere			Plane sheet		
	$-k$ min^{-1}	M_e % d.b.	SD % d.b.	$-k$ min^{-1}	M_e % d.b.	SD % d.b.
90	0.004751	7.36	10.51	0.004639	8.33	3.62
91	0.003342	28.11	3.78	0.003827	26.40	3.01
92	0.10244	7.96	4.01	0.011081	4.91	2.26
93	0.003543	10.86	3.79	0.0033905	9.51	1.70
94	0.002336	25.34	3.07	0.002596	23.83	1.73
95	0.006245	-3.67	3.33	0.007054	-8.39	3.63
96	0.003663	9.07	2.69	0.004209	7.12	0.95
97	0.002067	17.07	1.99	0.002356	15.31	0.64
98	0.010615	9.08	3.21	0.012035	6.99	1.83
100	0.002835	23.05	2.24	0.002939	21.7	1.21
101	0.006845	1.47	2.17	0.007749	-0.74	2.20
102	0.003810	9.18	1.67	0.004407	7.88	0.55
103	0.002373	14.89	1.63	0.002665	13.80	0.57
108	0.011256	5.49	1.86	0.012741	3.37	0.99
109	0.003698	7.22	0.97	0.004218	5.42	1.00
110	0.002265	13.55	0.93	0.002689	12.80	0.51
111	0.0012989	3.37	1.61	0.014761	1.10	1.32
112	0.007183	0.04	2.02	0.007874	-3.54	3.02
113	0.007807	-1.90	2.43	0.008774	-5.47	3.34
114	0.018427	-0.95	2.23	0.020488	-4.18	1.18
115	0.003646	6.25	0.78	0.004106	4.30	0.59
116	0.012538	6.57	1.57	0.014369	4.98	0.44
117	0.002599	13.17	1.07	0.003050	12.24	5.97
118	0.008116	-10.76	4.50	0.009163	-13.80	3.07
119	0.006254	-2.16	2.14	0.007028	-5.45	0.79
121	0.003663	6.94	1.06	0.004166	5.24	0.53
122	0.002381	14.04	1.32	0.002746	12.84	0.71
123	0.012566	7.37	1.97	0.014147	5.20	5.91
124	0.009297	-10.17	4.39	0.010457	-14.0	1.89
125	0.008075	1.38	1.9215	0.009166	-1.66	1.8891
126	0.018513	2.10	2.1253	0.021093	0.22	2.0569
128	0.002599	15.95	1.7412	0.002929	15.01	0.6239
129	0.013557	8.54	3.2009	0.014789	7.65	1.5036
130	0.08568	-8.90	3.9450	0.009295	-12.72	5.4471

Table 3.2.5 Contd. .....

Run No.	$-k$ min^{-1}	M_e % d.b.	SD % d.b.	$-k$ min^{-1}	M_e % d.b.	SD % d.b.
131	0.007102	-0.01	2.1112	0.007888	-3.02	2.1542
132	0.018987	-1.54	2.1023	0.020800	-4.56	2.8982
133	0.003992	5.94	0.9030	0.004479	3.78	1.3639
134	0.002730	12.39	1.0981	0.003170	11.25	0.3605
135	0.012744	6.99	1.9400	0.014363	4.86	0.7555
136	0.008141	-9.53	5.2695	0.009003	-12.43	6.8411
137	0.007730	-1.16	1.9411	0.008645	-4.59	2.8056
138	0.023838	0.04	2.5213	0.026089	-2.93	2.7422
139	0.004023	10.44	2.0610	0.004636	9.04	0.7881
140	0.003028	16.94	5.6746	0.002990	17.09	2.5848
141	0.011397	6.39	7.5461	0.010960	7.25	3.1826
142	0.033369	6.50	2.9440	0.037153	3.67	1.8615
143	0.007129	5.29	1.8617	0.008085	3.02	0.6550
144	0.010687	-12.47	5.3558	0.011826	-16.02	7.0545
145	0.024970	-2.17	2.5348	0.027138	-5.40	3.5856
146	0.009759	20.22	2.4042	0.010520	19.97	1.3294
147	0.01364	8.25	6.0603	0.014778	7.23	3.8593
148	0.008622	-12.82	5.6884	0.009285	-15.13	7.2325
149	0.004765	7.84	1.1389	0.005358	6.03	0.5833
150	0.003026	15.05	1.1392	0.003515	14.08	0.3473
160	0.009633	11.03	1.3333	0.011213	10.01	0.7802
161	0.010858	11.19	2.1460	0.011863	10.62	0.9619
162	0.012212	7.99	4.2801	0.012012	8.36	1.9343
163	0.009424	10.00	1.3507	0.011155	8.77	1.0557
164	0.01451	11.91	1.7831	0.011860	11.08	1.0793
166	0.005876	5.90	1.8620	0.006654	3.93	1.0327
167	0.005905	6.27	1.6168	0.006642	4.78	0.6743
168	0.005329	6.07	1.3892	0.007146	4.52	0.3641
169	0.005632	5.55	1.8042	0.006691	3.91	0.9092
170	0.005568	6.57	1.8212	0.006305	5.01	0.8395
171	0.005903	5.72	1.0437	0.006695	4.34	0.9601
172	0.007239	8.96	2.6585	0.008447	6.85	1.3259
173	0.007789	8.32	2.2858	0.009044	6.64	0.9858
175	0.007261	8.04	1.9900	0.008599	6.01	0.8232
176	0.007121	8.51	2.3008	0.008232	6.82	0.9997
177	0.008149	7.77	1.6805	0.009300	5.83	0.5317
184	0.004289	1.88	1.9839	0.004981	-1.32	2.4918
185	0.004576	3.51	2.1823	0.004740	-0.27	2.4669
186	0.005271	1.84	1.4874	0.005764	-1.11	2.0413
187	0.004434	2.58	1.9851	0.005087	-0.16	2.6208
188	0.004808	4.31	2.0014	0.004927	0.33	2.3178
190	0.004568	2.95	1.1656	0.005373	1.52	1.3583
191	0.005294	3.69	1.6177	0.005999	1.94	0.9405
192	0.005289	2.60	0.9088	0.005787	0.80	1.2168
193	0.005216	2.55	1.1885	0.006043	0.59	1.1054
194	0.005193	3.40	1.2859	0.005882	1.64	0.8050
195	0.003268	12.73	0.9611	0.003591	11.56	1.2147
196	0.002867	13.47	1.0171	0.003370	12.73	0.6020
197	0.002972	13.62	0.7083	0.003406	12.73	0.4019
198	0.003650	12.50	1.1267	0.003932	11.41	0.6755
199	0.002603	14.32	0.6413	0.002975	13.47	0.4009
200	0.002288	14.41	0.6090	0.002714	13.69	0.4566
201	0.002755	13.36	0.6236	0.003174	12.60	0.4514
202	0.002341	13.52	0.6572	0.002740	12.79	0.3781
203	0.002416	13.22	0.5903	0.002800	12.48	0.4831
204	0.002635	12.75	0.7398	0.003143	12.07	0.4850
205	0.002644	11.47	0.7410	0.003060	10.10	0.8062

Table 3.2.5 Contd. .....

Run No.	$-k_{-1}$ min^{-1}	M_e % d.b.	SD % d.b.	$-k_{-1}$ min^{-1}	M_e % d.b.	SD % d.b.
206	0.002605	12.47	0.8124	0.002976	11.18	0.9124
207	0.003029	11.32	0.7985	0.003390	9.73	0.7617
208	0.002755	11.31	0.7914	0.003251	10.23	0.6090
209	0.002735	11.44	0.8111	0.003107	10.04	0.7619
210	0.003072	10.95	1.0147	0.003437	9.25	0.6220

Table 3.2.6 Drying conditions for 1971 runs.

RUN NO.	SEED	*	MOISTURE CONTENT, % D.B. INITIAL	MOISTURE CONTENT, % D.B. FINAL	DRYING AIR TEMP., C	DRYING AIR RH %	DRYING AIR ABSOLUTE HUMIDITY, RATIO	NO. OF OBS.
31	SABEL	F	99.8	9.1	32.4	30.6	0.00907	88
32	SABEL	F	99.9	10.0	30.3	33.7	0.00878	86
33	SABEL	F	99.1	7.9	35.2	25.7	0.00885	90
34	SABEL	F	98.9	8.2	41.1	19.4	0.00935	90
35	SABEL	F	99.5	6.3	46.4	15.3	0.00968	92
36	SABEL	F	99.5	15.3	20.4	0.0	0.00000	81
37	SABEL	F	99.1	5.7	50.5	13.0	0.00995	92
38	SABEL	F	100.6	84.1	30.7	94.6	0.02649	0
39	SABEL	F	94.9	6.5	46.6	14.8	0.00938	90
40	SABEL	F	0.0	0.0	49.6	13.6	0.01010	0
41	SABEL	F	80.7	22.5	29.9	61.3	0.01607	59
42	SABEL	F	93.8	6.4	41.1	18.7	0.00899	89
43	SABEL	F	91.5	5.3	49.8	11.9	0.00886	89
44	SABEL	F	84.9	8.7	32.4	30.2	0.00928	85
45	SABEL	F	84.1	9.5	30.1	32.1	0.00842	80
46	SABEL	F	81.9	7.3	35.0	24.6	0.00851	82
47	SABEL	F	83.3	5.9	41.0	19.5	0.00948	84
48	SABEL	F	83.1	4.9	46.6	14.5	0.00922	85
49	SABEL	F	81.3	16.1	20.3	0.0	0.00000	0
50	SABEL	F	84.2	4.6	49.8	11.5	0.00865	85
51	SABEL	F	84.0	34.9	30.6	89.5	0.02488	0
52	SABEL	F	69.8	9.9	32.3	37.4	0.01089	68
53	SABEL	F	68.4	11.3	30.1	40.9	0.01057	69
54	SABEL	F	68.2	8.6	35.0	31.4	0.01073	70
55	SABEL	F	66.6	7.5	41.2	20.2	0.00980	72
56	SABEL	F	66.9	5.3	46.8	15.4	0.01000	73
57	SABEL	F	70.4	21.0	20.0	30.8	0.00440	60
58	SABEL	F	68.5	5.3	50.1	12.5	0.00950	75
59	SABEL	F	69.0	33.5	30.8	84.4	0.02350	43
60	SABEL	F	68.6	8.6	41.2	21.0	0.01049	69
61	SABEL	F	68.3	6.3	46.7	16.6	0.01060	72
62	SABEL	F	67.8	6.0	50.0	13.6	0.01030	72
63	SABEL	CS	83.4	5.3	62.6	7.4	0.01020	83
64	SABEL	CS	81.9	5.1	62.6	7.5	0.01040	85
65	SABEL	CS	81.4	5.2	62.5	7.5	0.01030	83
66	SABEL	CS	82.2	5.1	62.3	7.6	0.01030	84
67	SABEL	CS	79.9	5.0	62.2	7.8	0.01050	83
68	SABEL	CS	79.1	30.9	20.5	32.3	0.00485	55
69	SABEL	CS	81.3	5.1	61.8	7.7	0.01020	84
70	SABEL	CS	82.6	34.2	30.3	74.8	0.02030	52
71	SABEL	F	48.1	10.2	29.5	43.5	0.01110	0
72	SABEL	F	48.5	8.1	35.1	31.7	0.01100	54
73	SABEL	F	48.8	8.0	35.2	31.7	0.01100	54
74	SABEL	F	48.9	7.3	40.5	23.5	0.01100	56
75	SABEL	F	49.6	6.1	46.3	17.4	0.01100	57
77	SABEL	F	50.3	5.3	50.9	12.6	0.01012	58
78	SABEL	F	49.0	26.8	30.1	75.5	0.02025	30
79	SABEL	F	48.9	6.9	40.6	23.6	0.01100	56
80	SABEL	F	49.1	5.4	46.5	17.4	0.01110	57
81	SABEL	F	48.8	16.4	20.4	49.2	0.00720	45
82	SABEL	F	49.3	4.8	51.0	13.4	0.01080	59
83	SABEL	F	26.7	16.1	29.8	67.9	0.01770	16
84	SABEL	F	23.7	13.1	29.5	45.8	0.01170	16

*=SEED CONDITION F=FRESH CS=COLD STORED DF=DEEP FROZEN

Table 3.2.6 Contd. .....

RUN NO.	SEED	*	MOISTURE CONTENT, % D.B. INITIAL	MOISTURE CONTENT, % D.B. FINAL	DRYING AIR TEMP., C	DRYING AIR RH %	DRYING AIR ABSOLUTE HUMIDITY, RATIO	NO. OF OBS.
85	SABEL	F	24.2	9.9	35.1	32.5	0.01140	23
86	SABEL	F	23.7	9.7	35.3	30.5	0.01140	25
87	SABEL	F	23.9	7.6	40.4	23.[illegible]	0.01140	27
88	SABEL	F	23.3	6.1	46.6	17.9	0.01150	29
89	SABEL	F	23.3	15.4	2[illegible].6	46.4	0.00690	0
90	SABEL	F	24.6	5.4	51.1	13.7	[illegible].1110	31
91	SABEL	F	23.2	18.4	29.7	71.7	0.01867	9
92	SABEL	CS	65.1	10.8	29.4	50.6	.01290	65
93	SABEL	CS	65.8	8.6	35.0	33.1	0.01150	67
94	SABEL	CS	66.0	8.4	35.1	30.0	0.01070	68
95	SABEL	CS	66.6	7.9	40.4	21.5	0.01070	69
96	SABEL	CS	66.4	6.4	46.6	16.0	0.01070	71
97	SABEL	CS	65.2	14.3	29.5	46.1	0.00680	59
98	SABEL	CS	65.8	5.5	51.0	13.5	0.01072	71
99	SABEL	CS	65.1	18.4	29.4	72.2	0.01860	57
100	SABEL	CS	65.9	7.3	40.5	21.5	.01070	70
101	SABEL	CS	66.6	6.1	46.6	15.5	0.01070	72
102	SABEL	CS	65.9	5.1	51.1	13.4	0.01070	72
103	S.23	F	72.4	12.0	29.3	44.3	[illegible].01066	62
104	S.23	F	73.3	8.8	35.1	29.9	0.01040	69
105	S.23	F	73.2	8.8	35.1	29.9	0.01040	69
106	S.23	F	73.5	6.9	40.3	21.[illegible]	0.01040	71
107	S.23	F	71.2	5.5	46.5	15.[illegible]	0.01040	71
108	S.23	F	72.2	17.5	29.7	64.1	[illegible].00660	0
109	S.23	F	73.1	4.7	51.0	12.5	0.01020	71
110	S.23	F	70.7	17.9	29.7	70.0	0.01850	0
111	S.23	CS	71.4	5.1	51.5	13.2	0.01080	74
112	S.23	CS	72.4	4.6	54.4	11.1	0.01040	73
113	S.23	CS	72.4	4.1	57.8	9.4	0.01040	74
114	S.23	CS	72.2	3.5	63.1	0.0	0.01040	76
115	S.23	CS	71.5	6.0	46.7	16.9	0.01040	73
116	S.23	CS	71.4	5.3	45.6	11.0	0.00660	0
117	S.23	CS	70.8	5.1	51.0	12.9	0.01030	71
118	S.23	CS	71.9	12.6	29.7	43.0	0.01070	0
119	S.23	CS	72.0	9.0	35.2	29.0	0.01070	69
120	S.23	CS	71.8	10.6	35.2	29.0	0.01070	66
121	S.23	CS	71.8	7.9	40.5	21.5	0.01070	71
122	S.23	CS	70.9	6.4	46.3	16.0	0.01070	72
123	S.23	CS	70.9	15.4	29.8	43.8	0.00660	0
124	S.23	CS	71.4	5.4	51.2	13.0	0.01130	72
125	S.23	CS	70.0	19.7	29.6	69.6	0.01810	57
126	SABEL	CS	48.4	10.9	35.4	28.0	0.01036	52
127	SABEL	CS	50.0	8.1	40.7	20.0	0.01036	55
128	SABEL	CS	49.2	6.5	46.4	13.5	0.01036	57
129	SABEL	CS	50.5	5.5	51.2	12.0	0.01036	59
130	S.23	F	66.7	11.9	29.2	42.2	0.01049	61
131	S.23	F	66.7	9.3	35.3	30.4	0.01073	64
132	S.23	F	66.4	9.2	35.4	29.2	0.01030	65
133	S.23	F	66.2	8.4	40.6	21.5	0.01080	67
134	S.23	F	66.0	6.8	46.4	16.0	0.01080	68
135	S.23	F	65.0	13.9	29.8	43.7	0.00649	59
136	S.23	F	67.3	6.3	51.2	13.0	0.01100	68
137	S.23	F	65.2	18.1	29.7	70.7	0.01839	56

*=SEED CONDITION F=FRESH CS=COLD STORED DF=DEEP FROZEN

Table 3.2.6 - Contd. .....

RUN NO.	SEED *	MOISTURE CONTENT, % D.B. INITIAL	MOISTURE CONTENT, % D.B. FINAL	DRYING AIR TEMP., C	DRYING AIR RH %	DRYING AIR ABSOLUTE HUMIDITY, RATIO	NO. OF OBS.
138	S.23	CS	70.0	7.9	40.6	22.6	0.01063	71
139	S.23	CS	70.3	6.8	46.4	16.6	0.01035	73
140	S.23	CS	70.5	5.9	51.1	13.2	0.01065	74
141	S.23	CS	69.8	9.8	31.0	37.5	0.01080	68
142	S.23	CS	70.2	9.1	35.4	25.0	0.01080	69
143	S.23	CS	69.4	9.1	35.4	25.0	0.01080	69
144	S.23	CS	70.3	7.6	40.6	21.5	0.01080	71
145	S.23	CS	70.7	6.3	46.6	16.0	0.01080	73
146	S.23	CS	70.3	8.3	30.6	25.3	0.00680	70
147	S.23	CS	70.5	5.6	51.2	13.7	0.01110	73
148	S.23	CS	70.0	27.7	30.8	88.6	0.02434	0
149	S.23	CS	68.4	13.3	31.2	42.8	0.01110	0
150	S.23	CS	68.4	10.3	35.3	34.4	0.01160	66
151	S.23	CS	68.1	10.3	35.3	33.6	0.01150	66
152	S.23	CS	68.4	8.4	40.5	23.8	0.01097	69
153	S.23	CS	68.5	10.4	30.5	26.6	0.00760	65
154	S.23	CS	68.1	35.7	30.7	91.2	0.02540	0
155	S.23	CS	70.1	10.9	31.2	37.8	0.01060	63
156	S.23	CS	70.1	8.5	35.6	29.6	0.01070	69
157	S.23	CS	70.4	8.7	35.6	29.8	0.01070	69
158	S.23	CS	70.8	6.9	40.9	21.5	0.01030	74
159	S.23	CS	70.4	5.8	46.9	15.9	0.01030	73
160	S.23	CS	70.5	9.3	31.0	24.6	0.00680	68
161	S.23	CS	69.2	18.4	30.4	64.1	0.01740	59
162	S.23	CS	69.5	10.8	31.2	38.6	0.01080	70
163	S.23	CS	69.5	9.3	35.7	28.8	0.01050	68
164	S.23	CS	69.1	9.2	35.6	29.2	0.01050	68
165	S.23	CS	69.1	7.6	40.9	21.1	0.01010	71
166	S.23	CS	69.1	6.2	46.8	15.6	0.01010	72
167	S.23	CS	69.1	8.4	31.1	25.0	0.00700	68
168	S.23	CS	69.5	15.8	30.4	63.5	0.01720	61
169	S.23	CS	71.7	9.7	35.6	32.5	0.01170	69
170	S.23	CS	71.7	9.7	35.6	32.7	0.01170	68
171	S.23	CS	71.9	8.0	40.9	23.9	0.01140	72
172	S.23	CS	70.9	6.5	46.8	17.6	0.01140	72
173	SABEL	CS	84.3	10.4	31.0	39.0	0.01080	79
174	SABEL	CS	85.5	8.5	35.4	30.7	0.01090	83
175	SABEL	CS	84.7	8.4	35.4	30.8	0.01100	82
176	SABEL	CS	83.9	7.4	40.8	23.4	0.01110	83
177	SABEL	CS	85.6	6.2	46.6	17.4	0.01120	84
178	SABEL	CS	83.6	8.1	30.9	24.9	0.00700	82
179	SABEL	CS	83.6	16.3	30.2	63.4	0.01700	73
180	SABEL	CS	82.0	8.8	31.2	31.7	0.00880	81
181	SABEL	CS	82.7	7.6	35.4	25.0	0.00880	83
182	SABEL	CS	82.9	7.5	35.5	25.0	0.00890	83
183	SABEL	CS	82.4	6.3	40.8	18.1	0.00860	85
184	SABEL	CS	81.8	12.2	25.6	43.4	0.00880	78
185	SABEL	CS	80.7	14.2	21.2	41.7	0.00640	75
186	SABEL	CS	81.2	45.9	21.7	93.6	0.01510	42
187	S.23	CS	70.8	11.0	30.8	44.0	0.01260	74
188	S.23	CS	71.4	9.2	35.4	34.1	0.01260	71
189	S.23	CS	71.3	9.1	35.4	34.2	0.01260	71
190	S.23	CS	72.0	7.5	41.0	25.1	0.01260	73

*=SEED CONDITION F=FRESH CS=COLD STORED DF=DEEP FROZEN

Table 3.2.6 Contd. .....

RUN NO.	SEED	*	MOISTURE CONTENT, % D.B. INITIAL	MOISTURE CONTENT, % D.B. FINAL	DRYING AIR TEMP., C	DRYING AIR RH %	DRYING AIR ABSOLUTE HUMIDITY, RATIO	NO. OF OBS.
191	S.23	CS	70.7	13.3	26.2	58.3	0.01260	65
192	S.23	CS	71.3	8.3	30.8	24.9	0.00678	71
193	S.23	CS	70.8	17.2	31.5	69.8	0.02020	63
194	S.23	CS	73.6	14.4	19.1	69.0	0.00640	65
195	S.23	CS	72.2	20.7	18.9	73.8	0.00992	59
196	SABEL	CS	67.6	13.9	19.2	69.4	0.00676	63
197	SABEL	CS	66.7	20.0	19.1	74.3	0.01010	56
198	S.23	CS	70.7	9.8	32.7	33.1	0.01013	69
199	S.23	CS	71.1	8.3	32.9	21.6	0.00660	72
200	S.23	CS	71.1	12.4	35.5	46.5	0.01680	0
201	S.23	CS	69.9	17.4	20.1	67.1	0.01690	0
202	S.23	CS	73.2	10.5	32.9	36.8	0.01140	70
203	S.23	CS	73.5	8.1	32.8	22.6	0.00691	72
204	S.23	CS	72.4	12.8	35.5	51.1	0.01852	67
205	S.23	CS	72.5	18.1	20.5	71.7	0.01852	61
206	S.23	CS	75.0	8.0	33.1	20.7	0.00642	73
207	S.23	CS	73.6	15.1	32.8	79.5	0.02493	51
208	S.23	CS	73.7	17.6	32.4	83.1	0.02549	51
209	S.23	DF	64.1	11.8	20.1	42.2	0.00610	60
210	S.23	DF	64.2	26.0	22.0	86.7	0.01424	44
211	S.23	DF	64.0	30.0	21.3	90.3	0.01416	42
212	S.23	DF	65.4	11.4	21.3	41.0	0.00639	61
213	S.23	DF	64.9	37.1	21.3	94.6	0.01484	0
214	S.23	DF	65.1	31.1	21.6	92.5	0.01483	40
215	S.23	DF	62.9	14.5	15.1	60.8	0.00640	57
216	S.23	DF	64.6	22.4	12.9	82.1	0.00748	49
217	S.23	DF	64.8	18.7	14.4	75.8	0.00762	53
218	S.23	DF	64.1	15.4	15.4	60.8	0.00653	56
219	S.23	DF	64.3	20.4	14.9	75.5	0.00786	50
220	S.23	DF	64.2	20.4	14.8	77.3	0.00800	50
221	S.23	DF	66.4	12.7	24.7	49.1	0.00942	61
222	S.23	DF	62.1	12.8	24.3	51.7	0.00971	59
223	S.23	DF	65.7	12.5	24.9	50.1	0.00974	62
224	S.23	DF	66.2	12.0	26.0	46.0	0.00952	66
225	S.23	DF	65.4	11.3	27.1	42.7	0.00947	63
226	SABEL	DF	49.9	13.0	16.2	50.6	0.00569	47
227	SABEL	DF	49.9	18.4	15.5	72.3	0.00784	42
228	SABEL	DF	49.8	17.6	16.0	71.6	0.00801	40
229	S.23	DF	70.2	4.5	55.2	10.8	0.01063	74
230	S.23	DF	69.9	4.5	56.3	10.2	0.01055	74
231	S.23	DF	70.6	4.5	58.4	9.4	0.01066	75
232	S.23	DF	72.7.	5.0	62.0	7.9	0.01059	76
233	S.23	DF	70.3	3.7	62.9	7.5	0.01050	75
234	S.23	DF	74.3	4.1	63.0	7.1	0.01001	78
235	S.23	DF	75.4	3.9	63.3	7.0	0.00993	76
236	S.23	DF	57.1	3.8	63.0	7.0	0.00989	75
237	S.23	DF	74.7	3.9	63.4	6.8	0.00974	78
238	S.23	DF	73.3	3.8	63.1	6.8	0.00967	77
239	SABEL	DF	51.7	8.5	26.5	26.3	0.00561	53
240	SABEL	DF	52.1	8.6	26.3	25.7	0.00540	56

*=SEED CONDITION F=FRESH CS=COLD STORED DF=DEEP FROZEN

Table 3.2.7 Constants in the single-exponential equation 3.1 derived from the 1971 data for Sabel.

THIN LAYER TESTS, 1971.					SINGLE EXPONENTIAL CONSTANTS			
RUN NO.	MOISTURE CONTENT, %D.B.		TEMP. DEG. C	R.H.	HUMIDITY RATIO	CONSTANTS		
	INITIAL	FINAL				K	MS	S.E.
31	99.3	9.1	32.4	30.6	0.00907	0.00151	10.95	3.058
32	99.9	10.0	30.3	35.7	0.00975	0.00139	11.47	3.166
33	97.1	7.9	35.2	25.7	0.00885	0.00125	9.93	2.883
34	93.9	8.2	41.1	19.4	0.00935	0.00302	7.53	2.544
37	97.5	6.3	45.4	15.3	0.00963	0.00501	5.57	2.292
36	92.5	15.3	20.4	33.3	0.00539	0.00090	16.53	3.527
37	99.1	9.7	30.5	15.0	0.00993	0.00778	4.69	1.843
38	94.9	6.5	46.6	14.8	0.00938	0.00563	7.73	2.341
41	89.7	22.5	29.9	61.3	0.01607	0.00079	16.97	2.209
42	93.3	6.4	41.1	18.7	0.00899	0.00361	8.19	2.751
43	97.5	5.5	49.8	11.9	0.00886	0.00208	4.52	1.925
44	94.9	8.7	32.4	30.2	0.00928	0.00150	7.29	1.905
45	94.1	9.5	30.1	32.1	0.00842	0.00119	7.87	1.914
46	91.9	7.3	35.0	24.6	0.00851	0.00165	6.25	1.925
47	93.3	5.9	41.0	19.5	0.00948	0.00273	5.21	1.853
48	93.1	4.9	46.6	14.5	0.00922	0.00451	3.78	1.711
50	94.2	4.6	49.9	11.5	0.00965	0.00650	3.92	1.581
52	97.8	9.9	32.3	37.4	0.01089	0.00144	8.63	1.953
53	99.4	11.3	30.1	40.9	0.01057	0.00111	7.03	1.852
54	93.2	8.6	35.0	31.4	0.01073	0.00163	7.07	1.854
55	95.4	7.5	41.2	20.2	0.00980	0.00291	6.37	1.527
56	95.7	5.3	48.3	15.4	0.01000	0.00518	4.83	1.174
57	70.4	21.0	20.0	50.8	0.00440	0.00071	13.93	1.977
58	95.5	5.3	50.1	12.5	0.00950	0.00723	4.96	1.603
59	92.0	33.5	30.3	84.4	0.02350	0.00104	32.24	1.284
60	98.4	8.6	41.2	21.0	0.01069	0.00385	8.71	2.037
61	93.3	6.3	46.7	16.6	0.01060	0.00604	6.76	1.767
62	97.9	6.0	50.0	15.6	0.01030	0.00889	6.39	1.623
71	98.1	10.2	29.5	45.5	0.01110	0.00121	9.75	0.927
72	98.5	8.1	35.1	31.7	0.01100	0.00215	9.10	1.034
73	99.9	8.0	35.2	31.7	0.01100	0.00215	8.83	0.953
74	92.9	7.3	40.5	23.5	0.01100	0.00340	7.59	0.854
75	99.6	6.1	46.3	17.4	0.01100	0.00614	6.60	0.842
77	99.3	5.3	50.9	12.6	0.01012	0.00995	5.82	0.619
78	99.0	26.8	30.1	75.5	0.02025	0.00115	32.62	0.853
79	98.9	6.9	40.6	23.6	0.01100	0.00380	7.93	1.161
80	99.1	5.4	46.5	17.4	0.01113	0.00662	6.56	0.952
81	98.8	16.4	20.6	49.2	0.00720	0.00100	14.96	1.491
82	99.3	4.8	51.0	13.4	0.01080	0.01093	5.83	0.872
83	26.7	16.1	29.8	67.9	0.01770	0.00122	15.28	0.300
84	23.7	13.1	29.5	45.9	0.01170	0.00237	12.49	0.467
85	24.2	9.9	35.1	32.5	0.01140	0.00395	10.27	0.524
86	23.7	9.7	35.3	30.5	0.01140	0.00409	10.09	0.603
87	23.9	7.6	40.4	23.0	0.01140	0.00566	8.17	0.593
88	23.3	6.1	46.6	17.9	0.01150	0.00961	6.83	0.669
90	24.6	5.4	51.1	13.7	0.01110	0.01503	6.43	0.719
91	23.2	18.4	29.7	71.7	0.01567	0.00104	16.09	0.300
63	83.4	5.3	62.6	7.4	0.01020	0.02648	4.74	1.118
64	81.9	5.1	62.6	7.5	0.01040	0.02670	3.62	1.200
65	81.4	5.2	62.5	7.5	0.01030	0.02628	4.61	1.053
66	82.2	5.1	62.3	7.6	0.01030	0.02603	4.67	1.163
67	79.9	5.0	62.2	7.8	0.01050	0.02667	4.26	1.030
68	77.1	30.9	20.5	52.3	0.00485	0.00129	27.14	2.203
69	81.3	5.1	61.8	7.7	0.01020	0.02640	4.68	1.255
70	82.6	34.2	30.3	74.8	0.02030	0.00150	32.73	2.333
92	65.1	10.8	29.4	50.6	0.01290	0.00162	12.61	2.212
93	65.8	8.6	33.0	33.1	0.01150	0.00270	10.05	2.114
94	65.0	7.4	35.1	30.0	0.01070	0.00271	10.17	2.260
95	66.6	7.9	40.4	21.9	0.01070	0.00464	9.70	2.122
96	66.4	6.4	46.6	16.0	0.01070	0.00703	7.63	1.851
97	65.2	14.3	20.5	46.1	0.00680	0.00118	14.97	2.373
98	65.8	5.5	51.0	13.5	0.01072	0.01226	6.32	1.601
99	65.1	18.4	29.4	72.2	0.01960	0.00114	18.14	2.062
100	65.9	7.3	40.5	21.5	0.01070	0.00633	8.51	1.523
101	66.6	6.1	46.6	15.5	0.01070	0.00762	7.12	1.603
102	65.9	5.1	51.1	13.4	0.01070	0.01216	6.24	1.403
126	48.4	10.9	35.4	28.0	0.01036	0.00587	11.16	1.351
127	50.0	8.1	40.7	20.0	0.01036	0.00573	9.35	1.309
128	49.2	6.5	46.4	13.5	0.01036	0.00943	7.66	1.171
129	50.5	5.5	51.2	12.0	0.01036	0.01489	6.72	1.053
173	84.3	10.4	31.0	39.0	0.01080	0.00200	11.84	3.169
174	85.5	8.5	35.4	30.7	0.01090	0.00287	10.59	3.242
175	84.7	7.4	35.4	30.8	0.01100	0.00283	10.17	2.993
176	85.9	7.4	40.8	23.4	0.01110	0.00457	8.59	2.854
177	85.6	6.2	46.4	17.4	0.01120	0.00729	6.71	2.660
178	85.6	8.1	30.9	24.9	0.00700	0.00220	9.78	3.153
179	85.6	16.3	30.2	65.4	0.01700	0.00167	17.55	3.170
180	82.0	8.8	31.2	31.7	0.00880	0.00282	10.25	2.916
181	82.7	7.4	35.4	25.0	0.00890	0.00285	8.61	2.993
182	82.9	7.5	35.5	25.0	0.00990	0.00283	8.94	2.970
183	82.4	6.3	40.8	18.1	0.00960	0.00435	7.73	2.773
184	81.8	12.2	25.6	43.4	0.00880	0.00129	12.10	3.123
185	80.7	14.2	21.2	41.7	0.00640	0.00105	12.33	3.023
186	81.2	45.9	21.7	93.6	0.01910	0.00080	45.34	2.327
196	67.6	13.9	19.2	49.4	0.00676	0.00163	16.55	2.765
197	68.7	20.0	19.1	74.3	0.01010	0.00133	22.33	2.659
226	49.9	13.0	16.2	50.6	0.00569	0.00133	14.24	1.601
227	49.9	18.4	15.5	72.3	0.00794	0.00099	18.84	1.266
228	49.8	17.0	16.0	71.6	0.00901	0.00130	18.91	1.607
239	51.7	8.5	26.5	26.3	0.00561	0.00211	9.77	1.429
240	52.1	8.0	26.3	25.7	0.00560	0.00200	9.40	1.349

Table 3.2.8 Constants in the single-exponential equation 3.1 derived from the 1971 data for S23.

THIN LAYER TESTS, 1971.					SINGLE EXPONENTIAL CONSTANTS			
RUN NO.	MOISTURE CONTENT, %D.B.		TEMP. DEG. C	R.H. RATIO	HUMIDITY	CONSTANTS		
	INITIAL	FINAL				K	ME	S.D.
103	72.4	12.0	29.3	44.3	0.01064	0.00186	19.53	1.908
104	72.3	8.9	35.1	22.7	0.01040	0.00216	9.71	1.744
105	73.2	7.8	35.1	27.9	0.01040	0.00215	9.58	1.824
106	72.5	6.9	40.3	21.0	0.01040	0.00331	7.49	1.614
107	71.2	9.5	46.5	15.9	0.01040	0.00613	4.01	1.468
109	73.1	4.7	51.0	12.8	0.01020	0.01029	3.71	1.214
130	66.7	11.9	29.2	42.2	0.01049	0.00250	15.50	2.507
131	68.7	9.3	35.3	30.6	0.01073	0.00365	10.73	1.494
132	66.4	9.2	35.4	29.2	0.01030	0.00356	10.64	1.556
133	66.7	8.4	40.6	21.5	0.01020	0.00531	9.31	1.583
134	68.0	6.8	46.4	16.9	0.01080	0.00822	7.75	1.346
134	65.0	13.9	20.8	68.7	0.00649	0.00159	14.75	1.849
136	67.3	6.3	51.2	13.0	0.01100	0.01319	6.22	1.031
137	65.2	18.1	29.7	70.7	0.01639	0.00177	19.69	1.647
111	71.4	5.1	51.5	15.2	0.01080	0.01401	5.76	1.833
112	72.4	4.4	54.4	11.1	0.01040	0.01879	5.40	1.613
113	72.4	4.1	57.8	9.4	0.01040	0.02695	5.48	1.295
114	72.2	3.5	65.1	0.0	0.01040	0.04242	5.61	1.249
115	71.5	6.0	46.7	19.9	0.01040	0.00810	6.65	2.318
117	70.9	5.1	51.0	12.9	0.01050	0.01308	5.43	1.703
119	72.0	9.0	30.2	29.9	0.01070	0.00378	11.79	3.000
120	71.9	10.6	30.2	22.8	0.01070	0.00389	12.04	2.812
121	71.9	7.9	40.3	21.3	0.01070	0.00529	10.23	2.774
122	70.2	6.4	46.3	16.9	0.01070	0.00859	7.89	2.562
124	71.4	5.4	51.2	13.9	0.01150	0.01467	6.34	2.097
125	70.9	19.7	20.4	69.5	0.01810	0.00171	21.67	2.776
126	70.9	7.9	40.6	22.6	0.01063	0.00610	10.11	2.460
127	70.3	6.9	46.4	16.4	0.01035	0.00934	8.49	2.288
140	70.9	5.9	51.1	13.2	0.01065	0.01515	7.22	1.988
141	69.3	9.1	31.0	27.5	0.01080	0.00359	13.03	2.831
142	70.2	9.1	35.4	25.9	0.01090	0.00493	12.02	2.707
143	69.4	9.1	25.4	25.0	0.01090	0.00480	11.73	2.607
144	70.3	7.6	40.6	21.5	0.01080	0.00698	10.20	2.596
145	70.7	6.3	44.6	16.9	0.01090	0.00995	6.45	2.163
146	70.9	8.3	30.6	25.3	0.00680	0.00366	11.10	2.617
147	70.3	5.6	51.2	15.7	0.01110	0.01679	7.44	2.079
150	69.4	10.3	25.3	34.4	0.01160	0.00586	12.93	2.633
151	69.1	10.3	28.3	33.6	0.01150	0.00584	12.93	2.681
152	69.4	8.4	40.3	23.8	0.01097	0.00823	10.91	2.670
153	69.5	10.4	30.5	24.6	0.00700	0.00483	13.27	2.725
153	70.1	10.9	31.2	37.8	0.01040	0.00401	13.23	3.027
156	70.1	8.5	35.6	22.4	0.01070	0.00500	11.84	2.887
157	70.4	8.7	35.6	25.8	0.01070	0.00504	12.02	2.908
159	70.8	6.9	40.9	21.3	0.01030	0.00711	10.81	2.931
192	70.4	5.3	46.9	15.9	0.01070	0.01137	8.23	2.507
160	70.5	9.3	31.0	26.6	0.00690	0.00426	12.62	3.061
161	69.2	18.4	20.4	64.1	0.01740	0.00216	21.14	2.787
162	69.5	10.3	31.2	33.6	0.01090	0.00388	13.76	2.825
163	69.5	9.3	35.7	29.4	0.01050	0.00602	12.15	2.737
164	69.1	9.2	35.6	29.2	0.01050	0.00592	11.79	2.671
165	69.1	7.6	40.9	21.	0.01010	0.00857	10.41	2.681
166	69.1	6.2	46.3	15.6	0.01010	0.01261	8.31	2.421
167	69.1	8.4	31.1	27.0	0.00700	0.00448	11.01	2.710
169	69.5	15.8	30.6	69.9	0.01720	0.00326	19.03	2.716
170	71.2	9.7	35.6	33.5	0.01170	0.00609	12.81	3.092
173	71.7	9.7	35.6	33.7	0.01170	0.00609	12.93	2.998
171	71.7	8.0	40.9	27.7	0.01140	0.00849	10.01	2.907
172	70.9	6.5	44.9	17.6	0.01140	0.01276	9.13	2.627
197	70.9	11.0	30.9	44.0	0.01260	0.00468	14.65	3.430
198	71.4	9.2	35.4	34.1	0.01260	0.00736	12.21	3.225
199	71.3	9.1	35.4	34.2	0.01260	0.00712	12.84	3.439
200	72.0	7.5	41.0	25.1	0.01260	0.01013	10.36	3.058
171	70.7	13.3	21.2	59.9	0.01260	0.00474	16.93	2.972
192	71.3	8.3	30.7	31.9	0.00678	0.00526	11.93	3.220
193	70.8	17.2	31.5	67.9	0.02020	0.00380	20.29	2.990
194	73.6	14.4	19.1	60.0	0.00640	0.00285	18.53	2.548
195	72.2	20.7	18.9	73.9	0.00593	0.00218	24.45	3.024
199	70.7	9.4	32.7	33.1	0.01013	0.00534	14.05	3.550
199	71.1	8.7	32.9	21.4	0.00660	0.00548	12.67	3.680
202	73.2	9.5	32.9	34.8	0.01140	0.00578	14.03	3.255
203	72.9	9.1	32.9	27.6	0.00691	0.00589	12.67	3.842
204	72.6	19.9	25.5	51.1	0.01652	0.00645	17.33	3.744
205	72.5	17.1	29.1	71.7	0.01652	0.00417	23.16	3.593
206	72.2	8.0	31.1	29.7	0.00642	0.00606	11.50	3.732
207	73.6	19.6	32.9	79.3	0.02493	0.00466	22.90	3.771
208	73.7	17.6	32.4	83.1	0.02569	0.00510	21.36	3.442
207	64.1	11.8	20.1	42.2	0.00610	0.00291	15.88	3.179
210	64.2	25.0	22.0	86.7	0.01424	0.00287	28.84	1.996
211	64.0	30.0	21.3	90.3	0.01416	0.00209	33.01	1.774
212	65.4	11.4	21.3	41.0	0.00639	0.00318	15.60	3.241
214	65.1	31.1	21.6	92.5	0.01433	0.00118	32.04	1.797
215	62.9	14.5	15.1	60.5	0.00640	0.00199	18.89	3.319
216	64.6	22.4	12.9	82.1	0.00748	0.00242	26.67	3.207
217	64.5	18.7	14.6	75.5	0.00762	0.00173	23.24	3.273
219	64.1	15.4	15.1	60.5	0.00653	0.00219	19.89	3.134
219	64.3	20.4	14.9	73.5	0.00726	0.00212	24.48	2.749
220	64.2	20.4	14.8	77.3	0.00800	0.00223	24.42	2.743
221	64.4	12.7	24.7	49.1	0.00942	0.00452	18.31	3.219
222	62.1	12.8	24.3	51.7	0.00971	0.00324	15.78	2.564
223	65.7	12.5	24.9	50.1	0.00974	0.00356	16.19	3.200
224	64.2	12.0	26.0	46.0	0.00952	0.00329	14.13	3.390
223	65.4	11.5	27.1	42.7	0.00947	0.00397	13.43	3.256
227	70.2	4.5	55.2	10.5	0.01061	0.03121	9.59	3.308
210	69.9	4.5	56.3	10.2	0.01055	0.03615	9.03	3.037
211	70.6	4.3	58.4	9.4	0.01064	0.04112	8.83	2.862
212	72.7	5.0	62.0	7.9	0.01059	0.05209	9.32	2.588
233	70.3	3.7	62.9	7.5	0.01050	0.05652	8.37	2.420
234	74.3	4.1	65.0	7.1	0.01001	0.03937	6.18	1.414
235	75.4	3.9	64.3	7.0	0.00993	0.03947	5.99	1.399
236	74.9	3.8	63.0	7.0	0.00989	0.04175	6.58	1.376
237	74.7	3.9	63.4	6.8	0.00976	0.04108	5.01	1.511
238	73.3	3.8	63.1	6.8	0.00967	0.03887	5.02	1.447

Table 3.2.9 Constants in the 2-term exponential equation 3.10 derived from the 1971 data for Sabel.

THIN LAYER TESTS, 1971. DOUBLE EXPONENTIAL CONSTANTS

RUN NO.	MOISTURE CONTENT, %D.B. INITIAL	FINAL	TEMP. DEG. C	R.H. %	HUMIDITY RATIO	CONSTANTS M1	K1	M2	K2	ME	S.D.
31	99.8	9.1	32.4	30.6	0.009069	15.10	0.07671	75.38	0.001239	7.88	0.76
32	99.9	10.0	30.3	33.7	0.008779	15.53	0.06993	74.81	0.001102	7.78	0.65
33	99.1	7.9	35.2	25.7	0.008849	14.36	0.12085	76.04	0.001589	7.27	0.51
34	98.9	8.2	41.1	19.4	0.009350	13.38	0.18078	80.42	0.002536	4.02	0.41
35	99.5	6.3	46.4	15.3	0.009680	13.79	0.27565	83.56	0.004438	3.33	0.72
36	99.5	15.3	20.4	35.3	0.005190	16.84	0.03443	72.42	0.000590	7.61	0.74
37	99.1	5.7	50.5	13.0	0.009948	11.14	0.36653	86.11	0.007179	3.28	0.90
39	94.9	6.5	46.6	14.8	0.009381	12.72	0.28693	75.91	0.004762	5.90	0.50
42	93.8	6.4	41.1	18.7	0.008985	14.50	0.18072	73.03	0.002855	5.60	0.37
43	91.5	5.3	49.8	11.9	0.008864	10.71	0.50434	77.69	0.007283	3.25	0.84
44	84.9	8.7	32.4	30.2	0.009275	8.18	0.14656	70.68	0.001182	5.69	0.76
45	84.1	9.5	30.1	32.1	0.008423	9.81	0.09485	68.08	0.001036	5.42	0.59
46	81.9	7.3	35.0	24.6	0.008506	9.47	0.16235	67.14	0.001682	4.39	0.65
47	83.3	5.9	41.0	19.5	0.009476	9.51	0.23650	69.57	0.002650	3.66	0.69
48	83.1	4.9	46.6	14.5	0.009224	8.28	0.40080	71.75	0.004193	2.73	0.93
50	84.2	4.6	49.8	11.5	0.008651	7.38	0.50755	74.29	0.006141	2.68	0.98
52	69.8	9.9	32.3	37.4	0.010892	7.90	0.10288	54.74	0.001230	6.40	0.44
53	68.4	11.3	30.1	40.9	0.010570	8.23	0.08173	55.80	0.000902	3.44	0.32
54	68.2	8.6	35.0	31.4	0.010730	7.42	0.16912	53.60	0.001623	6.45	0.38
55	66.6	7.5	41.2	20.2	0.009800	7.07	0.28085	54.35	0.002590	4.76	0.35
56	66.9	5.3	46.8	15.4	0.010000	6.30	0.47657	56.50	0.004803	3.96	0.48
57	70.4	21.0	20.0	30.8	0.004400	6.53	0.07257	56.25	0.000532	6.70	0.53
58	68.5	5.3	50.1	12.5	0.009500	5.86	0.54580	58.37	0.006020	4.32	0.56
59	69.0	33.5	30.8	84.4	0.023500	6.40	0.03443	33.52	0.000723	28.53	0.26
60	68.6	8.6	41.2	21.0	0.010490	10.76	0.24711	51.68	0.003062	5.69	0.28
61	65.3	6.3	46.7	16.6	0.010600	9.69	0.35987	53.41	0.005205	5.13	0.32
62	67.8	6.0	50.0	13.6	0.010300	8.82	0.49776	53.77	0.007033	5.07	0.40
71	48.1	10.2	29.5	43.5	0.011100	4.06	0.09200	34.58	0.001072	8.76	0.44
72	48.5	8.1	35.1	31.7	0.011000	5.19	0.15017	34.35	0.001836	8.29	0.24
73	48.8	8.0	35.2	31.7	0.011000	4.83	0.16122	35.26	0.001911	7.99	0.22
74	48.9	7.3	40.5	23.5	0.011000	4.67	0.24726	36.89	0.003058	6.79	0.15
75	49.6	6.1	46.3	17.4	0.011000	4.48	0.44634	38.72	0.005637	6.01	0.17
77	50.3	5.3	50.9	12.6	0.010120	3.55	0.74998	41.14	0.009446	5.47	0.19
78	49.0	26.8	30.1	75.5	0.020248	3.65	0.06100	28.64	0.000646	16.08	0.23
79	48.9	6.9	40.6	23.6	0.011100	5.83	0.75008	35.49	0.009208	6.97	0.18
80	49.1	5.4	46.5	17.4	0.011100	5.53	0.36982	37.74	0.005918	5.78	0.11
81	48.8	16.4	20.4	49.2	0.007200	6.36	0.08606	31.82	0.000679	9.76	0.36
82	49.3	4.8	51.0	13.4	0.010200	5.19	0.51779	38.90	0.009019	5.32	0.16
83	26.7	16.1	29.8	67.9	0.017700	1.22	2.06000	10.47	0.000092	14.58	0.16
84	23.7	13.1	29.5	45.8	0.011700	2.08	0.31833	10.65	0.004881	10.91	0.22
85	24.2	9.9	35.1	32.5	0.011400	2.44	0.20401	11.99	0.002572	9.45	0.15
86	23.7	9.7	35.3	30.5	0.011400	2.32	0.24396	11.46	0.003020	9.20	0.19
87	23.9	7.6	40.4	23.0	0.011400	2.71	0.21187	13.15	0.002891	7.61	0.16
88	23.3	6.1	46.6	17.9	0.011500	2.98	0.34035	13.64	0.003787	6.32	0.20
90	24.6	5.4	51.1	13.7	0.011100	3.32	0.43751	14.87	0.011765	5.92	0.26
91	23.2	18.4	29.7	71.7	0.018670	1.26	3.95180	15.14	0.000278	6.86	0.07
63	83.4	5.3	62.6	7.4	0.010200	6.65	0.79126	73.71	0.024857	3.78	0.60
64	81.9	5.1	62.6	7.5	0.010400	6.74	0.80259	72.87	0.025095	2.73	0.66
65	81.4	5.2	62.5	7.5	0.010300	6.04	0.96472	72.07	0.029953	3.08	0.62
66	82.2	5.1	62.3	7.6	0.010300	6.46	0.80007	72.14	0.026484	3.79	0.61
67	79.9	5.0	62.2	7.8	0.010500	5.85	0.99501	70.86	0.032309	3.53	0.66
68	79.1	30.9	20.5	32.3	0.004949	10.54	0.08482	51.43	0.000751	16.18	0.41
69	81.3	5.1	61.8	7.7	0.010700	7.31	1.09563	70.93	0.026758	3.77	0.69
70	82.6	34.2	30.3	74.8	0.020300	11.64	0.05100	50.84	0.000760	19.03	0.35
92	65.1	10.8	29.4	50.6	0.012000	10.31	0.11493	43.47	0.001271	10.31	0.53
93	65.8	8.6	35.0	33.1	0.011500	10.50	0.16944	46.50	0.002167	8.00	0.33
94	66.0	8.4	35.1	30.0	0.010700	10.74	0.19590	46.93	0.002163	8.16	0.38
95	66.6	7.9	40.4	21.5	0.010700	10.91	0.20136	47.72	0.002566	7.50	0.25
96	66.4	6.4	46.6	16.0	0.010700	9.90	0.46710	50.24	0.006709	6.20	0.35
97	65.2	14.3	20.5	46.1	0.006800	11.47	0.02861	42.74	0.000761	9.31	0.52
98	65.8	5.5	51.0	13.5	0.010720	8.10	0.67173	52.32	0.010979	5.31	0.40
99	65.1	18.4	29.4	72.2	0.018600	9.75	0.08940	40.52	0.000803	12.92	0.31
100	65.9	7.3	40.5	21.5	0.010700	10.03	0.20073	48.79	0.003596	6.60	0.20
101	66.6	6.1	46.6	15.5	0.010700	9.15	0.42347	51.40	0.006480	5.89	0.33
102	65.9	5.1	51.1	13.4	0.010700	8.09	0.50765	52.65	0.010009	5.25	0.32
126	48.4	10.9	35.4	28.0	0.010360	6.81	0.21780	31.94	0.003005	9.17	0.18
127	50.0	8.1	40.7	20.0	0.010360	6.80	0.29280	34.80	0.004778	7.99	0.13
128	49.2	6.5	46.4	13.5	0.010360	6.37	0.47599	35.89	0.008161	6.75	0.10
129	50.5	5.5	51.2	12.0	0.010360	6.02	0.63075	38.48	0.012241	6.00	0.18
173	84.3	10.4	31.0	39.0	0.010800	15.65	0.16879	59.94	0.001537	8.14	0.43
174	85.5	8.5	35.4	30.7	0.010900	16.15	0.20099	61.20	0.002257	7.50	0.41
175	84.7	8.4	35.4	30.8	0.011000	15.37	0.20041	61.41	0.002282	7.56	0.38
176	83.9	7.4	40.8	23.4	0.011100	14.75	0.27138	62.94	0.003546	5.80	0.48
177	85.6	6.2	46.6	17.4	0.011200	14.42	0.36144	67.41	0.006207	3.95	0.32
178	83.6	8.1	30.9	24.9	0.007000	15.34	0.17701	61.03	0.001707	6.20	0.40
179	83.6	16.3	30.2	63.4	0.017000	15.46	0.09299	54.99	0.001014	12.10	0.28
180	82.0	8.9	31.2	31.7	0.008800	14.81	0.16535	59.24	0.001615	7.51	0.38
181	82.7	7.6	35.4	25.0	0.008800	14.55	0.23161	61.43	0.002296	5.71	0.49
182	82.9	7.5	35.5	25.0	0.008900	14.67	0.21149	61.57	0.002241	5.75	0.40
183	82.4	6.3	40.8	18.1	0.008600	14.17	0.28975	62.33	0.003560	5.20	0.46
184	81.8	12.2	25.6	43.4	0.008800	15.05	0.09293	60.20	0.000809	5.39	0.45
185	80.7	14.2	21.2	41.7	0.006400	14.19	0.10474	60.40	0.000717	4.76	0.40
196	67.6	13.9	19.2	49.4	0.006760	12.76	0.09019	40.54	0.001111	13.11	0.43
197	66.7	20.0	19.1	74.3	0.010100	11.52	0.05373	35.21	0.000894	18.82	0.35
226	49.9	13.0	16.2	50.6	0.005692	7.26	0.08729	29.01	0.001016	12.70	0.36
227	49.9	18.4	15.5	72.3	0.007838	5.76	0.08209	25.87	0.000708	17.61	0.30
228	49.8	17.6	16.0	71.4	0.008008	7.14	0.07440	24.45	0.000891	16.93	0.30
239	51.7	8.5	26.5	26.3	0.005612	7.17	0.10297	35.44	0.001694	8.21	0.32
240	52.1	8.6	26.3	25.7	0.005402	7.46	0.14087	36.06	0.001618	7.79	0.24

Table 3.2.10 Constants in the 2-term exponential equation 3.10 derived from the 1971 data for S23.

THIN LAYER TESTS, 1971. DOUBLE EXPONENTIAL CONSTANTS

RUN NO.	MOISTURE CONTENT, %D.B. INITIAL	FINAL	TEMP. DEG. C	R.H. %	HUMIDITY RATIO	CONSTANTS M1	K1	M2	K2	M%	S.D.
103	72.4	12.0	29.3	44.3	0.010660	9.37	0.09395	49.74	0.001536	12.03	0.62
104	73.3	8.8	35.1	29.9	0.010400	9.49	0.13444	55.32	0.001817	7.54	0.28
105	73.2	8.8	35.1	29.9	0.010400	9.13	0.13882	55.27	0.001825	7.65	0.33
106	73.5	6.9	40.3	21.0	0.010400	8.53	0.24724	58.41	0.002929	6.01	0.31
107	71.2	5.5	46.5	15.0	0.010400	7.21	0.63797	61.05	0.005635	2.91	0.78
109	73.1	4.7	51.0	12.8	0.010200	5.05	1.23962	64.51	0.009896	2.22	0.93
130	66.7	11.9	29.2	42.2	0.010490	13.44	0.04742	56.16	0.002028	11.74	0.72
131	66.7	9.3	35.3	30.6	0.010750	7.72	0.18837	48.76	0.003157	9.32	0.28
132	66.4	9.2	35.4	29.2	0.010500	7.99	0.18422	48.40	0.003053	9.22	0.29
133	66.2	8.4	40.6	21.5	0.010800	8.21	0.29277	49.59	0.004545	7.72	0.24
134	66.0	6.8	46.4	16.0	0.010800	7.32	0.48739	52.26	0.007400	6.14	0.26
135	65.0	13.9	20.8	43.7	0.006491	8.87	0.05626	43.37	0.001171	11.31	0.47
136	67.3	6.3	51.2	13.0	0.011000	6.26	0.77400	55.90	0.012219	5.44	0.33
137	65.2	18.1	29.7	70.7	0.018390	8.02	0.04803	38.68	0.001512	16.93	0.53
111	71.4	5.1	51.5	13.2	0.010800	10.51	0.56702	57.00	0.012331	4.59	0.56
112	72.4	4.6	54.4	11.1	0.010400	8.61	0.82610	59.59	0.016840	4.14	0.57
113	72.4	4.1	57.8	9.4	0.010400	8.12	0.93424	60.34	0.026918	4.51	0.54
114	72.2	3.5	63.1	0.0	0.010400	7.30	1.14678	60.72	0.039061	4.60	0.58
115	71.5	6.0	46.7	14.9	0.010400	11.88	0.42603	56.78	0.036715	4.53	0.49
117	70.8	5.1	51.0	12.9	0.010300	9.25	0.66760	57.62	0.011502	4.12	0.51
119	72.0	9.0	35.2	29.0	0.010700	14.35	0.19772	47.41	0.002783	9.15	0.37
120	71.8	10.6	35.2	29.0	0.010700	15.63	0.19506	47.70	0.002814	9.49	0.35
121	71.8	7.9	40.5	21.5	0.010700	13.70	0.27272	49.52	0.006059	7.77	0.24
122	70.9	6.4	46.3	16.0	0.010700	12.70	0.42244	52.31	0.006377	5.26	0.46
124	71.4	5.4	51.2	13.0	0.011300	11.36	0.59186	55.85	0.012547	4.62	0.48
125	70.0	19.7	29.6	69.6	0.018100	13.32	0.06756	38.78	0.001640	16.81	0.40
138	70.0	7.9	40.6	22.6	0.010630	12.74	0.27685	49.41	0.004650	7.37	0.22
139	70.5	6.8	46.4	16.6	0.010350	12.27	0.39341	51.65	0.007521	6.78	0.22
140	70.5	5.9	51.1	13.2	0.010650	11.28	0.60414	54.08	0.012017	5.53	0.36
141	69.8	9.8	31.0	37.5	0.010800	13.79	0.18054	45.02	0.002593	10.13	0.37
142	70.2	9.1	35.4	25.0	0.010800	13.42	0.24706	46.28	0.003756	9.25	0.33
143	69.4	9.1	35.4	25.0	0.010800	13.03	0.24045	46.33	0.003649	9.44	0.28
144	70.3	7.6	40.6	21.5	0.010800	13.47	0.31055	51.21	0.005625	7.73	0.22
145	70.7	6.3	46.6	16.0	0.010800	12.33	0.57556	54.70	0.007072	6.07	0.25
146	70.3	8.3	30.8	25.3	0.006800	12.82	0.19814	47.61	0.002829	8.95	0.37
147	70.5	5.6	51.2	13.7	0.011100	11.68	0.60634	53.74	0.012871	5.60	0.31
150	65.4	10.3	35.3	34.4	0.011600	13.26	0.24870	44.20	0.006310	10.42	0.25
151	68.1	10.3	35.3	33.6	0.011500	13.44	0.24825	43.82	0.006249	10.31	0.27
152	68.4	8.4	40.5	23.8	0.010970	13.43	0.30566	46.22	0.006173	8.47	0.16
153	68.5	10.4	30.5	26.6	0.007600	13.37	0.21272	44.15	0.005410	10.18	0.44
155	70.1	10.9	31.2	37.8	0.010600	14.96	0.12853	44.68	0.002593	9.40	0.53
156	70.1	8.5	35.6	29.6	0.010700	14.38	0.20052	46.15	0.005042	8.24	0.46
157	70.4	8.7	35.6	29.8	0.010700	14.34	0.19783	46.01	0.005033	9.05	0.43
158	70.8	6.9	40.9	21.5	0.010300	14.93	0.26249	47.05	0.005163	8.26	0.44
159	70.4	5.8	46.9	15.9	0.010300	13.33	0.42714	50.64	0.009032	6.37	0.30
160	70.5	9.3	31.0	24.6	0.006800	14.86	0.17702	46.18	0.002833	8.45	0.53
161	69.2	18.4	30.4	64.1	0.017400	13.61	0.10106	38.31	0.001841	16.71	0.44
162	69.5	10.8	31.2	38.6	0.010800	14.03	0.18424	43.79	0.002791	11.03	0.32
163	69.5	9.3	35.7	28.8	0.010500	13.65	0.26521	46.91	0.005493	9.31	0.24
164	69.1	9.2	35.6	29.2	0.010500	13.42	0.26537	46.01	0.004932	9.03	0.20
165	69.1	7.6	40.9	21.1	0.010100	13.63	0.32927	47.27	0.006733	7.29	0.18
166	69.1	6.2	46.8	15.6	0.010100	12.75	0.48203	50.14	0.009093	5.93	0.19
167	69.1	8.4	31.1	25.0	0.007000	13.11	0.23659	46.50	0.005563	8.42	0.33
168	69.5	15.8	30.4	63.5	0.017200	13.33	0.10924	38.88	0.002220	16.32	0.38
169	71.7	9.7	35.6	32.5	0.011700	15.23	0.24929	45.98	0.004859	9.71	0.24
170	71.7	9.7	35.6	32.7	0.011700	14.91	0.25614	46.38	0.004524	9.79	0.23
171	71.9	8.0	40.9	23.9	0.011400	15.35	0.31203	48.05	0.006171	8.10	0.15
172	70.9	6.5	46.8	17.6	0.011400	14.23	0.42010	50.44	0.009692	6.25	0.15
187	70.8	11.0	30.8	44.0	0.012600	16.56	0.21927	41.85	0.002093	11.44	0.39
188	71.4	9.2	35.4	34.1	0.012600	16.35	0.27160	43.98	0.005015	8.81	0.23
189	71.3	9.1	35.4	34.2	0.012600	16.61	0.27437	44.49	0.004745	9.36	0.39
190	72.0	7.5	41.0	25.1	0.012600	16.03	0.33423	48.65	0.007261	7.15	0.15
191	70.7	13.3	26.2	58.3	0.012600	14.59	0.19094	41.04	0.003277	14.22	0.31
192	71.3	8.3	30.8	24.9	0.006780	15.73	0.23945	45.75	0.005712	9.03	0.31
193	70.8	17.2	31.5	69.8	0.020200	14.80	0.10506	37.05	0.002644	18.17	0.30
194	73.6	14.4	19.1	49.0	0.006400	16.83	0.10165	41.06	0.001726	14.45	0.52
195	72.2	20.7	18.9	73.8	0.009920	14.69	0.06066	36.07	0.001252	20.29	0.41
198	70.7	9.8	32.7	33.1	0.010130	17.41	0.17912	42.04	0.003346	10.45	0.37
199	71.1	8.3	32.9	21.6	0.006600	17.77	0.21643	43.41	0.003523	9.16	0.42
202	73.2	10.5	32.9	36.8	0.011400	19.05	0.17035	42.73	0.003410	10.75	0.32
203	73.5	8.1	32.8	22.6	0.006905	18.67	0.21746	43.11	0.003640	8.59	0.39
204	72.4	12.8	35.5	51.1	0.018520	18.89	0.16417	39.93	0.003653	13.14	0.32
205	72.5	18.1	29.5	71.7	0.018517	18.24	0.07922	34.45	0.002103	18.53	0.37
206	73.0	8.0	33.1	20.7	0.006423	18.25	0.26281	47.80	0.006070	7.23	0.30
207	73.6	19.6	32.8	79.5	0.024932	18.13	0.05684	39.70	0.002532	17.24	0.37
208	73.7	17.6	32.4	83.1	0.025490	18.61	0.05856	40.38	0.002800	16.53	0.34
209	64.1	11.8	20.1	42.2	0.006098	14.91	0.09248	35.29	0.001699	12.54	0.69
210	64.2	26.0	22.0	86.7	0.014240	10.29	0.03717	25.01	0.001615	27.33	0.62
211	64.0	30.0	21.3	90.3	0.014165	8.39	0.03363	22.93	0.001274	31.47	0.84
212	65.4	11.4	21.3	41.0	0.006388	15.27	0.10739	36.49	0.001677	12.20	0.68
214	65.1	31.1	21.6	92.5	0.014830	8.98	0.02326	26.26	0.000689	29.11	0.33
215	62.9	14.5	15.1	60.8	0.006405	14.99	0.07460	30.98	0.001063	15.47	0.68
216	64.6	22.4	12.9	82.1	0.007483	15.22	0.04966	25.47	0.000930	22.65	0.54
217	64.8	18.7	14.4	75.8	0.007616	15.27	0.04873	28.93	0.000837	19.20	0.66
218	64.1	15.4	15.4	60.8	0.006528	14.40	0.07051	32.07	0.001101	16.19	0.72
219	64.3	20.4	14.9	75.5	0.007861	13.35	0.04520	28.71	0.001084	20.29	0.60
220	64.2	20.4	14.8	77.3	0.008000	13.32	0.04871	28.34	0.001183	21.23	0.66
221	66.4	12.7	24.7	49.1	0.009424	15.18	0.13122	34.04	0.002604	16.15	1.40
222	62.1	12.8	24.3	51.7	0.009713	12.47	0.14986	35.48	0.002255	13.32	0.30
223	65.7	12.5	24.9	50.1	0.009743	15.35	0.16605	36.53	0.002262	13.19	0.32
224	66.2	12.0	26.0	46.0	0.009518	16.65	0.12736	37.86	0.002067	11.15	0.34
225	65.4	11.3	27.1	42.7	0.009465	15.77	0.17185	36.95	0.002465	12.16	0.37
229	70.2	4.5	55.2	10.8	0.010629	19.51	0.41273	46.02	0.018937	5.26	0.23
230	69.9	4.5	56.3	10.2	0.010554	18.23	0.46555	47.35	0.021935	5.04	0.21
231	70.6	4.5	58.4	9.4	0.010660	17.86	0.51271	48.21	0.027332	5.37	0.26
232	72.7	5.0	62.0	7.9	0.010590	17.02	0.55623	50.42	0.036037	6.17	0.34
233	70.3	3.7	62.9	7.5	0.010501	16.36	0.58406	49.93	0.039284	5.16	0.33
234	74.3	4.1	63.0	7.1	0.010015	8.76	0.99884	61.40	0.035859	5.33	0.62
235	75.4	3.9	63.3	7.0	0.009932	8.43	1.02492	63.03	0.035759	4.83	0.59
236	75.1	3.8	63.0	7.0	0.009990	8.21	1.15936	62.06	0.038059	5.64	0.60
237	74.7	3.9	63.4	6.8	0.009739	9.38	1.12492	62.29	0.036888	5.82	0.58
238	73.3	3.5	63.1	6.8	0.009667	8.79	1.07152	60.93	0.035054	4.44	0.56

Table 3.2.11 Constants in the exponential series equation 3.39 derived from the 1971 data for Sabel.

THIN LAYER TESTS. 1971. EXPONENTIAL SERIES CONSTANTS - CLAY

RUN NO.	MOISTURE CONTENT, %D.B. INITIAL	FINAL	TEMP. DEG. C	R.H.	HUMIDITY RATIO	K	CONSTANTS N	S.D.
31	99.8	9.1	32.4	30.6	0.00907	0.00122	8.26	1.237
32	97.9	10.0	30.3	33.7	0.00878	0.00103	8.18	1.141
33	99.1	7.9	35.2	25.7	0.00885	0.00149	6.96	1.135
34	98.9	8.2	41.1	19.4	0.00935	0.00246	5.10	1.230
35	99.5	6.3	46.4	15.3	0.00968	0.00431	4.32	1.596
36	99.3	15.3	20.4	83.3	0.00332	0.00059	7.89	1.383
37	97.1	5.7	50.5	13.0	0.00995	0.00710	5.12	1.853
38	94.9	6.5	46.6	14.8	0.00938	0.00463	6.69	1.209
41	80.7	22.5	29.9	61.3	0.01607	0.00089	22.35	1.929
42	93.8	6.4	41.1	18.7	0.00899	0.00260	4.31	1.068
43	91.5	5.3	49.8	11.9	0.00886	0.00724	4.74	1.747
44	86.9	8.7	32.4	30.2	0.00923	0.00106	8.64	1.654
45	84.1	9.5	30.1	32.1	0.00842	0.00100	7.22	1.371
46	81.9	7.3	35.0	24.6	0.00851	0.00132	7.37	1.758
47	83.3	5.9	41.0	19.5	0.00948	0.00245	5.27	1.473
48	83.1	4.9	46.6	14.5	0.00922	0.00407	4.48	1.906
51	84.2	4.6	49.8	11.5	0.00865	0.00605	4.73	2.062
52	69.8	9.9	32.3	37.4	0.01089	0.00133	8.91	1.347
53	69.4	11.3	30.1	40.9	0.01057	0.00087	4.38	0.875
54	69.2	8.6	35.0	31.4	0.01073	0.00176	9.69	1.413
55	66.6	7.5	41.2	20.2	0.00980	0.00292	8.67	1.728
56	66.9	5.3	46.8	15.4	0.01000	0.00426	5.54	1.229
57	70.4	21.0	20.0	30.8	0.00440	0.00053	6.81	2.018
58	65.5	5.3	50.1	12.5	0.00950	0.00657	5.49	1.432
59	69.0	33.5	30.8	84.4	0.02350	0.00069	28.21	0.418
60	65.6	8.6	41.2	21.0	0.01049	0.00301	6.06	0.972
61	69.3	6.3	46.7	16.6	0.01060	0.00491	5.28	0.882
62	67.9	6.0	50.0	13.6	0.01030	0.00767	5.52	1.006
71	48.1	10.2	29.5	43.5	0.01110	0.00111	10.31	0.830
72	48.5	8.1	35.1	31.7	0.01100	0.00182	8.65	0.348
73	48.8	8.0	35.2	31.7	0.01100	0.00147	5.62	0.613
74	48.9	7.3	40.5	23.5	0.01100	0.00293	7.28	0.616
75	49.6	6.1	46.3	17.4	0.01100	0.00428	3.54	0.782
77	50.3	5.3	50.9	12.6	0.01012	0.00924	6.47	0.514
78	49.0	26.8	30.1	75.5	0.02025	0.00158	27.33	0.994
79	49.9	6.9	40.6	23.6	0.01100	0.00252	4.34	0.673
80	49.1	5.4	46.5	17.4	0.01110	0.00580	6.17	0.650
81	48.8	16.4	20.4	49.2	0.00720	0.00060	9.08	0.628
82	49.3	4.8	51.0	13.4	0.01080	0.01000	5.29	0.952
83	26.7	16.1	29.8	67.9	0.01770	0.00107	15.41	0.382
84	23.7	13.1	29.5	45.8	0.01170	0.00234	12.90	0.387
85	24.2	9.9	35.1	32.5	0.01140	0.00292	9.53	0.179
86	23.7	9.7	35.3	30.5	0.01140	0.00298	9.33	0.221
87	23.9	7.6	40.4	23.0	0.01140	0.00425	7.66	0.161
88	23.3	6.1	46.6	17.9	0.01150	0.00752	6.35	0.200
89	24.6	5.4	51.1	13.7	0.01110	0.01171	5.04	0.255
91	23.2	18.4	29.7	71.7	0.01267	0.00174	18.27	0.603
63	83.4	5.3	62.6	7.4	0.01020	0.02086	1.00	1.370
64	81.9	5.1	62.6	7.5	0.01040	0.02100	0.08	1.429
65	81.4	5.2	62.5	7.5	0.01030	0.02056	0.96	1.485
66	82.2	5.1	62.3	7.6	0.01030	0.02140	2.31	1.359
67	79.9	5.0	62.2	7.8	0.01050	0.02097	0.83	1.487
68	79.1	30.9	20.5	32.3	0.00485	0.00071	16.76	1.178
69	81.3	5.1	61.8	7.7	0.01020	0.02010	0.35	1.487
70	82.6	34.2	20.3	74.8	0.02030	0.00072	19.29	1.073
92	65.1	10.8	29.4	50.6	0.01290	0.00125	10.50	1.042
93	65.8	8.6	35.0	33.1	0.01150	0.00203	7.48	0.854
94	66.0	8.4	35.1	30.0	0.01070	0.00213	8.39	0.978
95	66.6	7.9	40.4	21.5	0.01070	0.00349	7.75	0.938
96	66.4	6.4	46.6	16.0	0.01070	0.00658	6.58	0.949
97	65.2	14.3	20.5	46.1	0.00680	0.00075	9.11	1.091
98	65.8	5.5	51.0	13.5	0.01072	0.01100	5.27	1.385
99	65.1	18.4	29.4	72.2	0.01860	0.00079	14.29	1.005
100	65.9	7.3	40.5	21.5	0.01070	0.00345	6.74	0.877
101	66.6	6.1	46.6	15.5	0.01070	0.00630	6.39	0.897
102	65.9	5.1	51.1	13.4	0.01070	0.01574	5.84	0.884
126	48.4	10.9	35.4	28.0	0.01036	0.00295	9.39	0.512
127	50.0	8.1	40.7	20.0	0.01036	0.00449	7.79	0.423
128	49.2	6.5	46.4	13.5	0.01036	0.00794	7.10	0.484
129	50.5	5.5	51.2	12.0	0.01036	0.01287	6.40	0.539
173	84.3	10.4	31.0	39.0	0.01080	0.00166	10.10	1.783
174	85.5	8.5	35.4	30.7	0.01090	0.00219	7.29	1.705
175	84.7	8.4	35.4	30.8	0.01100	0.00216	6.98	1.526
176	83.9	7.4	40.8	23.4	0.01110	0.00338	5.49	1.454
177	85.6	6.2	46.6	17.4	0.01120	0.00527	0.82	1.424
178	83.6	8.1	30.9	24.9	0.00700	0.00184	8.60	1.748
179	83.6	16.3	30.2	65.4	0.01700	0.00101	12.19	1.678
180	82.0	8.8	31.2	31.7	0.00880	0.00165	9.10	1.599
181	82.7	7.6	35.4	25.0	0.00880	0.00219	5.52	1.577
182	82.9	7.5	35.5	25.0	0.00890	0.00221	6.19	1.545
183	82.4	6.3	40.8	18.1	0.00860	0.00297	2.07	1.561
184	81.8	12.2	25.6	43.4	0.00880	0.00105	10.54	1.796
185	80.7	14.2	21.2	61.7	0.00640	0.00080	8.55	1.720
186	81.2	45.9	21.7	93.6	0.01510	0.00069	43.13	1.587
196	67.6	13.9	19.2	49.4	0.00676	0.00120	13.96	1.467
197	66.7	20.0	19.1	74.3	0.01010	0.00103	20.15	1.292
224	49.9	13.0	16.2	50.6	0.00569	0.00098	12.25	0.674
227	49.9	18.4	15.5	72.3	0.00784	0.00075	17.96	0.528
228	49.8	17.6	16.0	71.6	0.00801	0.00084	16.17	0.872
239	51.7	8.5	26.5	26.3	0.00561	0.00162	8.05	0.436
240	52.1	8.6	26.3	25.7	0.00540	0.00164	8.49	0.663

Table 3.2.12 Constants in the exponential series equation 3.39 derived from the 1971 data for S23.

THIN LAYER TESTS. 1971.					EXPONENTIAL SERIES CONSTANTS = BIAS			
RUN No.	MOISTURE CONTENT, D.B.		TEMP. DEG C	R.No.	HUMIDITY RATIO	K	CONSTANTS N	S.D.
	INITIAL	FINAL						
103	77.4	12.0	29.3	44.3	0.01066	0.00155	12.79	0.857
104	73.1	8.8	29.1	29.9	0.01040	0.00186	9.11	0.919
105	71.9	8.9	31.1	27.7	0.01040	0.00185	8.91	0.909
106	71.1	8.7	40.3	21.0	0.01040	0.00259	8.01	0.914
107	71.1	8.9	49.9	15.0	0.01040	0.00563	8.23	1.727
109	71.1	4.7	51.0	12.9	0.01070	0.01066	4.91	2.486
130	61.7	11.9	27.2	47.2	0.01049	0.00205	11.74	0.784
131	69.7	8.9	31.3	30.6	0.01073	0.00306	8.75	0.535
132	69.4	9.2	31.4	29.2	0.01050	0.00262	8.67	0.665
133	69.7	8.4	40.6	21.5	0.01080	0.00429	7.84	0.576
134	69.0	6.9	49.4	16.0	0.01080	0.00725	6.53	1.052
135	69.0	12.9	21.5	43.7	0.00647	0.00119	11.53	0.539
136	67.5	6.3	51.2	13.0	0.01100	0.01169	6.21	1.118
137	63.2	18.1	27.7	70.7	0.01839	0.00130	17.02	0.464
111	71.4	5.1	31.5	13.2	0.01080	0.01212	9.00	1.030
112	72.4	4.6	34.4	11.1	0.01040	0.01630	4.93	1.102
113	72.4	4.1	27.8	9.4	0.01040	0.02375	5.23	1.045
114	72.2	3.3	49.1	0.0	0.01040	0.03955	3.09	1.305
115	71.3	6.9	44.7	14.9	0.01040	0.00730	6.22	1.463
116	70.3	5.1	51.0	12.9	0.01030	0.01155	5.23	1.129
117	72.1	9.0	23.2	22.9	0.01070	0.00281	9.01	1.527
118	71.1	10.6	23.2	29.0	0.01070	0.00382	9.45	1.378
141	71.1	7.9	40.3	21.5	0.01070	0.00405	7.77	1.341
142	72.2	6.4	44.3	16.0	0.01070	0.00680	5.44	1.240
144	71.4	5.6	51.2	13.0	0.01130	0.01212	4.83	1.011
145	72.2	19.2	27.6	62.6	0.01819	0.00106	16.40	1.603
123	70.0	7.2	40.4	22.4	0.01063	0.00466	7.45	1.088
124	70.3	6.1	44.4	16.4	0.01055	0.00743	6.23	0.956
125	70.3	5.9	51.1	13.2	0.01065	0.01260	5.07	0.889
126	69.3	9.8	31.0	37.3	0.01080	0.00282	9.07	1.450
127	70.2	9.1	23.4	23.0	0.01080	0.00370	9.37	1.331
128	69.4	9.1	23.4	23.0	0.01080	0.00362	9.24	1.221
146	70.3	7.6	40.4	21.5	0.01080	0.00538	7.73	1.148
147	70.7	6.3	44.6	16.0	0.01080	0.00778	6.41	0.864
148	70.3	8.3	30.4	25.3	0.00680	0.00277	8.64	1.195
149	70.3	5.6	51.2	13.7	0.01110	0.01380	5.51	0.926
150	69.4	10.3	23.3	34.4	0.01160	0.00433	10.21	1.301
151	69.1	10.3	23.3	33.6	0.01150	0.00430	10.12	1.355
152	69.4	8.4	40.3	23.8	0.01097	0.00621	8.31	1.222
153	69.3	10.4	30.3	26.6	0.00760	0.00357	10.54	1.386
155	70.1	10.9	21.2	37.9	0.01060	0.00284	10.17	1.608
156	72.1	8.5	23.4	22.4	0.01070	0.00360	8.83	1.474
157	70.4	8.7	23.4	22.8	0.01070	0.00361	8.73	1.479
158	70.3	6.9	40.2	21.5	0.01030	0.00526	7.07	1.518
159	70.4	8.8	44.2	15.2	0.01030	0.00902	8.40	1.129
160	70.3	9.3	21.0	24.6	0.00680	0.00314	9.89	1.475
161	69.2	18.4	20.4	64.1	0.01760	0.00240	18.07	1.594
162	69.3	10.3	21.2	35.6	0.01080	0.00208	11.87	1.501
163	69.3	9.3	23.7	28.8	0.01050	0.00425	8.89	1.364
164	69.1	9.2	23.4	28.2	0.01050	0.00440	9.00	1.302
165	69.1	7.6	40.9	21.1	0.01010	0.00709	8.25	1.392
166	69.1	6.2	44.1	15.4	0.01010	0.00985	6.00	1.066
167	69.1	8.4	21.1	25.0	0.00700	0.00337	8.44	1.299
168	69.3	15.3	20.4	69.3	0.01720	0.00238	15.93	1.663
169	71.7	9.7	23.6	32.1	0.01170	0.00437	9.27	1.680
170	71.7	9.7	23.6	32.7	0.01170	0.00400	9.50	1.594
171	71.2	8.0	40.2	23.2	0.01140	0.00628	7.79	1.585
172	70.2	6.5	44.8	17.6	0.01140	0.00970	6.24	1.239
187	70.1	11.0	30.1	44.0	0.01280	0.00322	11.04	2.154
188	71.4	9.2	23.6	34.1	0.01260	0.00516	8.25	1.866
189	71.3	9.1	23.4	34.2	0.01260	0.00493	8.13	2.047
190	72.0	7.5	41.0	25.1	0.01260	0.00742	6.76	1.667
191	70.7	15.3	26.2	58.3	0.01260	0.00338	13.82	1.691
192	71.3	8.3	30.8	24.9	0.00673	0.00380	8.71	1.811
193	70.1	17.2	31.5	69.8	0.02020	0.00264	17.91	1.782
194	73.6	14.4	19.1	49.0	0.00640	0.00188	14.24	2.223
195	72.2	20.7	19.9	73.8	0.00992	0.00140	20.25	1.866
196	70.7	9.8	32.7	33.1	0.01013	0.00378	10.60	2.211
197	71.1	8.3	32.9	21.6	0.00660	0.00307	8.63	2.316
202	73.2	10.5	32.9	34.8	0.01140	0.00360	10.02	2.561
203	73.5	8.1	32.8	22.6	0.00691	0.00395	8.02	2.505
204	72.4	12.8	35.5	51.1	0.01852	0.00389	12.15	2.584
205	72.5	18.1	22.5	71.7	0.01852	0.00246	18.24	2.548
206	73.0	8.0	35.1	20.7	0.00642	0.00422	7.50	2.283
207	73.6	19.6	32.8	79.9	0.02493	0.00358	19.85	1.807
208	73.7	17.6	32.4	83.1	0.02549	0.00341	17.02	1.703
209	64.1	11.8	20.1	42.2	0.00610	0.00193	12.79	1.924
210	64.2	26.0	22.0	86.7	0.01424	0.00169	26.15	1.346
211	64.0	30.0	21.3	90.5	0.01416	0.00142	31.44	1.135
212	65.4	11.4	21.3	41.0	0.00639	0.00213	12.27	2.038
214	65.1	31.1	21.6	92.5	0.01483	0.00090	31.12	0.943
215	62.9	14.5	15.1	60.8	0.00640	0.00133	14.20	2.227
216	64.6	22.4	12.9	82.1	0.00748	0.00120	22.55	2.426
217	64.8	18.7	14.4	75.8	0.00762	0.00100	19.24	2.342
218	64.1	15.4	15.4	60.8	0.00653	0.00142	16.67	2.039
219	64.3	20.4	14.9	75.5	0.00786	0.00120	20.42	1.878
220	64.2	20.4	14.8	77.3	0.00800	0.00131	20.69	1.892
221	66.4	12.7	24.7	49.1	0.00942	0.00250	13.69	2.588
222	62.1	12.8	24.3	51.7	0.00971	0.00226	12.81	1.477
223	65.7	12.5	24.9	50.1	0.00974	0.00234	12.91	2.089
224	64.2	12.0	26.0	46.0	0.00952	0.00218	10.03	2.246
225	65.4	11.3	27.1	42.7	0.00947	0.00256	11.20	2.139
229	70.2	4.5	55.2	10.8	0.01063	0.02068	4.51	2.122
230	69.9	4.5	56.3	10.2	0.01055	0.02335	4.29	1.837
231	70.4	4.5	58.4	9.4	0.01066	0.02813	4.17	1.754
232	72.7	5.0	62.0	7.9	0.01059	0.03686	4.93	1.518
233	70.3	5.7	62.9	7.5	0.01050	0.04084	4.31	1.378
234	74.3	4.1	69.0	7.1	0.01001	0.03395	5.24	0.964
235	75.4	5.9	69.3	7.0	0.00995	0.02845	5.15	0.988
236	75.1	3.8	63.0	7.0	0.00959	0.03651	6.02	0.999
237	74.7	3.9	69.4	6.8	0.00974	0.03589	4.33	0.972
238	75.3	3.8	63.1	6.8	0.00967	0.03421	5.03	0.946

Table 3.2.13 Constants in the exponential series equation 3.38 derived from the 1971 data for Sabel.

THIN LAYER TESTS. 1971. EXPONENTIAL SERIES CONSTANTS - SPHERE

RUN NO.	MOISTURE CONTENT, %D.B. INITIAL	FINAL	TEMP. DEG. C	R.H.	HUMIDITY RATIO	K	CONSTANTS ME	S.D.
31	99.8	9.1	32.4	30.6	0.00907	0.00101	11.21	2.698
32	99.9	10.0	30.3	33.7	0.00878	0.00089	9.73	2.647
33	99.1	7.9	35.2	25.7	0.00885	0.00116	8.03	2.555
34	98.9	8.2	41.1	19.4	0.00935	0.00206	7.24	3.229
35	99.5	6.3	46.4	15.3	0.00968	0.00355	5.90	3.662
36	99.5	15.3	20.4	35.3	0.00519	0.00048	10.69	2.058
37	99.1	5.7	50.5	13.0	0.00995	0.00553	6.17	3.696
39	94.9	6.5	46.6	14.8	0.00938	0.00270	1.49	2.725
41	80.7	22.5	29.9	61.3	0.01607	0.00073	22.85	2.876
42	93.8	6.4	41.1	18.7	0.00899	0.00227	8.05	2.565
43	91.5	5.3	49.8	11.9	0.00886	0.00473	1.08	3.101
44	84.9	8.7	32.4	30.2	0.00928	0.00091	9.23	3.508
45	84.1	9.5	30.1	32.1	0.00842	0.00085	9.02	3.073
46	81.9	7.3	35.0	24.6	0.00851	0.00116	6.53	3.007
47	83.3	5.9	41.0	19.5	0.00948	0.00203	7.38	3.379
48	83.1	4.9	46.6	14.5	0.00922	0.00259	0.73	3.224
50	84.2	4.6	49.8	11.5	0.00865	0.00303	6.52	3.879
52	69.8	9.9	32.5	37.4	0.01089	0.00119	11.95	1.707
53	68.4	11.3	30.1	40.9	0.01057	0.00090	10.26	2.750
54	68.2	8.6	35.0	31.4	0.01073	0.00139	9.70	2.629
55	66.6	7.5	41.2	20.2	0.00980	0.00226	9.47	2.866
56	66.9	5.3	46.8	15.4	0.01000	0.00375	6.82	2.778
57	70.4	21.0	20.0	30.8	0.00440	0.00053	16.93	2.564
58	68.5	5.3	50.1	12.5	0.00950	0.00443	3.32	2.732
59	69.0	33.5	30.8	84.4	0.02350	0.00059	30.31	1.006
60	68.6	8.6	41.2	21.0	0.01049	0.00249	7.32	1.916
61	68.3	6.3	46.7	16.6	0.01060	0.00331	2.87	1.728
62	67.8	6.0	50.0	13.6	0.01030	0.00566	5.55	2.007
71	48.1	10.2	29.5	43.5	0.01110	0.00090	11.45	1.727
72	48.5	8.1	35.1	31.7	0.01100	0.00128	7.89	1.123
73	48.8	8.0	35.2	31.7	0.01100	0.00130	7.72	1.784
74	48.9	7.3	40.5	23.5	0.01100	0.00201	6.73	1.465
75	49.6	6.1	46.3	17.4	0.01100	0.00378	5.61	1.489
77	50.3	5.3	50.9	12.6	0.01012	0.00719	6.60	1.036
78	49.0	26.8	30.1	75.5	0.02025	0.00125	28.11	1.454
79	48.9	6.9	40.6	23.6	0.01100	0.00214	5.99	1.104
80	49.1	5.4	46.5	17.4	0.01110	0.00460	6.66	1.515
81	48.9	16.4	20.4	49.2	0.00720	0.00050	11.78	1.072
82	49.3	4.8	51.0	13.4	0.01080	0.00639	6.95	1.663
83	26.7	16.1	29.8	67.9	0.01770	0.00087	15.78	0.654
84	23.7	13.1	29.5	45.8	0.01170	0.00101	13.19	0.570
85	24.2	9.9	35.1	32.5	0.01140	0.00244	9.09	0.404
86	23.7	9.7	35.3	30.5	0.01140	0.00215	8.91	0.311
87	23.9	7.6	40.4	23.0	0.01140	0.00316	7.60	0.318
88	23.3	6.1	46.6	17.9	0.01150	0.00482	5.20	0.263
90	24.6	5.4	51.1	13.7	0.01110	0.00569	6.11	0.753
91	23.2	18.4	29.7	71.7	0.01867	0.00128	18.17	0.461
63	83.4	5.3	62.6	7.4	0.01020	0.01886	4.51	2.999
64	81.9	5.1	62.6	7.5	0.01040	0.01747	2.16	2.889
65	81.4	5.2	62.5	7.5	0.01030	0.01639	1.96	2.838
66	82.2	5.1	62.3	7.6	0.01030	0.01872	5.94	3.126
67	79.9	5.0	62.2	7.8	0.01050	0.01770	3.32	2.937
68	79.1	30.9	20.5	32.3	0.00485	0.00058	20.35	1.685
69	81.3	5.1	61.8	7.7	0.01020	0.01799	4.42	2.996
70	82.6	34.2	30.3	74.8	0.02030	0.00059	22.87	1.277
92	65.1	10.8	29.4	50.6	0.01290	0.00087	9.40	1.337
93	65.8	8.6	35.0	33.1	0.01150	0.00175	9.61	1.980
94	66.0	8.4	35.1	30.0	0.01070	0.00168	9.19	1.503
95	66.6	7.9	40.4	21.5	0.01070	0.00290	9.50	1.710
96	66.4	6.4	46.6	16.0	0.01070	0.00448	5.07	1.655
97	65.2	14.3	20.5	46.1	0.00680	0.00064	10.93	1.173
98	65.8	5.5	51.0	13.5	0.01072	0.00917	7.99	2.316
99	65.1	18.4	29.4	72.2	0.01460	0.00063	15.55	1.428
100	65.9	7.3	40.5	21.5	0.01070	0.00279	7.50	1.734
101	66.6	6.1	46.6	15.5	0.01070	0.00393	3.69	1.729
102	65.9	5.1	51.1	13.4	0.01070	0.00873	6.77	2.126
126	48.4	10.9	35.4	28.0	0.01036	0.00251	10.37	1.118
127	50.0	8.1	40.7	20.0	0.01036	0.00269	8.40	1.118
128	49.2	6.5	46.4	13.5	0.01036	0.00564	5.80	1.055
129	50.5	5.5	51.2	12.0	0.01036	0.01113	7.55	1.551
173	84.3	10.4	31.0	39.0	0.01080	0.00137	11.65	2.494
174	85.5	8.5	35.4	30.7	0.01090	0.00107	10.12	2.269
175	84.7	8.4	35.4	30.8	0.01100	0.00103	9.15	2.253
176	83.9	7.4	40.8	23.4	0.01110	0.00203	7.67	2.252
177	85.6	6.2	46.6	17.4	0.01120	0.00427	2.78	2.105
178	83.6	8.1	30.9	24.9	0.00700	0.00149	10.45	2.563
179	83.6	16.3	30.2	63.4	0.01700	0.00085	15.00	2.020
180	82.0	8.8	31.2	31.7	0.00880	0.00110	5.98	1.502
181	82.7	7.6	35.4	25.0	0.00880	0.00158	4.79	2.183
182	82.9	7.5	35.5	25.0	0.00890	0.00157	5.04	2.126
183	82.4	6.3	40.8	18.1	0.00860	0.00226	2.27	2.014
184	81.5	12.2	25.6	43.4	0.00880	0.00091	12.90	2.659
185	80.7	14.2	21.2	41.7	0.00640	0.00067	11.98	2.590
186	81.2	45.9	21.7	93.6	0.01510	0.00059	44.73	1.723
196	67.6	13.9	19.2	49.4	0.00676	0.00096	14.26	1.374
197	66.7	20.0	19.1	74.3	0.01010	0.00080	20.10	1.107
226	49.9	13.0	16.2	59.6	0.00569	0.00078	12.98	0.815
227	49.9	18.4	15.5	77.3	0.00784	0.00063	18.58	0.932
228	49.8	17.6	14.0	71.6	0.00801	0.00072	17.23	0.751
239	51.7	8.5	26.5	26.3	0.00561	0.00133	8.67	1.085
240	52.1	8.6	26.3	25.7	0.00540	0.00139	9.63	1.409

Table 3.2.14 Constants in the exponential series equation 3.30 derived from the 1971 data for S23.

TWIN LAYER TESTS. 1971. EXPONENTIAL SERIES CONSTANTS - SPHERE

RUN NO.	MOISTURE CONTENT.%D.B. INITIAL	MOISTURE CONTENT.%D.B. FINAL	TEMP. DEG. C	R.H.	HUMIDITY RATIO	K	CONSTANTS ME	CONSTANTS S.D.
103	72.4	12.0	29.3	44.3	0.01066	0.00124	13.90	1.820
104	73.3	8.8	35.1	29.9	0.01040	0.00140	8.45	1.999
105	73.2	8.8	35.1	29.9	0.01040	0.00141	8.55	2.082
106	73.5	6.9	40.3	21.0	0.01040	0.00224	7.69	2.432
107	71.2	5.9	46.5	15.0	0.01040	0.00489	7.62	3.323
109	73.1	4.7	51.0	12.8	0.01020	0.00198	8.71	3.930
130	66.7	11.9	29.2	42.2	0.01049	0.00173	13.27	1.306
131	66.7	9.3	35.3	30.6	0.01073	0.00229	9.64	1.578
132	66.4	9.2	35.4	29.2	0.01030	0.00229	10.06	1.611
133	66.2	8.4	40.6	21.5	0.01080	0.00345	9.38	1.865
134	66.0	6.8	46.4	16.0	0.01080	0.00502	5.55	1.879
135	65.0	13.9	20.8	63.7	0.00649	0.00095	12.84	1.299
136	67.3	6.3	51.2	13.0	0.01100	0.00997	7.79	2.590
137	65.2	18.1	29.7	70.7	0.01839	0.00107	17.61	1.091
111	71.4	5.1	51.5	13.2	0.01080	0.01002	6.47	2.156
112	72.4	4.6	54.4	11.1	0.01040	0.01336	5.53	2.495
113	72.4	4.1	57.8	9.4	0.01040	0.02067	7.20	2.539
114	72.2	3.5	63.1	0.0	0.01040	0.02954	5.72	2.314
115	71.5	6.0	46.7	14.9	0.01040	0.00466	3.86	1.824
117	70.8	5.1	51.0	12.9	0.01030	0.01003	7.51	2.567
119	72.0	9.0	35.2	29.0	0.01070	0.00196	7.37	1.281
120	71.8	10.6	35.2	29.0	0.01070	0.00262	11.56	1.367
121	71.8	7.9	40.5	21.5	0.01070	0.00297	6.97	1.390
122	70.9	6.4	46.3	16.0	0.01070	0.00473	4.17	1.653
124	71.6	5.4	51.2	13.0	0.01150	0.01236	4.40	5.207
125	70.0	19.7	29.6	69.6	0.01810	0.00093	18.18	1.317
138	70.0	7.9	40.6	22.6	0.01063	0.00365	7.53	1.290
139	70.3	6.8	46.4	16.6	0.01035	0.00555	6.12	1.437
160	70.5	5.9	51.1	13.2	0.01065	0.01104	7.94	2.319
161	69.8	9.8	31.0	37.5	0.01080	0.00188	8.96	1.227
162	70.2	9.1	35.4	25.0	0.01080	0.00276	9.16	1.217
163	69.4	9.1	35.4	25.0	0.01080	0.00279	9.61	1.241
164	70.3	7.6	40.6	21.5	0.01080	0.00373	6.11	1.761
165	70.7	6.3	46.6	16.0	0.01080	0.00676	6.39	1.849
166	70.3	8.3	30.6	25.3	0.00680	0.00128	6.84	1.153
167	70.5	5.6	51.2	13.7	0.01110	0.01397	5.28	4.781
150	68.4	10.3	35.3	34.4	0.01160	0.00349	11.17	1.235
151	68.1	10.3	35.3	33.6	0.01150	0.00352	11.33	1.273
152	68.4	8.4	40.5	23.8	0.01097	0.00480	8.52	1.173
153	68.5	10.4	30.5	26.6	0.00760	0.00297	11.98	1.403
155	70.1	10.9	31.2	37.8	0.01060	0.00216	9.79	1.155
156	70.1	8.5	35.6	29.6	0.01070	0.00292	9.60	1.241
157	70.4	8.7	35.6	29.8	0.01070	0.00289	9.72	1.205
158	70.8	6.9	40.9	21.5	0.01030	0.00371	6.62	1.084
159	70.4	5.8	46.9	15.9	0.01030	0.00787	8.24	1.621
160	70.5	9.3	31.0	24.6	0.00680	0.00229	9.01	1.359
161	69.2	18.4	30.4	64.1	0.01740	0.00169	17.43	1.221
162	69.5	10.8	31.2	38.6	0.01080	0.00205	10.12	1.244
163	69.5	9.3	35.7	28.8	0.01050	0.00361	10.34	1.366
164	69.1	9.2	35.6	29.2	0.01050	0.00365	9.89	1.369
165	69.1	7.6	40.9	21.1	0.01010	0.00469	6.66	1.169
166	69.1	6.2	46.8	15.6	0.01110	0.00859	7.95	1.618
167	69.1	8.4	31.1	25.0	0.00700	0.00240	7.35	1.214
168	69.5	15.8	30.4	63.5	0.01720	0.00173	15.77	0.958
169	71.7	9.7	35.6	32.5	0.01170	0.00308	8.40	1.367
170	71.7	9.7	35.6	32.7	0.01170	0.00353	10.50	1.395
171	71.9	8.0	40.9	23.9	0.01140	0.00443	6.45	1.274
172	70.9	6.5	46.8	17.6	0.01140	0.00809	7.29	1.443
187	70.8	11.0	30.8	44.0	0.01260	0.00217	9.17	1.702
188	71.4	9.2	35.4	34.1	0.01260	0.00444	10.43	1.586
189	71.3	9.1	35.4	34.2	0.01260	0.00437	10.51	1.666
190	72.0	7.5	41.0	25.1	0.01260	0.00644	8.51	1.493
191	70.7	13.3	26.2	58.3	0.01260	0.00214	11.36	1.337
192	71.3	8.3	30.8	24.9	0.00678	0.00332	10.90	1.581
193	70.8	17.2	31.5	69.8	0.02020	0.00170	15.57	1.351
194	73.6	14.4	19.1	49.0	0.00640	0.00148	15.32	1.686
195	72.2	20.7	18.9	73.8	0.00992	0.00115	20.97	1.274
198	70.7	9.8	32.7	33.1	0.01013	0.00244	7.99	1.643
199	71.1	8.3	32.9	21.6	0.00660	0.00233	6.48	1.961
202	73.2	10.5	32.9	36.8	0.01140	0.00340	10.78	2.340
203	73.5	8.1	32.8	22.6	0.00691	0.00364	8.50	2.663
204	72.4	12.8	35.5	51.1	0.01852	0.00361	13.20	2.009
205	72.5	18.1	29.5	71.7	0.01852	0.00207	19.00	1.743
206	75.0	8.0	33.1	20.7	0.00642	0.00339	8.16	1.801
207	73.6	19.6	32.8	79.5	0.02493	0.00280	20.70	1.427
208	73.7	17.6	32.4	83.1	0.02549	0.00300	18.56	1.165
209	64.1	11.8	20.1	43.2	0.00610	0.00137	11.56	1.332
210	64.2	26.0	22.0	86.7	0.01424	0.00140	27.06	0.719
211	64.1	30.0	21.3	90.3	0.01416	0.00091	30.02	0.767
212	65.4	11.6	21.3	41.0	0.00639	0.00146	10.77	1.390
214	63.1	31.1	21.6	92.5	0.01483	0.00059	29.44	0.687
215	62.9	14.5	19.1	60.8	0.00640	0.00102	15.69	1.646
216	64.6	22.4	12.9	82.1	0.00748	0.00100	22.52	1.755
217	64.8	18.7	14.4	75.8	0.00762	0.00081	19.22	1.683
218	64.1	15.4	15.4	60.8	0.00653	0.00099	15.50	1.417
219	64.3	20.4	14.9	75.5	0.00786	0.00095	20.77	1.212
220	64.2	20.4	14.9	77.3	0.00800	0.00100	20.39	1.202
221	66.4	12.7	24.7	49.1	0.00942	0.00213	15.32	1.602
222	62.1	12.8	24.5	51.7	0.00971	0.00186	13.90	1.148
223	65.7	12.5	24.9	50.1	0.00976	0.00213	13.21	1.857
224	66.2	12.0	24.0	46.0	0.00952	0.00197	10.87	2.002
225	65.4	11.3	27.1	42.7	0.00947	0.00233	12.05	1.906
229	70.2	4.5	55.2	10.8	0.01063	0.01783	5.45	1.299
230	69.9	4.5	56.3	10.2	0.01055	0.02049	5.97	1.110
231	70.6	4.5	58.4	9.4	0.01066	0.02492	5.96	0.990
232	72.7	5.0	62.0	7.9	0.01059	0.03186	6.30	0.871
233	70.3	3.7	62.9	7.5	0.01050	0.03597	5.89	0.946
234	74.3	4.1	63.0	7.1	0.01001	0.02851	6.37	2.206
235	75.4	3.9	63.5	7.0	0.00993	0.02845	6.33	2.342
236	73.1	3.8	63.0	7.0	0.00989	0.03152	7.89	2.431
237	74.7	3.9	63.4	6.8	0.00974	0.03011	5.18	2.342
238	73.3	3.8	63.1	6.8	0.00967	0.02867	5.94	2.321

TABLE 3.2.15

Drying rate constant, k, as a function of temperature, humidity and initial moisture content.
Coefficients and standard errors in fit of $\ln k = a + bT + cH + d M_0$ to Sabel and S23 seperately.

	Coefficient	Single Exponential	Double Exponential		Exponential Series	
			k_1	k_2	Sphere	Plate
Sabel	Intercept	-7.6207 ± 0.159	-2.7697 ± 0.361	-8.0405 ± 0.162	-8.1723 ± 0.149	-7.9795 ± 0.149
	Temp	0.07972 ± 0.00235	0.06010 ± 0.00539	0.08875 ± 0.00242	0.08091 ± 0.0022	0.08302 ± 0.00219
	Humidity	-55.07 ± 8.57	-10.75 ± 20.1	-73.20 ± 9.0	-46.40 ± 8.01	-46.48 ± 7.99
	I.M.C.	-0.00778 ± 0.00137	-0.013837 ± 0.00313	-0.007088 ± 0.0014	-0.008149 ± 0.00128	-0.00877 ± 0.00128
	Residual	0.0661	0.333	0.0669	0.0578	0.0574
	d.f.	87	85	85	87	87
	% var.*	92.8	60.0	93.9	93.8	94.1
S.23	Intercept	-6.7313 ± 0.847	-4.7108 ± 0.835	-7.3789 ± 0.644	-7.7448 ± 0.793	-7.2908 ± 0.700
	Temp	0.06602 ± 0.00312	0.06089 ± 0.00307	0.07584 ± 0.00237	0.07563 ± 0.00292	0.07248 ± 0.00258
	Humidity	-23.02 ± 9.64	-77.01 ± 9.49	-31.16 ± 7.33	-24.80 ± 9.03	-25.31 ± 7.97
	I.M.C.	-0.007992 ± 0.0132	0.02527 ± 0.0131	-0.007561 ± 0.0101	-0.005861 ± 0.0124	0.007424 ± 0.011
	Residual	0.104	0.101	0.0604	0.0917	0.0714
	d.f.	98	98	98	98	98
	% var.*	86.8	87.8	93.8	90.9	92.1

* % var. = % variation accounted for = $(r^2) \times 100$

TABLE 3.2.16

t-test comparisons of coefficients in Table 3.2.15.

Comparison		t values and level of significance for each factor			
		Intercept	Temperature	Humidity	Initial Moisture Content
Sabel v S.23					
Single exponential		1.12	3.51^{***}	2.44^{**}	0.00
Double exponential	k_1	1.57	0.13	3.16^{**}	2.06^{*}
	k_2	0.98	3.82^{***}	3.64^{***}	0.05
Exponential series	Sphere	0.58	1.45	1.76	0.20
	Plate	1.01	3.11^{**}	1.86	0.13
Single v Double k_2	Sabel	1.85	2.68^{**}	1.46	0.35
	S.23	0.61	2.51^{**}	0.67	0.57
Single v Sphere	Sabel	2.53^{*}	0.37	0.74	0.20
	S.23	0.87	2.25^{*}	0.13	0.11
Single v Plate	Sabel	1.64	1.02	0.73	0.53
	S.23	0.51	1.60	0.18	0.03
Double k_1 v Double k_2	Sabel	13.3^{***}	4.84^{***}	2.8^{**}	1.97^{*}
	S.23	2.53^{**}	3.85^{***}	3.82^{***}	1.99^{*}
Double k_2 v Sphere	Sabel	0.60	2.40^{*}	2.23^{*}	0.56
	S.23	0.36	0.06	0.55	0.11
Double k_2 v Plate	Sabel	0.28	1.76	2.22^{*}	0.89
	S.23	0.09	0.96	0.54	1.00
Sphere v Plate	Sabel	0.92	0.68	0.01	0.34
	S.23	0.43	0.81	0.04	0.94

TABLE 3.2.17

Drying rate constant, k, as a function of drying air temperature, humidity and seed initial moisture content. Coefficients and standard errors in fit of $\ln k = a + bT + cH + d M_o$ to all 1971 data.

Coefficient	Single Exponential	Double Exponential		Exponential Series	
		k_1	k_2	Sphere	Plate
Intercept	-7.3914 ± 0.222	-2.465 ± 0.227	-7.9696 ± 0.190	-8.0746 ± 0.193	-7.7667 ± 0.192
Temp	0.070579 ± 0.00278	0.063964 ± 0.00284	0.079461 ± 0.00238	0.076998 ± 0.00248	0.075035 ± 0.0024
Humidity	28.351 ± 10.2	44.349 ± 10.5	38.793 ± 8.78	26.66 ± 9.07	25.94 ± 8.79
I.M.C.	-0.0048117 ± 0.00242	-0.011428 ± 0.00247	-0.0036645 ± 0.00207	-0.0057069 ± 0.00215	-0.0063235 ± 0.00209
Residual	0.217	0.223	0.157	0.172	0.162
d.f.	189	187	187	189	189
% var. *	77.1	73.0	85.5	83.4	83.9

* % variation accounted for = $(r^2) \times 100$

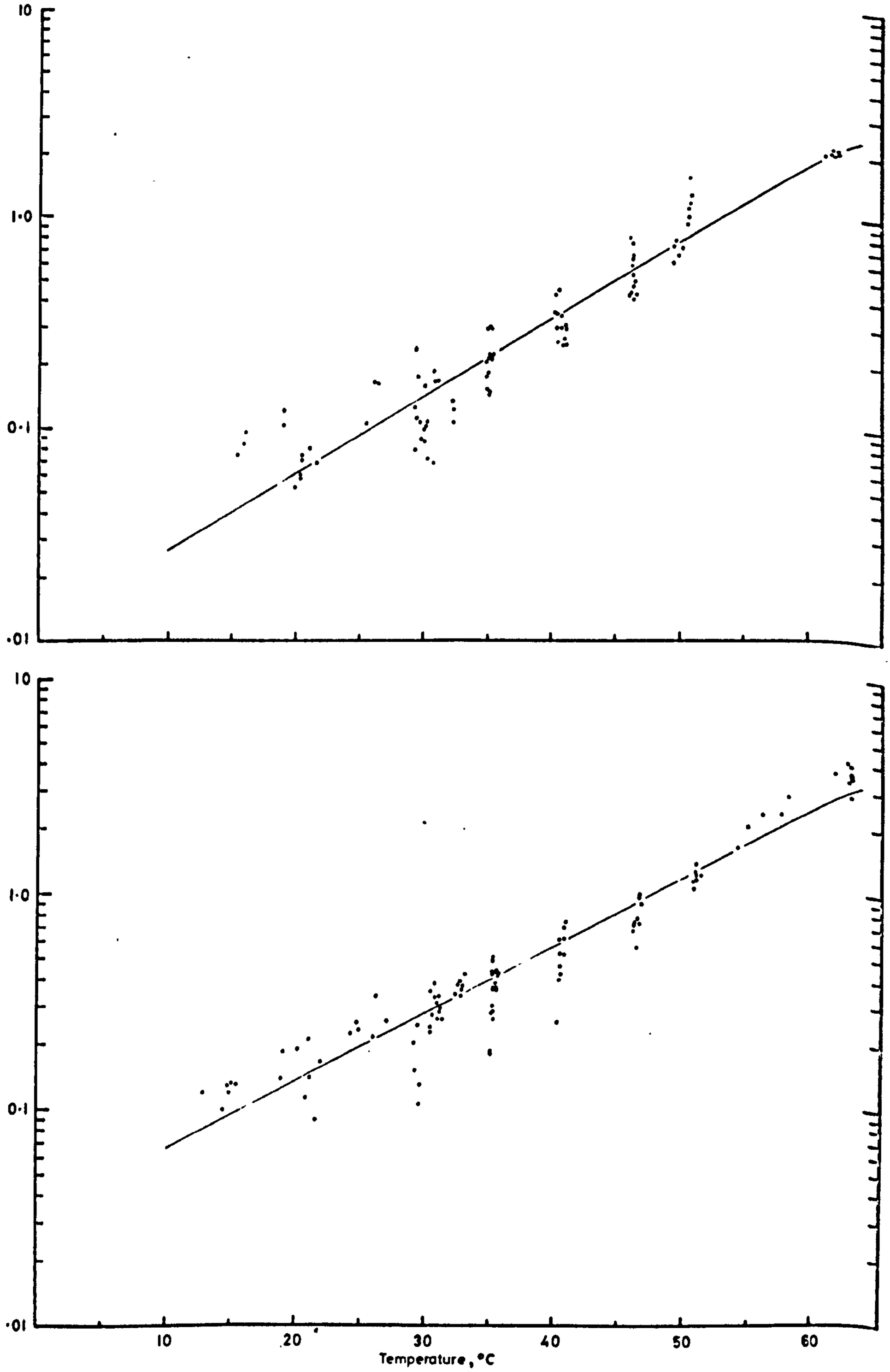


Fig. 3.2.1 Values of drying constant, k, derived from the fits of the single exponential equation, 3.1. for Sabel (top) and S.23 (bottom) 1971 data.

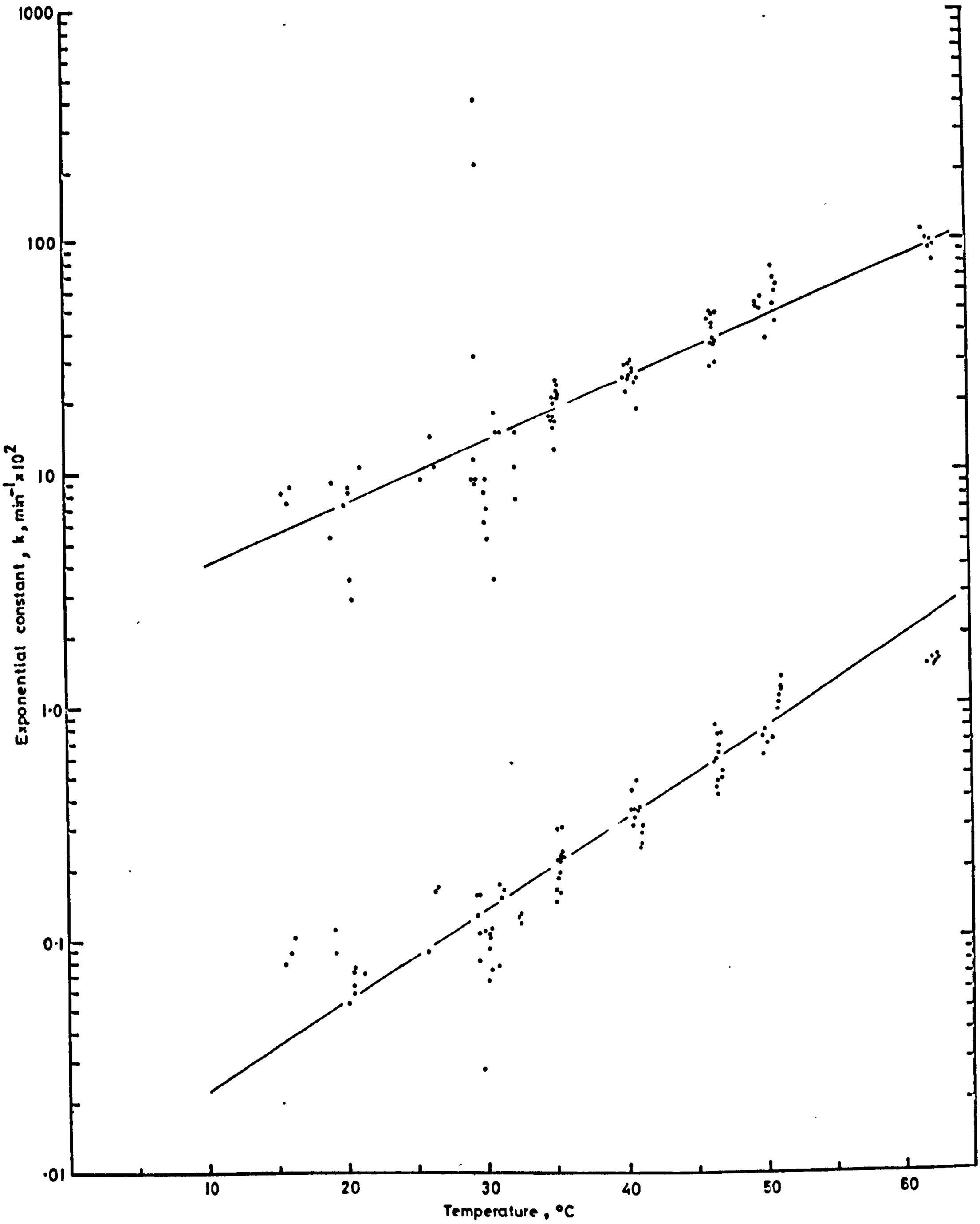


Fig. 3.2.2 Values of drying constants k_1 (top) and k_2 (bottom) derived from fitting the 2 term-exponential equation, 3.10 for Sabel, 1971 data.

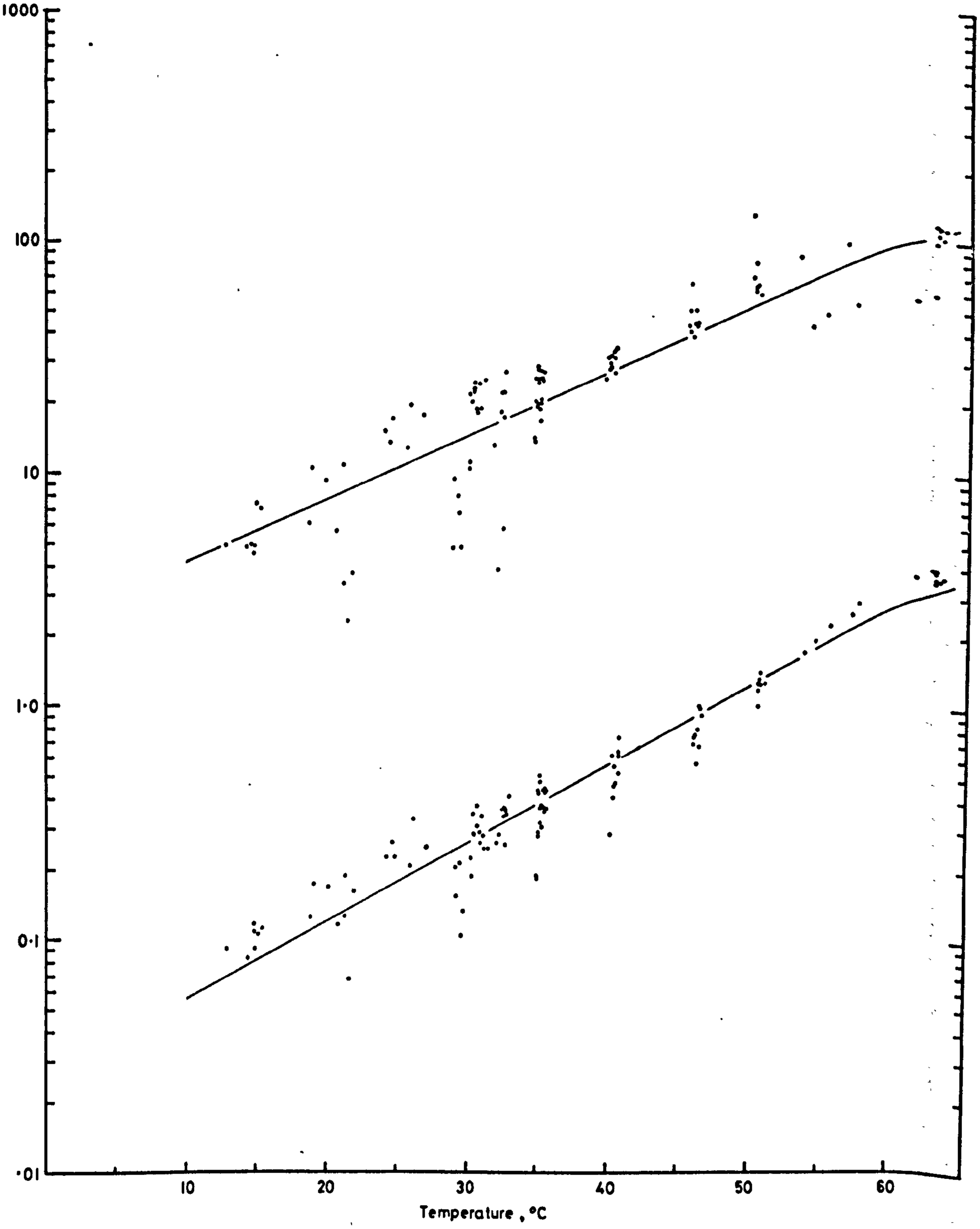


Fig. 3.2.3 Values of drying constants k_1 (top) and k_2 (bottom) derived from fitting the 2 term-exponential equation, 3.10 for S.23, 1971 data.

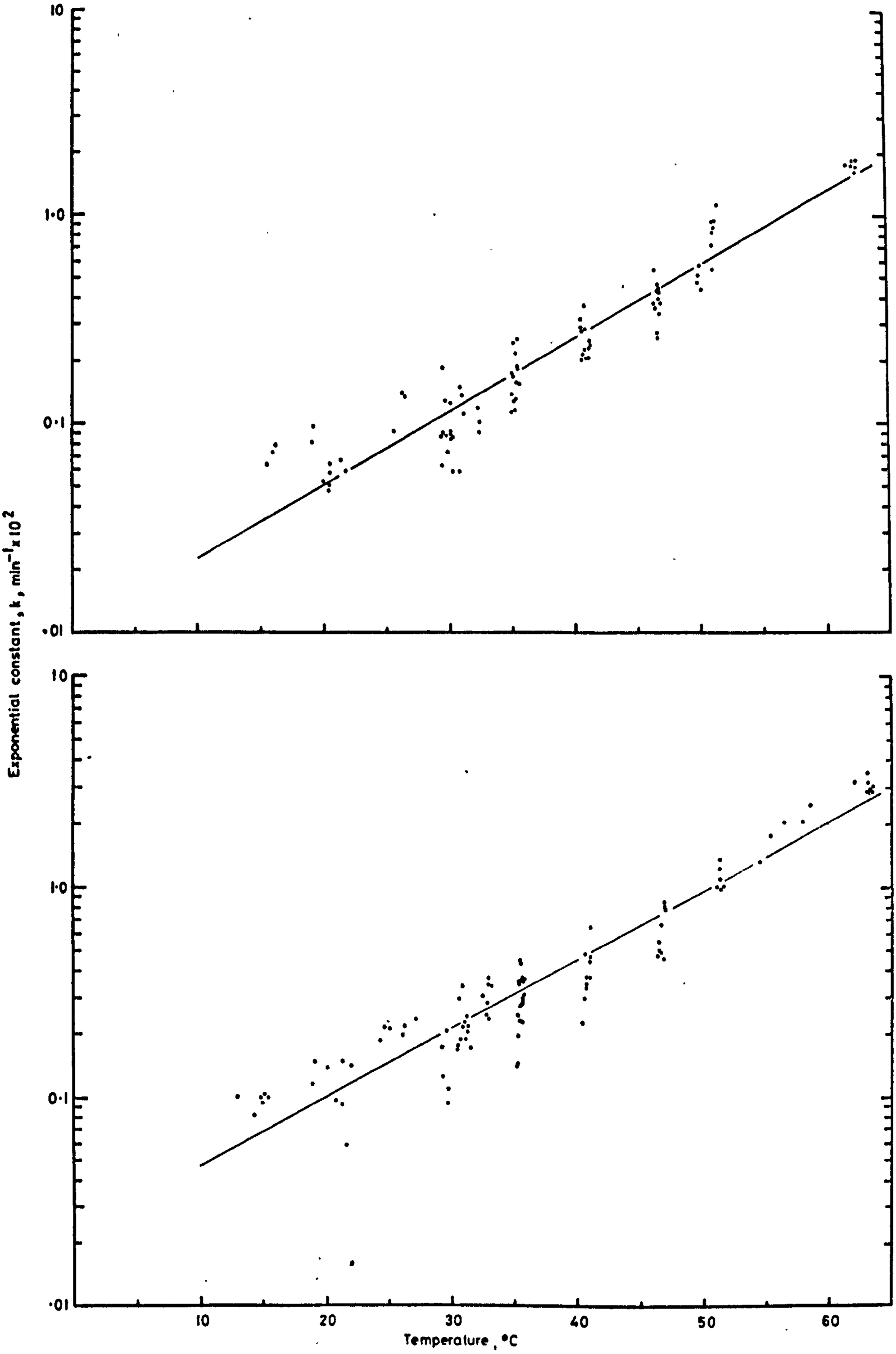


Fig. 3.2.4 Values of drying constant, k_1 derived from the fits of the exponential equation for the sphere, 3.38, for Sabel (top) and S.23 (bottom), 1971 data.

Table 3.2.18

Asymptotic moisture contents, M_e, as a function of temperature and relative humidity. Coefficients and standard errors in fit of $M_e = a - b \ln T - c \ln (1 - rh)$ for combined data from 1971

Coefficient	Asymptotic moisture content, M_e			
	Single exponential	2 term exponential	Exponential series	
			Sphere	Plate
a	19.931 ± 2.64	12.975 ± 2.11	11.563 ± 2.41	10.065 ± 2.14
b	3.709 ± 0.0692	2.333 ± 0.549	1.806 ± 0.629	1.631 ± 0.559
c	10.818 ± 0.506	9.399 ± 0.426	10.676 ± 0.460	10.993 ± 0.409
Residual ^{2}	6.00	3.63	4.97	3.92
d.f.	190	188	190	190
% var.	86.4	86.7	86.3	89.2

Table 3.2.19

Final moisture content, M_e and asymptotic moisture contents, M_e as a function of temperature and relative humidity. Coefficients and standard errors in fit of $M_e = a - b \ln T - c \ln (1-rh)$ for Sabel and S.23, 1971 data

	Coefficient	Final moisture content, M_f.	Asymptotic moisture content, M_e			
			Single exponential	2 term exponential	Exponential series	
					Sphere	Plate
Sabel	a	13.183 ± 2.52	15.09 ± 4.44	7.769 ± 3.48	11.710 ± 4.05	5.055 ± 3.68 NS
	b	2.294 ± 0.645	2.834 ± 1.17	1.147 ± 0.904	2.137 ± 1.06	6.319 ± 0.968 NS
	c	10.711 ± 0.648	12.93 ± 0.875	9.561 ± 0.813	12.856 ± 0.799	13.175 ± 0.727
	r^2	1.58	8.06	4.41	6.71	5.56
	d.f.	82 (1)	88	86	88	88
	% var. *	91.3	83.3	76.3	84.9	86.4
S.23	a	16.50 ± 1.45	25.67 ± 2.21	18.841 ± 1.84	12.406 ± 2.07	15.696 ± 1.57
	b	3.047 ± 0.377	4.849 ± 0.576	3.657 ± 0.479	1.797 ± 0.540	2.8249 ± 0.410
	c	9.017 ± 0.272	8.898 ± 0.415	8.640 ± 0.345	9.107 ± 0.389	9.117 ± 0.296
	r^2	0.933	2.18	1.51	1.92	1.11
	d.f.	99	99	99	99	99
	% var. *	97.0	94.2	95.2	93.3	96.4

* % var. = % variation accounted for = $(r^2) \times 100$

(1) 4 values removed from the data set.

Table 3.2.20

Final moisture contents from 1971 and 1972 thin layer experiments. Coefficients and standard errors in fit of $M_e = a - b \ln T - c \ln (1-rh)$ for 1971 data only and 1971 and 1972 data combined

Coefficient	1971 only	1971 + 1972
a	16.051 ± 1.32	16.251 ± 1.12
b	2.9567 ± 0.343	3.0013 ± 0.284
c	9.3356 ± 0.272	9.2778 ± 0.256
Residual ^{2}	1.26	1.16
d.f.	184	214
% var. *	95.0	95.6

* var. = % variation accounted for = $r^2 \times 100$.

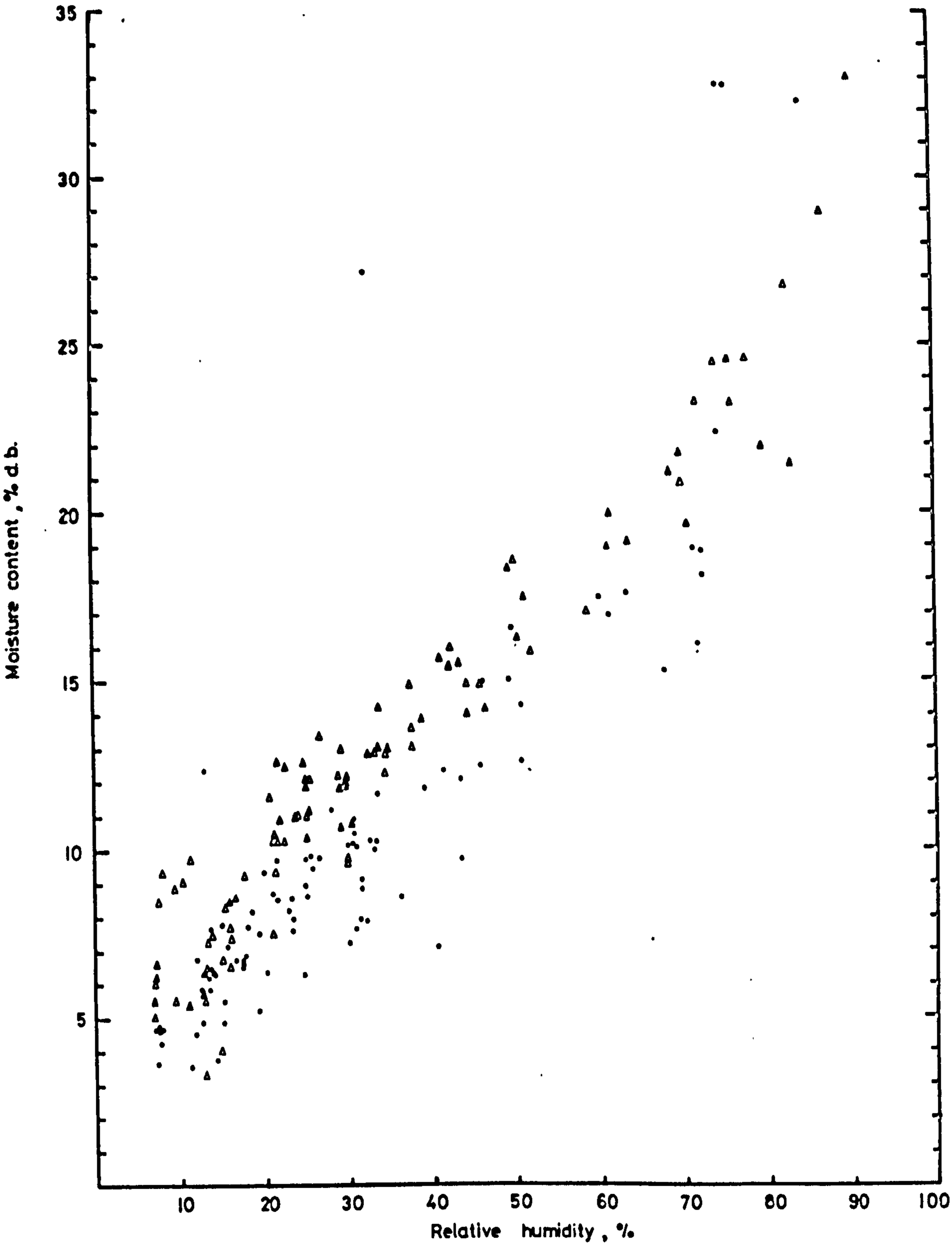


Fig. 3.2.5 Values of asymptotic constants, M_e, derived from the fitting of the single exponential equation, 3.1 for Sabel (•) and S.23 (▲) 1971 data.

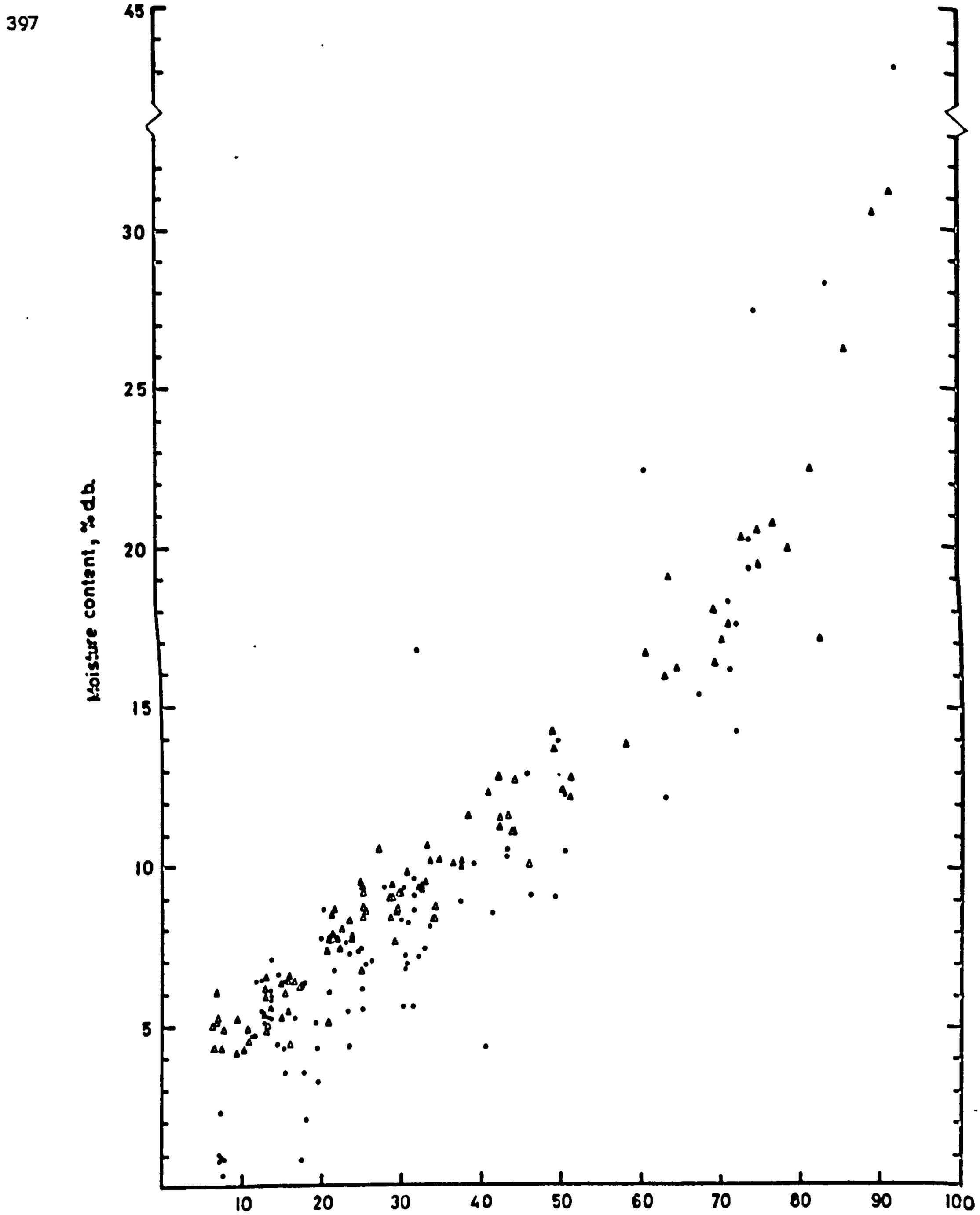


Fig. 3.2.6 Values of asymptotic constants, M_e, derived from the fitting of the exponential series for the plane sheet, 3.39 . for Sabel (•) and S.23 (▲), 1971 data.

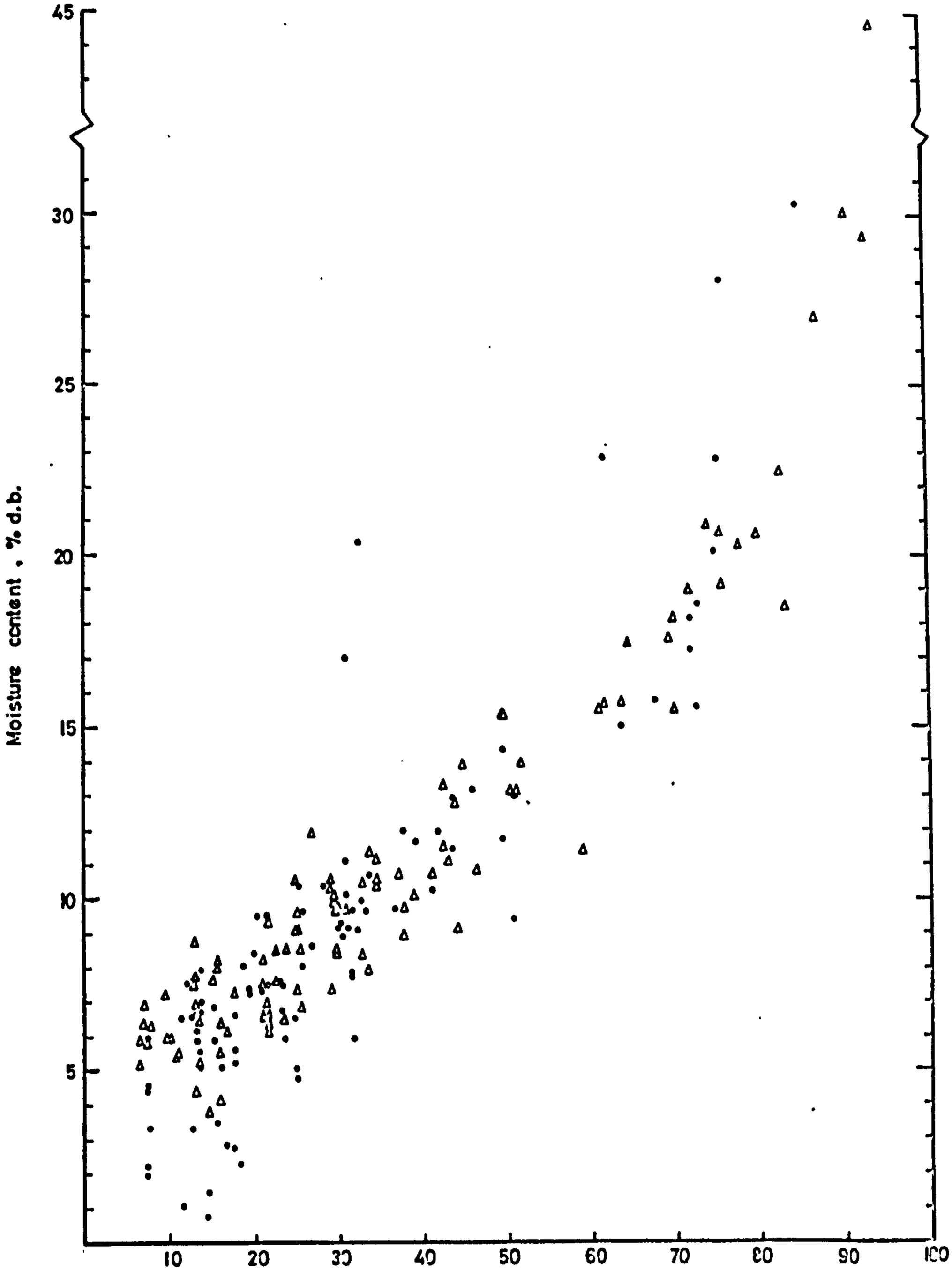


Fig. 3.2.7 Values of asymptotic constants, M_e, derived from the fitting of the exponential series for the sphere, 3.38 for Sabel (•) and S.23 (▵), 1971 data.

Table 3.2.21 Germination results. 1971 data for Sabel.

THIN LAYER TESTS 1971 GERMINATION RESULTS

RUN NO.	MOISTURE CONTENTS, %D.B. INITIAL	FINAL	DRYING AIR TEMPERATURE DEG C	PERCENT GERMINATION AFTER STATED TIME-PERIOD 7 DAYS			14 DAYS			MEAN 7 DAY	MEAN 14 DAY	VIGOUR %
31	99.8	9.1	32.4	60	62	69	74	72	79	63.7	75.0	84.9
32	99.9	10.0	30.3	65	61	61	74	72	72	62.3	72.7	85.8
33	99.1	7.9	35.2	73	66	71	83	74	81	70.0	79.3	88.2
34	98.9	8.2	41.1	67	65	71	81	81	79	67.7	80.3	84.2
35	99.5	6.3	46.4	57	64	54	67	81	65	58.3	71.0	82.2
36	99.5	15.3	20.4	64	77	73	73	86	83	71.3	80.7	88.4
37	99.1	5.7	50.5	50	42	40	70	59	56	44.0	61.7	71.4
39	94.9	6.5	46.6	65	52	55	71	65	65	57.3	67.0	85.6
40	99.0	7.1	49.6	25	53	49	46	71	59	42.3	58.7	72.2
41	72.6	22.5	29.9	83	77	80	86	80	84	80.0	83.3	96.0
42	93.8	6.4	44.1	61	56	56	71	63	64	57.7	66.0	87.4
43	91.5	5.3	49.8	76	64	64	84	71	77	68.0	77.3	87.9
44	84.9	8.7	32.4	67	74	73	73	81	81	71.3	78.3	91.1
45	84.1	9.5	30.1	78	71	71	82	75	77	73.3	78.0	94.0
46	81.9	7.3	35.0	70	67	69	77	77	73	68.7	75.7	90.7
47	83.3	5.9	41.0	64	66	71	67	76	76	67.0	73.0	91.8
48	83.1	4.9	46.6	58	58	62	71	66	69	59.3	68.7	86.4
49	81.3	16.1	20.3	72	74	73	77	77	77	73.0	77.0	94.8
50	84.2	4.6	49.8	55	57	58	65	68	66	56.7	66.3	85.4
52	69.8	9.9	32.3	79	84	79	85	86	85	80.7	85.3	94.5
53	68.4	11.3	30.1	83	84	76	86	87	86	81.0	86.3	93.8
54	68.2	8.6	35.0	81	72	75	87	83	82	76.0	84.0	90.5
55	66.6	7.5	41.2	70	70	68	80	86	87	69.3	84.3	82.2
56	66.9	5.3	46.8	72	65	58	88	83	84	65.0	85.0	76.5
57	70.4	21.0	20.0	64	76	60	76	83	72	66.7	77.0	86.6
58	68.5	5.3	50.1	53	54	59	79	83	85	55.3	82.3	67.2
60	68.6	8.6	41.2	73	82	67	82	90	83	74.0	85.0	87.1
61	68.3	6.3	46.7	67	71	70	77	88	84	69.3	83.0	83.5
62	67.3	6.0	50.0	59	47	59	88	81	78	55.0	82.3	66.8
71	68.1	10.2	29.5	80	82	80	89	86	86	80.7	87.0	92.7
72	68.5	8.1	35.1	84	80	84	86	95	91	82.7	87.3	94.7
73	68.8	8.0	35.2	88	89	85	91	94	91	87.3	92.0	94.9
74	68.9	7.3	40.5	79	84	80	84	93	89	81.0	88.7	91.4
75	69.6	6.1	46.3	76	82	83	88	88	89	80.3	88.3	90.9
77	50.3	5.3	50.9	74	78	70	89	86	85	74.0	86.7	85.4
79	48.9	6.9	40.6	80	89	90	88	93	96	86.3	92.3	93.5
82	49.3	4.8	51.0	71	75	76	85	88	92	74.0	88.3	83.0
83	26.7	16.1	29.8	84	86	90	89	91	95	86.7	91.7	94.5
84	23.7	13.1	29.5	87	87	90	92	93	91	88.3	91.0	96.7
85	24.2	9.9	35.1	91	92	90	94	95	94	91.0	94.3	96.5
86	23.7	9.7	35.3	88	94	92	91	96	95	91.3	94.0	97.2
87	23.9	7.6	40.4	92	93	90	96	94	91	91.7	93.7	97.9
88	23.3	6.1	46.6	89	92	91	92	93	98	90.7	94.3	96.1
89	23.3	15.4	20.6	91	92	89	93	93	92	90.7	92.7	97.8
90	24.6	5.4	51.1	90	91	92	93	95	92	91.0	93.3	97.5
91	23.2	18.4	29.7	89	84	90	92	84	94	87.7	90.0	97.4
63	83.4	5.3	62.6	6	2	2	46	51	47	3.3	48.0	6.9
64	81.9	5.1	62.6	2	3	1	36	35	28	2.0	33.0	6.1
65	81.4	5.2	62.5	3	3	0	39	43	38	2.0	40.0	5.0
66	82.2	5.1	62.3	3	2	4	52	45	45	3.0	47.3	6.3
67	79.9	5.0	62.2	1	2	1	44	46	34	1.3	41.3	3.2
69	81.3	5.1	61.8	4	1	1	49	58	43	2.0	50.0	4.0
92	65.1	10.8	29.4	88	80	93	93	85	95	87.0	91.0	95.6
93	65.8	8.6	35.0	83	79	79	88	84	89	80.3	87.0	92.3
94	66.0	8.4	35.1	85	79	82	89	86	86	82.0	87.0	94.3
95	66.6	7.9	40.4	80	78	87	84	82	89	81.7	85.0	96.1
96	66.4	6.4	46.6	87	79	78	94	83	91	81.3	89.3	91.0
97	65.2	14.3	20.5	82	87	78	88	91	87	82.3	88.7	92.9
98	65.8	5.5	51.0	77	79	71	84	85	81	75.7	83.3	90.8
99	65.1	18.4	29.4	89	89	81	94	91	87	86.3	90.7	95.2
100	65.9	7.3	40.5	82	85	86	86	89	91	84.3	88.7	95.1
101	66.6	6.1	46.6	76	89	82	81	93	85	82.3	86.3	95.4
102	65.9	5.1	51.1	86	80	79	94	87	87	81.7	89.3	91.4
126	48.4	10.9	35.4	93	90	87	94	92	90	90.0	92.0	97.8
127	50.0	8.1	40.7	89	87	85	90	89	88	87.0	89.0	97.8
128	49.2	6.5	46.4	85	89	86	88	93	89	86.7	90.0	96.3
129	50.5	5.5	51.2	92	87	89	95	94	90	89.3	93.0	96.1
173	84.3	10.4	31.0	64	71	74	81	79	80	69.7	80.0	87.1
174	85.5	8.5	35.4	68	63	73	83	72	81	68.0	78.7	86.4
175	84.7	8.4	35.4	62	66	70	75	76	84	66.0	78.3	84.3
176	83.9	7.4	40.8	65	66	66	80	80	87	65.7	82.3	79.8
177	85.6	6.2	46.6	58	55	52	77	73	73	55.0	74.3	74.0
178	83.6	8.1	30.9	59	65	67	72	76	78	65.7	75.3	84.5
179	83.6	16.3	30.2	79	77	74	93	84	85	76.7	87.3	87.8
180	82.0	8.8	31.2	77	79	71	85	85	80	75.7	83.3	90.8
181	82.7	7.6	35.4	53	78	66	76	85	79	65.7	80.0	82.1
182	82.9	7.5	35.5	63	70	61	82	83	72	64.7	79.0	81.9
183	82.4	6.3	40.8	69	49	66	77	73	79	61.3	76.3	80.3
184	81.8	12.2	25.6	69	71	72	81	77	85	70.7	81.0	87.2
185	80.7	14.2	21.2	73	77	70	77	85	85	73.3	82.3	89.1
196	67.6	13.9	19.2	80	85	83	87	87	86	82.7	86.7	95.4
197	66.7	20.0	19.1	81	83	72	86	86	80	78.7	84.0	93.7
226	49.9	13.0	16.2	80	81	81	82	86	85	80.7	84.3	95.7
227	49.9	18.4	15.5	77	82	76	82	84	78	78.3	81.3	96.3
228	49.8	17.6	16.0	81	87	86	86	89	90	84.7	88.3	95.8
239	51.7	8.5	26.5	51	57	55	61	70	67	54.3	66.0	82.3
240	52.1	8.6	26.3	54	51	56	69	68	65	53.7	67.3	79.7

Table 3.2.22 Germination results. 1971 data for S23.

THIN LAYER TESTS 1971 GERMINATION RESULTS

RUN NO.	MOISTURE CONTENTS, W.B. % INITIAL	FINAL	DRYING AIR TEMPERATURE DEG C	PERCENT GERMINATION AFTER STATED TIME PERIOD 7 DAYS			14 DAYS			MEAN 7 DAY	MEAN 14 DAY	VIGOUR %
103	72.4	12.0	29.3	92	87	93	94	93	97	90.7	94.7	95.8
104	73.3	8.8	35.1	90	92	94	94	96	96	92.0	95.3	96.5
105	73.2	8.8	35.1	36	91	94	92	97	96	90.3	95.0	95.1
106	73.5	6.9	49.3	86	79	89	94	91	96	84.7	93.7	90.4
107	71.2	5.5	46.5	69	74	79	85	89	94	74.0	89.3	82.8
108	72.2	17.5	20.7	83	92	91	88	94	94	88.7	92.0	96.4
109	73.1	4.7	51.0	70	70	66	89	90	82	68.7	87.0	78.9
110	70.7	17.9	29.7	92	90	92	93	95	94	91.3	94.0	97.2
130	66.7	11.9	29.2	94	95	89	95	96	91	92.7	94.0	98.6
131	64.7	9.3	35.3	95	92	97	96	95	99	94.7	96.7	97.9
132	66.4	9.2	35.4	92	92	90	94	95	95	91.3	94.7	96.5
133	66.2	8.4	40.6	94	79	88	97	89	93	87.0	93.0	93.5
134	65.0	6.8	46.4	82	70	79	91	83	91	77.0	88.3	87.2
135	65.0	13.9	20.8	90	92	93	93	96	98	91.7	95.7	95.8
136	67.3	6.3	51.2	77	73	75	86	86	91	75.0	87.7	85.6
137	65.2	18.1	29.7	84	94	87	93	99	96	88.3	96.0	92.0
111	71.4	5.1	51.5	77	69	75	93	86	91	73.7	90.0	81.9
112	72.4	4.8	54.4	64	61	70	86	95	90	65.0	90.3	72.0
113	72.4	4.1	57.8	64	42	33	89	80	74	46.3	81.0	57.2
114	72.2	3.5	63.1	17	22	22	56	65	47	20.3	56.0	36.3
115	71.5	6.0	46.7	78	80	76	94	87	85	78.0	88.7	88.0
116	71.4	5.3	45.6	78	66	66	95	89	78	70.0	87.3	80.2
117	70.3	5.1	51.0	60	70	72	91	94	91	67.3	92.0	73.2
118	71.7	12.6	28.7	86	88	92	91	96	96	88.7	94.3	94.0
119	72.7	9.0	35.2	81	93	93	90	98	95	89.0	94.3	94.3
120	71.7	10.6	35.2	87	90	82	90	94	88	86.3	90.7	95.2
121	71.8	7.9	40.5	77	76	78	97	85	94	77.0	92.0	83.7
122	70.9	6.4	46.3	74	70	70	97	93	90	71.3	93.3	76.4
123	70.2	15.4	20.8	68	69	59	89	88	87	65.3	88.0	74.2
124	71.4	5.4	51.2	82	82	92	88	87	94	85.3	89.7	95.2
125	70.0	19.7	29.6	91	90	86	93	93	89	89.0	91.7	97.1
126	70.0	7.9	40.6	85	88	83	93	95	95	85.1	94.3	90.5
127	70.3	6.8	46.4	81	83	76	95	97	88	80.0	93.3	85.7
128	70.5	5.9	51.1	72	74	78	90	90	89	74.7	89.7	83.3
141	69.3	9.8	31.0	95	93	95	98	98	98	94.3	98.0	96.3
142	70.2	9.1	35.4	93	94	93	97	97	98	93.3	97.3	95.9
143	69.4	9.1	35.4	98	98	91	93	99	95	95.0	97.7	97.2
144	70.3	7.6	40.6	90	88	89	97	93	98	89.0	96.0	92.7
145	70.7	6.3	46.6	92	91	87	99	97	96	90.0	97.3	92.5
146	70.3	6.3	30.6	94	93	87	96	96	93	91.3	95.0	94.1
147	70.5	5.6	51.2	77	75	73	94	90	85	75.0	89.7	83.6
111	70.9	27.7	30.8	82	89	89	90	95	93	86.7	92.7	93.5
112	68.4	13.3	31.2	80	94	87	86	99	96	87.0	93.7	92.9
150	68.4	10.3	35.3	83	88	92	90	96	97	87.7	94.3	92.9
151	68.1	10.3	35.3	92	89	91	98	94	94	90.7	95.3	95.1
152	68.4	8.4	40.5	84	85	86	93	96	93	85.0	95.3	89.2
153	68.5	10.4	30.5	82	95	93	89	96	99	90.0	94.7	95.1
155	70.1	10.9	31.2	87	83	93	92	92	97	87.7	93.7	93.6
156	70.1	8.5	35.6	90	93	89	97	98	94	90.7	96.3	94.1
157	70.4	8.7	35.6	87	83	93	93	92	96	87.7	93.7	93.6
158	70.9	6.9	40.9	77	77	83	89	86	92	79.0	89.0	88.8
159	70.4	5.8	46.9	85	73	88	89	82	92	82.0	87.7	93.5
160	70.5	9.5	31.0	85	85	83	93	93	91	84.3	92.3	91.3
161	69.2	18.4	30.4	91	84	91	92	88	96	88.7	92.0	96.4
162	69.5	10.8	31.2	86	90	90	92	93	94	88.7	93.0	95.3
163	67.5	9.3	35.7	93	83	86	95	89	92	87.3	92.0	94.9
164	69.1	9.2	35.6	90	92	93	94	97	93	91.7	94.7	96.8
165	69.1	7.6	40.9	88	86	92	96	98	98	88.7	97.3	91.1
166	69.1	6.2	46.8	84	78	87	95	94	97	83.0	95.3	87.1
167	69.1	8.4	31.1	93	93	92	98	95	98	92.7	97.0	95.5
168	69.5	15.8	30.4	89	89	91	92	91	95	89.7	92.7	96.8
169	71.7	9.7	35.6	91	89	96	94	93	98	92.0	95.0	96.8
170	71.7	9.7	35.6	88	85	92	95	92	95	88.3	94.0	94.0
171	71.9	8.0	40.9	89	89	87	94	93	94	88.3	93.7	94.5
172	70.9	6.5	46.8	82	89	86	92	97	96	85.7	95.0	90.2
187	70.8	11.0	30.8	93	91	95	93	93	97	93.0	94.3	98.6
188	71.4	9.2	35.4	92	96	84	95	97	90	90.7	94.0	96.5
189	71.3	9.1	35.4	86	92	87	97	98	91	88.3	95.3	92.7
190	72.0	7.5	41.0	88	89	87	93	94	95	88.0	94.0	93.6
191	70.7	13.3	28.2	91	96	98	98	98	98	94.3	98.0	96.3
192	71.3	8.3	30.8	96	92	92	97	97	94	93.3	96.0	97.2
193	70.3	17.2	31.5	93	88	91	96	92	95	90.7	94.3	96.1
194	73.6	14.4	19.1	96	94	96	97	95	96	95.3	96.0	99.3
195	72.2	20.7	18.9	88	92	92	94	94	97	90.7	95.0	95.4
196	70.7	9.8	32.7	78	78	81	83	83	83	79.0	83.0	95.2
199	71.1	8.3	32.9	88	76	82	90	86	88	82.0	88.0	93.2
200	71.9	12.4	35.5	77	77	83	83	82	85	79.0	83.5	94.8
201	69.9	17.6	29.1	75	80	82	80	85	88	79.0	84.3	93.7
202	73.2	10.5	32.9	86	85	82	89	85	85	84.3	88.3	95.5
203	73.5	8.1	32.8	86	85	84	89	89	88	85.0	88.7	95.9
204	72.4	12.8	35.5	85	81	81	89	84	90	82.3	87.7	93.9
205	72.5	18.1	29.5	78	78	77	85	85	85	77.7	85.0	91.4
206	75.0	8.0	35.1	74	76	74	86	87	93	74.7	88.7	84.2
207	73.6	15.1	32.8	69	79	79	87	91	89	75.7	89.0	85.0
208	73.7	17.6	32.4	70	63	71	87	90	88	68.0	88.3	77.0
209	64.1	11.8	20.1	12	15	12	23	28	26	13.0	25.7	50.8
210	64.2	26.0	22.0	7	11	18	14	15	25	12.0	17.3	69.2
211	64.0	30.0	21.3	9	9	12	11	14	20	10.0	15.0	66.7
212	63.4	11.4	21.3	10	10	15	20	20	27	11.7	22.3	52.2
213	62.9	14.5	15.1	7	10	13	20	30	20	10.0	23.3	42.9
216	64.6	22.4	12.9	15	19	15	20	26	23	15.7	23.0	68.1
217	66.8	18.8	14.4	17	11	18	26	17	22	15.3	21.7	70.8
218	64.1	15.4	15.4	27	26	20	30	31	29	24.3	30.0	81.1
219	64.3	20.4	14.9	22	25	17	27	30	20	21.3	25.7	83.1
220	64.2	20.4	14.8	22	18	19	30	24	21	19.7	25.0	78.7
221	66.4	12.7	24.7	13	17	10	17	23	10	13.3	16.7	80.0
222	62.1	12.8	24.3	6	9	16	9	15	17	9.7	13.7	70.7
223	65.7	12.5	24.9	11	17	12	21	22	21	13.3	21.3	62.5
224	66.2	12.0	26.0	15	20	16	20	23	19	16.3	20.7	79.0
225	65.4	11.3	27.1	23	24	20	23	29	23	21.3	25.0	85.3
229	70.2	4.9	55.2	11	15	5	18	20	5	10.3	15.3	67.4
230	69.9	4.5	56.3	6	10	9	11	14	14	8.3	13.0	64.1
231	70.6	6.5	58.4	7	15	11	12	19	14	11.3	15.0	75.6
232	72.7	5.0	62.0	8	10	12	12	17	17	10.0	15.3	65.2
233	70.5	3.7	62.9	6	13	5	12	16	11	7.7	13.0	59.0
234	74.3	4.1	63.0	12	11	9	17	11	12	10.3	13.3	77.5
235	75.4	5.9	63.3	9	8	9	7	14	13	8.7	11.3	58.8
236	57.1	5.8	65.0	10	9	10	12	9	12	9.7	11.0	87.9
237	74.7	3.9	63.4	9	10	9	16	12	11	9.3	13.0	71.8
238	73.5	5.8	63.1	10	11	7	15	14	11	9.3	13.3	70.0

Table 3.2.23

Coefficients and standard errors in equations describing the depression of germinations and the effect on germination vigour of pooled results from 1970, 1971 and 1972 presented in Section 3.4.2.1.

Germination depression, G_D, % $G_D = a + bT + cT^2 + dT^3$			
Coefficient	Sabel	S.23	t
a	38.106 ± 18.1	51.743 ± 17.6	-0.54^{NS}
b	-2.6813 ± 1.28	-3.8084 ± 1.19	0.65^{NS}
c	0.046906 ± 0.0284	0.081266 ± 0.0256	-0.90^{NS}
d	0.0001074 ± 0.000917	0.0004121 ± 0.000174	-1.13^{NS}
Residual ^{2}	68.5	65.2	
d.f.	93	22.7	320
% var.acc.for	80.9	66.7	

Vigour, % $Vigour = a + bT + cT^2 + dT^3 + eMd$		
Coefficients	Sabel	S.23
a	34.235 ± 31.9	68.739 ± 14.8
b	6.371 ± 2.22	2.9322 ± 0.982
c	-0.1440 ± 0.0492	0.057944 ± 0.0211
d	0.0008348 ± 0.000341	0.0002312 ± 0.000144
e	-0.3329 ± 0.0714	-0.24078 ± 0.0404
Residual ^{2}	206	44.3
d.f.	92	226
% Var.acc.for	67.4	72.7

Note: The differences between the residual σ^2 for vigour is significant so that it is not possible to compare the coefficients.

Table 3.2.24

Germination experiment, 1972. 1000 seed weights of Sabel samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
	57.7	3.73	3.84	3.62	3.94	3.83	3.98	3.82
	63.2	3.96	3.87	3.91	4.06	3.82	3.81	3.90
1	68.8	3.92	3.92	3.89	3.76	3.85	3.89	3.87
	74.2	4.12	4.11	3.83	3.57	3.77	4.00	3.90
	78.5	4.01	3.85	3.97	3.87	3.94	3.83	3.91
	MEAN	3.95	3.92	3.84	3.84	3.84	3.90	3.88
	57.7	3.80	4.03	4.08	4.14	3.79	3.91	3.96
	63.2	4.05	3.88	3.98	4.00	4.10	3.76	3.96
2	68.8	3.95	4.03	3.97	4.22	3.70	3.98	3.98
	74.2	3.83	4.09	3.89	3.90	3.93	3.80	3.91
	78.5	4.07	3.92	4.13	3.88	3.95	3.82	3.96
	MEAN	3.94	3.99	4.01	4.03	3.89	3.85	3.95
	57.7	4.09	3.97	4.06	3.98	3.80	3.69	3.93
	63.2	4.09	3.89	3.81	3.86	3.77	3.92	3.89
3	68.8	4.13	3.77	4.06	3.83	3.90	3.95	3.94
	74.2	3.80	4.04	4.00	3.92	4.06	4.02	3.97
	78.5	4.05	3.90	3.83	3.91	3.80	3.90	3.90
	MEAN	4.03	3.91	3.95	3.90	3.87	3.90	3.93
	57.7	3.87	3.95	3.92	4.02	3.81	3.86	3.91
	63.2	4.03	3.88	3.90	3.97	3.90	3.83	3.92
MEAN	68.8	4.00	3.91	3.97	3.94	3.81	3.94	3.93
	74.2	3.92	4.08	3.91	3.80	3.92	3.94	3.93
	78.5	4.04	3.89	3.98	3.89	3.89	3.85	3.92
	MEAN	3.97	3.94	3.94	3.92	3.87	3.89	3.92

Table 3.2.25

Germination experiment, 1972. 1000 seed weights of S23 samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
	57.7	1.44	1.50	1.47	1.50	1.45	1.49	1.47
	63.2	1.43	1.46	1.48	1.42	1.53	1.46	1.46
1	68.8	1.44	1.50	1.47	1.46	1.55	1.47	1.48
	74.2	1.52	1.53	1.55	1.50	1.46	1.54	1.52
	78.5	1.54	1.50	1.53	1.52	1.46	1.48	1.50
	MEAN	1.47	1.50	1.50	1.48	1.49	1.49	1.49
	57.7	1.55	1.56	1.51	1.59	1.52	1.58	1.55
	63.2	1.60	1.58	1.55	1.67	1.54	1.53	1.58
2	68.8	1.53	1.61	1.56	1.58	1.52	1.57	1.56
	74.2	1.54	1.59	1.55	1.56	1.55	1.51	1.55
	78.5	1.56	1.52	1.51	1.55	1.52	1.51	1.53
	MEAN	1.56	1.57	1.54	1.59	1.53	1.54	1.55
	57.7	1.60	1.60	1.53	1.55	1.51	1.54	1.55
	63.2	1.59	1.58	1.60	1.51	1.58	1.53	1.57
3	68.8	1.60	1.54	1.59	1.48	1.51	1.52	1.54
	74.2	1.55	1.55	1.53	1.46	1.52	1.46	1.51
	78.5	1.52	1.51	1.50	1.51	1.46	1.47	1.50
	MEAN	1.57	1.56	1.55	1.50	1.52	1.50	1.53
	57.7	1.53	1.55	1.50	1.55	1.49	1.54	1.53
	63.2	1.54	1.54	1.54	1.53	1.55	1.51	1.54
MEAN	68.8	1.52	1.55	1.54	1.51	1.53	1.52	1.53
	74.2	1.53	1.56	1.54	1.51	1.51	1.51	1.53
	78.5	1.54	1.51	1.51	1.53	1.48	1.49	1.51
	MEAN	1.53	1.54	1.53	1.52	1.51	1.51	1.53

Table 3.2.26

Germination experiment, 1972. Germination and vigour of control samples.

	Crop	Sabel			S23		
	Date	18/7	20/7	25/7	3/8	8/8	10/8
7 day counts	1	79	80	81	91	81	94
	2	74	86	75	87	84	94
	3	74	76	83	79	86	90
	4	75	82	83	82	67	86
	5	72	80	84	87	84	88
	6	80	82	80	85	69	93
	Mean	75.7	81.0	81.0	85.2	78.5	90.8
	S.D.	±3.1	±3.3	±3.3	±4.2	±8.3	±3.4
14 day counts	1	81	86	83	97	88	96
	2	79	90	80	93	88	99
	3	80	82	88	89	91	97
	4	83	89	86	89	82	96
	5	79	84	86	95	89	94
	6	88	87	86	93	78	96
	Mean	81.7	86.3	84.8	92.7	86.0	96.3
	S.D.	±3.4	±3.0	±2.9	±3.2	±4.9	±1.6
Vigour, %	1	97.5	93.0	97.6	93.8	92.0	97.9
	2	93.7	95.6	93.8	93.5	95.5	94.9
	3	92.5	92.7	94.3	88.8	94.5	92.8
	4	90.4	94.4	93.3	92.1	81.7	89.6
	5	91.1	95.2	97.7	91.6	94.4	93.6
	6	90.9	94.3	93.0	91.4	88.5	96.9
	Mean	92.7	94.2	95.0	91.9	91.1	94.3
	S.D.	±2.7	±1.2	±2.1	±1.8	±5.2	±3.0

Table 3.2.27

Germination experiment, 1972. 7 day germination counts of Sabel samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
1	57.7	68.0	58.3	47.7	34.7	26.3	27.0	43.7
	63.2	22.0	20.7	15.3	35.3	17.3	12.7	20.6
	68.8	12.0	11.7	10.3	9.3	6.7	8.3	9.7
	74.2	12.7	12.7	3.0	7.3	2.3	5.3	7.2
	78.5	6.7	11.3	9.0	5.0	2.7	1.7	6.1
	MEAN	24.3	22.9	17.1	18.3	11.1	11.0	17.4
2	57.7	79.0	73.3	65.0	66.0	56.7	59.0	66.5
	63.2	63.3	51.3	41.0	46.3	39.7	47.7	48.2
	68.8	26.7	24.0	21.3	16.7	17.3	18.7	20.8
	74.2	23.0	23.7	24.3	17.3	18.7	12.7	19.9
	78.5	17.0	15.7	6.3	14.3	2.7	5.3	10.2
	MEAN	41.8	37.6	31.6	32.1	27.0	28.7	33.1
3	57.7	75.3	71.0	75.0	69.0	69.3	63.3	70.5
	63.2	67.0	55.0	63.0	66.7	63.7	61.0	62.7
	68.8	55.7	52.0	66.0	60.0	44.3	40.3	53.1
	74.2	41.0	43.7	33.0	33.7	30.3	27.7	34.9
	78.5	21.0	19.3	27.0	22.7	13.0	20.3	20.6
	MEAN	52.0	48.2	52.8	50.4	44.1	42.5	48.3
MEAN	57.7	74.1	67.6	62.6	56.6	50.8	49.8	60.2
	63.2	50.8	42.3	39.8	49.4	40.2	40.4	43.8
	68.8	31.4	29.2	32.6	28.7	22.8	22.4	27.9
	74.2	25.6	26.7	20.1	19.4	17.1	15.2	20.7
	78.5	14.9	15.4	14.1	14.0	6.1	9.1	12.3
	MEAN	39.4	36.2	33.8	33.6	27.4	27.4	33.0

Table 3.2.28

Germination experiment, 1972. 14 day germination counts of Sabel samples.
(Each treatment values = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
	57.7	74.3	75.0	62.0	55.0	58.0	58.0	63.7
	63.2	58.3	49.3	38.3	61.0	37.0	33.3	46.2
1	68.8	21.0	22.3	21.7	14.7	20.7	20.0	20.1
	74.2	18.3	16.7	10.7	17.7	14.7	13.3	15.2
	78.5	9.3	14.0	12.7	12.0	9.3	10.3	11.3
	MEAN	36.3	35.5	29.1	32.1	27.9	27.0	31.3
	57.7	81.7	80.7	77.0	80.3	71.3	75.0	77.7
	63.2	72.7	61.3	58.7	58.7	53.7	61.7	61.1
2	68.8	40.7	33.0	33.0	33.7	38.3	33.3	35.3
	74.2	27.0	26.7	27.7	25.3	30.0	27.0	27.3
	78.5	23.7	18.0	17.3	25.0	18.3	20.3	20.4
	MEAN	49.1	43.9	42.7	44.6	42.3	43.5	44.4
	57.7	87.3	83.3	91.0	85.7	80.3	81.7	84.9
	63.2	84.0	78.0	80.0	77.3	74.3	74.7	78.1
3	68.8	60.0	57.0	69.7	64.0	59.3	57.7	61.3
	74.2	53.3	52.3	51.3	51.7	53.3	49.7	51.9
	78.5	42.0	39.7	44.7	49.3	46.3	51.3	45.6
	MEAN	65.3	62.1	67.3	65.6	62.7	63.0	64.3
	57.7	81.1	79.7	76.7	73.7	69.9	71.6	75.4
	63.2	71.7	62.9	59.0	65.7	55.0	56.6	61.8
MEAN	68.8	40.6	37.4	41.4	37.4	39.4	37.3	38.9
	74.2	32.9	31.9	29.9	31.6	32.7	30.0	31.5
	78.5	25.0	23.9	24.9	28.8	24.7	27.3	25.8
	MEAN	50.2	47.2	46.4	47.4	44.3	44.5	46.7

Table 3.2.29

Germination experiment, 1972. 21 day germination counts of Sabel samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
1	57.7	74.7	76.3	65.0	57.0	59.7	62.7	65.9
	63.2	64.3	51.7	41.7	63.0	38.3	35.0	49.0
	68.8	23.3	24.0	24.3	15.7	21.7	21.7	21.8
	74.2	19.0	17.3	10.7	17.7	15.7	14.0	15.7
	78.5	9.3	14.0	12.7	12.0	10.3	12.0	11.7
	MEAN	38.1	36.7	30.9	33.1	29.1	29.1	32.8
2	57.7	82.3	82.0	78.3	34.0	75.0	76.0	79.6
	63.2	77.3	64.7	62.7	61.3	56.3	65.7	64.7
	68.8	42.0	33.0	34.0	34.3	40.0	34.3	36.3
	74.2	27.7	27.0	29.0	26.7	30.7	27.3	28.1
	78.5	24.7	18.3	18.0	25.7	18.7	21.7	21.2
	MEAN	50.8	45.0	44.4	46.4	44.1	45.0	46.0
3	57.7	88.0	83.7	91.0	87.0	81.3	81.7	85.4
	63.2	84.0	79.3	81.3	78.0	75.7	76.0	79.1
	68.8	61.3	57.0	69.7	64.0	60.3	58.3	61.8
	74.2	54.3	52.7	52.7	53.7	55.7	52.0	53.5
	78.5	43.0	40.7	44.7	50.0	47.0	51.7	46.2
	MEAN	66.1	62.7	67.9	66.5	64.0	63.9	65.2
MEAN	57.7	81.7	80.7	78.1	76.0	72.0	73.4	77.0
	63.2	75.2	65.2	61.9	67.4	56.8	58.9	64.2
	68.8	42.2	38.0	42.7	38.0	40.7	38.1	39.9
	74.2	33.7	32.3	30.8	32.7	34.0	31.1	32.4
	78.5	25.7	24.3	25.1	29.2	25.3	28.4	26.4
	MEAN	51.7	48.1	47.7	48.7	45.8	46.0	48.0

Table 3.2.30

Germination experiment, 1972. Vigour percentage (7/14 day) of Sabel samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
1	57.7	91.2	77.7	77.4	63.2	45.6	46.7	67.0
	63.2	38.0	42.6	39.8	57.9	46.7	33.6	45.9
	68.8	57.0	53.0	46.9	64.0	32.3	43.1	49.4
	74.2	68.9	76.5	28.1	42.0	15.1	40.3	45.2
	78.5	61.5	80.6	69.7	50.1	26.7	12.8	50.2
	MEAN	63.4	66.1	52.4	55.5	33.3	36.3	51.1
2	57.7	96.7	91.0	84.4	82.3	79.5	78.6	85.4
	63.2	87.2	93.4	69.7	79.1	73.9	77.7	78.5
	68.8	65.6	72.9	65.1	50.1	45.4	56.2	59.2
	74.2	85.2	88.5	88.1	68.5	61.7	47.1	73.2
	78.5	72.5	84.4	36.3	56.4	13.9	25.8	48.2
	MEAN	81.4	84.0	68.7	67.3	54.9	57.1	68.9
3	57.7	86.3	85.2	82.4	80.6	86.4	77.6	83.1
	63.2	79.6	70.6	78.7	86.3	85.2	81.7	80.5
	68.8	92.8	91.2	94.7	93.4	74.5	69.4	86.0
	74.2	76.6	83.8	64.2	64.9	57.2	56.0	67.1
	78.5	49.8	48.8	59.5	45.3	27.3	39.7	45.1
	MEAN	77.0	75.9	75.9	74.1	66.2	64.9	72.3
MEAN	57.7	91.4	84.6	81.4	75.3	70.5	67.6	78.5
	63.2	68.3	65.5	62.7	74.4	68.9	66.0	67.6
	68.8	71.8	72.4	68.9	69.2	50.7	56.2	64.9
	74.2	76.9	83.0	60.1	58.5	44.6	47.8	61.8
	78.5	61.3	71.3	55.2	59.6	22.6	26.1	47.8
	MEAN	73.9	75.4	65.7	65.6	51.5	52.7	64.1

Table 3.2.31

Germination experiment, 1972. Vigour percentage (7/21 day) of Sabel samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
	57.7	90.9	76.3	74.1	61.0	44.3	43.2	65.0
	63.2	34.4	40.8	36.5	56.1	45.1	36.6	41.6
1	68.8	50.9	48.9	41.9	59.8	30.9	39.4	45.3
	74.2	66.9	74.3	28.1	42.0	14.4	38.3	44.0
	78.5	61.5	80.6	69.7	50.1	24.4	11.9	49.7
	MEAN	60.9	64.2	50.1	53.8	31.8	33.9	49.1
	57.7	96.0	89.5	83.0	78.6	75.5	77.6	83.4
	63.2	81.9	79.1	65.3	75.7	70.5	72.9	74.2
2	68.8	63.4	72.9	63.4	49.1	43.2	54.5	57.7
	74.2	83.2	86.9	83.8	64.9	60.3	46.7	70.9
	78.5	69.4	82.8	35.0	54.9	13.9	24.4	46.7
	MEAN	78.8	82.2	66.1	64.6	52.7	55.2	66.6
	57.7	85.6	84.9	82.4	79.3	85.3	77.6	82.5
	63.2	79.6	69.4	77.4	85.6	84.3	80.3	79.4
3	68.8	90.7	91.2	94.7	93.4	73.3	68.7	85.3
	74.2	75.1	83.4	62.6	62.6	54.6	53.7	65.3
	78.5	48.7	47.5	59.5	44.8	26.9	39.5	44.5
	MEAN	76.0	75.3	75.3	73.2	64.9	63.9	71.4
	57.7	90.8	83.6	79.8	73.0	68.4	66.2	77.0
	63.2	65.3	63.1	59.7	72.5	66.6	63.2	65.1
MEAN	68.8	68.3	71.0	66.7	67.4	49.1	54.2	62.8
	74.2	75.1	81.5	58.2	56.5	43.1	46.2	60.1
	78.5	59.9	70.3	54.7	49.9	21.7	25.2	47.0
	MEAN	71.9	73.9	63.8	63.9	49.8	51.0	62.4

Table 3.2.32

Germination experiment, 1972. 7 day germination counts of S23 samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
	57.7	55.0	45.0	48.0	40.7	41.3	39.3	44.9
	63.2	29.3	25.0	28.3	25.0	22.0	20.3	25.0
1	68.8	24.3	21.3	17.3	20.3	16.0	17.7	19.5
	74.2	11.3	8.7	8.0	18.3	7.0	9.7	10.5
	78.5	6.0	12.0	12.3	9.7	15.0	6.3	10.2
	MEAN	25.2	22.4	22.8	22.8	20.3	18.7	22.0
	57.7	60.3	60.7	59.3	51.3	49.3	47.7	54.9
	63.2	33.0	60.0	42.7	49.7	52.7	47.7	47.6
2	68.8	44.7	44.3	40.3	37.3	36.0	39.7	40.4
	74.2	39.0	39.0	36.0	33.3	36.0	30.7	35.7
	78.5	21.7	20.0	29.3	31.7	17.0	20.3	23.3
	MEAN	39.7	44.8	41.5	40.7	38.2	37.2	40.4
	57.7	87.7	82.0	82.3	74.3	69.7	65.7	76.9
	63.2	77.3	77.7	72.0	71.7	70.0	55.0	70.6
3	68.8	68.7	68.7	64.0	50.3	44.0	36.0	55.3
	74.2	65.7	64.3	57.0	46.0	45.0	45.7	53.9
	78.5	58.7	49.7	44.0	43.7	38.0	33.7	44.6
	MEAN	71.6	68.5	63.9	57.2	53.3	47.2	60.3
	57.7	67.7	62.6	63.2	55.4	53.4	50.9	58.9
	63.2	46.6	54.2	47.7	48.8	48.2	41.0	47.7
MEAN	68.8	45.9	44.8	40.6	36.0	32.0	31.1	38.4
	74.2	38.7	37.3	33.7	32.6	29.3	28.7	33.4
	78.5	28.8	27.2	28.6	28.3	23.3	20.1	26.1
	MEAN	45.5	45.2	42.7	40.2	37.3	34.4	40.9

Table 3.2.33

Germination experiment, 1972. 14 day germination counts of S23 samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
	57.7	71.3	64.0	58.7	49.0	49.0	51.0	57.2
	63.2	45.3	37.3	36.3	37.7	34.7	34.0	37.6
1	68.8	34.3	30.7	27.3	25.3	30.0	27.7	29.2
	74.2	16.7	17.7	19.7	26.3	19.0	23.7	20.5
	78.5	16.0	20.0	17.7	16.3	27.0	28.3	20.9
	MEAN	36.7	33.9	31.9	30.9	31.9	32.9	33.1
	57.7	78.0	82.3	75.3	75.7	73.0	71.3	75.9
	63.2	58.3	79.0	56.7	65.3	68.3	63.7	65.7
2	68.8	51.0	59.3	55.0	47.0	51.3	57.3	53.5
	74.2	41.7	46.7	47.0	42.0	47.0	50.3	45.8
	78.5	46.0	40.3	40.0	42.7	40.3	44.7	42.3
	MEAN	55.0	61.5	54.8	55.1	56.0	57.5	56.7
	57.7	96.0	92.3	88.3	88.0	87.7	87.0	89.9
	63.2	85.7	85.3	81.0	82.0	85.0	85.3	84.1
3	68.8	75.0	74.0	72.7	66.0	69.7	72.0	71.6
	74.2	67.7	67.3	76.0	69.7	70.0	66.0	69.3
	78.5	68.0	58.7	58.3	67.0	67.3	65.0	64.1
	MEAN	78.5	75.5	75.3	74.4	75.0	75.1	75.8
	57.7	81.8	79.6	74.1	70.9	69.9	69.8	74.3
	63.2	63.1	67.2	58.0	62.7	62.7	61.0	62.4
MEAN	68.8	53.4	54.7	51.7	46.1	50.3	52.3	51.4
	74.2	42.0	43.9	47.6	45.8	45.3	46.7	45.2
	78.5	43.3	39.7	38.7	42.0	44.0	46.0	42.4
	MEAN	56.7	57.0	54.0	53.5	54.6	55.2	55.2

Table 3.2.34

Germination experiment, 1972. 21 day germination counts of S23 samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
1	57.7	72.7	65.7	59.0	50.7	50.0	51.7	58.3
	63.2	45.3	37.3	38.0	40.7	35.3	36.0	38.8
	68.8	35.0	31.3	28.3	26.0	31.7	27.7	30.0
	74.2	18.3	18.0	20.3	26.3	21.7	24.7	21.6
	78.5	17.7	23.7	19.0	19.3	28.3	30.7	23.1
	MEAN	37.8	35.2	32.9	32.6	33.4	34.1	34.3
2	57.7	80.3	83.0	77.7	78.0	74.0	73.7	77.8
	63.2	63.7	79.7	58.7	71.7	71.3	67.0	68.7
	68.8	51.0	59.7	55.7	47.0	51.3	57.3	53.7
	74.2	42.3	47.3	47.7	42.3	47.3	51.7	46.4
	78.5	47.0	41.0	40.3	42.7	41.0	45.0	42.8
	MEAN	56.9	62.1	56.0	56.3	57.0	58.9	57.9
3	57.7	96.0	92.7	88.7	88.0	88.7	87.3	90.2
	63.2	86.3	86.0	92.3	82.3	85.3	86.3	84.8
	68.8	75.7	74.3	73.0	66.3	70.3	72.7	72.1
	74.2	70.7	67.3	76.7	71.3	71.7	66.7	70.6
	78.5	69.3	60.7	59.3	69.0	68.7	67.3	65.7
	MEAN	79.6	76.2	76.0	75.2	76.9	76.1	76.7
MEAN	57.7	83.0	80.4	75.1	72.2	70.9	70.9	75.4
	63.2	65.1	67.7	59.7	64.9	64.0	63.1	64.1
	68.8	53.9	55.1	52.3	46.4	51.1	52.6	51.9
	74.2	43.8	44.2	48.2	46.3	46.9	47.7	46.2
	78.5	44.7	41.8	39.6	43.7	46.0	47.7	43.9
	MEAN	58.1	57.8	55.0	54.7	55.8	56.4	56.3

Table 3.2.35

Germination experiment, 1972. Vigour percentage (7/14 day) of S23 samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
	57.7	77.1	70.5	82.1	83.1	83.9	77.2	78.9
	63.2	64.2	66.8	77.8	66.8	63.1	59.4	66.4
1	68.8	70.5	69.6	63.9	79.7	52.3	63.5	66.6
	74.2	69.2	53.3	41.9	69.9	35.8	38.8	51.5
	78.5	39.9	61.2	70.5	61.6	54.7	22.4	51.7
	MEAN	64.2	64.3	67.2	72.2	58.0	52.3	63.0
	57.7	77.2	73.6	78.8	68.0	67.5	66.9	72.0
	63.2	56.0	76.3	75.9	73.2	77.2	74.3	72.2
2	68.8	87.5	74.6	73.4	79.2	70.3	69.2	75.7
	74.2	93.7	83.0	76.8	79.3	76.7	69.7	78.4
	78.5	47.4	49.3	74.4	74.5	42.4	45.3	55.6
	MEAN	72.4	71.4	75.9	74.8	66.8	63.5	70.8
	57.7	91.4	88.9	93.2	84.5	79.5	75.8	85.5
	63.2	90.2	91.0	89.0	87.3	82.4	64.2	84.0
3	68.8	91.6	92.8	88.1	76.1	63.6	49.9	77.0
	74.2	97.0	95.5	75.3	66.6	64.4	69.2	78.0
	78.5	86.2	84.5	75.6	65.7	56.5	51.7	70.8
	MEAN	91.3	90.6	84.2	76.0	69.3	62.2	78.9
	57.7	81.9	77.7	84.7	78.5	76.9	73.3	78.8
	63.2	70.1	78.1	80.9	75.8	74.2	66.1	74.2
MEAN	68.8	83.2	79.0	75.1	78.3	62.0	60.8	73.1
	74.2	86.6	77.3	64.7	71.9	59.0	56.2	69.3
	78.5	57.8	65.0	73.5	67.3	51.2	40.0	59.1
	MEAN	75.9	75.4	75.8	74.4	64.7	59.3	70.9

Table 3.2.36

Germination experiment, 1972. Vigour percentage (7/21 day) of S23 samples.
(Each treatment value = mean of 3 replicates)

MOISTURE LEVEL	TEMP C	EXPOSURE TIME, H 0.25	0.5	1.0	2.0	4.0	10.0	MEAN
	57.7	75.6	68.7	81.7	80.4	82.1	76.1	77.4
	63.2	64.2	66.8	74.4	61.8	62.0	56.4	64.3
1	68.8	69.1	68.2	61.9	77.6	49.7	63.5	65.0
	74.2	63.1	52.8	39.8	69.9	31.5	37.4	49.1
	78.5	35.4	51.0	65.5	51.6	52.1	20.6	46.0
	MEAN	61.5	61.5	64.7	68.3	55.5	50.8	60.4
	57.7	74.9	73.1	76.6	65.7	66.6	64.8	70.7
	63.2	51.4	75.7	73.4	69.5	73.3	70.2	69.1
2	68.8	87.5	74.3	72.5	79.2	70.3	69.2	75.5
	74.2	92.1	82.0	75.6	78.7	76.2	58.9	77.2
	78.5	46.4	48.5	73.9	74.5	41.8	45.4	55.1
	MEAN	70.5	70.7	74.4	73.5	65.7	61.8	69.4
	57.7	91.4	88.6	92.8	84.5	78.5	75.6	85.2
	63.2	89.5	90.3	87.6	87.0	82.0	63.5	83.3
3	68.8	90.8	92.4	87.7	75.7	62.8	49.4	76.5
	74.2	93.0	95.5	74.8	65.4	62.9	68.6	76.7
	78.5	84.6	81.7	74.3	63.9	55.5	49.9	68.3
	MEAN	89.8	89.7	83.4	75.3	68.4	61.4	78.0
	57.7	80.6	76.8	83.7	76.9	75.7	72.2	77.6
	63.2	68.4	77.6	78.5	72.8	72.6	63.1	72.2
MEAN	68.8	82.5	73.3	74.1	77.5	60.9	60.7	72.3
	74.2	82.7	76.8	63.4	71.3	56.9	55.0	67.7
	78.5	55.5	60.4	71.3	63.3	49.8	38.6	56.5
	MEAN	73.9	74.9	74.2	72.4	63.2	58.0	69.3

Table 3.2.37

Germination experiments, 1972. Standard deviations of replicate 14 day counts for Sabel and S.23

Crop	Run No.	Initial m.c. % d.b.	Temp °C	Exposure time, h					
				0.25	0.5	1	2	4	10
Sabel	1	80.0	57.7	7.64	5.29	7.00	2.00	7.55	5.29
			63.2	5.03	11.02	7.09	4.58	3.46	6.66
			68.8	6.56	2.08	3.21	3.06	2.31	2.65
			74.2	1.15	7.02	5.51	4.04	3.79	2.31
			78.5	5.51	1.73	2.52	4.58	3.06	4.62
	2	64.2	57.7	0.58	5.86	3.46	2.08	3.06	1.73
			63.2	3.21	6.66	2.08	8.74	2.89	5.51
			68.8	2.08	1.00	5.29	2.52	5.51	4.93
			74.2	3.00	8.50	4.16	2.31	7.55	8.19
			78.5	5.51	6.93	2.08	6.08	2.08	5.03
	3	46.6	57.7	0.58	4.04	2.65	4.16	2.08	4.16
			63.2	2.65	4.58	5.29	7.37	4.51	4.16
			68.8	4.36	4.58	1.15	6.08	4.16	6.66
			74.2	7.02	8.02	2.52	3.79	2.08	3.79
			78.5	1.73	3.06	3.21	4.73	5.51	1.53
	4	71.5	57.7	1.53	7.94	4.73	2.00	7.21	3.61
			63.2	4.73	1.53	2.31	5.51	4.62	6.24
			68.8	4.16	7.23	2.31	2.08	6.56	1.15
			74.2	3.79	5.51	3.21	5.51	6.56	5.86
			78.5	5.20	4.58	5.03	3.06	6.24	0.58
S.23	5	53.4	57.7	8.19	3.79	2.08	1.53	5.29	2.52
			63.2	7.77	7.81	6.43	11.72	8.14	11.02
			68.8	4.00	0.58	5.00	3.61	5.13	5.69
			74.2	8.50	8.50	4.36	8.54	2.65	2.31
			78.5	7.00	6.66	6.00	3.21	3.79	4.04
	6	36.1	57.7	2.65	6.03	1.15	2.65	1.15	10.82
			63.2	4.04	1.53	4.58	4.36	2.65	6.33
			68.8	2.65	5.57	2.52	7.00	4.93	2.65
			74.2	4.04	3.21	4.36	2.65	2.65	5.57
			78.5	6.08	7.64	4.93	4.00	3.06	2.65

3.2.1 Analysis of results from 1972 Germination Experiment

The experiment was of split-plot design in which the three moisture levels for each variety represented the blocks. Strictly speaking all interactive effects with moisture should have been assigned to error. However, it was known that experimental error due to moisture levels was small in comparison with that due to the germination testing and that moisture differences were most probably real effects. That this was true was also shown by a parallel-curve analysis details of which are given after the details of the analyses of variance.

In the analyses of variance the germination results have been transformed to angles and the examination of treatment effects is based on their angular means. For any significant treatment effect the differences between means were examined by the Studentised range test. In this the means are ranked in descending order and them differences between/tabulated according to the range of the ranking across which they are being compared. To obtain the least significant difference at each range the standard error of the mean is multiplied by the appropriate value of y, the percentage value of the Studentised range. The standard error of the mean is defined

$$\text{S.E.M.} = \sqrt{\frac{\text{Error variance}}{\text{No. of observations forming each mean}}}$$

but for comparison of interaction effect in split-plot experiments where interacting factors have different error variances the calculation of S.E.M. is slightly more complicated.

For a 2 factor interaction of a main effect related to Error 1 and a split-plot effect related to Error 2, the S.E.M. for comparing the split-plot effect at any single level of the main effect is defined as above. But for comparing the main effect at any level of the split-plot effect, the error associated with main effect must be weighted by the split-plot error.

$$\text{S.E.M.} = \sqrt{\frac{\text{Error 1} + (y - 1)\ \text{Error 2}}{N}}$$

where y = no of levels of split-plot effect

N = no of observations in each main effect mean

(not the interaction mean)

and the degrees of freedom for y are calculated from

$$\text{d.f.} = (\text{Error 1} + (y - 1)\ \text{Error 2})^2 \Big/ \left(\frac{\text{Error 1}}{\text{d.f.}_1}\right)^2 + \frac{(y-1)\ \text{Error 2})^2}{\text{d.f.}_2}$$

In testing the Moisture x Temperature x Exposure interaction only the effect of exposure at any moisture x temperature level was examined so that a weighted S.E.M. was not required.

3.2.1.1 Analysis of Variance of Germination Results for Sabel

14 day counts - Analysed after Angular Transformations

Source of variation	d.f.	M.S.	F
Moisture (M)	2	10067.91	978.56***
Temperature (T)	4	9432.88	81.84***
M x T (error a)	8	115.26	6.20***
Exposure (E)	5	88.85	2.51*
M x E	10	35.34	1.90 NS
T x E	20	38.61	2.08*
M x T x E (error b)	40	18.60	1.808**
Residual	180	10.29	
	269		

Comparisons of means of significant effects

1. Temperature

$$S.E.M. = \sqrt{\frac{115.26}{54}} = \sqrt{2.13444} = 1.46 \quad d.f. = 8$$

Range of comparison

	2	3	4	5
L.S.D. (5%)	4.76	5.90	6.60	7.40

Values		Differences							
T1	60.81 (a)	a-b	8.64*	a-c	22.64*	a-d	27.4*	a-e	31.31*
T2	52.17 (b)	b-c	14.00*	b-d	18.77*	b-e	27.67*		
T3	38.17 (c)	c-d	4.77	c-e	8.67				
T4	33.40 (d)	d-e	3.90						
T5	29.50 (e)								

2. Moisture x Temperature Interaction

Comparing temperature effect at any moisture level.

$$S.E.M. = \sqrt{18.6 \times \frac{3 \times 5}{270}} = \sqrt{\frac{18.6}{18}} = \sqrt{1.0333} = 1.0165 \quad d.f. = 40$$

Range of comparison

	2	3	4	5
L.S.D. (5%)	2.91	3.50	3.85	4.11

Comparing moisture effect at any temperature

$$S.E.M. = \sqrt{\frac{115.26 + 4 \times 18.6}{90}} = \sqrt{2.107} = 1.452 \quad d.f. = 20$$

Range of comparison

	2	3
L.S.D. (5%)	4.28	5.20

Values

	T1	T2	T3	T4	T5
M1	53.15	42.77	26.49	22.72	19.32
M2	61.91	51.50	36.43	31.38	26.73
M3	67.36	62.22	51.57	46.12	42.44

M1 52.15(a) 42.77(b) 26.49(c) 22.72(d) 19.32(e)

a-b	10.38*	a-c	26.66*	a-d	30.43*	a-e	33.83*
b-c	16.28*	b-d	20.05*	b-e	23.45		
c-d	3.77*	c-e	7.17				
d-e	3.40						

M2 61.91(a) 51.50(b) 36.43(c) 31.38(d) 26.73(e)

a-b	10.41*	a-c	25.48*	a-d	30.53*	a-e	35.18*
b-c	15.07*	b-d	20.12*	b-e	24.77		
c-d	5.05*	c-e	9.70				
d-e	4.65						

M3 67.36(a) 62.22(b) 51.57(c) 46.12(d) 42.44(e)

a-b	5.14*	a-c	15.79*	a-d	21.24*	a-e	24.92*
b-c	10.65*	b-d	16.10*	b-e	19.78		
c-d	5.45*	c-e	9.13				
d-e	3.68						

T1 67.36(a) 61.91(b) 53.15(c)

a-b	5.45*	a-c	14.21*
b-c	8.76		

T2

a-b	10.72*	a-c	19.45*
b-c	8.73		

T3

a-b	15.14*	a-c	25.08*
b-c	9.94		

T4

a-b	14.74*	a-c	23.40
b-c	8.66		

T5

a-b	15.71*	a-c	23.12*
b-c	7.41		

3. Exposure

$$S.E.M. = \sqrt{\frac{18.60}{45}} = 0.6429 \qquad d.f. = 40$$

Range of comparisons

	2	3	4	5	6
L.S.D. (5%)	1.839	2.212	2.437	2.497	2.719

Values

E1	E2	E3	E4	E5	E6
45.06 (a)	43.17 (c)	42.70 (d)	43.28(b)	41.27(f)	41.37(e)

a-b	1.78	a-c	1.78	a-d	2.36	a-e	3.69*	a-f	3.79*
b-c	0.11	b-d	0.58	b-e	1.91	b-f	2.01		
c-a	0.47	c-e	1.80	c-f	1.90				
d-c	1.33	d-f	1.43						
e-f	0.10								

4. Temperature x Exposure

For comparing exposure effect at any temperature level.

$$S.E.M. = \sqrt{\frac{18.60}{} \times \frac{5 \times 6}{270}} = \sqrt{\frac{18.60}{9}} = \sqrt{2.0666} = 1.437 \qquad d.f. = 40$$

Range of comparison

	2	3	4	5	6
L.S.D. (5%)	4.11	4.94	5.45	5.81	6.08

For comparing temperature effect at any exposure level.

$$S.E.M. = \sqrt{\frac{115.26 + 5 \times 18.6}{54}} = \sqrt{3.949} = 1.987 \qquad d.f. = 23$$

Range of comparison

	2	3	4	5
L.S.D. (5%)	5.80	7.01	7.75	8.29

Values

	E1	E2	E3	E4	E5	E6
T1	64.51	63.38	62.02	59.82	56.99	58.12
T2	58.26	52.77	50.58	54.39	48.06	48.93
T3	39.16	37.43	39.77	37.03	38.54	37.06
T4	34.52	33.67	32.03	33.64	34.14	32.43
T5	28.85	28.61	29.10	31.52	28.61	30.28

5. Moisture x Temperature x Exposure

$$S.E.M. = \sqrt{\frac{10.29}{3}} = \sqrt{3.430} = 1.852 \qquad d.f. = 180$$

Range of comparison

	2	3	4	5	6
L.S.D.(5%)	5.17	6.19	6.78	7.22	7.56

Values

		E1	E2	E3	E4	E5	E6
M1	T1	59.72	60.08	52.00	47.87	49.64	49.62
	T2	49.81	44.61	38.21	51.37	37.45	35.19
	T3	27.08	28.19	27.70	22.45	27.02	26.53
	T4	25.34	23.78	18.62	24.76	22.41	21.37
	T5	17.13	21.95	20.79	20.05	17.63	18.40
M2	T1	64.65	64.07	61.39	63.69	57.65	60.01
	T2	58.50	51.60	49.99	50.04	47.11	51.78
	T3	39.62	35.06	35.02	35.46	38.22	35.23
	T4	31.28	30.87	31.69	30.21	33.09	31.12
	T5	29.02	24.87	24.58	29.90	25.33	26.69
M3	T1	69.15	66.00	72.67	67.88	63.69	64.74
	T2	66.47	62.11	63.55	61.75	59.62	59.83
	T3	50.78	49.04	56.58	53.17	50.39	49.43
	T4	46.92	46.35	45.76	45.96	46.91	44.81
	T5	40.39	39.03	41.93	44.62	42.89	45.76

M1

T1 60.08(a) 59.72(b) 52.00(c) 49.64(d) 49.62(e) 47.87(f)

a-b 0.36	a-c 8.08*	a-d 10.44*	a-e 10.46*	a-f 12.21*
b-c 7.72*	b-d 10.08*	b-e 10.10*	b-f 11.85*	
c-d 2.36	c-e 2.38	c-f 4.13		
d-e 0.02	d-f 1.77			
e-f 1.75				

T2 51.37(a) 49.81(b) 44.61(c) 38.21(d) 37.45(e) 35.19(f)

a-b 1.56*	a-c 6.76*	a-d 13.16*	a-e 13.92*	a-f 16.18*
b-c 5.20*	b-d 11.60*	b-e 12.36*	b-f 14.62*	
c-d 6.40	c-e 7.16	c-f 9.42		
d-e 0.76	d-f 3.02			
e-f 2.26				

T3, T4, T5 No significant differences.

M2

T1 No significant differences.

T2 58.50(a) 51.78(b) 51.60(c) 50.04(d) 49.99(e) 47.11(f)

T1 64.51(a) 63.38(b) 62.02(c) 59.82(d) 56.99(f) 58.12(e)

a-b 1.13 a-c 2.49 a-d 4.69 a-e 6.39* a-f 7.52*
b-c 1.36 b-d 3.56 b-e 5.26 b-f 6.39*
c-d 2.20 c-e 3.90 c-f 5.03
d-e 1.70 d-f 2.83
e-f 1.13

T2 58.26(a) 52.77(c) 50.58(d) 54.39(b) 48.06(f) 48.93(e)

a-b 3.87 a-c 5.49* a-d 7.68* a-e 9.33* a-f 10.20*
b-c 1.62 b-d 3.81 b-e 5.46 b-f 6.33
c-d 2.19 c-e 3.84 c-f 4.71
d-e 1.65 d-f 2.52
e-f 0.87

T3 No significant differences

T4 No significant differences

T5 No significant differences

E1 64.51(a) 58.26(b) 39.16(c) 34.52(d) 28.85(e)

a-b 6.25* a-c 25.35* a-d 29.99* a-e 35.66*
b-c 19.10* b-d 23.74* b-e 29.41*
c-d 4.64 c-e 10.31*
d-e 5.67

E2 63.38(a) 52.77(b) 37.43(c) 33.67(d) 28.61(e)

a-b 10.61* a-c 25.95* a-d 29.71* a-e 34.77*
b-c 15.34* b-d 19.10* b-e 24.16*
c-d 3.76 c-e 8.82*
d-e 5.06

E3 62.02(a) 50.58(b) 39.77(c) 32.03(d) 29.10(e)

a-b 11.44* a-c 22.25* a-d 29.99* a-e 32.92*
b-c 10.81* b-d 18.55* b-e 21.48*
c-d 7.74 c-e 10.67*
d-e 2.93

E4 59.82(a) 54.39(b) 37.03(c) 33.64(d) 31.52(e)

a-b 5.43* a-c 22.79* a-d 26.18* a-e 28.30*
b-c 17.36* b-d 20.75* b-e 22.87*
c-d 3.39 c-e 5.51
d-e 2.12

E5 56.97(a) 48.06(b) 38.54(c) 34.14(d) 28.61(e)

a-b 8.93* a-c 18.54* a-d 22.85* a-e 28.38*
b-c 9.52* b-d 13.92* b-e 19.45*
c-d 4.40 c-e 9.93*
d-e 5.53

E6 58.12(a) 48.93(b) 37.06(c) 32.43(d) 30.28(e)

a-b 9.19* a-c 21.06* a-d 25.69* a-e 27.84*
b-c 11.87* b-d 16.50* b-e 18.65*
c-d 4.63 c-e 6.78
d-c 2.15

a-b 6.72* a-c 6.90* a-d 8.46* a-e 8.51* a-f 11.39*
b-c 0.18 b-d 1.74 b-e 1.79 b-f 4.67
c-d 1.56 c-e 1.61 c-f 4.49
d-e 0.05 d-f 2.93
e-f 2.88

T3)
T4) No significant differences.
T5)

M3

T1 72.67(a) 69.15(b) 67.88(c) 66.00(d) 64.74(e) 63.69(f)

a-b 3.52 a-c 4.79 a-d 6.67 a-e 7.93* a-f 8.98*
b-c 1.27 b-d 3.15 b-e 4.41 b-f 5.46
c-d 1.88 c-e 3.14 c-f 4.19
d-e 1.26 d-f 2.31
e-f 1.05

T2)
T3)
T4) No significant differences.
T5)

3.2.1.2 Analysis of Variance of Germination Results for S.23

14 day counts - analysed after Angular Transformation

Source of variation	d.f.	M.s.	F.
Moisture (M)	2	15951.11	1333.21***
Temperature (T)	4	3880.36	100.04***
M x T (error a)	8	38.79	2.087*
Exposure (E)	5	43.91	2.362NS
M x E	10	18.95	1.019NS
T x E	20	47.78	2.570***
M x T x E (error b)	40	18.59	1.554*
Residual	180	11.96	
	269		

Comparisons of means of significant effects

1. Temperature

$$S.E.M. = \sqrt{\frac{38.79}{54}} = \sqrt{0.7183} = 0.8475 \qquad d.f. = 8$$

Range of comparison

	2	3	4	5
L.S.D. (5%)	2.76	3.42	3.84	4.14

Values

T1	60.71(a)	a-b	7.75*	a-c	14.87*	a-d	18.81*	a-e	20.46*
T2	52.94(b)	b-c	7.10*	b-d	11.04*	b-e	12.69*		
T3	45.84(c)	c-d	3.94*	c-e	5.59*				
T4	41.90(d)	d-e	1.65						
T5	40.25(e)								

2. Moisture x Temperature Interaction

Comparing temperature effect at any moisture level

$$S.E.M. = \sqrt{\frac{18.59 \times 3 \times 5}{270}} = \sqrt{\frac{18.59}{18}} = \sqrt{1.0328} = 1.0163 \qquad d.f. = 40$$

Range of comparison

	2	3	4	5
L.S.D. (5%)	2.91	3.50	3.85	4.11

Comparing moisture effect at any temperature

$$S.E.M. = \sqrt{\frac{38.79 + 4 \times 18.59}{90}} = \sqrt{1.2572} = 1.121 \qquad d.f. = 39$$

Range of comparison

	2	3
L.S.D. (5%)	3.21	3.86

Values

	T1	T2	T3	T4	T5
M1	49.21	37.75	32.66	26.73	26.95
M2	60.76	54.44	47.02	42.55	40.57
M3	72.17	66.62	57.84	56.43	53.22

M1 49.21(a) 37.75(b) 32.66(c) 26.95(d) 26.73(e)

a-b	11.46*	a-c	16.55*	a-d	22.26*	a-e	22.48*
b-c	5.09*	b-d	10.80*	b-e	11.02		
c-d	5.71	c-e	5.93				
d-e	0.22						

M2 60.76(a) 54.44(b) 47.02(c) 42.55(d) 40.57(e)

a-b	6.32*	a-c	13.74*	a-d	18.21*	a-e	20.19*
b-c	7.42*	b-d	11.89*	b-c	13.87		
c-d	4.47	c-e	6.45				
d-e	1.98						

M3 72.17(a) 66.62(b) 57.84(c) 56.43(d) 53.22(e)

a-b	5.55*	a-c	14.33*	a-d	15.74*	a-e	18.95*
b-c	8.78	b-d	10.19*	b-e	13.40		
c-d	1.41*	c-e	4.62				
d-e	3.21						

T1 72.17(a) 60.76(b) 49.21(c)

a-b	11.41*	a-c	22.96*
b-c	11.55		

T2 66.62(a) 54.44(b) 37.75(c)

a-b	12.18*	a-c	28.87*
b-c	16.69		

T3 57.84(a) 47.02(b) 32.66(c)

a-b	10.82*	a-c	25.18*
b-c	14.36		

T4 56.43(a) 42.55(b) 26.73(c)

a-b	13.88*	a-c	29.70*
b-c	15.82		

T5 53.22(a) 40.57(b) 26.95(c)

a-b	12.65*	a-c	26.27*
b-c	13.62		

3. Temperature x Exposure

For comparing exposure effect at any temperature level

$$S.E.M. = \sqrt{\frac{18.59}{} \times \frac{5 \times 6}{270}} = \sqrt{\frac{18.59}{9}} = \sqrt{2.0656} = 1.437$$

d.f. = 40

Range of comparison

	2	3	4	5	6
L.S.D. (5%)	4.11	4.94	5.45	5.81	6.08

For comparing temperature effect at any exposure level

$$S.E.M. = \sqrt{\frac{38.79 + 5 \times 18.59}{54}} = \sqrt{\frac{131.74}{54}} = \sqrt{2.4396} = 1.562$$

d.f. = 42.95

Range of comparison

	2	3	4	5
L.S.D. (5%)	4.47	5.37	5.92	6.31

Values

	E1	E2	E3	E4	E5	E6
T1	66.25	64.42	60.09	58.23	57.54	57.74
T2	53.35	56.06	50.06	52.94	53.06	52.15
T3	47.15	47.78	45.96	42.63	45.17	46.34
T4	39.84	40.97	43.42	42.44	41.90	42.85
T5	40.57	38.63	37.91	39.84	41.92	42.61

T1	66.25(a)	64.42(b)	60.09(c)	58.23(d)	57.54(f)	57.74(e)

a-b	1.83	a-c	6.16*	a-d	8.02*	a-c	8.51*	a-f	8.71*
b-c	4.33	b-d	6.19	b-e	6.68	b-f	6.88		
c-d	1.86	c-e	2.35	c-f	2.55				
d-e	0.49	d-f	0.69						
e-f	0.20								

T2 - T5 No significant differences

E1	66.25(a)	53.35(b)	47.15(c)	39.84(e)	40.57(d)

a-b	12.90*	a-c	19.10*	a-d	25.68*	a-e	26.41*			
b-c	6.20*	b-d	12.78*	b-e	13.51					
c-d	6.58	c-e	7.31							
d-e	0.73									

E2	66.42(a)	56.06(b)	47.78(c)	40.97(d)	38.63(e)

a-b	10.36*	a-c	18.64*	a-d	25.45*	a-e	27.79*			
b-c	8.28*	b-d	15.09*	b-e	17.43					
c-d	6.81	c-e	9.15							
d-e	2.34									

E3		60.09(a)		50.06(b)		45.96(c)		43.42(d)	37.91(e)
a-b	10.03*	a-c	14.13*	a-d	16.67*	a-e	22.18*		
b-c	4.10	b-d	6.64*	b-e	12.15				
c-d	2.54*	c-e	8.05						
d-e	5.51								
E4		58.23(a)		52.96(b)		42.63(c)		42.44(d)	39.84(e)
a-b	5.29*	a-c	15.60*	a-d	15.79*	a-e	18.39*		
b-c	10.31	b-d	10.50	b-e	13.10				
c-d	0.19	c-e	2.79						
d-e	2.60								
E5		57.54(a)		53.06(b)		45.17(c)		41.90(d)	41.92(e)
a-b	4.48*	a-c	12.37*	a-d	15.62*	a-e	15.64*		
b-c	7.89	b-d	11.14	b-e	11.16				
c-d	3.25	c-e	3.77						
d-c	0.02								
E6		57.74(a)		52.15(b)		46.34(c)		42.85(d)	42.61(e)
a-b	5.59*	a-c	11.40*	a-d	14.89*	a-e	15.13*		
b-c	5.81	b-d	9.30	b-e	9.54				
c-d	3.49	c-e	3.73						
d-e	0.24								

4. Moisture x Temperature x Exposure

S.E.M. $= \sqrt{\frac{11.96}{3}} = \sqrt{3.987} = 1.997$ d.f. = 180

Range of comparison

	2	3	4	5	6
L.S.D. (5%)	5.55	6.67	7.31	7.79	8.15

Values

		E1	E2	E3	E4	E5	E6
	T1	57.63	53.20	50.01	44.43	44.42	45.57
	T2	42.31	37.66	37.06	37.83	36.04	35.62
M1	T3	35.85	33.54	31.51	30.21	33.12	31.73
	T4	24.01	24.68	26.27	30.79	25.61	28.99
	T5	23.41	26.47	24.71	23.78	31.20	32.16
	T1	62.27	65.22	60.23	60.45	58.76	57.64
	T2	49.84	63.02	48.86	55.97	55.86	53.08
M2	T3	45.57	50.38	47.88	43.28	45.77	49.23
	T4	40.14	43.07	43.27	40.35	43.28	45.19
	T5	42.69	39.39	39.20	40.78	39.41	41.93
	T1	78.85	74.85	70.04	69.81	69.45	70.01
	T2	67.89	67.50	64.27	65.01	67.26	67.76
M3	T3	60.02	59.43	58.49	54.40	56.63	58.07
	T4	55.37	55.16	60.72	56.18	56.80	54.37
	T5	55.61	50.04	49.82	54.96	55.16	53.74

M1

T1 57.63(a) 53.20(b) 50.01(c) 44.43(e) 44.42(f) 45.57(d)

a-b	4.43	a-c	7.62*	a-d	12.06*	a-e	13.20*	a-f	13.21*		
b-c	3.19	b-d	7.63	b-e	8.77	b-f	8.78				
c-d	4.44	c-e	5.58	c-f	5.59						
d-e	1.14	d-f	1.15								
e-f	0.01										

T2, T3, T4 } No significant differences

T5 23.41(f) 26.47(c) 24.71(d) 23.78(e) 31.20(b) 32.16(a)

a-b	0.96	a-c	5.69	a-d	7.45*	a-e	8.38*	a-f	8.75*		
b-c	4.73	b-d	6.49	b-e	7.42	b-f	7.79				
c-d	1.76	c-e	2.69	c-f	3.06						
d-e	0.93	d-f	1.30								
e-f	0.37										

M2

T1 No significant differences

T2 49.84(e) 63.02(a) 48.86(f) 55.97(b) 55.86(c) 53.08(d)

a-b	7.05*	a-c	7.16*	a-d	9.94*	a-e	13.18*	a-f	14.16*		
b-c	0.11	b-d	2.89	b-e	6.13	b-f	7.11				
c-d	2.78	c-e	6.02	c-f	7.00						
d-e	3.24	d-f	4.22								
e-f	0.98										

T3, T4, T5 } No significant differences

M3

T1 78.85(a) 74.85(b) 70.04(c) 69.81(e) 69.45(f) 70.01(d)

a-b	4.00	a-c	8.81*	a-d	8.84*	a-e	9.04*	a-f	9.40*		
b-c	4.81	b-d	4.84	b-e	5.04	b-f	5.40				
c-d	0.03	c-e	0.23	c-f	0.59						
d-e	0.20	d-f	0.56								
e-f	0.36										

T2, T3, T4, T5 } No significant differences

3.2.1.3 Analysis of variance for 14 day vigour results for Sabel

Source of variation	d.f.	M.S.	F;
Moisture (M)	2	11652.42	130.6 ***
Temperature (T)	4	6609.98	3.201 NS
M x T (error a)	8	2064.72	7.186 ***
Exposure (E)	5	4649.93	16.184 ***
M x E	10	376.20	1.309 NS
T x E	20	627.96	2.186 *
M x T x E (error b)	40	287.32	3.2095 ***
Residual	180/269	89.52	

Comparison of means of significant effects

1. Moisture x Temperature Interaction

Comparing temperature effect at any moisture level.

$$\text{S.E.M.} = \sqrt{287.32 \times \frac{3 \times 5}{270}} = \sqrt{\frac{287.32}{18}} = \sqrt{15.96} = 3.995$$

d.f. = 40

Range of comparison

	2	3	4	5
L.S.D. (5%)	11.43	13.74	15.14	16.14

Comparing moisture effect at any temperature

$$\text{S.E.M.} = \sqrt{\frac{2064.72 + (4 \times 287.32)}{90}} = \sqrt{35.71} = 5.976 \quad \text{d.f.} = 18$$

Range of comparison

	2	3
L.S.D. (5%)	17.75	21.57

Values

	T1	T2	T3	T4	T5
M1	67.0	43.9	49.4	45.2	50.2
M2	85.4	78.5	59.2	73.2	48.2
M3	83.1	80.5	86.0	67.1	45.1
M1	67.0(a)	43.9(e)	49.4(c)	45.2(d)	50.2(b)

a-b	16.8*	a-c	17.6*	a-d	21.8*	a-e	23.1*	
b-c	0.8	b-d	5.0	b-e	6.3			
c-d	4.2	c-e	5.5					
d-e	1.3							

M2 85.4(a) 78.5(b) 59.2(d) 73.2(c) 48.2(e)

a-b	6.9	a-c	12.2*	a-d	26.2*	a-e	37.2*
b-c	5.3*	b-d	19.3*	b-e	30.3		
c-d	14.0*	c-e	25.0				
d-e	11.7						

M3 83.1(b) 80.5(c) 86.0(a) 67.1(d) 45.1(e)

a-b	2.9	a-c	5.5	a-d	18.9*	a-e	40.9*
b-c	2.6	b-d	16.0*	b-e	38.0*		
c-d	13.4*	c-e	35.4*				
d-e	22.0*						

T1 No significant differences

T2 43.9(c) 78.5(b) 80.5(a)

a-b	2.0	a-c	36.6*
b-c	34.6*		

T3 49.4(c) 59.2(b) 86.0(a)

a-b	26.8*	a-c	36.6*
b-c	9.8		

T4 45.2(c) 73.2(a) 67.1(b)

a-b	6.1	a-c	28.0*
b-c	21.9*		

T5 No significant differences

2. Exposure

$$S.E.M. = \sqrt{\frac{287.32}{45}} = \sqrt{6.384} = 2.527 \qquad d.f. = 40$$

Range of comparison

	2	3	4	5	6
L.S.D. (5%)	7.23	8.69	9.58	10.21	10.69

Values

E1	E2	E3	E4	E5	E6
73.94(b)	75.35(a)	65.66(c)	65.61(d)	51.46(f)	52.75(e)

a-b	1.41	a-c	9.69*	a-d	9.74*	a-e	22.6*	a-f	23.89*
b-c	8.28*	b-d	8.33	b-e	21.19*	b-f	22.48*		
c-d	0.05	c-e	12.91*	c-f	14.20*				
d-e	12.86*	d-f	14.15*						
e-f	1.29								

3. Temperature x Exposure

For comparing Exposure effect at any temperature level

$$\text{S.E.M.} = \sqrt{287.32 \times \frac{5 \times 6}{270}} = \sqrt{\frac{287.32}{9}} = \sqrt{31.92} = 5.650 \qquad \text{d.f.} = 40$$

Range of comparison

	2	3	4	5	6
L.S.D.(5%)	16.16	19.44	21.41	22.83	23.90

For comparing Temperature effect at any exposure level

$$\text{S.E.M.} = \sqrt{\frac{2064.72 + (5 \times 287.32)}{54}} = \sqrt{64.839} = 8.052 \qquad \text{d.f.} = 21$$

Range of comparison

	2	3	4	5
L.S.D. (5%)	23.75	28.83	31.89	34.06

Values

	E1	E2	E3	E4	E5	E6
T1	91.42	84.64	81.40	75.34	70.46	67.64
T2	68.28	65.52	62.71	74.43	68.86	65.98
T3	71.80	72.38	68.90	69.18	50.74	56.25
T4	76.91	82.95	60.12	58.48	44.62	47.79
T5	61.27	71,27	55.16	50.60	22.63	26.09

T1 No significant differences between exposures

T2 No significant differences between exposures

T3 No significant differences between exposures

T4 76,91(b) 82.95(a) 60.12(c) 58.48(d) 44.62(f) 47.79(e)

a-b 6.04	a-c 22.83*	a-d 24.47*	a-e 35.16*	a-f 38.33*	
b-c 16.79*	b-d 18.43	b-c 29.12*	b-f 32.29*		
c-d 1.64	c-e 12.33	c-f 15.5			
e-f 10.69	d-f 13.86				

T5 61.27(b) 71.27(a) 55.61(c) 50.60(d) 22.63(f) 26.09(e)

a-b 10.0	a-c 16.11	a-d 20.67	a-e 45.18*	a-f 48.64*	
b-c 6.11	b-d 10.67	b-c 35.18*	b-f 38.64*		
c-d 4.56	c-e 29.07*	c-f 32.53*			
e-f 24.51*	d-f 27.97*				

E1, E2, E3, E4 } No significant differences between temperatures

E5 70.46(a) 68.86(b) 50.74(c) 44.62(d) 22.63(e)

a-b	1.6	a-c	19.72	a-d	25.84	a-e	47.83*
b-c	18.12	b-d	24.24	b-e	46.23*		
c-d	6.12	c-e	28.11				
d-e	21.99						

E6 67.64(a) 65.98(b) 56.25(c) 47.79(d) 26.09(e)

a-b	1.66	a-c	11.39	a-d	19.85	a-e	41.55*
b-c	9.73	b-d	18.19	b-e	39.89*		
c-d	8.46	c-e	30.16*				
d-e	21.7						

4. Moisture x Temperature x Exposure

$$S.E.M. = \sqrt{\frac{89.52}{3}} = \sqrt{29.84} = 5.463 \qquad d.f. = 180$$

Range of comparison

	2	3	4	5	6
L.S.D.(5%)	15.19	18.25	19.94	21.31	22.29

Values

		E1	E2	E3	E4	E5	E6
	T1	91.2	77.7	77.4	63.2	45.6	46.7
	T2	38.0	47.6	39.8	57.9	46.7	38.6
M1	T3	57.0	53.0	46.9	64.0	32.3	43.1
	T4	68.9	76.5	28.1	42.0	15.1	40.3
	T5	61.5	80.6	69.7	50.1	26.7	12.8
	T1	96.7	91.0	84.4	82.3	79.5	78.6
	T2	87.2	83.4	69.7	79.1	73.9	77.7
M2	T3	65.6	72.9	65.1	50.1	45.4	56.2
	T4	85.2	88.5	88.1	68.5	61.7	47.1
	T5	72.5	84.4	36.3	56.4	13.9	25.8
	T1	86.3	85.2	82.4	80.6	86.4	77.6
	T2	79.6	70.6	78.7	86.3	85.9	81.7
M3	T3	92.8	91.2	94.7	93.4	74.5	69.4
	T4	76.6	83.8	64.2	64.9	57.0	56.0
	T5	49.8	48.8	59.5	45.3	27.3	39.7

M1

T1 91.2(a) 77.7(b) 77.4(c) 63.2(d) 45.6(f) 46.7(e)

a-b	13.5	a-c	13.8	a-d	28.0*	a-e	44.5*	a-f	45.6*
b-c	0.3	b-d	14.5	b-e	31.0*	b-f	32.1*		
c-d	14.2	c-e	30.7*	c-f	31.8*				
d-e	16.5*	d-f	17.6						
e-f	1.1								

T2 No significant differences

T3 57.0(b) 53.0(c) 46.9(d) 64.0(a) 32.3(f) 43.1(e)

a-b	7.0	a-c	11.0	a-d	17.1	a-e	20.9	a-f	31.7*
b-c	1.0	b-d	10.1	b-c	13.9	b-f	24.7*		
c-d	6.1	c-e	9.9	c-f	20.7*				
d-e	3.8	d-f	14.6						
e-f	10.8								

T4 68.9(b) 76.5(a) 28.1(e) 42.0(c) 15.1(f) 40.3(d)

a-b	7.6	a-c	34.5*	a-d	36.2*	a-e	48.4*	a-f	61.4*
b-c	26.9*	b-d	28.6*	b-e	40.8*	b-f	53.8*		
c-d	1.7	c-e	13.9	c-f	26.9*				
d-e	12.2	d-f	25.2*						
e-f	13.0								

T5 61.5(c) 80.6(a) 69.7(b) 50.1(d) 26.7(e) 12.8(f)

a-b	10.9	a-c	19.1*	a-d	30.5*	a-e	53.9*	a-f	67.8*
b-c	8.2	b-d	19.6*	b-e	43.0*	b-f	56.9*		
c-d	11.4	c-e	34.8*	c-f	48.7*				
d-e	23.4*	d-f	37.3*						
e-f	13.9								

M2

T1, T2 } No significant differences

T3 65.6(b) 72.9(a) 65.1(c) 50.1(e) 45.4(f) 56.2(d)

a-b	7.3	a-c	7.8	a-d	16.7	a-e	22.8*	a-f	27.5*
b-c	0.5	b-d	9.4	b-e	15.5	b-f	20.2		
c-d	8.9	c-e	15.0	c-f	19.7				
d-e	6.1	d-f	10.8						
e-f	4.7								

T4 85.2(c) 88.5(a) 88.1(b) 68.5(d) 61.7(e) 47.1(f)

a-b	0.4	a-c	3.3	a-d	20.0*	a-e	26.8*	a-f	41.4*
b-c	2.9	b-d	19.6*	b-e	26.4*	b-f	41.0*		
c-d	16.7*	c-e	23.5	c-f	38.1*				
d-e	6.8	d-f	21.4*						
e-f	14.6								

T5 72.5(b) 84.4(a) 36.3(d) 56.4(c) 13.9(f) 25.8(e)

a-b	11.9	a-c	28.0*	a-d	48.1*	a-e	58.6*	a-f	70.5*
b-c	16.1*	b-d	36.2*	b-c	46.7*	b-f	58.6*		
c-d	20.1	c-e	30.6*	c-f	42.5*				
d-e	10.5	d-f	22.4*						
e-f	11.9								

M3

T1, T2 } No significant differences

T3 92.8(c) 91.2(d) 94.7(a) 93.4(b) 74.5(e) 69.4(f)

a-b	1.3	a-c	1.9	a-d	3.5	a-e	20.2	a-f	25.3*
b-c	0.6	b-d	2.2	b-e	18.9	b-f	24.0*		
c-d	1.6	c-e	18.3*	c-f	23.4*				
d-e	16.7*	d-f	21.8*						
c-f	5.1								

T4 76.6(b) 83.8(a) 64.2(d) 64.9(c) 57.0(e) 56.0(f)

a-b	7.2	a-c	18.9*	a-d	19.6	a-e	26.8*	a-f	27.8*
b-c	11.7	b-d	12.4	b-e	19.6	b-f	20.6		
c-d	0.7	c-e	7.9	c-f	8.9				
d-e	7.2	d-f	8.2						
e-f	1.0								

T5 49.8(b) 48.8(c) 59.5(a) 45.3(d) 27.3(f) 39.7(e)

a-b	9.7	a-c	10.7	a-d	14.2	a-e	19.8	a-f	32.2*
b-c	1.0	b-d	4.5	b-e	16.1	b-f	22.5*		
c-d	3.5	c-e	9.1	c-f	21.5*				
d-e	5.6	d-f	18.0						
e-f	12.4								

3.2.1.4 Analysis of Variance for 14 day Vigour results for S.23

Source of variation	d.f.	M.S.	F
Moisture (M)	2	5692.15	76.75
Temperature (T)	4	2966.07	3.796^{NS}
M x T (error a)	8	781.30	4.213***
Exposure (E)	5	2292.51	12.363***
M x E	10	443.21	2.390*
T x E	20	359.84	1.941*
M x T x E (error b)	40	185.43	2.500***
Residual	180	74.16	
	269		

Comparison of means of significant effects

1. Moisture x Temperature Interaction

Comparing temperature effect at any moisture level

$$S.E.M. = \sqrt{\frac{185.43}{18}} = \sqrt{10.30} = 3.209 \qquad d.f. = 40$$

Range of comparison

	2	3	4	5
L.S.D. (5%)	9.18	11.04	12.16	12.96

Comparing moisture effect at any temperature

$$S.E.M. = \sqrt{\frac{781.3 + (4 \times 185.43)}{90}} = \sqrt{16.92} = 4.113 \qquad d.f. = 26$$

Range of comparison

	2	3
L.S.D. (5%)	12.01	14.52

Values

	T1	T2	T3	T4	T5
M1	78.9	66.4	66.6	51.5	51.7
M2	72.0	72.2	75.7	78.4	55.6
M3	85.5	84.0	77.0	78.0	70.0
M1	78.9(a)	66.4(c)	66.6(b)	51.5(e)	51.7(d)

a-b	12.3*	a-c	12.5*	a-d	27.2*	a-c	27.4*
b-c	0.2	b-d	14.9*	b-e	15.1*		
c-d	14.7*	c-e	14.9*				
d-e	0.2						

M2 72.0(d) 72.2(c) 75.7(b) 78.4(a) 55.6(e)

a-b	2.7	a-c	6.2	a-d	6.4	a-e	22.8*
b-c	3.5	b-d	3.7	b-e	20.1*		
c-d	0.2	c-e	16.6*				
d-e	16.4*						

M3 85.5(a) 84.0(b) 77.0(d) 78.0(c) 70.0(e)

a-b	1.5	a-c	7.5	a-d	8.5	a-e	15.5*
b-c	6.0	b-d	7.0	b-e	14.0*		
c-d	1.0	c-e	8.0				
d-e	16.4*						

T1 No significant differences

T2 66.4(c) 72.2(b) 84.0(a)

a-b	11.8	a-c	17.6*
b-c	5.8		

T3 No significant differences

T4 51.5(c) 78.4(b) 78.0(a)

a-b	0.4	a-c	26.9*
b-c	26.5*		

T5 51.7(c) 55.6(b) 70.0(a)

a-b	14.4*	a-c	18.3*
b-c	3.9		

2. Exposure

$$S.E.M. = \sqrt{\frac{185.43}{45}} = \sqrt{4.121} = 2.03 \qquad d.f. = 40$$

Range of comparison

	2	3	4	5	6
L.S.D. (5%)	5.81	6.98	7.69	8.20	8.59

Values

E1	E2	E3	E4	E5	E6
75.93(a)	75.40(c)	75.78(b)	74.36(d)	64.68(e)	59.30(f)

a-b	0.15	a-c	0.53	a-d	1.57	a-e	11.25*	a-f	16.63*
b-c	0.38	b-d	1.42	b-e	11.10*	b-f	16.48*		
c-d	1.04	d-f	10.72*	c-f	16.10*				
c-e	9.60*								

3. Moisture x Exposure

Comparing exposure effect at any moisture level

$$S.E.M. = \sqrt{\frac{185.43 \times 3 \times 6}{270}} = \sqrt{\frac{185.43}{15}} = \sqrt{12.362} = 3.515 \quad d.f. = 40$$

Range of comparison

	2	3	4	5	6
L.S.D. (5%)	10.05	12.09	13.32	14.2	14.87

Comparing moisture effect at any exposure level

$$S.E.M. = \sqrt{\frac{781.30 + (5 \times 185.43)}{90}} = \sqrt{18.98} = 4.356 \quad d.f. = 30$$

Range of comparison

	2	3
L.S.D. (5%)	12.59	15.20

Values

	E1	E2	E3	E4	E5	E6
M1	64.2	64.3	67.2	72.2	58.0	52.3
M2	72.4	71.4	75.9	74.8	66.8	63.5
M3	91.3	90.6	84.2	76.0	69.3	62.2

M1 64.2(d) 64.3(c) 67.2(b) 72.2(a) 58.0(e) 52.3(f)

a-b 5.0	a-c 7.9	a-d 8.0	a-e 14.2*	a-f 19.9*
b-c 2.9	b-d 3.0	b-e 9.2	b-f 14.9*	
c-d 0.1	c-e 6.3	c-f 12.0		
d-e 6.2	d-f 11.9			
e-f 5.7				

M2 No significant differences

M3 91.3(a) 90.6(b) 84.2(c) 76.0(d) 69.3(e) 62.2(f)

a-b 0.7	a-c 7.1	a-d 15.3*	a-e 22.0*	a-f 29.1*
b-c 6.4	b-d 14.6*	b-e 21.3*	b-f 28.4*	
c-d 8.2	c-e 14.9*	c-f 22.0*		
d-e 6.7	d-f 13.8*			
e-f 7.1				

E1 64.2(c) 72.4(b) 91.3(a)

a-b 18.9	a-c 27.1*
b-c 8.2	

E2 64.3(c) 71.4(b) 90.6(a)

a-b 19.2*	a-c 26.3*
b-c 7.1	

E3 67.2(c) 75.9(b) 84.2(a)

a-b 8.3 a-c 17.0*
b-c 8.7

E4 No significant differences

E5 No significant differences

E6 No significant differences

4. Temperature x Exposure

For comparing exposure effect at any temperature level

$$S.E.M. = \sqrt{\frac{185.43}{9}} = \sqrt{20.60} = 4.539 \qquad d.f. = 40$$

Range of comparison

	2	3	4	5	6
L.S.D.(5%)	12.98	15.61	17.20	18.34	19.20

For comparing temperature effect at any exposure level

$$S.E.M. = \sqrt{\frac{781.30 + (5 \times 185.43)}{54}} = \sqrt{31.638} = 5.624 \qquad d.f. = 30$$

Range of comparison

	2	3	4	5
L.S.D. (5%)	16.25	19.63	21.65	23.06

Values

	E1	E2	E3	E4	E5	E6
T1	81.87	77.68	84.69	78.51	76.94	73.29
T2	70.10	78.06	80.91	75.76	74.24	66.14
T3	83.22	79.01	75.15	78.32	62.04	60.84
T4	86.63	77.27	64.66	71.92	58.96	56.24
T5	57.83	64.99	73.50	67.29	51.21	39.97

T1 No significant differences between exposures

T2 No significant differences between exposures

T3 83.22(a) 79.01(b) 75.15(d) 78.32(c) 62.04(e) 60.84(f)

a-b 4.21 a-c 4.90 a-d 8.07 a-e 21.18* a-f 22.38*
b-c 0.69 b-d 3.86 b-e 16.97 b-f 18.17*
c-d 3.17 c-e 16.28* c-f 17.48*
d-e 13.11* d-f 14.31*
e-f 1.2

T4 86.63(a) 77.27(h) 64.66(d) 71.92(c) 58.96(e) 56.24(f)

a-b	9.36	a-c	14.71	a-d	21.97*	a-e	27.67*	a-f	30.39*
b-c	5.35	b-d	12.61	b-e	18.31*	b-f	21.03*		
c-d	7.26	c-e	12.96	c-f	15.68				
d-e	5.70	d-f	8.42						
e-f	2.72								

T5 57.83(d) 64.99(c) 73.50(a) 67.29(b) 51.21(e) 39.97(f)

a-b	6.21	a-c	8.51	a-d	15.67	a-e	22.29*	a-f	33.53*
b-c	2.3	b-d	9.46	b-e	16.08	b-f	27.32*		
c-d	7.16	c-e	13.73	c-f	25.02*				
d-e	6.62	d-f	17.86*						
e-f	11.24								

E1 81.87(c) 70.10(d) 83.22(b) 86.63(a) 57.83(e)

a-b	3.41	a-c	4.76	a-d	16.53	a-e	28.8*		
b-c	1.35	b-d	13.12	b-e	25.39*				
c-d	11.77	c-e	24.04*						
d-e	12.27								

E2 No significant temperature effects

E3 No significant temperature effects

E4 No significant temperature effects

E5 76.94(a) 74.24(b) 62.04(c) 58.96(d) 51.21(e)

a-b	2.7	a-c	14.9	a-d	17.98	a-e	25.73*		
b-c	12.2	b-d	15.28	b-e	23.03*				
c-d	30.8	c-e	10.83						
d-e	7.75								

E6 73.29(a) 66.14(b) 60.84(c) 56.24(d) 39.97(e)

a-b	7.15.	a-c	12.45	a-d	17.05	a-e	33.32*		
b-c	5.3	b-d	9.9	b-e	26.17*				
c-d	4.6	c-e	20.87*						
d-e	16.27*								

5. Moisture x Temperature x Exposure

S.E.M. = $\sqrt{\frac{74.16}{3}}$ = $\sqrt{24.72}$ = 4.972 d.f. = 180

Range of comparison

	2	3	4	5	6
L.S.D. (5%)	13.82	16.61	18.20	19.39	20.29

Values

		E1	E2	E3	E4	E5	E6
	T1	77.1	70.5	82.1	83.1	83.9	77.2
	T2	64.2	66.8	77.8	66.8	63.1	59.4
M1	T3	70.5	69.6	63.9	79.7	52.3	63.5
	T4	69.2	53.3	41.9	69.9	35.8	38.8
	T5	39.9	61.2	70.5	61.6	54.7	22.4
	T1	77.2	73.6	78.8	68.0	67.5	66.9
	T2	56.0	76.3	75.9	73.2	77.2	74.8
M2	T3	87.5	74.6	73.4	79.2	70.3	69.2
	T4	93.7	83.0	76.8	79.3	76.7	60.7
	T5	47.4	49.3	74.4	74.5	42.4	45.8
	T1	91.4	88.9	93.2	84.5	79.5	75.8
	T2	90.2	91.0	89.0	87.3	82.4	64.2
M3	T3	91.6	92.8	88.1	76.1	63.6	49.9
	T4	97.0	95.5	75.3	66.6	64.4	69.2
	T5	86.2	84.5	75.6	65.7	56.5	51.7

M1

T1, T2 } No significant differences

T3 70.5(b) 69.6(c) 63.9(d) 79.7(a) 52.3(f) 63.5(e)

a-b	9.2	a-c	10.1	a-d	15.8	a-e	16.2	a-f	27.4*
b-c	0.9	b-d	6.6	b-e	7.0	b-f	18.2		
c-d	5.7	c-e	6.1	c-f	17.3				
d-e	0.4	d-f	11.6						
e-f	11.2								

T4 69.2(b) 53.3(c) 41.9(d) 69.9(a) 35.8(f) 38.8(e)

a-b	0.7	a-c	16.6*	a-d	28.0*	a-e	31.1*	a-f	34.1*
b-c	15.9	b-d	27.3*	b-e	30.4*	b-f	33.4*		
c-d	11.4	c-e	14.5	c-f	17.5				
d-e	3.1	d-f	6.1						
e-f	3.0								

T5 39.9(e) 61.2(c) 70.5(a) 61.6(b) 54.7(d) 22.4(f)

a-b	8.9	a-c	9.3	a-d	15.8	a-e	30.6*	a-f	48.1*
b-c	0.4	b-d	6.9	b-e	21.7*	b-f	39.2*		
c-d	6.5	c-e	21.3*	c-f	38.8*				
d-e	14.8*	d-f	32.3*						
e-f	17.5*								

M2

T1 No significant differences

T2 56.0(f) 76.3(b) 75.9(c) 73.2(e) 77.2(a) 74.8(d)

a-b	0.9	a-c	1.3	a-d	2.4	a-e	4.0	a-f	21.2*
b-c	0.4	b-d	1.5	b-e	3.1	b-f	20.3*		
c-d	1.1	c-e	2.7	c-f	19.9*				
d-e	1.6	d-f	18.8*						
e-f	17.2*								

T3 No significant differences

T4 93.7(a) 83.0(b) 76.8(d) 79.3(c) 76.7(e) 60.7(f)

a-b	10.7	a-c	14.4	a-d	16.9	a-e	17.0	a-f	33.0*
b-c	3.7	b-d	6.2	b-e	6.3	b-f	22.3*		
c-d	2.5	c-e	2.6	c-f	18.6*				
d-e	0.1	d-f	16.1						
e-f	16.0*								

T5 47.4(d) 49.3(c) 74.4(b) 74.5(a) 43.4(f) 45.8(e)

a-b	0.1	a-c	25.2*	a-d	27.1*	a-e	28.7*	a-f	32.1*
b-c	25.1*	b-d	27.0*	b-e	28.6*	b-f	32.0*		
c-d	1.9	c-e	3.5	c-f	6.9				
d-e	1.6	d-f	5.0						
e-f	3.4								

M3

T1 No significant differences

T2 90.2(b) 91.0(a) 89.0(c) 87.3(d) 82.4(e) 64.2(f)

a-b	0.8	a-c	2.0	a-d	3.7	a-e	8.6	a-f	26.8*
b-c	1.2	b-d	2.9	b-e	7.8	b-f	26.0*		
c-d	1.7	c-e	6.6	c-f	24.8*				
d-e	4.9	d-f	23.1*						
e-f	18.2*								

T3 91.6(b) 92.8(a) 88.1(c) 76.1(d) 63.6(e) 49.9(f)

a-b	1.2	a-c	4.7	a-d	16.7	a-e	29.2*	a-f	42.9*
b-c	3.5	b-d	15.5	b-e	28.0*	b-f	41.7*		
c-d	12.0	c-e	24.5*	c-f	38.2*				
d-e	12.5	d-f	26.2*						
e-f	13.7								

T4 97.0(a) 95.5(b) 75.3(c) 66.6(e) 64.4(f) 69.2(d)

a-b	1.5	a-c	21.7*	a-d	27.8*	a-e	30.4*	a-f	32.6*
b-c	20.2*	b-d	26.3*	b-e	28.9*	b-f	31.1*		
c-d	6.1	c-e	8.7	c-f	10.9				
d-e	2.6	d-f	4.8						
e-f	2.2								

T5 86.2(a) 84.5(b) 75.6(c) 65.7(d) 56.5(e) 51.7(f)

a-b	1.7	a-c	10.6	a-d	20.5*	a-e	29.7*	a-f	34.5*
b-c	8.9	b-d	18.8*	b-e	28.0*	b-f	32.8*		
c-d	9.9	c-e	19.1*	c-f	23.9*				
d-e	9.2	d-f	14.0						
e-f	4.8								

Table 3.2.38

Parallel curve analysis of germination as a straight line function of temperature at 3 moisture levels and for each exposure time. (This analysis was carried out on the percentages - use of angular transformation did not alter the conclusions).

Exposure time h	Source of variance	d.f.	Sabel		S.23	
			M.S.	F	M.S.	F.
¼	Displacement (D)	2	1060.79	19.12***	2188.63	65.87***
	Parallelism (P)	2	72.19	1.30NS	130.35	3.92NS
	Within curves (WC)	9	55.48		33.22	
½	D	2	923.36	17.74***	2240.04	82.33***
	P	2	71.49	1.37NS	26.98	0.99NS
	WC	9	52.06		27.21	
1	D	2	1880.17	55.11***	2349.48	82.88***
	P	2	24.56	0.72NS	32.12	1.13NS
	WC	9	34.12		28.35	
2	D	2	1435.37	16.17**	2371.99	88.09***
	P	2	57.74	0.65NS	35.92	1.33NS
	WC	9	88.75		26.93	
4	D	2	1528.45	99.45***	2427.10	108.01***
	P	2	45.73	2.29NS	27.24	1.21NS
	WC	9	15.37		22.47	
10	D	2	1624.28	42.39***	2238.90	120.12
	P	2	85.28	2.23NS	2.39	0.13
	WC	9	38.32		18.64	

APPENDIX TO SECTION 4

DEEP BED EXPERIMENTS

APPENDIX 4. DEEP BED EXPERIMENTS.

4.1. APPARATUS.

4.1.1. Fan performance and control.

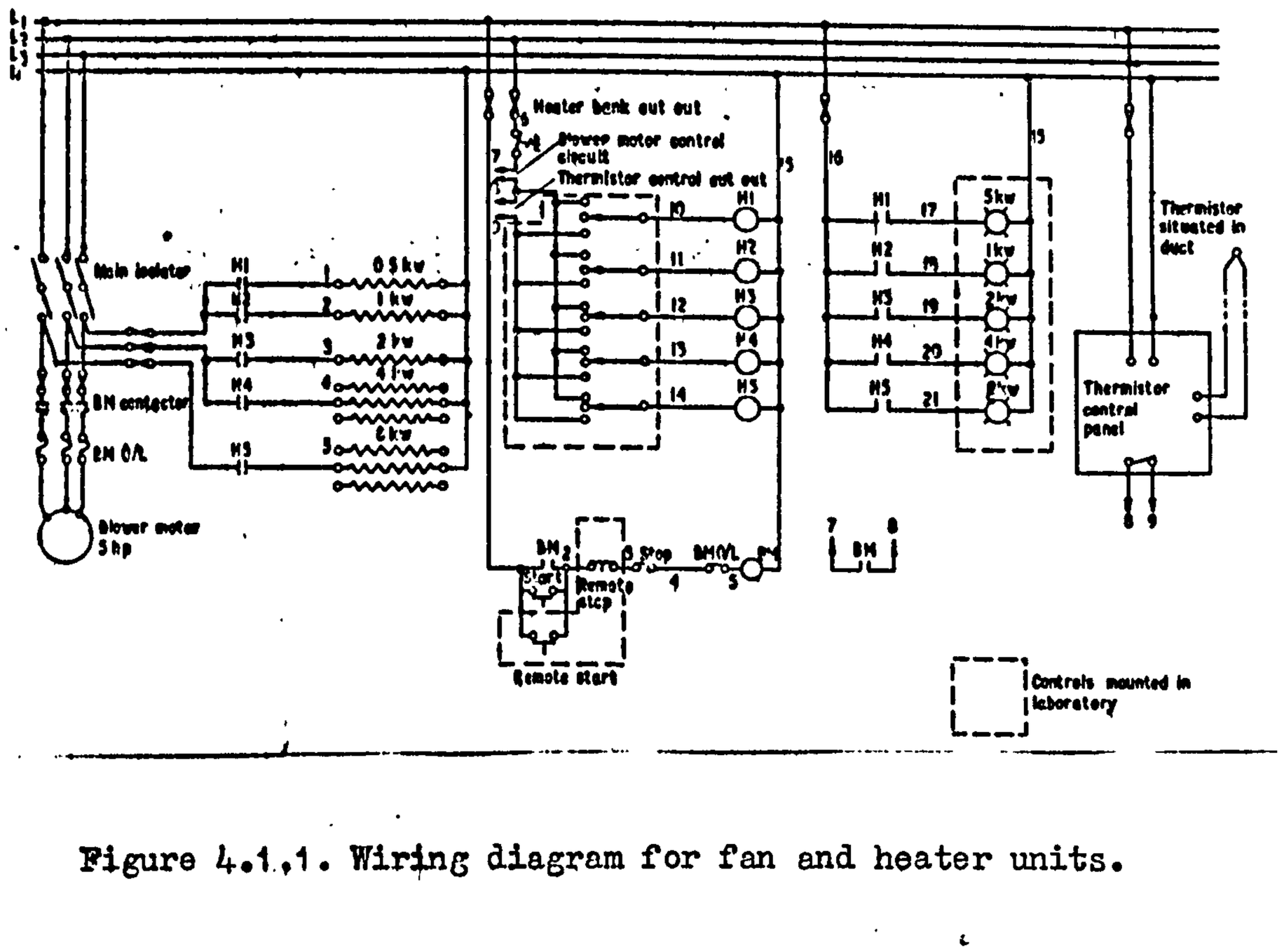


Figure 4.1.1. Wiring diagram for fan and heater units.

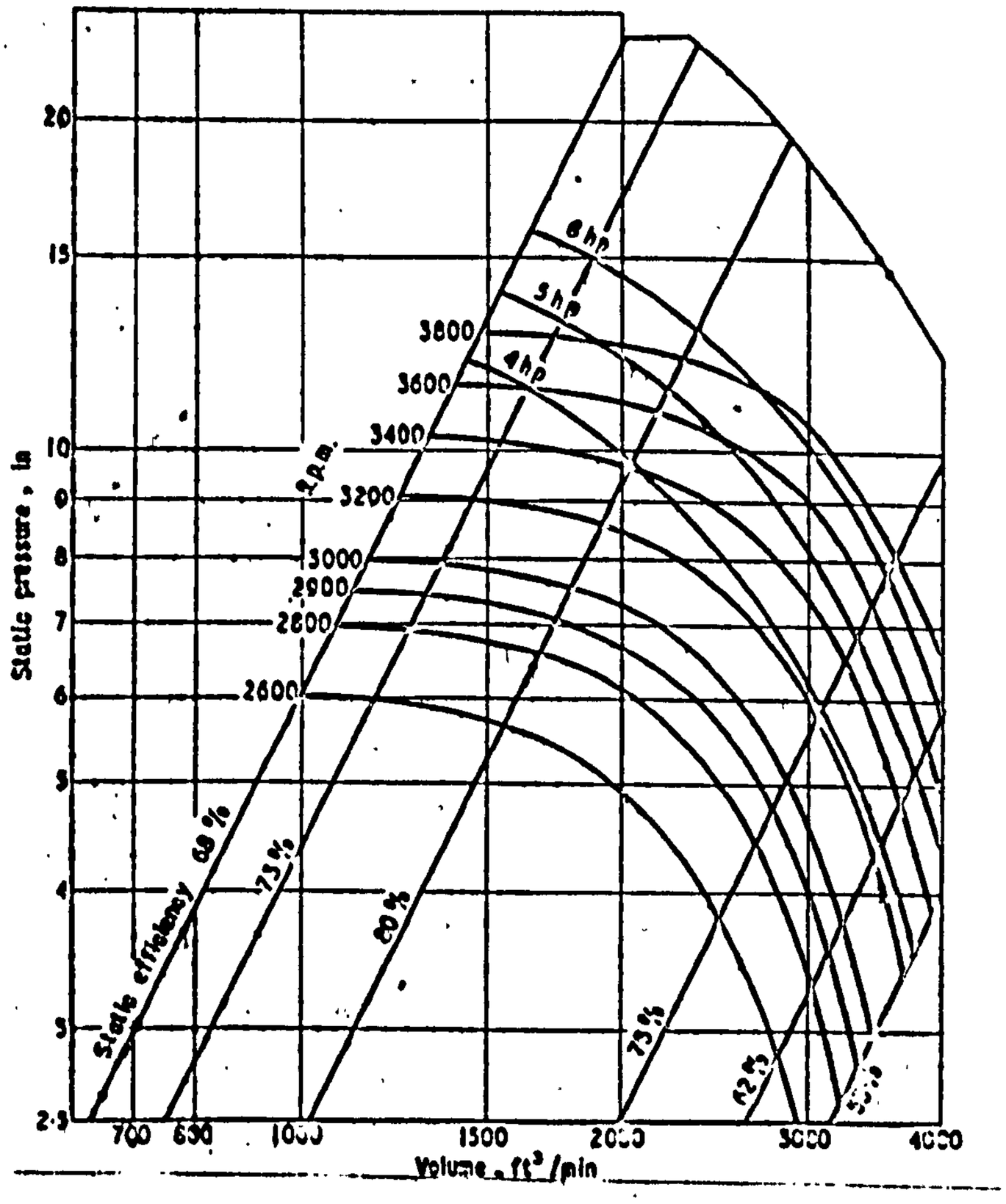


Figure 4.1.2. Fan performance characteristics.

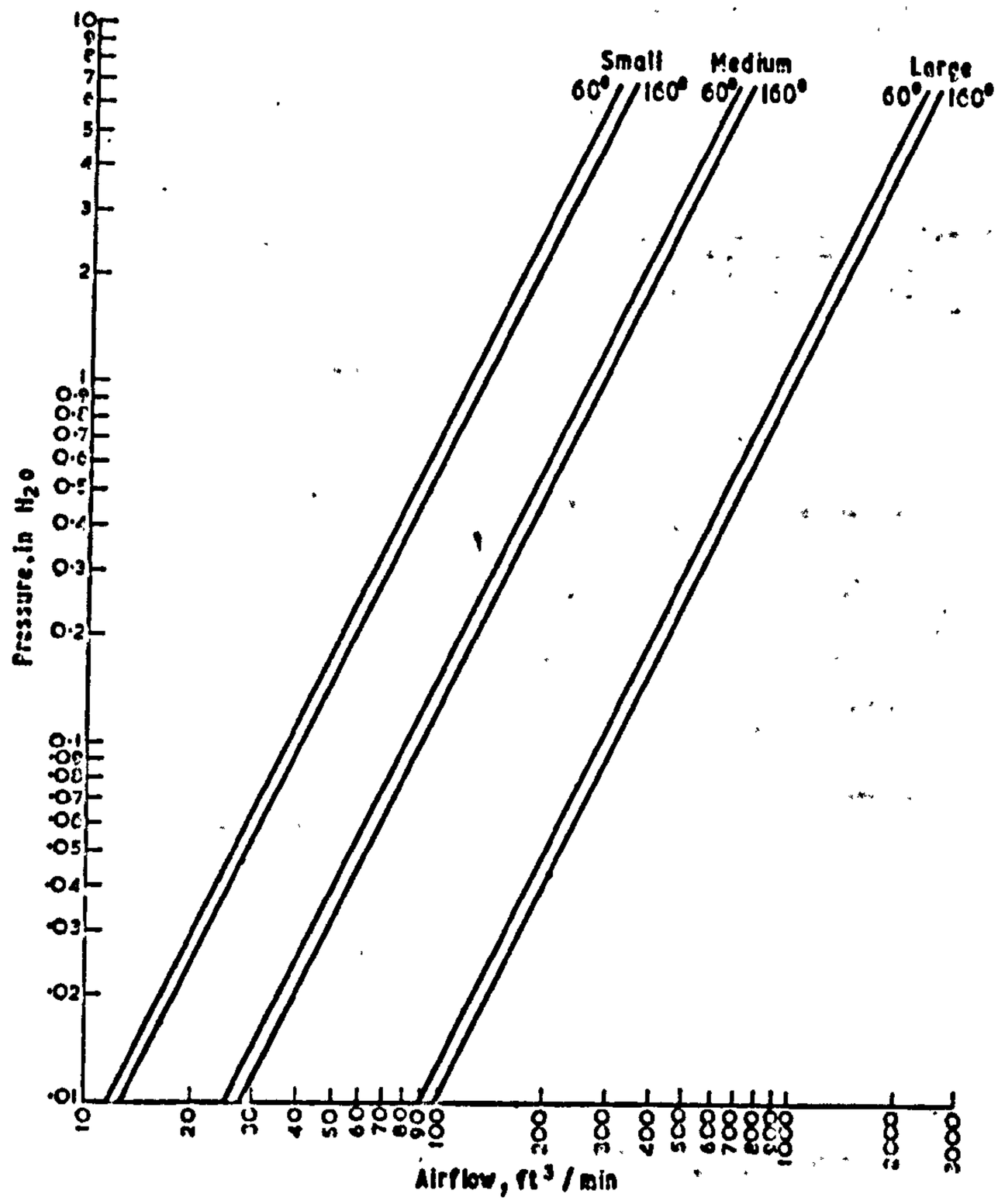


Figure 4.1.3. Airflow as a function of differential pressure for the 3 sizes of orifice plate.

4.1.2. Air velocity and pressure resistance in the radial flow batch drier.

4.1.2.1. The general case.

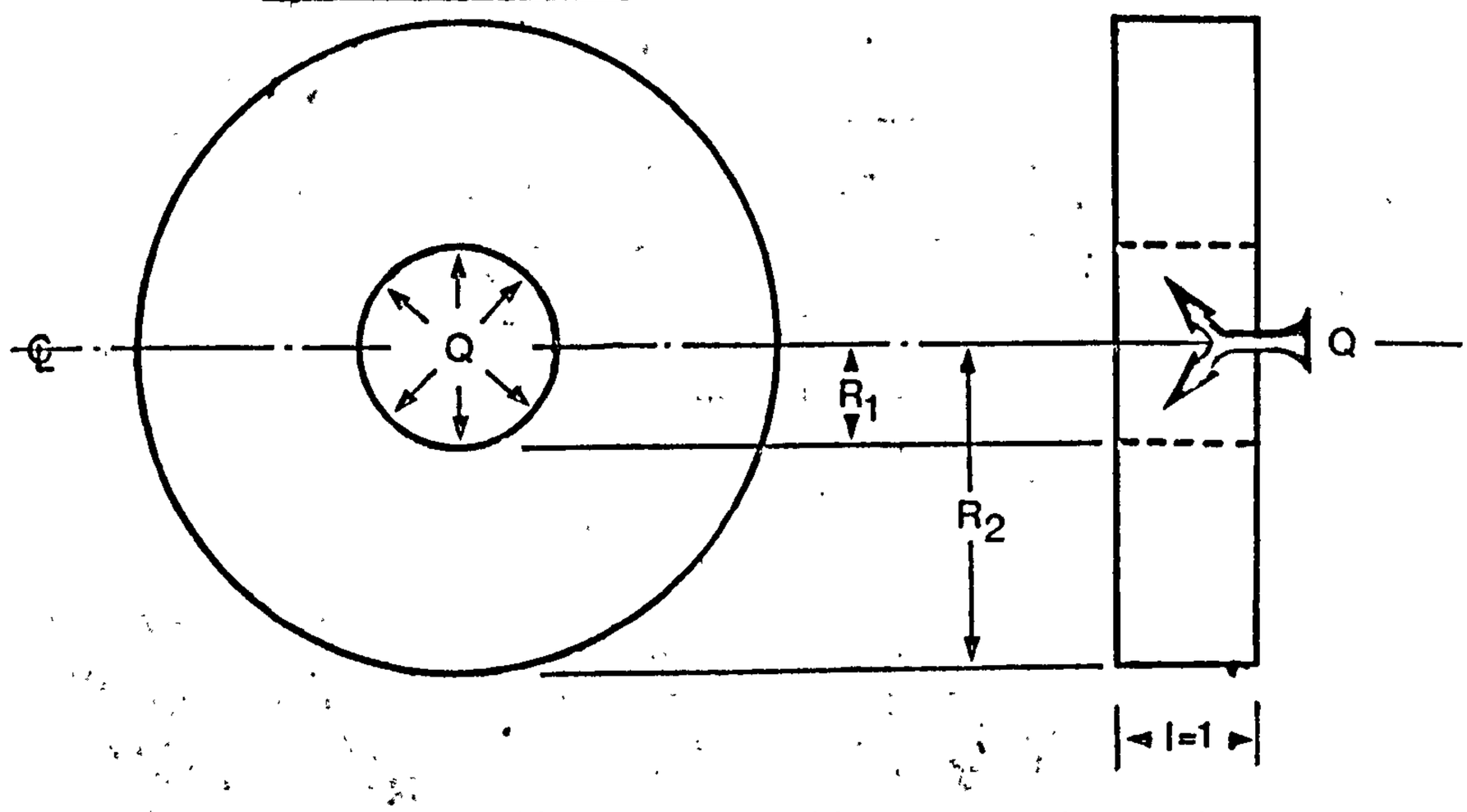


Figure 4.1.4 Schematic cross-section of radial drier.

Consider a cross-section of unit length as shown in

Fig. 4.1.4. with inner and outer radii, R_1 and R2 respectively and ventilated by a volume of air, Q cubic units/ unit length of section and time.

At any radius, R, the linear velocity of the air = $Q/2\pi R$

Hence the velocity occurring at the bin wall = $Q/2\pi R_1$ and at the outer wall = $Q/2\pi R_2$

Also the mean velocity across the annulus from R_1 to R_2

$$\bar{V} = \frac{1}{R_2-R_1}\int_{R_1}^{R_2}\frac{Q}{2\pi R}.\,\delta R \quad = \quad \frac{Q}{2\pi}.\frac{\ln\left(\frac{R_2}{R_1}\right)}{(R_2-R_1)}$$

Let $R_1 = \phi R_2$

Then mean velocity, $\bar{V} = \dfrac{Q\ \ln\left[\frac{1}{\phi}\right]}{2\pi R_2(1-\phi)}$

If bulk density of seed = ρ, then the mass of seed in the annulus $\rho\pi(R_2^2 - R_1^2) = \rho\pi R_2^2(1-\phi^2)$

and ratio of air to seed $= Q/\rho\pi R_2^2(1-\phi^2)$

In parallel flow the pressure drop, P, per unit length for a constant air velocity, V, is given by $P = aV^n$ where a and n are constants and n lies between 1 and 2.

At any point in the radial bed the velocity, $V = Q/2\pi R$

The pressure difference P through an elemental ring δR is given by $\delta P = a\left(\frac{Q}{2\pi R}\right)^n \delta R$

Hence the pressure difference, P_R across the annular distance $R_2 - R_1$ is given by

$$P_R = a\left[\frac{Q}{2\pi}\right]^n \int_{R_1}^{R_2}\left[\frac{1}{R}\right]^n \delta R$$

$$\text{hence} \quad P_R = \frac{a}{1-n}\left[\frac{Q}{2\pi}\right]^n \left[\frac{1}{R_2^{n-1}} - \frac{1}{R_1^{n-1}}\right] \quad = \quad \frac{a}{1-n}\left[\frac{Q}{2\pi}\right]^n \frac{\left[\phi^{n-1}-1\right]}{\left[R_2\phi\right]^{n-1}}$$

In the special case when n=1

$$P_R = a\left[\frac{Q}{2\pi}\right]\ln\left[\frac{1}{\phi}\right]$$

and when n=2

$$P_R = a\left[\frac{Q^2}{4\pi^2}\right]\left[\frac{R_2-R_1}{R_2R_1}\right] = a\left[\frac{Q^2}{4\pi^2}\right]\left[\frac{1-\phi}{R_2\phi}\right]$$

4.1.2.2 <u>The experimental rig.</u>

The experimental rig is based upon one of the sizes offered by Simplex Ltd., and is a 40 degree section of a bin having R_1=1 ft. and R_2=6 ft. 1 in. The length(or depth) of the section, D, is not necessarily unity and must be introduced into the equations just derived.

Hence the area of the bin wall = 0.69813 R_1.D

It follows that,

Velocity at bin wall = $\frac{Q}{D}$. 1.4324

Velocity at bin exterior = $\frac{Q}{D}$. 0.2355

and mean velocity = $\frac{Q}{D}$. 0.5088

The pressure difference through an elemental arc of thickness δR is given by

$$\delta P = a\left[\frac{Q}{0.69813\ D.R}\right]^n \delta R$$

∴ Pressure difference across the annular distance, R_2-R_1 is given by

$$P_R = a\left[\frac{Q}{0.69813\ D}\right]^n \int_{R_1}^{R_2}\left[\frac{1}{R}\right]^n \delta R$$

$$= \frac{a}{1-n}\left[\frac{Q}{0.69813\ D}\right]^n \frac{(\phi^{n-1}-1)}{(R_2\phi)^{n-1}}$$

$$= \frac{a}{1-n}\left[\frac{Q}{0.69813\ D}\right]^{n} \quad (0.1644^{n-1} - 1)$$

Values of the constants a and n can be determined by linear regression of ln P upon ln(Q/0.69813.D).

$$\ln P = \ln\left[\frac{a}{1-n}\,0.1644^{n-1} - 1\right] + n \ln\left[\frac{Q}{0.69813\ D}\right]$$

APPENDIX 4.1.3 Data processing

4.1.3.1 Programs DEEP and RDEEP for processing data read from Honeywell Brown recorder charts

The Honeywell Brown recorder is a multi-point instrument in which each point is scanned and printed separately at intervals of 0.01h in cycles of (0.01 * n) h where n = the number of points scanned. n = 24 and 20 for the parallel- and radial flow tests respectively so that the longest complete cycle was only 0.24 h. For runs lasting many hours this produced more information per run than it was reasonable or necessary to read and process. Sets of observations were therefore read off the charts at pre-determined intervals. The intervals could be varied within each run so that, for example, more detail was read during the rapidly changing initial part of the run than later when the temperature profile had more or less stabilised. Since each point was printed serially each thermocouple location had a staggered time start. In particular, only 19 of the 24 points were used in the parallel- flow tests and these were not consecutive points. All such stagger is taken account of by the programme and each temperature array is output with its own time array.

The temperature readings were read in on DSET8 and information on the number of sets of observations and intervals between observations was read from DSET5. Tables with appropriate headings were output to DSET6 (130 byte) and the data values only to DSET29 (80 byte). Because of lack of space it was necessary to tabulate inlet conditions separately from the temperatures within the bed and these also had to be tabulated in two halves. A simplified flow diagram is given in Fig. 4.15 .

Variable list

TEMP (2,19,150)	Array of temperatures and times (Note in RDEEP the 2nd dimension is increased to 20).
A (19)	Transient temperature array
IN (4/50)	Array of inlet conditions
SUM (4)	$\sum x$ array
SSQ (4)	$\sum x^2$ array
AV (4)	$\bar{x}$ array
SD (4)	σ array
SATPRE	Function statement to calculate saturated vapour pressure - equation of Brooker (21)
PREVAP	Function statement to calculate vapour pressure - equation of Brooker (21)
N	Total number of sets of observations
NA, NB	Integar parameters of read loops allowing observation interval to be changed.
TD	Dry bulb temperature
TW	Wet bulb temperature
AMB	Mean ambient temperature
SUMT	Sum of ambient temperatures

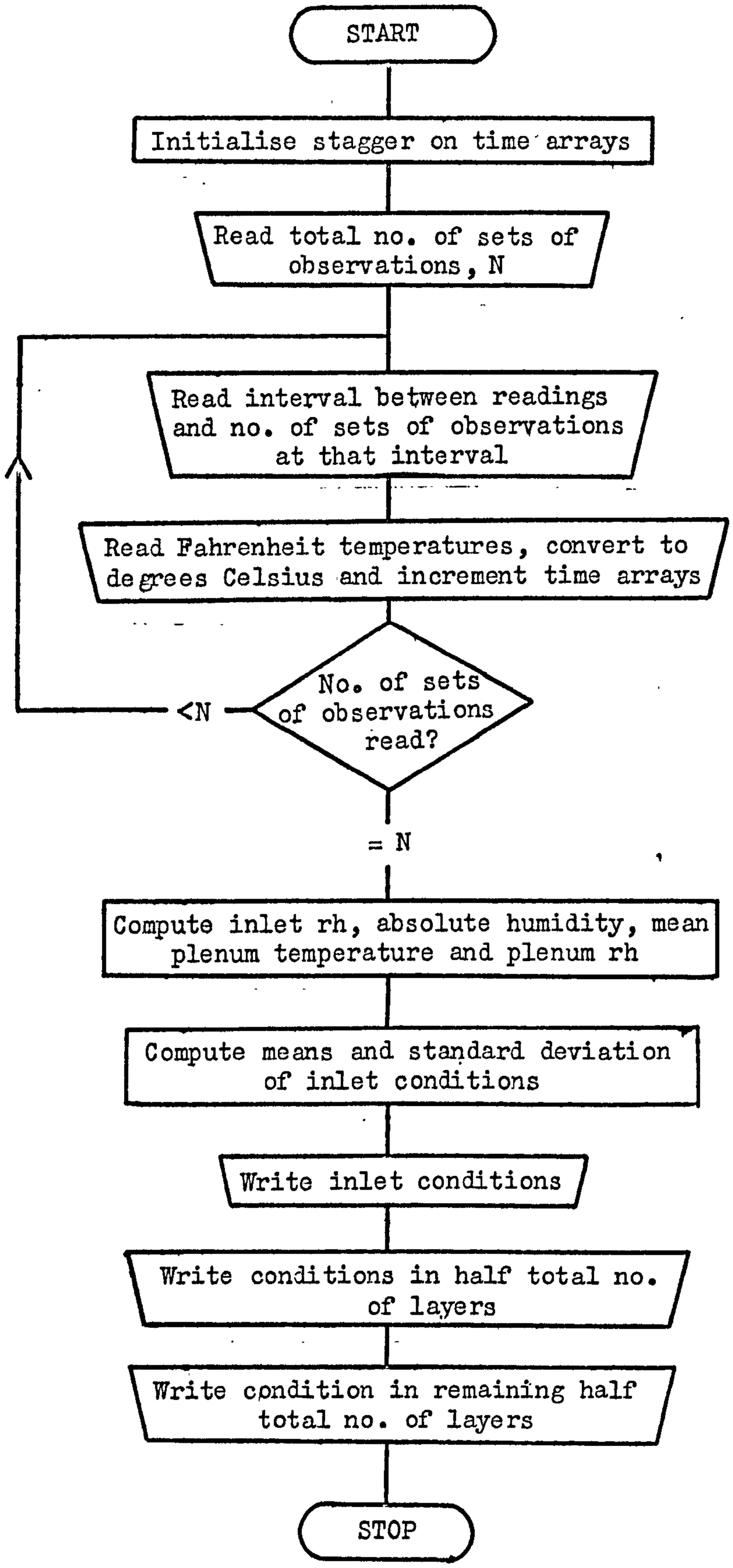


Fig. 4.15 Simplified flow diagram for programmes DEEP and RDEEP

```
C       PROGRAMME TO READ DEEP-BIN DRIER TAPES
C       FILE INPUT  DSET5  DSET8
C       FILE OUTPUT DSET6  DSET29(80BYTES)
C
        REAL TEMP(2,19,150),A(19),IN(4,150),SUM(4)
        REAL SSQ(4),AV(4),SD(4)
        SATPRE(X)=EXP(54.6329-6834.27/(X+273)
       1-5.16923*ALOG(1.8*(X+273)))
        PREVAP(TD,TW)=SATPRE(TW)+(0.6961*(SATPRE(TW)-14.6996)
       1*(TD-TW))/(1075.89-1.0257*TW)
C       INITIALISE TIMES
        DO 1 J=1,15
 1      TEMP(1,J,1)=0.01*(J-1)
        DO 2 J=16,19
 2      TEMP(1,J,1)=0.19+0.01*J
        SUMT=0.0
        DO 28 J=1,4
        SUM(J)=0.0
 28     SSQ(J)=0.0
C
C       READ TOTAL NO OF OBSERVATIONS,INTERVAL BETWEEN
C       READINGS AND NO OF OBSERVATIONS AT THAT INTERVAL
C
        READ(5,3) N
 3      FORMAT(G0.0)
        NA=0
 7      READ(5,4) INT,NO
 4      FORMAT(2G0.0)
        NB=NA+NO
        NA=NA+1
C
C       READ DATA,CONVERT TO DEGREES CELSIUS AND COMPUTE TIME
C
        DO 5 I=NA,NB
        READ(8,6) A
 6      FORMAT(10G0.0/9G0.0)
        DO 5 J=1,19
        IF(I.EQ.1) GO TO 5
        TEMP(1,J,I)=TEMP(1,J,I-1) + 0.24*INT
 5      TEMP(2,J,I)=(A(J)-320.0)/18.0
C
        NA=NB
        IF(NB.LT.N) GO TO 7
C
C       COMPUTE INLET CONDITIONS
C
        DO 8 I=1,N
        TD=TEMP(2,18,I)
        TW=TEMP(2,19,I)
        VAPRES=PREVAP(TD,TW)
        IN(1,I)=(VAPRES*100.0)/SATPRE(TD)
        IN(2,I)=0.622*(VAPRES/(14.6996-VAPRES))
        IN(3,I)=0.5*(TEMP(2,16,I)+TEMP(2,17,I))
        IN(4,I)=(VAPRES*100.0)/SATPRE(IN(3,I))
C
        SUMT=SUMT+TD
        DO 8 J=1,4
        SUM(J)=SUM(J)+IN(J,I)
 8      SSQ(J)=SSQ(J)+(IN(J,I)**2)
C
```

```
451
      AMB=SUMT/N
      DO 9 J=1,4
      AV(J)=SUM(J)/N
      SD(J)=SSQ(J)-((SUM(J)**2)/N)
 9    SD(J)=SQRT(SD(J)/(N-1))
C     WRITE INLET CONDITIONS
      I=0
 14   WRITE(6,26)
      DO 13 J=1,32
      I=I+1
      WRITE(6,10) TEMP(1,18,I),TEMP(2,18,I),(IN(K,I),K=1,4)
      WRITE(29,11)TEMP(1,18,I),IN(3,I),IN(2,I)
      IF(I.EQ.N) GO TO 12
 13   CONTINUE
      GO TO 14
 12   WRITE(6,15)AMB,AV
      WRITE(6,16) (SD(K),K=2,4)
C
C     WRITE LAYER TEMPERATURES FOR POINTS 2-8
C
      I=0
 23   WRITE(6,17)
      WRITE(6,18)
      DO 19 J=1,32
      I=I+1
      WRITE(6,20) ((TEMP(L,K,I),L=1,2),K=2,8)
      WRITE(29,27)((TEMP(L,K,I),L=1,2),K=2,8)
 27   FORMAT(4(F8.2,F6.1)/3(F8.2,F6.1))
      IF(I.EQ.N) GO TO 21
19    CONTINUE
      GO TO 23
 21   I=0
      WRITE(6,24)
      WRITE(6,18)
      DO 25 J=1,32
      I=I+1
      WRITE(6,20) ((TEMP(L,K,I),L=1,2),K=9,15)
      WRITE(29,27)((TEMP(L,K,I),L=1,2),K=9,15)
      IF(I.EQ.N) GO TO 22
 25   CONTINUE
C
 26   FORMAT('1'///13X,'TIME,',5X,'AMBIENT CONDITIONS',
     17X,'INLET CONDITIONS'//
     221X,'TEMP,  RELATIVE ABSOLUTE  TEMP,  RELATIVE'/
     313X,'HOURS   DEG C  HUMIDITY HUMIDITY  DEG C  HUMIDITY'/
     431X,'%',7X,'KG/KG',14X,'%'/)
C
 10   FORMAT(' ',12X,F6.2,2F8.1,F11.6,F7.1,F8.1)
 11   FORMAT(' ',12X,F6.2,F7.1,F11.6)
 15   FORMAT('0',12X,'MEAN  ',2F8.1,F11.6,F7.1,F8.1)
 16   FORMAT('0',12X,'STANDARD DEVIATION',F17.8,F7.2,F8.2)
 17   FORMAT('1'///20X,'2',13X,'3',13X,
     1'4',13X,'5',13X,'6',13X,'7',13X,'8'//)
 20   FORMAT(' ',12X,7(F8.2,F6.1))
 18   FORMAT(' ',15X,'TIME,  TEMP,  TIME,  TEMP,  TIME,',
     1'  TEMP,  TIME,  TEMP,  TIME,  TEMP,',
     2'  TIME,  TEMP,'/15X,'HOURS  DEG C  HOURS  DEG C',
     3'  HOURS  DEG C  HOURS  DEG C  HOURS  DEG C',
     4'  HOURS  DEG C  HOURS  DEG C'/)
 24   FORMAT('1'///20X,'9',13X,'10',13X,'11',
     113X,'12',13X,'13',13X,'14',13X,'15'//)
 22   CALL EXIT(5)
      STOP
      END
```

Fortran programme RDEEP

```
C       PROGRAMME TO READ RADIAL BIN DRIER TAPES                          452
C       FILE INPUT  DSET5  DSET5
C       FILE OUTPUT DSET6  DSET20(80BYTES)
C
        REAL TEMP(2,20,150),AV(20),IN(4,150),SUM(4)
        REAL SSQ(4),AV(4),SD(4)
        SATPRE(X)=EXP(54.6389-6334.27/(X+273)
       1-5.16923*ALOG(1.8*(X+273)))
        PREVAP(TD,TW)=SATPRE(TW)-(0.6961*(SATPRE(TW)-14.6996)
       1*(TD-TW))/(1075.69-1.0257*TW)
C       INITIALISE TIMES
        DO 1 J=1,20
    1   TEMP(1,J,1)=0.01*(J-1)
C
C       READ TOTAL NO OF OBSERVATIONS,INTERVAL BETWEEN
C       READINGS AND NO OF OBSERVATIONS AT THAT INTERVAL
C
        READ(5,3) N
    3   FORMAT(G0.0)
        NA=0
    7   READ(5,4) INT,NO
    4   FORMAT(2G0.0)
        NB=NA+NO
        NA=NA+1
C
C       READ DATA,CONVERT TO DEGREES CELSIUS AND COMPUTE TIME
C
        DO 5 I=NA,NB
        READ(8,6) A
    6   FORMAT(10G0.0/10G0.0)
        DO 5 J=1,20
        IF(I.EQ.1) GO TO 5
        TEMP(1,J,I)=TEMP(1,J,I-1)+0.20*INT
    5   TEMP(2,J,I)=(A(J)-320.0)/18.0
C
        NA=NB
        IF(NB.LT.N) GO TO 7
C
C       COMPUTE INLET CONDITIONS
C
        DO 8 I=1,N
        TD=TEMP(2,20,I)
        TW=TEMP(2,19,I)
        VAPRES=PREVAP(TD,TW)
        IN(1,I)=(VAPRES*100.0)/SATPRE(TD)
        IN(2,I)=0.622*(VAPRES/(14.6996-VAPRES))
        IN(3,I)=0.5*(TEMP(2,1,I)+TEMP(2,2,I))
        IN(4,I)=(VAPRES*100.0)/SATPRE(IN(3,I))
C
        SUMT=SUMT+TD
        DO 8 J=1,4
        SUM(J)=SUM(J)+IN(J,I)
    8   SSQ(J)=SSQ(J)+(IN(J,I)**2)
C
        AMD=SUMT/N
        DO 9 J=1,4
        AV(J)=SUM(J)/N
        SD(J)=SSQ(J)-((SUM(J)**2)/N)
    9   SD(J)=SQRT(SD(J)/(N-1))
C       WRITE INLET CONDITIONS
        I=0
   14   WRITE(6,26)
```

```
 453
       DO 13 J=1,55
       I=I+1
       WRITE(6,10) TEMP(1,2,I),TEMP(2,20,I),(IN(K,I),K=1,4)
       WRITE(29,11) TEMP(1,2,I),IN(3,I),IN(2,I)
       IF(I.EQ.N) GO TO 12
 13    CONTINUE
       GO TO 14
 12    WRITE(6,15)AMB,AV
       WRITE(6,16) (SD(K),K=2,4)
       WRITE(6,1111)
 1111  FORMAT('1')
C
C      TAKE MEANS OF OBSERVATIONS ON SAME RADIUS
C
       DO 30 I=1,N
       TEMP(2,8,I)=(TEMP(2,8,I)+TEMP(2,17,I)+TEMP(2,18,I))/3.0
       TEMP(2,10,I)=(TEMP(2,10,I)+TEMP(2,16,I)+TEMP(2,15,I))/3.0
 30    TEMP(2,12,I)=(TEMP(2,12,I)+TEMP(2,13,I)+TEMP(2,14,I))/3.0
C
C      WRITE LAYER TEMPERATURES FOR POINTS 3-12
C
       I=0
 23    WRITE(6,17)
       WRITE(6,18)
       DO 19 J=1,55
       I=I+1
       WRITE(6,20) ((TEMP(L,K,I),L=1,2),K=3,7)
       WRITE(29,27)((TEMP(L,K,I),L=1,2),K=3,7)
 27    FORMAT(5(F8.2,F6.1))
       IF(I.EQ.N) GO TO 21
19     CONTINUE
       GO TO 23
 21    I=0
 28    WRITE(6,24)
       WRITE(6,18)
       DO 25 J=1,55
       I=I+1
       WRITE(6,20)((TEMP(L,K,I),L=1,2),K=8,12)
       WRITE(29,27)((TEMP(L,K,I),L=1,2),K=8,12)
       IF(I.EQ.N) GO TO 22
 25    CONTINUE
       GO TO 28
 26    FORMAT('1'///13X,'TIME,',5X,'AMBIENT CONDITIONS',
      17X,'INLET CONDITIONS'//
      221X,'TEMP,  RELATIVE ABSOLUTE  TEMP,  RELATIVE'/
      313X,'HOURS   DEG C  HUMIDITY HUMIDITY  DEG C  HUMIDITY'/
      431X,'%',7X,'KG/KG',14X,'%'/)
C
 10    FORMAT(' ',12X,F6.2,2F8.1,F11.6,F7.1,F8.1)
 11    FORMAT(' ',12X,F6.2,F7.1,F11.6)
 15    FORMAT('0',12X,'MEAN  ',2F8.1,F11.6,F7.1,F8.1)
 16    FORMAT('0',12X,'STANDARD DEVIATION  ',F11.8,F7.2,F8.2)
 17    FORMAT('1'///20X,'3',13X,'4',13X,
      1'5',13X,'6',13X,'7'//)
 20    FORMAT(' ',12X,5(F8.2,F6.1))
 18    FORMAT(' ',15X,'TIME,  TEMP,  TIME,  TEMP,  TIME,',
      1'  TEMP,  TIME,  TEMP,  TIME,  TEMP,'/
      215X,'HOURS  DEG C  HOURS  DEG C',
      3',  HOURS  DEG C  HOURS  DEG C  HOURS  DEG C',
      4/)
 24    FORMAT('1'///20X,'8',13X,'9',13X,'10',
      113X,'11',13X,'12'//)
 22    CALL EXIT(5)
       STOP
       END
```

4.1.3.2 Plotting programs SIMPLT and RADPLT

SIMPLT and RADPLT are parallel- and radial-flow versions respectively of the program which plotted experimental and/or simulated data for deep beds. Experimentally recorded temperatures were plotted as continuous lines and absolute humidity as a continuous line marked with an X at every 5th point. Simulated temperatures and mean bed moisture content were plotted as dotted lines. The length of the y and x axes was fixed at 40 cm and 60 cm respectively but the scales for moisture content, temperature and time were chosen by the subroutine XYSCAL and function TSCAL. Humidity was plotted on a fixed scale incrementing 0.0005 kg/kg per cm.

The programme was controlled through the control index N read, together with maximum values of temperature, time and moisture content and minimum value of temperature, from DSET5. Experimentally recorded data (normally output from DEEP or RDEEP) was input on DSET8 and simulated data (output from STATIC or RADIAL) on DSET29. A simplified flow diagram is given in Fig. 4.16

Variable list - main programme

N = control index read twice by the programme.

On 1st read = length of experimental arrays to be plotted or if 0 or -ve caused reading and plotting of experimental data to be skipped.

On 2nd read = -ve if no simulated records were to be plotted or = 0 or +ve if simulated records were to be read and plotted.

H(150)	array of absolute humidities
X(150)	array of times for current plot
Y(150)	array of temperatures for current plot
A(14,150)	master array of data to be plotted
YAXIS	length of y axes
XAXIS	length of x axis
XMAX	maximum value of time
YMAX	maximum value of moisture content
TMAX	maximum value of temperature
TMIN	minimum value of temperature
YINCR	moisture increment per cm.
XINCR	time increment per cm.
TINCR	temperature increment per cm.
M	integer device to read 2 consecutive sets of data

Variables in subroutine XYSCAL and function TSCAL are not listed. XYSCAL is a modified version of that used in plotting programme PLOT and PPLOT, Appendix 3.1.3.3 and function TSCAL is easily followed from the program listing.

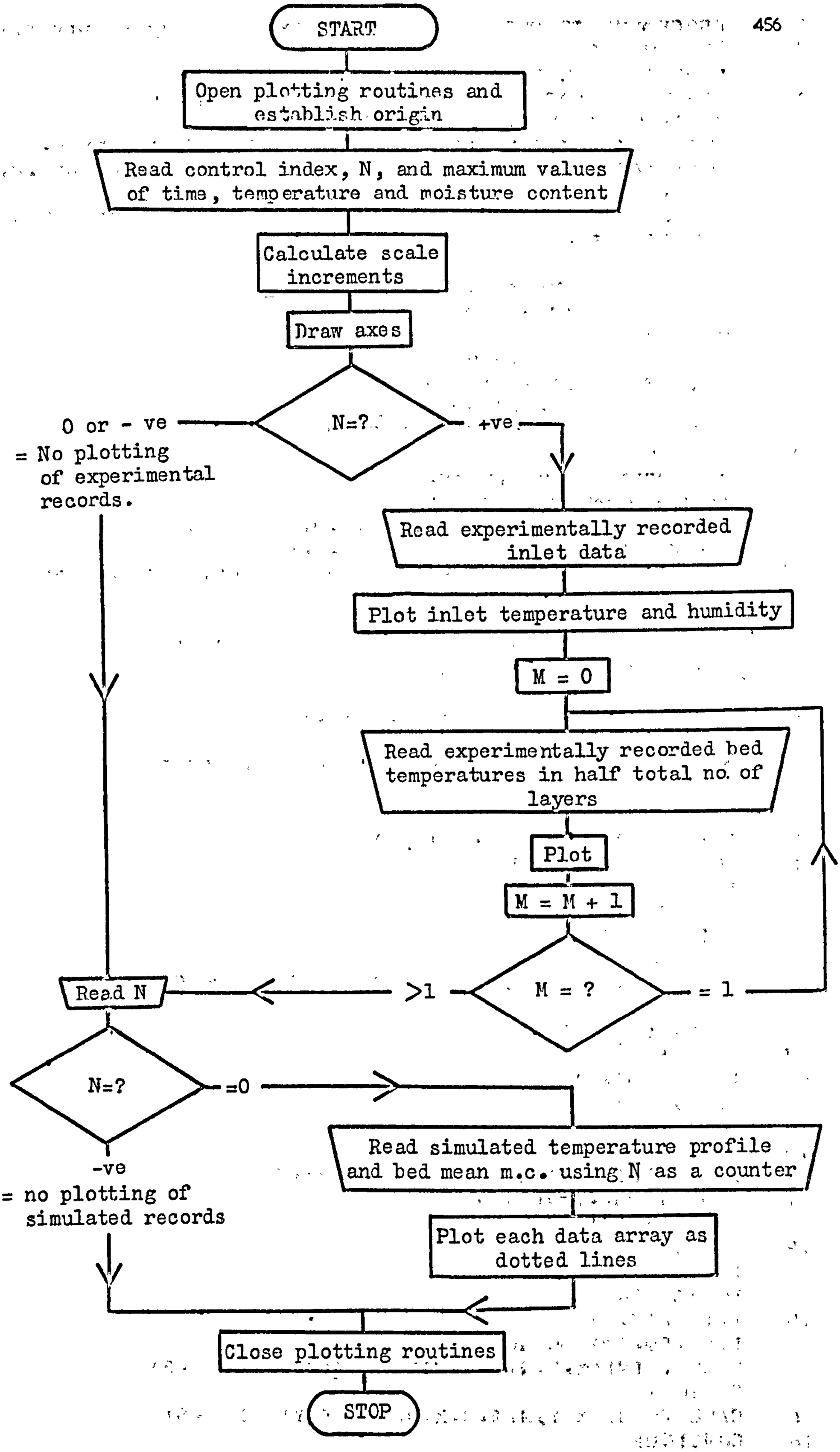


Fig. 4.1.6 Simplified flow diagram for programmes SIMPLT and RADPLT

Fortran programme SIMPLT

```
C       PROGRAMME TO PLOT EITHER EXPERIMENTAL  DEEP   BIN RUN
C       OR SIMULATED RUN OR BOTH.
C       EXPERIMENTAL DATA READ IN AS DSET8
C       SIMULATED DATA READ IN AS DSET29(80 BYTE)
C       CONTROL EXCERCISED THROUGH DSET5
C       XMAX=MAXIMUM TIME, HRS.       YMAX=MAXIMUM M.C. %D.B.
C       TMAX=MAXIMUM TEMP, DEG.C.   TMIN=MINIMUM TEMP, DEG.C.
C       IF N.LE.0 IN FIRST DATA LINE DSET8 NOT READ
C       IF N.LE.0 IN SECOND DATA LINE DSET29 NOT READ & PROGRAMME
C       TERMINATED.
        REAL H(150)
        REAL X(150),Y(150),A(14,150)
        DATA YAXIS/40.0/,XAXIS/60.0/
        CALL PLOTS(1)
        CALL PLOT(0.0,0.0,999)
        CALL PLOT(0.0,-5.0,-3)
        CALL PLOT(0.0,1.3,-3)
        READ(5,1) XMAX,YMAX,TMAX,TMIN,N
1       FORMAT(5G0.0)
        CALL XYSCAL(YMAX,XMAX,YINCR,XINCR)
        TINCR=TSCAL(TMAX,TMIN)
        CALL AXIS(0.0,0.0,YAXIS,90.0,0.0,YINCR,
       126HMOISTURE CONTENT, O/O D.B.,-26)
        CALL AXIS(0.0,0.0,XAXIS,0.0,0.0,XINCR,11HTIME, HOURS,11)
        CALL AXIS(-2.5,0.0,YAXIS,90.0,TMIN,TINCR,
       118HTEMPERATURE, DEG.C.,-18)
        CALL AXIS(60.5,0.0,YAXIS,90.0,0.0,0.0005,
       115HHUMIDITY, KG/KG,15)
        IF(N) 17,17,18
18      READ(8,3)(X(I),Y(I),H(I),I=1,N)
3       FORMAT(3G0.0)
        CALL CURVE(X,Y,N,0,7,0.0,XINCR,TMIN,TINCR)
        CALL CURVE(X,H,N,5,2,0.0,XINCR,0.0,0.0005)
        M=0
7       READ(8,4) ((A(J,I),J=1,14),I=1,N)
4       FORMAT(8G0.0/6G0.0)
        DO 5 J=1,13,2
        DO 6 I=1,N
        X(I)=A(J,I)
6       Y(I)=A(J+1,I)
5       CALL CURVE(X,Y,N,0,7,0.0,XINCR,TMIN,TINCR)
        M=M+1
        IF(M.EQ.1) GO TO 7
17      READ(5,8) N
8       FORMAT(G0.0)
        IF(N) 9,10,10
10      N=0
13      N=N+1
        READ(29,11,END=12) X(N),(A(J,N),J=1,14)
11      FORMAT(8G0.0/7G0.0)
        GO TO 13
12      N=N-1
        DO 14 J=1,14
        DO 15  I=1,N
15      Y(I)=A(J,I)
        IF(J.EQ.14) GO TO 16
        CALL DLINE(X,Y,N,0.0,XINCR,TMIN,TINCR,0.3)
        GO TO 14
16      CALL DLINE(X,Y,N,0.0,XINCR,0.0,YINCR,0.5)
14      CONTINUE
9       CALL PLOT(0.0,0.0,1000)
        CALL EXIT(3)
        STOP
        END
```

```
      FUNCTION TSCAL(TMAX,TMIN)
      A=1.0
2     F=(TMAX-TMIN)/A
      IF(E.LE.10.0) GO TO 3
      A=A*2.0
      IF(A.EQ.16.0) GO TO 4
      GO TO 2
3     TSCAL=0.25*A
      RETURN
4     TSCAL=5.0
      RETURN
      END
      SUBROUTINE XYSCAL(A,B,C,D)
C     CALCULATES SUITABLE INCREMENTS OF X AND Y
C     FOR AXES OF 40 AND 60 CM. RESPECTIVELY
C     MAX. VALUE OF Y=880
C     X SCALE IN HOURS
      DO 4 I=1,22
      F=A/FLOAT(I)
      IF(E.LE.40.0) GO TO 3
      IF(I.NE.2) GO TO 4
      IF(A.LE.100.0) GO TO 5
4     CONTINUE
3     C=FLOAT(I)
      GO TO 6
5     C=2.5
6     F=0.0
8     F=F+0.1
      E=B/F
      IF(E.LE.60.0) GO TO 7
      IF(E.LE.120) GO TO 8
      IF(E.LE.150) GO TO 10
      F=0
9     F=F+0.5
      E=B/F
      IF(E.LE.60) GO TO 7
      GO TO 9
10    D=0.25
      RETURN
7     D=F
      RETURN
      END
```

Fortran programme RADPLT

```
C       PROGRAMME TO PLOT EITHER EXPERIMENTAL RADIAL BIN RUN
C       OR SIMULATED RUN OR BOTH.
C       EXPERIMENTAL DATA READ IN AS DSET8
C       SIMULATED DATA READ IN AS DSET29(80 BYTE)
C       CONTROL EXCERCISED THROUGH DSET5
C       XMAX=MAXIMUM TIME,HRS.      YMAX=MAXIMUM M.C.%D.B.
C       TMAX=MAXIMUM TEMP, DEG.C.   TMIN=MINIMUM TEMP, DEG.C.
C       IF N.LE.0 IN FIRST DATA LINE DSET8 NOT READ
C       IF N.LE.0 IN SECOND DATA LINE DSET29 NOT READ & PROGRAMME
C       TERMINATED.
        REAL H(150)
        REAL X(150),Y(150),A(14,150)
        DATA YAXIS/40.0/,XAXIS/60.0/
        CALL PLOTS(1)
        CALL PLOT(0.0,0.0,999)
        CALL PLOT(0.0,-5.0,-3)
        CALL PLOT(0.0,1.3,-3)
        READ(5,1) XMAX,YMAX,TMAX,TMIN,N
1       FORMAT(5G0.0)
        CALL XYSCAL(YMAX,XMAX,YINCR,XINCR)
        TINCR=TSCAL(TMAX,TMIN)
        CALL AXIS(0.0,0.0,YAXIS,90.0,0.0,YINCR,
       126HMOISTURE CONTENT, O/O D.B.,-26)
        CALL AXIS(0.0,0.0,XAXIS,0.0,0.0,XINCR,11HTIME, HOURS,11)
        CALL AXIS(-2.5,0.0,YAXIS,90.0,TMIN,TINCR,
       118HTEMPERATURE, DEG.C,-18)
        CALL AXIS(60.5,0.0,YAXIS,90.0,0.0,0.0005,
       115HHUMIDITY, KG/KG,15)
        IF(N) 17,17,18
18      READ(8,3)(X(I),Y(I),H(I),I=1,N)
3       FORMAT(3G0.0)
        CALL CURVE(X,Y,N,0,7,0.0,XINCR,TMIN,TINCR)
        CALL CURVE(X,H,N,5,2,0.0,XINCR,0.0,0.0005)
        M=0
7       READ(8,4) ((A(J,I),J=1,10),I=1,N)
4       FORMAT(10G0.0)
        DO 5 J=1,9,2
        DO 6 I=1,N
        X(I)=A(J,I)
6       Y(I)=A(J+1,I)
5       CALL CURVE(X,Y,N,0,7,0.0,XINCR,TMIN,TINCR)
        M=M+1
        IF(M.EQ.1) GO TO 7
17      READ(5,8) N
8       FORMAT(G0.0)
        IF(N) 9,10,10
10      N=0
13      N=N+1
        READ(29,11,END=12) X(N),(A(J,N),J=1,14)
11      FORMAT(8G0.0/7G0.0)
        GO TO 13
12      N=N-1
        DO 14 J=1,14
        DO 15 I=1,N
15      Y(I)=A(J,I)
        IF(J.EQ.14) GO TO 16
        CALL DLINE(X,Y,N,0.0,XINCR,TMIN,TINCR,0.3)
        GO TO 14
16      CALL DLINE(X,Y,N,0.0,XINCR,0.0,YINCR,0.5)
14      CONTINUE
9       CALL PLOT(0.0,0.0,1000)
        CALL EXIT(3)
        STOP
        END
```

```
      FUNCTION TSCAL(TMAX,TMIN)
      A=1.0
2     F=(TMAX-TMIN)/A
      IF(F.LE.10.0) GO TO 3
      A=A*2.0
      IF(A.EQ.16.0) GO TO 4
      GO TO 2
3     TSCAL=0.25*A
      RETURN
4     TSCAL=5.0
      RETURN
      END
      SUBROUTINE XYSCAL(A,B,C,D)
C     CALCULATES SUITABLE INCREMENTS OF X AND Y
C     FOR AXES OF 40 AND 60 CM. RESPECTIVELY
C     MAX. VALUE OF Y=880
C     X SCALE IN HOURS
      DO 4 I=1,22
      E=A/FLOAT(I)
      IF(E.LE.40.0) GO TO 3
      IF(I.NE.2) GO TO 4
      IF(A.LE.100.0) GO TO 5
4     CONTINUE
3     C=FLOAT(I)
      GO TO 6
5     C=2.5
6     F=0.0
8     F=F+0.1
      E=B/F
      IF(E.LE.60.0) GO TO 7
      IF(E.LE.120) GO TO 8
      IF(E.LE.150) GO TO 10
      F=0
9     F=F+0.5
      E=B/F
      IF(E.LE.60) GO TO 7
      GO TO 9
10    D=0.25
      RETURN
7     D=F
      RETURN
      END
```

APPENDIX 4.2.

TABLE 4.2.1

Initial and final moisture contents, % w.b. (% d.b.) for Run 1, 10: 7:70, Sabrina.

Layer	Initial	Final		
		Edge	Centre	General
1 (Bottom)	-	-	-	7.9 (8.6)
2	46.2 (85.9)	8.0	7.9	8.0 (8.7)
3	44.3 (79.5)	8.1	8.0	8.1 (8.8)
4	43.6 (77.3)	8.2	8.1	8.3 (9.1)
5	44.4 (79.9)	8.3	8.3	8.4 (9.2)
6	44.5 (80.2)	8.9	8.9	8.8 (9.6)
7	46.6 (87.3)	9.0	9.1	9.1 (10.0)
8	45.9 (84.8)	9.5	10.0	9.6 (10.6)
Mean	45.1	8.6	8.6	8.5 (9.3)

TABLE 4.2.2.

Initial and final moisture contents, % w.b. (% d.b.) Runs 2 and 3, 28:7:70 and 4:8:70, S23

Layer	Run 2		Run 3	
	Initial % w.b.	Final % w.b.	Initial % w.b.	Final % w.b.
1 (Bottom)	41.4 (70.6)	(12.1) 10.8	35.2 (54.3)	(9.4) 8.6
2	40.9 (69.2)	(12.0) 10.7	36.2 (56.7)	(9.1) 8.3
3	40.7 (68.6)	(12.1) 10.8	36.5 (57.5)	(9.3) 8.5
4	41.4 (70.6)	(11.6) 10.4	36.3 (57.0)	(9.6) 8.8
5	40.5 (68.1)	(12.5) 11.1	35.8 (55.8)	(10.0) 9.1
6 (Top)	41.0 (69.5)	(12.5) 11.1	35.5 (55.0)	(10.4) 9.4
Mean	41.0	(12.1) 10.8	35.9	(9.6) 8.8

TABLE 4.2.3

Purity, 1000 seed weight and germination of individual layers in Runs 1, 2 and 3

Layer	Run 1			Run 2			Run 3		
	Purity %	1000 seed wt. g	Germ %	Purity %	1000 seed wt. g	Germ %	Purity %	1000 seed wt. g	Germ %
1 (Bottom)	88.4	3.46	75	65.5	1.27	85	88.6	1.66	91
2	92.3	3.68	76	87.7	1.49	92	88.2	1.65	92
3	85.2	3.53	72	89.6	1.50	93	90.7	1.63	88
4	89.7	3.79	75	89.4	1.53	92	92.8	1.80	95
5	92.9	4.02	84	83.3	1.42	89	92.1	1.69	91
6	92.5	3.60	82	80.7	1.39	94	94.5	1.80	93
7	86.8	3.56	76						
8	93.9	4.10	84						
Mean	90.2	3.72	78	82.7	1.43	91	91.2	1.70	92

TABLE 4.2.4

Key to thermocouple positions identified by numbers in Appendix Tables 4.2.5 - 4.2.7

Position	Run 1 (Table 4.2.5) Thermocouple Number	Run 2 (Table 4.2.6) Thermocouple Number	Run 3 (Table 4.2.7) Thermocouple Number
3 in from bottom	16, 15		
6 in " "	13, 14		
9 in " "	11, 12		
12 in " "	10		
15 in " "	9		
18 in " "	7, 8		
1 in below surface	5, 6		
On surface (24 in)	3, 4		
3 in above surface	2		
Plenum	1		
0 in from bottom		15	1
6 in " "		12, 16	13, 14
12 in " "		5, 14	12, 10
18 in " "		6, 8	6, 8
24 in " "		9, 10	5, 7
30 in " "		7, 13	9, 11
1 in below surface		11, 4	
On surface (36 in)		3, 2	2, 3, 4

TABLE 4.2.5

Temperature records, Run 1. °F

Time t hrs.	Thermocouple No. 1	2	3	4	5	6	7	8	9
0									
0.5	87.0	49.0			48.0				
1.0	90.0	49.0			48.0				
1.5	89.0	49.5			48.5				
2.0	90.0	49			48.5				
2.5	90.5	50.0							
3.0	89.0	52.0			50.5				
3.5	86.5	50.0							
4.0	89.5	50.0							
4.5	90.5	50.5							
5.0	91.0	50.5							
5.5	90.5	50.5							
6.0	90.0	50.5							
6.5	90.0	50.5							
7.0	90.0	51.0							53.5
7.5	90.0	51.0							59.5
8.0	93.0	51.5							63.5
8.5	95.0	52.0							66.0
9.0	90.5	52.0							67.0
9.5	91.5	51.5							68.5
10.0	91.0	51.5							69.0
10.5	92.0	51.5							69.5
11.0	92.0	51.5							71.0
11.5	93.5	51.5							72.0
12.0	92.0	52.0			56.0	52.0			
13	95.0	52.5			64.0	52.5	59.0	58.0	74.0
14	90.5	52.5			66.5	58.0	64.5		74.5
15	89.0	52.0	52.0	53.5	67.0	64.5	66.0		73.5
16	88.5	57.5	52.0	58.0	67.5	66.0	67.0		74.0
18	88.5	61.5	52.0	61.0	66.5	65.5	66.0		73.5
19	86.0	62.0	50.5	61.5	66.5	65.5	65.5		72.5
20	85.5	61.5	50.5	60.5	65.5	64.5	65.0		72.5
21	88.5	57.5	55.5	61.5	66.5	65.5	66.0		73.0
22	88.5	61.5	59.5	63.0	68.5	67.5	68.0		75.0
23	91.5	64.0	62.0	65.5	70.5	69.5	70.0		77.0
24	93.0	66.5	64.5	67.5	72.5	71.0	72.0		79.0
25	88.0	67.0	65.5	66.5	70.0	68.5	69.0		76.0
26	88.5	67.0	64.0	66.5	69.5	68.0	69.0		76.0
28	94.0	70.0	68.5	71.5	76.0	75.0	75.5		82.5
30	93.0	74.0	72.0	74.5	80.0	79.0	79.5		85.5
32	92.5	76.5	74.5	76.5	83.0	82.0	82.5		88.0
34	93.0	79.0	77.5	79.0	85.5	84.5	84.5		89.5
36	96.0	81.5	80.0	81.5	87.5	87.0			91.0
38	96.5	83.5	82.5	83.5	89.5	89.0			93.0
40	91.0	83.5	82.5	83.5	88.0	88.0			90.0
42	90.0	82.5	81.0	82.0	86.5	86.0			89.0
44	87.5	83.0	81.5	82.0	86.0				87.5
46	87.5	83.5	82.5		86.0				87.5
48	90.5	88.0	87.5		90.0				91.5
50	87.5	84.0	83.0	83.0	85.5				87.0
52	89.5	87.5	86.5	86.5	89.5				90.0

TABLE 4.2.5 Cont'd....

10	11	12	13	14	15	16
		48.5	47.0		50.0	48.5
		48.5	47.5		74.0	64.5
		48.5	47.5		79.0	76.0
(49.0			56.0	53.0	80.5	79.0
			67.0	66.0	82.5	81.5
	53.5	50.5	71.5	71.0	82.0	80.5
	66.0	58.5	73.5		82.0	80.0
	70.5	67.5	74.5		81.5	81.0
51.0	72.0	71.0	75.5		83.0	82.0
57.5	73.5	72.5	76.0		83.5	82.5
65.0	74.0	73.0	76.5		83.0	82.5
67.5	74.5	74.0	77.0		84.0	83.0
69.0	75.5	75.0	77.5		84.0	83.5
70.0	76.0	75.5	78.5		84.0	83.5
71.0	76.5	76.0	79.0		85.0	84.5
72.0	78.0	77.5	80.0		86.5	86.0
74.0	80.0	79.5	81.5		88.5	87.5
75.0	80.5	80.0	81.5		87.0	86.5
74.5	80.5	80.0	81.5		86.5	86.0
75.0	80.5	80.0	82.0		87.0	87.0
75.5	81.0	80.5	82.5		85.0	87.0
76.5	81.5	81.0	83.0		88.0	87.5
77.5	82.0	81.5	33.5		88.5	88.0
77.5	82.5	82.0	83.5		88.5	88.0
79.0	84.0	83.5	85.5		90.0	90.0
79.0	83.0	83.0	84.0		(88.0	
78.0	(81.5		82.0		(85.5	
78.0	(81.5		82.5		(85.5	
77.5	(81.0		82.5		(84.5	
77.0	(80.0		81.0		(85.0	
76.5	(80.5		81.5		(85.0	
77.5	(81.5		82.5		(85.0	
79.5	(83.5		84.0		(87.5	
81.0	(85.0		86.0		(90.0	89.5
83.5	(86.5		87.5		(89.5	
80.0	(84.0		(84.5		(87.5	
79.5	(83.0				(84.5	
86.5	(88.5		(89.5		(90.5	
88.5	(90.5		(90.0		(91.5	
90.5	(92.5				(94.0	
91.5	(93.0		(92.5		(94.0	
92.5	(94.0		(93.5		(94.0	
94.5	(95.0		(94.5		(94.5	
90.5	(91.0		(90.5		(90.0	
89.5	(90.5		(89.5		(89.5	
88.0	(88.0		(87.5		(87.5	
					(87.5	
			(90.5		(90.5	
(87.5			(87.5		(87.5	
			(89.5		(87.5	

TABLE 4.2.5 . Cont'd.....

Time t hrs.	Thermocouple No. 1	2	3	4	5	6	7	8	9
FAN OFF									
52.5	83.0	(67.5			(89.5				(90.0
53.0	73.5	(64.0			90.0	89.0	87.5	90.0	(91.0
53.5	69.5	(62.5			90.5	88.0	86.0	90.0	(91.5
54.0	67.0	(61.5			90.5	87.0	84.5	89.5	(92.5
56	62.0	58.0			89.0	83.0	80.5	83.0	(95.0
58	59.0	56.0			87.0	80.5	77.5	86.5	(96.5
60	57.5	54.5			85.5	78.5	75.5	85.0	(97.5
62	56.0	53.5			84.0	77.0	74.0	84.0	97.5
64	56.0	55.5			81.5	74.5	71.5	82.0	96.0
65	56.5	57.5			79.5	73.0	70.0	80.0	94.0
65.4	Cold air switched on								

10	11	12	13	14	15	16
			(89.5			
			(89.5			
			(90.0			
			(91.0		(90.5	
			(93.0		(90.0	
			(94.0		(89.0	
93.5	98.0	97.0	93.5	94.0	86.5	87.5
99.0	98.5	97.0	92.5	93.5	84.0	85.5
98.0	97.0	95.5	90.0	91.0	81.0	82.5
95.5	94.5	92.5	87.0	88.5	78.0	79.5

TABLE 4.2.6

Temperature records, Run 2, °F

Time hour	Thermocouple No.															
	15	12	16	5	14	6	8	9	10	7	13	11	4	3	2	1
0	80	59	56	65	60	73	67	74	69	70	74	71	72	70.5	69.5	89
0.5	88	55	54.5	55									55.5			89
1.0	88	55	54.5	55	54.5	55					54.5	55				89
1.5	87.5	53	54	53	54											88
2.0	86.5	53	52	53	52	53							54	54	54	87
2.5	86.5	52.5														87
3.0	85	60.5	60	52	51	52					51	52	52.5			86
3.5	87.5	69	67.5	52									53			88
4.0	91.0	73.5	72	53				54	54	53	53	54	53			91.5
4.5	90.5	75	74.5	53	53	53	54				53	54				92.5
5.0	93	76.5	75	53	52	53	54				53	54				94
5.5	90.5	78	76.5	53									54			91.5
6.0	91.0	78.5	78.0	52	52	52	53				52	53				90.5
6.5	92	80	79	53.5	57.5	53.5					53	53.5				93
7.0	91.5	80.5	79.5	54	63	54					53	54				93
7.5	92	81	80	53	66	53	54				53	54				91.5
8.0	89.5	81	80	53	68	53										89.5
8.5	91	81	80	55.5	69	53										90.5
9.0	88.5	82	81	59.5	70	52										90
10	93	84.5	83.5	65.5	72.5	51.5										93.5
11	93.5	87	86	70	76	52										93.5
12	96	89	88	72.5	78	51										96
13	95.5	90.5	89.5	75	80.5	51										95.5
14	95	91	90	77.5	82	50.5	59	50.5								95
15	95	91.5	91	79	83.5	50	65	50			49	50				95
16	96	93.5	92.5	81.5	86	50	69.5	50	56	50						96
17	95	94	93	84	87.5	51	72.5	51	66	51						96
18	92	91.5	90.5	83	86	56	74	50	68.5	50						93
19	89	90	90	83	86	63	74.5	50	70	50						90
20	88	88	87	83	85	66	75	50	71	50						88.5
22	87	87	86	81	84	67	75	50	71.5	49	48	49			52.5	88
23	86.5	87	86.5	82.5	84	69	77	57	76	49	49	54	49	49	58	87.5
							Power out 40 mins									

TABLE 4.2.6. Cont'd .....

Time hour	Thermocouple No.															
	15	12	16	5	14	6	8	9	10	7	13	11	4	3	2	1
24	91.5	89	88	83	85	67	77	57	72	50	50	52	50	50	57	92.5
26	91	90	90	87	89	75	82	66	78.5	50	50	62	50	50	64.5	90
28	90	90	89	87	88	76	83	69	79.5	48	48	67	48	48	67.5	90
30	95	92	91	88	90	80	85	73	82.5	60	60	71	48	48	71	92.5
32	90	91.5	90	90	90	85	88	79	87	67	67	76	47.5	58.5	75	89
34	92.5	93	91.5	90	90.5	85.5	88.5	81	87	71.5	71.5	81	59	65	77.5	92.5
36	93	93.5	93	91.5	92	88.5	90.5	85	90	77	77	84	67	70.5	81	93
38	92.5	93	92.5	91.5	91.5	89.5	91	87	91	81	80	86	72	75	83	92.5
40	90.5	92	90.5	90	90.5	89	90	88	90	83	82	87	76	78	83.5	90.5
45	88	88							89	86	85.5	88	82	83	84.5	89
48	88	88	88	85.5	87	85.5	86	86	86	85.5	85	86	83	83	83	89
50	73	74	73	76	73	76	75	76	76	77	75.5	76	76	76	75	73
55	67	69	67	69	69	70	70	71	71	71	71	71	70	70	70	67
60	60	62	60	62	61	62	62	62	62	62	61	62	61	61	61	60
64	64	66	65	66	64	66	66	66	66	66	64	66	64	64	64	65

TABLE 4.2.7

Temperature records, Run 3, °F

Time t hrs.	Thermocouple No. 1	2	3	4	5	6	7	8	9
0	117	76	71	70	86	78	86	83	86
0.5	121	62							
1.0	119	63							
1.5	119	63							
2.0	118	62							
2.5	118	62							
3.0	118	62							
3.5	118	62							
4.0	118	62							
4.5	118	62							
5.0	120	62					61	62	
5.5	121	61			61		61	62	
6.0	120	62					61	61	
6.5	119	63	62	63	62				
7.0	120	62	62	62	61				
7.5	119.5	61	60	61	60				
8.0	119.5	60.5					59	60.5	
8.5	119	60							
9.0	118	61	60						
9.5	119	60	59						
10.0	117	59	58						
10.5	124	59	58						
11.0	124	59	58				62	58	
12	119	59	58				69	58	
13	122	59	58				74.5	58	
14	123	59	58				79.5	58	
15	123	58					83	58	66
16	124	59	59	59	65.5		88	59	74
17	124.5	60	60	60	72		91	60	78.5
18	124	60	60	60	77		94.5	60	82.5
19	124	59	59	59	81.5		98	59	86.5
20	121.5	59	59	59	85		101	59	90
21	114.5	58	58	58	88		102	58	92.5
22	113.5	60	60	60	91		105	60	95.5
23	121	60	60	60	93.5		105.5	61.5	98
24	124	59	64	59	97		109	70	101
25	128.5	58	59	59	100		111.5	75.5	104.5
26	126.5	57	71.5	58	103		114	79	107
28	118.5	52	75	53	103		110	83.5	106
30	122	51	80	63	107		113	90.5	110
32	118	52	85	61	111.5		115	99	113
34	126.5	67.5	95	75	117		120.5	108	119
36	125.5	79	102	84	120.5		122.5	114	122
38	123	87.5	106	91.5	120		121	116.5	121
40	119.5	96	103.5	99.5	119		119.5	117	120
42	122	104	111	106	120		120	119	121
44.5	121	111	113	112	120		120	120	120
46	62	101.5	92	93	88.5		83	96	87
49	62	81	77.5	81	76.5		74	79	76

TABLE 4.2.7 Cont'd....

10	11	12	13	14	15	16
73	84	73	70	64	85	86
					112	117
			61.5		112.5	116.5
			61	80	113	116
			61	89	113	116
			62	92	113	115.5
			70	95	114	116
			79	96	114	116
			83	93	114	116
		61	84	93	114	116
67	62	61	86	100	115.5	118
74	61		89	102	116	119
78	62		91	104	117	118
80	62	64	91	103	116	117
81	62	67	92	104	116	117.5
83	61	72	94	106	116	117.5
85	61	75	95	106	116	117.5
87	61	77	96	107	116	117
88	61	80	98	108	116	116.5
89	60	81	99	109	116	117
90.5	59	82.5	100	109.5	115	115.5
92	59	84	100.5	110	120	121
94	59	86	104	113	120	121
97	59	89.5	106	113.5	116.5	118
101	59	93	108	115	119	120
104	59	97	111	116	120.5	121
105	59	100	113	118	120.5	121
110.5	59	104	115	119	121	122
113	60	107	117	120	122	122.5
115	60	110	117.5	120	121	122
115.5	59	111	118	119	121	122
115	59	112.5	116	119	119.5	120
112.5	59	111	111.5	111.5	113	113.5
117.5	65.5	115	117	115.5	112.5	112.5
116	73	114	116.5	118	119	119.5
119	76	117	119	121	122	122.5
120.5	80	119	121.5	123.5	125.5	126
122.5	83	121	123	124.5	124	125
115	86.5	114	115	115.5	117	117
118	93	117	118	119	120	120
118	100	117.5	117.5	117.5	117	117
123.5	110	123.5	122	122.5	124.5	125
125	115	124.5	124	124	124	124
123	117	123	122	122	121.5	121.5
121	118	121	119	118	117	117
121	120	121	120	120	120	120.5
121	120.5	121	120	120	120	120
76	96	79	71	68	64	65
70	79	72	67	65	62	62

Appendix 4.2 Run Data (Cont'd)

Table 4.2.8 Run 4 12:7:71 Temperatures (^{o}F) read at intervals of 0.48h.

Thermocouple position (distance from air inlet)				
INLET	0"	3"	6"	9" (surface)
76.50	73.40	62.10	62.10	63.10
79.50	78.00	62.80	62.50	62.80
80.00	79.00	62.80	62.50	62.70
80.00	79.40	66.80	62.00	62.20
80.00	79.30	72.00	61.40	61.70
79.60	79.00	73.80	61.30	61.20
79.30	78.80	74.50	62.40	62.00
78.50	78.10	74.50	66.10	61.50
77.80	77.60	74.20	69.00	62.10
77.30	77.00	74.00	69.90	65.00
77.30	77.00	74.00	70.40	67.30
77.00	76.80	74.00	70.80	68.60
77.00	76.70	74.00	71.00	69.10
76.50	76.50	74.00	71.00	69.50
76.50	76.30	74.00	71.00	69.80
77.00	76.50	74.00	71.20	70.00
77.00	76.70	74.20	71.70	70.50
77.00	76.70	74.50	72.00	70.80
76.50	76.40	74.20	72.00	70.80
76.10	76.00	74.00	71.80	70.80
76.10	76.00	74.00	71.80	70.80
76.10	76.00	74.00	71.80	71.00
76.10	76.00	74.00	72.00	71.00
76.00	75.80	74.00	71.80	71.00
75.50	75.20	73.50	71.60	71.00
75.00	74.90	73.10	71.20	70.50
75.00	74.90	73.00	71.10	70.20
75.00	74.90	73.00	71.10	70.20
74.80	74.70	73.00	71.20	70.50
74.80	74.70	73.10	71.30	70.80
74.90	74.70	73.10	71.50	70.80
75.90	74.90	73.30	72.00	71.30
75.50	75.50	73.80	72.00	71.50
76.50	76.50	74.80	73.00	72.00
77.10	76.70	75.00	73.20	72.60
76.10	76.00	74.50	73.00	72.20
76.00	75.90	73.80	72.50	72.00
77.80	77.60	75.80	73.70	73.00
78.50	78.50	76.50	74.50	73.70
78.50	78.50	76.70	75.00	74.10
79.40	79.00	77.20	75.20	74.60
79.20	79.00	77.20	75.50	74.90
79.50	79.30	77.70	76.00	75.10
79.80	79.50	78.00	76.20	75.50
80.10	79.80	78.10	76.50	75.80
80.50	80.30	78.60	77.00	76.10

Mean 77.30
S.D. 1.73

Appendix 4.2. Run Data (cont'd)

TABLE 4.2.9

Initial conditions Run 5, 14:7:71, Sabel

Distance from air inlet, in	Moisture content	
	% w.b.	% d.b.
1.5	48.4	93.6
4.5	48.8	95.2
7.5	48.2	93.0
10.5	48.8	95.2
13.5	48.7	94.8
16.5	48.5	94.2
19.5	47.2	89.3
22.5	47.6	90.7
25.5	48.3	93.5
28.5	48.1	92.5
31.5	47.7	91.2
34.5	47.7	88.1
37.5	48.4	93.9
Mean $\pm \sigma$	48.1 $\pm$ 0.6	

TABLE 4.2.10

Final conditions, Run 5, 14:7:71, Sabel

Distance from air inlet, in	Weight in layer, g	Dry weight in layer, g	Moisture content		Mean Germination %
			% w.b.	% d.b.	
0.6	4305	3883	9.8	10.9	62
1.8	4415	3988	9.7	10.7	
3.0	4955	4454	10.1	11.3	74
4.2	4820	4337	10.0	11.1	
5.4	4210	3776	10.3	11.5	80
6.6	4700	4219	10.2	11.4	
7.8	5630	5051	10.3	11.5	84
9.0	4455	3977	10.7	12.0	
10.2	4360	3891	10.8	12.0	80
11.4	5455	4875	10.6	11.9	
12.6	3890	3455	11.2	12.6	76
13.8	5080	4523	11.0	12.3	
15.0	5500	4872	11.4	12.9	71
16.2	4115	3633	11.7	13.3	
17.4	4770	4220	11.5	13.0	72
18.6	4740	4173	12.0	13.6	71
19.8	4395	3835	12.7	14.6	72
21.0	4135	3554	14.1	16.4	80
22.2	4625	3924	15.2	17.9	82
23.4	4475	3700	17.3	20.9	82
24.6	4110	3360	18.3	22.3	79
25.8	5090	4024	20.9	26.5	72
27.0	4910	3856	21.5	27.3	74
28.2	4710	3468	26.4	35.8	75
29.4	4800	3350	30.2	43.3	

Total wet weight 116 650 g
Total dry weight 100 398 g Mean moisture content 16.2% d.b.

Table 4.2.11.

Inlet air conditions, Run 5, 14:7:71, Sabel.

TIME	INLET	HUMIDITY
0.00	26.39	0.009533
1.50	26.39	0.008938
3.00	26.22	0.008968
4.50	26.06	0.009214
6.00	25.44	0.009397
7.50	25.28	0.009216
9.00	24.72	0.009591
10.50	24.28	0.009576
12.00	24.06	0.009626
13.50	23.78	0.009936
15.00	23.11	0.009304
16.50	24.44	0.009535
18.00	25.44	0.009720
19.50	25.39	0.010264
21.00	26.00	0.010625
22.50	27.39	0.010558
24.00	28.44	0.010379
25.50	30.00	0.010974
27.00	30.39	0.010069
28.50	29.44	0.011080
30.00	28.17	0.010164
31.50	27.06	0.009510
33.00	26.50	0.009199
34.50	25.33	0.008215
36.00	24.83	0.008071
37.50	24.17	0.008119
39.00	24.17	0.007940
40.50	24.83	0.008272
42.00	23.89	0.008014
43.50	24.61	0.008272
45.00	25.28	0.007970
46.50	25.17	0.007451
48.00	24.83	0.007719
49.50	25.28	0.007940
51.00	25.33	0.008318
52.50	24.50	0.007976
54.00	23.50	0.008373
55.50	22.78	0.007997
57.00	22.22	0.007764
58.50	20.83	0.007464
60.00	20.33	0.007464
61.50	20.56	0.007763
63.00	21.00	0.007685
64.50	23.06	0.008247
66.00	24.72	0.008106
67.50	25.11	0.007155
69.00	25.00	0.007089
70.50	25.00	0.007443
72.00	24.17	0.007612
73.50	24.44	0.007426
75.00	24.61	0.007377
76.50	24.61	0.007801
78.00	23.06	0.007360
79.50	22.50	0.007344
81.00	21.22	0.006639
82.50	20.56	0.006452
84.00	19.89	0.006257
85.50	19.22	0.006885
87.00	19.72	0.007007
88.50	21.67	0.007923
90.00	22.50	0.007908
91.50	23.61	0.008029
93.00	23.89	0.008129
94.50	24.44	0.008387
96.00	25.00	0.008601
97.50	25.56	0.008474
99.00	25.28	0.008991
100.50	24.78	0.009111
102.00	23.61	0.008875
103.50	22.94	0.008680
105.00	22.78	0.008794
106.50	22.22	0.008693
108.00	22.22	0.008840
109.50	22.22	0.008909
111.00	22.72	0.008836
112.50	22.22	0.009468
MEAN	24.24	0.0085
STANDARD DEVIATION	2.243	0.001074

Table 4.2.12.

Layer temperatures, °F Run 5, 14:7:71, Sabel.

Thermocouple No.					
2	3	4	5	6	7
77.50	84.50	83.80	83.10	84.00	84.00
67.20	71.40	80.10	83.50	84.50	84.20
73.00	60.80	61.50	63.60	68.40	72.40
74.50	61.20	61.10	61.10	61.20	62.20
75.00	61.70	61.50	61.70	61.60	61.80
75.80	62.20	62.20	62.00	62.00	62.00
76.30	62.20	62.20	62.20	62.20	62.50
76.40	62.00	62.00	62.00	62.40	62.60
76.50	62.00	62.00	62.00	62.00	62.10
76.80	62.00	62.00	62.10	62.10	62.10
77.00	61.60	61.80	61.80	61.80	62.00
77.00	61.90	63.50	61.80	61.90	62.00
76.00	62.20	64.40	62.00	62.00	62.00
75.40	63.00	65.10	62.50	62.00	62.00
74.60	65.00	66.10	66.50	61.80	61.80
74.00	67.20	67.00	68.00	62.00	62.00
73.50	68.70	67.80	68.20	63.90	62.00
73.00	70.00	68.20	68.00	65.50	61.40
72.00	70.80	69.00	68.00	65.80	61.00
73.00	71.10	69.20	68.00	66.40	61.60
75.00	71.60	69.50	70.30	68.40	64.00
75.30	72.00	69.70	71.00	69.40	66.10
76.40	72.00	70.20	72.00	70.10	67.80
79.10	72.50	70.10	73.10	71.20	68.90
81.50	72.70	70.10	75.60	73.50	70.70
84.00	73.00	70.00	77.80	75.60	73.10
84.60	73.00	69.80	78.20	76.00	73.50
82.40	73.00	69.10	78.00	76.40	74.50
80.00	73.20	69.30	76.20	74.80	73.00
78.50	73.20	71.80	75.00	73.50	72.00
77.30	73.00	72.40	74.00	72.50	71.00
75.50	72.40	73.20	73.60	71.40	70.00
74.00	72.00	74.60	71.80	70.50	69.40
74.00	73.60	77.10	71.50	70.40	69.10
75.00	71.40	79.20	72.10	71.00	69.70
74.00	70.60	80.00	71.80	70.70	69.40
74.40	71.10	79.00	72.00	70.90	69.60
75.00	73.50	77.20	72.50	71.10	70.00
75.50	74.00	76.00	72.10	71.00	69.70
75.00	75.00	75.00	73.50	72.10	71.00
76.00	76.80	73.50	74.00	72.90	71.60
76.00	79.30	73.50	74.00	73.00	71.90
74.40	81.90	73.20	73.20	72.40	71.30
72.70	82.40	73.00	72.00	71.20	70.50
71.00	82.40	72.50	70.50	69.80	69.00
70.00	79.00	72.70	69.30	68.80	68.00
67.50	77.50	73.20	67.20	66.90	67.50
67.50	76.00	73.00	67.00	67.50	66.00
67.50	75.00	74.20	67.00	66.70	66.00
69.70	73.50	74.70	68.80	68.00	67.20
74.00	73.40	74.70	72.10	71.20	70.00
75.60	74.20	73.80	73.80	72.90	71.80
74.50	73.50	72.00	73.90	73.00	71.90
75.00	74.00	70.80	74.20	73.50	72.50
74.00	74.50	69.60	74.10	74.00	73.10
74.60	74.50	67.50	74.00	73.20	72.70
74.80	75.00	67.00	74.10	73.50	72.90

Interval between readings = 1.6 hrs except where indicated

1 = 0.16 hrs 3 = 0.48 hrs

2 = 0.32 hrs 5 = 0.8 hrs

Table 4.2.12. (Cont'd)

Thermocouple No.					
2	3	4	5	6	7
75.00	76.00	67.00	74.60	74.10	73.80
71.60	75.50	69.00	71.70	71.80	71.50
70.50	74.20	72.80	70.50	70.60	70.30
68.50	73.60	74.20	68.50	68.50	68.30
66.90	71.00	74.20	67.00	66.90	67.70
65.00	70.00	74.80	65.10	65.30	65.10
65.00	67.50	74.10	65.20	65.30	65.20
68.00	67.30	74.00	68.00	68.00	68.00
70.00	67.30	74.10	70.00	70.00	70.00
73.30	69.50	74.70	73.00	72.80	72.40
73.50	73.60	71.50	73.20	73.00	72.70
74.00	75.00	70.50	74.00	72.80	73.50
75.20	74.50	68.50	75.20	75.20	75.00
76.00	75.00	66.80	75.70	75.40	75.10
76.00	74.00	65.10	76.00	76.00	76.00
74.80	74.50	65.10	75.00	75.00	75.20
72.50	74.70	68.00	72.70	72.80	73.00
71.50	74.80	70.00	71.50	71.60	71.60
71.00	71.60	73.00	71.40	71.50	71.50
70.10	70.50	73.40	70.50	70.60	70.70
70.00	73.50	74.00	70.20	70.50	70.50
70.00	66.90	75.20	70.10	70.30	70.50
70.40	65.00	75.80	70.50	70.60	70.70
71.00	65.00	76.00	71.00	71.00	71.00
70.50	68.00	75.00	71.00	71.00	71.10
	70.00	72.50			
	73.20	71.50			
	73.40	71.20			
	74.00	70.30			
	75.10	70.10			
	76.00	70.00			
	75.80	70.50			
	74.80	71.00			
	72.50	71.00			
	71.50				
	71.10				
	70.30				
	70.10				
	70.00				
	70.40				
	71.00				
	70.90				

Table 4.2.12. (Cont'd)

Thermocouple No.							
8	9	10	11	12	13	14	15
83.00	82.80	82.70	83.50	83.70	82.20	84.00	83.80
84.00	84.50	82.70	83.50	83.70	83.00	83.00	83.70
77.00	83.50	74.50	82.60	85.00	84.50	84.50	84.00
64.50	71.50	63.70	71.00	77.70	81.50	83.20	85.00
61.80	63.30	61.80	63.20	68.00	72.40	75.00	80.20
62.00	62.00	62.00	62.00	63.00	65.10	67.10	72.60
62.50	62.50	62.50	62.50	62.50	62.50	62.90	66.20
62.50	63.00	63.00	63.00	63.00	62.50	62.50	63.10
62.50	63.00	62.80	63.00	63.40	63.00	63.00	63.00
62.80	62.80	62.70	62.80	63.40	63.20	63.10	63.20
62.00	62.00	62.00	62.10	62.40	62.00	62.00	62.10
62.00	62.10	62.00	62.10	62.70	62.50	62.50	63.00
62.00	62.50	62.50	63.00	63.00	63.00	62.80	63.20
62.00	62.50	62.20	62.50	63.00	62.60	62.70	63.00
61.90	62.10	62.00	62.50	62.50	62.40	62.30	62.90
62.00	62.00	62.00	62.10	62.50	62.40	62.40	63.00
62.00	62.00	62.10	62.10	62.50	62.40	62.40	63.00
61.50	61.80	61.50	61.80	62.00	62.00	62.10	62.80
61.00	61.00	61.00	61.20	61.50	61.50	61.40	62.00
61.20	61.10	61.20	61.20	61.50	61.20	61.20	61.70
62.70	62.60	62.70	62.90	63.00	63.00	63.00	63.20
63.50	63.50	63.50	63.90	64.00	63.80	63.80	64.20
64.00	64.10	64.10	64.20	64.50	64.50	64.50	65.00
64.90	64.80	65.00	65.00	65.40	65.30	65.30	65.80
65.70	65.70	65.70	65.80	66.00	65.80	65.80	66.50
67.50	67.50	67.50	67.50	68.00	67.50	67.70	68.50
68.40	66.70	66.50	66.50	66.80	66.80	66.80	68.00
71.00	67.20	67.50	67.10	67.40	67.40	67.40	68.70
70.10	65.10	67.00	65.10	65.40	65.40	65.40	67.00
69.70	63.80	67.00	64.00	64.00	64.00	64.00	65.00
69.00	62.00	66.80	62.20	62.10	62.00	62.00	63.60
68.20	60.40	66.10	60.60	60.60	60.40	60.40	61.60
67.90	59.80	66.00	60.00	60.00	59.70	59.80	60.70
67.90	59.50	66.00	59.90	59.90	59.40	59.40	60.40
68.20	60.00	66.50	60.00	60.00	59.40		60.10
68.10	61.80	66.50	59.90	59.90	59.40	59.30	60.80
68.20	63.10	66.70	60.00	60.00	59.40	59.30	60.80
68.60	63.60	67.00	60.00	60.00	59.60	59.30	61.00
68.40	63.20	66.50	60.20	58.80	58.40	59.60	60.00
69.60	64.60	67.80	62.00	58.90	58.40	58.20	60.00
70.20	65.80	68.50	64.00	60.00	58.20	58.20	61.20
70.70	66.70	69.00	65.10	60.60	60.00	59.20	61.60
70.20	66.20	68.70	65.00	59.80	59.30	60.00	61.00
69.80	66.22	68.50	65.50	59.80	59.30	59.00	61.00
68.30	66.20	67.00	64.50	58.50	58.00	59.10	59.80
67.40	64.70	66.10	63.80	57.90	57.20	58.00	59.00
65.90	63.20	64.80	62.80	56.30	55.90	57.10	57.80
65.50	63.10	64.50	62.80	56.40	55.80	55.90	57.50
65.50	63.10	64.50	62.80	56.40	55.80	55.80	57.50
66.60	64.00	65.50	63.60	57.00	56.00	55.60	58.00
69.00	64.50	67.70	65.00	58.40	57.50	56.00	59.30
70.70	67.00	69.10	66.50	59.00	58.50	57.50	60.10
71.00	67.00	69.10	66.30	57.40	56.40	58.10	58.50
71.70	68.00	70.00	67.80	58.50	56.60	56.00	59.10
72.60	69.50	71.20	69.00	61.00	57.20	56.30	60.10
72.00	69.00	70.80	69.00	62.30	57.30	57.20	60.30
72.10	69.10	71.00	69.00	63.00	57.00	57.00	

Table 4.2.12. (Cont'd)

Thermocouple No.							
8	9	10	11	12	13	14	15
73.20	70.50	72.10	70.50	65.00	58.00	57.00	60.00
71.20	69.20	70.50	69.20	64.40	56.80	59.00	61.00
70.00	68.10	69.50	68.20	63.80	55.90	56.50	59.60
68.00	66.60	67.30	66.60	63.00	54.40	56.00	58.70
66.50	65.10	66.00	65.20	61.90	53.00	55.50	57.10
65.00	64.10	65.00	64.20	61.20	52.00	55.10	55.50
65.40	64.30	65.00	64.70	61.50	53.00	55.10	54.80
67.60	66.20	67.00	66.60	63.70	56.60	56.00	54.80
70.00	63.60	69.50	68.90	65.70	59.20	58.50	56.80
72.00	70.20	71.30	70.50	67.10	61.00	60.50	58.20
72.40	70.80	71.80	71.00	67.50	61.00	62.00	59.60
73.00	71.80	72.50	71.80	68.50	62.20	62.00	59.10
75.00	73.10	74.10	73.50	70.00	64.00	63.00	60.20
75.00	73.70	74.20	73.80	71.00	65.00	64.60	61.50
76.00	74.00	75.70	75.00	72.30	66.50	65.50	62.00
75.50	75.00	75.50	75.30	73.00	67.70	67.00	63.00
73.00	73.00	73.00	73.00	71.50	67.00	68.00	63.40
71.90	71.80	72.00	72.00	70.50	66.30	67.00	62.00
71.60	71.80	71.80	72.00	70.50	66.60	66.50	61.00
71.00	71.00	71.00	71.00	70.10	66.50	66.70	61.30
70.50	70.50	70.80	70.80	70.00	66.60	66.70	61.10
70.50	70.50	70.80	70.80	70.00	67.00	66.70	61.20
70.80	70.80	71.00	71.00	70.50	67.40	67.00	61.20
71.00	71.10	71.50	71.60	71.00	68.00	67.40	61.60
71.00	71.00	71.20	71.50	71.00	68.00	68.00	62.00
						68.00	61.80

Appendix 4.2. Run Data (Cont'd)

TABLE 4.2.13

Initial condition, Run 6, 19:7:71, Sabel

Distance from air inlet, in.	Moisture content	
	% w.b.	% d.b.
1.4	39.9	66.4
4.2	40.6	68.3
7.0	40.5	68.2
9.8	41.0	69.4
12.6	39.8	66.1
15.3	41.1	69.9
18.1	38.6	62.8
20.9	39.0	63.9
23.7	34.6	52.8
26.5	38.0	61.4
29.3	37.1	59.1
32.0	36.2	56.8
34.8	37.2	59.3
37.6	37.8	60.9
Mean $\pm$ σ	38.7 $\pm$ 2.0	

TABLE 4.2.14

Final conditions

Distance from air inlet, in	Weight in layer, g.	Dry weight in layer g.	Moisture content		Mean Germination %
			% w.b.	% d.b.	
0.7	6220	5501	11.6	13.1	87
2.1	5840	5137	12.0	13.7	87
3.4	5750	5024	12.6	14.4	83
4.8	4550	3949	13.2	15.2	83
6.2	5835	4989	14.5	16.9	88
7.6	6560	5591	14.8	17.3	89
8.9	5595	4719	15.6	18.5	86
10.3	5740	4797	16.4	19.6	83
11.7	5015	4148	17.3	20.9	83
13.1	5295	4345	18.0	21.9	88
14.4	6025	4864	19.3	23.9	84
15.8	5960	4797	19.5	24.2	84
17.2	5905	4659	21.1	26.7	86
18.6	5255	4156	20.9	26.5	85
19.9	5370	4147	22.8	29.5	84
21.3	5475	4114	24.9	33.1	88
22.7	5715	4254	25.6	34.3	83
24.1	5300	3817	28.0	38.9	84
25.4	5835	4176	28.4	39.7	91
26.8	5935	4293	27.7	38.2	86
28.2	5035	3522	30.0	42.9	84
29.6	5235	3661	30.1	43.0	
30.9	5720	3997	30.1	43.1	83
32.3	4140	2751	33.6	50.5	

Total dry weight = 105412
Total wet weight = 133305

Mean moisture content = 26.5% d.b.

Table 4.2.15 Inlet air conditions, Run 6. 19:7:71 Sabel.

TIME,	AMBIENT CONDITIONS			INLET CONDITIONS	
HOURS	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
0.23	23.7	49.4	0.008887	24.2	47.9
0.95	23.7	47.2	0.008500	24.9	43.9
1.67	23.7	47.2	0.008500	25.3	42.9
2.39	23.4	46.9	0.008296	25.4	41.5
3.11	23.5	44.6	0.007935	25.4	39.7
3.83	23.3	48.3	0.008510	25.6	42.1
4.55	23.1	48.7	0.008474	25.4	42.3
5.27	22.3	51.0	0.008438	25.3	42.6
5.99	22.3	52.9	0.008754	25.1	44.8
6.71	22.3	53.3	0.008818	25.1	45.1
7.43	22.1	55.8	0.009142	25.0	46.9
8.15	22.0	55.7	0.009060	24.9	46.8
8.87	21.7	58.4	0.009326	24.5	49.2
9.59	21.8	59.4	0.009580	24.5	50.6
10.31	20.7	60.3	0.009081	24.2	48.9
11.03	20.8	58.8	0.008909	23.8	49.2
11.75	21.0	57.8	0.008840	23.7	49.1
12.47	19.4	62.9	0.008740	23.1	50.2
13.19	20.2	59.8	0.008687	22.9	50.4
13.91	19.6	61.3	0.008610	22.9	50.0
14.63	19.7	60.6	0.008564	22.8	50.2
15.35	19.9	59.5	0.008495	22.6	50.5
16.07	19.5	62.5	0.008717	22.7	51.4
16.79	21.3	58.1	0.009041	23.7	50.2
17.51	22.7	56.4	0.009562	25.1	48.8
18.23	23.7	53.0	0.009544	25.6	47.1
18.95	23.9	53.2	0.009719	25.7	47.7
19.67	23.4	54.1	0.009593	25.6	47.5
20.39	23.5	52.0	0.009283	25.6	45.9
21.11	23.5	52.8	0.009414	25.9	45.8
21.83	23.4	52.3	0.009263	26.0	44.7
22.55	23.9	51.4	0.009386	26.2	44.9
23.27	23.9	52.2	0.009562	26.4	45.1
23.99	23.9	52.2	0.009562	26.4	45.1
24.71	23.9	50.0	0.009122	26.2	43.6
25.43	23.8	51.3	0.009300	26.1	44.6
26.15	23.3	51.1	0.009025	26.0	43.6
26.87	23.1	53.4	0.009270	25.8	45.2
27.59	23.1	56.4	0.009797	25.7	48.1
28.31	22.8	58.8	0.010045	25.4	50.1
29.03	22.2	59.4	0.009811	25.2	49.7
29.75	21.8	61.4	0.009907	24.9	51.1
30.47	21.2	62.8	0.009726	24.7	50.6
31.19	21.3	61.3	0.009551	24.5	50.4
31.91	21.0	62.7	0.009602	24.2	51.5
32.63	20.4	64.2	0.009512	23.9	51.9
33.35	19.4	65.9	0.009171	23.5	51.4
34.07	20.3	63.7	0.009327	23.3	52.8
34.79	19.9	65.9	0.009425	23.3	53.4
35.51	19.9	65.0	0.009299	23.2	53.0
36.23	20.6	63.9	0.009530	23.3	54.0
36.95	20.4	64.7	0.009575	23.3	54.2
37.67	20.3	66.3	0.009749	23.4	55.0
38.39	20.8	66.3	0.010059	23.6	56.0
39.11	21.0	68.1	0.010450	23.5	58.5

Table 4.2.15 Contd.

TIME, HOURS	AMBIENT CONDITIONS TEMP. DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	INLET CONDITIONS TEMP. DEG C	RELATIVE HUMIDITY %
39.83	21.1	68.6	0.010603	23.7	58.7
40.55	21.7	65.4	0.010423	23.9	57.1
41.27	21.7	64.9	0.010372	24.4	54.9
41.99	21.8	64.6	0.010437	24.7	54.3
42.71	22.3	61.0	0.010119	24.8	52.5
43.43	22.5	59.7	0.010027	25.1	51.2
44.15	22.4	61.1	0.010206	25.3	51.2
44.87	22.8	58.8	0.010045	25.6	49.7
45.59	23.2	56.5	0.009884	25.8	48.3
46.31	22.9	57.0	0.009799	25.9	47.4
47.03	22.8	59.2	0.010112	25.6	49.8
47.75	22.6	59.0	0.009981	25.6	49.4
48.47	22.2	61.4	0.010142	25.5	51.1
49.19	21.7	64.5	0.010306	24.8	53.3
49.91	20.6	66.9	0.009980	24.1	53.8
50.63	21.1	61.5	0.009450	23.4	51.9
51.35	20.6	62.7	0.009379	23.6	52.2
52.07	19.1	65.6	0.008939	23.1	51.5
52.79	19.8	62.8	0.008948	22.9	51.9
53.51	18.8	65.4	0.008749	22.6	51.7
54.23	18.6	64.3	0.008478	22.2	51.3
54.95	19.2	63.1	0.008649	22.4	51.9
55.67	18.3	65.8	0.008496	22.2	51.7
56.39	18.3	65.8	0.008496	21.9	52.6
57.11	18.0	65.5	0.008314	21.8	51.8
57.83	17.8	66.8	0.008383	21.8	52.1
58.55	18.4	65.9	0.008570	21.6	54.1
59.27	19.3	65.8	0.009054	22.0	55.6
59.99	21.4	60.2	0.009482	23.6	52.8
60.71	22.7	54.1	0.009212	24.6	48.3
MEAN	21.5	59.0	0.009308	24.3	47.7
STANDARD DEVIATION		0.00062066	1.28	3.99	

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.01	23.6	0.02	26.6	0.03	27.4	0.04	28.3	0.05	28.4	0.06	28.4	0.07	28.1
0.73	20.3	0.74	15.7	0.75	18.7	0.76	24.5	0.77	25.2	0.78	26.1	0.79	27.2
1.45	22.2	1.46	14.9	1.47	15.1	1.48	16.3	1.49	16.9	1.50	17.8	1.51	19.4
2.17	23.0	2.18	14.9	2.19	14.9	2.20	15.1	2.21	15.2	2.22	15.4	2.23	15.7
2.89	23.6	2.90	15.2	2.91	15.0	2.92	15.0	2.93	15.0	2.94	15.1	2.95	15.2
3.61	24.2	3.62	20.8	3.63	14.9	3.64	14.9	3.65	14.9	3.66	14.9	3.67	14.9
4.33	24.1	4.34	22.3	4.35	16.3	4.36	15.2	4.37	15.2	4.38	15.2	4.39	15.2
5.05	24.2	5.06	22.6	5.07	20.0	5.08	15.4	5.09	15.4	5.10	15.4	5.11	15.4
5.77	23.7	5.78	22.4	5.79	20.8	5.80	15.5	5.81	15.5	5.82	15.5	5.83	15.5
6.49	23.9	6.50	22.8	6.51	21.4	6.52	15.9	6.53	15.8	6.54	15.8	6.55	15.9
7.21	23.8	7.22	22.8	7.23	21.6	7.24	16.8	7.25	16.1	7.26	16.1	7.27	16.1
7.93	23.7	7.94	22.7	7.95	21.7	7.96	18.7	7.97	16.7	7.98	16.5	7.99	16.4
8.65	22.3	8.66	21.4	8.67	20.5	8.68	18.3	8.69	16.8	8.70	15.4	8.71	15.4
9.37	22.2	9.38	21.3	9.39	20.4	9.40	18.7	9.41	17.9	9.42	15.6	9.43	15.6
10.09	23.1	10.10	22.2	10.11	21.1	10.12	19.4	10.13	18.8	10.14	16.3	10.15	16.1
10.81	22.7	10.82	22.0	10.83	21.2	10.84	19.4	10.85	18.9	10.86	16.8	10.87	15.8
11.53	22.7	11.54	21.9	11.55	21.1	11.56	19.4	11.57	19.0	11.58	17.6	11.59	15.8
12.25	22.3	12.26	21.6	12.27	20.7	12.28	19.4	12.29	18.9	12.30	17.9	12.31	15.8
12.97	21.7	12.98	21.1	12.99	20.2	13.00	19.1	13.01	18.7	13.02	17.9	13.03	16.1
13.69	21.8	13.70	21.0	13.71	20.3	13.72	18.9	13.73	18.7	13.74	17.9	13.75	16.7
14.41	21.4	14.42	20.9	14.43	20.1	14.44	18.8	14.45	18.6	14.46	17.8	14.47	16.8
15.13	21.2	15.14	20.7	15.15	19.9	15.16	18.8	15.17	18.5	15.18	17.8	15.19	17.1
15.85	21.3	15.86	20.8	15.87	20.1	15.88	18.9	15.89	18.7	15.90	18.1	15.91	17.4
16.57	22.2	16.58	21.3	16.59	20.4	16.60	19.1	16.61	18.9	16.62	18.4	16.63	17.8
17.29	23.5	17.30	22.6	17.31	21.5	17.32	19.9	17.33	19.6	17.34	18.9	17.35	18.2
18.01	24.0	18.02	23.0	18.03	22.1	18.04	20.6	18.05	20.2	18.06	19.6	18.07	18.8
18.73	24.2	18.74	23.3	18.75	22.3	18.76	20.7	18.77	20.3	18.78	19.6	18.79	18.9
19.45	25.4	19.46	24.7	19.47	23.8	19.48	22.2	19.49	21.8	19.50	21.1	19.51	20.4
20.17	25.5	20.18	24.6	20.19	23.7	20.20	22.3	20.21	22.1	20.22	21.4	20.23	20.7
20.89	24.6	20.90	23.7	20.91	22.7	20.92	21.3	20.93	20.8	20.94	20.2	20.95	19.7
21.61	24.8	21.62	23.9	21.63	23.1	21.64	21.6	21.65	21.2	21.66	20.5	21.67	19.9
22.33	24.7	22.34	23.9	22.35	23.1	22.36	21.6	22.37	21.4	22.38	20.7	22.39	20.1

Table 4.2.16 Layer temperatures, °C, Run 6. 19:7:71 Sabel.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
23.05	24.9	23.06	24.2	23.07	23.2	23.08	21.7	23.09	21.5	23.10	20.8	23.11	20.2
23.77	24.9	23.78	24.2	23.79	23.2	23.80	21.9	23.81	21.6	23.82	20.9	23.83	20.4
24.49	24.8	24.50	24.1	24.51	23.2	24.52	21.6	24.53	21.4	24.54	20.8	24.55	20.2
25.21	24.7	25.22	24.1	25.23	23.1	25.24	21.6	25.25	21.3	25.26	20.7	25.27	20.1
25.93	24.8	25.94	23.9	25.95	23.1	25.96	21.7	25.97	21.4	25.98	20.9	25.99	20.3
26.65	24.6	26.66	24.1	26.67	23.3	26.68	21.9	26.69	21.7	26.70	21.1	26.71	20.4
27.37	24.4	27.38	23.9	27.39	23.3	27.40	22.2	27.41	21.9	27.42	21.3	27.43	20.8
28.09	24.3	28.10	23.8	28.11	23.3	28.12	22.2	28.13	21.9	28.14	21.4	28.15	21.0
28.81	24.0	28.82	23.4	28.83	22.9	28.84	22.0	28.85	21.8	28.86	21.2	28.87	20.9
29.53	23.7	29.54	23.4	29.55	22.8	29.56	21.9	29.57	21.7	29.58	21.2	29.59	20.8
30.25	23.6	30.26	23.2	30.27	22.6	30.28	21.6	30.29	21.3	30.30	20.9	30.31	20.4
30.97	23.3	30.98	23.0	30.99	22.4	31.00	21.5	31.01	21.3	31.02	20.8	31.03	20.4
31.69	23.1	31.70	22.7	31.71	22.1	31.72	21.2	31.73	21.1	31.74	20.6	31.75	20.2
32.41	22.9	32.42	22.5	32.43	22.1	32.44	21.2	32.45	20.9	32.46	20.6	32.47	20.2
33.13	22.6	33.14	22.3	33.15	21.8	33.16	21.1	33.17	20.8	33.18	20.4	33.19	20.1
33.85	21.9	33.86	21.6	33.87	21.2	33.88	20.6	33.89	20.4	33.90	19.9	33.91	19.6
34.57	22.2	34.58	21.9	34.59	21.6	34.60	20.7	34.61	20.4	34.62	20.0	34.63	19.8
35.29	22.3	35.30	21.8	35.31	21.6	35.32	20.7	35.33	20.5	35.34	20.2	35.35	19.9
36.01	22.1	36.02	21.8	36.03	21.4	36.04	20.7	36.05	20.5	36.06	20.2	36.07	19.8
36.73	22.3	36.74	22.1	36.75	21.7	36.76	20.8	36.77	20.7	36.78	20.4	36.79	20.1
37.45	22.3	37.46	22.1	37.47	21.8	37.48	20.9	37.49	20.8	37.50	20.4	37.51	20.1
38.17	22.3	38.18	22.2	38.19	22.0	38.20	21.2	38.21	21.0	38.22	20.8	38.23	20.3
38.89	22.4	38.90	22.3	38.91	22.1	38.92	21.5	38.93	21.3	38.94	20.9	38.95	20.6
39.61	22.4	39.62	22.2	39.63	21.9	39.64	21.4	39.65	21.2	39.66	20.9	39.67	20.6
40.33	22.6	40.34	22.4	40.35	22.0	40.36	21.3	40.37	21.1	40.38	20.9	40.39	20.6
41.05	23.2	41.06	22.8	41.07	22.4	41.08	21.5	41.09	21.3	41.10	20.8	41.11	20.5
41.77	23.4	41.78	23.1	41.79	22.7	41.80	21.9	41.81	21.7	41.82	21.2	41.83	20.8
42.49	23.6	42.50	23.3	42.51	22.8	42.52	21.9	42.53	21.8	42.54	21.3	42.55	20.9
43.21	23.7	43.22	23.4	43.23	23.0	43.24	22.0	43.25	21.8	43.26	21.3	43.27	21.0
43.93	24.1	43.94	23.8	43.95	23.3	43.96	22.3	43.97	22.1	43.98	21.7	43.99	21.2
44.65	24.1	44.66	24.0	44.67	23.6	44.68	22.6	44.69	22.4	44.70	21.9	44.71	21.5
45.37	25.6	45.38	25.2	45.39	24.8	45.40	23.7	45.41	23.5	45.42	23.2	45.43	22.7

Table 4.2.16 Contd.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
46.09	25.8	46.10	25.6	46.11	25.1	46.12	24.1	46.13	23.9	46.14	23.7	46.15	23.2
46.81	25.6	46.82	25.5	46.83	25.2	46.84	24.3	46.85	24.2	46.86	23.9	46.87	23.4
47.53	25.6	47.54	25.4	47.55	25.1	47.56	24.3	47.57	24.1	47.58	24.0	47.59	23.7
48.25	25.4	48.26	25.2	48.27	25.1	48.28	24.2	48.29	24.1	48.30	24.1	48.31	23.6
48.97	25.1	48.98	24.9	48.99	24.7	49.00	24.0	49.01	23.8	49.02	23.9	49.03	23.7
49.69	24.7	49.70	24.4	49.71	24.3	49.72	23.7	49.73	23.5	49.74	23.6	49.75	23.3
50.41	23.9	50.42	23.7	50.43	23.5	50.44	22.9	50.45	22.8	50.46	22.9	50.47	22.7
51.13	23.9	51.14	23.7	51.15	23.5	51.16	22.8	51.17	22.7	51.18	22.9	51.19	22.5
51.85	23.5	51.86	23.3	51.87	23.1	51.88	22.5	51.89	22.4	51.90	22.5	51.91	22.2
52.57	23.1	52.58	22.9	52.59	22.7	52.60	22.1	52.61	22.0	52.62	22.2	52.63	21.8
53.29	22.9	53.30	22.7	53.31	22.6	53.32	21.9	53.33	21.8	53.34	21.9	53.35	21.6
54.01	22.7	54.02	22.6	54.03	22.3	54.04	21.7	54.05	21.7	54.06	21.8	54.07	21.7
54.73	22.6	54.74	22.3	54.75	22.1	54.76	21.6	54.77	21.6	54.78	21.7	54.79	21.4
55.45	22.3	55.46	22.2	55.47	22.2	55.48	21.6	55.49	21.5	55.50	21.7	55.51	21.4
56.17	22.0	56.18	21.9	56.19	21.8	56.20	21.2	56.21	21.2	56.22	21.4	56.23	21.2
56.89	21.9	56.90	21.8	56.91	21.6	56.92	21.1	56.93	21.0	56.94	21.3	56.95	20.9
57.61	21.7	57.62	21.6	57.63	21.6	57.64	21.0	57.65	20.9	57.66	21.1	57.67	20.9
58.33	21.7	58.34	21.5	58.35	21.4	58.36	21.0	58.37	20.9	58.38	21.1	58.39	20.9
59.05	22.0	59.06	21.8	59.07	21.7	59.08	21.3	59.09	21.2	59.10	21.4	59.11	21.2
59.77	23.4	59.78	23.0	59.79	22.8	59.80	22.1	59.81	22.0	59.82	22.1	59.83	21.8
60.49	24.4	60.50	23.9	60.51	23.6	60.52	22.8	60.53	22.7	60.54	22.9	60.55	22.4

Table 4.2.16 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.08	28.6	0.09	28.3	0.10	27.2	0.11	27.3	0.12	27.8	0.13	27.8	0.14	28.1
0.80	28.6	0.81	28.9	0.82	28.5	0.83	28.7	0.84	28.2	0.85	28.2	0.86	28.1
1.52	24.3	1.53	27.2	1.54	24.5	1.55	27.2	1.56	28.6	1.57	28.6	1.58	28.7
2.24	18.4	2.25	21.6	2.26	18.9	2.27	21.7	2.28	26.2	2.29	25.2	2.30	27.0
2.96	15.9	2.97	17.3	2.98	16.3	2.99	17.6	3.00	21.7	3.01	20.6	3.02	23.2
3.68	15.0	3.69	15.1	3.70	15.1	3.71	15.1	3.72	15.1	3.73	15.1	3.74	16.0
4.40	15.5	4.41	15.6	4.42	15.6	4.43	15.6	4.44	15.6	4.45	15.6	4.46	16.3
5.12	15.5	5.13	15.7	5.14	15.7	5.15	15.7	5.16	15.6	5.17	15.6	5.18	16.2
5.84	15.7	5.85	15.8	5.86	16.0	5.87	15.9	5.88	15.7	5.89	15.7	5.90	16.4
6.56	16.1	6.57	16.2	6.58	16.2	6.59	16.2	6.60	16.0	6.61	15.9	6.62	16.8
7.28	16.3	7.29	16.4	7.30	16.4	7.31	16.4	7.32	16.2	7.33	16.2	7.34	16.9
8.00	15.8	8.01	15.9	8.02	15.9	8.03	15.9	8.04	15.7	8.05	15.6	8.06	16.3
8.72	15.6	8.73	15.7	8.74	15.7	8.75	15.7	8.76	15.7	8.77	15.7	8.78	16.3
9.44	15.6	9.45	15.7	9.46	15.7	9.47	15.8	9.48	15.5	9.49	15.6	9.50	16.2
10.16	16.3	10.17	16.7	10.18	16.7	10.19	16.7	10.20	16.7	10.21	16.7	10.22	17.3
10.88	15.8	10.89	16.0	10.90	16.1	10.91	16.1	10.92	16.0	10.93	15.9	10.94	16.6
11.60	15.8	11.61	15.9	11.62	15.9	11.63	16.0	11.64	15.9	11.65	15.9	11.66	16.4
12.32	15.8	12.33	15.9	12.34	15.8	12.35	15.8	12.36	15.8	12.37	15.8	12.38	16.3
13.04	15.4	13.05	15.5	13.06	15.5	13.07	15.6	13.08	15.5	13.09	15.5	13.10	16.1
13.76	15.3	13.77	15.3	13.78	15.4	13.79	15.4	13.80	15.2	13.81	15.2	13.82	15.7
14.48	15.2	14.49	15.2	14.50	15.2	14.51	15.2	14.52	15.2	14.53	15.2	14.54	15.7
15.20	15.1	15.21	15.1	15.22	15.1	15.23	15.0	15.24	14.9	15.25	14.9	15.26	15.4
15.92	15.2	15.93	15.2	15.94	15.2	15.95	15.2	15.96	14.8	15.97	14.9	15.98	15.4
16.64	15.6	16.65	15.6	16.66	15.6	16.67	15.6	16.68	15.2	16.69	15.2	16.70	15.9
17.36	16.1	17.37	16.1	17.38	16.1	17.39	16.1	17.40	15.7	17.41	15.7	17.42	16.4
18.08	16.6	18.09	16.6	18.10	16.6	18.11	16.6	18.12	16.5	18.13	16.4	18.14	17.1
18.80	16.4	18.81	16.4	18.82	16.5	18.83	16.6	18.84	16.5	18.85	16.5	18.86	17.2
19.52	17.6	19.53	17.6	19.54	17.6	19.55	17.6	19.56	17.4	19.57	17.4	19.58	18.1
20.24	17.7	20.25	17.7	20.26	17.7	20.27	17.7	20.28	17.6	20.29	17.6	20.30	18.3
20.96	16.8	20.97	16.7	20.98	16.7	20.99	16.7	21.00	16.5	21.01	16.5	21.02	17.3
21.68	17.0	21.69	16.8	21.70	16.8	21.71	16.8	21.72	16.6	21.73	16.6	21.74	17.4
22.40	17.3	22.41	16.9	22.42	16.9	22.43	16.9	22.44	16.7	22.45	16.7	22.46	17.4

Table 4.2.16 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
23.12	17.8	23.13	17.1	23.14	17.1	23.15	17.1	23.16	16.6	23.17	16.6	23.18	17.6
23.84	18.1	23.85	17.1	23.86	17.1	23.87	17.1	23.88	16.8	23.89	16.8	23.90	17.6
24.56	18.1	24.57	16.8	24.58	16.8	24.59	16.8	24.60	16.7	24.61	16.7	24.62	17.5
25.28	17.9	25.29	16.6	25.30	16.6	25.31	16.6	25.32	16.3	25.33	16.3	25.34	17.2
26.00	18.2	26.01	16.6	26.02	16.6	26.03	16.6	26.04	16.3	26.05	16.3	26.06	17.2
26.72	18.5	26.73	16.6	26.74	16.8	26.75	16.6	26.76	16.3	26.77	16.3	26.78	17.1
27.44	19.0	27.45	16.9	27.46	17.2	27.47	16.9	27.48	16.6	27.49	16.6	27.50	17.4
28.16	19.4	28.17	17.2	28.18	17.7	28.19	17.2	28.20	17.0	28.21	17.0	28.22	17.8
28.88	19.5	28.89	17.4	28.90	18.1	28.91	17.5	28.92	17.2	28.93	17.2	28.94	18.1
29.60	19.6	29.61	17.3	29.62	18.3	29.63	17.4	29.64	17.1	29.65	17.1	29.66	17.8
30.32	19.2	30.33	17.0	30.34	18.0	30.35	17.1	30.36	16.8	30.37	16.8	30.38	17.8
31.04	19.2	31.05	16.8	31.06	18.1	31.07	16.8	31.08	16.7	31.09	16.6	31.10	17.4
31.76	18.9	31.77	16.6	31.78	17.8	31.79	16.7	31.80	16.5	31.81	16.4	31.82	17.3
32.48	18.9	32.49	16.4	32.50	17.8	32.51	16.7	32.52	16.1	32.53	16.1	32.54	17.1
33.20	18.8	33.21	16.3	33.22	17.9	33.23	16.6	33.24	16.2	33.25	16.1	33.26	17.0
33.92	18.5	33.93	15.9	33.94	17.5	33.95	16.1	33.96	15.7	33.97	15.7	33.98	16.7
34.64	18.8	34.65	16.1	34.66	17.7	34.67	16.2	34.68	15.8	34.69	15.8	34.70	16.6
35.36	18.7	35.37	16.3	35.38	17.9	35.39	16.3	35.40	15.9	35.41	15.9	35.42	16.8
36.08	18.7	36.09	16.4	36.10	17.9	36.11	16.3	36.12	15.8	36.13	15.8	36.14	16.7
36.80	18.9	36.81	16.7	36.82	18.1	36.83	16.5	36.84	15.9	36.85	15.9	36.86	16.8
37.52	19.1	37.53	16.9	37.54	18.2	37.55	16.7	37.56	16.1	37.57	16.1	37.58	17.0
38.24	19.3	38.25	17.2	38.26	18.4	38.27	17.0	38.28	16.3	38.29	16.3	38.30	17.1
38.96	19.6	38.97	17.7	38.98	18.8	38.99	17.6	39.00	16.5	39.01	16.5	39.02	16.9
39.68	19.7	39.69	18.1	39.70	18.9	39.71	17.8	39.72	16.8	39.73	16.8	39.74	17.3
40.40	19.7	40.41	18.1	40.42	19.1	40.43	17.9	40.44	17.0	40.45	17.0	40.46	17.6
41.12	19.6	41.13	18.1	41.14	18.9	41.15	18.1	41.16	16.9	41.17	16.9	41.18	17.6
41.84	19.7	41.85	18.2	41.86	18.9	41.87	18.2	41.88	17.0	41.89	17.0	41.90	17.6
42.56	19.8	42.57	18.2	42.58	18.9	42.59	18.3	42.60	16.9	42.61	16.9	42.62	17.7
43.28	19.8	43.29	18.1	43.30	18.8	43.31	18.1	43.32	16.8	43.33	16.8	43.34	17.4
44.00	19.9	44.01	18.2	44.02	19.0	44.03	18.1	44.04	16.9	44.05	16.9	44.06	17.5
44.72	20.2	44.73	18.4	44.74	19.2	44.75	18.3	44.76	16.8	44.77	16.8	44.78	17.7
45.44	21.1	45.45	19.3	45.46	20.0	45.47	18.9	45.48	18.0	45.49	17.8	45.50	18.9

Table 4.2.16 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
46.16	21.4	46.17	19.6	46.18	20.4	46.19	19.2	46.20	18.2	46.21	18.1	46.22	18.8
46.88	21.8	46.89	19.9	46.90	20.6	46.91	19.4	46.92	18.2	46.93	18.0	46.94	19.1
47.60	22.3	47.61	20.2	47.62	20.9	47.63	19.8	47.64	18.6	47.65	18.4	47.66	19.1
48.32	22.1	48.33	20.3	48.34	20.9	48.35	19.9	48.36	18.7	48.37	18.3	48.38	19.3
49.04	22.2	49.05	20.4	49.06	21.0	49.07	19.9	49.08	18.5	49.09	18.4	49.10	19.4
49.76	22.0	49.77	20.4	49.78	20.9	49.79	19.8	49.80	18.4	49.81	18.2	49.82	19.8
50.48	21.4	50.49	19.9	50.50	20.4	50.51	19.6	50.52	17.9	50.53	17.8	50.54	18.6
51.20	21.3	51.21	19.3	51.22	20.1	51.23	19.4	51.24	17.7	51.25	17.5	51.26	17.9
51.92	21.0	51.93	19.6	51.94	20.0	51.95	19.1	51.96	17.3	51.97	17.1	51.98	17.8
52.64	20.7	52.65	19.2	52.66	19.6	52.67	18.9	52.68	16.8	52.69	16.6	52.70	17.4
53.36	20.4	53.37	19.1	53.38	19.4	53.39	18.6	53.40	16.6	53.41	16.3	53.42	17.1
54.08	20.4	54.09	19.2	54.10	19.4	54.11	18.6	54.12	16.3	54.13	16.1	54.14	16.8
54.80	20.3	54.81	18.9	54.82	19.3	54.83	18.6	54.84	16.2	54.85	15.9	54.86	16.6
55.52	20.3	55.53	19.1	55.54	19.3	55.55	18.7	55.56	16.2	55.57	16.0	55.58	16.5
56.24	20.1	56.25	18.9	56.26	19.2	56.27	18.5	56.28	15.9	56.29	15.9	56.30	16.4
56.96	19.9	56.97	18.8	56.98	18.9	56.99	18.3	57.00	15.8	57.01	15.7	57.02	16.3
57.68	19.8	57.69	18.7	57.70	18.9	57.71	18.3	57.72	15.6	57.73	15.4	57.74	16.1
58.40	19.8	58.41	18.7	58.42	19.1	58.43	18.3	58.44	15.5	58.45	15.6	58.46	15.9
59.12	20.2	59.13	19.0	59.14	19.4	59.15	18.6	59.16	15.7	59.17	16.0	59.18	16.3
59.84	20.8	59.85	19.6	59.86	19.8	59.87	19.1	59.88	16.3	59.89	16.8	59.90	16.9
60.56	21.3	60.57	20.1	60.58	20.6	60.59	19.8	60.60	17.1	60.61	17.7	60.62	17.7

Table 4.2.16 Contd.

Appendix 4.2. Run Data (Cont'd)

TABLE 4.2.17

Initial conditions, Run 7, 22:7:71 Sabel

Distance from air inlet, in	Moisture content	
	% w.b.	% d.b.
1.5	33.8	51.1
4.5	34.2	51.8
7.5	33.6	50.6
10.5	34.3	52.2
13.5	31.1	45.2
16.5	33.1	49.5
19.5	32.8	48.7
22.5	33.0	49.2
25.5	33.3	50.0
28.5	32.5	48.2
31.5	31.2	45.4
34.5	31.4	45.8
37.5	34.8	53.5
Mean ± σ	32.9 ± 1.1	

TABLE 4.2.18

Final conditions

Distance from air inlet, in	Weight in layer, g	Dry weight in layer, g	Moisture content		Mean Germination %
			% w.b.	% d.b.	
0.6	4165	3987	4.3	4.5	83
1.8	5005	4803	4.0	4.2	83
3.1	4935	4735	4.1	4.2	87
4.3	5040	4830	4.2	4.4	87
5.5	4870	4663	4.3	4.4	89
6.7	4990	4769	4.4	4.6	88
7.9	4820	4598	4.6	4.8	83
9.2	5020	4780	4.8	5.0	89
11.0	10185	9653	5.2	5.5	83
12.8	4885	4599	5.9	6.2	86
14.1	5595	5183	7.4	7.9	85
15.3	5215	4733	9.3	10.2	89
16.5	5030	4453	11.5	13.0	81
17.7	4695	4081	13.1	15.0	90
18.9	5165	.4369	15.4	18.2	86
20.2	5085	4109	19.2	23.7	89
21.4	4835	3718	23.1	30.0	82
22.6	5290	4015	24.1	31.8	88
23.8	4765	3511	26.3	35.7	
25.1	4210	3144	25.3	33.9	88
26.3	4820	3560	26.1	35.4	
27.5	4205	3058	27.3	37.5	87
28.7	5255	3737	28.9	40.6	
29.9	4815	3473	27.9	38.6	85
31.2	4495	3178	29.3	41.4	
32.4	4390	3019	31.2	45.4	89

Total wet weight = 131780 g
Total dry weight = 112759.6 g Mean moisture content = 16.86 % d.b.

Table 4.2.19 Inlet air conditions, Run 7. 22:7:71 Sabel

TIME.	AMBIENT CONDITIONS			INLET CONDITIONS	
HOURS	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
0.23	25.7	48.9	0.009934	56.4	9.6
0.47	25.6	51.1	0.010118	56.3	9.8
0.71	25.7	49.4	0.010072	56.2	9.8
0.95	25.7	49.6	0.010072	55.5	10.1
1.19	25.1	48.9	0.009572	55.9	9.5
1.43	25.1	48.9	0.009572	56.2	9.3
1.67	25.2	51.0	0.010072	56.1	9.8
1.91	24.9	52.5	0.010302	55.8	10.2
2.15	25.1	53.7	0.010534	56.0	10.4
2.39	25.2	55.6	0.010951	55.7	10.9
2.63	25.2	54.9	0.010836	55.7	10.9
2.87	25.2	55.6	0.011025	55.7	11.0
3.11	25.4	55.8	0.011177	55.7	11.1
3.35	25.3	56.4	0.011219	55.6	11.2
3.59	25.2	57.0	0.011265	55.9	11.1
3.83	25.3	56.0	0.011143	56.1	10.9
4.07	24.9	56.0	0.010884	55.6	10.9
4.31	24.7	56.1	0.010765	55.7	10.7
4.55	24.3	58.5	0.010927	55.3	11.1
4.79	24.6	56.5	0.010789	55.3	11.0
5.03	24.7	56.1	0.010736	55.2	11.0
5.27	24.5	56.0	0.010625	56.2	10.3
5.51	24.4	57.0	0.010741	55.8	10.6
5.75	24.4	56.7	0.010718	55.7	10.7
5.99	24.2	58.2	0.010834	56.0	10.7
6.23	24.3	57.3	0.010764	55.8	10.7
6.47	24.6	57.2	0.010920	54.9	11.3
6.71	24.1	60.3	0.011160	55.5	11.2
6.95	23.9	60.9	0.011158	56.0	11.0
7.19	24.2	59.4	0.011080	55.5	11.2
7.43	24.1	59.6	0.011066	56.0	11.0
7.67	23.9	60.6	0.011135	55.7	11.1
7.91	23.6	63.7	0.011439	55.1	11.7
8.15	23.7	61.1	0.011041	56.1	10.9
8.39	23.7	61.9	0.011181	55.4	11.3
8.63	24.1	60.0	0.011137	55.6	11.1
8.87	23.8	61.3	0.011132	55.2	11.4
9.11	23.3	61.6	0.011252	56.2	10.9
9.35	23.7	61.2	0.011093	55.9	11.0
9.59	23.2	62.3	0.010947	55.4	11.0
9.83	23.5	62.9	0.011250	55.2	11.5
10.07	23.3	63.1	0.011133	55.9	11.6
10.31	22.9	62.8	0.010857	55.1	11.1
10.55	23.3	61.6	0.010902	56.2	10.6
10.79	21.9	66.4	0.010794	55.1	11.0
11.03	23.4	60.1	0.010672	55.9	10.5
11.27	23.0	61.3	0.010628	55.3	10.8
11.51	23.1	61.8	0.010787	56.0	10.6
11.75	23.2	61.4	0.010764	56.1	10.5
11.99	23.5	61.9	0.010902	56.2	10.6
12.23	22.4	62.8	0.010519	56.0	10.3
12.47	22.7	62.2	0.010562	55.9	10.4
12.71	22.8	60.7	0.010381	55.2	10.6
12.95	22.8	60.3	0.010313	55.5	10.4
13.19	22.3	62.2	0.010310	55.7	10.3

Table 4.2.19 Contd.

TIME,	AMBIENT CONDITIONS			INLET CONDITIONS	
HOURS	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
13.43	22.4	62.7	0.010475	55.2	10.7
13.67	22.3	62.7	0.010430	55.6	10.5
13.91	21.9	64.3	0.010458	54.9	10.8
14.15	21.9	64.3	0.010458	55.0	10.8
14.39	22.4	62.7	0.010475	54.9	10.9
14.63	22.5	63.2	0.010631	55.0	11.0
14.87	22.9	62.0	0.010674	55.3	10.8
15.11	23.3	61.8	0.010764	55.4	10.9
15.35	23.7	61.9	0.010671	55.3	10.9
15.59	24.3	59.4	0.010974	55.7	10.9
15.83	24.2	59.6	0.010950	55.9	10.8
16.07	24.4	58.1	0.010951	55.9	10.8
16.31	24.7	58.0	0.011117	56.1	10.8
16.55	24.9	56.1	0.010931	56.1	10.7
16.79	24.2	58.3	0.010980	55.4	11.0
17.03	24.5	57.1	0.010835	55.7	10.8
17.27	24.8	58.4	0.011234	56.1	11.0
17.51	24.9	54.7	0.011025	56.0	10.3
17.75	24.9	55.3	0.010743	56.2	10.4
17.99	24.8	57.0	0.011048	55.5	11.1
18.23	25.1	54.4	0.010674	55.7	10.6
18.47	25.3	53.9	0.010722	56.3	10.4
18.71	25.0	56.5	0.011050	55.5	11.1
18.95	25.0	55.1	0.010737	55.9	10.6
19.19	24.9	56.0	0.010884	56.1	10.6
19.43	24.3	56.9	0.010837	56.1	10.6
19.67	25.0	55.4	0.010938	55.6	10.9
19.91	25.0	55.4	0.010938	56.1	10.6
20.15	25.2	55.6	0.011028	55.6	11.0
20.39	25.2	54.9	0.010839	55.3	11.0
20.63	23.9	58.8	0.010396	56.1	10.2
20.87	24.9	56.4	0.011002	55.4	11.1
21.11	25.6	53.6	0.010867	55.7	10.8
21.35	24.7	55.1	0.010556	30.0	40.2
MEAN	24.2	58.0	0.010780	55.4	11.1
Standard deviation			0.00035927	2.75	3.15

3		4		5		6		7		8		9	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.01	50.5	0.02	24.4	0.03	24.6	0.04	24.2	0.05	24.3	0.06	25.6	0.07	24.9
0.25	52.1	0.26	25.3	0.27	25.3	0.28	24.8	0.29	25.1	0.30	25.6	0.31	25.4
0.49	52.3	0.50	30.9	0.51	25.9	0.52	25.5	0.53	25.7	0.54	26.2	0.55	26.1
0.73	52.9	0.74	36.4	0.75	26.0	0.76	25.7	0.77	25.9	0.78	26.6	0.79	26.3
0.97	52.8	0.98	38.4	0.99	26.1	1.00	25.8	1.01	25.8	1.02	26.6	1.03	26.4
1.21	53.1	1.22	39.5	1.23	26.2	1.24	25.7	1.25	25.7	1.26	26.6	1.27	26.3
1.45	53.7	1.46	39.3	1.47	28.0	1.48	25.7	1.49	25.8	1.50	26.4	1.51	26.2
1.69	53.5	1.70	40.6	1.71	31.1	1.72	25.9	1.73	25.9	1.74	26.6	1.75	26.4
1.93	53.5	1.94	41.3	1.95	33.2	1.96	26.2	1.97	26.2	1.93	26.9	1.99	26.6
2.17	53.3	2.18	41.8	2.19	34.4	2.20	26.2	2.21	26.2	2.22	26.9	2.23	26.7
2.41	53.5	2.42	42.4	2.43	35.2	2.44	26.3	2.45	26.8	2.46	27.4	2.47	27.2
2.65	53.5	2.66	43.0	2.67	35.7	2.68	26.7	2.69	26.7	2.70	27.4	2.71	27.1
2.89	53.6	2.90	43.7	2.91	36.3	2.92	26.7	2.93	26.7	2.94	27.4	2.95	27.1
3.13	53.6	3.14	44.2	3.15	36.9	3.16	26.8	3.17	27.1	3.18	27.4	3.19	27.2
3.37	53.5	3.38	44.9	3.39	37.4	3.40	26.9	3.41	28.1	3.42	27.4	3.43	27.3
3.61	53.7	3.62	45.6	3.63	37.8	3.64	26.9	3.65	29.7	3.66	27.4	3.67	27.3
3.85	53.7	3.86	46.1	3.87	38.2	3.88	26.8	3.89	30.8	3.90	27.3	3.91	27.2
4.09	53.7	4.10	46.8	4.11	38.7	4.12	26.8	4.13	31.6	4.14	27.2	4.15	27.1
4.33	53.6	4.34	47.4	4.35	39.1	4.36	27.2	4.37	32.1	4.38	27.2	4.39	26.9
4.57	53.4	4.58	48.2	4.59	39.6	4.60	27.9	4.61	32.7	4.62	27.1	4.63	26.9
4.81	53.4	4.82	48.9	4.83	40.2	4.84	29.1	4.85	33.2	4.86	27.1	4.87	26.9
5.05	53.4	5.06	49.8	5.07	40.7	5.08	30.0	5.09	33.7	5.10	27.0	5.11	26.9
5.29	53.6	5.30	50.5	5.31	41.3	5.32	30.7	5.33	34.2	5.34	27.0	5.35	26.9
5.53	54.0	5.54	51.1	5.55	41.9	5.56	31.4	5.57	34.7	5.58	27.0	5.59	26.9
5.77	53.7	5.78	51.6	5.79	42.4	5.80	31.9	5.81	35.2	5.82	27.0	5.83	27.0
6.01	54.1	6.02	52.2	6.03	43.1	6.04	32.4	6.05	35.4	6.06	27.1	6.07	27.3
6.25	53.9	6.26	52.7	6.27	43.8	6.28	32.8	6.29	36.1	6.30	27.4	6.31	28.3
6.49	53.6	6.50	53.0	6.51	44.5	6.52	33.3	6.53	36.6	6.54	27.6	6.55	29.3
6.73	53.9	6.74	53.0	6.75	45.0	6.76	33.7	6.77	37.0	6.78	27.9	6.79	30.1
6.97	54.2	6.98	53.5	6.99	45.1	7.00	34.2	7.01	37.4	7.02	28.8	7.03	30.8
7.21	53.7	7.22	53.4	7.23	46.7	7.24	34.5	7.25	37.9	7.26	29.6	7.27	31.5
7.45	54.2	7.46	53.7	7.47	47.5	7.48	35.0	7.49	38.6	7.50	30.1	7.51	31.9

Table 4.2.20 Layer temperatures, °C, Run7. 22:7:71 Sabel

3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
7.69	53.9	7.70	53.6	7.71	48.2	7.72	35.4	7.73	39.1	7.74	30.8	7.75	32.3
7.93	53.6	7.94	54.0	7.95	48.9	7.96	35.8	7.97	39.6	7.98	31.3	7.99	32.7
8.17	54.0	8.18	53.8	8.19	49.6	8.20	36.1	8.21	40.0	8.22	31.8	8.23	33.2
8.41	53.8	8.42	53.6	8.43	50.3	8.44	36.7	8.45	40.5	8.46	32.2	8.47	33.7
8.65	53.5	8.66	54.1	8.67	50.9	8.68	37.1	8.69	41.2	8.70	32.7	8.71	34.2
8.89	53.6	8.90	54.3	8.91	51.6	8.92	37.6	8.93	41.8	8.94	33.1	8.95	34.6
9.13	53.8	9.14	54.0	9.15	52.1	9.16	38.1	9.17	42.5	9.18	33.6	9.19	35.0
9.37	54.2	9.38	54.0	9.39	52.4	9.40	38.6	9.41	43.0	9.42	33.9	9.43	35.5
9.61	53.9	9.62	53.8	9.63	52.8	9.64	39.0	9.65	43.7	9.66	34.3	9.67	35.9
9.85	53.5	9.86	54.2	9.87	53.0	9.88	39.6	9.89	44.3	9.90	34.8	9.91	36.3
10.09	54.0	10.10	54.1	10.11	53.1	10.12	39.9	10.13	45.2	10.14	35.3	10.15	36.8
10.33	53.5	10.34	53.9	10.35	53.5	10.36	40.5	10.37	45.8	10.38	35.6	10.39	37.2
10.57	53.9	10.58	53.9	10.59	53.3	10.60	41.0	10.61	46.4	10.62	36.1	10.63	37.7
10.81	53.7	10.82	53.8	10.83	53.7	10.84	41.7	10.85	47.3	10.86	36.7	10.87	38.2
11.05	54.1	11.06	54.1	11.07	53.5	11.08	42.3	11.09	48.1	11.10	37.1	11.11	38.9
11.29	53.7	11.30	54.2	11.31	53.9	11.32	42.9	11.33	48.8	11.34	37.6	11.35	39.3
11.53	54.0	11.54	54.2	11.55	53.3	11.56	43.6	11.57	49.7	11.58	38.2	11.59	39.8
11.77	54.3	11.78	54.3	11.79	53.9	11.80	44.2	11.81	50.3	11.82	38.7	11.83	40.6
12.01	54.3	12.02	54.5	12.03	54.1	12.04	45.1	12.05	51.1	12.06	39.2	12.07	41.2
12.25	54.2	12.26	54.6	12.27	54.2	12.28	45.8	12.29	51.6	12.30	39.7	12.31	41.6
12.49	54.2	12.50	54.4	12.51	54.2	12.52	46.5	12.53	52.1	12.54	40.5	12.55	42.4
12.73	53.6	12.74	54.0	12.75	54.2	12.76	47.2	12.77	52.3	12.78	41.1	12.79	43.1
12.97	53.7	12.98	53.8	12.99	53.7	13.00	47.9	13.01	52.3	13.02	41.5	13.03	43.7
13.21	53.9	13.22	54.1	13.23	53.8	13.24	48.4	13.25	52.4	13.26	42.1	13.27	44.2
13.45	53.7	13.46	54.1	13.47	53.9	13.48	49.2	13.49	52.7	13.50	42.8	13.51	45.0
13.69	53.4	13.70	54.0	13.71	53.9	13.72	49.8	13.73	52.7	13.74	43.3	13.75	45.7
13.93	53.3	13.94	53.9	13.95	53.9	13.96	50.5	13.97	52.8	13.98	44.1	13.99	46.4
14.17	53.2	14.18	53.5	14.19	53.7	14.20	50.9	14.21	52.8	14.22	44.9	14.23	47.2
14.41	53.2	14.42	53.4	14.43	53.4	14.44	51.2	14.45	52.7	14.46	45.5	14.47	47.9
14.65	53.4	14.66	53.6	14.67	53.5	14.68	51.5	14.69	52.9	14.70	46.2	14.71	48.6
14.89	53.5	14.90	53.8	14.91	53.7	14.92	51.7	14.93	52.8	14.94	46.7	14.95	49.3
15.13	53.5	15.14	54.0	15.15	53.8	15.16	52.0	15.17	53.0	15.18	47.5	15.19	49.8

Table 4.2.20 Contd.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
15.37	53.7	15.38	54.0	15.39	53.9	15.40	52.3	15.41	53.2	15.42	48.4	15.43	50.8
15.61	53.8	15.62	54.2	15.63	54.2	15.64	52.6	15.65	53.3	15.66	49.2	15.67	51.3
15.85	54.1	15.86	54.2	15.87	54.1	15.88	52.7	15.89	53.6	15.90	49.9	15.91	51.9
16.09	53.9	16.10	54.2	16.11	54.3	16.12	52.9	16.13	53.7	16.14	50.7	16.15	52.4
16.33	54.2	16.34	54.4	16.35	54.5	16.36	53.1	16.37	53.3	16.38	51.3	16.39	52.9
16.57	54.2	16.58	54.6	16.59	54.5	16.60	53.3	16.61	53.9	16.62	51.9	16.63	53.2
16.81	53.4	16.82	54.1	16.83	54.6	16.84	53.4	16.85	53.9	16.86	52.4	16.87	53.3
17.05	53.6	17.06	53.9	17.07	53.7	17.08	53.3	17.09	53.6	17.10	52.8	17.11	53.5
17.29	53.9	17.30	54.2	17.31	54.0	17.32	53.2	17.33	53.5	17.34	52.9	17.35	53.4
17.53	53.9	17.54	54.3	17.55	54.3	17.56	53.2	17.57	53.7	17.58	52.9	17.59	53.4
17.77	54.2	17.78	54.3	17.79	54.3	17.80	53.3	17.81	53.7	17.82	53.1	17.83	53.5
18.01	53.7	18.02	54.3	18.03	54.5	18.04	53.4	18.05	53.9	18.06	53.4	18.07	53.7
18.25	53.9	18.26	54.1	18.27	54.1	18.28	53.7	18.29	53.3	18.30	53.7	18.31	53.8
18.49	54.1	18.50	54.6	18.51	54.4	18.52	53.4	18.53	53.7	18.54	53.6	18.55	53.8
18.73	53.7	18.74	54.4	18.75	54.7	18.76	53.7	18.77	54.1	18.78	53.8	18.79	54.0
18.97	53.9	18.98	54.3	18.99	54.3	19.00	53.3	19.01	53.9	19.02	54.1	19.03	54.2
19.21	54.1	19.22	54.4	19.23	54.4	19.24	53.6	19.25	53.8	19.26	54.0	19.27	54.1
19.45	54.2	19.46	54.5	19.47	54.5	19.48	53.7	19.49	54.0	19.50	54.0	19.51	54.1
19.69	53.8	19.70	54.4	19.71	54.7	19.72	53.7	19.73	54.1	19.74	54.1	19.75	54.2
19.93	54.1	19.94	54.3	19.95	54.3	19.96	53.8	19.97	54.1	19.98	54.3	19.99	54.4
20.17	53.9	20.18	54.0	20.19	54.4	20.20	53.8	20.21	54.1	20.22	54.2	20.23	54.3
20.41	53.7	20.42	54.5	20.43	54.4	20.44	53.6	20.45	53.9	20.46	54.2	20.47	54.3
20.65	53.9	20.66	54.2	20.67	54.2	20.68	53.6	20.69	53.9	20.70	54.1	20.71	54.1
20.89	53.7	20.90	54.4	20.91	54.6	20.92	53.7	20.93	54.0	20.94	54.2	20.95	54.2
21.13	54.1	21.14	54.3	21.15	54.3	21.16	53.8	21.17	54.1	21.18	54.3	21.19	54.4

Table 4.2.20 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.08	27.1	0.09	26.9	0.10	27.2	0.11	28.4	0.12	29.2	0.13	28.8	0.14	29.4
0.32	24.7	0.33	25.0	0.34	24.7	0.35	24.9	0.36	25.6	0.37	25.0	0.38	27.1
0.56	25.4	0.57	25.8	0.58	25.5	0.59	25.4	0.60	26.0	0.61	25.7	0.62	25.3
0.80	26.1	0.81	26.3	0.82	26.1	0.83	26.1	0.84	26.5	0.85	26.3	0.86	26.2
1.04	26.2	1.05	26.4	1.06	26.1	1.07	26.2	1.08	26.7	1.09	26.6	1.10	26.6
1.28	26.1	1.29	26.3	1.30	26.1	1.31	26.2	1.32	26.7	1.33	26.6	1.34	26.4
1.52	25.9	1.53	26.1	1.54	25.9	1.55	26.1	1.56	26.7	1.57	26.4	1.58	26.4
1.76	26.1	1.77	26.3	1.78	26.1	1.79	26.1	1.80	26.7	1.81	26.6	1.82	26.4
2.00	26.3	2.01	26.6	2.02	26.3	2.03	26.3	2.04	26.8	2.05	26.7	2.06	26.6
2.24	26.4	2.25	26.6	2.26	26.6	2.27	26.6	2.28	27.1	2.29	26.9	2.30	26.8
2.48	26.7	2.49	27.0	2.50	26.7	2.51	26.6	2.52	27.0	2.53	26.9	2.54	26.9
2.72	26.9	2.73	27.1	2.74	26.9	2.75	26.9	2.76	27.4	2.77	27.3	2.78	27.2
2.96	26.8	2.97	27.1	2.98	26.9	2.99	27.0	3.00	27.4	3.01	27.3	3.02	27.3
3.20	26.9	3.21	27.1	3.22	26.8	3.23	26.9	3.24	27.4	3.25	27.3	3.26	27.2
3.44	27.0	3.45	27.1	3.46	26.9	3.47	26.9	3.48	27.5	3.49	27.5	3.50	27.4
3.68	27.1	3.69	27.2	3.70	27.1	3.71	27.1	3.72	27.6	3.73	27.6	3.74	27.4
3.92	26.9	3.93	27.2	3.94	26.9	3.95	27.1	3.96	27.4	3.97	27.6	3.93	27.5
4.16	26.8	4.17	27.2	4.18	26.9	4.19	27.0	4.20	27.3	4.21	27.3	4.22	27.4
4.40	26.8	4.41	26.9	4.42	26.8	4.43	26.8	4.44	27.4	4.45	27.2	4.46	27.3
4.64	26.7	4.65	26.9	4.66	26.8	4.67	26.8	4.68	27.2	4.69	27.2	4.70	27.1
4.88	26.6	4.89	26.8	4.90	26.7	4.91	26.8	4.92	27.2	4.93	27.2	4.94	27.1
5.12	26.6	5.13	26.9	5.14	26.7	5.15	26.7	5.16	27.2	5.17	27.2	5.18	27.1
5.36	26.6	5.37	26.8	5.38	26.7	5.39	26.8	5.40	27.1	5.41	27.2	5.42	26.9
5.60	26.7	5.61	26.8	5.62	26.6	5.63	26.7	5.64	27.2	5.65	27.1	5.66	27.0
5.84	26.7	5.85	26.8	5.86	26.7	5.87	26.7	5.88	27.1	5.89	27.0	5.90	27.0
6.08	26.7	6.09	26.8	6.10	26.7	6.11	26.8	6.12	27.1	6.13	27.2	6.14	27.1
6.32	26.7	6.33	27.0	6.34	26.8	6.35	26.8	6.36	27.2	6.37	27.2	6.38	27.0
6.56	26.8	6.57	26.9	6.58	26.8	6.59	26.9	6.60	27.2	6.61	27.3	6.62	27.1
6.80	26.8	6.81	27.0	6.82	26.9	6.83	27.0	6.84	27.2	6.85	27.3	6.86	27.2
7.04	26.8	7.05	27.1	7.06	26.9	7.07	27.0	7.08	27.3	7.09	27.2	7.10	27.2
7.28	27.0	7.29	27.2	7.30	26.9	7.31	27.0	7.32	27.4	7.33	27.4	7.34	27.4
7.52	26.9	7.53	27.1	7.54	26.9	7.55	27.0	7.56	27.4	7.57	27.4	7.58	27.3

Table 4.2.20 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
7.76	26.9	7.77	27.1	7.78	26.9	7.79	26.9	7.80	27.4	7.81	27.4	7.82	27.2
8.00	26.9	8.01	27.1	8.02	26.9	8.03	26.9	8.04	27.4	8.05	27.4	8.06	27.3
8.24	26.8	8.25	27.0	8.26	26.8	8.27	27.0	8.28	27.4	8.29	27.4	8.30	27.3
8.48	26.8	8.49	27.0	8.50	26.8	8.51	26.9	8.52	27.4	8.53	27.3	8.54	27.3
8.72	26.9	8.73	27.0	8.74	26.8	8.75	26.9	8.76	27.4	8.77	27.4	8.78	27.3
8.96	26.9	8.97	27.1	8.98	26.9	8.99	26.9	9.00	27.4	9.01	27.4	9.02	27.3
9.20	27.0	9.21	27.1	9.22	26.9	9.23	26.9	9.24	27.4	9.25	27.3	9.26	27.3
9.44	26.9	9.45	27.1	9.46	26.8	9.47	26.9	9.48	27.3	9.49	27.3	9.50	27.3
9.68	26.8	9.69	27.1	9.70	26.9	9.71	27.0	9.72	27.3	9.73	27.3	9.74	27.1
9.92	26.9	9.93	26.9	9.94	26.8	9.95	26.9	9.96	27.3	9.97	27.3	9.98	27.2
10.16	26.9	10.17	27.0	10.18	26.8	10.19	26.9	10.20	27.2	10.21	27.2	10.22	27.2
10.40	27.0	10.41	26.8	10.42	26.7	10.43	26.9	10.44	27.2	10.45	27.2	10.46	27.2
10.64	27.3	10.65	26.9	10.66	26.6	10.67	26.7	10.68	27.1	10.69	27.1	10.70	27.1
10.88	27.9	10.89	26.7	10.90	26.5	10.91	26.6	10.92	27.1	10.93	27.1	10.94	26.9
11.12	28.7	11.13	26.9	11.14	26.6	11.15	26.7	11.16	27.2	11.17	27.2	11.18	27.1
11.36	29.2	11.37	26.9	11.38	26.6	11.39	26.6	11.40	27.1	11.41	27.1	11.42	27.1
11.60	30.1	11.61	27.2	11.62	26.6	11.63	26.7	11.64	27.2	11.65	27.2	11.66	27.1
11.84	30.6	11.85	27.8	11.86	26.7	11.87	26.7	11.88	27.2	11.89	27.2	11.90	27.0
12.08	31.1	12.09	28.2	12.10	26.7	12.11	26.7	12.12	27.2	12.13	27.1	12.14	27.0
12.32	31.5	12.33	28.7	12.34	26.4	12.35	26.6	12.36	27.0	12.37	27.1	12.38	27.1
12.56	32.0	12.57	29.5	12.58	26.5	12.59	26.5	12.60	27.2	12.61	27.0	12.62	27.0
12.80	32.3	12.81	30.1	12.82	26.6	12.83	26.4	12.84	26.9	12.85	26.9	12.86	26.9
13.04	32.8	13.05	30.4	13.06	26.6	13.07	26.4	13.08	26.9	13.09	26.9	13.10	26.9
13.28	33.2	13.29	31.0	13.30	26.6	13.31	26.2	13.32	26.8	13.33	26.8	13.34	26.7
13.52	33.6	13.53	31.5	13.54	27.0	13.55	26.2	13.56	26.7	13.57	26.7	13.58	26.7
13.76	34.1	13.77	31.9	13.78	27.4	13.79	26.2	13.80	26.8	13.81	26.8	13.82	26.7
14.00	34.7	14.01	32.4	14.02	28.0	14.03	26.2	14.04	26.7	14.05	26.7	14.06	26.7
14.24	34.9	14.25	32.8	14.26	28.7	14.27	26.2	14.28	26.8	14.29	26.8	14.30	26.8
14.48	35.5	14.49	33.4	14.50	29.4	14.51	26.3	14.52	26.6	14.53	26.7	14.54	26.7
14.72	36.0	14.73	33.8	14.74	30.0	14.75	26.2	14.76	26.7	14.77	26.7	14.78	26.7
14.96	36.4	14.97	34.2	14.98	30.4	14.99	26.4	15.00	26.8	15.01	26.8	15.02	26.8
15.20	36.9	15.21	34.6	15.22	31.1	15.23	26.4	15.24	26.8	15.25	26.7	15.26	26.9

Table 4.2.20 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
15.44	37.3	15.45	35.1	15.46	31.6	15.47	26.4	15.48	26.8	15.49	26.8	15.50	26.8
15.68	38.0	15.69	35.6	15.70	31.9	15.71	26.5	15.72	27.1	15.73	26.9	15.74	26.8
15.92	38.4	15.93	36.0	15.94	32.4	15.95	26.7	15.96	26.9	15.97	26.9	15.98	26.6
16.16	39.1	16.17	36.3	16.18	32.8	16.19	26.8	16.20	27.2	16.21	27.2	16.22	26.7
16.40	39.7	16.41	37.0	16.42	33.3	16.43	27.3	16.44	27.3	16.45	27.0	16.46	26.9
16.64	40.2	16.65	37.4	16.66	33.8	16.67	27.8	16.68	27.3	16.69	27.1	16.70	27.0
16.88	40.8	16.89	38.0	16.90	34.1	16.91	28.6	16.92	27.6	16.93	27.0	16.94	26.8
17.12	41.4	17.13	38.6	17.14	34.6	17.15	29.4	17.16	27.9	17.17	26.9	17.18	26.8
17.36	42.1	17.37	39.2	17.38	35.1	17.39	30.2	17.40	28.4	17.41	27.0	17.42	26.9
17.60	42.6	17.61	39.7	17.62	35.4	17.63	30.6	17.64	28.9	17.65	26.9	17.66	26.9
17.84	43.2	17.85	40.1	17.86	35.8	17.87	31.2	17.88	29.5	17.89	26.8	17.90	27.0
18.08	43.8	18.09	40.8	18.10	36.4	18.11	31.6	18.12	30.0	18.13	26.8	18.14	26.8
18.32	44.7	18.33	41.6	18.34	36.9	18.35	32.1	18.36	30.4	18.37	26.9	18.38	26.8
18.56	45.5	18.57	42.2	18.58	37.3	18.59	32.5	18.60	31.0	18.61	27.0	18.62	26.7
18.80	46.2	18.81	42.9	18.82	37.8	18.83	33.0	18.84	31.5	18.85	27.2	18.86	26.8
19.04	46.8	19.05	43.5	19.06	38.7	19.07	33.5	19.08	32.1	19.09	27.6	19.10	26.8
19.28	47.8	19.29	44.3	19.30	39.0	19.31	34.1	19.32	32.4	19.33	28.0	19.34	26.8
19.52	48.3	19.53	45.1	19.54	39.5	19.55	34.4	19.56	33.0	19.57	28.4	19.58	26.8
19.76	48.9	19.77	45.8	19.78	40.2	19.79	34.9	19.80	33.4	19.81	28.9	19.82	26.6
20.00	49.6	20.01	46.6	20.02	40.8	20.03	35.4	20.04	33.9	20.05	29.5	20.06	26.8
20.24	50.2	20.25	47.3	20.26	41.5	20.27	36.0	20.28	34.4	20.29	30.1	20.30	27.1
20.48	50.8	20.49	48.2	20.50	42.1	20.51	36.6	20.52	34.9	20.53	30.6	20.54	27.1
20.72	51.1	20.73	48.8	20.74	42.6	20.75	36.9	20.76	35.2	20.77	30.9	20.78	27.1
20.96	51.4	20.97	49.6	20.98	43.3	20.99	37.6	21.00	35.8	21.01	31.6	21.02	27.0
21.20	51.7	21.21	50.3	21.22	43.9	21.23	38.1	21.24	36.1	21.25	31.7	21.26	24.9

Table 4.2.20 Contd.

Appendix 4.2. Run Data (Cont'd)

TABLE 4.2.21

Initial conditions, Run 8, 26:7:71, Sabel

Distance from air inlet, in.	Moisture content	
	% w.b.	% d.b.
1.5	19.6	24.4
4.5	19.8	24.6
7.5	19.6	24.3
10.5	19.5	24.3
13.5	18.5	22.8
16.5	18.8	23.1
19.5	17.9	21.8
22.5	18.0	22.0
25.5	20.4	25.6
28.5	19.1	23.6
31.5	18.3	22.4
34.5	18.1	22.1
37.5	17.6	21.4
Mean $\pm \sigma$	19.0 $\pm$ 0.8	

TABLE 4.2.22

Final conditions

Distance from air inlet, in	Weight in layer, g	Dry weight in layer, g	Moisture Content % w.b.	Moisture Content % d.b.	Mean Germination %
1.2	11185	9978	10.8	12.1	86
3.7	8860	7898	10.9	12.2	89
6.2	9310	8291	10.9	12.3	88
8.6	9520	8465	11.1	12.5	88
11.1	8395	7460	11.1	12.5	90
13.6	9655	8575	11.2	12.6	91
16.0	8805	7819	11.2	12.6	89
18.5	8970	7937	11.5	13.0	89
20.9	10265	9077	11.6	13.1	88
23.4	8770	7741	11.7	13.3	91
25.9	9565	8427	11.9	13.5	84
28.3	9585	8450	11.8	13.4	92
30.8	9665	8482	12.2	13.9	88
33.3	9255	8120	12.3	14.0	89
35.0	5250	4600	12.4	14.1	88

Total wet weight = 137055
Total dry weight = 121320

Mean moisture content = 13.0% d.b.

Table 4.2.23 Inlet air conditions, Run 8. 26:7:71 Sabel

TIME.	AMBIENT CONDITIONS			INLET CONDITIONS	
HOURS	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
0.23	22.1	92.0	0.015177	22.8	88.1
0.47	23.2	69.3	0.012169	24.6	63.4
0.71	23.3	69.4	0.012316	25.5	61.0
0.95	23.4	67.1	0.011982	26.1	57.4
1.19	23.6	67.6	0.012200	26.6	56.8
1.43	23.6	69.6	0.012564	26.8	57.6
1.67	24.1	70.7	0.013118	27.1	59.1
1.91	24.0	73.5	0.013593	27.4	60.2
2.15	24.1	69.1	0.012821	27.4	56.8
2.39	24.2	67.3	0.012553	27.4	55.4
2.63	24.3	68.5	0.012877	27.6	56.2
2.87	24.2	67.3	0.012603	27.8	54.5
3.11	24.2	67.3	0.012553	27.8	54.3
3.35	24.3	68.5	0.012877	27.9	55.3
3.59	24.2	68.9	0.012900	27.9	55.3
3.83	24.0	70.3	0.012993	27.9	55.7
4.07	24.1	70.7	0.013170	27.9	56.4
4.79	23.5	71.5	0.012831	27.7	55.7
5.51	22.4	73.7	0.012399	27.2	55.4
6.23	22.5	75.5	0.012737	26.9	57.9
6.95	21.6	79.3	0.012627	26.3	59.7
7.67	21.8	77.2	0.012462	26.3	58.7
8.39	21.7	77.6	0.012486	26.4	58.7
9.11	21.2	78.6	0.012222	25.8	59.3
9.83	21.4	81.0	0.012768	25.8	62.1
10.55	21.2	80.4	0.012504	25.8	60.9
11.27	20.1	82.2	0.011967	25.5	59.4
11.99	20.3	80.9	0.011943	25.2	60.1
12.71	20.1	81.7	0.011898	25.0	60.7
13.43	20.3	83.2	0.012289	24.8	63.3
14.15	19.2	85.6	0.011791	24.9	60.6
14.87	20.2	83.6	0.012266	24.7	63.8
15.59	20.6	85.2	0.012759	25.0	65.0
16.31	20.9	85.8	0.013169	25.2	66.4
17.03	21.1	81.3	0.012598	24.9	64.7
17.75	23.1	76.2	0.013364	26.0	64.1
18.47	23.3	80.9	0.014408	26.6	66.6
19.19	24.1	81.3	0.015123	27.1	68.0
19.91	23.6	81.9	0.014836	27.3	65.7
20.63	24.1	84.6	0.015764	27.7	68.1
21.35	23.9	86.3	0.015915	28.0	67.7
22.07	24.2	88.5	0.016678	28.0	70.8
22.79	24.7	89.5	0.017333	28.1	73.0
23.51	24.9	57.1	0.011096	28.4	46.5
24.23	24.8	60.2	0.011643	28.6	48.2
24.95	24.8	64.0	0.012422	28.3	52.2
25.67	24.7	64.6	0.012418	28.4	51.3
26.39	24.4	65.5	0.012386	28.4	51.7
27.11	24.2	68.1	0.012751	28.2	53.8
27.83	24.2	67.7	0.012626	28.3	52.9
28.55	23.8	68.2	0.012471	28.1	53.1
29.27	23.3	70.2	0.012461	27.8	53.9
29.99	22.3	73.2	0.012183	27.4	53.8
30.71	22.2	69.9	0.011572	27.0	52.5
31.43	22.5	68.0	0.011456	27.0	52.0

Table 4.2.23 Contd.

TIME, HOURS	AMBIENT CONDITIONS TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	INLET CONDITIONS TEMP, DEG C	RELATIVE HUMIDITY %
32.15	22.4	68.7	0.011503	26.9	52.4
32.87	22.2	69.4	0.011502	26.8	52.8
33.59	21.9	70.1	0.011410	26.7	52.8
34.31	22.1	69.4	0.011410	26.7	52.8
35.03	21.9	69.2	0.011226	26.5	52.5
35.75	21.9	67.6	0.010998	26.5	51.4
36.47	20.9	70.6	0.010806	26.3	51.2
37.19	21.7	69.0	0.011045	26.2	52.5
37.91	21.4	70.5	0.011093	26.1	53.1
38.63	21.6	70.3	0.011205	26.1	53.6
39.35	21.9	70.0	0.011364	26.4	53.5
40.07	21.9	70.5	0.011433	26.2	54.3
40.79	21.9	69.2	0.011226	26.1	53.7
41.51	21.7	71.1	0.011388	25.8	55.5
42.23	21.8	70.0	0.011318	25.8	55.0
42.95	21.7	69.9	0.011182	25.5	55.5
43.67	21.6	69.4	0.011069	25.4	55.3
44.39	22.3	67.0	0.011134	25.9	54.0
45.11	22.7	65.3	0.011110	26.2	53.0
45.83	22.5	64.4	0.010836	26.4	51.0
46.55	22.9	64.0	0.011063	26.6	51.4
47.27	22.9	64.3	0.011086	26.9	50.5
47.99	22.7	66.6	0.011364	26.7	52.6
48.71	23.6	62.5	0.011227	27.2	50.3
49.43	23.9	61.3	0.011229	27.5	49.5
50.15	22.9	65.1	0.011225	27.3	50.1
50.87	23.9	66.3	0.012157	27.6	53.2
51.59	24.0	63.7	0.011751	27.8	50.8
52.31	23.6	64.9	0.011698	27.7	51.0
53.03	23.2	66.1	0.011600	27.5	51.1
53.75	21.9	68.8	0.011203	27.2	50.2
54.47	22.8	65.9	0.011318	26.9	51.5
55.19	22.2	77.0	0.012780	26.7	59.0
55.91	22.0	81.7	0.013384	26.2	63.4
56.63	20.4	86.5	0.012877	26.0	61.9
57.35	21.4	86.4	0.013691	25.8	66.5
58.07	21.1	88.6	0.013756	25.6	67.7
58.79	20.6	90.3	0.013550	25.3	67.8
59.51	19.4	91.0	0.012730	25.0	64.9
60.23	20.0	90.2	0.013062	24.5	68.7
60.95	20.2	90.2	0.013207	24.6	68.8
61.67	19.7	91.1	0.012966	24.4	68.3
62.39	20.0	92.1	0.013349	24.4	70.3
63.11	19.8	93.5	0.013418	24.5	70.5
63.83	20.1	91.2	0.013302	24.6	69.6
64.55	20.6	65.6	0.009786	24.7	50.9
65.27	20.6	66.5	0.009915	24.7	51.6
65.99	20.1	69.1	0.010034	24.4	53.1
66.71	21.4	65.1	0.010223	25.0	52.3
67.43	21.0	66.8	0.010252	25.0	52.5
68.15	21.7	66.5	0.010640	25.4	53.2
68.87	22.5	65.2	0.010972	26.1	52.5
MEAN	22.4	73.7	0.012300	26.4	57.7
STANDARD DEVIATION		0.00133005	1.22	6.94	

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.01	22.9	0.02	24.2	0.03	24.4	0.04	24.7	0.05	24.3	0.06	24.7	0.07	26.1
0.25	23.3	0.26	21.9	0.27	22.6	0.28	23.1	0.29	23.7	0.30	24.1	0.31	25.2
0.49	24.3	0.50	21.8	0.51	21.7	0.52	21.3	0.53	22.0	0.54	22.3	0.55	22.9
0.73	25.0	0.74	22.5	0.75	21.6	0.76	21.9	0.77	21.9	0.78	22.2	0.79	22.6
0.97	25.7	0.98	23.1	0.99	21.8	1.00	21.6	1.01	21.9	1.02	22.3	1.03	22.4
1.21	26.1	1.22	23.7	1.23	21.9	1.24	21.4	1.25	21.6	1.26	21.9	1.27	22.3
1.45	26.4	1.46	24.4	1.47	22.4	1.48	21.6	1.49	21.8	1.50	22.2	1.51	22.4
1.69	26.7	1.70	25.0	1.71	22.8	1.72	21.8	1.73	21.8	1.74	22.2	1.75	22.3
1.93	27.0	1.94	25.3	1.95	23.3	1.96	22.0	1.97	21.7	1.98	22.2	1.99	22.3
2.17	27.0	2.18	25.6	2.19	23.6	2.20	22.0	2.21	21.7	2.22	22.1	2.23	22.3
2.41	27.1	2.42	25.8	2.43	23.9	2.44	22.3	2.45	21.9	2.46	22.2	2.47	22.3
2.65	27.4	2.66	26.0	2.67	24.2	2.68	22.7	2.69	21.9	2.70	22.2	2.71	22.3
2.89	27.4	2.90	26.2	2.91	24.6	2.92	22.9	2.93	22.2	2.94	22.3	2.95	22.5
3.13	27.4	3.14	26.4	3.15	24.7	3.16	23.1	3.17	22.1	3.18	22.4	3.19	22.4
3.37	27.6	3.38	26.4	3.39	24.8	3.40	23.2	3.41	22.2	3.42	22.2	3.43	22.2
3.61	27.6	3.62	26.4	3.63	24.8	3.64	23.3	3.65	22.2	3.66	22.1	3.67	22.1
3.85	27.6	3.86	26.5	3.87	25.1	3.88	23.4	3.89	22.3	3.90	22.3	3.91	22.1
4.57	27.7	4.58	26.7	4.59	25.5	4.60	24.1	4.61	22.8	4.62	22.6	4.63	22.2
5.29	27.2	5.30	26.4	5.31	25.4	5.32	23.9	5.33	23.1	5.34	22.6	5.35	22.0
6.01	26.8	6.02	26.0	6.03	25.1	6.04	23.9	6.05	22.9	6.06	22.5	6.07	21.7
6.73	26.6	6.74	25.9	6.75	25.2	6.76	24.0	6.77	23.1	6.78	22.8	6.79	21.4
7.45	26.4	7.46	25.6	7.47	24.9	7.48	23.9	7.49	23.1	7.50	22.8	7.51	21.8
8.17	26.3	8.18	25.6	8.19	24.9	8.20	23.9	8.21	23.2	8.22	22.9	8.23	21.3
8.89	26.0	8.90	25.4	8.91	24.7	8.92	23.9	8.93	23.1	8.94	22.8	8.95	21.9
9.61	25.7	9.62	25.3	9.63	24.8	9.64	23.8	9.65	23.2	9.66	22.9	9.67	21.8
10.33	25.7	10.34	25.3	10.35	24.8	10.36	24.1	10.37	23.4	10.38	23.2	10.39	22.2
11.05	25.7	11.06	25.2	11.07	24.4	11.08	23.8	11.09	23.3	11.10	23.1	11.11	22.1
11.77	25.2	11.78	24.8	11.79	24.5	11.80	23.6	11.81	22.9	11.82	22.8	11.83	21.9
12.49	25.0	12.50	24.6	12.51	24.2	12.52	23.4	12.53	22.9	12.54	22.8	12.55	21.8
13.21	24.9	13.22	24.6	13.23	24.0	13.24	23.6	13.25	22.9	13.26	22.8	13.27	21.9
13.93	25.1	13.94	24.6	13.95	24.2	13.96	23.7	13.97	23.2	13.98	23.1	13.99	22.3
14.65	24.7	14.66	24.4	14.67	23.5	14.68	23.1	14.69	23.1	14.70	22.1	14.71	21.5

Table 4.2.24 Layer temperatures, ^{o}C, Run 8. 26:7:71 Sabel

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
15.37	24.9	15.38	24.4	15.39	24.1	15.40	23.5	15.41	23.2	15.42	23.2	15.43	22.3
16.09	25.1	16.10	24.7	16.11	24.4	16.12	23.8	16.13	23.3	16.14	23.3	16.15	22.7
16.81	25.1	16.82	24.7	16.83	24.4	16.84	23.9	16.85	23.4	16.86	23.6	16.87	22.9
17.53	25.4	17.54	24.9	17.55	24.4	17.56	24.0	17.57	23.7	17.58	23.9	17.59	23.1
18.25	26.0	18.26	25.6	18.27	25.1	18.28	24.4	18.29	23.9	18.30	23.9	18.31	23.3
18.97	26.8	18.98	26.3	18.99	25.8	19.00	25.2	19.01	24.4	19.02	24.5	19.03	23.9
19.69	27.1	19.70	26.4	19.71	25.8	19.72	25.0	19.73	24.4	19.74	24.4	19.75	23.7
20.41	27.4	20.42	26.8	20.43	26.3	20.44	25.6	20.45	25.0	20.46	25.0	20.47	24.2
21.13	27.7	21.14	27.2	21.15	26.6	21.16	25.8	21.17	25.1	21.18	25.2	21.19	24.2
21.85	28.0	21.86	27.6	21.87	26.9	21.88	26.1	21.89	25.4	21.90	25.3	21.91	24.4
22.57	27.9	22.58	27.4	22.59	27.1	22.60	26.4	22.61	25.6	22.62	25.5	22.63	24.4
23.29	28.1	23.30	27.7	23.31	27.4	23.32	26.7	23.33	26.1	23.34	26.1	23.35	25.3
24.01	28.4	24.02	27.9	24.03	27.6	24.04	27.0	24.05	26.5	24.06	26.4	24.07	25.6
24.73	28.1	24.74	28.1	24.75	27.9	24.76	27.3	24.77	26.8	24.78	26.7	24.79	25.8
25.45	28.1	25.46	28.1	25.47	27.9	25.48	27.4	25.49	26.9	25.50	26.9	25.51	26.2
26.17	28.3	26.18	28.1	26.19	27.8	26.20	27.2	26.21	26.9	26.22	27.1	26.23	26.3
26.89	28.3	26.90	28.1	26.91	28.0	26.92	27.5	26.93	27.0	26.94	27.2	26.95	26.5
27.61	28.1	27.62	28.1	27.63	28.1	27.64	27.6	27.65	27.4	27.66	27.6	27.67	26.9
28.33	28.2	28.34	27.9	28.35	27.6	28.36	27.3	28.37	27.1	28.38	27.5	28.39	26.8
29.05	27.8	29.06	27.7	29.07	27.6	29.08	27.1	29.09	26.9	29.10	27.2	29.11	26.7
29.77	27.7	29.78	27.4	29.79	27.3	29.80	27.2	29.81	26.9	29.82	27.2	29.83	26.7
30.49	27.2	30.50	26.9	30.51	26.7	30.52	26.5	30.53	26.3	30.54	26.7	30.55	25.9
31.21	26.9	31.22	26.6	31.23	26.7	31.24	26.4	31.25	26.1	31.26	26.3	31.27	25.8
31.93	26.9	31.94	26.7	31.95	26.6	31.96	26.3	31.97	25.8	31.98	26.2	31.99	25.8
32.65	26.8	32.66	26.7	32.67	26.6	32.68	26.1	32.69	26.1	32.70	26.4	32.71	25.8
33.37	26.8	33.38	26.7	33.39	26.4	33.40	26.1	33.41	25.9	33.42	26.1	33.43	25.8
34.09	26.7	34.10	26.5	34.11	26.4	34.12	26.1	34.13	25.8	34.14	26.2	34.15	25.8
34.81	26.5	34.82	26.4	34.83	26.2	34.84	25.8	34.85	25.8	34.86	26.1	34.87	25.8
35.53	26.6	35.54	26.4	35.55	26.1	35.56	25.9	35.57	25.7	35.58	26.1	35.59	25.7
36.25	26.4	36.26	26.3	36.27	26.1	36.28	25.7	36.29	25.5	36.30	25.9	36.31	25.6
36.97	26.2	36.98	26.1	36.99	25.9	37.00	25.7	37.01	25.6	37.02	25.9	37.03	25.4
37.69	26.2	37.70	26.1	37.71	25.9	37.72	25.7	37.73	25.5	37.74	25.8	37.75	25.5

Table 4.2.24 Contd.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
38.41	26.2	38.42	26.1	38.43	25.9	38.44	25.7	38.45	25.6	38.46	25.8	38.47	25.6
39.13	26.3	39.14	26.2	39.15	26.0	39.16	25.7	39.17	25.6	39.18	25.9	39.19	25.6
39.85	26.4	39.86	26.2	39.87	26.1	39.88	25.7	39.89	25.7	39.90	26.0	39.91	25.7
40.57	26.2	40.58	26.3	40.59	26.4	40.60	25.9	40.61	25.8	40.62	26.3	40.63	26.0
41.29	25.8	41.30	25.9	41.31	25.9	41.32	25.8	41.33	25.8	41.34	26.2	41.35	25.9
42.01	25.8	42.02	25.7	42.03	25.7	42.04	25.5	42.05	25.6	42.06	25.6	42.07	26.1
42.73	25.7	42.74	25.7	42.75	25.6	42.76	25.4	42.77	25.4	42.78	25.8	42.79	25.7
43.45	25.4	43.46	25.4	43.47	25.4	43.48	25.1	43.49	25.2	43.50	25.6	43.51	25.4
44.17	25.8	44.18	25.7	44.19	25.4	44.20	25.1	44.21	25.0	44.22	25.4	44.23	25.5
44.89	26.2	44.90	25.9	44.91	25.8	44.92	25.3	44.93	25.0	44.94	25.6	44.95	25.4
45.61	26.4	45.62	26.1	45.63	25.9	45.64	25.6	45.65	25.3	45.66	25.7	45.67	25.5
46.33	26.4	46.34	26.1	46.35	26.0	46.36	25.6	46.37	25.4	46.38	25.8	46.39	25.4
47.05	26.7	47.06	26.7	47.07	26.4	47.08	26.1	47.09	25.8	47.10	26.2	47.11	25.8
47.77	26.7	47.78	26.8	47.79	26.7	47.80	26.4	47.81	26.2	47.82	26.4	47.83	26.2
48.49	27.0	48.50	26.7	48.51	26.6	48.52	26.3	48.53	26.3	48.54	26.6	48.55	26.4
49.21	27.5	49.22	27.1	49.23	26.9	49.24	26.4	49.25	26.4	49.26	26.6	49.27	26.4
49.93	27.4	49.94	27.4	49.95	27.2	49.96	26.8	49.97	26.6	49.98	26.9	49.99	26.5
50.65	27.5	50.66	27.3	50.67	27.2	50.68	27.0	50.69	26.9	50.70	27.2	50.71	26.8
51.37	27.8	51.38	27.4	51.39	27.4	51.40	26.9	51.41	26.8	51.42	27.3	51.43	27.2
52.09	27.8	52.10	27.6	52.11	27.4	52.12	27.2	52.13	26.9	52.14	27.3	52.15	27.2
52.81	27.6	52.82	27.5	52.83	27.4	52.84	27.3	52.85	27.1	52.86	27.4	52.87	27.2
53.53	27.4	53.54	27.3	53.55	27.2	53.56	27.0	53.57	26.9	53.58	27.2	53.59	26.9
54.25	27.0	54.26	26.9	54.27	26.9	54.28	26.7	54.29	26.6	54.30	26.9	54.31	26.7
54.97	26.7	54.98	26.7	54.99	26.6	55.00	26.2	55.01	26.2	55.02	26.7	55.03	26.4
55.69	26.4	55.70	26.4	55.71	26.4	55.72	26.1	55.73	26.0	55.74	26.3	55.75	26.1
56.41	26.4	56.42	26.2	56.43	26.1	56.44	25.8	56.45	25.8	56.46	26.1	56.47	25.9
57.13	25.8	57.14	25.7	57.15	25.7	57.16	25.5	57.17	25.3	57.18	25.7	57.19	25.6
57.85	25.7	57.86	25.6	57.87	25.5	57.88	25.2	57.89	25.1	57.90	25.4	57.91	25.3
58.57	25.5	58.58	25.3	58.59	25.2	58.60	25.0	58.61	24.9	58.62	25.2	58.63	25.1
59.29	25.5	59.30	25.2	59.31	25.0	59.32	24.8	59.33	24.7	59.34	25.0	59.35	24.9
60.01	24.7	60.02	24.6	60.03	24.5	60.04	24.4	60.05	24.4	60.06	24.7	60.07	24.6
60.73	24.5	60.74	24.4	60.75	24.4	60.76	24.4	60.77	24.4	60.78	24.7	60.79	24.6

Table 4.2.24 Contd.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
61.45	24.6	61.46	24.4	61.47	24.4	61.48	24.2	61.49	24.2	61.50	24.6	61.51	24.4
62.17	24.5	62.18	24.4	62.19	24.4	62.20	24.2	62.21	24.2	62.22	24.6	62.23	24.4
62.89	24.6	62.90	24.4	62.91	24.4	62.92	24.4	62.93	24.4	62.94	24.7	62.95	24.7
63.61	24.7	63.62	24.6	63.63	24.5	63.64	24.4	63.65	24.4	63.66	24.9	63.67	24.8
64.33	24.7	64.34	24.8	64.35	24.8	64.36	24.7	64.37	24.7	64.38	25.1	64.39	25.1
65.05	24.7	65.06	24.7	65.07	24.7	65.08	24.7	65.09	24.7	65.10	25.2	65.11	25.2
65.77	24.5	65.78	24.5	65.79	24.5	65.80	24.5	65.81	24.6	65.82	25.0	65.83	25.0
66.49	24.7	66.50	24.7	66.51	24.7	66.52	24.7	66.53	24.5	66.54	25.0	66.55	24.9
67.21	24.8	67.22	24.9	67.23	24.9	67.24	24.7	67.25	24.7	67.26	25.2	67.27	25.3
67.93	25.2	67.94	25.1	67.95	25.1	67.96	25.0	67.97	25.0	67.98	25.4	67.99	25.4
68.65	25.7	68.66	25.4	68.67	25.3	68.68	25.1	68.69	25.1	68.70	25.6	68.71	25.6

Table 4.2.24 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.08	26.9	0.09	26.1	0.10	25.6	0.11	24.8	0.12	24.4	0.13	24.0	0.14	23.7
0.32	25.3	0.33	25.4	0.34	25.8	0.35	25.3	0.36	26.2	0.37	25.7	0.38	25.7
0.56	23.2	0.57	23.6	0.58	24.4	0.59	23.8	0.60	25.0	0.61	24.6	0.62	25.7
0.80	22.5	0.81	22.8	0.82	23.0	0.83	22.5	0.84	23.3	0.85	23.2	0.86	23.9
1.04	22.4	1.05	22.7	1.06	22.7	1.07	22.3	1.08	22.8	1.09	22.8	1.10	23.2
1.28	22.2	1.29	22.3	1.30	22.4	1.31	22.1	1.32	22.8	1.33	22.7	1.34	22.8
1.52	22.2	1.53	22.4	1.54	22.3	1.55	22.1	1.56	22.7	1.57	22.6	1.58	22.8
1.76	22.2	1.77	22.4	1.78	22.4	1.79	22.1	1.80	22.6	1.81	22.4	1.82	22.6
2.00	22.2	2.01	22.4	2.02	22.2	2.03	22.1	2.04	22.5	2.05	22.4	2.06	22.6
2.24	22.1	2.25	22.4	2.26	22.3	2.27	22.2	2.28	22.6	2.29	22.4	2.30	22.7
2.48	22.2	2.49	22.3	2.50	22.2	2.51	22.1	2.52	22.4	2.53	22.6	2.54	22.4
2.72	22.0	2.73	22.3	2.74	22.2	2.75	22.1	2.76	22.4	2.77	22.4	2.78	22.4
2.96	22.2	2.97	22.3	2.98	22.2	2.99	22.1	3.00	22.5	3.01	22.5	3.02	22.5
3.20	22.1	3.21	22.3	3.22	22.1	3.23	22.1	3.24	22.4	3.25	22.4	3.26	22.4
3.44	22.0	3.45	22.2	3.46	22.1	3.47	21.9	3.48	22.3	3.49	22.2	3.50	22.2
3.68	21.9	3.69	21.9	3.70	21.9	3.71	21.7	3.72	22.2	3.73	22.2	3.74	22.1
3.92	21.8	3.93	22.1	3.94	21.9	3.95	21.7	3.96	22.2	3.97	22.2	3.98	22.2
4.64	21.8	4.65	22.1	4.66	21.8	4.67	21.8	4.68	22.2	4.69	22.2	4.70	22.1
5.36	21.7	5.37	21.9	5.38	21.7	5.39	21.7	5.40	22.2	5.41	22.0	5.42	22.1
6.08	21.3	6.09	21.3	6.10	21.2	6.11	21.1	6.12	21.6	6.13	21.6	6.14	21.6
6.80	21.0	6.81	20.8	6.82	20.7	6.83	20.6	6.84	21.0	6.85	21.0	6.86	21.0
7.52	21.2	7.53	21.1	7.54	20.8	7.55	20.8	7.56	21.2	7.57	21.2	7.58	21.3
8.24	21.3	8.25	20.9	8.26	20.6	8.27	20.6	8.28	21.0	8.29	21.0	8.30	21.0
8.96	21.3	8.97	20.9	8.98	20.4	8.99	20.4	9.00	20.8	9.01	20.8	9.02	20.8
9.68	21.2	9.69	20.7	9.70	20.1	9.71	20.1	9.72	20.5	9.73	20.5	9.74	20.5
10.40	21.7	10.41	21.1	10.42	20.3	10.43	20.3	10.44	20.6	10.45	20.6	10.46	20.5
11.12	21.5	11.13	21.1	11.14	20.2	11.15	20.3	11.16	20.7	11.17	20.7	11.18	20.6
11.84	21.4	11.85	20.8	11.86	19.9	11.87	20.0	11.88	20.3	11.89	20.3	11.90	20.3
12.56	21.2	12.57	20.6	12.58	19.6	12.59	19.8	12.60	19.9	12.61	19.8	12.62	19.7
13.28	21.2	13.29	20.7	13.30	19.5	13.31	19.6	13.32	19.9	13.33	19.7	13.34	19.7
14.00	21.6	14.01	21.1	14.02	19.6	14.03	20.1	14.04	20.0	14.05	19.9	14.06	19.7
14.72	21.0	14.73	20.7	14.74	19.6	14.75	19.9	14.76	19.9	14.77	19.8	14.78	19.7

Table 4.2.24 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
15.44	21.8	15.45	21.1	15.46	19.6	15.47	20.0	15.48	20.0	15.49	20.0	15.50	19.7
16.16	22.1	16.17	21.6	16.18	20.2	16.19	20.3	16.20	20.3	16.21	20.3	15.22	20.1
16.88	22.3	16.89	21.8	16.90	20.2	16.91	20.7	16.92	20.7	16.93	20.7	16.94	20.3
17.60	22.6	17.61	21.9	17.62	20.4	17.63	20.8	17.64	20.7	17.65	20.7	17.66	20.2
18.32	22.8	18.33	22.3	18.34	20.9	18.35	21.3	18.36	21.1	18.37	21.1	18.38	20.5
19.04	23.5	19.05	22.9	19.06	21.1	19.07	21.5	19.08	21.3	19.09	21.3	19.10	20.8
19.76	23.2	19.77	22.8	19.78	21.2	19.79	21.7	19.80	21.5	19.81	21.4	19.82	20.9
20.48	23.6	20.49	23.1	20.50	21.4	20.51	21.8	20.52	21.7	20.53	21.6	20.54	21.1
21.20	23.7	21.21	23.2	21.22	21.7	21.23	22.1	21.24	21.9	21.25	21.7	21.26	21.3
21.92	23.3	21.93	23.4	21.94	21.7	21.95	22.1	21.96	21.9	21.97	21.7	21.98	21.1
22.64	23.9	22.65	23.3	22.66	21.7	22.67	22.2	22.68	21.9	22.69	21.8	22.70	21.1
23.36	24.6	23.37	23.9	23.38	22.2	23.39	22.7	23.40	22.6	23.41	22.4	23.42	21.7
24.08	25.1	24.09	24.3	24.10	22.7	24.11	23.2	24.12	22.9	24.13	22.6	24.14	21.9
24.80	25.3	24.81	24.8	24.82	22.9	24.83	23.4	24.84	23.1	24.85	23.1	24.86	22.2
25.52	25.6	25.53	25.0	25.54	23.1	25.55	23.6	25.56	23.6	25.57	23.5	25.58	22.8
26.24	25.8	26.25	25.3	26.26	23.5	26.27	23.9	26.28	23.7	26.29	23.6	26.30	22.9
26.96	25.9	26.97	25.3	26.98	23.6	26.99	24.1	27.00	23.8	27.01	23.4	27.02	22.8
27.68	26.2	27.69	25.7	27.70	23.9	27.71	24.3	27.72	24.2	27.73	23.8	27.74	23.2
28.40	26.2	28.41	25.7	28.42	24.0	28.43	24.4	28.44	24.2	28.45	23.8	28.46	23.3
29.12	26.1	29.13	25.6	29.14	23.9	29.15	24.4	29.16	24.1	29.17	23.9	29.18	23.2
29.84	26.1	29.85	25.7	29.86	23.9	29.87	24.4	29.88	24.0	29.89	23.8	29.90	23.0
30.56	25.6	30.57	25.3	30.58	23.6	30.59	24.0	30.60	23.7	30.61	23.6	30.62	22.8
31.28	25.5	31.29	24.9	31.30	23.4	31.31	23.8	31.32	23.6	31.33	23.4	31.34	22.5
32.00	25.3	32.01	25.0	32.02	23.4	32.03	23.9	32.04	23.4	32.05	23.4	32.06	22.4
32.72	25.5	32.73	25.1	32.74	23.4	32.75	23.9	32.76	23.7	32.77	23.4	32.78	22.5
33.44	25.3	33.45	25.0	33.46	23.4	33.47	23.8	33.48	23.6	33.49	23.4	33.50	22.5
34.16	25.3	34.17	24.8	34.18	23.5	34.19	23.9	34.20	23.7	34.21	23.5	34.22	22.5
34.88	25.2	34.89	24.8	34.90	23.4	34.91	23.9	34.92	23.7	34.93	23.5	34.94	22.6
35.60	25.2	35.61	24.8	35.62	23.4	35.63	23.9	35.64	23.6	35.65	23.4	35.66	22.5
36.32	25.2	36.33	24.7	36.34	23.6	36.35	23.8	36.36	23.6	36.37	23.4	36.38	22.3
37.04	24.9	37.05	24.7	37.06	23.3	37.07	23.6	37.08	23.4	37.09	23.3	37.10	22.3
37.76	25.1	37.77	24.7	37.78	23.3	37.79	23.7	37.80	23.7	37.81	23.4	37.82	22.4

Table 4.2.24 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
38.48	25.1	38.49	24.7	38.50	23.4	38.51	23.9	38.52	23.7	38.53	23.6	38.54	22.6
39.20	25.2	39.21	24.7	39.22	23.4	39.23	23.8	39.24	23.7	39.25	23.5	39.26	22.5
39.92	25.3	39.93	25.0	39.94	23.7	39.95	23.8	39.96	23.8	39.97	23.6	39.98	22.6
40.64	25.6	40.65	25.3	40.66	23.9	40.67	24.3	40.68	24.3	40.69	24.0	40.70	23.1
41.36	25.4	41.37	25.1	41.38	23.9	41.39	24.3	41.40	24.3	41.41	24.2	41.42	23.1
42.08	25.5	42.09	25.2	42.10	24.3	42.11	24.4	42.12	24.3	42.13	24.2	42.14	23.1
42.80	25.4	42.81	25.1	42.82	24.1	42.83	24.4	42.84	24.4	42.85	24.2	42.86	23.2
43.52	25.1	43.53	25.0	43.54	23.9	43.55	24.2	43.56	24.2	43.57	24.0	43.58	23.3
44.24	25.1	44.25	24.7	44.26	23.8	44.27	24.2	44.28	24.2	44.29	23.8	44.30	23.2
44.96	25.0	44.97	24.8	44.98	23.9	44.99	24.2	45.00	24.2	45.01	24.1	45.02	23.3
45.68	25.0	45.69	24.9	45.70	23.9	45.71	24.3	45.72	24.3	45.73	24.1	45.74	23.4
46.40	25.2	46.41	24.8	46.42	24.0	46.43	24.2	46.44	24.4	46.45	24.1	46.46	23.4
47.12	25.4	47.13	25.2	47.14	24.2	47.15	24.5	47.16	24.5	47.17	24.3	47.18	23.6
47.84	25.7	47.85	25.4	47.86	24.4	47.87	24.6	47.88	24.7	47.89	24.4	47.90	23.9
48.56	25.9	48.57	25.7	48.58	24.7	48.59	25.1	48.60	25.1	48.61	24.8	48.62	24.0
49.28	25.9	49.29	25.7	49.30	24.7	49.31	25.1	49.32	25.2	49.33	24.9	49.34	24.1
50.00	26.1	50.01	25.8	50.02	24.9	50.03	25.4	50.04	25.3	50.05	25.1	50.06	24.3
50.72	26.4	50.73	26.1	50.74	25.0	50.75	25.3	50.76	25.3	50.77	25.2	50.78	24.4
51.44	26.6	51.45	26.4	51.46	25.3	51.47	25.7	51.48	25.7	51.49	25.4	51.50	24.7
52.16	26.7	52.17	26.3	52.18	25.4	52.19	25.7	52.20	25.9	52.21	25.5	52.22	24.8
52.88	26.7	52.89	26.4	52.90	25.5	52.91	25.8	52.92	25.8	52.93	25.5	52.94	24.9
53.60	26.6	53.61	26.4	53.62	25.4	53.63	25.7	53.64	25.6	53.65	25.4	53.66	24.8
54.32	26.4	54.33	26.2	54.34	25.3	54.35	25.5	54.36	25.5	54.37	25.3	54.38	24.6
55.04	26.1	55.05	25.8	55.06	25.0	55.07	25.3	55.08	25.3	55.09	25.1	55.10	24.4
55.76	25.7	55.77	25.6	55.78	24.7	55.79	25.0	55.80	25.1	55.81	24.8	55.82	24.2
56.48	25.6	56.49	25.3	56.50	24.6	56.51	24.8	56.52	24.8	56.53	24.6	56.54	24.1
57.20	25.2	57.21	25.0	57.22	24.2	57.23	24.4	57.24	24.4	57.25	24.3	57.26	23.7
57.92	25.0	57.93	24.7	57.94	24.0	57.95	24.2	57.96	24.3	57.97	24.2	57.98	23.5
58.64	24.7	58.65	24.5	58.66	23.8	58.67	23.9	58.68	24.1	58.69	23.9	58.70	23.3
59.36	24.4	59.37	24.3	59.38	23.6	59.39	23.8	59.40	23.9	59.41	23.8	59.42	23.1
60.08	24.2	60.09	24.1	60.10	23.3	60.11	23.6	60.12	23.7	60.13	23.4	60.14	22.9
60.80	24.2	60.81	24.0	60.82	23.3	60.83	23.6	60.84	23.6	60.85	23.5	60.86	22.8

Table 4.2.24 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
61.52	24.1	61.53	23.9	61.54	23.2	61.55	23.4	61.56	23.6	61.57	23.4	61.58	22.8
62.24	24.2	62.25	23.9	62.26	23.3	62.27	23.6	62.28	23.8	62.29	23.6	62.30	22.9
62.96	24.4	62.97	24.2	62.98	23.6	62.99	23.9	63.00	23.9	63.01	23.9	63.02	23.2
63.68	24.5	63.69	24.4	63.70	23.8	63.71	23.9	63.72	24.2	63.73	24.1	63.74	23.4
64.40	24.7	64.41	24.7	64.42	24.1	64.43	24.3	64.44	24.4	64.45	24.1	64.46	23.7
65.12	24.8	65.13	24.8	65.14	24.3	65.15	24.4	65.16	24.7	65.17	24.4	65.18	23.9
65.84	24.8	65.85	24.7	65.86	24.3	65.87	24.4	65.88	24.8	65.89	24.6	65.90	24.0
66.56	24.8	66.57	24.7	66.58	24.3	66.59	24.4	66.60	24.7	66.61	24.6	66.62	24.1
67.28	25.1	67.29	25.1	67.30	24.5	67.31	24.6	67.32	24.9	67.33	24.8	67.34	24.3
68.00	25.1	68.01	25.1	68.02	24.7	68.03	24.8	68.04	25.2	68.05	25.1	68.06	24.4
68.72	25.3	68.73	25.3	68.74	24.9	68.75	25.0	68.76	25.3	68.77	25.0	68.78	24.7

Table 4.2.24 Contd.

Appendix 4.2. Run Data (Cont'd)

TABLE 4.2.25

Initial conditions, Run 9, 30:7:71, S23

Distance from air inlet, in.	Moisture content	
	% w.b.	% d.b.
1.3	43.8	77.9
4.0	43.0	75.5
6.7	42.4	73.5
9.9	42.6	74.3
12.1	41.6	71.2
14.7	43.2	76.1
17.4	42.7	74.4
20.0	43.0	75.3
22.8	44.1	78.8
25.4	41.4	70.7
28.1	39.3	64.6
30.8	39.4	65.0
33.4	40.2	67.3
36.2	41.7	71.6
Mean $\pm \sigma$	42.0 $\pm$ 1.6	

TABLE 4.2.26

Final conditions

Distance from air inlet, in.	Weight in layer, g	Dry weight in layer, g	Moisture content		Mean Germination %
			% w.b.	% d.b.	
1.1	4940	4388	11.2	12.6	95
3.2	6865	6101	11.1	12.5	95
5.3	5765	5118	11.2	12.6	95
7.5	6175	5491	11.1	12.5	90
9.6	6095	5392	11.5	13.0	94
11.7	5520	4878	11.6	13.2	90
13.9	5720	5031	12.0	13.7	95
16.0	5730	5058	11.7	13.3	93
18.1	5385	4722	12.3	14.1	93
20.3	5250	4568	13.0	14.9	92
22.4	5725	4974	13.1	15.1	97
24.5	5275	4534	14.0	16.3	94
26.7	6020	5153	14.4	16.8	91
28.8	6090	5153	15.4	18.2	91
30.9	5700	4696	17.6	21.4	90

Total wet weight = 86255 g
Total dry weight = 75256.9 g Mean moisture content = 14.6% d.b.

Table 4.2. 27 Inlet air conditions, Run 9. 30:7:71 S23

TIME, HOURS	AMBIENT CONDITIONS TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	INLET CONDITIONS TEMP, DEG C	RELATIVE HUMIDITY %
0.23	26.8	52.7	0.011465	28.3	48.2
1.19	27.1	50.7	0.011253	29.5	44.1
2.15	27.3	49.3	0.011038	30.3	41.4
3.11	26.8	46.9	0.010171	30.0	38.9
4.07	25.3	47.5	0.009457	29.2	37.9
5.03	24.9	53.2	0.010325	28.5	43.0
5.99	23.9	56.5	0.010328	27.8	44.9
6.95	23.3	58.9	0.010377	26.9	47.3
7.91	23.1	62.6	0.010925	26.9	49.9
8.87	22.7	64.2	0.010949	26.6	50.9
9.83	23.0	66.0	0.011458	26.4	53.7
10.79	22.6	68.5	0.011573	26.4	54.4
11.75	22.1	68.1	0.011157	25.9	54.1
12.71	22.2	67.0	0.011088	25.8	53.9
13.67	22.0	66.4	0.010839	25.4	54.0
14.63	21.6	66.9	0.010663	25.3	53.6
15.59	21.9	65.1	0.010548	25.2	53.4
16.55	22.5	61.2	0.010294	25.6	50.7
17.51	22.6	58.2	0.009805	25.6	48.4
18.47	22.9	55.8	0.009601	26.1	46.0
19.43	23.4	51.9	0.009197	26.4	43.4
20.39	23.3	54.1	0.009549	26.6	44.6
21.35	23.9	50.7	0.009254	26.8	42.7
22.31	23.9	49.6	0.009056	27.0	41.2
23.27	23.9	46.9	0.008578	27.3	38.5
24.23	24.4	46.1	0.008796	27.7	38.1
25.19	24.3	45.6	0.008547	27.9	36.9
26.15	24.2	47.5	0.008811	27.9	38.1
27.11	23.7	48.4	0.008735	27.5	38.7
28.07	23.1	49.4	0.008601	27.1	38.9
29.03	22.5	51.3	0.008599	26.4	40.6
29.99	21.9	54.1	0.008765	25.8	42.8
30.95	20.4	58.4	0.008634	25.0	44.3
31.91	20.6	58.5	0.008712	24.5	46.0
32.87	19.7	63.1	0.008933	24.1	48.3
33.83	19.6	63.9	0.008978	24.0	48.9
34.79	19.4	65.0	0.009008	23.6	50.2
35.75	19.1	66.1	0.009000	23.4	50.8
36.71	18.9	65.9	0.008885	23.3	50.5
37.67	18.4	67.3	0.008788	22.8	51.5
38.63	19.4	66.8	0.009256	23.1	53.3
39.59	20.8	63.8	0.009671	24.0	52.6
40.55	21.1	62.4	0.009620	24.7	50.1
41.51	22.1	59.2	0.009684	25.1	49.4
42.47	23.6	49.6	0.008868	26.0	42.8
43.43	23.4	49.1	0.008720	26.4	41.2
44.39	23.2	51.7	0.009029	26.7	41.9
45.35	23.4	51.2	0.009067	26.8	41.7
46.31	23.8	52.1	0.009475	27.3	42.4
47.27	23.9	52.2	0.009562	27.3	42.7
48.23	23.9	51.8	0.009495	27.5	41.9
49.19	24.7	52.7	0.010119	28.1	43.3
50.15	24.4	61.1	0.011566	28.3	48.5
51.11	23.8	66.6	0.012180	27.9	52.2
52.07	23.9	70.2	0.012890	27.6	56.3

Table 4.2.27 Contd.

TIME, HOURS	AMBIENT CONDITIONS TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	INLET CONDITIONS TEMP, DEG C	RELATIVE HUMIDITY %
53.03	23.1	74.9	0.013090	27.3	58.3
53.99	22.2	75.3	0.012492	26.6	57.9
54.95	20.4	76.9	0.011418	25.7	55.9
55.91	21.4	76.6	0.012106	25.9	58.5
56.87	20.8	76.2	0.011597	25.6	57.3
57.83	20.4	74.2	0.011013	24.9	56.5
58.79	19.6	76.4	0.010763	24.6	56.3
59.75	19.6	76.8	0.010828	24.3	57.6
60.71	19.7	76.5	0.010848	24.4	57.5
61.67	19.6	76.8	0.010786	24.2	58.0
62.63	19.6	77.7	0.010918	24.2	58.7
63.59	21.4	62.2	0.009764	25.1	49.8
64.55	21.7	60.8	0.009714	25.6	48.1
65.51	21.3	60.5	0.009464	25.0	48.5
66.47	21.4	57.4	0.008995	25.1	45.8
67.43	21.8	53.2	0.008559	25.3	43.2
68.39	22.3	53.3	0.008859	25.7	43.7
69.35	22.8	53.5	0.009125	26.1	43.8
70.31	22.8	57.2	0.009779	25.9	47.3
71.27	23.3	56.7	0.010016	26.5	46.9
72.23	23.3	57.0	0.010083	26.4	47.5
73.19	23.9	66.7	0.012279	27.2	54.9
74.15	23.6	74.4	0.013454	27.1	60.7
75.11	23.6	50.0	0.008975	27.0	40.9
76.07	23.2	53.1	0.009289	26.9	42.4
77.03	23.1	53.5	0.009312	26.7	43.2
77.99	22.8	55.7	0.009516	26.3	45.0
78.95	22.4	55.7	0.009327	25.9	45.3
79.91	21.4	61.0	0.009570	25.6	47.4
80.87	20.7	63.2	0.009484	24.8	49.2
81.83	21.1	63.6	0.009814	24.8	50.8
82.79	21.1	64.8	0.010009	24.9	51.4
83.75	20.1	70.0	0.010122	24.5	53.4
84.71	20.4	67.6	0.009984	24.2	53.5
85.67	20.1	70.4	0.010187	23.8	55.9
86.63	19.9	69.8	0.009998	23.7	55.3
87.59	19.8	70.7	0.010085	23.7	55.7
88.55	20.3	69.7	0.010224	20.2	70.2
MEAN	22.3	60.6	0.010018	26.0	48.6
STANDARD DEVIATION		0.00114303	1.67		6.50

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.01	25.2	0.02	30.0	0.03	34.0	0.04	35.2	0.05	35.6	0.06	36.4	0.07	35.9
0.97	29.3	0.98	20.9	0.99	20.5	1.00	20.4	1.01	20.4	1.02	21.3	1.03	21.2
1.93	30.0	1.94	26.6	1.95	20.6	1.96	20.5	1.97	20.4	1.98	21.1	1.99	21.0
2.89	29.9	2.90	27.9	2.91	20.8	2.92	20.0	2.93	20.0	2.94	20.8	2.95	20.8
3.85	29.4	3.86	27.7	3.87	24.6	3.88	19.2	3.89	19.2	3.90	20.1	3.91	19.9
4.81	28.5	4.82	27.3	4.83	26.0	4.84	21.5	4.85	20.1	4.86	20.6	4.87	20.6
5.77	27.8	5.78	26.7	5.79	25.5	5.80	23.4	5.81	19.6	5.82	20.2	5.83	20.2
6.73	27.1	6.74	26.3	6.75	25.2	6.76	23.9	6.77	20.3	6.78	20.1	6.79	20.0
7.69	26.8	7.70	25.8	7.71	24.9	7.72	23.9	7.73	22.1	7.74	20.2	7.75	20.1
8.65	26.7	8.66	25.8	8.67	24.9	8.68	23.9	8.69	22.9	8.70	20.4	8.71	20.3
9.61	26.5	9.62	25.8	9.63	25.2	9.64	24.2	9.65	23.4	9.66	20.6	9.67	20.6
10.57	26.3	10.58	25.5	10.59	24.8	10.60	24.1	10.61	23.4	10.62	20.6	10.63	20.6
11.53	26.1	11.54	25.3	11.55	24.6	11.56	23.8	11.57	23.1	11.58	20.6	11.59	20.3
12.49	25.8	12.50	25.0	12.51	24.3	12.52	23.6	12.53	23.0	12.54	20.5	12.55	20.1
13.45	25.6	13.46	24.8	13.47	24.2	13.48	23.5	13.49	22.8	13.50	20.6	13.51	20.1
14.41	25.4	14.42	24.6	14.43	24.0	14.44	23.2	14.45	22.7	14.46	20.8	14.47	20.2
15.37	25.2	15.38	24.3	15.39	23.7	15.40	23.0	15.41	22.5	15.42	20.9	15.43	20.4
16.33	25.6	16.34	24.8	16.35	24.0	16.36	23.2	16.37	22.6	16.38	21.4	16.39	20.8
17.29	25.6	17.30	24.7	17.31	23.9	17.32	23.2	17.33	22.5	17.34	21.2	17.35	20.9
18.25	25.9	18.26	25.1	18.27	24.2	18.28	23.4	18.29	22.7	18.30	21.4	18.31	21.2
19.21	26.4	19.22	25.2	19.23	24.4	19.24	23.6	19.25	22.9	19.26	21.6	19.27	21.4
20.17	26.5	20.18	25.8	20.19	24.9	20.20	23.8	20.21	23.3	20.22	21.9	20.23	21.7
21.13	26.6	21.14	25.7	21.15	24.9	21.16	24.1	21.17	23.4	21.18	22.3	21.19	22.0
22.09	26.9	22.10	26.1	22.11	25.2	22.12	24.3	22.13	23.6	22.14	22.3	22.15	22.2
23.05	27.3	23.06	26.4	23.07	25.3	23.08	24.3	23.09	23.6	23.10	22.2	23.11	22.0
24.01	27.6	24.02	26.7	24.03	25.7	24.04	24.7	24.05	23.9	24.06	22.7	24.07	22.5
24.97	27.8	24.98	26.9	24.99	25.9	25.00	24.9	25.01	24.2	25.02	22.9	25.03	22.8
25.93	28.1	25.94	27.2	25.95	26.3	25.96	25.4	25.97	24.7	25.98	23.4	25.99	23.3
26.89	27.6	26.90	26.9	26.91	26.2	26.92	25.4	26.93	24.7	26.94	23.5	26.95	23.4
27.85	27.2	27.86	26.6	27.87	25.9	27.88	25.2	27.89	24.5	27.90	23.4	27.91	23.3
28.81	26.7	28.82	26.2	28.83	25.8	28.84	25.0	28.85	24.6	28.86	23.4	28.87	23.3
29.77	26.3	29.78	25.8	29.79	25.2	29.80	24.6	29.81	24.1	29.82	23.5	29.83	23.4

Table 4.2.28 Layer temperatures, ^{o}C, Run 9. 30:7:71 S23.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
30.73	25.1	30.74	24.8	30.75	24.4	30.76	23.9	30.77	23.7	30.78	23.1	30.79	23.1
31.69	24.6	31.70	24.3	31.71	23.9	31.72	23.3	31.73	23.0	31.74	22.6	31.75	22.6
32.65	24.3	32.66	24.1	32.67	23.8	32.68	23.3	32.69	22.8	32.70	22.4	32.71	22.4
33.61	24.2	33.62	23.8	33.63	23.6	33.64	23.1	33.65	22.3	33.66	22.4	33.67	22.4
34.57	23.7	34.58	23.6	34.59	23.4	34.60	22.9	34.61	22.4	34.62	22.1	34.63	22.1
35.53	23.6	35.54	23.3	35.55	23.0	35.56	22.5	35.57	22.3	35.58	22.1	35.59	21.9
36.49	23.3	36.50	23.1	36.51	22.8	36.52	22.4	36.53	22.1	36.54	21.8	36.55	21.7
37.45	23.1	37.46	22.9	37.47	22.4	37.48	22.1	37.49	21.9	37.50	21.6	37.51	21.6
38.41	23.0	38.42	22.8	38.43	22.6	38.44	22.2	38.45	21.9	38.46	21.8	38.47	21.7
39.37	23.8	39.38	23.5	39.39	23.2	39.40	22.8	39.41	22.4	39.42	22.1	39.43	22.1
40.33	24.6	40.34	24.3	40.35	24.0	40.36	23.4	40.37	23.1	40.38	22.5	40.39	22.3
41.29	24.9	41.30	24.6	41.31	24.2	41.32	23.7	41.33	23.4	41.34	22.9	41.35	22.8
42.25	25.7	42.26	25.2	42.27	24.7	42.28	24.1	42.29	23.7	42.30	23.1	42.31	23.1
43.21	26.3	43.22	25.8	43.23	25.4	43.24	24.7	43.25	24.4	43.26	23.2	43.27	23.1
44.17	26.7	44.18	26.1	44.19	25.7	44.20	25.3	44.21	24.8	44.22	24.1	44.23	23.9
45.13	26.7	45.14	26.4	45.15	26.1	45.16	25.6	45.17	25.3	45.18	24.5	45.19	24.4
46.09	27.1	46.10	26.7	46.11	26.3	46.12	25.8	46.13	25.3	46.14	24.7	46.15	24.7
47.05	27.4	47.06	26.9	47.07	26.6	47.08	26.2	47.09	25.8	47.10	25.3	47.11	25.1
48.01	27.6	48.02	27.3	48.03	26.8	48.04	26.2	48.05	25.8	48.06	25.1	48.07	25.0
48.97	27.7	48.98	27.4	48.99	26.9	49.00	26.6	49.01	26.2	49.02	25.5	49.03	25.3
49.93	28.4	49.94	27.9	49.95	27.6	49.96	26.9	49.97	26.6	49.98	25.7	49.99	25.6
50.89	28.2	50.90	27.8	50.91	27.5	50.92	26.9	50.93	26.6	50.94	25.9	50.95	25.9
51.85	27.7	51.86	27.6	51.87	27.3	51.88	26.9	51.89	26.6	51.90	26.0	51.91	25.3
52.81	27.5	52.82	27.2	52.83	27.2	52.84	26.7	52.85	26.6	52.86	26.1	52.87	25.9
53.77	26.8	53.78	26.9	53.79	27.1	53.80	26.9	53.81	26.9	53.82	26.7	53.83	26.7
54.73	26.1	54.74	26.2	54.75	26.2	54.76	26.1	54.77	26.2	54.78	26.2	54.79	26.1
55.69	26.2	55.70	26.1	55.71	25.9	55.72	25.7	55.73	25.7	55.74	25.8	55.75	25.7
56.65	25.9	56.66	25.8	56.67	25.8	56.68	25.7	56.69	25.7	56.70	25.8	56.71	25.6
57.61	25.3	57.62	25.2	57.63	25.1	57.64	24.8	57.65	24.8	57.66	25.0	57.67	24.8
58.57	24.8	58.58	24.7	58.59	24.7	58.60	24.6	58.61	24.6	58.62	24.6	58.63	24.4
59.53	24.6	59.54	24.6	59.55	24.6	59.56	24.2	59.57	24.2	59.58	24.5	59.59	24.5
60.49	24.6	60.50	24.4	60.51	24.4	60.52	24.2	60.53	24.2	60.54	24.3	60.55	24.2

Table 4.2.28 Contd.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
61.45	24.3	61.46	24.3	61.47	24.3	61.48	23.9	61.49	23.9	61.50	24.1	61.51	24.1
62.41	24.1	62.42	24.1	62.43	24.1	62.44	23.7	62.45	23.9	62.46	24.2	62.47	24.0
63.37	25.0	63.38	24.8	63.39	24.8	63.40	24.4	63.41	24.4	63.42	24.4	63.43	24.4
64.33	25.7	64.34	25.6	64.35	25.3	64.36	25.1	64.37	25.0	64.38	25.0	64.39	24.9
65.29	25.3	65.30	25.2	65.31	25.2	65.32	25.0	65.33	25.0	65.34	25.1	65.35	24.9
66.25	25.1	66.26	24.8	66.27	24.7	66.28	24.4	66.29	24.4	66.30	24.6	66.31	24.4
67.21	25.2	67.22	24.9	67.23	24.8	67.24	24.4	67.25	24.4	67.26	24.4	67.27	24.3
68.17	25.8	68.18	25.5	68.19	25.1	68.20	24.9	68.21	24.8	68.22	24.7	68.23	24.7
69.13	26.2	69.14	25.8	69.15	25.7	69.16	25.4	69.17	25.3	69.18	25.4	69.19	25.4
70.09	26.1	70.10	26.1	70.11	26.1	70.12	25.8	70.13	25.8	70.14	25.9	70.15	25.9
71.05	26.5	71.06	26.3	71.07	26.3	71.08	26.0	71.09	26.0	71.10	26.3	71.11	26.5
72.01	26.4	72.02	26.2	72.03	26.3	72.04	25.9	72.05	25.8	72.06	25.8	72.07	25.8
72.97	27.2	72.98	26.8	72.99	26.7	73.00	26.3	73.01	26.1	73.02	26.3	73.03	26.3
73.93	27.2	73.94	27.1	73.95	26.9	73.96	26.7	73.97	26.7	73.98	26.7	73.99	26.6
74.89	27.2	74.90	27.0	74.91	26.9	74.92	26.7	74.93	26.7	74.94	26.8	74.95	26.8
75.85	27.2	75.86	27.0	75.87	27.0	75.88	26.8	75.89	26.6	75.90	26.8	75.91	26.8
76.81	26.9	76.82	26.7	76.83	26.7	76.84	26.4	76.85	26.4	76.86	26.8	76.87	26.7
77.77	26.6	77.78	26.4	77.79	26.4	77.80	26.2	77.81	26.2	77.82	26.7	77.83	26.5
78.73	26.4	78.74	26.4	78.75	26.3	78.76	26.0	78.77	25.9	78.78	26.3	78.79	26.3
79.69	25.8	79.70	25.8	79.71	25.8	79.72	25.7	79.73	25.7	79.74	26.1	79.75	26.1
80.65	25.2	80.66	25.3	80.67	25.4	80.68	25.2	80.69	25.3	80.70	25.8	80.71	25.8
81.61	24.8	81.62	24.8	81.63	24.8	81.64	24.8	81.65	24.8	81.66	25.4	81.67	25.6
82.57	25.0	82.58	25.0	82.59	25.0	82.60	24.8	82.61	24.8	82.62	25.3	82.63	25.3
83.53	25.0	83.54	24.9	83.55	24.9	83.56	24.9	83.57	24.9	83.58	25.6	83.59	25.6
84.49	24.4	84.50	24.4	84.51	24.4	84.52	24.4	84.53	24.3	84.54	25.0	84.55	25.0
85.45	24.2	85.46	24.2	85.47	24.4	85.48	24.4	85.49	24.4	85.50	24.8	85.51	24.8
86.41	23.9	86.42	23.9	86.43	23.9	86.44	23.9	86.45	23.9	86.46	24.4	86.47	24.4
87.37	23.8	87.38	23.8	87.39	23.8	87.40	23.8	87.41	23.8	87.42	24.3	87.43	24.3
88.33	23.8	88.34	23.8	88.35	23.9	88.36	23.8	88.37	23.9	88.38	24.4	88.39	24.4

Table 4.2.28 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.08	34.8	0.09	33.7	0.10	33.3	0.11	33.0	0.12	33.5	0.13	33.4	0.14	32.6
1.04	21.1	1.05	21.1	1.06	21.1	1.07	21.3	1.08	21.8	1.09	21.5	1.10	21.8
2.00	20.7	2.01	20.8	2.02	20.6	2.03	20.9	2.04	21.4	2.05	21.3	2.06	21.7
2.96	20.6	2.97	20.8	2.98	20.6	2.99	20.8	3.00	21.4	3.01	21.2	3.02	21.5
3.92	19.6	3.93	20.0	3.94	19.8	3.95	20.1	3.96	20.6	3.97	20.6	3.98	20.8
4.88	20.3	4.89	20.6	4.90	20.2	4.91	20.4	4.92	21.0	4.93	20.8	4.94	21.1
5.84	19.9	5.85	20.2	5.86	19.9	5.87	20.2	5.88	20.8	5.89	20.8	5.90	20.9
6.80	19.8	6.81	20.2	6.82	19.7	6.83	20.1	6.84	20.7	6.85	20.6	6.86	20.6
7.76	19.9	7.77	20.1	7.78	19.7	7.79	20.0	7.80	20.6	7.81	20.6	7.82	20.6
8.72	20.2	8.73	20.3	8.74	20.0	8.75	20.2	8.76	20.6	8.77	20.6	8.78	20.6
9.68	20.3	9.69	20.5	9.70	20.3	9.71	20.6	9.72	20.9	9.73	20.9	9.74	20.9
10.64	20.3	10.65	20.7	10.66	20.3	10.67	20.6	10.68	21.1	10.69	21.1	10.70	21.1
11.60	20.0	11.61	20.3	11.62	20.1	11.63	20.3	11.64	20.8	11.65	20.8	11.66	20.8
12.56	19.9	12.57	20.0	12.58	19.8	12.59	20.1	12.60	20.6	12.61	20.6	12.62	20.6
13.52	19.6	13.53	19.8	13.54	19.6	13.55	19.8	13.56	20.4	13.57	20.3	13.58	20.3
14.48	19.3	14.49	19.5	14.50	19.2	14.51	19.4	14.52	20.1	14.53	20.1	14.54	20.0
15.44	19.0	15.45	19.2	15.46	18.9	15.47	19.1	15.48	19.7	15.49	19.7	15.50	19.7
16.40	18.8	16.41	19.1	16.42	18.8	16.43	19.1	16.44	19.5	16.45	19.5	16.46	19.6
17.36	18.8	17.37	18.8	17.38	18.7	17.39	18.8	17.40	19.3	17.41	19.3	17.42	19.4
18.32	18.9	18.33	18.7	18.34	18.8	18.35	18.7	18.36	19.1	18.37	19.1	18.38	19.2
19.28	19.3	19.29	18.6	19.30	18.8	19.31	18.6	19.32	19.0	19.33	19.0	19.34	19.2
20.24	19.8	20.25	18.8	20.26	18.1	20.27	18.3	20.28	18.7	20.29	18.8	20.30	19.0
21.20	20.5	21.21	18.4	21.22	18.2	21.23	18.3	21.24	18.8	21.25	18.8	21.26	18.9
22.16	20.8	22.17	18.3	22.18	18.1	22.19	18.2	22.20	18.7	22.21	18.7	22.22	19.1
23.12	20.8	23.13	17.8	23.14	17.5	23.15	17.7	23.16	18.2	23.17	18.2	23.18	18.6
24.08	21.3	24.09	17.8	24.10	17.6	24.11	17.8	24.12	18.2	24.13	18.2	24.14	18.3
25.04	21.6	25.05	17.8	25.06	17.6	25.07	17.7	25.08	18.2	25.09	18.4	25.10	18.7
26.00	22.1	26.01	18.0	26.02	17.8	26.03	18.0	26.04	18.4	26.05	18.6	26.06	18.8
26.96	22.2	26.97	17.9	26.98	17.6	26.99	17.9	27.00	18.1	27.01	18.3	27.02	18.6
27.92	22.2	27.93	17.8	27.94	17.4	27.95	17.4	27.96	17.8	27.97	17.8	27.98	18.2
28.88	22.2	28.89	18.4	28.90	17.8	28.91	17.1	28.92	17.7	28.93	17.7	28.94	18.0
29.84	22.4	29.85	19.4	29.86	19.2	29.87	17.5	29.88	17.9	29.89	17.9	29.90	18.0

Table 4.2.28 Contd.

10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
30.80	22.0	30.81	19.8	30.82	19.7	30.83	17.2	30.84	17.6	30.85	17.6	30.86	17.9
31.76	21.7	31.77	20.0	31.78	19.8	31.79	16.8	31.80	17.2	31.81	17.4	31.82	17.7
32.72	21.6	32.73	20.1	32.74	20.1	32.75	16.9	32.76	17.3	32.77	17.4	32.78	17.6
33.68	21.6	33.69	20.2	33.70	20.0	33.71	17.4	33.72	17.4	33.73	17.5	33.74	17.6
34.64	21.3	34.65	19.9	34.66	19.8	34.67	18.0	34.68	16.9	34.69	17.1	34.70	17.3
35.60	21.3	35.61	20.2	35.62	19.9	35.63	18.6	35.64	17.2	35.65	17.4	35.66	17.6
36.56	21.0	36.57	19.9	36.58	19.7	36.59	18.6	36.60	17.1	36.61	17.2	36.62	17.4
37.52	20.9	37.53	19.8	37.54	19.4	37.55	18.6	37.56	16.9	37.57	16.9	37.58	17.2
38.48	21.0	38.49	19.9	38.50	19.7	38.51	18.8	38.52	17.1	38.53	16.9	38.54	17.2
39.44	21.4	39.45	20.2	39.46	20.1	39.47	19.4	39.48	17.7	39.49	17.2	39.50	17.6
40.40	21.7	40.41	20.7	40.42	20.5	40.43	19.8	40.44	18.3	40.45	17.9	40.46	18.2
41.36	22.2	41.37	20.9	41.38	20.7	41.39	20.0	41.40	18.8	41.41	18.1	41.42	18.3
42.32	22.2	42.33	21.1	42.34	20.9	42.35	20.1	42.36	19.1	42.37	18.0	42.38	18.6
43.28	22.3	43.29	20.8	43.30	20.6	43.31	19.8	43.32	18.9	43.33	17.6	43.34	18.3
44.24	23.1	44.25	21.4	44.26	21.2	44.27	20.3	44.28	19.6	44.29	17.9	44.30	18.4
45.20	23.4	45.21	21.9	45.22	21.7	45.23	21.3	45.24	20.0	45.25	18.3	45.26	18.7
46.16	23.7	46.17	22.3	46.18	21.9	46.19	21.1	46.20	20.4	46.21	18.4	46.22	19.1
47.12	24.1	47.13	22.7	47.14	22.6	47.15	21.6	47.16	20.8	47.17	18.8	47.18	19.3
48.08	24.1	48.09	22.6	48.10	22.3	48.11	21.5	48.12	20.8	48.13	18.8	48.14	19.2
49.04	24.5	49.05	23.0	49.06	22.7	49.07	22.0	49.08	21.2	49.09	19.5	49.10	19.5
50.00	24.7	50.01	23.3	50.02	22.9	50.03	22.1	50.04	21.4	50.05	19.8	50.06	19.2
50.96	24.3	50.97	23.3	50.98	22.9	50.99	22.2	51.00	21.4	51.01	20.1	51.02	19.1
51.92	25.0	51.93	23.5	51.94	23.1	51.95	22.3	51.96	21.6	51.97	20.2	51.98	18.8
52.88	25.2	52.89	23.6	52.90	23.4	52.91	22.6	52.92	21.8	52.93	20.6	52.94	18.7
53.84	26.1	53.85	24.7	53.86	24.4	53.87	23.6	53.88	23.0	53.89	21.8	53.90	19.4
54.80	25.6	54.81	24.7	54.82	24.3	54.83	23.6	54.84	23.2	54.85	22.1	54.86	19.7
55.76	25.2	55.77	24.3	55.78	24.0	55.79	23.6	55.80	23.3	55.81	22.2	55.82	19.7
56.72	25.1	56.73	24.2	56.74	23.9	56.75	23.4	56.76	23.2	56.77	22.3	56.78	19.7
57.68	24.2	57.69	23.3	57.70	23.1	57.71	22.6	57.72	22.5	57.73	21.6	57.74	18.9
58.64	23.9	58.65	23.1	58.66	22.8	58.67	22.5	58.68	22.2	58.69	21.4	58.70	18.6
59.60	23.9	59.61	23.1	59.62	22.9	59.63	22.3	59.64	22.0	59.65	21.3	59.66	18.3
60.56	23.7	60.57	22.9	60.58	22.8	60.59	22.3	60.60	22.1	60.61	21.4	60.62	18.4

Table 4.2.28 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
61.52	23.7	61.53	22.9	61.54	22.7	61.55	22.2	61.56	22.3	61.57	21.4	61.58	18.3
62.48	23.6	62.49	22.9	62.50	22.7	62.51	22.3	62.52	22.2	62.53	21.4	62.54	18.2
63.44	23.9	63.45	23.3	63.46	23.1	63.47	22.7	63.48	22.6	63.49	21.9	63.50	18.6
64.40	24.2	64.41	23.6	64.42	23.3	64.43	22.9	64.44	22.8	64.45	22.2	64.46	18.9
65.36	24.4	65.37	23.8	65.33	23.4	65.39	23.0	65.40	23.0	65.41	22.2	65.42	18.3
66.32	23.9	66.33	23.3	66.34	23.1	66.35	22.6	66.36	22.4	66.37	21.7	66.38	18.3
67.28	23.8	67.29	23.0	67.30	22.7	67.31	22.2	67.32	22.2	67.33	21.5	67.34	17.8
68.24	24.1	68.25	23.3	63.26	22.8	63.27	22.4	63.28	22.4	68.29	21.6	68.30	17.8
69.20	25.0	69.21	24.2	69.22	23.9	69.23	23.3	69.24	23.2	69.25	22.5	69.26	18.7
70.16	25.4	70.17	24.8	70.18	24.3	70.19	23.9	70.20	23.7	70.21	23.0	70.22	18.6
71.12	25.8	71.13	25.3	71.14	24.9	71.15	24.5	71.16	24.4	71.17	23.6	71.18	12.2
72.08	25.4	72.09	24.7	72.10	24.6	72.11	24.1	72.12	24.0	72.13	23.2	72.14	18.3
73.04	25.8	73.05	25.1	73.06	24.8	73.07	24.4	73.08	24.3	73.09	23.6	73.10	19.4
74.00	26.0	74.01	25.3	74.02	25.0	74.03	24.4	74.04	24.4	74.05	23.7	74.06	19.6
74.96	26.3	74.97	25.7	74.98	25.3	74.99	24.8	75.00	24.8	75.01	24.0	75.02	19.8
75.92	26.4	75.93	25.8	75.94	25.6	75.95	25.2	75.96	25.1	75.97	24.2	75.98	20.3
76.88	26.3	76.89	25.9	76.90	25.7	76.91	25.3	76.92	25.3	76.93	24.6	76.94	20.7
77.84	26.1	77.85	25.7	77.86	25.6	77.87	25.2	77.88	25.3	77.89	24.5	77.90	20.9
78.80	25.9	78.81	25.5	78.82	25.4	78.83	25.1	78.84	25.2	78.85	24.7	78.86	21.3
79.76	25.8	79.77	25.6	79.78	25.3	79.79	25.1	79.80	25.3	79.81	24.6	79.82	21.5
80.72	25.5	80.73	25.3	80.74	25.1	80.75	25.0	80.76	25.3	80.77	24.6	80.78	21.7
81.68	25.3	81.69	25.2	81.70	24.9	81.71	24.3	81.72	25.2	81.73	24.6	81.74	21.9
82.64	24.9	82.65	24.9	82.66	24.8	82.67	24.6	82.68	24.8	82.69	24.6	82.70	22.3
83.60	25.2	83.61	25.0	83.62	24.8	83.63	24.7	83.64	24.9	83.65	24.6	83.66	22.3
84.56	24.6	84.57	24.6	84.58	24.6	84.59	24.4	84.60	24.3	84.61	24.4	84.62	22.3
85.52	24.7	85.53	24.6	85.54	24.4	85.55	24.4	85.56	24.8	85.57	24.5	85.58	22.6
86.48	24.2	86.49	24.3	86.50	24.1	86.51	24.0	86.52	24.4	86.53	24.0	86.54	22.3
87.44	23.9	87.45	23.9	87.46	23.8	87.47	23.8	87.48	24.4	87.49	23.9	87.50	22.4
88.40	24.2	88.41	24.2	88.42	24.3	88.43	24.2	88.44	24.5	88.45	24.2	88.46	22.2

Table 4.2.28 Contd.

Appendix 4.2. Run Data (Cont'd)

TABLE 4.2.29

Initial conditions, Run 10, 4:8:71, S23.

Distance from air inlet in.	Moisture content	
	% w.b.	% d.b.
1.5	40.8	68.9
4.4	40.4	67.8
7.3	38.8	63.3
10.2	37.5	60.0
13.2	40.0	66.5
16.1	41.1	69.6
19.0	39.6	65.7
21.9	38.6	62.9
24.8	38.5	62.5
27.8	37.7	60.5
30.7	38.2	61.9
33.6	38.6	62.9
36.5	38.4	62.2
Mean $\pm\sigma$	39.1 ± 1.2	

TABLE 4.2.30

Final conditions

Distance from air inlet, in	Weight in layer, g	Dry Weight in layer, g	Moisture content		Mean Germination
			% w.b.	% d.b.	
0.8	5105	4552	10.8	12.2	96
2.6	7490	6679	10.8	12.1	93
4.6	7755	6912	10.9	12.2	95
6.7	7635	6798	11.0	12.3	94
8.7	7460	6639	11.0	12.4	96
10.7	7450	6627	11.1	12.4	95
12.8	6815	6055	11.2	12.5	96
14.8	6855	6063	11.6	13.1	94
16.8	7020	6177	12.0	13.6	96
18.8	6055	5213	13.9	16.2	96
20.9	4790	3997	16.6	19.8	97
22.9	6120	4979	18.7	22.9	97
24.9	6480	5201	19.7	24.6	98
26.9	4430	3460	21.9	28.0	95
29.0	4835	3696	23.6	30.8	95
31.0	5910	4499	23.9	31.4	97
32.5	2835	2121	25.2	33.7	94

Total wet weight = 105040 g
Total dry weight = 89667 g Mean moisture content = 17.1% d.b.

Table 4.2.31 Inlet air conditions, Run 10. 4:8:71 S23.

TIME,	AMBIENT CONDITIONS			INLET CONDITIONS	
HOURS	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
0.23	22.2	67.4	0.011111	24.3	59.1
0.71	22.5	66.4	0.011179	25.4	55.6
1.19	22.6	66.1	0.011202	26.1	53.8
1.67	22.5	64.8	0.010904	26.2	51.8
2.15	22.7	64.5	0.010972	26.2	52.2
2.63	22.5	64.0	0.010767	26.4	50.7
3.11	22.5	63.2	0.010631	26.3	50.3
3.59	22.3	63.1	0.010498	26.3	49.6
4.07	22.1	64.0	0.010479	26.1	50.3
4.55	21.9	63.5	0.010324	26.1	49.6
5.03	22.0	63.6	0.010368	25.9	51.1
5.51	21.7	64.1	0.010240	25.9	49.7
5.99	21.4	65.9	0.010398	25.7	51.1
6.47	21.2	69.1	0.010713	25.5	53.2
6.95	21.2	70.4	0.010950	25.4	54.7
7.43	21.2	72.5	0.011253	25.4	56.2
7.91	20.8	74.0	0.011256	25.2	56.9
8.39	20.9	76.7	0.011712	25.1	59.4
8.87	21.0	78.1	0.012011	25.1	60.9
9.35	21.1	81.3	0.012598	25.1	64.0
10.79	21.6	86.2	0.013291	25.1	67.5
12.23	20.9	90.9	0.013974	25.0	71.1
13.67	20.5	91.3	0.013646	24.8	70.1
15.11	21.7	93.4	0.015031	25.2	75.3
16.55	21.9	64.3	0.010414	25.7	51.1
17.99	22.0	65.6	0.010703	25.4	53.3
19.43	21.4	68.9	0.010867	25.4	54.1
20.87	21.4	72.2	0.011366	25.4	56.5
22.31	21.2	73.4	0.011390	25.5	56.6
23.75	20.5	68.6	0.010198	24.6	53.4
25.19	20.3	70.2	0.010332	24.2	55.6
26.63	21.1	71.6	0.011028	25.0	56.4
28.07	20.7	73.9	0.011167	25.1	56.9
29.51	20.7	69.6	0.010456	24.8	54.2
30.95	20.1	69.6	0.009929	24.4	52.7
32.39	20.2	67.0	0.009754	24.2	52.3
33.83	19.6	68.7	0.009626	23.9	52.7
35.27	19.3	69.4	0.009552	23.7	52.8
36.71	19.0	69.1	0.009355	23.4	52.6
38.15	19.4	69.9	0.009735	23.6	54.4
39.59	20.0	67.7	0.009759	24.3	52.2
41.03	19.9	66.8	0.009551	24.0	51.9
42.47	21.4	59.8	0.009377	24.8	48.5
43.91	21.8	59.8	0.009603	25.2	48.7
45.35	22.5	58.5	0.009828	26.1	47.3
46.79	23.2	56.2	0.009961	26.6	46.0
48.23	23.7	54.5	0.009855	27.4	43.7
49.67	24.6	53.2	0.010120	28.3	42.6
51.11	27.9	55.8	0.010236	28.2	43.5
52.55	23.4	57.3	0.010263	27.4	45.6
53.99	22.9	60.9	0.010515	26.9	48.1
55.43	22.4	61.9	0.010340	26.5	48.4
56.87	21.9	62.7	0.010147	25.9	49.1
58.31	21.4	65.5	0.010332	25.7	50.8
59.75	19.9	69.8	0.009998	25.1	50.8

Table 4.2.31 Contd.

TI E.	AMBIENT CONDITIONS			INLET CONDITIONS	
HOURS	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
61.19	20.4	66.4	0.009832	24.9	50.8
62.63	20.6	66.9	0.010021	25.0	51.3
64.07	21.3	63.3	0.009875	24.9	50.7
65.51	21.8	58.6	0.009451	25.9	45.9
66.95	21.9	62.7	0.010191	25.8	49.6
68.39	22.4	60.4	0.010117	26.3	47.0
69.83	22.9	60.4	0.010402	26.9	47.6
71.27	23.2	58.0	0.010152	27.3	45.3
72.71	23.5	56.1	0.010014	27.3	44.8
74.15	23.6	53.2	0.009524	27.6	42.0
75.59	22.7	52.3	0.008690	27.2	40.1
77.03	21.7	51.4	0.008192	26.3	39.0
78.47	20.2	52.4	0.007636	25.2	38.7
79.91	19.3	54.7	0.007530	24.5	39.9
81.35	18.8	56.2	0.007502	24.1	40.8
82.79	18.3	56.5	0.007305	23.6	40.8
84.23	18.2	57.6	0.007373	23.2	42.3
85.67	18.4	57.9	0.007547	23.1	43.4
87.11	20.1	55.9	0.008063	23.9	44.3
88.55	22.5	51.7	0.008662	26.2	41.3
89.99	22.4	50.8	0.008496	26.7	39.5
91.43	22.8	50.1	0.008548	26.7	39.7
92.87	23.1	50.8	0.008816	27.0	40.2
94.31	22.9	55.1	0.009512	26.9	43.4
95.75	23.4	55.7	0.009903	27.3	44.2
97.19	23.9	56.1	0.010259	27.7	44.7
98.63	23.9	57.6	0.010533	27.8	45.7
100.07	23.6	59.6	0.010717	27.7	46.2
101.51	23.3	63.1	0.011133	27.5	49.1
102.95	22.7	64.1	0.010903	26.9	49.7
104.39	22.3	64.6	0.010724	26.7	49.5
105.83	22.1	64.0	0.010479	26.4	49.4
107.27	21.3	67.1	0.010511	25.8	51.3
108.71	21.7	67.8	0.010887	25.8	53.0
110.15	21.8	68.7	0.011113	26.1	53.3
111.59	21.9	67.5	0.010908	25.8	53.2
113.03	21.7	69.9	0.011227	25.9	54.5
114.47	22.5	69.6	0.011736	26.2	55.9
115.91	22.5	69.6	0.011736	26.4	55.0
117.35	23.9	64.4	0.011797	27.5	52.0
118.79	24.2	62.0	0.011587	28.1	49.4
120.23	25.3	56.1	0.011196	28.9	45.5
121.67	24.9	56.8	0.011073	29.2	44.3
123.11	24.7	58.3	0.011138	28.8	45.8
124.55	24.1	60.0	0.011089	28.3	46.7
125.99	23.9	61.7	0.011347	28.2	48.1
127.43	23.6	66.8	0.012007	28.0	51.3
128.87	22.9	68.3	0.011786	27.3	52.6
130.31	22.8	68.3	0.011738	27.1	53.1
131.75	22.8	67.4	0.011551	27.0	52.4
133.19	22.5	69.2	0.011666	26.8	53.6
134.63	22.5	67.6	0.011387	26.9	52.0
MEAN	21.9	64.5	0.010430	26.0	50.4
STANDARD DEVIATION		0.00130507	1.34		6.60

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.01	21.6	0.02	25.1	0.03	25.4	0.04	25.3	0.05	24.7	0.06	24.6	0.07	24.8
0.49	23.7	0.50	19.3	0.51	19.2	0.52	19.2	0.53	19.3	0.54	19.7	0.55	23.2
0.97	24.9	0.98	19.5	0.99	19.5	1.00	19.5	1.01	19.5	1.02	19.9	1.03	20.1
1.45	25.4	1.46	19.5	1.47	19.3	1.48	19.5	1.49	19.6	1.50	20.1	1.51	20.2
1.93	25.7	1.94	19.6	1.95	19.4	1.96	19.3	1.97	19.4	1.98	20.1	1.99	20.2
2.41	25.9	2.42	19.4	2.43	19.4	2.44	19.5	2.45	19.6	2.46	20.1	2.47	20.3
2.89	25.8	2.90	19.2	2.91	19.1	2.92	19.2	2.93	19.3	2.94	19.8	2.95	20.2
3.37	25.8	3.38	20.1	3.39	19.1	3.40	19.1	3.41	19.1	3.42	19.7	3.43	19.8
3.85	25.8	3.86	20.9	3.87	18.3	3.33	18.9	3.89	18.9	3.90	19.3	3.91	19.8
4.33	25.7	4.34	21.6	4.35	18.7	4.36	18.6	4.37	18.3	4.38	19.3	4.39	19.6
4.81	25.6	4.82	22.2	4.83	18.7	4.84	18.6	4.85	18.7	4.86	19.2	4.87	19.4
5.29	25.6	5.30	22.3	5.31	18.7	5.32	18.4	5.33	18.6	5.34	19.2	5.35	19.3
5.77	25.5	5.73	22.4	5.79	18.6	5.80	18.3	5.81	18.6	5.82	19.1	5.83	19.3
6.25	25.4	6.26	22.6	6.27	19.0	6.28	18.3	6.29	18.5	6.30	18.9	6.31	19.2
6.73	25.3	6.74	22.7	6.75	19.6	6.76	18.3	6.77	18.4	6.78	18.9	6.79	19.2
7.21	25.2	7.22	22.8	7.23	20.3	7.24	18.2	7.25	18.4	7.26	18.8	7.27	19.1
7.69	24.9	7.70	22.6	7.71	20.6	7.72	18.2	7.73	18.2	7.74	18.7	7.75	18.9
8.17	24.9	8.18	22.8	8.19	20.8	8.20	18.1	8.21	18.3	8.22	18.8	8.23	18.9
8.65	24.9	8.66	22.8	8.67	21.2	8.68	18.2	8.69	18.4	8.70	18.8	8.71	19.0
9.13	24.9	9.14	22.9	9.15	21.3	9.16	18.3	9.17	18.3	9.18	18.7	9.19	18.9
10.57	24.9	10.58	23.0	10.59	21.8	10.60	18.4	10.61	18.4	10.62	18.8	10.63	19.1
12.01	24.9	12.02	23.1	12.03	21.9	12.04	18.3	12.05	18.3	12.06	18.9	12.07	19.2
13.45	24.7	13.46	23.2	13.47	22.2	13.48	18.4	13.49	18.4	13.50	19.0	13.51	19.2
14.89	24.8	14.90	23.3	14.91	22.3	14.92	18.4	14.93	18.3	14.94	18.9	14.95	19.2
16.33	25.5	16.34	23.8	16.35	22.7	16.36	18.6	16.37	18.6	16.38	19.3	16.39	19.6
17.77	25.2	17.78	24.1	17.79	23.1	17.80	18.6	17.81	18.3	17.82	18.9	17.83	19.2
19.21	25.2	19.22	24.2	19.23	23.2	19.24	19.5	19.25	18.8	19.26	19.4	19.27	19.5
20.65	25.3	20.66	24.3	20.67	23.7	20.68	20.2	20.69	19.2	20.70	19.7	20.71	19.7
22.09	25.3	22.10	24.5	22.11	23.8	22.12	20.8	22.13	19.4	22.14	19.9	22.15	20.1
23.53	24.8	23.54	23.7	23.55	22.8	23.56	19.8	23.57	18.1	23.58	18.9	23.59	19.6
24.97	24.2	24.98	23.4	24.99	22.3	25.00	20.1	25.01	17.9	25.02	18.4	25.03	18.6
26.41	25.	26.42	24.2	26.43	23.6	26.44	21.2	26.45	19.1	26.46	19.4	26.47	19.4

Table 4.2.32 Layer temperatures, °C, Run 10. 4:8:71 S23.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
27.85	25.1	27.86	24.4	27.87	23.8	27.88	21.4	27.89	19.4	27.90	19.4	27.91	19.6
29.29	24.9	29.30	24.1	29.31	23.4	29.32	21.2	29.33	19.4	29.34	18.7	29.35	19.3
30.73	24.5	30.74	23.3	30.75	23.2	30.76	20.9	30.77	19.1	30.78	18.2	30.79	18.6
32.17	24.3	32.18	23.6	32.19	23.1	32.20	21.1	32.21	19.4	32.22	18.1	32.23	18.4
33.61	23.8	33.62	23.3	33.63	22.3	33.64	20.9	33.65	19.4	33.66	17.8	33.67	18.0
35.05	23.8	35.06	23.2	35.07	22.8	35.08	21.0	35.09	19.7	35.10	17.4	35.11	17.7
36.49	23.6	36.50	23.1	36.51	22.7	36.52	20.9	36.53	19.7	36.54	17.2	36.55	17.4
37.93	23.6	37.94	23.1	37.95	22.9	37.96	21.3	37.97	20.2	37.98	17.3	37.99	17.3
39.37	24.2	39.38	23.8	39.39	23.4	39.40	21.9	39.41	21.0	39.42	18.1	39.43	18.0
40.81	24.1	40.82	23.8	40.83	23.5	40.84	22.1	40.85	21.2	40.86	17.9	40.87	18.2
42.25	24.8	42.26	24.1	42.27	23.7	42.28	22.4	42.29	21.6	42.30	18.1	42.31	18.2
43.69	25.2	43.70	24.5	43.71	24.1	43.72	22.6	43.73	21.6	43.74	17.7	43.75	17.9
45.13	25.7	45.14	25.2	45.15	24.9	45.16	23.3	45.17	22.4	45.18	18.1	45.19	18.1
46.57	26.4	46.58	26.0	46.59	25.4	46.60	23.9	46.61	23.1	46.62	18.6	46.63	18.5
48.01	27.3	48.02	26.7	48.03	26.3	48.04	24.8	48.05	23.9	48.06	19.3	48.07	18.8
49.45	28.2	49.46	27.5	49.47	27.1	49.48	25.6	49.49	24.7	49.50	20.5	49.51	19.3
50.89	28.4	50.90	27.9	50.91	27.7	50.92	26.4	50.93	25.6	50.94	21.6	50.95	19.5
52.33	27.4	52.34	27.3	52.35	27.2	52.36	26.4	52.37	25.3	52.38	22.4	52.39	19.6
53.77	27.2	53.78	27.0	53.79	26.9	53.80	26.2	53.81	25.8	53.82	23.1	53.83	19.5
55.21	26.7	55.22	26.5	55.23	26.4	55.24	25.8	55.25	25.4	55.26	23.3	55.27	19.3
56.65	26.1	56.66	26.0	56.67	25.9	56.68	25.6	56.69	25.3	56.70	23.4	56.71	19.1
58.09	25.9	58.10	25.8	58.11	25.8	58.12	25.5	58.13	25.3	58.14	23.9	58.15	19.1
59.53	25.3	59.54	25.2	59.55	25.2	59.56	24.9	59.57	24.9	59.58	23.8	59.59	18.8
60.97	24.9	60.98	24.8	60.99	24.8	61.00	24.4	61.01	24.4	61.02	23.6	61.03	18.4
62.41	24.9	62.42	24.8	62.43	24.8	62.44	24.6	62.45	24.4	62.46	23.8	62.47	18.4
63.85	25.0	63.86	24.8	63.87	24.8	63.88	24.4	63.89	24.3	63.90	23.8	63.91	18.3
65.29	25.9	65.30	25.2	65.31	24.9	65.32	24.6	65.33	24.3	65.34	23.9	65.35	18.7
66.73	25.7	66.74	25.6	66.75	25.6	66.76	25.4	66.77	25.3	66.78	24.7	66.79	18.4
68.17	26.3	68.18	26.1	68.19	26.1	68.20	25.6	68.21	25.3	68.22	25.0	68.23	18.8
69.61	26.8	69.62	26.5	69.63	26.4	69.64	26.1	69.65	26.0	69.66	25.5	69.67	19.4
71.05	27.4	71.06	27.2	71.07	26.9	71.08	26.5	71.09	26.3	71.10	25.9	71.11	19.2
72.49	27.3	72.50	27.0	72.51	26.9	72.52	26.3	72.53	26.2	72.54	25.7	72.55	18.3

Table 4.2.32 Contd.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
73.93	27.6	73.94	27.4	73.95	27.2	73.96	26.8	73.97	26.6	73.98	26.3	73.99	19.0
75.37	27.3	75.38	27.1	75.39	27.0	75.40	26.6	75.41	26.3	75.42	26.0	75.43	13.5
76.81	26.5	76.82	26.1	76.83	25.9	76.84	25.4	76.85	25.3	76.86	25.1	76.87	17.4
78.25	25.6	78.26	25.4	78.27	25.3	78.28	24.9	78.29	24.3	78.30	24.6	78.31	16.6
79.69	24.3	79.70	24.7	79.71	24.7	79.72	24.4	79.73	24.3	79.74	24.3	79.75	16.1
81.13	24.2	81.14	24.0	81.15	24.2	81.16	24.0	81.17	24.0	81.18	24.1	81.19	15.9
82.57	23.8	82.58	23.7	82.59	23.6	82.60	23.4	82.61	23.4	82.62	23.7	82.63	15.7
84.01	23.2	84.02	23.1	84.03	23.2	84.04	23.1	84.05	23.1	84.06	23.3	84.07	15.2
85.45	23.2	85.46	23.1	85.47	23.2	85.48	22.9	85.49	22.9	85.50	23.3	85.51	15.2
86.89	23.7	86.90	23.7	86.91	23.7	86.92	23.5	86.93	23.5	86.94	23.8	86.95	16.0
88.33	25.9	88.34	25.4	88.35	25.3	88.36	24.3	88.37	24.7	88.38	25.0	88.39	17.7
89.77	26.5	89.78	26.4	89.79	26.2	89.80	25.7	89.81	25.5	89.82	25.5	89.83	18.4
91.21	26.7	91.22	26.4	91.23	26.4	91.24	26.0	91.25	25.9	91.26	25.9	91.27	19.3
92.65	27.0	92.66	26.9	92.67	26.9	92.68	26.6	92.69	26.6	92.70	26.8	92.71	20.9
94.09	26.9	94.10	26.9	94.11	26.9	94.12	26.9	94.13	27.0	94.14	27.4	94.15	22.2
95.53	27.2	95.54	27.2	95.55	27.2	95.56	27.2	95.57	27.2	95.58	27.6	95.59	23.5
96.97	27.7	96.98	27.7	96.99	27.6	97.00	27.4	97.01	27.7	97.02	27.9	97.03	24.6
98.41	27.8	98.42	27.8	98.43	27.8	98.44	27.7	98.45	27.3	98.46	28.2	98.47	25.4
99.85	27.9	99.86	27.9	99.87	27.9	99.88	27.9	99.89	27.9	99.90	28.4	99.91	26.1
101.29	27.6	101.30	27.6	101.31	27.7	101.32	27.3	101.33	27.8	101.34	28.3	101.35	26.6
102.73	27.1	102.74	27.1	102.75	27.1	102.76	27.2	102.77	27.2	102.78	27.8	102.79	26.7
104.17	26.9	104.18	26.8	104.19	26.8	104.20	26.8	104.21	26.9	104.22	27.5	104.23	26.7
105.61	26.4	105.62	26.3	105.63	26.5	105.64	26.4	105.65	26.6	105.66	27.1	105.67	26.6
107.05	25.9	107.06	25.9	107.07	25.9	107.08	26.0	107.09	26.1	107.10	26.6	107.11	26.1
108.49	25.9	108.50	25.9	108.51	25.9	108.52	25.8	108.53	26.0	108.54	26.5	108.55	26.3
109.93	25.1	109.94	25.9	109.95	25.9	109.96	25.9	109.97	26.1	109.98	26.7	109.99	26.4
111.37	25.9	111.38	25.9	111.39	25.9	111.40	26.0	111.41	26.1	111.42	26.6	111.43	26.6
112.81	26.0	112.82	25.9	112.83	25.9	112.84	25.9	112.85	26.1	112.86	26.6	112.87	26.8
114.25	26.3	114.26	26.3	114.27	26.3	114.28	26.3	114.29	26.4	114.30	27.0	114.31	27.2
115.69	26.4	115.70	26.4	115.71	26.4	115.72	26.4	115.73	26.6	115.74	27.0	115.75	27.3
117.13	27.2	117.14	26.8	117.15	26.6	117.16	26.4	117.17	26.6	117.18	27.2	117.19	27.4
118.57	28.4	118.58	28.1	118.59	27.8	118.60	27.4	118.61	27.2	118.62	27.3	118.63	27.2

Table 4.2.32 Contd.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
120.01	28.8	120.02	28.3	120.03	28.1	120.04	27.6	120.05	27.3	120.06	27.4	120.07	27.1
121.45	29.3	121.46	29.0	121.47	28.7	121.48	28.2	121.49	28.1	121.50	28.0	121.51	27.4
122.89	29.0	122.90	28.9	122.91	28.8	122.92	28.5	122.93	28.4	122.94	28.6	122.95	27.8
124.33	28.5	124.34	28.3	124.35	28.3	124.36	28.0	124.37	28.2	124.38	28.4	124.39	27.9
125.77	28.3	125.78	28.3	125.79	28.3	125.80	28.2	125.81	28.2	125.82	28.5	125.83	28.1
127.21	28.2	127.22	28.4	127.23	28.4	127.24	28.4	127.25	28.7	127.26	28.9	127.27	28.5
128.65	27.3	128.66	27.3	128.67	27.4	128.68	27.6	128.69	27.9	128.70	28.4	128.71	28.6
130.09	27.3	130.10	27.2	130.11	27.2	130.12	27.3	130.13	27.4	130.14	28.0	130.15	28.2
131.53	27.1	131.54	27.0	131.55	27.1	131.56	27.1	131.57	27.2	131.58	27.8	131.59	28.0
132.97	26.7	132.98	26.7	132.99	26.7	133.00	26.7	133.01	26.8	133.02	27.3	133.03	27.6
134.41	26.9	134.42	26.8	134.43	26.8	134.44	26.6	134.45	26.6	134.46	27.1	134.47	27.4

Table 4.2.32 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.08	25.0	0.09	24.7	0.10	24.0	0.11	22.6	0.12	23.3	0.13	24.4	0.14	25.4
0.56	23.4	0.57	22.3	0.58	23.7	0.59	25.2	0.60	26.3	0.61	26.0	0.62	25.6
1.04	19.7	1.05	19.7	1.06	19.8	1.07	20.3	1.08	20.8	1.09	21.2	1.10	24.7
1.52	20.0	1.53	19.9	1.54	20.2	1.55	20.3	1.56	20.7	1.57	20.7	1.58	21.1
2.00	20.1	2.01	20.0	2.02	20.1	2.03	20.2	2.04	20.3	2.05	20.7	2.06	21.1
2.48	20.1	2.49	19.9	2.50	19.9	2.51	20.2	2.52	20.6	2.53	20.6	2.54	21.1
2.96	20.2	2.97	19.9	2.98	19.9	2.99	20.4	3.00	20.8	3.01	20.7	3.02	21.0
3.44	19.6	3.45	19.6	3.46	19.7	3.47	20.1	3.48	20.6	3.49	20.5	3.50	21.9
3.92	19.6	3.93	19.5	3.94	19.5	3.95	19.3	3.96	20.2	3.97	20.2	3.98	20.7
4.40	19.3	4.41	19.3	4.42	19.3	4.43	19.7	4.44	20.0	4.45	20.0	4.46	20.5
4.88	19.2	4.89	19.1	4.90	19.1	4.91	19.6	4.92	19.9	4.93	19.9	4.94	20.3
5.36	19.2	5.37	19.1	5.38	19.1	5.39	19.4	5.40	19.7	5.41	19.8	5.42	20.2
5.84	19.0	5.85	18.9	5.86	19.0	5.87	19.4	5.88	19.7	5.89	19.7	5.90	20.0
6.32	18.9	6.33	18.9	6.34	18.9	6.35	19.2	6.36	19.7	6.37	19.6	6.38	19.9
6.80	18.8	6.81	18.8	6.82	18.8	6.83	19.2	6.84	19.6	6.85	19.5	6.86	19.8
7.28	18.8	7.29	18.8	7.30	18.8	7.31	19.1	7.32	19.6	7.33	19.6	7.34	19.3
7.76	18.7	7.77	18.7	7.78	18.7	7.79	19.3	7.80	19.4	7.81	19.2	7.82	19.6
8.24	18.7	8.25	18.6	8.26	18.7	8.27	19.2	8.28	19.4	8.29	19.3	8.30	19.7
8.72	18.7	8.73	18.7	8.74	18.7	8.75	18.9	8.76	19.3	8.77	19.2	8.78	19.7
9.20	18.7	9.21	18.7	9.22	18.6	9.23	18.9	9.24	19.3	9.25	19.2	9.26	19.6
10.64	18.9	10.65	18.8	10.66	18.8	10.67	19.0	10.68	19.3	10.69	19.4	10.70	19.7
12.08	18.8	12.09	18.8	12.10	18.8	12.11	18.9	12.12	19.4	12.13	19.4	12.14	19.5
13.52	18.9	13.53	18.8	13.54	18.8	13.55	19.0	13.56	19.4	13.57	19.3	13.58	19.6
14.96	19.3	14.97	18.9	14.98	18.7	14.99	19.0	15.00	19.5	15.01	19.5	15.02	19.7
16.40	19.3	16.41	19.3	16.42	19.3	16.43	19.6	16.44	20.1	16.45	20.1	16.46	20.1
17.84	18.9	17.85	18.8	17.86	18.8	17.87	19.1	17.88	19.5	17.89	19.4	17.90	19.3
19.28	19.2	19.29	19.2	19.30	19.2	19.31	19.4	19.32	19.9	19.33	19.9	19.34	20.1
20.72	19.3	20.73	19.4	20.74	19.3	20.75	19.4	20.76	19.9	20.77	19.9	20.78	20.2
22.16	19.3	22.17	19.7	22.18	19.7	22.19	19.9	22.20	20.3	22.21	20.3	22.22	20.7
23.60	19.2	23.61	19.0	23.62	19.2	23.63	20.0	23.64	20.4	23.65	20.6	23.66	20.8
25.04	18.2	25.05	18.2	25.06	18.2	25.07	18.4	25.08	18.8	25.09	18.8	25.10	19.1
26.48	19.0	26.49	19.0	26.50	18.9	26.51	18.9	26.52	19.4	26.53	19.4	26.54	19.4

Table 4.2.32 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
27.92	19.3	27.93	19.2	27.94	19.2	27.95	19.6	27.96	19.9	27.97	19.9	27.98	20.2
29.36	18.9	29.37	18.8	29.38	18.8	29.39	19.2	29.40	19.7	29.41	19.3	29.42	19.9
30.80	18.3	30.81	18.2	30.82	18.2	30.83	18.5	30.84	18.9	30.85	18.9	30.86	19.4
32.24	17.9	32.25	18.1	32.26	17.9	32.27	18.2	32.28	18.6	32.29	18.6	32.30	18.8
33.68	17.6	33.69	17.4	33.70	17.4	33.71	17.7	33.72	18.1	33.73	18.1	33.74	18.4
35.12	17.4	35.13	17.4	35.14	17.3	35.15	17.5	35.16	18.0	35.17	18.0	35.18	18.2
36.56	17.2	36.57	17.2	36.58	17.1	36.59	17.3	36.60	17.7	36.61	17.7	36.62	17.9
38.00	17.1	38.01	17.1	38.02	16.9	38.03	17.1	38.04	17.4	38.05	17.3	38.06	17.6
39.44	17.7	39.45	17.8	39.46	17.5	39.47	17.7	39.48	18.1	39.49	17.9	39.50	18.2
40.88	17.9	40.89	17.8	40.90	17.8	40.91	17.9	40.92	18.5	40.93	18.3	40.94	18.6
42.32	17.8	42.33	17.8	42.34	17.7	42.35	17.7	42.36	18.2	42.37	18.1	42.38	18.3
43.76	17.6	43.77	17.7	43.78	17.5	43.79	17.7	43.80	18.1	43.81	18.0	43.82	18.3
45.20	17.8	45.21	17.8	45.22	17.7	45.23	17.6	45.24	18.1	45.25	18.0	45.26	18.4
46.64	18.2	46.65	18.3	46.66	18.1	46.67	18.1	46.68	18.6	46.69	18.5	46.70	19.0
48.08	18.5	48.09	18.5	48.10	18.4	48.11	18.4	48.12	18.9	48.13	18.8	48.14	19.5
49.52	19.0	49.53	19.0	49.54	18.9	49.55	19.2	49.56	19.5	49.57	19.4	49.58	19.9
50.96	19.2	50.97	19.3	50.98	19.1	50.99	19.1	51.00	19.6	51.01	19.4	51.02	20.0
52.40	19.2	52.41	19.2	52.42	19.2	52.43	19.2	52.44	19.7	52.45	19.7	52.46	20.1
53.84	19.1	53.85	19.1	53.86	19.1	53.87	19.2	53.88	19.7	53.89	19.7	53.90	20.1
55.28	18.8	55.29	18.9	55.30	18.7	55.31	18.9	55.32	19.3	55.33	19.3	55.34	19.7
56.72	18.6	56.73	18.6	56.74	18.5	56.75	18.7	56.76	19.1	56.77	19.1	56.78	19.7
58.16	18.6	58.17	18.8	58.18	18.6	58.19	18.7	58.20	19.2	58.21	19.2	58.22	19.5
59.60	18.3	59.61	18.4	59.62	18.3	59.63	18.4	59.64	18.9	59.65	18.8	59.66	19.4
61.04	18.0	61.05	18.1	61.06	17.9	61.07	18.1	61.08	18.6	61.09	18.5	61.10	19.1
62.48	18.1	62.49	18.2	62.50	17.9	62.51	18.2	62.52	18.6	62.53	18.4	62.54	18.9
63.92	17.9	63.93	18.1	63.94	17.9	63.95	18.1	63.96	18.4	63.97	18.4	63.98	18.8
65.36	18.3	65.37	18.4	65.38	18.3	65.39	18.3	65.40	18.7	65.41	18.7	65.42	18.9
66.80	18.1	66.81	18.3	66.82	17.9	66.83	17.7	66.84	18.3	66.85	18.3	66.86	18.7
68.24	18.4	68.25	18.6	68.26	18.3	68.27	18.6	68.28	18.9	68.29	18.9	68.30	19.5
69.68	18.8	69.69	19.1	69.70	18.9	69.71	18.7	69.72	19.3	69.73	19.2	69.74	19.7
71.12	18.3	71.13	19.0	71.14	18.8	71.15	18.8	71.16	19.3	71.17	19.4	71.18	20.1
72.56	18.3	72.57	18.5	72.58	18.3	72.59	18.4	72.60	18.8	72.61	18.9	72.62	19.8

Table 4.2.32 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
74.00	18.5	74.01	18.6	74.02	18.5	74.03	18.6	74.04	19.0	74.05	19.0	74.06	19.7
75.44	17.9	75.45	18.3	75.46	18.1	75.47	18.1	75.48	18.5	75.49	18.5	75.50	19.5
76.88	16.8	76.89	16.9	76.90	16.9	76.91	17.1	76.92	17.6	76.93	17.6	76.94	18.7
78.32	15.9	78.33	16.2	78.34	16.1	78.35	16.3	78.36	16.7	78.37	16.7	78.38	17.8
79.76	16.4	79.77	15.6	79.78	15.6	79.79	15.6	79.80	16.0	79.81	16.0	79.82	17.1
81.20	18.4	81.21	15.6	81.22	15.4	81.23	15.3	81.24	15.8	81.25	15.8	81.26	16.6
82.64	19.2	82.65	15.9	82.66	15.1	82.67	15.3	82.68	15.6	82.69	15.7	82.70	16.6
84.08	19.6	84.09	17.0	84.10	14.8	84.11	14.8	84.12	15.2	84.13	15.4	84.14	16.4
85.52	19.9	85.53	18.0	85.54	14.8	85.55	14.7	85.56	15.1	85.57	15.2	85.58	16.9
86.96	20.9	86.97	19.3	86.98	15.4	86.99	15.2	87.00	15.7	87.01	15.7	87.02	16.4
88.40	22.3	88.41	20.3	88.42	16.6	88.43	16.5	88.44	16.8	88.45	16.8	88.46	17.5
89.84	22.8	89.85	21.4	89.86	16.9	89.87	16.6	89.88	17.0	89.89	17.1	89.90	18.1
91.28	23.4	91.29	22.2	91.30	17.7	91.31	16.8	91.32	17.3	91.33	17.3	91.34	18.4
92.72	24.6	92.73	23.4	92.74	18.9	92.75	17.4	92.76	17.8	92.77	17.8	92.78	18.9
94.16	25.4	94.17	24.5	94.18	19.9	94.19	17.9	94.20	18.3	94.21	18.3	94.22	19.1
95.60	26.2	95.61	25.3	95.62	21.1	95.63	18.4	95.64	18.3	95.65	18.8	95.66	19.9
97.04	26.7	97.05	26.1	97.06	22.1	97.07	18.9	97.08	19.2	97.09	19.3	97.10	20.4
98.48	27.2	98.49	26.6	98.50	23.0	98.51	19.3	98.52	19.4	98.53	19.6	98.54	20.6
99.92	27.4	99.93	27.1	99.94	23.9	99.95	19.5	99.96	19.7	99.97	19.9	99.98	21.0
101.36	27.7	101.37	27.4	101.38	24.5	101.39	19.3	101.40	19.3	101.41	20.1	101.42	21.1
102.80	27.4	102.81	27.1	102.82	24.9	102.83	19.6	102.84	19.6	102.85	19.8	102.86	21.0
104.24	27.3	104.25	27.0	104.26	25.2	104.27	19.6	104.28	19.4	104.29	19.8	104.30	20.9
105.68	26.9	105.69	26.7	105.70	25.4	105.71	19.9	105.72	19.4	105.73	19.7	105.74	20.9
107.12	26.5	107.13	26.3	107.14	25.2	107.15	20.2	107.16	19.0	107.17	19.3	107.18	20.3
108.56	26.4	108.57	26.4	108.58	25.5	108.59	21.2	108.60	19.6	108.61	19.4	108.62	20.4
110.00	26.4	110.01	26.5	110.02	25.3	110.03	22.1	110.04	21.2	110.05	19.3	110.06	20.7
111.44	26.4	111.45	26.4	111.46	25.9	111.47	22.3	111.48	22.5	111.49	19.9	111.50	20.7
112.88	26.5	112.89	26.6	112.90	26.1	112.91	23.5	112.92	23.4	112.93	20.3	112.94	20.9
114.32	26.8	114.33	26.8	114.34	26.5	114.35	24.4	114.36	24.4	114.37	21.0	114.38	21.3
115.76	27.0	115.77	27.0	115.78	26.7	115.79	24.9	115.80	25.1	115.81	21.4	115.82	21.2
117.20	27.1	117.21	27.1	117.22	26.8	117.23	25.6	117.24	25.7	117.25	22.1	117.26	21.8
118.64	27.0	118.65	27.1	118.66	26.6	118.67	25.8	118.68	26.1	118.69	22.5	118.70	21.9

Table 4.2.32 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
120.08	26.9	120.09	26.8	120.10	26.7	120.11	25.7	120.12	25.9	120.13	22.7	120.14	22.2
121.52	27.3	121.53	27.2	121.54	26.9	121.55	26.1	121.56	26.3	121.57	23.3	121.58	22.0
122.96	27.6	122.97	27.5	122.98	27.2	122.99	26.5	123.00	26.7	123.01	23.8	123.02	21.9
124.40	27.9	124.41	27.7	124.42	27.3	124.43	26.7	124.44	27.0	124.45	24.4	124.46	21.9
125.84	27.9	125.85	27.9	125.86	27.5	125.87	26.9	125.88	27.3	125.89	25.0	125.90	21.7
127.28	28.3	127.29	28.5	127.30	28.2	127.31	27.7	127.32	28.0	127.33	26.1	127.34	22.1
128.72	28.3	128.73	28.3	128.74	28.1	128.75	27.8	128.76	28.1	128.77	26.5	128.78	22.1
130.16	27.9	130.17	27.9	130.18	27.9	130.19	27.6	130.20	28.1	130.21	26.8	130.22	22.0
131.60	27.7	131.61	27.8	131.62	27.7	131.63	27.5	131.64	27.9	131.65	26.9	131.66	21.9
133.04	27.3	133.05	27.4	133.06	27.3	133.07	27.3	133.08	27.7	133.09	27.0	133.10	21.7
134.48	27.0	134.49	27.2	134.50	27.1	134.51	27.1	134.52	27.5	134.53	27.0	134.54	21.3

Table 4.2.32 Contd.

Appendix 4.2. Run Data (Cont'd)

TABLE 4.2.33

Initial conditions, Run 11, 16:8:71, S23

Distance from air inlet, in	Moisture content	
	% w.b.	% d.b.
1.4	23.6	30.8
4.2	23.7	31.1
6.9	23.7	31.1
9.7	23.9	31.4
12.5	24.6	32.7
15.3	24.2	31.9
18.1	23.1	30.1
20.8	23.1	30.0
23.6	23.3	30.4
Mean $\pm\sigma$	23.7 ± 0.5	

TABLE 4.2.34

Final conditions

Distance from air inlet, in	Weight in layer, g	Dry weight in layer, g	Moisture content		Mean Germination %
			% w.b.	% d.b.	
1.2	7465	7121	4.6	4.8	97
3.7	6690	6377	4.7	4.9	95
6.1	6670	6355	4.7	5.0	96
8.5	6785	6445	5.0	5.3	96
11.0	6710	6370	5.1	5.3	88
13.4	6620	6284	5.1	5.3	95
15.8	6970	6603	5.3	5.6	96
18.3	6670	6294	5.6	6.0	97
20.0	3720	3499	5.9	6.3	96
21.0	3415	3212	6.0	6.3	95
22.0	3450	3229	6.4	6.8	96

Total wet weight = 61788

Total dry weight = 65165 Mean moisture content = 5.5% d.b.

Table 4.2.35 Inlet air conditions, Run 11. 16:8:71 S23.

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TIME.	AMBIENT CONDITIONS			INLET CONDITIONS	
MINS	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
1.23	24.0	37.8	0.006926	49.9	9.2
1.47	24.0	37.3	0.006789	49.5	9.2
1.71	23.9	36.7	0.006668	48.6	9.4
1.95	24.2	36.4	0.006736	49.1	9.3
2.19	24.1	38.3	0.007063	48.4	10.1
2.43	24.2	37.4	0.006918	48.9	9.6
2.67	24.1	36.6	0.006721	49.2	9.3
2.91	24.1	37.2	0.006842	48.3	9.8
3.15	24.1	38.6	0.007086	48.4	10.1
3.39	23.9	40.7	0.007440	49.1	10.3
3.63	23.6	42.2	0.007538	48.1	11.0
3.87	23.7	42.7	0.007679	48.5	10.9
4.11	23.2	44.2	0.007737	48.8	10.8
4.35	23.1	46.5	0.008055	47.9	11.8
4.59	22.7	46.4	0.007842	48.5	11.1
4.83	22.3	48.9	0.008103	49.4	11.0
5.07	22.2	48.3	0.007963	48.7	11.2
5.31	22.4	47.1	0.007833	49.1	10.8
5.55	21.6	52.1	0.008277	48.3	11.9
5.79	21.4	51.1	0.007999	48.9	11.2
6.03	21.9	49.1	0.007954	49.3	10.9
6.27	21.3	51.0	0.007961	49.0	11.1
6.51	21.0	53.0	0.008098	48.4	11.6
6.75	21.1	51.1	0.007870	49.4	10.7
6.99	20.4	53.5	0.007903	48.9	11.0
7.23	19.8	55.2	0.007819	49.0	10.9
7.47	20.6	53.6	0.007975	48.5	11.3
7.71	20.4	53.2	0.007919	48.7	11.1
7.95	19.5	52.8	0.007345	48.3	10.6
8.19	20.1	52.2	0.007527	49.0	10.4
8.43	19.7	51.8	0.007312	49.3	10.0
8.67	19.2	53.7	0.007343	48.4	10.5
8.91	19.2	53.3	0.007285	48.4	10.4
9.15	19.7	53.1	0.007031	49.9	9.8
9.39	17.9	56.9	0.007190	47.9	11.6
9.63	18.6	53.3	0.007020	48.3	10.1
9.87	19.2	53.2	0.007259	48.6	10.3
10.11	19.1	55.3	0.007021	49.0	9.7
10.35	18.5	54.1	0.007065	48.6	10.0
10.59	17.4	57.6	0.007015	48.3	9.8
10.83	17.7	57.0	0.007068	47.9	10.4
11.07	18.7	53.1	0.007031	48.0	10.3
11.31	18.4	54.4	0.007054	48.7	9.9
11.55	17.6	55.1	0.006779	49.0	9.4
11.79	18.3	52.5	0.006762	47.8	10.0
12.03	18.2	52.9	0.006784	48.2	9.8
12.27	17.3	55.7	0.006760	48.0	9.9
12.51	16.9	59.3	0.006997	48.3	10.1
12.75	17.3	54.8	0.006649	48.4	9.5
12.99	17.9	52.0	0.006532	48.6	9.3
13.23	17.7	51.7	0.006403	48.8	9.0
13.47	17.7	52.6	0.006512	48.8	9.2
13.71	17.2	53.8	0.006475	48.5	9.2
13.95	17.1	51.7	0.006164	48.7	8.7
14.19	16.4	55.9	0.006383	48.6	9.1

Table 4.2.35 Contd.

TIME	AMBIENT CONDITIONS			INLET CONDITIONS	
HOURS	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
13.43	16.0	56.3	0.006275	48.1	9.1
13.67	16.1	56.9	0.006390	48.0	9.4
13.91	16.1	56.5	0.006336	49.0	8.8
14.15	17.2	52.9	0.006366	48.8	9.0
14.39	16.6	55.7	0.006454	48.7	9.1
14.63	16.9	55.7	0.006589	48.8	9.2
14.87	17.9	57.6	0.006841	49.1	9.5
15.11	17.7	57.9	0.007181	48.6	10.2
15.35	17.9	60.4	0.007602	48.0	11.1
15.59	18.2	60.8	0.007812	48.4	11.1
15.83	20.1	58.0	0.008404	48.4	12.0
MEAN	19.9	50.8	0.007193	48.6	10.2
STANDARD DEVIATION		0.00058620	0.43	0.83	

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.01	38.0	0.02	20.7	0.03	22.5	0.04	23.6	0.05	23.3	0.06	23.8	0.07	24.3
0.25	46.6	0.26	22.6	0.27	22.2	0.28	21.8	0.29	21.4	0.30	22.2	0.31	21.5
0.49	48.2	0.50	34.9	0.51	22.7	0.52	22.6	0.53	22.2	0.54	23.1	0.55	22.8
0.73	46.7	0.74	37.9	0.75	23.3	0.76	22.7	0.77	22.4	0.78	23.1	0.79	23.0
0.97	47.6	0.98	39.5	0.99	27.9	1.00	22.8	1.01	22.6	1.02	23.2	1.03	22.9
1.21	47.9	1.22	40.7	1.23	32.8	1.24	22.8	1.25	22.6	1.26	23.2	1.27	23.2
1.45	47.3	1.46	42.1	1.47	34.5	1.48	24.0	1.49	22.6	1.50	23.2	1.51	23.3
1.69	47.3	1.70	43.1	1.71	36.1	1.72	28.2	1.73	22.7	1.74	23.2	1.75	23.1
1.93	48.2	1.94	43.9	1.95	37.3	1.96	30.6	1.97	22.7	1.98	23.3	1.99	23.1
2.17	47.3	2.18	44.9	2.19	38.7	2.20	32.4	2.21	23.0	2.22	23.3	2.23	23.2
2.41	48.2	2.42	45.3	2.43	39.8	2.44	33.7	2.45	22.9	2.46	23.5	2.47	23.4
2.65	47.9	2.66	46.1	2.67	40.8	2.68	35.0	2.69	24.1	2.70	23.4	2.71	23.6
2.89	47.1	2.90	46.4	2.91	41.8	2.92	36.3	2.93	26.6	2.94	23.6	2.95	23.3
3.13	47.8	3.14	46.4	3.15	42.5	3.16	37.5	3.17	28.7	3.18	23.8	3.19	23.7
3.37	48.5	3.38	47.1	3.39	43.5	3.40	38.8	3.41	30.4	3.42	23.8	3.43	23.7
3.61	47.7	3.62	47.3	3.63	44.2	3.64	39.7	3.65	31.5	3.66	24.2	3.67	23.5
3.85	48.4	3.86	47.6	3.87	44.8	3.88	40.8	3.89	32.8	3.90	25.5	3.91	23.8
4.09	48.5	4.10	47.4	4.11	45.3	4.12	41.8	4.13	34.1	4.14	27.3	4.15	23.8
4.33	48.7	4.34	47.8	4.35	45.6	4.36	42.7	4.37	35.2	4.38	28.8	4.39	23.8
4.57	48.8	4.58	47.3	4.59	45.5	4.60	43.1	4.61	36.0	4.62	30.1	4.63	23.9
4.81	47.4	4.82	47.6	4.83	45.9	4.84	43.7	4.85	37.1	4.86	31.8	4.87	24.0
5.05	48.7	5.06	47.9	5.07	46.6	5.08	44.7	5.09	38.3	5.10	33.0	5.11	24.1
5.29	48.7	5.30	47.9	5.31	46.7	5.32	45.2	5.33	39.3	5.34	34.1	5.35	24.1
5.53	48.4	5.54	48.1	5.55	46.9	5.56	45.4	5.57	40.1	5.58	35.4	5.59	24.1
5.77	47.9	5.78	48.2	5.79	46.9	5.80	45.8	5.81	41.0	5.82	36.2	5.83	24.1
6.01	48.8	6.02	47.9	6.03	47.2	6.04	46.2	6.05	41.8	6.06	37.3	6.07	24.7
6.25	47.6	6.26	48.4	6.27	47.1	6.28	46.2	6.29	42.2	6.30	38.3	6.31	26.1
6.49	43.8	6.50	47.9	6.51	47.2	6.52	46.4	6.53	43.0	6.54	39.3	6.55	27.8
6.73	47.4	6.74	47.7	6.75	48.7	6.76	46.1	6.77	42.8	6.78	39.5	6.79	28.8
6.97	48.5	6.78	47.7	6.99	47.3	7.00	46.6	7.01	43.8	7.02	40.8	7.03	30.3
7.21	47.9	7.22	48.0	7.23	47.0	7.24	46.5	7.25	44.1	7.26	41.6	7.27	31.4
7.45	48.7	7.46	48.0	7.47	47.2	7.48	46.6	7.49	44.3	7.50	42.3	7.51	32.5

Table 4.2.36 Layer temperatures, ^{o}C , Run 11. 16:8:71 S23.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
7.69	47.7	7.70	47.6	7.71	46.8	7.72	46.3	7.73	44.2	7.74	42.6	7.75	33.4
7.93	48.0	7.94	47.5	7.95	46.8	7.96	46.4	7.97	44.6	7.98	43.1	7.99	34.3
8.17	47.6	8.18	47.8	8.19	46.8	8.20	46.3	8.21	44.8	8.22	43.8	8.23	35.3
8.41	47.7	8.42	47.7	8.43	47.1	8.44	46.7	8.45	45.1	8.46	44.1	8.47	36.1
8.65	48.0	8.66	47.4	8.67	47.0	8.68	46.7	8.69	45.3	8.70	44.7	8.71	37.1
8.89	48.2	8.90	47.4	8.91	46.9	8.92	46.8	8.93	45.4	8.94	45.1	8.95	38.1
9.13	47.5	9.14	47.8	9.15	46.9	9.16	46.6	9.17	45.3	9.18	45.3	9.19	38.9
9.37	48.2	9.38	47.4	9.39	47.0	9.40	46.7	9.41	45.4	9.42	45.5	9.43	39.6
9.61	48.6	9.62	47.7	9.63	46.8	9.64	46.3	9.65	45.7	9.66	45.9	9.67	40.6
9.85	47.5	9.86	47.3	9.87	47.1	9.88	47.1	9.89	45.7	9.90	45.2	9.91	41.3
10.09	47.9	10.10	47.5	10.11	47.1	10.12	46.7	10.13	45.8	10.14	46.2	10.15	41.6
10.33	48.1	10.34	47.4	10.35	47.1	10.36	46.3	10.37	45.7	10.38	46.3	10.39	42.2
10.57	47.9	10.58	47.9	10.59	47.1	10.60	46.9	10.61	45.8	10.62	46.5	10.63	42.8
10.81	47.6	10.82	47.8	10.83	47.1	10.84	46.8	10.85	45.7	10.86	46.7	10.87	43.2
11.05	47.8	11.06	47.6	11.07	47.2	11.08	46.7	11.09	45.9	11.10	46.7	11.11	43.6
11.29	47.9	11.30	47.5	11.31	47.1	11.32	46.9	11.33	45.9	11.34	46.5	11.35	44.0
11.53	47.7	11.54	47.4	11.55	46.9	11.56	47.0	11.57	45.9	11.58	46.8	11.59	44.2
11.77	47.8	11.78	47.3	11.79	46.8	11.80	47.1	11.81	46.0	11.82	46.9	11.83	44.6
12.01	47.9	12.02	47.4	12.03	46.8	12.04	46.9	12.05	45.9	12.06	46.7	12.07	44.8
12.25	48.2	12.26	47.4	12.27	46.9	12.28	47.0	12.29	46.0	12.30	46.8	12.31	44.9
12.49	48.2	12.50	47.7	12.51	47.1	12.52	46.9	12.53	46.0	12.54	46.7	12.55	45.1
12.73	48.0	12.74	47.4	12.75	46.8	12.76	46.9	12.77	46.0	12.78	46.8	12.79	45.1
12.97	48.3	12.98	47.3	12.99	46.9	13.00	47.0	13.01	46.1	13.02	46.9	13.03	45.3
13.21	47.3	13.22	47.6	13.23	46.8	13.24	47.1	13.25	46.0	13.26	47.0	13.27	45.4
13.45	47.8	13.46	47.5	13.47	47.0	13.48	47.1	13.49	46.2	13.50	47.2	13.51	45.3
13.69	47.6	13.70	47.6	13.71	47.2	13.72	47.1	13.73	46.3	13.74	47.2	13.75	45.3
13.93	47.9	13.94	48.1	13.95	47.2	13.96	46.9	13.97	46.3	13.98	47.2	13.99	46.0
14.17	47.9	14.18	47.8	14.19	47.3	14.20	47.3	14.21	46.4	14.22	47.3	14.23	46.2
14.41	48.1	14.42	47.7	14.43	46.9	14.44	47.3	14.45	46.7	14.46	47.6	14.47	46.2
14.65	47.6	14.66	47.9	14.67	47.1	14.68	47.3	14.69	46.7	14.70	47.6	14.71	46.6
14.89	47.3	14.90	48.1	14.91	47.1	14.92	47.3	14.93	46.7	14.94	47.3	14.95	46.7
15.13	47.7	15.14	48.3	15.15	47.6	15.16	47.6	15.17	46.9	15.18	47.9	15.19	47.0

Table 4.2.36 Contd.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
15.37	47.6	15.38	47.9	15.39	47.3	15.40	47.7	15.41	47.0	15.42	47.9	15.43	47.3
15.61	48.1	15.62	47.8	15.63	47.7	15.64	47.9	15.65	47.2	15.66	48.2	15.67	47.3

Table 4.2.36 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.08	24.5	0.09	24.1	0.10	25.1	0.11	24.9	0.12	25.8	0.13	25.0	0.14	25.4
0.32	21.8	0.33	21.2	0.34	22.4	0.35	22.2	0.36	23.3	0.37	22.5	0.38	22.4
0.56	22.8	0.57	22.3	0.58	23.2	0.59	23.1	0.60	23.8	0.61	23.6	0.62	23.4
0.80	23.0	0.81	22.8	0.82	23.6	0.83	23.4	0.84	24.0	0.85	23.9	0.86	23.6
1.04	22.9	1.05	22.3	1.06	23.4	1.07	23.6	1.08	23.9	1.09	23.7	1.10	23.7
1.28	22.9	1.29	22.9	1.30	23.6	1.31	23.4	1.32	24.1	1.33	23.9	1.34	23.9
1.52	23.4	1.53	22.3	1.54	23.8	1.55	23.6	1.56	24.2	1.57	24.0	1.58	23.9
1.76	23.1	1.77	22.9	1.78	23.6	1.79	23.4	1.80	24.2	1.81	24.1	1.82	23.7
2.00	23.2	2.01	22.9	2.02	23.7	2.03	23.4	2.04	24.2	2.05	23.9	2.06	23.9
2.24	22.9	2.25	23.1	2.26	23.6	2.27	23.4	2.28	24.2	2.29	23.9	2.30	23.7
2.48	23.2	2.49	23.2	2.50	23.9	2.51	23.6	2.52	24.3	2.53	24.0	2.54	23.3
2.72	23.3	2.73	23.2	2.74	23.9	2.75	23.6	2.76	24.4	2.77	23.9	2.78	23.9
2.96	23.3	2.97	23.2	2.98	23.9	2.99	23.5	3.00	24.2	3.01	23.9	3.02	23.8
3.20	23.4	3.21	23.5	3.22	23.9	3.23	23.8	3.24	24.3	3.25	24.1	3.26	23.9
3.44	23.6	3.45	23.4	3.46	24.0	3.47	23.7	3.48	24.3	3.49	24.0	3.50	23.9
3.68	23.6	3.69	23.5	3.70	23.8	3.71	23.6	3.72	24.4	3.73	24.1	3.74	23.8
3.92	23.6	3.93	23.4	3.94	23.7	3.95	23.5	3.96	24.2	3.97	24.1	3.98	23.9
4.16	23.5	4.17	23.5	4.18	23.9	4.19	23.7	4.20	24.2	4.21	24.0	4.22	23.9
4.40	23.7	4.41	23.6	4.42	23.9	4.43	23.8	4.44	24.4	4.45	24.2	4.46	24.0
4.64	23.6	4.65	23.6	4.66	23.8	4.67	23.8	4.68	24.3	4.69	24.1	4.70	23.9
4.88	23.7	4.89	23.5	4.90	24.2	4.91	24.1	4.92	24.7	4.93	24.4	4.94	24.2
5.12	23.8	5.13	23.8	5.14	23.9	5.15	23.7	5.16	24.6	5.17	24.2	5.18	24.1
5.36	23.9	5.37	23.7	5.38	23.9	5.39	23.7	5.40	24.4	5.41	24.2	5.42	24.1
5.60	23.8	5.61	23.8	5.62	23.8	5.63	23.7	5.64	24.4	5.65	24.1	5.66	24.0
5.84	23.7	5.85	24.8	5.86	23.7	5.87	23.8	5.88	24.4	5.89	24.2	5.90	24.0
6.08	23.6	6.09	26.2	6.10	23.8	6.11	23.6	6.12	24.5	6.13	24.2	6.14	24.0
6.32	23.7	6.33	27.9	6.34	23.7	6.35	23.7	6.36	24.5	6.37	24.2	6.38	24.1
6.56	23.8	6.57	29.4	6.58	23.8	6.59	24.0	6.60	24.4	6.61	24.3	6.62	24.0
6.80	23.3	6.81	29.8	6.82	23.1	6.83	23.4	6.84	23.6	6.85	23.7	6.86	23.3
7.04	23.6	7.05	31.3	7.06	23.4	7.07	23.7	7.08	24.2	7.09	24.1	7.10	23.7
7.28	23.4	7.29	32.6	7.30	23.4	7.31	23.6	7.32	24.2	7.33	24.0	7.34	23.6
7.52	23.6	7.53	33.4	7.54	23.3	7.55	24.0	7.56	24.1	7.57	23.9	7.58	23.5

Table 4.2.36 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
7.76	24.1	7.77	34.3	7.78	23.1	7.79	23.8	7.80	23.9	7.81	23.8	7.82	23.4
8.00	25.7	8.01	35.2	8.02	23.2	8.03	23.8	8.04	23.7	8.05	23.7	8.06	23.4
8.24	27.4	8.25	36.0	8.26	23.2	8.27	23.9	8.28	23.8	8.29	24.0	8.30	23.4
8.48	28.6	8.49	37.1	8.50	23.5	8.51	24.2	8.52	23.8	8.53	24.1	8.54	23.6
8.72	29.9	8.73	38.1	8.74	24.4	8.75	24.2	8.76	24.0	8.77	24.3	8.78	23.5
8.96	31.1	8.97	38.9	8.98	25.5	8.99	24.5	9.00	24.0	9.01	24.7	9.02	23.8
9.20	32.2	9.21	39.7	9.22	26.9	9.23	24.5	9.24	23.9	9.25	25.1	9.26	24.1
9.44	33.1	9.45	40.4	9.46	27.8	9.47	24.5	9.48	24.3	9.49	25.8	9.50	24.4
9.68	34.2	9.69	41.2	9.70	28.9	9.71	25.5	9.72	24.7	9.73	26.0	9.74	26.3
9.92	35.2	9.93	41.7	9.94	30.1	9.95	27.1	9.96	25.8	9.97	26.9	9.98	28.1
10.16	36.1	10.17	42.2	10.18	30.9	10.19	27.2	10.20	26.0	10.21	28.7	10.22	29.5
10.40	37.0	10.41	42.7	10.42	31.9	10.43	28.4	10.44	26.7	10.45	28.2	10.46	29.6
10.64	37.7	10.65	43.1	10.66	32.8	10.67	28.2	10.68	27.6	10.69	28.3	10.70	31.6
10.88	38.7	10.89	43.3	10.90	33.6	10.91	29.2	10.92	28.6	10.93	29.3	10.94	32.5
11.12	39.4	11.13	43.7	11.14	34.5	11.15	30.3	11.16	28.4	11.17	29.8	11.18	32.2
11.36	40.1	11.37	44.0	11.38	35.3	11.39	31.2	11.40	29.4	11.41	31.4	11.42	32.7
11.60	40.7	11.61	44.3	11.62	36.2	11.63	32.1	11.64	29.5	11.65	30.1	11.66	33.9
11.84	41.4	11.85	44.4	11.86	36.9	11.87	31.7	11.88	29.7	11.89	31.1	11.90	34.7
12.08	41.9	12.09	44.5	12.10	37.7	12.11	33.5	12.12	30.5	12.13	32.9	12.14	33.6
12.32	42.4	12.33	44.7	12.34	38.3	12.35	34.3	12.36	31.0	12.37	33.1	12.38	35.3
12.56	42.8	12.57	44.9	12.58	38.6	12.59	34.9	12.60	32.4	12.61	33.1	12.62	35.4
12.80	43.1	12.81	45.1	12.82	39.4	12.83	35.5	12.84	31.8	12.85	31.3	12.86	34.9
13.04	43.5	13.05	45.2	13.06	39.3	13.07	33.9	13.08	31.8	13.09	31.1	13.10	35.3
13.28	43.8	13.29	45.2	13.30	40.2	13.31	35.3	13.32	31.8	13.33	33.3	13.34	34.3
13.52	44.2	13.53	45.3	13.54	40.6	13.55	32.9	13.56	32.3	13.57	31.0	13.58	36.6
13.76	44.5	13.77	45.6	13.78	41.1	13.79	37.2	13.80	33.6	13.81	32.2	13.82	36.1
14.00	44.7	14.01	45.6	14.02	41.2	14.03	36.4	14.04	31.8	14.05	34.6	14.06	36.7
14.24	45.0	14.25	45.8	14.26	41.8	14.27	34.8	14.28	32.6	14.29	34.1	14.30	35.3
14.48	45.1	14.49	46.1	14.50	42.2	14.51	35.6	14.52	34.1	14.53	35.9	14.54	36.1
14.72	45.6	14.73	46.2	14.74	42.4	14.75	38.8	14.76	34.2	14.77	38.3	14.78	36.9
14.96	45.9	14.97	46.4	14.98	43.0	14.99	37.7	15.00	36.3	15.01	38.1	15.02	38.4
15.20	46.2	15.21	46.7	15.22	43.0	15.23	39.7	15.24	36.2	15.25	36.8	15.26	37.6

Table 4.2.36 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
15.44	46.5	15.45	46.9	15.46	43.6	15.47	37.9	15.48	35.5	15.49	33.7	15.50	40.1
15.68	46.7	15.69	47.0	15.70	43.7	15.71	40.1	15.72	34.9	15.73	36.2	15.74	39.2

Table 4.2.36 Contd.

Appendix 4.2. Run Data (Cont'd)

TABLE 4.2.37

Initial conditions, Run 12, 17:7:72, Sabel

Moisture contents of separate samples	
% w.b.	% d.b.
44.9	81.4
43.9	78.3
44.8	81.0
44.8	81.1
44.3	79.4
	80.2 ± 1.3

TABLE 4.2.38

Final conditions

Distance from air inlet, in	Weight in layer, g	Dry weight in layer, g	Moisture content		Mean Germination %
			% w.b.	% d.b.	
1.4	7110	5457	23.2	30.3	
3.1	8086	6017	25.6	34.4	
5.1	8306	5955	28.3	39.5	78
7.2	9120	6424	29.6	42.0	
9.1	8637	5844	32.3	47.8	81
11.3	8850	5816	34.3	52.2	
13.4	9965	6211	37.7	60.4	85
15.6	8180	4955	39.4	65.1	
17.9	7665	4598	40.0	66.7	88
20.0	9090	5443	40.1	67.0	
22.2	8391	4960	40.9	69.2	81
24.3	8730	5131	41.2	70.1	
26.7	8265	4829	41.6	71.1	82
28.6	8970	5284	41.1	69.8	
30.7	8600	5009	41.8	71.7	85
33.2	8445	4890	42.1	72.7	
35.5	8495	4993	41.2	70.1	89
37.7	7285	4293	41.1	69.7	83
40.0	8340	4931	40.9	69.1	87
42.1	7874	4674	40.6	68.5	84
44.2	6715	3926	41.5	71.1	86
46.0	5510	3272	40.6	68.4	79

Total wet weight = 180629 g
Total dry weight = 112914 g

Mean moisture content = 60.0% d.b.
= 37.5% w.b.

Table 4.2.39 Inlet air conditions, Run 12. 17:7:72 Sabel

TIME,	AMBIENT CONDITIONS			INLET CONDITIONS	
HOURS	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
0.23	24.1	61.1	0.011348	27.3	50.5
0.95	23.6	62.5	0.011227	27.4	49.9
1.67	23.6	62.5	0.011227	27.2	50.3
2.39	22.7	63.0	0.010743	27.1	48.8
3.11	22.1	61.7	0.010122	26.4	47.7
3.83	21.2	62.4	0.009662	26.0	46.7
4.55	20.7	64.5	0.009717	25.9	47.3
5.27	21.3	60.9	0.009528	25.[illegible]	47.1
5.99	19.9	64.6	0.009276	24.9	47.7
6.71	19.7	66.6	0.009431	24.2	50.7
7.43	20.3	65.4	0.009621	24.2	51.8
8.15	21.3	62.1	0.009722	24.6	51.0
8.87	20.7	65.3	0.009846	24.9	50.7
9.59	20.8	66.2	0.010017	24.8	52.0
10.31	21.4	69.0	0.010221	24.4	54.2
11.03	20.3	69.3	0.010160	23.9	55.4
11.75	20.3	66.3	0.010059	24.1	54.3
12.47	19.7	70.0	0.010026	24.0	54.5
13.19	19.8	69.8	0.009957	23.7	55.2
13.91	19.6	71.4	0.010008	23.4	56.4
14.63	19.6	70.1	0.009857	23.3	56.0
15.35	19.8	69.7	0.009916	23.4	55.9
16.07	20.1	70.8	0.010252	23.5	57.5
16.79	21.0	70.2	0.010783	24.0	58.5
17.51	21.5	69.3	0.010979	24.6	57.4
18.23	21.8	69.6	0.011250	25.2	56.9
18.95	22.3	70.3	0.011689	25.2	58.8
19.67	22.6	71.7	0.012138	25.9	58.5
20.39	22.5	74.2	0.012520	26.2	59.3
21.11	23.7	66.9	0.012154	26.7	56.2
21.83	24.3	67.0	0.012630	27.4	56.0
22.55	24.1	68.7	0.012746	27.6	56.2
23.27	24.6	65.7	0.012582	27.8	54.5
23.99	25.3	62.5	0.012459	28.1	52.9
24.71	25.6	62.8	0.012769	28.9	51.8
25.43	25.3	62.1	0.012385	28.9	50.3
26.15	24.0	64.1	0.011822	28.4	49.3
26.87	22.8	64.2	0.010994	27.6	48.2
27.59	22.2	65.4	0.010815	26.9	49.3
28.31	21.6	64.4	0.010263	26.6	47.7
29.03	21.3	66.3	0.010378	26.4	49.0
29.75	21.1	67.3	0.010361	26.0	49.9
30.47	21.0	68.5	0.010516	25.9	51.0
31.19	20.8	69.2	0.010476	26.0	50.5
31.91	20.6	69.5	0.010413	26.2	49.5
32.63	20.5	68.6	0.010193	25.8	49.7
33.35	21.3	66.3	0.010378	25.7	51.0
34.07	19.8	71.1	0.010150	25.6	50.3
34.79	19.4	73.1	0.010141	25.4	50.5
35.51	19.6	71.0	0.009985	25.3	50.1
36.23	20.4	66.8	0.009896	25.4	49.5
36.95	20.9	65.9	0.010078	25.6	49.7
37.67	19.3	73.9	0.010187	25.6	50.4
38.39	20.4	68.5	0.010155	25.5	50.4
39.11	19.8	72.9	0.010409	25.5	51.8

Table 4.2.39 Contd.

TIME, HOURS	AMBIENT CONDITIONS TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	INLET CONDITIONS TEMP, DEG C	RELATIVE HUMIDITY %
39.83	20.3	71.5	0.010528	25.0	53.9
40.55	21.5	66.8	0.010575	25.2	53.4
41.27	20.6	71.7	0.010744	25.1	54.7
41.99	20.9	71.0	0.010829	24.8	55.9
42.71	20.9	70.6	0.010806	24.7	56.2
43.43	21.3	68.7	0.010734	25.0	54.9
44.15	21.3	70.4	0.011004	25.1	55.9
44.87	22.2	67.4	0.011111	25.6	54.9
45.59	23.1	65.6	0.011435	26.4	53.8
46.07	22.8	67.9	0.011668	26.7	54.0
MEAN	21.5	67.5	0.010709	25.7	52.5
STANDARD DEVIATION		0.00091059	1.35	3.36	

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.01	25.2	0.02	25.3	0.03	29.9	0.04	31.9	0.05	32.4	0.06	32.2	0.07	32.2
0.73	27.2	0.74	22.9	0.75	20.6	0.76	20.6	0.77	20.8	0.78	21.2	0.79	21.6
1.45	27.2	1.46	25.4	1.47	20.3	1.48	20.4	1.49	20.6	1.50	20.9	1.51	21.3
2.17	27.0	2.18	25.8	2.19	22.4	2.20	20.1	2.21	20.4	2.22	20.8	2.23	21.1
2.89	26.6	2.90	25.4	2.91	23.5	2.92	19.5	2.93	19.7	2.94	20.1	2.95	20.4
3.61	26.2	3.62	25.3	3.63	23.7	3.64	19.1	3.65	19.2	3.66	19.6	3.67	19.9
4.33	25.9	4.34	25.2	4.35	24.1	4.36	18.8	4.37	19.0	4.38	19.7	4.39	20.0
5.05	25.7	5.06	24.9	5.07	23.9	5.08	19.2	5.09	18.7	5.10	19.2	5.11	19.6
5.77	25.2	5.78	24.6	5.79	23.5	5.80	19.6	5.81	18.5	5.82	18.8	5.83	19.1
6.49	24.4	6.50	23.9	6.51	23.3	6.52	20.5	6.53	18.2	6.54	18.8	6.55	19.0
7.21	24.2	7.22	23.7	7.23	23.1	7.24	20.9	7.25	18.1	7.26	18.7	7.27	18.9
7.93	24.5	7.94	23.9	7.95	22.9	7.96	21.0	7.97	18.5	7.98	18.7	7.99	18.8
8.65	24.8	8.66	24.2	8.67	23.3	8.68	21.3	8.69	18.9	8.70	18.7	8.71	19.1
9.37	24.8	9.38	24.3	9.39	23.5	9.40	21.7	9.41	19.7	9.42	19.1	9.43	19.2
10.09	24.4	10.10	24.0	10.11	23.4	10.12	21.8	10.13	20.2	10.14	19.3	10.15	19.4
10.81	24.1	10.82	23.7	10.83	23.2	10.84	21.7	10.85	20.4	10.86	19.1	10.87	19.3
11.53	24.1	11.54	23.6	11.55	22.9	11.56	21.6	11.57	20.4	11.58	18.9	11.59	19.1
12.25	24.2	12.26	23.6	12.27	22.9	12.28	21.4	12.29	20.4	12.30	18.9	12.31	18.9
12.97	23.3	12.98	23.3	12.99	22.8	13.00	21.4	13.01	20.5	13.02	19.3	13.03	18.9
13.69	23.4	13.70	23.1	13.71	22.5	13.72	21.4	13.73	20.5	13.74	19.3	13.75	18.9
14.41	23.4	14.42	22.8	14.43	22.3	14.44	21.2	14.45	20.3	14.46	19.5	14.47	18.9
15.13	23.4	15.14	22.9	15.15	22.3	15.16	21.1	15.17	20.3	15.18	19.6	15.19	18.7
15.85	23.4	15.86	23.2	15.87	22.6	15.88	21.2	15.89	20.5	15.90	19.9	15.91	18.7
16.57	23.7	16.58	23.2	16.59	22.6	16.60	21.5	16.61	20.8	16.62	20.4	16.63	19.2
17.29	24.4	17.30	23.9	17.31	23.1	17.32	21.8	17.33	21.0	17.34	20.7	17.35	19.5
18.01	25.0	18.02	24.4	18.03	23.6	18.04	22.2	18.05	21.5	18.06	21.2	18.07	20.1
18.73	25.6	18.74	24.9	18.75	24.2	18.76	22.7	18.77	21.8	18.78	21.6	18.79	20.6
19.45	25.0	19.46	25.3	19.47	24.5	19.48	22.9	19.49	22.1	19.50	21.8	19.51	20.8
20.17	26.1	20.18	25.6	20.19	24.7	20.20	23.2	20.21	22.3	20.22	22.0	20.23	20.9
20.89	26.3	20.90	25.9	20.91	25.2	20.92	23.7	20.93	22.8	20.94	22.4	20.95	21.2
21.61	27.2	21.62	26.4	21.63	25.6	21.64	24.2	21.65	23.2	21.66	22.7	21.67	21.7
22.33	27.4	22.34	26.8	22.35	26.1	22.36	24.3	22.37	23.5	22.38	23.1	22.39	21.9

Table 4.2.40 Layer temperatures, °C, Run 12. 17:7:72. Sabel.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
23.05	27.8	23.06	26.9	23.07	26.3	23.08	24.7	23.09	23.7	23.10	23.3	23.11	22.1
23.77	27.8	23.78	27.4	23.79	26.4	23.80	24.8	23.81	23.8	23.82	23.3	23.83	21.9
24.49	28.5	24.50	27.8	24.51	26.9	24.52	25.2	24.53	24.2	24.54	23.7	24.55	22.2
25.21	28.9	25.22	28.2	25.23	27.3	25.24	25.3	25.25	24.4	25.26	23.9	25.27	22.4
25.93	28.5	25.94	28.0	25.95	27.2	25.96	25.3	25.97	24.2	25.98	23.6	25.99	21.9
26.65	27.9	26.66	27.4	26.67	26.6	26.68	25.0	26.69	24.0	26.70	23.3	26.71	21.6
27.37	27.2	27.38	26.6	27.39	25.9	27.40	24.5	27.41	23.6	27.42	22.9	27.43	20.9
28.09	26.7	28.10	26.3	28.11	25.5	28.12	24.1	28.13	23.2	23.14	22.6	28.15	20.2
28.81	26.7	28.82	26.1	28.83	25.3	28.84	24.0	28.85	23.1	28.86	22.6	28.87	20.1
29.53	26.2	29.54	25.8	29.55	25.0	29.56	23.8	29.57	22.9	29.58	22.6	29.59	20.0
30.23	26.1	30.26	25.6	30.27	25.1	30.28	23.7	30.29	22.9	30.30	22.6	30.31	20.0
30.97	25.9	30.98	25.6	30.99	24.9	31.00	23.7	31.01	23.0	31.02	22.8	31.03	20.2
31.69	26.3	31.70	25.7	31.71	25.1	31.72	23.6	31.73	23.0	31.74	22.7	31.75	20.3
32.41	25.9	32.42	25.4	32.43	24.9	32.44	23.6	32.45	22.8	32.46	22.4	32.47	20.1
33.13	25.7	33.14	25.3	33.15	24.7	33.16	23.5	33.17	22.7	33.18	22.5	33.19	20.1
33.85	25.8	33.86	25.3	33.87	24.6	33.88	23.3	33.89	22.6	33.90	22.3	33.91	20.1
34.57	25.6	34.58	25.1	34.59	24.5	34.60	23.3	34.61	22.6	34.62	22.3	34.63	20.2
35.29	25.4	35.30	24.9	35.31	24.3	35.32	23.1	35.33	22.6	35.34	22.3	35.35	20.2
36.01	25.3	36.02	24.7	36.03	24.2	36.04	23.1	36.05	22.3	36.06	22.1	36.07	20.2
36.73	25.4	36.74	24.9	36.75	24.3	36.76	22.9	36.77	22.3	36.78	22.1	36.79	20.3
37.45	25.7	37.46	25.4	37.47	24.6	37.48	23.2	37.49	22.4	37.50	22.2	37.51	20.6
38.17	25.6	38.18	25.1	38.19	24.5	38.20	23.3	38.21	22.6	38.22	22.2	38.23	20.4
38.89	25.5	38.90	25.0	38.91	24.4	38.92	23.2	38.93	22.6	38.94	22.3	38.95	20.6
39.61	25.3	39.62	24.9	39.63	24.4	39.64	23.2	39.65	22.7	39.66	22.5	39.67	20.9
40.33	25.1	40.34	24.7	40.35	24.2	40.36	23.2	40.37	22.6	40.38	22.5	40.39	21.4
41.05	25.1	41.06	24.7	41.07	24.3	41.08	23.2	41.09	22.7	41.10	22.7	41.11	21.3
41.77	24.8	41.78	24.6	41.79	24.2	41.80	22.9	41.81	22.6	41.82	22.4	41.83	21.2
42.49	24.3	42.50	24.1	42.51	23.7	42.52	22.9	42.53	22.5	42.54	22.7	42.55	21.4
43.21	24.9	43.22	24.6	43.23	24.0	43.24	22.8	43.25	22.2	43.26	22.2	43.27	21.1
43.93	25.0	43.94	24.7	43.95	24.2	43.96	22.9	43.97	22.3	43.98	22.3	43.99	21.1
44.65	25.3	44.66	24.8	44.67	24.4	44.68	23.1	44.69	22.6	44.70	22.3	44.71	21.3
45.37	26.0	45.38	25.5	45.39	25.0	45.40	23.4	45.41	22.8	45.42	22.6	45.43	21.4

Table 4.2.40 Contd.

2		3		4		5		6		7		8	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
45.85	26.6	45.86	26.1	45.87	25.2	45.88	23.8	45.89	22.9	45.90	22.9	45.91	21.8

Table 4.2.40 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.08	31.9	0.09	31.9	0.10	31.7	0.11	32.4	0.12	32.6	0.13	31.9	0.14	32.2
0.80	21.3	0.81	21.9	0.82	22.2	0.83	25.3	0.84	24.8	0.85	26.6	0.86	28.9
1.52	21.0	1.53	21.1	1.54	21.1	1.55	21.4	1.56	21.8	1.57	22.1	1.58	22.4
2.24	20.9	2.25	21.0	2.26	20.9	2.27	21.3	2.28	21.5	2.29	21.8	2.30	21.9
2.96	20.2	2.97	20.5	2.98	20.6	2.99	20.9	3.00	21.2	3.01	21.3	3.02	21.6
3.68	19.6	3.69	19.8	3.70	19.7	3.71	20.2	3.72	20.6	3.73	20.7	3.74	20.8
4.40	19.6	4.41	19.7	4.42	19.8	4.43	20.2	4.44	20.5	4.45	20.7	4.46	20.8
5.12	19.3	5.13	19.5	5.14	19.3	5.15	19.8	5.16	20.1	5.17	20.3	5.18	20.4
5.84	18.8	5.85	19.1	5.86	19.2	5.87	19.5	5.88	20.0	5.89	20.1	5.90	20.0
6.56	18.5	6.57	18.7	6.58	18.7	6.59	19.0	6.60	19.3	6.61	19.6	6.62	19.6
7.28	18.6	7.29	18.8	7.30	18.6	7.31	19.0	7.32	19.3	7.33	19.5	7.34	19.5
8.00	18.5	8.01	18.7	8.02	18.7	8.03	18.9	8.04	19.3	8.05	19.4	8.06	19.4
8.72	18.8	8.73	18.8	8.74	18.8	8.75	19.1	8.76	19.3	8.77	19.6	8.78	19.4
9.44	18.8	9.45	19.0	9.46	18.9	9.47	19.2	9.48	19.6	9.49	19.6	9.50	19.6
10.16	19.1	10.17	19.3	10.18	19.2	10.19	19.4	10.20	19.8	10.21	19.8	10.22	19.8
10.88	18.9	10.89	19.2	10.90	19.2	10.91	19.4	10.92	19.7	10.93	19.9	10.94	19.8
11.60	18.8	11.61	18.9	11.62	18.9	11.63	19.2	11.64	19.7	11.65	19.8	11.66	19.8
12.32	18.8	12.33	18.9	12.34	18.8	12.35	19.1	12.36	19.5	12.37	19.6	12.38	19.7
13.04	18.7	13.05	18.8	13.06	18.7	13.07	19.1	13.08	19.3	13.09	19.5	13.10	19.5
13.76	18.7	13.77	18.8	13.78	18.7	13.79	19.0	13.80	19.4	13.81	19.5	13.82	19.5
14.48	18.5	14.49	18.8	14.50	18.6	14.51	18.8	14.52	19.2	14.53	19.5	14.54	19.5
15.20	18.4	15.21	18.5	15.22	18.4	15.23	18.8	15.24	19.1	15.25	19.3	15.26	19.4
15.92	18.4	15.93	18.6	15.94	18.5	15.95	18.8	15.96	19.2	15.97	19.3	15.98	19.3
16.64	18.9	16.65	19.0	16.66	18.8	16.67	19.1	16.68	19.5	16.69	19.5	16.70	19.5
17.36	19.2	17.37	19.4	17.38	19.2	17.39	19.4	17.40	19.8	17.41	19.8	17.42	19.8
18.03	19.8	18.09	19.9	18.10	19.8	18.11	19.9	18.12	20.2	18.13	20.2	18.14	20.2
18.80	20.2	18.81	20.3	18.82	20.1	18.83	20.4	18.84	20.8	18.85	20.3	18.86	20.8
19.52	20.5	19.53	20.7	19.54	20.7	19.55	21.2	19.56	21.4	19.57	21.4	19.58	21.3
20.24	20.6	20.25	20.9	20.26	20.7	20.27	21.1	20.28	21.3	20.29	21.4	20.30	21.4
20.96	20.8	20.97	20.9	20.98	20.9	20.99	21.1	21.00	21.3	21.01	21.4	21.02	21.4
21.68	21.4	21.69	21.6	21.70	21.3	21.71	21.6	21.72	22.0	21.73	22.0	21.74	22.0
22.40	21.5	22.41	21.8	22.42	21.5	22.43	21.9	22.44	22.2	22.45	22.4	22.46	22.4

Table 4.2.40 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
23.12	21.7	23.13	22.1	23.14	21.9	23.15	22.2	23.16	22.5	23.17	22.7	23.18	22.7
23.84	21.7	23.85	21.8	23.86	21.8	23.87	22.2	23.88	22.4	23.89	22.6	23.90	22.8
24.56	21.9	24.57	22.1	24.58	21.9	24.59	22.3	24.60	22.6	24.61	22.6	24.62	22.7
25.28	22.2	25.29	22.3	25.30	22.2	25.31	22.8	25.32	22.9	25.33	22.9	25.34	22.9
26.00	21.6	26.01	21.7	26.02	21.9	26.03	22.4	26.04	22.7	26.05	22.7	26.06	22.9
26.72	21.2	26.73	21.6	26.74	21.5	26.75	21.9	26.76	22.2	26.77	22.5	26.78	22.7
27.44	20.5	27.45	20.8	27.46	20.6	27.47	21.3	27.48	21.5	27.49	21.7	27.50	21.9
28.16	19.8	28.17	20.1	28.18	20.2	28.19	20.6	28.20	20.8	28.21	20.9	28.22	21.3
28.88	19.7	28.89	19.8	28.90	19.7	28.91	20.2	28.92	20.6	28.93	20.6	28.94	20.8
29.60	19.6	29.61	19.7	29.62	19.7	29.63	20.1	29.64	20.3	29.65	20.4	29.66	20.5
30.32	19.6	30.33	19.7	30.34	19.6	30.35	19.9	30.36	20.3	30.37	20.3	30.38	20.4
31.04	19.7	31.05	19.8	31.06	19.6	31.07	20.0	31.08	20.3	31.09	20.4	31.10	20.4
31.76	19.8	31.77	19.8	31.78	19.7	31.79	20.2	31.80	20.4	31.81	20.4	31.82	20.5
32.48	19.7	32.49	19.7	32.50	19.6	32.51	20.1	32.52	20.3	32.53	20.4	32.54	20.5
33.20	19.6	33.21	19.5	33.22	19.5	33.23	19.9	33.24	20.1	33.25	20.3	33.26	20.3
33.92	19.7	33.93	19.4	33.94	19.3	33.95	19.8	33.96	20.0	33.97	20.0	33.98	20.2
34.64	19.7	34.65	19.2	34.66	19.2	34.67	19.7	34.68	19.9	34.69	20.1	34.70	20.1
35.36	19.9	35.37	19.3	35.38	19.2	35.39	19.7	35.40	19.8	35.41	20.1	35.42	20.2
36.08	19.8	36.09	19.2	36.10	19.1	36.11	19.6	36.12	19.8	36.13	19.9	36.14	20.1
36.80	19.9	36.81	19.1	36.82	18.9	36.83	19.4	36.84	19.7	36.85	19.8	36.86	19.8
37.52	20.1	37.53	19.2	37.54	19.1	37.55	19.6	37.56	19.8	37.57	19.8	37.58	19.9
38.24	20.2	38.25	19.2	38.26	19.2	38.27	19.7	38.28	19.8	38.29	20.0	38.30	20.1
38.96	20.4	38.97	19.3	38.98	19.3	38.99	19.5	39.00	19.8	39.01	19.9	39.02	20.1
39.68	20.6	39.69	19.4	39.70	19.3	39.71	19.7	39.72	20.0	39.73	20.0	39.74	20.0
40.40	20.7	40.41	19.7	40.42	19.4	40.43	20.0	40.44	20.4	40.45	20.4	40.46	20.3
41.12	20.7	41.13	19.7	41.14	19.5	41.15	19.8	41.16	20.1	41.17	20.3	41.18	20.5
41.84	20.6	41.85	19.6	41.86	19.4	41.87	20.0	41.88	20.2	41.89	20.3	41.90	20.3
42.56	20.9	42.57	19.9	42.58	19.7	42.59	20.1	42.60	20.3	42.61	20.3	42.62	20.4
43.28	20.7	43.29	19.6	43.30	19.3	43.31	20.1	43.32	20.2	43.33	20.3	43.34	20.6
44.00	20.8	44.01	19.7	44.02	19.4	44.03	19.9	44.04	20.1	44.05	20.3	44.06	20.3
44.72	20.8	44.73	19.9	44.74	19.7	44.75	20.0	44.76	20.3	44.77	20.2	44.78	20.3
45.44	21.1	45.45	20.1	45.46	19.8	45.47	20.0	45.48	20.2	45.49	20.3	45.50	20.4

Table 4.2.40 Contd.

9		10		11		12		13		14		15	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
45.92	21.3	45.93	20.3	45.94	20.1	45.95	20.4	45.96	20.7	45.97	20.7	45.98	20.7

Table 4.2.40 Contd.

Appendix 4.2. Run Data (Cont'd)

TABLE 4.2.41

Radial-flow run 13, 25:7:72, Sabel, Conditions after 19 hrs.

Distance from air inlet, in	Moisture content	
	% w.b.	% d.b.
0	14.9	17.5
12	16.4	19.5
24	19.4	24.1
36	25.6	34.4
48	30.4	43.7
60	30.1	43.0
	Temperature °C	
Inlet	21.0	
6	22.4	
12	22.3	
18	22.5	
24	20.9	
30	18.6	
36	16.0	
42	15.6	
48	15.0	
54	15.4	
60	15.1	

TABLE 4.2.42

Final conditions

Distance from air inlet, in	Moisture content		Mean Germination %
	% w.b.	% d.b.	
0	11.6	13.1	82
6	11.3	12.7	91
12	11.0	12.4	87
18	11.4	12.8	86
24	11.6	13.1	83
30	11.6	13.2	85
36	11.9	13.5	89
42	12.3	14.1	89
48	12.9	14.8	86
54	14.7	17.2	84
60	17.7	21.4	83

Table 4.2.43 Inlet air conditions , Run 13. 25:7:72 Sabel.

TIME. HOURS	AMBIENT CONDITIONS TEMP. DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	INLET CONDITIONS TEMP. DEG C	RELATIVE HUMIDITY %
0.01	21.8	63.0	0.010170	22.2	59.9
0.41	22.7	59.8	0.010154	25.2	51.4
1.01	22.1	59.7	0.009791	25.1	50.1
1.41	21.1	55.2	0.010075	24.4	53.5
2.21	21.9	55.9	0.009705	23.4	55.1
3.01	20.3	57.1	0.009837	24.3	52.4
3.41	20.3	52.8	0.009201	24.2	49.4
4.21	19.4	52.9	0.008749	24.1	47.3
5.01	20.3	53.7	0.009327	24.2	50.1
5.41	19.7	53.1	0.008933	24.1	48.2
6.21	19.3	55.0	0.008970	24.1	48.7
6.41	19.1	56.5	0.010962	24.1	49.4
7.01	18.8	56.7	0.008393	23.5	49.5
7.41	20.1	51.1	0.009372	23.7	47.9
8.21	19.9	51.3	0.009318	23.7	47.9
8.41	19.7	52.2	0.008771	24.1	47.4
9.01	19.2	52.2	0.008527	23.5	47.5
9.41	19.6	51.3	0.008572	23.3	47.2
10.21	19.1	50.5	0.008157	23.5	45.3
10.41	18.6	47.2	0.007536	23.2	43.2
11.01	19.3	53.0	0.008797	22.5	43.2
11.41	19.7	48.6	0.008024	22.1	41.9
12.01	19.3	51.3	0.007966	22.2	42.9
12.41	20.4	47.5	0.006979	22.3	42.2
13.21	20.8	46.2	0.006972	21.9	45.6
13.41	20.8	45.8	0.006915	23.2	39.5
14.01	20.3	47.0	0.006851	23.5	38.5
14.41	20.7	44.9	0.006727	23.2	38.6
15.21	21.0	46.0	0.007021	24.1	38.3
15.41	20.2	48.6	0.007308	24.3	40.4
16.01	21.2	48.5	0.007426	24.4	40.0
16.41	20.6	48.5	0.007203	24.7	37.7
17.21	20.5	47.0	0.007169	24.7	37.2
17.41	20.0	47.3	0.007031	24.2	38.3
18.01	20.1	50.3	0.007226	23.7	39.9
18.41	20.3	52.2	0.007649	23.7	42.1
19.01	20.4	52.3	0.007727	23.4	43.6
19.41	19.7	53.9	0.007617	23.3	43.2
20.01	20.0	50.6	0.007256	22.7	42.9
20.41	19.2	52.4	0.007169	22.4	43.2
21.01	19.2	52.0	0.007112	22.4	42.7
21.41	19.2	52.0	0.007112	22.0	43.9
22.01	19.4	53.9	0.007649	21.8	46.3
22.41	19.9	55.5	0.007657	21.6	47.1
23.21	19.0	54.3	0.007318	21.6	46.2
23.41	19.5	54.4	0.007579	21.9	47.1
24.01	19.3	55.5	0.007647	21.7	47.8
24.41	19.1	54.1	0.007621	21.6	48.1
25.21	19.2	54.0	0.007365	21.4	47.1
25.41	19.0	53.4	0.007267	21.2	46.5
26.01	19.2	52.8	0.007192	20.9	47.4
26.41	19.0	53.8	0.007261	20.5	49.0
27.01	18.3	53.9	0.006964	20.4	47.5
27.41	18.7	53.8	0.007111	20.3	48.5
28.01	18.7	52.1	0.006883	20.3	47.0

Table 4.2.43 Contd.

TIME,	AMBIENT CONDITIONS			INLET CONDITIONS	
HOURS	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
44.01	19.7	51.8	0.007276	21.2	47.2
44.81	19.5	49.9	0.006940	21.4	44.3
45.61	20.2	48.1	0.006990	21.5	44.4
46.41	19.8	49.9	0.007091	21.9	44.0
47.21	19.8	49.5	0.006999	21.8	43.7
48.01	20.2	50.8	0.007359	22.3	44.7
48.81	20.4	50.3	0.007436	22.5	44.4
49.61	19.8	52.7	0.007464	22.3	45.2
50.41	19.3	54.2	0.007472	21.9	46.3
51.21	18.7	56.1	0.007432	21.5	47.3
52.01	19.1	54.4	0.007644	21.9	47.4
52.81	19.4	53.1	0.007332	21.5	46.6
53.61	19.0	52.1	0.007031	21.4	45.1
54.41	18.7	53.4	0.007054	21.1	46.0
55.21	17.9	54.7	0.006898	20.6	46.4
56.01	18.3	54.7	0.007043	20.7	46.3
56.81	18.6	54.1	0.007059	20.6	47.6
57.61	18.4	54.9	0.007145	20.6	47.9
58.41	18.5	54.1	0.007065	20.4	47.9
59.21	18.0	54.1	0.007191	20.1	49.1
60.01	18.3	54.7	0.007063	20.7	48.1
60.81	17.6	54.9	0.006923	19.7	49.2
61.61	17.5	55.3	0.006969	19.7	51.2
62.41	17.6	55.1	0.006772	19.4	49.2
63.21	17.5	54.4	0.006913	19.2	50.5
64.01	18.2	56.5	0.007488	19.9	52.6
64.81	18.3	59.0	0.007751	19.9	54.0
65.61	18.4	61.0	0.007954	20.0	55.3
66.41	18.6	62.5	0.008240	20.2	56.5
67.21	18.6	61.6	0.008035	20.2	55.7
68.01	18.9	62.8	0.008431	20.6	56.8
68.81	19.2	62.2	0.008410	20.6	56.9
69.61	19.3	61.9	0.008542	20.9	56.0
70.61	19.7	62.7	0.008832	20.7	58.7
MEAN	19.5	55.4	0.007719	22.2	47.0
STANDARD DEVIATION		0.00089804	1.58		4.67

Table 4.2.44 Layer temperatures, °C, Run 13. 25:7:72 Sabel.

3		4		5		6		7	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.02	17.8	0.03	20.2	0.04	21.1	0.05	24.6	0.06	24.9
0.82	24.2	0.83	18.5	0.84	19.0	0.85	19.2	0.86	18.8
1.62	24.4	1.63	21.6	1.64	19.9	1.65	18.7	1.66	18.7
2.42	24.0	2.43	22.4	2.44	22.1	2.45	18.4	2.46	18.2
3.22	23.2	3.23	22.0	3.24	21.8	3.25	18.2	3.26	18.1
4.02	24.0	4.03	22.7	4.04	22.6	4.05	18.4	4.06	18.3
4.82	23.9	4.83	22.8	4.84	22.6	4.85	17.9	4.86	17.8
5.62	23.9	5.63	22.8	5.64	22.6	5.65	17.3	5.66	17.3
6.42	23.9	6.43	23.2	6.44	23.1	6.45	18.1	6.46	17.6
7.22	23.9	7.23	22.9	7.24	22.9	7.25	18.8	7.26	17.4
8.02	24.1	8.03	23.2	8.04	23.2	8.05	19.6	8.06	17.5
8.82	23.9	8.83	23.2	8.84	23.2	8.85	20.2	8.86	17.6
9.62	23.6	9.63	23.0	9.64	23.0	9.65	20.3	9.66	17.4
10.42	23.8	10.43	23.0	10.44	23.0	10.45	20.5	10.46	17.3
11.22	23.6	11.23	23.1	11.24	23.1	11.25	20.5	11.26	17.0
12.02	23.9	12.03	22.3	12.04	23.6	12.05	21.1	12.06	17.3
12.82	23.8	12.83	23.2	12.84	23.2	12.85	21.1	12.86	17.1
13.62	23.7	13.63	23.3	13.64	23.3	13.65	21.2	13.66	17.1
14.42	23.6	14.43	22.7	14.44	22.9	14.45	20.9	14.46	17.4
15.22	23.3	15.23	22.6	15.24	22.8	15.25	20.7	15.26	17.4
16.02	22.6	16.03	22.3	16.04	22.4	16.05	20.9	16.06	17.9
16.82	22.3	16.83	21.8	16.84	21.6	16.85	20.3	16.86	17.7
17.62	22.4	17.63	22.1	17.64	22.2	17.65	20.5	17.66	18.1
18.42	22.3	18.43	22.2	18.44	22.3	18.45	20.6	18.46	19.3
19.22	22.4	19.23	22.3	19.24	22.5	19.25	20.9	19.26	18.6
20.02	23.2	20.03	22.8	20.04	22.8	20.05	21.1	20.06	19.1
20.82	23.5	20.83	23.2	20.84	23.1	20.85	21.7	20.86	19.6
21.62	23.4	21.63	22.8	21.64	23.1	21.65	21.6	21.66	19.8
22.42	23.9	22.43	23.8	22.44	23.8	22.45	22.3	22.46	20.3
23.22	24.0	23.23	23.8	23.24	24.0	23.25	22.8	23.26	21.1
24.02	24.3	24.03	24.2	24.04	24.4	24.05	23.3	24.06	21.7
24.82	25.1	24.83	24.4	24.84	24.8	24.85	23.3	24.86	21.8
25.62	24.7	25.63	24.3	25.64	24.6	25.65	23.7	25.66	22.2
26.42	24.3	26.43	24.1	26.44	24.4	26.45	23.4	26.46	22.1
27.22	24.0	27.23	23.8	27.24	24.0	27.25	23.2	27.26	22.1
28.02	23.8	28.03	23.9	28.04	24.2	28.05	23.4	28.06	22.2
28.82	23.6	28.83	23.5	28.84	23.5	28.85	23.1	28.86	22.1
29.62	23.6	29.63	23.3	29.64	23.5	29.65	22.9	29.66	22.1
30.42	23.1	30.43	22.8	30.44	23.2	30.45	22.7	30.46	21.6
31.22	22.5	31.23	22.3	31.24	22.6	31.25	22.2	31.26	21.4
32.02	22.5	32.03	22.5	32.04	22.7	32.05	22.3	32.06	21.6
32.82	22.4	32.83	22.1	32.84	22.4	32.85	21.9	32.86	21.2
33.62	22.1	33.63	22.1	33.64	22.3	33.65	22.1	33.66	21.4
34.42	21.9	34.43	21.9	34.44	22.1	34.45	21.7	34.46	21.3
35.22	21.7	35.23	21.6	35.24	21.9	35.25	21.7	35.26	21.1
36.02	22.2	36.03	22.1	36.04	22.3	36.05	21.9	36.06	21.5
36.82	21.9	36.83	22.0	36.84	22.0	36.85	21.8	36.86	21.3
37.62	21.9	37.63	21.9	37.64	22.0	37.65	21.6	37.66	21.4
38.42	21.7	38.43	21.5	38.44	21.8	38.45	21.4	38.46	21.1
39.22	21.5	39.23	21.4	39.24	21.7	39.25	21.3	39.26	20.9
40.02	21.3	40.03	21.4	40.04	21.6	40.05	21.3	40.06	21.1
40.82	20.8	40.83	20.8	40.84	20.9	40.85	20.7	40.86	20.4
41.62	20.6	41.63	20.5	41.64	20.7	41.65	20.6	41.66	20.3
42.42	20.6	42.43	20.6	42.44	20.7	42.45	20.4	42.46	20.2
43.22	20.6	43.23	20.5	43.24	20.7	43.25	20.4	43.26	20.1

Table 4.2.44 Contd.

3		4		5		6		7	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
44.02	21.4	44.03	21.2	44.04	21.4	44.05	21.2	44.06	20.7
44.82	21.7	44.83	21.7	44.84	21.7	44.85	21.3	44.86	20.9
45.62	21.9	45.63	21.7	45.64	21.9	45.65	21.4	45.66	20.9
46.42	22.1	46.43	22.0	46.44	22.1	46.45	21.5	46.46	21.1
47.22	22.1	47.23	21.9	47.24	22.1	47.25	21.9	47.26	21.5
48.02	22.4	48.03	22.0	48.04	22.1	48.05	22.3	48.06	22.1
48.82	22.3	48.83	22.2	48.84	22.7	48.85	22.6	48.86	22.1
49.62	22.5	49.63	22.4	49.64	22.6	49.65	22.4	49.66	22.2
50.42	22.2	50.43	22.3	50.44	22.4	50.45	22.6	50.46	22.4
51.22	21.7	51.23	21.8	51.24	21.9	51.25	21.9	51.26	21.7
52.02	22.1	52.03	22.2	52.04	22.2	52.05	22.4	52.06	22.2
52.82	21.8	52.83	21.8	52.84	21.9	52.85	21.7	52.86	21.5
53.62	21.6	53.63	21.6	53.64	21.8	53.65	21.5	53.66	21.3
54.42	21.3	54.43	21.5	54.44	21.6	54.45	21.5	54.46	21.3
55.22	20.9	55.23	21.1	55.24	21.1	55.25	21.2	55.26	20.9
56.02	21.0	56.03	21.0	56.04	21.2	56.05	21.1	56.06	20.9
56.82	20.8	56.83	20.8	56.84	21.0	56.85	21.0	56.86	20.9
57.62	20.9	57.63	21.0	57.64	21.2	57.65	21.2	57.66	20.9
58.42	20.6	58.43	20.7	58.44	20.9	58.45	21.7	58.46	20.7
59.22	20.4	59.23	20.6	59.24	20.7	59.25	20.7	59.26	20.4
60.02	20.4	60.03	20.2	60.04	20.8	60.05	20.8	60.06	20.8
60.82	19.9	60.83	20.2	60.84	20.3	60.85	20.4	60.86	20.3
61.62	19.4	61.63	19.6	61.64	19.7	61.65	19.8	61.66	19.9
62.42	19.6	62.43	19.6	62.44	19.6	62.45	19.6	62.46	19.5
63.22	19.3	63.23	19.4	63.24	19.6	63.25	19.7	63.26	19.6
64.02	20.2	64.03	20.2	64.04	20.3	64.05	20.4	64.06	20.3
64.82	20.1	64.83	20.2	64.84	20.3	64.85	20.6	64.86	20.6
65.62	20.3	65.63	20.3	65.64	20.4	65.65	20.6	65.66	20.7
66.42	20.6	66.43	20.6	66.44	20.7	66.45	20.8	66.46	20.8
67.22	20.4	67.23	20.6	67.24	20.6	67.25	20.8	67.26	20.9
68.02	21.0	68.03	20.9	68.04	21.2	68.05	21.3	68.06	21.3
68.82	20.9	68.83	20.9	68.84	21.1	68.85	21.3	68.86	21.5
69.62	21.2	69.63	21.2	69.64	21.3	69.65	21.3	69.66	21.5
70.62	20.9	70.63	21.1	70.64	21.2	70.65	21.4	70.66	21.6

Table 4.2.44 Contd.

8		9		10		11		12	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.07	24.0	0.08	24.2	0.09	24.6	0.10	24.8	0.11	24.6
0.87	18.8	0.88	19.0	0.89	18.7	0.90	18.9	0.91	18.7
1.67	18.9	1.68	19.7	1.69	19.3	1.70	19.9	1.71	19.4
2.47	18.1	2.48	19.7	2.49	18.4	2.50	19.4	2.51	18.8
3.27	18.1	3.28	19.7	3.29	18.9	3.30	19.2	3.31	18.6
4.07	18.3	4.08	18.8	4.09	18.4	4.10	19.3	4.11	18.8
4.87	17.7	4.88	18.4	4.89	17.9	4.90	18.7	4.91	18.2
5.67	17.2	5.68	17.7	5.69	18.5	5.70	18.3	5.71	17.9
6.47	17.8	6.48	18.2	6.49	17.7	6.50	18.4	6.51	17.9
7.27	17.3	7.28	17.9	7.29	17.4	7.30	18.1	7.31	17.6
8.07	17.5	8.08	18.0	8.09	17.6	8.10	18.3	8.11	17.8
8.87	17.5	8.88	17.9	8.89	17.6	8.90	18.2	8.91	17.6
9.67	17.3	9.68	17.8	9.69	17.5	9.70	18.2	9.71	17.8
10.47	17.1	10.48	17.6	10.49	17.2	10.50	17.9	10.51	17.4
11.27	16.9	11.28	17.5	11.29	17.1	11.30	17.8	11.31	17.2
12.07	17.2	12.08	17.9	12.09	17.3	12.10	18.1	12.11	17.5
12.87	16.8	12.88	17.6	12.89	17.0	12.90	17.8	12.91	17.3
13.67	16.9	13.68	17.4	13.69	16.9	13.70	17.6	13.71	17.1
14.47	16.4	14.48	17.2	14.49	16.8	14.50	17.4	14.51	16.9
15.27	16.0	15.28	16.3	15.29	16.0	15.30	16.8	15.31	16.4
16.07	16.2	16.08	16.4	16.09	16.1	16.10	17.0	16.11	16.4
16.87	15.6	16.88	15.9	16.89	15.3	16.90	16.2	16.91	15.5
17.67	15.7	17.68	15.4	17.69	14.9	17.70	15.5	17.71	14.9
18.47	15.7	18.48	15.3	18.49	14.9	18.50	15.4	18.51	15.1
19.27	16.0	19.28	15.6	19.29	15.0	19.30	15.4	19.31	15.1
20.07	16.1	20.08	15.5	20.09	15.0	20.10	15.3	20.11	15.4
20.87	16.3	20.88	15.7	20.89	15.1	20.90	15.7	20.91	15.1
21.67	16.5	21.68	15.4	21.69	15.1	21.70	15.7	21.71	15.1
22.47	17.2	22.48	15.5	22.49	15.1	22.50	15.8	22.51	15.1
23.27	18.3	23.28	15.7	23.29	15.6	23.30	16.1	23.31	15.8
24.07	19.1	24.08	16.6	24.09	16.1	24.10	16.9	24.11	16.1
24.87	19.5	24.88	16.4	24.89	15.9	24.90	16.6	24.91	16.0
25.67	19.9	25.68	16.4	25.69	16.1	25.70	16.6	25.71	16.1
26.47	20.0	26.48	16.2	26.49	15.7	26.50	16.3	26.51	15.9
27.27	20.1	27.28	16.2	27.29	15.6	27.30	16.3	27.31	15.6
28.07	20.8	28.08	16.4	28.09	16.1	28.10	16.8	28.11	16.1
28.87	20.7	28.88	16.3	28.89	16.0	28.90	16.6	28.91	16.1
29.67	20.6	29.68	16.2	29.69	15.8	29.70	16.6	29.71	15.9
30.47	20.4	30.48	16.2	30.49	15.3	30.50	16.1	30.51	15.5
31.27	20.2	31.28	16.1	31.29	15.0	31.30	15.7	31.31	15.3
32.07	20.4	32.08	16.8	32.09	15.2	32.10	15.9	32.11	15.4
32.87	20.2	32.88	17.1	32.89	15.0	32.90	15.5	32.91	15.0
33.67	20.4	33.68	17.7	33.69	15.3	33.70	15.4	33.71	15.0
34.47	20.5	34.48	18.1	34.49	15.6	34.50	15.8	34.51	15.2
35.27	20.3	35.28	18.2	35.29	15.6	35.30	15.5	35.31	15.1
36.07	20.6	36.08	18.8	36.09	16.1	36.10	15.9	36.11	15.4
36.87	20.4	36.88	18.8	36.89	16.1	36.90	15.8	36.91	15.3
37.67	20.5	37.68	18.8	37.69	16.1	37.70	15.8	37.71	15.2
38.47	20.4	38.48	18.8	38.49	16.1	38.50	15.7	38.51	15.0
39.27	20.1	39.28	18.7	39.29	16.0	39.30	15.3	39.31	14.8
40.07	20.3	40.08	19.0	40.09	16.5	40.10	15.4	40.11	14.9
40.87	20.0	40.88	18.8	40.89	16.2	40.90	14.9	40.91	14.5
41.67	19.7	41.68	18.7	41.69	16.2	41.70	14.7	41.71	14.3
42.47	19.6	42.48	18.8	42.49	16.4	42.50	14.6	42.51	14.1
43.27	19.6	43.28	18.6	43.29	16.5	43.30	14.5	43.31	14.1

Table 4.2.44 Contd.

8		9		10		11		12	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
44.07	20.1	44.08	19.2	44.09	17.2	44.10	14.8	44.11	14.4
44.87	20.3	44.88	19.2	44.89	17.4	44.90	14.9	44.91	14.3
45.67	20.4	45.68	19.4	45.69	17.4	45.70	14.9	45.71	14.4
46.47	20.5	46.48	19.4	46.49	17.6	46.50	14.8	46.51	14.4
47.27	20.8	47.28	19.9	47.29	18.1	47.30	15.0	47.31	14.5
48.07	21.5	48.08	20.5	48.09	18.6	48.10	15.5	48.11	15.0
48.87	21.6	48.88	20.6	48.89	19.1	48.90	15.7	48.91	15.1
49.67	21.6	49.68	20.8	49.69	19.2	49.70	15.6	49.71	15.2
50.47	21.7	50.48	21.0	50.49	19.4	50.50	15.7	50.51	15.2
51.27	21.4	51.28	20.9	51.29	19.3	51.30	15.5	51.31	15.1
52.07	21.8	52.08	21.2	52.09	19.9	52.10	16.0	52.11	15.4
52.87	21.3	52.88	20.7	52.89	19.4	52.90	15.5	52.91	15.2
53.67	21.0	53.68	20.7	53.69	19.4	53.70	15.7	53.71	15.1
54.47	20.8	54.48	20.4	54.49	19.2	54.50	15.1	54.51	14.8
55.27	20.6	55.28	20.2	55.29	19.1	55.30	15.4	55.31	14.6
56.07	20.6	56.08	20.4	56.09	19.3	56.10	15.9	56.11	14.8
56.87	20.7	56.88	20.3	56.89	19.3	56.90	16.4	56.91	14.7
57.67	20.6	57.68	20.4	57.69	19.4	57.70	16.7	57.71	15.0
58.47	20.4	58.48	20.3	58.49	19.4	58.50	16.9	58.51	15.0
59.27	20.2	59.28	20.2	59.29	19.3	59.30	17.2	59.31	14.9
60.07	20.6	60.08	20.5	60.09	19.7	60.10	17.6	60.11	15.3
60.87	20.0	60.88	20.0	60.89	19.2	60.90	17.5	60.91	15.2
61.67	19.7	61.68	19.7	61.69	19.0	61.70	17.3	61.71	14.8
62.47	19.4	62.48	19.3	62.49	18.7	62.50	17.3	62.51	14.7
63.27	19.4	63.28	19.3	63.29	18.7	63.30	17.4	63.31	14.7
64.07	20.1	64.08	20.1	64.09	19.5	64.10	18.2	64.11	15.6
64.87	20.4	64.88	20.5	64.89	19.8	64.90	18.6	64.91	16.1
65.67	20.5	65.68	20.5	65.69	20.0	65.70	18.9	65.71	16.4
66.47	20.7	66.48	20.8	66.49	20.2	66.50	19.2	66.51	16.8
67.27	20.8	67.28	20.8	67.29	20.3	67.30	19.5	67.31	17.2
68.07	21.1	68.08	21.4	68.09	20.8	68.10	20.1	68.11	17.8
68.87	21.1	68.88	21.4	68.89	20.8	68.90	20.1	68.91	18.0
69.67	21.3	69.68	21.5	69.69	20.9	69.70	20.3	69.71	18.2
70.67	21.5	70.68	21.6	70.69	21.2	70.70	20.5	70.71	18.6

Appendix 4.2. Run Data (Cont'd)

TABLE 4.2.45

Radial flow run 14, 3:8:72, S23, Condition after 45 hrs.

Distance from air inlet, in	Moisture content	
	% w.b.	% d.b.
3	11.8	13.3
12	13.8	16.1
21	19.5	24.2
30	36.6	57.7
39	38.9	63.7
48	38.7	63.0
57	37.7	60.4
	Temperature, °C	
Inlet	24.7	
6	25.2	
12	25.2	
18	24.2	
24	22.8	
30	19.8	
36	17.6	
42	18.2	
48	17.8	
54	18.6	
60	18.0	

TABLE 4.2.46

Final conditions

Distance from air inlet, in	Moisture content		Mean Germination %
	% w.b.	% d.b.	
2	9.9	10.9	88
11	9.9	11.0	94
20	10.1	11.2	92
29	10.0	11.1	92
38	10.3	11.4	94
44 (centre)	10.7	12.0	93
(left)	11.2	12.6	91
(right)	12.5	14.2	92
50 (centre)	14.9	17.4	92
(left)	14.0	16.3	96
(right)	16.1	19.2	
56 (centre)	29.4	41.5	94
(left)	31.5	45.9	
(right)	32.8	48.9	
61 (centre)	32.4	47.9	95
(left)	34.8	53.3	
(right)	34.4	52.5	

Table 4.2.47 Inlet air conditions, Run 14 . 3:8:72 S23.

TIME.	AMBIENT CONDITIONS			INLET CONDITIONS	
HOURS	TEMP. DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP. DEG C	RELATIVE HUMIDITY %
0.01	20.4	52.0	0.007737	21.3	49.7
1.21	21.0	49.5	0.007554	24.0	39.8
2.41	20.7	50.6	0.007577	24.7	39.6
3.61	20.6	53.3	0.007955	24.3	42.6
4.81	19.2	57.1	0.007311	24.7	40.8
6.01	18.4	57.4	0.007454	24.6	39.1
7.21	18.6	56.2	0.007316	24.5	38.8
8.41	18.2	58.1	0.007465	24.2	40.1
9.61	18.7	55.6	0.007340	23.9	40.3
10.81	17.0	57.1	0.006736	23.7	37.7
12.01	17.0	56.6	0.006731	22.4	40.5
13.21	17.1	54.5	0.006521	22.1	40.1
14.41	18.2	55.0	0.007066	23.3	40.4
15.61	18.3	56.0	0.007213	23.2	41.4
16.81	18.2	57.6	0.007373	23.1	42.4
18.01	19.3	55.4	0.007611	23.9	41.7
19.21	19.5	58.2	0.008112	23.3	44.7
20.41	19.2	60.4	0.008249	24.1	44.7
21.61	19.7	64.0	0.009056	24.4	48.0
22.81	19.7	61.8	0.008709	24.1	47.0
24.01	19.9	62.9	0.009027	24.2	48.5
25.21	20.2	63.1	0.009134	25.5	45.8
26.41	20.2	62.7	0.009122	24.8	47.3
27.61	19.7	60.6	0.008564	24.8	44.5
28.81	19.8	62.8	0.008948	24.9	46.1
30.01	19.7	61.4	0.008648	24.9	44.7
31.21	19.3	62.3	0.008603	24.6	45.2
32.41	18.9	64.2	0.008642	24.3	46.2
33.61	18.7	62.6	0.008313	24.1	45.0
34.81	18.4	61.4	0.008013	23.9	44.0
36.01	18.3	60.9	0.007883	23.7	43.9
37.21	18.4	61.8	0.008036	23.6	44.8
38.41	18.4	62.7	0.008154	23.3	46.3
39.61	18.3	64.0	0.008259	23.5	46.5
40.81	18.2	65.2	0.008364	23.5	46.9
42.01	18.4	65.4	0.008510	23.6	47.5
43.21	18.8	64.4	0.008590	24.1	46.4
44.41	19.7	62.3	0.008809	24.9	45.5
45.61	20.2	60.7	0.008850	24.7	46.3
46.81	21.2	57.6	0.008937	25.0	45.7
48.01	21.4	55.6	0.008742	25.4	43.9
49.21	21.6	56.8	0.009050	25.9	44.0
50.41	21.6	57.2	0.009093	25.2	46.0
51.61	21.1	58.7	0.009046	24.3	46.9
52.81	20.8	57.9	0.008745	24.4	46.6
54.01	20.4	58.8	0.008657	24.0	47.2
55.21	20.2	57.7	0.008419	23.7	46.8
56.41	20.0	58.8	0.008450	23.0	48.9
57.61	20.1	61.8	0.008919	23.0	51.5
58.81	19.8	62.8	0.008948	23.1	51.4
60.01	19.6	63.5	0.008917	22.9	51.8
61.21	19.7	64.0	0.009017	23.0	52.1
62.41	20.0	64.7	0.009316	23.5	52.1
63.61	20.5	64.3	0.009553	23.5	53.4
64.81	20.5	66.0	0.009809	23.7	54.2

Table 4.2.47 Contd.

TIME, HOURS	AMBIENT CONDITIONS			INLET CONDITIONS	
	TEMP, DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP, DEG C	RELATIVE HUMIDITY %
66.01	20.4	68.5	0.010114	23.8	55.8
67.21	20.5	69.5	0.010371	23.8	56.2
68.41	21.3	70.9	0.010741	23.9	58.5
69.61	19.8	72.0	0.010279	23.9	56.1
70.81	19.6	73.2	0.010265	22.7	61.3
72.01	20.1	75.3	0.010908	23.5	61.1
73.21	20.5	73.8	0.010900	23.6	61.3
74.41	20.6	73.8	0.011034	23.8	60.7
75.61	20.7	73.5	0.011000	23.5	62.1
76.81	20.5	72.5	0.010790	23.5	61.4
78.01	20.4	72.0	0.010681	23.2	60.7
79.21	20.1	72.2	0.010447	23.2	59.7
80.41	20.2	70.0	0.010218	23.1	58.7
81.61	19.8	71.5	0.010173	22.9	58.9
82.81	19.9	70.7	0.010027	22.7	58.4
84.01	19.8	69.7	0.009914	22.6	57.5
85.21	19.6	70.0	0.009836	22.7	57.8
86.41	20.0	67.7	0.009759	22.9	56.7
87.61	19.6	68.7	0.009626	23.6	53.6
88.81	20.4	64.2	0.009371	23.5	53.2
90.01	20.8	61.2	0.009247	23.8	51.3
91.21	21.8	59.4	0.009253	25.2	53.2
92.41	21.5	59.0	0.009515	25.0	52.7
93.61	22.2	56.6	0.009513	25.4	44.6
94.81	22.7	51.9	0.009826	25.9	42.9
96.01	22.9	54.0	0.009273	26.6	43.3
97.21	23.1	53.1	0.009247	25.9	44.9
98.41	22.6	53.6	0.009727	25.7	44.5
99.61	21.3	55.9	0.009645	25.9	41.9
100.81	21.6	54.5	0.009651	26.0	41.8
102.01	21.6	54.4	0.009611	25.9	42.0
103.21	21.0	56.2	0.009591	25.9	41.7
104.41	20.6	61.9	0.009253	25.6	43.7
105.61	20.3	63.7	0.009368	25.3	43.1
106.81	20.3	64.6	0.009494	25.1	43.3
108.01	20.0	67.6	0.009678	24.9	50.0
109.21	20.1	67.8	0.009800	24.9	50.6
110.41	20.3	67.1	0.009878	25.1	50.2
111.61	20.6	61.4	0.009140	24.6	48.2
112.81	20.2	61.6	0.009053	25.0	46.3
114.01	20.2	58.5	0.008503	24.5	45.0
115.21	20.5	54.8	0.008122	24.7	42.5
116.41	20.6	54.8	0.008328	25.1	42.6
117.61	21.1	53.4	0.008198	24.9	42.2
118.81	20.6	61.4	0.009149	25.1	46.7
120.01	21.7	59.3	0.009497	26.2	45.3
121.21	21.2	58.3	0.009023	25.8	44.2
122.41	21.2	54.4	0.008437	25.3	42.4
123.61	20.5	53.2	0.007880	24.7	41.2
124.81	20.2	51.6	0.007481	24.7	39.2
126.01	19.7	53.4	0.007510	24.6	39.5
127.21	19.7	51.8	0.007275	24.3	38.9
128.41	19.6	51.6	0.007206	24.4	39.3
129.61	19.1	50.6	0.006871	23.7	38.2
130.81	19.1	52.3	0.007100	23.6	39.7

Table 4.2.47 Contd.

TIME, HOURS	AMBIENT CONDITIONS TEMP, DEG C	AMBIENT CONDITIONS RELATIVE HUMIDITY %	AMBIENT CONDITIONS ABSOLUTE HUMIDITY KG/KG	INLET CONDITIONS TEMP, DEG C	INLET CONDITIONS RELATIVE HUMIDITY %
132.01	18.7	53.4	0.007054	23.5	39.6
133.21	18.6	52.9	0.006963	23.2	40.0
134.41	19.1	54.8	0.007446	23.9	40.8
135.61	19.2	52.8	0.007576	23.9	41.5
136.81	19.2	51.2	0.007246	23.5	44.0
138.01	19.7	53.1	0.007762	24.1	42.3
139.21	19.4	54.8	0.007601	24.5	40.7
140.41	20.0	56.1	0.007837	24.5	39.3
141.61	21.9	44.6	0.007065	25.4	35.6
142.81	20.7	48.7	0.007212	26.2	35.1
144.01	20.4	50.1	0.007843	25.2	39.9
145.21	21.1	51.6	0.008377	25.2	42.6
146.41	21.0	55.4	0.008467	24.8	44.0
147.61	20.6	58.2	0.008689	24.4	46.2
148.81	20.3	57.0	0.008373	23.9	46.9
150.01	19.7	53.5	0.007546	23.2	43.1
151.21	19.5	55.1	0.007585	23.1	43.3
152.41	19.1	55.2	0.007504	22.8	44.1
153.61	19.1	54.4	0.007388	22.6	43.3
154.81	18.5	57.5	0.007524	22.3	45.6
156.01	18.3	56.9	0.007362	22.2	44.9
157.01	17.9	55.5	0.006977	21.6	44.0
MEAN	20.0	59.8	0.008613	24.2	46.5
STANDARD DEVIATION	0.00107071	1.03	6.27		

Table 4.2.48 Layer temperatures, °C, Run 14. 3:8:72 S23.

3		4		5		6		7	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.02	14.8	0.03	14.9	0.04	20.4	0.05	23.5	0.06	23.8
1.22	23.1	1.23	16.1	1.24	16.6	1.25	16.8	1.26	16.7
2.42	24.0	2.43	19.8	2.44	16.7	2.45	16.2	2.46	16.8
3.62	23.8	3.63	22.1	3.64	16.9	3.65	17.1	3.66	17.1
4.82	24.4	4.83	22.8	4.84	16.9	4.85	17.1	4.86	17.1
6.02	24.5	6.03	22.7	6.04	16.6	6.05	17.0	6.06	16.9
7.22	24.3	7.23	22.9	7.24	16.4	7.25	16.6	7.26	16.4
8.42	23.9	8.43	22.2	8.44	16.5	8.45	16.7	8.46	16.7
9.62	23.6	9.63	22.7	9.64	16.2	9.65	16.4	9.66	16.4
10.82	23.3	10.83	22.4	10.84	16.4	10.85	16.4	10.86	16.2
12.02	22.1	12.03	21.4	12.04	16.1	12.05	15.0	12.06	15.0
13.22	21.9	13.23	21.4	13.24	16.3	13.25	15.9	13.26	15.9
14.42	23.2	14.43	22.4	14.44	16.6	14.45	15.9	14.46	15.9
15.62	23.1	15.63	22.5	15.64	16.9	15.65	16.3	15.66	16.3
16.82	23.0	16.83	22.3	16.84	16.9	16.85	16.2	16.86	16.1
18.02	23.6	18.03	22.3	18.04	20.1	18.05	16.6	18.06	16.3
19.22	23.3	19.23	23.3	19.24	20.7	19.25	17.0	19.26	16.6
20.42	24.1	20.43	23.2	20.44	21.1	20.45	17.5	20.46	16.9
21.62	24.6	21.63	24.1	21.64	20.1	21.65	19.0	21.66	18.0
22.82	24.1	22.83	23.7	22.84	21.5	22.85	19.1	22.86	17.4
24.02	24.3	24.03	23.8	24.04	21.9	24.05	19.6	24.06	17.6
25.22	25.4	25.23	24.8	25.24	22.3	25.25	20.3	25.26	18.0
26.42	24.8	26.43	24.6	26.44	22.6	26.45	20.3	26.46	18.0
27.62	24.8	27.63	24.4	27.64	22.3	27.65	20.2	27.66	17.6
28.82	25.1	28.83	24.7	28.84	22.2	28.85	20.2	28.86	17.7
30.02	25.0	30.03	24.6	30.04	22.2	30.05	19.9	30.06	17.7
31.22	24.7	31.23	24.5	31.24	22.2	31.25	19.8	31.26	17.5
32.42	24.5	32.43	24.2	32.44	22.2	32.45	19.9	32.46	17.6
33.62	24.4	33.63	24.1	33.64	22.4	33.65	20.4	33.66	16.9
34.82	24.1	34.83	24.0	34.84	22.4	34.85	19.9	34.86	16.7
36.02	23.8	36.03	23.6	36.04	22.4	36.05	19.8	36.06	16.6
37.22	23.5	37.23	23.7	37.24	22.4	37.25	19.8	37.26	16.5
38.42	23.5	38.43	23.5	38.44	22.4	38.45	19.9	38.46	16.5
39.62	23.8	39.63	23.8	39.64	22.4	39.65	20.4	39.66	17.1
40.82	23.8	40.83	23.8	40.84	22.7	40.85	20.4	40.86	17.1
42.02	23.7	42.03	23.7	42.04	23.1	42.05	20.7	42.06	18.0
43.22	24.3	43.23	24.1	43.24	23.3	43.25	21.9	43.26	19.6
44.42	24.8	44.43	24.8	44.44	23.6	44.45	22.6	44.46	19.4
45.62	25.2	45.63	25.2	45.64	24.2	45.65	22.8	45.66	19.8
46.82	25.2	46.83	25.0	46.84	24.2	46.85	23.6	46.86	19.6
48.02	25.6	48.03	25.6	48.04	24.8	48.05	24.3	48.06	20.4
49.22	26.2	49.23	26.2	49.24	25.5	49.25	24.2	49.26	21.2
50.42	25.6	50.43	25.6	50.44	25.3	50.45	24.2	50.46	21.7
51.62	25.0	51.63	25.2	51.64	25.0	51.65	24.1	51.66	21.9
52.82	24.7	52.83	24.7	52.84	24.6	52.85	23.9	52.86	21.8
54.02	24.3	54.03	24.5	54.04	24.2	54.05	23.7	54.06	21.8
55.22	24.1	55.23	24.2	55.24	24.2	55.25	23.3	55.26	21.8
56.42	23.3	56.43	23.6	56.44	23.5	56.45	23.0	56.46	21.4
57.62	23.3	57.63	23.6	57.64	23.6	57.65	23.3	57.66	21.9
58.82	23.4	58.83	23.6	58.84	23.6	58.85	23.2	58.86	21.9
60.02	23.3	60.03	23.4	60.04	23.5	60.05	23.2	60.06	22.1
61.22	23.5	61.23	23.4	61.24	23.6	61.25	23.3	61.26	22.3
62.42	23.8	62.43	23.9	62.44	23.8	62.45	23.7	62.46	22.6
63.62	23.8	63.63	24.0	63.64	24.1	63.65	23.9	63.66	22.9
64.82	24.0	64.83	24.2	64.84	24.3	64.85	24.1	64.86	23.3

Table 4.2.48 Contd.

3		4		5		6		7	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
66.02	24.1	66.03	24.4	66.04	24.5	66.05	24.5	66.06	23.6
67.22	24.2	67.23	24.5	67.24	24.7	67.25	24.7	67.26	24.1
68.42	24.3	68.43	24.6	68.44	24.8	68.45	24.9	68.46	24.3
69.62	24.4	69.63	24.6	69.64	24.8	69.65	24.9	69.66	24.4
70.82	23.1	70.83	23.6	70.84	23.7	70.85	23.7	70.86	23.2
72.02	23.8	72.03	24.2	72.04	24.6	72.05	24.6	72.06	24.2
73.22	23.9	73.23	24.2	73.24	24.3	73.25	24.5	73.26	24.3
74.42	24.1	74.43	24.3	74.44	24.5	74.45	24.6	74.46	24.3
75.62	24.0	75.63	24.2	75.64	24.3	75.65	24.3	75.66	24.2
76.82	23.9	76.83	23.9	76.84	24.1	76.85	24.2	76.86	24.1
78.02	23.6	78.03	23.7	78.04	23.7	78.05	23.7	78.06	23.6
79.22	23.4	79.23	23.5	79.24	23.6	79.25	23.5	79.26	23.4
80.42	23.4	80.43	23.5	80.44	23.5	80.45	23.6	80.46	23.1
81.62	23.1	81.63	23.4	81.64	23.6	81.65	23.1	81.66	22.9
82.82	23.0	82.83	23.3	82.84	23.7	82.85	23.1	82.86	22.9
84.02	22.3	84.03	23.0	84.04	23.0	84.05	22.9	84.06	22.9
85.22	22.9	85.23	23.1	85.24	23.0	85.25	22.9	85.26	22.7
86.42	23.2	86.43	23.3	86.44	23.1	86.45	23.2	86.46	23.2
87.62	23.6	87.63	23.9	87.64	23.4	87.65	23.2	87.66	23.1
88.82	23.8	88.83	24.0	88.84	23.6	88.85	23.2	88.86	22.8
90.02	24.1	90.03	23.9	90.04	23.6	90.05	23.2	90.06	22.8
91.22	25.2	91.23	25.1	91.24	24.1	91.25	24.2	91.26	23.7
92.42	25.4	92.43	25.5	92.44	25.2	92.45	24.8	92.46	24.2
93.62	25.6	93.63	25.7	93.64	25.4	93.65	25.1	93.66	24.6
94.82	26.1	94.83	25.9	94.84	25.1	94.85	24.6	94.86	24.3
96.02	26.8	96.03	26.8	96.04	26.2	96.05	25.6	96.06	24.9
97.22	26.3	97.23	26.5	97.24	26.4	97.25	25.9	97.26	25.3
98.42	25.9	98.43	26.1	98.44	26.1	98.45	25.9	98.46	25.3
99.62	26.2	99.63	26.2	99.64	26.1	99.65	25.5	99.66	25.3
100.82	26.2	100.83	26.2	100.84	26.1	100.85	25.8	100.86	25.3
102.02	26.1	102.03	26.1	102.04	26.1	102.05	25.8	102.06	25.4
103.22	26.2	103.23	26.4	103.24	26.4	103.25	26.1	103.26	25.7
104.42	26.1	104.43	26.2	104.44	26.4	104.45	26.4	104.46	26.1
105.62	25.6	105.63	25.8	105.64	25.9	105.65	26.2	105.66	26.3
106.82	25.4	106.83	25.6	106.84	25.9	106.85	26.1	106.86	26.1
108.02	25.6	108.03	25.7	108.04	25.9	108.05	26.0	108.06	26.0
109.22	25.3	109.23	25.4	109.24	25.9	109.25	26.1	109.26	26.2
110.42	25.3	110.43	25.4	110.44	25.7	110.45	25.9	110.46	26.2
111.62	24.8	111.63	24.8	111.64	25.1	111.65	25.3	111.66	25.5
112.82	25.2	112.83	25.3	112.84	25.2	112.85	24.9	112.86	24.9
114.02	24.8	114.03	24.8	114.04	24.8	114.05	24.7	114.06	24.7
115.22	24.9	115.23	24.8	115.24	24.7	115.25	24.5	115.26	24.4
116.42	25.1	116.43	25.1	116.44	25.1	116.45	24.9	116.46	24.6
117.62	25.3	117.63	25.4	117.64	25.3	117.65	25.0	117.66	24.9
118.82	25.7	118.83	25.9	118.84	25.6	118.85	25.7	118.86	25.4
120.02	26.3	120.03	26.3	120.04	26.2	120.05	26.4	120.06	26.5
121.22	26.2	121.23	26.3	121.24	26.3	121.25	26.3	121.26	26.3
122.42	25.9	122.43	25.9	122.44	25.7	122.45	25.6	122.46	25.5
123.62	25.2	123.63	25.0	123.64	24.9	123.65	24.7	123.66	24.7
124.82	24.9	124.83	24.8	124.84	24.7	124.85	24.7	124.86	24.6
126.02	24.7	126.03	24.7	126.04	24.8	126.05	24.6	126.06	24.3
127.22	24.9	127.23	24.8	127.24	24.8	127.25	24.8	127.26	24.6
128.42	24.3	128.43	24.5	128.44	24.6	128.45	24.5	128.46	24.3
129.62	24.0	129.63	24.0	129.64	24.1	129.65	24.1	129.66	24.1
130.82	23.8	130.83	23.9	130.84	24.1	130.85	23.9	130.86	24.1

Table 4.2.48 Contd.

3		4		5		6		7	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
132.02	23.8	132.03	23.9	132.04	24.0	132.05	23.9	132.06	23.9
133.22	23.4	133.23	23.6	133.24	23.6	133.25	23.6	133.26	23.6
134.42	24.2	134.43	24.2	134.44	24.1	134.45	24.1	134.46	24.0
135.62	24.1	135.63	24.2	135.64	24.3	135.65	24.8	135.66	24.6
136.82	24.0	136.83	24.2	136.84	24.3	136.85	24.5	136.86	24.6
138.02	24.3	138.03	23.9	138.04	24.2	138.05	24.4	138.06	24.6
139.22	24.6	139.23	24.6	139.24	24.4	139.25	24.3	139.26	24.3
140.42	24.6	140.43	24.6	140.44	24.5	140.45	24.3	140.46	24.2
141.62	25.6	141.63	25.7	141.64	25.1	141.65	24.9	141.66	24.4
142.82	26.6	142.83	26.6	142.84	26.2	142.85	25.1	142.86	25.5
144.02	25.6	144.03	25.9	144.04	26.2	144.05	26.1	144.06	25.8
145.22	25.4	145.23	25.6	145.24	26.1	145.25	26.6	145.26	26.8
146.42	25.2	146.43	25.3	146.44	25.6	146.45	25.8	146.46	26.0
147.62	24.7	147.63	25.1	147.64	25.2	147.65	25.5	147.66	25.8
148.82	24.3	148.83	24.4	148.84	24.7	148.85	25.1	148.86	25.4
150.02	23.5	150.03	23.7	150.04	23.9	150.05	24.1	150.06	24.3
151.22	23.3	151.23	23.6	151.24	23.6	151.25	23.6	151.26	23.7
152.42	23.3	152.43	23.4	152.44	23.6	152.45	23.6	152.46	23.7
153.62	22.8	153.63	22.9	153.64	23.1	153.65	23.2	153.66	23.4
154.82	22.7	154.83	22.8	154.84	22.9	154.85	23.1	154.86	23.3
156.02	22.4	156.03	22.5	156.04	22.5	156.05	22.6	156.06	22.7
157.02	21.9	157.03	22.1	157.04	22.1	157.05	22.1	157.06	22.3

Table 4.2.48 Contd.

8		9		10		11		12	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.07	25.8	0.08	24.1	0.09	0.0	0.10	23.9	0.11	23.8
1.27	16.6	1.28	17.2	1.29	17.4	1.30	18.1	1.31	18.4
2.47	16.9	2.48	17.6	2.49	17.8	2.50	18.3	2.51	18.1
3.67	17.2	3.68	17.8	3.69	17.6	3.70	18.5	3.71	18.1
4.87	17.1	4.88	17.9	4.89	17.6	4.90	18.4	4.91	18.1
6.07	17.0	6.08	17.9	6.09	17.6	6.10	18.6	6.11	18.2
7.27	16.6	7.28	17.4	7.29	17.2	7.30	18.-	7.31	17.8
8.67	16.6	8.68	17.4	8.69	17.3	8.70	17.9	8.51	17.4
9.67	16.6	9.68	17.4	9.69	17.2	9.70	18.2	9.71	17.7
10.87	15.7	10.88	17.2	10.89	16.9	10.90	17.5	10.91	16.7
12.07	15.2	12.08	17.2	12.09	15.6	12.10	17.5	12.11	15.1
13.27	15.0	13.28	17.-	13.29	15.6	13.30	17.3	13.31	14.7
14.47	16.1	14.48	17.7	14.49	15.5	14.50	17.3	14.51	17.1
15.67	16.2	15.68	16.9	15.69	16.6	15.70	17.4	15.71	17.-
16.87	16.0	16.88	16.7	16.89	16.6	16.90	17.7	16.91	17.5
18.07	16.5	18.08	17.0	18.09	16.6	18.10	17.6	18.11	17.9
19.27	16.7	19.28	17.4	19.29	17.2	19.30	18.0	19.31	17.5
20.47	17.1	20.48	17.9	20.49	17.5	20.50	18.3	20.51	17.9
21.67	17.8	21.68	18.5	21.69	17.7	21.70	18.6	21.71	18.2
22.87	17.6	22.88	18.4	22.89	18.3	22.90	18.2	22.91	18.-
24.07	17.8	24.08	18.7	24.09	18.2	24.10	18.9	24.11	18.7
25.27	18.1	25.28	18.8	25.29	18.6	25.30	19.6	25.31	18.-
26.47	18.1	26.48	18.8	26.49	18.6	26.50	19.7	26.51	19.1
27.67	17.8	27.68	18.7	27.69	18.5	27.70	19.2	27.71	19.-
28.87	17.9	28.88	18.6	28.89	18.4	28.90	19.3	28.91	18.9
30.07	17.7	30.08	18.6	30.09	18.3	30.10	19.2	30.11	18.7
31.27	17.5	31.28	18.3	31.29	18.1	31.30	19.0	31.31	18.5
32.47	17.5	32.48	18.1	32.49	18.0	32.50	18.7	32.51	18.4
33.67	17.1	33.68	17.9	33.69	17.6	33.70	18.6	33.71	18.5
34.87	16.8	34.88	17.5	34.89	17.2	34.90	18.1	34.91	17.8
36.07	16.7	36.08	17.4	36.09	17.2	36.10	18.-	36.11	17.6
37.27	16.7	37.28	17.4	37.29	17.0	37.30	17.9	37.31	17.5
38.47	16.5	38.48	17.2	38.49	17.0	38.50	17.7	38.51	17.4
39.67	16.8	39.68	17.5	39.69	17.1	39.70	17.9	39.71	17.6
40.87	16.7	40.88	17.3	40.89	16.9	40.90	17.8	40.91	17.4
42.07	16.9	42.08	17.6	42.09	17.1	42.10	17.9	42.11	17.4
43.27	17.0	43.28	17.3	43.29	17.5	43.30	17.6	43.31	17.3
44.47	17.3	44.48	18.2	44.49	17.5	44.50	18.3	44.51	17.8
45.67	17.6	45.68	18.2	45.69	17.8	45.70	18.6	45.71	18.0
46.87	17.3	46.88	17.7	46.89	17.5	46.90	18.2	46.91	18.7
48.07	17.5	48.08	18.3	48.09	17.9	48.10	18.5	48.11	18.1
49.27	17.8	49.28	18.5	49.29	18.-	49.30	18.6	49.31	18.3
50.47	18.1	50.48	18.5	50.49	18.4	50.50	18.6	50.51	18.8
51.67	18.0	51.68	18.5	51.69	18.2	51.70	18.9	51.71	18.6
52.87	17.6	52.88	18.2	52.89	17.8	52.90	18.7	52.91	18.3
54.07	17.6	54.08	18.0	54.09	17.6	54.10	18.4	54.11	18.1
55.27	17.4	55.28	17.6	55.29	17.3	55.30	18.1	55.31	17.8
56.47	17.2	56.48	17.2	56.49	16.9	56.50	17.8	56.51	17.3
57.67	17.7	57.68	17.5	57.69	17.1	57.70	17.9	57.71	17.4
58.87	17.8	58.88	17.5	58.89	17.1	58.90	17.9	58.91	17.4
60.07	18.0	60.08	17.5	60.09	17.1	60.10	17.7	60.11	17.4
61.27	18.1	61.28	17.6	61.29	17.2	61.30	17.9	61.31	17.5
62.47	18.5	62.48	17.8	62.49	17.5	62.50	18.2	62.51	17.8
63.67	18.7	63.68	18.0	63.69	17.7	63.70	18.4	63.71	18.0
64.87	19.4	64.88	18.4	64.89	18.0	64.90	18.7	64.91	18.3

Table 4.2.48 Contd.

8		9		10		11		12	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
66.07	19.8	66.09	18.7	66.09	18.2	66.10	18.9	66.11	18.5
67.27	20.3	67.29	19.1	67.29	18.6	67.30	19.3	67.31	18.9
68.47	20.8	68.49	19.2	68.49	19.0	68.50	19.7	68.51	19.2
69.67	20.5	69.69	18.5	69.69	18.5	69.70	19.7	69.71	18.4
70.87	20.1	70.89	18.6	70.89	18.2	70.90	19.1	70.91	18.6
72.07	21.2	72.09	19.1	72.09	19.1	72.10	19.7	72.11	19.4
73.27	21.4	73.29	19.4	73.29	19.1	73.30	19.8	73.31	19.6
74.47	21.5	74.49	19.6	74.49	19.1	74.50	19.8	74.51	19.6
75.67	21.6	75.69	19.3	75.69	19.2	75.70	19.8	75.71	19.7
76.87	21.6	76.89	19.6	76.89	19.3	76.90	19.8	76.91	19.6
78.07	21.7	78.08	19.1	78.09	19.2	78.10	19.8	78.11	19.4
79.27	21.2	79.28	18.8	79.29	19.7	79.30	19.4	79.31	19.1
80.47	21.2	80.48	18.7	80.49	19.2	80.50	19.8	80.51	18.8
81.67	21.1	81.68	18.6	81.69	19.1	81.70	19.8	81.71	18.5
82.87	21.2	82.88	18.2	82.89	18.9	82.90	19.8	82.91	18.4
84.07	21.2	84.08	18.2	84.09	17.9	84.10	19.8	84.11	18.3
85.27	21.2	85.28	17.8	85.29	17.7	85.30	19.6	85.31	18.1
86.47	21.6	86.48	18.3	86.49	17.9	86.50	19.8	86.51	18.2
87.67	21.8	87.68	18.2	87.69	17.8	87.70	19.8	87.71	18.0
88.87	21.6	88.88	17.8	88.89	17.6	88.90	19.8	88.91	18.1
90.07	21.5	90.08	17.7	90.09	17.4	90.10	19.7	90.11	17.8
91.27	22.4	91.28	18.6	91.29	18.1	91.30	19.8	91.31	18.1
92.47	22.8	92.48	18.5	92.49	18.1	92.50	19.8	92.51	18.3
93.67	23.2	93.68	18.7	93.69	18.2	93.70	19.8	93.71	18.6
94.87	22.9	94.88	17.9	94.89	17.7	94.90	19.7	94.91	18.4
96.07	23.5	96.08	18.6	96.09	18.0	96.10	19.8	96.11	17.9
97.27	23.8	97.28	18.6	97.29	18.2	97.30	19.8	97.31	18.7
98.47	23.9	98.48	18.3	98.49	18.0	98.50	19.8	98.51	18.4
99.67	23.9	99.68	18.1	99.69	17.7	99.70	19.6	99.71	18.1
100.87	24.1	100.88	18.0	100.89	17.7	100.90	19.6	100.91	18.2
102.07	24.2	102.08	18.2	102.09	17.6	102.10	19.6	102.11	18.0
103.27	24.6	103.28	17.9	103.29	17.6	103.30	19.6	103.31	18.0
104.47	25.0	104.48	18.3	104.49	17.1	104.50	19.5	104.51	17.8
105.67	25.5	105.68	18.6	105.69	17.6	105.70	19.8	105.71	18.2
106.87	25.6	106.88	18.7	106.89	17.2	106.90	19.8	106.91	18.6
108.07	25.5	108.08	18.5	108.09	17.0	108.10	19.8	108.11	18.4
109.27	25.8	109.28	18.6	109.29	17.3	109.30	19.8	109.31	18.5
110.47	25.6	110.48	18.7	110.49	18.3	110.50	19.8	110.51	18.6
111.67	25.2	111.68	18.4	111.69	18.0	111.70	19.8	111.71	18.7
112.87	24.7	112.88	18.0	112.89	17.8	112.90	19.8	112.91	18.0
114.07	24.3	114.08	18.0	114.09	17.4	114.10	19.1	114.11	17.9
115.27	23.9	115.28	17.9	115.29	16.8	115.30	17.6	115.31	17.4
116.47	24.2	116.48	18.4	116.49	16.9	116.50	17.8	116.51	17.1
117.67	24.4	117.68	19.6	117.69	17.0	117.70	18.8	117.71	17.3
118.87	25.0	118.88	21.1	118.89	17.3	118.90	17.9	118.91	17.3
120.07	26.0	120.08	22.5	120.09	18.1	120.10	18.5	120.11	18.0
121.27	26.0	121.28	23.2	121.29	18.1	121.30	18.4	121.31	18.5
122.47	25.3	122.48	23.2	122.49	17.5	122.50	18.7	122.51	18.3
123.67	24.4	123.68	22.8	123.69	16.7	123.70	17.4	123.71	17.4
124.87	24.0	124.88	22.8	124.89	16.2	124.90	17.0	124.91	16.7
126.07	23.8	126.08	22.6	126.09	16.0	126.10	16.6	126.11	16.3
127.27	23.9	127.28	22.8	127.29	16.4	127.30	16.4	127.31	16.0
128.47	24.0	128.48	23.0	128.49	16.8	128.50	16.5	128.51	16.1
129.67	23.6	129.68	23.0	129.69	16.9	129.70	16.4	129.71	15.7
130.87	23.8	130.88	23.2	130.89	17.2	130.90	16.2	130.91	15.8

Table4.2.48 Contd.

8		9		10		11		12	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
132.07	23.6	132.08	23.2	132.09	17.5	132.10	16.1	132.11	15.6
133.27	23.4	133.28	23.1	133.29	17.9	133.30	15.7	133.31	15.3
134.47	23.8	134.48	23.4	134.49	18.5	134.50	15.9	134.51	15.2
135.67	24.3	135.68	24.0	135.69	19.4	135.70	16.2	135.71	16.0
136.87	24.4	136.88	23.9	136.89	19.8	136.90	16.3	136.91	16.1
138.07	24.4	138.08	24.2	138.09	20.1	138.10	16.4	138.11	16.0
139.27	24.2	139.28	24.1	139.29	20.5	139.30	16.4	139.31	15.9
140.47	24.2	140.48	24.1	140.49	20.8	140.50	16.3	140.51	16.1
141.67	24.1	141.68	23.9	141.69	21.1	141.70	16.2	141.71	16.0
142.87	25.1	142.88	24.7	142.89	22.3	142.90	16.6	142.91	16.2
144.07	25.4	144.08	25.1	144.09	22.8	144.10	16.8	144.11	16.8
145.27	26.4	145.28	26.1	145.29	23.9	145.30	17.8	145.31	17.0
146.47	26.0	146.48	25.9	146.49	24.1	146.50	17.6	146.51	17.2
147.67	25.7	147.68	26.1	147.69	24.6	147.70	17.8	147.71	17.1
148.87	25.3	148.88	25.9	148.89	24.6	148.90	17.9	148.91	17.0
150.07	24.3	150.08	25.0	150.09	24.0	150.10	17.7	150.11	16.5
151.27	23.7	151.28	24.0	151.29	23.5	151.30	17.5	151.31	15.9
152.47	23.7	152.48	24.0	152.49	23.4	152.50	18.0	152.51	15.7
153.67	23.5	153.68	23.7	153.69	23.2	153.70	18.7	153.71	15.6
154.87	23.2	154.88	23.7	154.89	23.3	154.90	20.0	154.91	15.7
156.07	22.7	156.08	23.1	156.09	22.6	156.10	19.1	156.11	15.1
157.07	22.3	157.08	22.5	157.09	22.4	157.10	19.1	157.11	14.7

Appendix 4.2. Run Data (Cont'd)

TABLE 4.2.49

Radial flow run 15, 10:8:72, S23 Conditions after 46 hrs.

Distance from air inlet, in	Moisture content	
	% w.b.	% d.b.
9	8.2	9.0
18	8.6	9.4
27	9.2	10.2
36	11.1	12.4
45	22.2	28.6
54	26.0	35.1
60	25.5	34.1
	Temperature °C	
Inlet	28.8	
6	29.3	
12	29.1	
18	28.7	
24	27.3	
30	27.6	
36	26.2	
42	20.8	
48	17.6	
54	17.8	
60	17.3	

TABLE 4.2.50

Final conditions

Distance from air inlet, in	Moisture content		Mean Germination %
	% w.b.	% d.b.	
2	8.6	9.4	95
11	8.7	9.5	94
20	9.3	10.2	95
29	9.0	9.8	94
38	9.1	10.0	94
44 (centre)	9.1	10.0	95
(left)	8.9	9.7	97
(right)	9.0	9.8	95
50 (centre)	9.6	10.6	94
(left)	9.1	10.0	93
(right)	9.1	10.0	92
56 (centre)	10.5	11.8	95
(left)	9.4	10.4	90
(right)	9.2	10.2	92
61 (centre)	13.4	15.4	94
(left)	10.0	11.1	90
(right)	10.4	11.6	90

Table 4.2.51 Inlet air conditions, Run 15. 10:8:72. S23.

TIME, HOURS	AMBIENT CONDITIONS TEMP. DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	INLET CONDITIONS TEMP. DEG C	RELATIVE HUMIDITY %
0.01	22.2	39.2	0.006425	23.1	34.4
0.81	22.3	38.4	0.006441	24.3	31.8
1.61	23.3	40.9	0.006854	26.1	31.6
2.41	22.4	41.8	0.006961	26.0	32.1
3.21	22.0	41.5	0.006728	25.7	31.3
4.01	21.4	45.0	0.007038	25.9	33.0
4.81	21.1	47.2	0.007234	26.0	33.8
5.61	21.3	46.5	0.007238	25.9	33.8
6.41	21.1	45.7	0.006903	26.4	33.2
7.21	20.3	46.6	0.006793	25.9	33.1
8.01	19.6	45.2	0.006327	25.6	31.5
8.81	19.4	44.1	0.006342	25.3	32.1
9.61	19.1	43.2	0.006552	25.1	33.5
10.41	18.6	44.9	0.006201	24.3	32.6
11.21	18.1	45.5	0.006286	24.5	30.7
12.01	17.8	45.8	0.006248	24.1	31.2
12.81	17.5	43.0	0.005975	23.7	32.7
13.61	17.4	44.5	0.006454	23.5	31.8
14.41	17.6	49.4	0.006899	25.7	30.0
15.21	18.5	47.0	0.006424	26.7	29.5
16.01	20.7	44.6	0.006901	26.3	31.8
16.81	21.8	44.8	0.007175	26.9	33.0
17.61	20.7	33.0	0.005671	27.2	25.7
18.41	20.7	34.1	0.005839	26.2	28.0
19.21	20.3	40.0	0.006831	26.1	28.3
20.01	21.6	40.5	0.006385	28.0	27.5
20.81	21.9	35.5	0.006226	28.1	26.6
21.61	22.3	39.0	0.006438	28.7	24.7
22.41	22.8	37.8	0.006445	29.3	25.8
23.21	23.0	38.0	0.006554	30.1	25.0
24.01	23.4	36.9	0.006514	29.6	25.3
24.81	23.8	37.3	0.006751	29.1	27.5
25.61	24.0	37.5	0.006965	29.0	27.9
26.41	23.5	38.1	0.006767	28.2	28.8
27.21	22.9	41.4	0.007116	27.7	31.2
28.01	21.7	45.5	0.007257	26.9	33.4
28.81	21.3	47.2	0.007358	26.4	34.9
29.61	20.8	46.5	0.006995	26.1	34.0
30.41	20.4	44.8	0.006575	25.2	33.4
31.21	20.2	46.4	0.006724	25.0	34.7
32.01	20.4	44.8	0.006575	25.6	32.7
32.81	20.0	47.8	0.006850	27.3	30.8
33.61	19.5	46.7	0.006685	27.2	29.3
34.41	19.2	47.9	0.006542	26.9	30.0
35.21	18.4	46.8	0.006084	26.6	28.6
36.01	17.5	49.3	0.006036	26.2	29.0
36.81	17.7	50.4	0.006239	25.8	30.7
37.61	17.3	53.0	0.006430	25.7	31.7
38.41	18.2	51.5	0.006584	25.7	32.6
39.21	18.6	55.5	0.007305	25.9	35.6
40.01	18.9	55.5	0.007457	26.0	36.2
40.81	20.6	51.3	0.007655	26.4	36.1
41.61	20.9	49.3	0.007481	27.0	34.2
42.41	22.2	45.4	0.007474	27.7	32.7
43.21	22.2	43.5	0.007135	28.2	30.3

TIME.	AMBIENT CONDITIONS			THICK CONDITIONS	
HOURS	TEMP. DEG C	RELATIVE HUMIDITY %	ABSOLUTE HUMIDITY KG/KG	TEMP. DEG C	RELATIVE HUMIDITY %
44.01	22.4	43.5	0.007261	28.2	30.0
44.81	22.7	39.6	0.006691	28.5	27.9
45.61	22.7	39.7	0.006725	28.4	27.7
46.41	22.7	41.4	0.007022	27.9	31.1
47.21	23.0	43.3	0.007276	28.3	30.9
48.01	22.9	49.6	0.008055	28.6	33.5
48.81	22.2	44.3	0.007434	28.4	33.2
49.61	21.9	45.7	0.007654	28.1	33.2
50.41	21.5	52.1	0.008227	24.3	34.9
51.21	21.6	53.3	0.008463	25.3	35.8
52.01	21.5	51.3	0.008114	27.8	35.4
52.81	21.3	56.9	0.008258	27.8	36.0
53.61	20.7	55.9	0.008236	27.7	36.0
54.41	21.2	54.9	0.008334	27.7	35.5
55.21	21.2	53.2	0.008252	27.7	36.1
56.01	20.9	54.1	0.008243	27.5	36.5
56.81	20.5	55.6	0.008243	27.5	36.6
57.61	20.7	56.2	0.008420	27.2	37.8
58.41	20.7	54.2	0.008114	27.1	36.8
59.21	20.2	52.4	0.007536	25.3	35.2
60.01	19.8	54.6	0.007796	26.3	36.6
60.81	20.1	53.9	0.007764	25.7	36.1
61.61	19.2	56.9	0.008347	26.5	39.3
62.41	19.5	60.8	0.008473	26.1	40.7
63.21	20.3	56.6	0.008312	26.3	39.5
64.01	22.3	53.7	0.008331	25.9	41.7
64.81	23.0	51.9	0.008968	28.3	38.6
65.61	23.2	50.6	0.008377	28.3	34.4
66.41	23.3	48.6	0.008574	28.9	35.1
67.21	23.5	47.0	0.008377	29.1	33.8
68.01	23.8	43.0	0.007798	29.0	31.6
68.81	24.4	44.7	0.008395	29.3	32.9
69.61	24.4	44.8	0.008437	29.9	32.5
70.41	24.4	44.8	0.008437	30.1	32.2
71.21	24.9	42.6	0.008256	30.2	31.2
72.01	24.2	42.7	0.007912	30.1	30.1
72.81	24.4	47.3	0.009024	30.1	34.4
73.61	24.0	54.8	0.010077	30.0	38.6
74.41	23.8	54.2	0.009832	29.7	38.1
75.21	22.7	55.2	0.009365	29.5	36.8
76.01	23.3	51.8	0.009113	29.4	36.1
76.81	22.9	55.5	0.009535	29.3	37.9
77.61	22.9	55.5	0.009535	29.1	38.4
78.41	22.0	56.4	0.009188	29.0	37.2
79.21	22.1	55.7	0.009101	28.7	37.6
80.01	21.4	54.7	0.008594	28.2	36.4
80.81	21.3	50.1	0.008765	28.2	37.2
81.61	21.3	54.9	0.008538	27.7	37.3
82.41	21.0	55.4	0.008447	27.2	36.6
83.21	20.9	50.5	0.008926	27.7	38.9
84.01	20.6	58.2	0.008689	27.3	39.0
84.81	20.6	58.4	0.008847	27.4	39.4
85.61	20.8	56.6	0.008598	27.3	38.4
86.21	21.0	60.6	0.009282	27.5	41.1
MEAN	21.3	48.3	0.007514	27.4	33.4
STANDARD DEVIATION		0.00108514	1.56		3.84

Table 4.2.52 Layer temperatures, °C, Run 15. 10:8:72. S23.

TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.02	15.1	0.03	14.9	0.04	18.9	0.05	23.9	0.06	24.2
0.82	27.6	0.83	16.7	0.84	17.0	0.85	16.4	0.86	16.4
1.62	26.7	1.63	21.6	1.64	17.1	1.65	17.4	1.66	17.1
2.42	26.3	2.43	23.4	2.44	16.9	2.45	17.2	2.46	17.0
3.22	26.3	3.23	23.9	3.24	16.8	3.25	17.3	3.26	17.0
4.02	25.9	4.03	24.1	4.04	17.7	4.05	17.1	4.06	16.8
4.82	26.2	4.83	24.5	4.84	20.0	4.85	17.3	4.86	16.9
5.62	26.4	5.63	24.9	5.64	21.5	5.65	17.4	5.66	17.2
6.42	26.2	6.43	24.7	6.44	21.8	6.45	17.2	6.46	16.7
7.22	25.8	7.23	24.6	7.24	22.1	7.25	17.0	7.26	16.5
8.02	25.4	8.03	24.4	8.04	22.0	8.05	16.7	8.06	16.3
8.82	25.3	8.83	24.2	8.84	22.3	8.85	16.4	8.86	16.1
9.62	25.1	9.63	24.1	9.64	22.2	9.65	16.3	9.66	16.0
10.42	24.7	10.43	23.8	10.44	22.0	10.45	16.0	10.46	15.6
11.22	24.5	11.23	23.7	11.24	22.0	11.25	15.8	11.26	15.4
12.02	24.1	12.03	23.4	12.04	21.9	12.05	15.3	12.06	14.9
12.82	23.9	12.83	23.1	12.84	21.8	12.85	15.2	12.86	14.8
13.62	23.8	13.63	22.9	13.64	21.8	13.65	14.9	13.66	14.5
14.42	25.8	14.43	24.5	14.44	22.6	14.45	15.4	14.46	15.4
15.22	27.2	15.23	26.2	15.24	24.2	15.25	16.2	15.26	16.7
16.02	27.3	16.03	26.8	16.04	25.1	16.05	17.2	16.06	18.1
16.82	27.1	16.83	26.7	16.84	25.2	16.85	17.5	16.86	18.6
17.62	27.4	17.63	26.8	17.64	24.9	17.65	17.2	17.66	18.8
18.42	26.5	18.43	25.6	18.44	23.5	18.45	16.0	18.46	17.9
19.22	26.3	19.23	25.3	19.24	23.7	19.25	16.3	19.26	18.1
20.02	28.4	20.03	27.4	20.04	25.9	20.05	18.0	20.06	19.8
20.82	28.7	20.83	27.8	20.84	26.3	20.85	18.6	20.86	20.1
21.62	29.3	21.63	28.6	21.64	26.7	21.65	19.3	21.66	20.6
22.42	29.7	22.43	29.2	22.44	27.7	22.45	20.5	22.46	21.8
23.22	30.5	23.23	29.8	23.24	28.5	23.25	21.2	23.26	22.4
24.02	30.6	24.03	30.0	24.04	28.7	24.05	21.6	24.06	22.6
24.82	29.7	24.83	29.2	24.84	28.6	24.85	22.1	24.86	23.2
25.62	29.3	25.63	29.3	25.64	28.7	25.65	22.6	25.66	23.8
26.42	28.9	26.43	28.9	26.44	28.5	26.45	23.2	26.46	23.8
27.22	28.3	27.23	28.6	27.24	28.3	27.25	23.4	27.26	24.3
28.02	27.6	28.03	27.7	28.04	27.9	28.05	23.5	28.06	24.6
28.82	26.8	28.83	27.1	28.84	27.3	28.85	23.7	28.86	24.4
29.62	26.3	29.63	26.6	29.64	26.7	29.65	23.6	29.66	24.4
30.42	25.7	30.43	25.8	30.44	25.9	30.45	23.3	30.46	23.9
31.22	25.3	31.23	25.5	31.24	25.7	31.25	23.4	31.26	23.7
32.02	25.7	32.03	25.4	32.04	25.4	32.05	23.3	32.06	23.8
32.82	27.6	32.83	27.2	32.84	26.0	32.85	23.8	32.86	24.4
33.62	27.9	33.63	27.6	33.64	27.1	33.65	23.8	33.66	24.6
34.42	27.7	34.43	27.6	34.44	27.1	34.45	24.1	34.46	24.6
35.22	27.2	35.23	26.9	35.24	26.6	35.25	24.1	35.26	24.8
36.02	26.7	36.03	26.8	36.04	26.5	36.05	23.9	36.06	24.7
36.82	26.4	36.83	26.8	36.84	26.4	36.85	24.2	36.86	24.8
37.62	26.4	37.63	26.5	37.64	26.5	37.65	24.6	37.66	25.2
38.42	26.4	38.43	26.4	38.44	26.6	38.45	24.8	38.46	25.4
39.22	26.4	39.23	26.7	39.24	26.7	39.25	25.4	39.26	25.8
40.02	26.8	40.03	26.8	40.04	27.0	40.05	25.9	40.06	26.4
40.82	27.0	40.83	27.2	40.84	27.4	40.85	26.6	40.86	26.9
41.62	27.5	41.63	27.5	41.64	27.1	41.65	26.4	41.66	26.8
42.42	28.3	42.43	28.2	42.44	27.8	42.45	26.7	42.46	27.0
43.22	28.6	43.23	28.3	43.24	27.8	43.25	26.6	43.26	27.1

Table 4.2.52 Contd.

3	4	5	6	7
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
44.02	28.3	44.03	28.7	44.04	28.4	44.05	28.6	44.06	27.1
44.82	29.2	44.83	29.2	44.84	28.7	44.85	28.9	44.86	27.4
45.62	29.3	45.63	29.1	45.64	28.7	45.65	27.3	45.66	27.6
46.42	28.0	46.43	27.8	46.44	28.6	46.45	27.1	46.46	27.4
47.22	29.4	47.23	29.2	47.24	28.7	47.25	27.8	47.26	28.3
48.02	29.3	48.03	29.6	48.04	28.6	48.05	28.4	48.06	28.6
48.82	29.1	48.83	29.3	48.84	28.6	48.85	28.9	48.86	29.2
49.62	29.0	49.63	29.2	49.64	28.9	49.65	28.7	49.66	28.9
50.42	29.0	50.43	29.1	50.44	29.3	50.45	27.1	50.46	29.1
51.22	29.1	51.23	29.1	51.24	29.1	51.25	28.3	51.26	29.1
52.02	28.4	52.03	28.8	52.04	28.9	52.05	28.5	52.06	28.8
52.82	28.6	52.83	28.9	52.84	29.0	52.85	28.8	52.86	29.1
53.62	28.3	53.63	28.6	53.64	28.7	53.65	28.9	53.66	29.1
54.42	28.2	54.43	28.4	54.44	28.7	54.45	28.9	54.46	28.9
55.22	28.3	55.23	28.5	55.24	28.7	55.25	28.7	55.26	28.9
56.02	28.0	56.03	28.1	56.04	28.3	56.05	28.3	56.06	28.5
56.82	28.0	56.83	28.2	56.84	28.2	56.85	28.3	56.86	28.5
57.62	27.8	57.63	28.0	57.64	28.1	57.65	28.2	57.66	28.3
58.42	27.7	58.43	27.8	58.44	27.9	58.45	28.1	58.46	28.2
59.22	27.4	59.23	27.6	59.24	27.8	59.25	28.1	59.26	28.1
60.02	27.2	60.03	27.3	60.04	27.3	60.05	27.5	60.06	27.7
60.82	27.3	60.83	27.3	60.84	27.3	60.85	27.4	60.86	27.4
61.62	27.2	61.63	27.3	61.64	27.3	61.65	27.1	61.66	27.5
62.42	26.7	62.43	26.8	62.44	27.2	62.45	27.5	62.46	27.7
63.22	26.9	63.23	27.1	63.24	27.1	63.25	27.6	63.26	27.7
64.02	27.3	64.03	27.2	64.04	27.3	64.05	27.6	64.06	27.8
64.82	28.4	64.83	28.3	64.84	28.1	64.85	28.1	64.86	28.2
65.62	29.3	65.63	28.7	65.64	28.5	65.65	28.2	65.66	28.3
66.42	29.6	66.43	29.6	66.44	29.1	66.45	28.6	66.46	28.4
67.22	29.7	67.23	29.6	67.24	29.1	67.25	28.7	67.26	29.1
68.02	29.6	68.03	29.6	68.04	29.1	68.05	28.7	68.06	28.8
68.82	30.3	68.83	30.3	68.84	29.8	68.85	29.0	68.86	29.6
69.62	30.5	69.63	30.3	69.64	30.2	69.65	29.5	69.66	29.8
70.42	30.8	70.43	30.2	70.44	30.0	70.45	29.5	70.46	30.2
71.22	30.8	71.23	30.7	71.24	30.6	71.25	30.3	71.26	30.4
72.02	30.8	72.03	30.6	72.04	30.5	72.05	30.2	72.06	30.4
72.82	30.8	72.83	31.2	72.84	31.2	72.85	30.4	72.86	30.8
73.62	30.7	73.63	31.1	73.64	31.5	73.65	31.4	73.66	31.6
74.42	30.4	74.43	30.8	74.44	31.1	74.45	31.5	74.46	31.8
75.22	30.4	75.23	30.6	75.24	30.7	75.25	31.1	75.26	31.1
76.02	30.0	76.03	30.2	76.04	30.3	76.05	30.4	76.06	30.4
76.82	29.9	76.83	30.1	76.84	30.3	76.85	30.6	76.86	30.7
77.62	29.8	77.63	30.1	77.64	30.2	77.65	30.3	77.66	30.4
78.42	29.6	78.43	29.7	78.44	29.9	78.45	30.2	78.46	30.2
79.22	29.3	79.23	29.5	79.24	29.6	79.25	29.8	79.26	29.8
80.02	28.8	80.03	28.9	80.04	28.9	80.05	29.1	80.06	29.3
80.82	28.8	80.83	28.8	80.84	28.9	80.85	28.9	80.86	29.1
81.62	28.6	81.63	28.8	81.64	28.8	81.65	28.9	81.66	28.9
82.42	28.4	82.43	28.6	82.44	28.7	82.45	28.8	82.46	29.0
83.22	28.4	83.23	28.6	83.24	28.7	83.25	28.7	83.26	28.7
84.02	27.9	84.03	28.0	84.04	28.3	84.05	28.4	84.06	28.4
84.82	28.0	84.83	28.0	84.84	28.2	84.85	28.3	84.86	28.6
85.62	27.9	85.63	28.1	85.64	28.3	85.65	28.4	85.66	28.6
86.22	28.0	86.23	28.2	86.24	28.5	86.25	28.7	86.26	28.7

Table 4.2.52 Contd.

8		9		10		11		12	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
0.07	23.8	0.03	23.9	0.09	24.0	0.10	24.1	0.11	23.8
0.87	16.4	0.88	16.6	0.89	17.4	0.90	21.3	0.91	21.5
1.67	17.2	1.68	17.8	1.69	17.5	1.70	17.8	1.71	17.1
2.47	17.1	2.48	17.4	2.49	17.0	2.50	17.7	2.51	17.2
3.27	17.0	3.28	17.6	3.29	17.2	3.30	17.7	3.31	17.2
4.07	16.9	4.08	17.5	4.09	17.1	4.10	17.7	4.11	17.2
4.87	17.0	4.88	17.6	4.89	17.1	4.90	17.8	4.91	17.3
5.67	17.3	5.68	17.8	5.69	17.3	5.70	18.0	5.71	17.3
6.47	16.8	6.48	17.6	6.49	17.2	6.50	17.9	6.51	17.3
7.27	16.8	7.28	17.4	7.29	17.0	7.30	17.7	7.31	17.1
8.07	16.5	8.08	17.1	8.09	16.7	8.10	17.7	8.11	16.9
8.87	16.1	8.88	16.6	8.89	16.4	8.90	17.2	8.91	16.6
9.67	16.0	9.68	16.6	9.69	16.1	9.70	17.0	9.71	16.4
10.47	15.6	10.48	16.4	10.49	16.1	10.50	16.8	10.51	16.3
11.27	15.5	11.28	15.9	11.29	15.7	11.30	16.4	11.31	15.8
12.07	14.8	12.08	15.5	12.09	15.0	12.10	15.9	12.11	15.4
12.87	14.7	12.88	15.2	12.89	14.9	12.90	15.7	12.91	15.1
13.67	14.6	13.68	15.0	13.69	14.8	13.70	15.6	13.71	15.0
14.47	15.0	14.48	15.1	14.49	14.7	14.50	15.3	14.51	14.8
15.27	16.0	15.28	16.1	15.29	15.7	15.30	15.9	15.31	15.4
16.07	16.7	16.08	17.1	16.09	16.6	16.10	17.1	16.11	16.5
16.87	17.0	16.88	17.6	16.89	17.2	16.90	17.8	16.91	17.3
17.67	16.0	17.68	16.4	17.69	15.8	17.70	16.7	17.71	15.9
18.47	15.8	18.48	15.7	18.49	15.6	18.50	16.3	18.51	15.9
19.27	15.8	19.28	15.8	19.29	15.5	19.30	16.1	19.31	15.5
20.07	17.1	20.08	16.4	20.09	16.3	20.10	16.8	20.11	16.4
20.87	17.4	20.88	17.1	20.89	16.7	20.90	17.3	20.91	16.6
21.67	17.7	21.68	17.2	21.69	16.8	21.70	17.3	21.71	16.8
22.47	18.2	22.48	17.4	22.49	17.0	22.50	17.4	22.51	17.0
23.27	18.9	23.28	18.0	23.29	17.4	23.30	18.0	23.31	17.4
24.07	19.0	24.08	17.9	24.09	17.7	24.10	18.2	24.11	17.8
24.87	19.1	24.88	17.9	24.89	17.4	24.90	18.2	24.91	17.7
25.67	19.5	25.68	17.7	25.69	17.3	25.70	18.2	25.71	17.5
26.47	19.7	26.48	17.8	26.49	17.6	26.50	18.6	26.51	17.7
27.27	20.1	27.28	17.7	27.29	17.2	27.30	18.1	27.31	17.3
28.07	20.4	28.08	18.0	28.09	17.4	28.10	18.2	28.11	17.5
28.87	20.8	28.88	17.6	28.89	17.2	28.90	18.0	28.91	17.5
29.67	21.0	29.68	17.3	29.69	16.8	29.70	17.7	29.71	17.1
30.47	21.2	30.48	17.0	30.49	16.6	30.50	17.3	30.51	16.8
31.27	21.1	31.28	16.7	31.29	16.2	31.30	17.1	31.31	16.4
32.07	21.4	32.08	16.5	32.09	16.0	32.10	16.8	32.11	16.2
32.87	22.0	32.88	16.9	32.89	16.2	32.90	16.8	32.91	16.2
33.67	22.3	33.68	17.0	33.69	16.6	33.70	17.1	33.71	16.6
34.47	22.4	34.48	16.8	34.49	16.3	34.50	17.1	34.51	16.6
35.27	22.3	35.28	16.6	35.29	16.3	35.30	17.0	35.31	16.4
36.07	22.4	36.08	16.2	36.09	15.8	36.10	16.6	36.11	16.1
36.87	22.7	36.88	15.8	36.89	15.5	36.90	16.3	36.91	15.7
37.67	23.0	37.68	16.2	37.69	15.6	37.70	16.3	37.71	15.7
38.47	23.4	38.48	16.0	38.49	15.6	38.50	16.3	38.51	15.7
39.27	24.1	39.28	16.6	39.29	16.0	39.30	16.3	39.31	15.9
40.07	24.7	40.08	17.1	40.09	16.7	40.10	16.9	40.11	16.4
40.87	25.4	40.88	17.9	40.89	17.1	40.90	17.4	40.91	17.0
41.67	25.5	41.68	18.3	41.69	17.3	41.70	18.0	41.71	17.3
42.47	25.6	42.48	18.8	42.49	17.4	42.50	17.9	42.51	17.4
43.27	25.5	43.28	19.2	43.29	17.6	43.30	18.7	43.31	17.9

Table 4.2.52 Contd.

9		10		11		12		13	
TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C	TIME, HOURS	TEMP, DEG C
44.07	25.5	44.08	19.4	44.09	17.2	44.10	17.7	44.11	17.4
44.87	26.1	44.88	20.1	44.89	17.5	44.90	17.7	44.91	17.3
45.67	26.2	45.68	20.8	45.69	17.6	45.70	17.8	45.71	17.5
46.47	26.1	46.48	20.3	46.49	17.0	46.50	17.3	46.51	17.3
47.27	27.1	47.28	22.0	47.29	18.1	47.30	17.9	47.31	17.2
48.07	27.5	48.08	22.8	48.09	18.7	48.10	17.7	48.11	17.2
48.87	28.2	48.88	23.9	48.89	20.0	48.90	18.7	48.91	18.1
49.67	28.1	49.68	24.1	49.69	20.1	49.70	18.6	49.71	18.0
50.47	28.5	50.48	24.9	50.49	20.9	50.50	18.6	50.51	18.0
51.27	28.4	51.28	25.1	51.29	21.2	51.30	18.4	51.31	18.0
52.07	28.4	52.08	25.4	52.09	21.5	52.10	18.4	52.11	18.0
52.87	28.5	52.88	26.1	52.89	21.8	52.90	18.5	52.91	18.1
53.67	28.6	53.68	26.3	53.69	22.4	53.70	18.5	53.71	18.2
54.47	28.5	54.48	26.7	54.49	22.6	54.50	18.5	54.51	18.3
55.27	28.4	55.28	27.0	55.29	22.9	55.30	18.8	55.31	18.3
56.07	28.1	56.08	26.9	56.09	22.9	56.10	18.4	56.11	18.0
56.87	28.1	56.88	27.0	56.89	23.1	56.90	18.4	56.91	18.1
57.67	28.0	57.68	26.9	57.69	23.3	57.70	18.4	57.71	18.1
58.47	28.0	58.48	27.2	58.49	23.3	58.50	18.2	58.51	17.8
59.27	27.8	59.28	27.0	59.29	23.4	59.30	18.2	59.31	18.0
60.07	27.5	60.08	27.0	60.09	23.4	60.10	18.1	60.11	17.8
60.87	27.2	60.88	26.9	60.89	23.6	60.90	18.1	60.91	18.0
61.67	27.1	61.68	26.7	61.69	23.8	61.70	18.4	61.71	18.2
62.47	27.6	62.48	27.2	62.49	24.7	62.50	19.2	62.51	18.7
63.27	27.5	63.28	27.3	63.29	25.9	63.30	20.0	63.31	18.9
64.07	27.6	64.08	27.8	64.09	25.4	64.10	20.8	64.11	19.3
64.87	28.0	64.88	28.0	64.89	26.0	64.90	21.9	64.91	20.1
65.67	28.2	65.68	28.3	65.69	26.6	65.70	22.8	65.71	20.5
66.47	28.2	66.48	28.2	66.49	26.6	66.50	23.4	66.51	20.6
67.27	28.5	67.28	28.4	67.29	26.7	67.30	23.9	67.31	20.6
68.07	28.4	68.08	28.2	68.09	26.7	68.10	24.2	68.11	20.4
68.87	28.6	68.88	28.3	68.89	26.8	68.90	24.6	68.91	20.4
69.67	29.3	69.68	28.7	69.69	27.4	69.70	25.2	69.71	20.9
70.47	29.5	70.48	28.9	70.49	27.8	70.50	25.7	70.51	21.2
71.27	30.0	71.28	29.5	71.29	28.2	71.30	26.3	71.31	21.5
72.07	29.9	72.08	29.7	72.09	28.3	72.10	26.6	72.11	21.6
72.87	30.4	72.88	29.7	72.89	28.5	72.90	26.9	72.91	21.8
73.67	31.2	73.68	30.6	73.69	29.6	73.70	28.2	73.71	23.0
74.47	31.4	74.48	31.0	74.49	30.0	74.50	28.8	74.51	23.7
75.27	30.9	75.28	31.1	75.29	30.1	75.30	28.9	75.31	23.8
76.07	30.4	76.08	30.6	76.09	29.7	76.10	28.8	76.11	23.8
76.87	30.4	76.88	30.7	76.89	29.9	76.90	29.2	76.91	24.2
77.67	30.4	77.68	30.7	77.69	30.1	77.70	29.4	77.71	24.6
78.47	30.2	78.48	30.7	78.49	29.9	78.50	29.6	78.51	24.8
79.27	29.5	79.28	29.9	79.29	29.6	79.30	29.3	79.31	24.7
80.07	29.2	80.08	29.6	80.09	29.2	80.10	29.1	80.11	24.7
80.87	29.3	80.88	29.4	80.89	28.9	80.90	28.9	80.91	24.6
81.67	29.7	81.68	29.2	81.69	28.6	81.70	28.8	81.71	25.0
82.47	29.7	82.48	29.1	82.49	28.5	82.50	28.6	82.51	25.2
83.27	29.6	83.28	29.0	83.29	28.6	83.30	28.7	83.31	25.7
84.07	29.3	84.08	28.7	84.09	28.3	84.10	28.6	84.11	25.9
84.87	29.4	84.88	28.9	84.89	28.5	84.90	28.7	84.91	26.3
85.67	29.4	85.68	28.7	85.69	28.4	85.70	28.7	85.71	26.5
86.27	29.5	86.28	28.9	86.29	28.6	86.30	28.9	86.31	26.9

Table 4.2.53

Summary data for parallel flow deep bed runs 1-6. S.I. Units

	Run No					
	1	2	3	4	5	6
Initial conditions						
Moisture content, % d.b.	82.0	69.4	56.0	104.5	92.7	63.1
Grain temperature, °C	-	-	-	29.4	-	27.9
Weight, kg	112	136	150	39.0	202.8	176.0
Depth, m	0.61	0.91	0.91	0.2	0.99	0.99
Bulk density, A, kg/m^3		340	372	-	376.4	347.6
B, kg/m^3	397	320	352	413.2	440.5	382.8
Final conditions						
Moisture content, % d.b.	9.3	12.1	9.6	43.1	16.2	26.5
Moisture range, % d.b.	8.6-11.1	12.0-12.5	9.1-10.4	36.6-48.6	10.9-43.3	13.1-50.6
Weight, kg	65	92	109	27.3	116.7	133.3
Depth, m	-	0.76	-	0.18	0.76	0.84
Shrinkage, %	-	16.7	-	12.5	23.0	15.4
Bulk density, kg/m^3	330	306	320	330.0	283.5	342.8
Mean germination, %	78	91	92	-	76	85
Mean 1000 seed wt, g.	3.72	1.43	1.70	-	3.44	3.83
Drying air						
Temperature, °C	32.5	32.5	49.1	25.2	24.2	24.3
±	1.4	1.9	1.8	1.0	2.2	1.3
Humidity, ratio	-	-	-	-	0.00850	0.00931
Relative humidity, %	-	-	-	-	-	49.7
Velocity, $m^3/min.\ m^2$	12.2	13.1	11.0	8.63	8.63	7.89
Mass flow, $kg/h\ m^2$	850	874	718	614.2	615.2	561.5
Static pressure, mm H_2O	-	91.4	83.9	10.2	63.5	57.2
Range, mm H_2O	-	-	-	11.4-10.2	71.0-55.9	58.4-55.9
Total drying time, h	52.4	43	43.5	23	115	65

A = measured in separate container

B = calculated from weight and depth in bulk bin

Table 4.2.54

Summary data for parallel flow deep-bed runs., 7 - 12. S.I. Units

	Run No					
	7	8	9	10	11	12
Initial conditions						
Moisture content, % d.b.	49.0	23.5	72.4	64.2	35.8	80.2
Grain temperature, °C	29.0	25.0	33.3	23.2	23.9	31.4
Weight, kg	156.5	151.5	128.4	147.4	81.6	208.2
Depth, m	0.99	0.99	0.95	0.97	0.63	1.23
Bulk density, A, kg/m^3	322.0	-	264.3	296.3	246.7	333.2
B, kg/m^3	339.6	329.1	289.9	328.4	273.9	349.2
Final conditions						
Moisture content, % d.b.	16.9	13.0	14.6	17.1	5.5	60.0
Moisture range, % d.b.	4.5-45.3	12.1-14.2	12.6-21.4	12.1-33.7	4.8-6.8	30.3-72.7
Weight, kg	131.8	137.0	86.3	105.0	65.2	180.5
Depth, m	0.84	0.9	0.81	0.84	0.57	1.17
Shrinkage, %	15.4	8.9	14.7	13.2	9.6	5.2
Bulk density, kg/m^3	338.0	323.6	229.1	269.1	245.1	333.2
Mean germination, %	86	89	93	96	95	84
Mean 1000 seed wt, g	3.93	3.71	1.25	1.39	1.48	3.88
Drying air						
Temperature, °C	55.4	26.4	26.0	26.0	48.6	25.7
±	2.8	1.2	1.7	1.3	0.4	1.4
Humidity ratio	0.01078	0.01128*	0.0114	0.01044	0.00719	0.010709
Relative humidity	11.1	57.7	48.6	50.4	10.2	52.5
Velocity, m^3/min m^2	6.95	5.0	7.01	4.97	7.32	5.0
Mass flow, kg/h m^2	453.1	354.0	501.0	354.0	482.9	354.5
Static pressure, mm H_2O	45.7	30.5	55.9	47.0	39.4	62.2
Range, mm H_2O	-	-	58.4-53.3	48.3-45.7	-	55.9-69.9
Total drying time, h	21.75	69	89	136	16	46.5

A = measured in separate container

B = calculated from weight and depth in bulk bin

* = estimated value (wick ran dry on aspirated hygrometer)

Table 4.2.55

Summary data for radial-flow deep bed runs, 13-15. S.I. Units

	Run No		
	13	14	15
Initial conditions			
Moisture content, % d.b.	46.9	75.1	36.7
Grain temperature, °C	24.7	22.8	24.4
Weight, kg.	97.3	152.0	138.3
Depth, m	0.28	0.51	0.44
Bulk density, A, kg/m^3	-	-	217.9-249.9
B, kg/m^3	294.7	256.3	265.7
Final conditions			
Moisture content, % d.b.	15.3	25.1	10.8
Moisture range, % d.b.	12.4-21.5	11.0-53.4	9.4-15.5
Weight, kg	76.4	108.6	109.3
Depth, m	-	0.44	0.39
Shrinkage, %	-	12.5	11.4
Bulk density, kg/m^3	-	209.8	237.1
Mean germination, %	86	93	94
Mean 1000 seed wt, g.	3.97	1.39	1.46
Drying air			
Temperature, $\pm$ °C	22.2	24.2	27.4
	1.6	1.0	1.6
Humidity ratio	0.007719	0.008613	0.007514
Relative humidity, %	47.0	46.5	33.4
Velocity, m^3/min m^2			
(a) at bin wall	29.7	13.9-15.9	15.8-18.0
(b) mean	10.5	4.9-5.6	5.6-6.4
(c) at periphery	4.9	2.3-2.6	2.6-3.0
Mass flow; kg air/h	128.2	107.0	106.6
Volume flow, m^3/h	107.2	90.3	90.7
Static pressure, min H_2O	80.0	83.8-106.7	78.7-91.4
Total drying time, h	70.9	160.5	87.8

1) Depth normal to flow along duct axis.

TABLE 4.2.56

Pressure resistance data, Runs 5, 6 and 8
(a) Pre-run

Run	Differential pressure in W.G.	V ft/min	Pp in W.G.	Pp/Dp in W.G./ft
5	0.3	28.3	2.83	0.87
	0.32	29.2	3.00	0.92
	0.27	26.9	2.65	0.82
	0.215	24.0	2.30	0.71
	0.18	21.9	2.07	0.64
	0.145	19.7	1.78	0.55
	0.11	17.1	1.5	0.46
	0.045	11.0	0.9	0.28
6	0.34	30.2	2.99	0.92
	0.33	29.7	2.88	0.89
	0.30	28.3	2.78	0.86
	0.285	27.6	2.65	0.82
	0.280	27.4	2.63	0.81
	0.275	27.1	2.61	0.80
	0.250	25.9	2.46	0.76
	0.215	24.0	2.22	0.68
	0.185	22.3	2.02	0.62
	0.175	21.7	1.98	0.61
	0.140	19.4	1.70	0.52
	0.095	16.0	1.38	0.42
	0.06	12.7	1.02	0.31
	0.03	9.0	0.70	0.22
	0.25	25.9	2.46	0.76
	0.31	28.8	2.71	0.83
8	0.025	8.2	0.60	0.18
	0.075	14.1	1.03	0.32
	0.12	17.9	1.40	0.43
	0.226	24.5	2.04	0.63
	0.28	27.3	2.35	0.72
	0.33	29.6	2.61	0.80
	0.375	31.6	2.82	0.87
	0.389	32.2	2.90	0.89
	0.184	22.1	1.80	0.55
	0.047	11.2	0.80	0.25
	0.10	16.3	1.20	0.37

(cont.) TABLE 4.2.56

Pressure resistance data, Runs 5, 6 and 8
(b) Post-run

Run	Differential pressure in W.G.	V ft/min	Pp in W.G.	Pp/Dp in W.G./ ft
5	0.03	8.9	0.57	0.23
	0.04	10.3	0.66	0.26
	0.08	14.6	0.96	0.38
	0.115	17.4	1.20	0.48
	0.15	19.9	1.42	0.57
	0.215	23.9	1.80	0.72
	0.285	27.5	2.15	0.86
	0.365	31.1	2.50	1.00
	0.410	32.9	2.70	1.08
	0.435	33.9	2.80	1.12
	0.465	35.1	2.92	1.17
6	0.405	33.0	2.92	1.06
	0.37	31.5	2.77	1.01
	0.33	29.8	2.60	0.95
	0.30	28.4	2.40	0.87
	0.24	25.4	2.11	0.77
	0.195	22.9	1.86	0.68
	0.16	20.7	1.64	0.60
	0.105	16.8	1.38	0.50
	0.05	11.6	0.82	0.30
	0.025	8.2	0.60	0.22
8	0.09	15.5	1.18	0.40
	0.39	32.2	2.90	0.98
	0.375	31.6	2.84	0.96
	0.360	31.0	2.79	0.94
	0.325	29.4	2.60	0.88
	0.29	27.8	2.42	0.82
	0.265	26.6	2.29	0.77
	0.215	23.9	2.00	0.68
	0.175	21.6	1.76	0.59
	0.145	19.6	1.56	0.53
	0.08	14.6	1.10	0.37
	0.035	9.7	0.70	0.24

TABLE 4.2.57

Pressure resistance data, Runs 9, 10 and 12
(a) Pre-run

Run	h in W.G.	V ft/min	Pp in W.G.	Pp/Dp in W.G./ ft
9	0.025	8.2	0.66	0.211
	0.065	13.2	1.21	0.39
	0.08	14.7	1.40	0.45
	0.11	17.2	1.68	0.54
	0.135	19.1	1.90	0.61
	0.170	21.4	2.19	0.70
	0.19	22.6	2.32	0.74
	0.205	23.5	2.43	0.78
	0.225	24.6	2.56	0.82
	0.240	25.4	2.69	0.86
	0.260	26.5	2.80	0.90
	0.270	27.0	2.85	0.91
	0.280	27.5	2.95	0.94
	0.285	27.7	2.97	0.95
10	0.01	5.2	0.59	0.19
	0.03	9.0	0.83	0.26
	0.05	11.6	1.10	0.35
	0.085	15.1	1.48	0.47
	0.120	17.9	1.86	0.59
	0.145	19.7	2.04	0.64
	0.185	22.2	2.40	0.76
	0.205	23.4	2.55	0.81
	0.23	24.8	2.77	0.87
	0.24	25.3	2.82	0.89
	0.26	26.4	2.98	0.94
	0.17	21.3	2.28	0.72
	0.10	16.3	1.65	0.52
12				

(cont.)

TABLE 4.2.57

Pressure resistance data, Runs 9, 10 and 12
(b) Post-run

Run	h in W.G.	V ft/min	Pp in W.G.	Pp/Dp in W.G./ ft
9	0.02	7.3	0.52	0.20
	0.035	9.6	0.70	0.26
	0.05	11.5	0.89	0.33
	0.075	14.1	1.10	0.41
	0.10	16.2	1.34	0.50
	0.13	18.5	1.58	0.59
	0.172	21.3	1.89	0.71
	0.23	24.6	2.25	0.84
	0.26	26.2	2.43	0.91
	0.285	27.4	2.58	0.97
	0.32	29.1	2.79	1.05
	0.35	30.4	2.94	1.10
10	0.24	25.4	2.98	1.08
	0.22	24.4	2.85	1.04
	0.195	22.9	2.64	0.96
	0.18	22.0	2.50	0.91
	0.165	21.1	2.35	0.85
	0.150	20.1	2.25	0.82
	0.135	19.1	2.10	0.76
	0.105	16.8	1.80	0.65
	0.08	14.7	1.58	0.57
	0.055	12.2	1.23	0.45
	0.03	9.0	0.90	0.33
	0.02	7.3	0.74	0.27
	0.13	18.7	2.00	0.73
	0.155	20.4	2.27	0.83
	0.18	22.0	2.50	0.91
	0.21	23.8	2.73	0.99
12	0.09	15.6	2.72	0.71
	0.07	13.8	2.30	0.60
	0.035	9.7	1.63	0.43
	0.015	6.4	1.12	0.29
	0.08	14.7	2.57	0.67
	0.095	16.0	2.81	0.73
	0.11.	17.2	3.0	0.78
	0.115	17.6	3.08	0.80

TABLE 4.2.58

Pressure resistance data, Runs 14 and 15

Run	Static pressure, P in W.G.	Volume flow Q ft^3/min	Mean velocity ft/min
14	2.1	29.88	10.26
	2.5	40.19	14.28
	3.0	41.47	14.73
	3.45	43.91	15.60
	3.7	45.66	16.22
	3.85	48.96	17.39
	4.0	51.05	18.13
	4.15	53.05	18.84
15 (Pre-run)	2.0	35.0	12.43
	2.7	45.19	16.05
	2.85	48.81	17.34
	3.1	51.52	18.30
	3.5	57.75	20.51
	3.75	61.19	21.73
	4.0	66.00	23.44
	4.35	69.52	24.69
15 (Post-run)	2.1	36.08	12.82
	2.2	36.08	12.82
	2.7	42.69	15.16
	3.1	49.29	17.51
	3.1	50.16	17.82
	3.3	52.69	18.72
	3.42	52.69	18.72
	3.6	55.89	19.85
	3.7	58.91	20.92
	3.85	61.08	21.70
	3.9	61.08	21.70
	4.2	67.17	23.86
	4.28	67.81	24.09

APPENDIX TO SECTION 5

SIMULATION OF DRYING IN DEEP BEDS

APPENDIX 5

SIMULATION OF DRYING IN DEEP LAYERS

5.1. Deep bed simulation programmes

5.1.1. Parallel flow: The programme consists of a main section plus the subroutines WTBULB and INLET and the functions EQRH, SATPRE, HTRANS, SER and TERP.

Subroutine WTBULB solved the equation of the wet-bulb line (Chapter 5.2.2.) and was called at the start of the programme to determine the adiabatic saturation temperature and humidity. It was also called at the beginning of every time iteration if inlet air conditions were being interpolated. The linear interpolation of the inlet air data was carried out by subroutine INLET. A similar interpolation of the initial moisture and temperature profiles was carried out by function TERP to initialise the layers at the start of the programme. Function SATPRE evaluated the saturated vapour pressure at a given temperature in degrees Celsius. Function HTRANS calculated the heat transfer coefficient and could use either the equation of Gamson, Thodos and Hougen[35] or that of Boyce[18]. Function SER evaluated the sums of the series E_1 and E_2 and hence the ratio E_2/E_1 (see Section 5.2.1.4.) Function EQRH was used to calculate an initial value of interstitial relative humidity to initialise the layers. Since these values were not used in the computations this was a relatively unimportant function and was left unchanged throughout the development of the program. The function used was the original Smith equation[111] with constants derived for wheat from data of Young and Nelson[136].

Variables in the main programme

A	twice initial difference between air and seed temperature in single layer.
ASER	$k.\Delta\theta.E_2/E$.
ASYMP	asymptotic moisture content, ratio d.b.

ATMOS	atmospheric pressure, read in millibars and converted to N/m^2 within the programme.
AV	mean bed moisture content at the end of each time iteration, ratio d.b.
B	specific heat capacity of seed before mass transfer, kJ/kg.K
BB	specific heat capacity of seed after mass transfer, kJ/kg.K
BOTTOM	temporary variable in heat and mass transfer equations.
CONST	drying rate constant, k, min^{-1}
CPA	specific heat capacity of air, kJ/kg.K
CPL	specific heat capacity of water liquid, kJ/kg.K
CPW	specific heat capacity of water vapour, kJ/kg.K
DEPTH	total bed depth, m
DHR	array of times for variable inlet air conditions, h
DHUM	array of time-dependent inlet absolute humidities
DIS	difference between layer exhaust r.h. and max permitted exhaust r.h. The value which was minimised by condensation search routine
DIV	temporary variable used for adjusting DZ to give integer number of layers
DM	incremental seed moisture change, ΔM, ratio d.b.
DP	if + ve = effective particle diameter, m and HTRANS used GTH equation. If - ve then equation of Boyce was used
DTA	incremental change in air temperature, ΔTa , ^{o}C
DTEMP	array of time-dependent inlet air temperatures, ^{o}C
DTG	incremental change in seed temperature, ΔTg , ^{o}C
DTIME	incremental change in time, $\Delta\theta$, min
DWT	dry matter weight per layer, kg
DZ	incremental depth, ΔZ, m
DZONE	depth of drying zone, m
E	temporary variable in heat and mass transfer equations

EMC	array of constants describing the asymptotic moisture content, ASYMP, as a function of r.h. and temperature (Equation 3.42)
EXHUM	array of layer exhaust humidities, kg/kg
EXTEMP	array of layer exhaust temperatures, ^{o}C
F	temporary variable in heat and mass transfer equations
GAIR	mass rate of airflow, kg/min m^2
GATIME	product of airflow and incremental time
GRE	product of airflow and temporary variable, E
GT	array of layer seed temperatures, ^{o}C
H	temporary value of layer exhaust humidity, kg/kg
HS	volumetric heat transfer coefficient
HSAT	adiabatic saturation humidity for inlet air, kg/kg
HAIN	inlet humidity, kg/kg
HUMT	humidity of air entering layer, kg/kg
I	do loop index
IGT	initial seed temperature (type real), ^{o}C
IK	do loop index
IM	length of depth-dependent initial moisture array, $\leqslant 20$
IMC	average initial moisture content of the seed (type real), ratio, d.b.
IND	indicator for identifying complete drying zone
IP	printing control for 1st 10 iterations : = 0, not printed, = 1, printed
IPL	counter for plotting output
IPLOT	time interval for plotting output, iterations
IPRINT	time interval for printing output, iterations
IRH	counter within condensation routine
IT	length of depth-dependent initial temperature array, $\leqslant 2$

IX	temporary subscript in condensation routine
J	indicator for controlling print command within layer iteration
JP	subscript for selecting layers to be plotted
K	do loop index
KQ	if = 1 drying rate constant, k. evaluated from equation 3.44. Otherwise equation 3.52 was used
KV	index in condensation routine
KZ	subscript of layer at base of drying zone
L	do loop index for layer iterations
LA	latent heat of vapourisation of water at $0^{o}C$, kJ/kg
LG	latent heat of vapourisation of water in seed, kJ/kg
LMAX	maximum number of layers
LPLOT	layer interval for plotting output. Calculated by programme if set to -1 on input
LSAT	subscript of layer at top of drying zone
M	do loop index for time iterations
MAX	maximum number of time iterations
MC	array of layer seed moisture contents, ratio d.b.
MCOUNT	counter for printing output
NDIN	length of arrays of inlet air conditions, If set = 0 inlet air conditions - constant throughout run
NS	control for selecting differential equation for drying rate constant, k. 1 = exponential series for sphere 2 = exponential series for plane sheet 3 = single exponential
P	temporary value of saturation vapour pressure at Ta + ΔTa, N/m^2
PMC	temporary array of layer moisture contents converted to percents
PS	temporary value of vapour pressure at H + ΔH. N/m^2

PV	vapour pressure of inlet air, N/m^2
PVS	saturation vapour pressure of inlet air, N/m^2
Q	array of constants describing the drying rate constant, k as a function of temperature and humidity
RAP	difference between adiabatic saturation ΔH and calculated ΔH
RAQ	ΔH as a percentage of adiabatic saturation ΔH
RATE	ΔH
REL	initial interstitial relative humidity, %
RGTIME	product of dry matter density and incremental time
RH	relative humidity of air entering layer, ratio
RHEX	maximum permitted value of exhaust r.h.,%
RHI	inlet air relative humidity, %
RHL	array of layer exhaust relative humidities, %
RHMC	maximum permitted value for the evaluation of asymptotic moisture content
RHOG	density of dry seed, kg/m^3
RHOW	density of wet seed, kg/m^3
RMAX	increase in humidity of inlet air if saturated adiabatically
S	specific surface area, m^{-1} or if DP set - ve S = multiplier for Boyce heat transfer coefficient
SH	temporary value of specific humidity in condensation routine, kg/kg
SPEED	speed of drying zone, m/min
ST	depth-dependent array of seed temperatures, ^oC
STD	depth array defining ST, m
SUM	sum of all layer moisture contents after one iteration, ratio d.b.
T	temporary value of Ta + ΔTa, ^oC
TAIN	inlet air temperature, ^oC
TEMPA	air temperature at inlet to individual layers, ^oC
TEXP	experimental time, min

TIME	accumulated simulated time, min
TITLE	title array
TLIM	limiting time, min
TMC	target moisture content, ratio d.b.
TOP	temporary variable in heat and mass transfer equations
TP	array of layer temperatures output for plotting, ^{o}C
TW	wet-bulb temperature, ^{o}C
VEL	volume rate of air flow, m/min
WC	depth dependent array of seed moisture contents, ratio d.b.
WCD	depth array defining WC, m
WWT	wet matter weight per layer, kg
X	array of incremental moisture changes in condensation routine search procedure
XVAL	triangular matrix in condensation routine search procedure
Y	array of y values to be minimised in condensation routine search procedure
YY	temporary variables in heat and mass transfer equations

Variables in subroutine WTBULB

A	
ATMOS	atmospheric pressure
B, C, D	numerical constants
DELTA	adjustment to Twb
H	absolute or relative humidity depending on J
IT	do loop parameter
J	= 0 H = relative humidity otherwise H = absolute humidity
P	numerical constant
PSWB	saturation vapour pressure at Twb, N/m^2
PV	vapour pressure, N/m^2

Q, R, S	numerical constants
SHM	saturation vapour pressure at final Twb, N/m^2
SPV	function for saturation vapour pressure - supplied by calling programme
TD	temperature of the dry bulb, ^oC and ^oK
TW	temperature of the wet bulb, ^oC and ^oK

Variables in subroutine INLET

A	proportional time change
B	time in hours
DHR, DHUM, DTEMP	common with main programme
H	interpolated humidity, ratio
NDIN	common with main programme
T	interpolated temperature, ^oC
TM	time in minutes

Variables in Function TERP

A	array of values to be interpolated
B	array of depths
DEPTH	depth for interpolation
DZ	incremental depth
I	do loop index
K	do loop parameter
L	number of layers
N	length of arrays A and B
TERP	interpolated value of A
X	proportional depth change

Variables in Function HTRANS

DP	= 0 Boyce equation used; if + ve = effective particle diameter and GTH equation used
G	= mass flow of air, kg/min m^2
HTRANS	heat transfer coefficient
MU	kinematic viscosity of air
P	pressure, N/m^2 (in Boyce equation only)
T	temperature, ^oC

Variables in Function SATPRE

P	natural logarithm of saturation vapour pressure
SATPRE	saturation vapour pressure, N/m^2
T	temperature, ^oK
TT	temperature, ^oK

Variables in Function SER

A	type real value of N squared
C	value of drying constant, k, min^{-1}
CT	value of $k\theta$
J	do loop index
M	index controlling jump within do loop
N	index for incrementing series
NS	index selecting series; 1 - sphere; 2 = plane sheet
R	value of single term in undifferentiated series
SER	value of ratio S1/S2
S1	value of differentiated series
S2	value of undifferentiated series
T	time, min
X	value of single term in differentiated series

Variables in Function EQRH

EQRH	equilibrium relative humidity, diurnal
K1, K2	constants in Smith equation
K3	natural logarithm of (1-rh)
X	seed moisture content, ratio d.b.

Data input

With the exception of the time-dependent air conditions, data were input from DSET5. The variable air-condition arrays were normally part of a file of experimental observations output by DEEP and were read on DSET8. The DSET5 file had the following form. Each line of variables represents a free-format data line, except in the case of variables WC and ST, which could occupy as many lines as necessary to fill the data space indicated by IM and IT. The programme was terminated by a negative value of DZ.

RHEX, RHMC, CPG

Q(1), Q(2), Q (3), KQ, NS

EMC (1...3)

DP, S

IM, IT

WC (1...IM) IM $\leqslant$ 20

ST (1...IT) IT $\leqslant$ 20

NDIN, PLOT

DZ, DTIME

TITLE

TITLE

RHOG, RHOW, IMC, TMC, IGT, DEPTH

GAIR, VEL, TAIN, HUIN, RHI, AT S

MAX, IPRINT, IP, TLIM, TEXP

The DSET8 file had the following form:

DHR (1), DTEMP (1), DHUM (1)
" " "
" " "
" " "
DHR(NDIN), DTEMP(NDIN), DHUM(NDIN)

Data output

The primary output file, DSET6 was used only for the FORTRAN start and stop messages and error messages if any. It was therefore a small file which was output to public disc storage and could be inspected from a terminal. The main annotated output and the optimal plotting file were output to private disc on DSET9 and DSET29 respectively. DSET29 was an 80 byte line file.

```
C                    SIMULATION OF DEEP BED DRYING                    587
C
C              S.I. UNITS VERSION
C
C  THE FOLLOWING VARIABLES ARE DEFINED
C
C          PROPERTIES OF THE AIR
C       GAIR= MASS RATE OF FLOW PER UNIT AREA
C       VEL= AIR VELOCITY
C       TAIN= INITIAL AIR TEMPERATURE
C       TEMPA=TEMPORARY VALUE OF AIR TEMPERATURE ENTERING LAYER
C       HUIN= INITIAL ABSOLUTE HUMIDITY
C       RHI= INITIAL RELATIVE HUMIDITY
C       HSAT= ABSOLUTE HUMIDITY AT SATURATION
C       HUMT= TRANSIENT ABSOLUTE HUMIDITY WITHIN BED
C       HUM(L)= HUMIDITY OF AIR ENTERING LAYER
C       EXTEMP(L)= TEMPERATURE OF AIR EXHAUSTING FROM LAYER
C       EXHUM(L)=HUMIDITY OF AIR EXHAUSTING FROM LAYER
C       RHL(L)= RELATIVE HUMIDITY WITHIN LAYER L
C       CPA= SPECIFIC HEAT OF DRY AIR
C       CPW= SPECIFIC HEAT OF WATER VAPOUR
C       LA= LATENT HEAT OF WATER VAPOUR
C       CPL= SPECIFIC HEAT OF WATER LIQUID
C       ATMOS=ATMOSPHERIC PRESSURE
C
C          PROPERTIES OF THE SEED OR GRAIN
C       RHOG= BULK DENSITY OF DRY MATTER
C       RHOW= BULK DENSITY OF WET MATERIAL
C       CPG= SPECIFIC HEAT OF DRY MATTER
C       LG= LATENT HEAT OF VAPOURISATION OF MOISTURE WITHIN SEED
C       IMC= INITIAL MOISTURE CONTENT , RATIO DRY BASIS
C       MC(L)= TRANSIENT MOISTURE CONTENT WITHIN LAYER, RATIO DRY BASIS
C       IGT= INITIAL GRAIN TEMPERATURE
C       GT(L)= TRANSIENT GRAIN TEMPERATURE
C       HS= HEAT TRANSFER COEFFICIENT
C       DEPTH= DEPTH OF BED
C       CONST= DRYING CONSTANT
C       ASYMP= ASYMPTOTIC MOISTURE VALUE
C       DP=+VE=EFFECTIVE PARTICLE DIAMETER,METRES
C       AND S=SPECIFIC SURFACE AREA PER METRE (CORRECTED FOR
C       POROSITY)
C       DP=-VE THEN S=MULTIPLIER FOR BOYCE  HEAT TRANSFER EQN.
C
C
C          PARAMETERS
C       DTIME = INCREMENTAL TIME
C       DZ= DEPTH OF THIN LAYER
C       Q(3)=CONSTANTS FOR DETERMINING K
C       TMC= TARGET MOISTURE CONTENT, RATIO DRY BASIS
C       TLIM= TIME LIMIT
C       TEXP= EXPERIMENTAL TIME
C       KQ=1=EXP RELATION FOR K =2= ARRHENIUS RELATION
C       NS=1,2,3=SPHERE,SLAB OR SINGLE EXPONENTIAL
C       EMC=CONSTANTS IN MODIFIED SMITH EQUATION
C       NDIN=0=CONSTANT INLET =+VE=NO INLET OBSERVATIONS
C       LPLOT=0=NO PLOT OUTPUT =+VE=LAYER INTERVAL FOR PLOTTING
C       IF LPLOT=-1 THEN LPLOT=LMAX/12
C       IP=0 - FIRST 10 ITERATIONS NOT PRINTED
C       IM=LENGTH OF INITIAL M.C. ARRAY MC & DEPTHS MCD
C       IT=LENGTH OF INITIAL TEMPERATURE ARRAY ST & DEPTHS STD
        X,Y,XVAL=ARRAYS USED IN MINIMISING SEARCH FOR DM
```

```
589
      COMMON DHR(150),DTEMP(150),DHUM(150),NDIN
      REAL EMC(3),Q(3),TP(14)
      REAL LA,LG,IMC,IGT
      REAL MC(200),GT(200),EXTEMP(200),EXHUM(200),RHL(200)
      REAL WC(20),ST(20),WCD(20(,STD(20)
      REAL X(10),Y(10),XVAL(10,10)
      INTEGER TITLE(30)
      EXTERNAL SATPRE
      DATA CPA/1.005/,CPW/1.88/,CPL/4.187/,LA/2500.8/
C
C     READ MAX EXHAUST RH & RHMC
      READ(5,3) RHEX,RHMC,CPG
C     READ IN VALUES OF CONSTANTS
      READ(5,4) Q,KQ,NS
 4    FORMAT(5G0.0)
      READ(5,3) EMC
      READ (5,521) DP,S
      READ(5,521) IM,IT
      IF(IM.NE.0)READ(5,522)(WC(I),I=1,IM),(WCD(I),I=1,IM)
      IF(IT.NE.0)READ(5,522) (ST(I),I=1,IT),(STD(I),I=1,IT)
 522  FORMAT(10G0.0)
      READ(5,521) NDIN,LPLOT
      IF(NDIN.EQ.0) GO TO 16
      READ(8,3) (DHR(I),DTEMP(I),DHUM(I),I=1,NDIN)
3     FORMAT(3G0.0)
 16   READ(5,521) DZ,DTIME
      IF(DZ) 74,10,10
 521  FORMAT(2G0.0)
   10 READ(5,505) TITLE
 505  FORMAT(15A4/15A4)
      WRITE(9,510) TITLE
 510  FORMAT('1'//5X,'DEEP BED SIMULATION...',15A4//
     129X,15A4///)
C
C     READ INITIAL CONDITIONS. INSERTING A -VE VALUE FOR A COMPLEMENTARY
C     CONDITION WILL CAUSE ITS VALUE TO BE CALCULATED FROM THE COMPLEMEN
      READ(5,515) RHOG,RHOW,IMC,TMC,IGT,DEPTH,GAIR,VEL,TAIN,HUIN,RHI,
     1ATMOS
 515  FORMAT(6G0.0/6G0.0)
C     CONVERT ATMOS TO NEWTONS/SQ.METRE
      ATMOS=ATMOS*100.0
      READ(5,4)MAX,IPRINT,IP,TLIM,TEXP
C
      IF (GAIR.LT.0.0) GAIR=(VEL*ATMOS)/(287*(TAIN+273.2))
      IF (VEL.LT.0.0)VEL=(GAIR*287*(TAIN+273.2))/(ATMOS)
      PVS=SATPRE(TAIN)
       IF (HUIN.LT.0.0) GO TO 11
   12 IF(RHI.LT.0.0) GO TO 13
   14 IF (RHOG.LT.0.0) RHOG= RHOW/(1+IMC)
      IF (RHOW.LT.0.0)  RHOW=RHOG*(1+IMC)
C     MAX. DRYING RATE ESTIMATED FROM WET BULB HUMIDITY
      CALL WTBULB(TAIN,TW,HUIN,1,ATMOS,HSAT,SATPRE)
      RMAX=HSAT-HUIN
      GO TO 15
   11 PV= (RHI*0.01)* PVS
      HUIN=(0.622*PV)/(ATMOS-PV)
      GO TO 12
   13 PV= (HUIN*ATMOS)/(0.622+HUIN)
      RHI= PV/(PVS*0.01)
      GO TO 14
C
```

```
C
C       CALCULATE NO OF LAYERS AND AMENDED LAYER DEPTH
C       START OF COMPUTATIONS FOR ONE VALUE OF INCREMENTAL DEPTH & TIME
C
   15 DIV=DEPTH/DZ
      LMAX=IFIX(DIV+0.5)
      IF (LMAX.GT.200) GO TO 17
      DZ=DEPTH/LMAX
      IF(LPLOT.EQ.-1)LPLOT=LMAX/12
      IPLOT=IFIX(TEXP/(DTIME*100.0))
C
C       CALCULATE DRY AND WET WEIGHT IN THE LAYER
C
        DWT= RHOG*DZ
        WWT= RHOW*DZ
        RGTIME=RHOG/DTIME
        GATIME=GAIR*DTIME
        IMC=IMC*100.0
        TMC=TMC*100.0
C
C
        WRITE(9,530)IMC,TAIN,TMC,HUIN,RHOG,RHI,RHOW,GAIR,IGT,
     1VEL,DEPTH,TW,HSAT
  530 FORMAT('0','SEED',46X,'AIR'//' MOISTURE CONTENT %D.B. INITIAL',F10
     1.5,9X,'TEMPERATURE, DEG.C.',12X,F10.2/24X,'TARGET ',F10.5,9X,'HUMI
     2DITY,  KG/KG',16X,F10.5/' BULK DENSITY DRY,  KG/CU.M.    ',F10.2,9X
     3,'RELATIVE HUMIDITY %',12X,F10.2/13X,' WET,  KG/CU.M.    ',F10.2,9X
     4,'MASS FLOW, KG/MIN/SQ.M. ',7X,F10.4/' TEMPERATURE, DEG.C.',11X,F1
     50.2,9X,'VELOCITY, M/MIN. ',13X,F10.3/' DEPTH, M. ',20X,F10.2,
     69X,'WET BULB TEMPERATURE, DEG.C.',F8.2/
     750X,'HUMIDITY AT WET BULB, KG/KG',F12.5//)
        IF(DP.GT.0.0) WRITE(9,88) DP,S
   88   FORMAT(' ',' ','EFFECTIVE PARTICLE',
     1'DIAMETER, METRES',15X,F10.6/
     2'SURFACE AREA, SQ.METRES',6X,F12.2//)
        IF(DP.LT.0.0) WRITE(9,99) S
   99   FORMAT(' ','SURFACE AREA IN RELATION TO BARLEY X',F10.2//)
        WRITE(9,531)DTIME,DZ,MAX,LMAX,IPRINT,DWT,WWT
  531 FORMAT(' RUN PARAMETERS'//' TIME INCREMENT,MIN.',11X,F10.2,9X,'DEP
     1TH INCREMENT,M. ',12X,F10.5//' MAX. NO OF ITERATIONS.',8X,I10,8X,'
     2 NUMBER OF LAYERS',15X,I10/' PRINTING INTERVAL',13X,I10,9X,'WEIGHT
     3/LAYER, KG, DRY',10X,F10.4/68X,'WET',10X,F10.4/////)
        WRITE(9,7) Q,KQ,NS,EMC,NDIN,LPLOT
   7    FORMAT('0','ARRAY Q=  ',3(E12.4,5X),'KQ=',I3,'  NS=',I3/
     1'ARRAY EMC=  ',3(E12.4,5X)/'LENGTH OF INLET ARRAY=',I4/
     2'LAYER INTERVAL FOR PLOTTING OUTPUT=',I4/
     3////)
C
C       CALCULATE INTERSTITIAL HUMIDITY
C
        IMC=IMC*0.01
        REL=EQRH(IMC)
        PVS=SATPRE(IGT)
        PV=(REL*0.01)*PVS
        HUMT=(0.622*PV)/(ATMOS-PV)
C
```

```
C
C       INITIALISE LAYERS
C
        DO 20 L=1,LMAX
        RHL(L)=REL
        MC(L)=IMC
        GT(L)=IGT
        IF(IM.EQ.0) GO TO 20
        MC(L)=TERP(WC,WCD,IM,DZ,L)
        RHL(L)=EQRH(MC(L))
 20     IF(IT.NE.0) GT(L)=TERP(ST,STD,IT,DZ,L)
C
C       SET COUNTERS FOR PRINT COMMANDS AND DRYING TIME
C
        MCOUNT=0
        TIME=0.0
        IND=0.0
        IPL=0
C
C       LOOP TO ITERATE IN TIME
C
        DO 25 M=1,MAX
        TIME=TIME+DTIME
        IF(NDIN.EQ.0) GO TO 5
        CALL INLET(TIME,TAIN,HUIN)
        PVS=SATPRE(TAIN)
        PV=(HUIN*ATMOS)/(0.622+HUIN)
        RHI=PV/(PVS*0.01)
        CALL WTBULB(TAIN,TW,HUIN,1,ATMOS,HSAT,SATPRE)
        RMAX=HSAT-HUIN
 5      MCOUNT=MCOUNT + 1
        IPL=IPL+1
        TEMPA=TAIN
        HUMT=HUIN
        IF(M.GT.10) GO TO 30
        IF(IP.EQ.0) GO TO 30
C
C       THE FIRST 10 ITERATIONS ARE PRINTED OUT
C
 35     WRITE(9,535) M,TIME
  535 FORMAT(' '///1X,' LAYER CONDITIONS IN ITERATION',I7,5X,'DRYING TIM
     1F=',F10.1,' MINUTES'//1X,'LAYER NO.',10X,'SEED',17X,'EXHAUST AIR',
     215X,'DRYING RATE'/11X,'M.C.%D.B. TEMP DEGC TEMP DEGC ',
     3'HUMIDITY    R.H.      KG/KG      %RMAX'/)
C
C       J = PARAMETER CONTROLLING PRINT COMMAND WITHIN LAYER ITERATION
C
        J=1
        GO TO 45
C       SUSEQUENT PRINTS OF THE ITERATIONS ARE CONTROLLEDBY IPRINT
    30  IF(MCOUNT.NE.IPRINT) GO TO 40
        MCOUNT=0
        GO TO 35
    40  J=0
    45  KZ=0
C
```

```
C
C       LOOP TO ITERATE THE LAYERS
C
        DO 58 L=1,LMAX
        IF(KQ.EQ.1) GO TO 22
        CONST=Q(1)*EXP(Q(2)/(TEMPA+273))
        GO TO 23
C       IF Q(3)=0 EQUATION FOR K INDEPENDENT OF HUMIDITY
 22     CONST=Q(2)*TEMPA  - Q(3)*HUMT
        CONST=Q(1) * EXP(CONST)
 23     RH=RHI*0.01
        IF(L.NE.1) RH=RHL(L-1)*0.01
C       IF EMC(3)=0 EQUATION FOR ME INDEPENDENT OF TEMPERATURE
        IF(RH.GT.RHMC) RH=RHMC
        ASYMP=EMC(1) -EMC(2)*ALOG(1.0-RH) -EMC(3)*ALOG(TEMPA)
        ASER=SER(CONST,TIME,NS)*DTIME*CONST
        DM=-ASER*(MC(L)-ASYMP)/(1+ASER*0.5)
C
C       DM -VE FOR DRYING AND +VE FOR WETTING
C
C       SET COUNTER FOR SATURATION LOOP
        IRH=0
    53  A= 2*(TEMPA - GT(L))
        R=CPG+CPL*MC(L)
        F=CPW*TEMPA+LA-GT(L)*CPL
        HS=S*HTRANS(DP,GAIR,TEMPA,ATMOS)
        LG=LA*(1+(23.0*EXP(-40.0*MC(L))))
        YY=CPA*TEMPA+LG-CPL*GT(L)
C       CONDENSATION ROUTINE RETURNS TO THIS POINT
 153    F=CPA+CPW*(HUMT-(DM*DWT/GATIME))
        GRE=GAIR*E
        TOP=RGTIME*DM
        TOP=A+(TOP*((2*YY/HS)+(F*DZ/GRE)))
        BB=B+CPL*DM
        BOTTOM=1.0+(RGTIME*(2*B/HS+DZ*BB/GRE))
        DTG= TOP/BOTTOM
        DTA=-(DWT/(GATIME*E))*((DTG*BB)-(DM*F))
        T=TEMPA+DTA
        P=SATPRE(T)
        H=HUMT-(DM*DWT/GATIME)
        PS=(H*ATMOS)/(0.622+H)
        RHL(L)=(PS/P)*100.0
C
        IF( RH.NE.0) GO TO 46
C
        IF(RHL(L)-RHEX)47,47,48
C
 48     IF(IND.EQ.0) LSAT=L
C
C       SEARCH FOR VALUE OF DM GIVING RHEX
C
 46     DIS=RHEX-RHL(L)
        IF(ABS(DIS).LE.0.1) GO TO 47
        IF(IRH.NE.0) GO TO 311
C
C       EVALUATE 2ND ESTIMATE OF DM BASED ON RHEX RH
C       AT OVERSHOOT TEMPERATURE
        X(1)=DM
        Y(1)=DIS
        P=P*RHEX*0.01
        SH=(0.622*P)/(ATMOS-P)
        DM=(HUMT-SH)*GATIME/DWT
        IRH=1
        GO TO 153
```

```
C
 311  IRH=IRH+1
      IF(IRH.EQ.11) GO TO 320
C
C     INSERT CURRENT DIS IN ASCENDING ORDER
C
      DO 313 I=2,IRH
      IF(DIS.GT.Y(I-1)) GO TO 313
      KV=IRH-I+1
C
C     MOVE ALL ARRAY ELEMENTS DOWN
C
      DO 317 K=1,KV
      IK=IRH-K
      IX=IK+1
      Y(IX)=Y(IK)
 317  X(IX)=X(IK)
C
C     INSERT NEW VALUE IN CORRECT POSITION
      Y(I-1)=DIS
      X(I-1)=DM
      GO TO 316
C
 313  CONTINUE
      Y(IRH)=DIS
      X(IRH)=DM
C
C     INDEX ARRAY XVAL
 316  DO 318 I=1,IRH
 318  XVAL(I,1)=X(I)
C
      DO 319 K=2,IRH
      DO 319 I=K,IRH
 319  XVAL(I,K)=(XVAL(K-1,K-1)*Y(I)-XVAL(I,K-1)*Y(K-1))
     1/(Y(I)-Y(K-1))
C
C     SET DM TO NEW ESTIMATE
      DM=XVAL(IRH,IRH)
      GO TO 153
C
 320  WRITE(9,321)DM,RHL(L),X,Y
 321  FORMAT('0','****CONDENSATION LOOP FAILED TO',
     1' CONVERGE**'/'DM=',F10.6,10X,'RH=',F8.2/
     210F10.6/10F10.4/)
C
  47 GT(L)=GT(L)+DTG
     TEMPA = TEMPA + DTA
     EXTEMP(L)=TEMPA
     MC(L) = MC(L) +DM
     HUMT=H
     EXHUM(L)=HUMT
     RATE= HUMT - HUIN
     IF(RATE.LT.0.00001) KZ=L
C
```

```
C       CHECK FOR TEMPERATURE OVERSHOOT
C
        IF ((GT(L) - TEMPA).LT.20) GO TO 54
        WRITE(9,540)TEMPA,GT(L),L,M
  540 FORMAT('0','*** AIR TEMPERATURE (',F6.1,') >20 DEG BELOW GRAIN (',
     1F6.1,') IN LAYER ',I5,' AT ITERATION ',I5/)
   54 RAP=RMAX-RATE
        RAQ = RATE/(RMAX*0.01)
        IF(J.NE.1) GOTO 58
        PMC=MC(L)*100.0
        WRITE(9,555)L,PMC,GT(L),TEMPA,HUMT,RHL(L),RATE,RAQ
  555   FORMAT(' ',I6,3F10.3,F10.5,F10.2,F10.5,F10.2)
C
   58 CONTINUE
C
C       CHECK FOR BASE OF DRYING ZONE
C
        IF(KZ.EQ.0.OR.IND.EQ.1.OR.IRH.EQ.0) GO TO 59
        DZONE=(LSAT-KZ)*DZ
        SPEED= DZONE/TIME
        WRITE(9,556) M,TIME,SPEED,DZONE
  556 FORMAT('0',//'***COMPLETE DRYING ZONE FORMED AT ITERATION',I7/1X,'
     1TIME=',F10.2,' MINUTES   SPEED=',F10.5,'M/MIN    DEPTH=',F10.5,'M
     2.')
        IND=1
C
C       CALCULATE AVERAGE MOISTURE CONTENT IN THE BED
C
   59 SUM=0.0
        DO 60 L=1,LMAX
   60 SUM=SUM +MC(L)
        AV=(SUM*100.0)/LMAX
C
C       CHECK MOISTURE CONTENT AGAINST TMC. IF REACHED JUMP OUT OF LOOP
C
        IF ((AV-TMC).LE.0.0) GO TO 65
C
C       CHECK COMPUTED TIME AGAINST TIME LIMIT
C
        IF(TIME.GE.TLIM) GO TO 76
        IF(J.NE.1) GO TO 255
        WRITE(9,561) AV
  561   FORMAT('0','MEAN MOISTURE CONTENT=',F10.4,'% D.B.')
  255   IF(LPLOT.EQ.0.OR.IPL.NE.IPLOT) GO TO 25
        IPL=0
        TP(1)=TIME/60.0
        TP(2)=TAIN
        DO 19 I=1,12
        JP=I*LPLOT
        TP(I+2)=EXTEMP(LMAX)
   19   IF(JP.LE.LMAX) TP(I+2)=EXTEMP(JP)
        WRITE(29,21) TP,AV
   21   FORMAT(' ',8F8.2/16X,7F8.2)
   25 CONTINUE
C
        GO TO 73
   76   WRITE(9,583)
  583 FORMAT('0','***LIMITING TIME EXCEEDED     ')
        GO TO 73
C
```

```
C       CHECK TIME AT WHICH TMC WAS REACHED
C
 65     WRITE(9,570) M,TIME,TEXP
  570 FORMAT('0','***TARGET MOISTURE REACHED***'/1X,'ITERATION=',I7,3X,
     1'TIME=',F10.2,' MINUTES'/1X,'EXPERIMENTAL TIME WAS ',F10.2,
     2' MINUTES')
 73     WRITE(9,581)
  581 FORMAT('0',30X,'**FINAL LAYER CONDITIONS'/1X,'LAYER NO.',10X,'SEED
     1',17X,'EXHAUST AIR'/11X,'M.C. D.B. TEMP DEGC TEMP DEGC HUMIDITY
     2 R.H.')
        DO 56 L=1,LMAX
 56     MC(L)=MC(L)*100.0
        WRITE(9,582)(L,MC(L),GT(L),EXTEMP(L),EXHUM(L),RHL(L),L=1,LMAX)
  582 FORMAT(1X,I6,F10.6,F10.3,F10.3,F10.5,F10.2)
C
C
        WRITE(9,561) AV
C
        TMC=TMC*0.01
        GO TO 16
 17     WRITE(9,18) LMAX
 18     FORMAT('0','***',I4,' LAYERS REQUIRED ')
        GO TO 16
 74     CALL EXIT(5)
        STOP
        END
```

```
      REAL FUNCTION EQRH(X)
C
C     FUNCTION TO CALCULATE INITIAL RELATIVE HUMIDITY WITHIN LAYER BASED
C     ON EQUILIBRIUM MOISTURE CURVE DESCRIBED BY THE SMITH EQUATION
C     CONSTANTS DERIVED FOR WHEAT FROM DATA OF YOUNG & NELSON
      REAL K1,K2,K3
      DATA K1/0.081411/,K2/0.071931/
      K3=(K1-X)/K2
      IF(X.LE.K1) K3=1.0
      EQRH=1.0 - EXP(K3)
      RETURN
      END
      REAL FUNCTION SER(C,T,NS)
      IF(NS.EQ.3) GO TO 30
      S1=0.0
      S2=0.0
      M=0
C
      CT=-(C*T)
      IF(CT.LT.-3) GO TO 30
      DO 10 J=1,150
      IF(NS.EQ.1) N=J
      IF(NS.EQ.2) N=(J*2)-1
      A=FLOAT(N**2)
      X=CT*A
      IF(X.LT.-100)GO TO 20
      X=EXP(X)
      S1=S1+X
      IF(X.LT.0.000001) GO TO 20
      IF(M.EQ.1) GO TO 10
      R=X/A
      S2=S2+R
      IF(R.LT.0.000001)  M=1
   10 CONTINUE
   20 SER=S1/S2
C
      GO TO 12
   30 SER=1.0
   12 RETURN
      END

       REAL FUNCTION SATPRE(TT)
C     CALCULATES SATURATED VAPOUR PRESSURE IN NEWTONS/SQ.METRE
      T=TT + 273.2
      P=72.73974-8.2*ALOG(T)+0.0057113*T-7235.4261/T
      SATPRE = EXP(P)*100.0
      RETURN
      END
C
      FUNCTION HTRANS(DP,G,T,P)
C     CALCULATES HEAT TRANSFER COEFFICIENT OF GAMSON,THODOS
C     AND HOUGEN(DP=+VE) OR OF BOYCE(DP=-VE)
C
       REAL MU
      IF(DP.LT.0.0) GO TO 1
      MU=0.0006*(1.72+T*0.00463)
      HTRANS=1.35636*(G**0.59)*((MU/DP)**0.41)
      GO TO 2
C
 1    HTRANS=4286.5*((G*(T+273)/P)**0.6011)
 2    RETURN
      END
```

```
C
      SUBROUTINE WTBULB(TD, TW, H, J, ATMOS, SHM, SPV)
C
C     ITERATIVE SOLUTION OF THE EQUATION OF THE WET BULB LINE
C     TO FIND WET BULB TEMPERATURE AND ABSOLUTE HUMIDITY
C     AT SATURATION.
C
      DATA P/1947.6664/, Q/2.473435/, R/1.473435/, S/101350.0/
      DATA B/0.0057113/, C/-7235.426/, D/-8.8/
C
C     VAPOUR PRESSURE CALCULATED FROM ABSOLUTE HUMIDITY
C     OR R.H.  (J=0 IF H=R.H.)
C
      PV=ATMOS*H/(0.622+H)
      IF(J.EQ.0) PV=H*SPV(TD)
C
C     USE TD AS STARTING VALUE, DEGREES K
C
      TD=TD + 273.0
      TW=TD
C
      DO 1 IT=1,10
      PSWB=SPV(TW-273.0)
      A=TD+P-Q*TW
      DELTA=PSWB*A + TW*(R*PV+S) - P*PV - S*TD
      DELTA=DELTA/(PSWB*(-Q+A*(B-C/(TW*TW)+D/TW))+R*PV+S)
      TW=TW-DELTA
      IF(ABS(DELTA).LT.0.005) GO TO 2
 1    CONTINUE
C
      WRITE(9,12)
 12   FORMAT(' ','***TOO MANY ITERATIONS IN WTBULB***')
 2    TW=TW-273.0
      TD=TD-273.0
      SHM=SPV(TW)
      SHM=0.622*SHM/(ATMOS-SHM)
      RETURN
      END
```

```
      FUNCTION TERP(A, B, N, DZ, L)
C     TERP=INTERPOLATED VALUE OF ARRAY A AT DEPTH=DZ*L-DZ*0.5
      REAL A(20), B(20)
      DEPTH=(DZ*L)-(DZ*0.5)
      TERP=A(1)
      IF(DEPTH.LE.B(1)) GO TO 1
      K=N-1
      DO 2 I=1,K
      IF(DEPTH.GE.B(I).AND.DEPTH.LT.B(I+1)) GO TO 3
2     CONTINUE
      TERP=A(N)
      GO TO 1
3     X=(DEPTH-B(I))/(B(I+1)-B(I))
      TERP=A(I) + (A(I+1)-A(I))*X
1     RETURN
      END
```

```
      SUBROUTINE INLET(TM, T, H)
      COMMON DHR(150), DTEMP(150), DHUM(150), NDIN
      B=TM/60.0
      T=DTEMP(1)
      H=DHUM(1)
      IF(B.LE.DHR(1)) GO TO 3
      N=NDIN-1
      DO 1 I=1,N
      IF(B.GE.DHR(I).AND.B.LT.DHR(I+1)) GO TO 2
1     CONTINUE
      T=DTEMP(NDIN)
      H=DHUM(NDIN)
      GO TO 3
2     A=(B-DHR(I))/(DHR(I+1)-DHR(I))
      T=DTEMP(I) + (DTEMP(I+1)-DTEMP(I))*A
      H=DHUM(I) + (DHUM(I+1)-DHUM(I))*A
3     RETURN
      END
/*F
```

Example output from parallel-flow simulation - Run 1.

DEEP BED SIMULATION...RUN 1 10:7:70

SABRINA 32 DEGREES C.

SEED

MOISTURE CONTENT %D.B.	INITIAL	81.99998
	TARGET	9.32000
BULK DENSITY DRY, KG/CU.M.		218.02
WET, KG/CU.M.		396.80
TEMPERATURE, DEG.C.		20.00
DEPTH, M.		0.61

AIR

TEMPERATURE, DEG.C.	32.50
HUMIDITY, KG/KG	0.00900
RELATIVE HUMIDITY %	29.49
MASS FLOW, KG/MIN/SQ.M.	14.0396
VELOCITY, M/MIN.	12.200
WET BULB TEMPERATURE, DEG.C.	19.61
HUMIDITY AT WET BULB, KG/KG	0.01436

SURFACE AREA IN RELATION TO BARLEY X 5.00

RUN PARAMETERS

TIME INCREMENT,MIN.	5.00	DEPTH INCREMENT,M.	0.01968
MAX. NO OF ITERATIONS.	1000	NUMBER OF LAYERS	31
PRINTING INTERVAL	126	WEIGHT/LAYER, KG, DRY	4.2201
		WET	7.3030

ARRAY Q= 0.1663E-03 0.8302E-01 0.4643E 02 KQ= 1 NS= 2
ARRAY EMC= 0.5355E-01 0.1317E 00 0.3312E-02
LENGTH OF INLET ARRAY= 0
LAYER INTERVAL FOR PLOTTING OUTPUT= 0

LAYER CONDITIONS IN ITERATION 126 DRYING TIME= 630.0 MINUTES

LAYER NO.	SEED M.C.%D.B.	SEED TEMP DEGC	EXHAUST AIR TEMP DEGC	EXHAUST AIR HUMIDITY	EXHAUST AIR R.H.	DRYING RATE KG/KG	DRYING RATE %RMAX
1	30.180	32.306	32.232	0.00911	30.31	0.00011	2.10
2	32.037	32.030	31.952	0.00923	31.19	0.00023	4.30
3	33.775	31.744	31.661	0.00935	32.11	0.00035	6.57
4	35.447	31.449	31.363	0.00948	33.09	0.00048	8.91
5	37.099	31.146	31.058	0.00961	34.12	0.00061	11.29
6	39.023	30.836	30.744	0.00974	35.20	0.00074	13.73
7	40.448	30.522	30.429	0.00987	36.32	0.00037	16.19
8	42.105	30.204	30.109	0.01000	37.48	0.00100	18.63
9	43.467	29.884	29.788	0.01014	38.68	0.00114	21.17
10	44.917	29.564	29.467	0.01027	39.91	0.00127	23.67
11	46.273	29.244	29.147	0.01040	41.18	0.00140	26.15
12	47.630	28.924	28.827	0.01054	42.47	0.00154	28.63
13	48.941	28.606	28.509	0.01067	43.80	0.00167	31.10
14	50.210	28.290	28.193	0.01080	45.15	0.00180	33.54
15	51.451	27.976	27.879	0.01093	46.52	0.00193	35.96
16	52.682	27.665	27.569	0.01106	47.92	0.00206	38.36
17	53.846	27.357	27.261	0.01118	49.34	0.00218	40.74
18	54.982	27.052	26.957	0.01131	50.78	0.00231	43.03
19	56.080	26.751	26.657	0.01143	52.24	0.00243	45.39
20	57.188	26.454	26.361	0.01156	53.72	0.00256	47.67
21	58.227	26.161	26.068	0.01168	55.22	0.00268	49.92
22	59.271	25.872	25.780	0.01180	56.73	0.00280	52.13
23	60.275	25.587	25.497	0.01191	58.25	0.00291	54.30
24	61.255	25.306	25.217	0.01203	59.78	0.00303	56.45
25	62.232	25.030	24.942	0.01214	61.33	0.00314	58.55
26	63.176	24.758	24.672	0.01225	62.89	0.00325	60.62
27	64.114	24.491	24.405	0.01236	64.45	0.00336	62.66
28	65.018	24.228	24.144	0.01247	66.03	0.00347	64.66
29	65.910	23.970	23.887	0.01257	67.61	0.00357	66.62
30	66.797	23.716	23.634	0.01268	69.20	0.00368	68.54
31	67.655	23.467	23.384	0.01278	70.79	0.00378	70.43

MEAN MOISTURE CONTENT= 51.34558% D.B.

LAYER CONDITIONS IN ITERATION 252 DRYING TIME= 1260.0 MINUTES

LAYER NO.	SEED M.C.%D.B.	SEED TEMP DEGC	EXHAUST AIR TEMP DEGC	EXHAUST AIR HUMIDITY	EXHAUST AIR R.H.	DRYING RATE KG/KG	DRYING RATE %RMAX
1	15.632	32.429	32.404	0.00904	29.78	0.00004	0.76
2	16.512	32.327	32.299	0.00908	30.10	0.00008	1.58
3	17.386	32.217	32.185	0.00913	30.45	0.00013	2.47
4	18.273	32.098	32.064	0.00918	30.83	0.00018	3.42
5	19.189	31.971	31.934	0.00924	31.24	0.00024	4.44
6	20.250	31.835	31.795	0.00930	31.68	0.00030	5.52
7	21.155	31.692	31.649	0.00936	32.15	0.00036	6.66
8	22.189	31.540	31.494	0.00942	32.66	0.00042	7.87
9	23.138	31.382	31.333	0.00949	33.19	0.00049	9.12
10	24.156	31.216	31.165	0.00956	33.75	0.00056	10.43
11	25.168	31.044	30.991	0.00963	34.34	0.00063	11.79
12	26.207	30.865	30.810	0.00971	34.97	0.00071	13.20
13	27.257	30.680	30.623	0.00979	35.62	0.00079	14.65
14	28.316	30.490	30.430	0.00987	36.31	0.00087	16.15
15	29.388	30.294	30.233	0.00995	37.02	0.00095	17.69
16	30.480	30.093	30.030	0.01003	37.77	0.00103	19.26
17	31.562	29.887	29.823	0.01012	38.54	0.00112	20.87
18	32.652	29.677	29.611	0.01021	39.35	0.00121	22.51
19	33.742	29.463	29.396	0.01030	40.18	0.00130	24.17
20	34.354	29.246	29.178	0.01039	41.04	0.00139	25.87
21	35.948	29.026	28.956	0.01048	41.93	0.00148	27.58
22	37.057	28.803	28.732	0.01057	42.85	0.00157	29.31
23	38.160	28.577	28.505	0.01067	43.80	0.00167	31.06
24	39.260	28.350	28.277	0.01076	44.77	0.00176	32.83
25	40.369	28.120	28.047	0.01086	45.77	0.00186	34.60
26	41.470	27.890	27.816	0.01095	46.79	0.00195	36.33
27	42.575	27.658	27.584	0.01105	47.84	0.00205	38.17
28	43.668	27.425	27.351	0.01114	48.91	0.00214	39.97
29	44.761	27.192	27.117	0.01124	50.00	0.00224	41.76
30	45.856	26.959	26.884	0.01134	51.12	0.00234	43.56
31	46.940	26.726	26.650	0.01143	52.26	0.00243	45.36

MEAN MOISTURE CONTENT= 30.7603% D.B.

LAYER CONDITIONS IN ITERATION 378 DRYING TIME= 1890.0 MINUTES

LAYER NO.	SEED		EXHAUST AIR			DRYING RATE	
	M.C.%D.B.	TEMP DEGC	TEMP DEGC	HUMIDITY	R.H.	KG/KG	%RMAX
1	10.398	32.472	32.465	0.00901	29.59	0.00001	0.27
2	10.756	32.435	32.427	0.00903	29.71	0.00003	0.57
3	11.120	32.394	32.384	0.00905	29.84	0.00005	0.91
4	11.497	32.349	32.338	0.00907	29.98	0.00007	1.27
5	11.895	32.300	32.288	0.00909	30.14	0.00009	1.66
6	12.357	32.246	32.232	0.00911	30.31	0.00011	2.10
7	12.773	32.189	32.173	0.00914	30.49	0.00014	2.56
8	13.250	32.126	32.109	0.00916	30.69	0.00016	3.06
9	13.707	32.059	32.040	0.00919	30.90	0.00019	3.60
10	14.205	31.988	31.967	0.00922	31.13	0.00022	4.17
11	14.714	31.912	31.889	0.00926	31.38	0.00026	4.77
12	15.249	31.831	31.807	0.00929	31.64	0.00029	5.42
13	15.804	31.745	31.719	0.00933	31.92	0.00033	6.10
14	16.379	31.654	31.627	0.00937	32.22	0.00037	6.82
15	16.977	31.559	31.529	0.00941	32.54	0.00041	7.58
16	17.601	31.458	31.427	0.00945	32.88	0.00045	8.38
17	18.239	31.352	31.319	0.00949	33.23	0.00049	9.22
18	18.899	31.241	31.206	0.00954	33.61	0.00054	10.09
19	19.578	31.125	31.089	0.00959	34.01	0.00059	11.01
20	20.286	31.004	30.966	0.00964	34.43	0.00064	11.96
21	21.005	30.878	30.838	0.00969	34.87	0.00069	12.95
22	21.751	30.747	30.705	0.00975	35.33	0.00075	13.99
23	22.514	30.611	30.568	0.00981	35.81	0.00081	15.05
24	23.296	30.470	30.425	0.00987	36.32	0.00087	16.16
25	24.102	30.325	30.278	0.00993	36.85	0.00093	17.30
26	24.923	30.175	30.126	0.00999	37.40	0.00099	18.47
27	25.767	30.020	29.970	0.01006	37.98	0.00106	19.68
28	26.624	29.861	29.810	0.01012	38.58	0.00112	20.93
29	27.500	29.698	29.645	0.01019	39.21	0.00119	22.20
30	28.396	29.531	29.476	0.01026	39.86	0.00126	23.51
31	29.305	29.359	29.303	0.01033	40.53	0.00133	24.84

MEAN MOISTURE CONTENT= 18.41[illegible]% D.B.

Run 1 (contd.)

LAYER CONDITIONS IN ITERATION 504 DRYING TIME= 2520.0 MINUTES

LAYER NO.	SEED M.C.%D.B.	SEED TEMP DEGC	EXHAUST AIR TEMP DEGC	EXHAUST AIR HUMIDITY	EXHAUST AIR R.H.	DRYING RATE KG/KG	DRYING RATE %RMAX
1	8.515	32.489	32.488	0.00901	29.53	0.00001	0.10
2	8.654	32.475	32.474	0.00901	29.57	0.00001	0.21
3	8.797	32.460	32.458	0.00902	29.62	0.00002	0.33
4	8.946	32.443	32.441	0.00902	29.67	0.00002	0.46
5	9.105	32.425	32.422	0.00903	29.73	0.00003	0.61
6	9.290	32.404	32.401	0.00904	29.79	0.00004	0.78
7	9.462	32.382	32.378	0.00905	29.86	0.00005	0.96
8	9.657	32.358	32.353	0.00906	29.94	0.00006	1.15
9	9.850	32.331	32.326	0.00907	30.02	0.00007	1.36
10	10.060	32.303	32.297	0.00909	30.11	0.00009	1.59
11	10.278	32.273	32.266	0.00910	30.20	0.00010	1.83
12	10.510	32.240	32.232	0.00911	30.31	0.00011	2.09
13	10.755	32.204	32.196	0.00913	30.42	0.00013	2.38
14	11.011	32.166	32.157	0.00914	30.54	0.00014	2.68
15	11.281	32.126	32.116	0.00916	30.67	0.00016	3.00
16	11.567	32.083	32.071	0.00918	30.81	0.00018	3.35
17	11.864	32.037	32.024	0.00920	30.95	0.00020	3.71
18	12.176	31.988	31.974	0.00922	31.11	0.00022	4.11
19	12.503	31.936	31.921	0.00924	31.28	0.00024	4.52
20	12.843	31.880	31.864	0.00927	31.46	0.00027	4.96
21	13.206	31.822	31.805	0.00929	31.65	0.00029	5.42
22	13.584	31.760	31.742	0.00932	31.85	0.00032	5.92
23	13.978	31.695	31.675	0.00935	32.06	0.00035	6.43
24	14.396	31.624	31.605	0.00937	32.29	0.00037	6.98
25	14.816	31.553	31.531	0.00941	32.53	0.00041	7.55
26	15.264	31.477	31.453	0.00944	32.79	0.00044	8.16
27	15.731	31.397	31.372	0.00947	33.06	0.00047	8.79
28	16.215	31.313	31.286	0.00951	33.34	0.00051	9.45
29	16.721	31.225	31.197	0.00954	33.64	0.00054	10.15
30	17.248	31.133	31.103	0.00958	33.95	0.00058	10.87
31	17.793	31.037	31.006	0.00962	34.28	0.00062	11.63

MEAN MOISTURE CONTENT= 12.13133% D.B.

LAYER CONDITIONS IN ITERATION 630 DRYING TIME= 3150.0 MINUTES

LAYER NO.	SEED		EXHAUST AIR			DRYING RATE	
	M.C.%D.B.	TEMP DEGC	TEMP DEGC	HUMIDITY	R.H.	KG/KG	%RMAX
1	7.837	32.496	32.496	0.00900	29.50	0.00000	0.04
2	7.890	32.491	32.490	0.00900	29.52	0.00000	0.07
3	7.945	32.485	32.485	0.00901	29.54	0.00001	0.12
4	8.003	32.479	32.478	0.00901	29.56	0.00001	0.17
5	8.065	32.472	32.471	0.00901	29.58	0.00001	0.22
6	8.137	32.464	32.464	0.00902	29.60	0.00002	0.29
7	8.204	32.456	32.455	0.00902	29.63	0.00002	0.35
8	8.281	32.447	32.446	0.00902	29.65	0.00002	0.43
9	8.353	32.437	32.435	0.00903	29.69	0.00003	0.51
10	8.442	32.426	32.424	0.00903	29.72	0.00003	0.59
11	8.530	32.414	32.412	0.00904	29.76	0.00004	0.69
12	8.624	32.401	32.399	0.00904	29.80	0.00004	0.79
13	8.723	32.387	32.385	0.00905	29.84	0.00005	0.90
14	8.828	32.372	32.370	0.00905	29.89	0.00005	1.02
15	8.940	32.356	32.353	0.00906	29.94	0.00006	1.15
16	9.058	32.338	32.335	0.00907	29.99	0.00007	1.28
17	9.183	32.320	32.316	0.00908	30.05	0.00008	1.43
18	9.315	32.300	32.296	0.00909	30.11	0.00009	1.59
19	9.454	32.278	32.274	0.00909	30.18	0.00009	1.76
20	9.602	32.256	32.251	0.00910	30.25	0.00010	1.94
21	9.757	32.231	32.226	0.00911	30.33	0.00011	2.14
22	9.921	32.205	32.199	0.00913	30.41	0.00013	2.34
23	10.094	32.177	32.171	0.00914	30.50	0.00014	2.56
24	10.277	32.148	32.141	0.00915	30.59	0.00015	2.80
25	10.470	32.116	32.109	0.00916	30.69	0.00016	3.05
26	10.673	32.083	32.075	0.00918	30.79	0.00018	3.31
27	10.887	32.048	32.039	0.00919	30.91	0.00019	3.60
28	11.113	32.010	32.000	0.00921	31.03	0.00021	3.89
29	11.350	31.970	31.960	0.00923	31.15	0.00023	4.21
30	11.600	31.928	31.917	0.00924	31.29	0.00024	4.54
31	11.862	31.884	31.871	0.00926	31.43	0.00026	4.90

MEAN MOISTURE CONTENT= 9.3362% D.B.

TARGET MOISTURE REACHED
ITERATION= 632 TIME= 3160.00 MINUTES
EXPERIMENTAL TIME WAS 3150.00 MINUTES

LAYER NO.	SEED	**FINAL LAYER CONDITIONS		
			EXHAUST AIR	
	M.C. D.B.	TEMP DEGC	TEMP DEGC	HUMIDITY R.H.
1	7.831240	32.496	32.496	0.00900 29.50
2	7.883494	32.491	32.491	0.00900 29.52
3	7.937538	32.485	32.485	0.00901 29.54
4	7.994533	32.479	32.479	0.00901 29.55
5	8.055425	32.472	32.472	0.00901 29.58
6	8.120109	32.465	32.464	0.00902 29.60
7	8.192545	32.456	32.456	0.00902 29.62
8	8.268505	32.447	32.446	0.00902 29.65
9	8.344000	32.437	32.436	0.00903 29.68
10	8.426725	32.427	32.425	0.00903 29.72
11	8.513349	32.415	32.413	0.00904 29.75
12	8.605367	32.402	32.401	0.00904 29.79
13	8.703810	32.389	32.387	0.00905 29.83
14	8.807456	32.374	32.372	0.00905 29.88
15	8.917367	32.358	32.355	0.00906 29.93
16	9.034324	32.341	32.339	0.00907 29.98
17	9.157091	32.322	32.319	0.00908 30.04
18	9.287029	32.303	32.299	0.00908 30.10
19	9.424078	32.282	32.278	0.00909 30.17
20	9.570044	32.259	32.255	0.00910 30.24
21	9.722333	32.235	32.230	0.00911 30.31
22	9.885216	32.209	32.204	0.00912 30.39
23	10.055988	32.182	32.176	0.00914 30.48
24	10.235994	32.153	32.146	0.00915 30.57
25	10.426562	32.122	32.115	0.00916 30.67
26	10.626046	32.089	32.081	0.00918 30.77
27	10.838461	32.054	32.045	0.00919 30.89
28	11.060607	32.017	32.007	0.00921 31.00
29	11.294563	31.978	31.967	0.00922 31.13
30	11.541503	31.936	31.925	0.00924 31.26
31	11.803433	31.893	31.880	0.00926 31.41

MEAN MOISTURE CONTENT= 9.3087% D.B.

DEEP BED SIMULATION....RUN 4 12:7:71

SABEL SHALLOW LAYER

SEED

MOISTURE CONTENT %D.B.	INITIAL	104.50000
	TARGET	43.09999
BULK DENSITY DRY, KG/CU.M.		201.86
WET, KG/CU.M.		412.80
TEMPERATURE, DEG.C.		29.40
DEPTH, M.		0.20

AIR

TEMPERATURE, DEG.C.	25.20
HUMIDITY, KG/KG	0.00900
RELATIVE HUMIDITY %	45.00
MASS FLOW, KG/MIN/SQ.M.	10.2105
VELOCITY, M/MIN.	8.630
WET BULB TEMPERATURE, DEG.C.	17.21
HUMIDITY AT WET BULB, KG/KG	0.01232

SURFACE AREA IN RELATION TO BARLEY X 5.00

RUN PARAMETERS

TIME INCREMENT,MIN.	2.00	DEPTH INCREMENT,M.	0.02000
MAX. NO OF ITERATIONS.	3000	NUMBER OF LAYERS	10
PRINTING INTERVAL	138	WEIGHT/LAYER, KG, DRY	4.0372
		WET	8.2560

ARRAY Q= 0.1368E-03 0.8302E-01 0.4648E 02 KQ= 1 NS= 2
ARRAY EMC= 0.5055E-01 0.1317E 00 0.6319E-02
LENGTH OF INLET ARRAY= 0
LAYER INTERVAL FOR PLOTTING OUTPUT= 0

Example output from parallel-flow simulation - Run 4.

LAYER CONDITIONS IN ITERATION 138 DRYING TIME= 276.0 MINUTES

LAYER NO.	SEED M.C.%D.B.	SEED TEMP DEGC	EXHAUST AIR TEMP DEGC	EXHAUST AIR HUMIDITY	EXHAUST AIR R.H.	DRYING RATE KG/KG	DRYING RATE %RMAX
1	75.567	24.832	24.672	0.00922	47.56	0.00022	6.65
2	77.729	24.309	24.150	0.00944	50.20	0.00044	13.19
3	79.618	23.794	23.637	0.00965	52.92	0.00065	19.60
4	81.692	23.288	23.132	0.00986	55.72	0.00086	25.89
5	83.720	22.789	22.635	0.01006	58.60	0.00106	32.06
6	85.592	22.298	22.147	0.01026	61.54	0.00126	38.10
7	87.319	21.818	21.669	0.01046	64.55	0.00146	43.99
8	89.103	21.347	21.200	0.01065	67.62	0.00165	49.75
9	90.657	20.887	20.743	0.01084	70.74	0.00184	55.35
10	92.083	20.438	20.298	0.01102	73.90	0.00202	60.78

MEAN MOISTURE CONTENT= 84.3080% D.B.

LAYER CONDITIONS IN ITERATION 276 DRYING TIME= 552.0 MINUTES

LAYER NO.	SEED M.C.%D.B.	SEED TEMP DEGC	EXHAUST AIR TEMP DEGC	EXHAUST AIR HUMIDITY	EXHAUST AIR R.H.	DRYING RATE KG/KG	DRYING RATE %RMAX
1	62.342	24.941	24.828	0.00916	46.79	0.00016	4.68
2	65.100	24.569	24.456	0.00931	48.64	0.00031	9.37
3	67.143	24.198	24.085	0.00947	50.55	0.00047	14.03
4	69.341	23.827	23.714	0.00962	52.51	0.00062	18.63
5	71.507	23.457	23.345	0.00977	54.54	0.00077	23.30
6	73.550	23.090	22.977	0.00993	56.62	0.00093	27.90
7	75.474	22.725	22.613	0.01008	58.75	0.00108	32.44
8	77.449	22.363	22.252	0.01023	60.92	0.00123	36.94
9	79.230	22.005	21.895	0.01037	63.15	0.00137	41.38
10	80.905	21.652	21.544	0.01052	65.40	0.00152	45.75

MEAN MOISTURE CONTENT= 72.2538% D.B.

LAYER CONDITIONS IN ITERATION 414 DRYING TIME= 828.0 MINUTES

LAYER NO.	SEED M.C.%D.B.	TEMP DEGC	EXHAUST AIR TEMP DEGC	HUMIDITY	R.H.	DRYING RATE KG/KG	%RMAX
1	53.219	24.995	24.906	0.00912	46.41	0.00012	3.71
2	55.409	24.697	24.607	0.00925	47.88	0.00025	7.47
3	57.441	24.397	24.306	0.00937	49.40	0.00037	11.26
4	59.612	24.094	24.001	0.00950	50.98	0.00050	15.08
5	61.772	23.738	23.695	0.00963	52.62	0.00063	18.92
6	63.840	23.421	23.338	0.00976	54.30	0.00076	22.78
7	65.918	23.174	23.080	0.00988	56.03	0.00088	26.63
8	67.945	22.866	22.773	0.01001	57.81	0.00101	30.48
9	69.714	22.560	22.466	0.01014	59.63	0.00114	34.30
10	71.501	22.255	22.162	0.01026	61.49	0.00126	38.10

MOISTURE CONTENT= 62.6172% D.B.

Run 4 (contd)

LAYER CONDITIONS IN ITERATION 552 DRYING TIME= 1104.0 MINUTES

LAYER NO.	SEED M.C.%D.B.	TEMP DEGC	EXHAUST AIR TEMP DEGC	HUMIDITY	R.H.	DRYING RATE KG/KG	%RMAX
1	45.475	25.033	24.961	0.00910	46.14	0.00010	3.01
2	47.514	24.790	24.715	0.00920	47.34	0.00020	6.11
3	49.442	24.541	24.465	0.00931	48.59	0.00031	9.26
4	51.502	24.297	24.209	0.00941	49.90	0.00041	12.47
5	53.569	24.028	23.949	0.00952	51.26	0.00052	15.73
6	55.575	23.766	23.686	0.00963	52.67	0.00063	19.04
7	57.521	23.511	23.420	0.00974	54.12	0.00074	22.38
8	59.513	23.233	23.151	0.00985	55.63	0.00085	25.74
9	61.396	22.964	22.881	0.00997	57.18	0.00097	29.12
10	63.207	22.694	22.611	0.01008	58.76	0.00108	32.49

MEAN MOISTURE CONTENT= 54.4720% D.B.

LAYER CONDITIONS IN ITERATION 690 DRYING TIME= 1380.0 MINUTES

LAYER NO.	SEED M.C.%D.B.	SEED TEMP DEGC	EXHAUST AIR TEMP DEGC	EXHAUST AIR HUMIDITY	EXHAUST AIR R.H.	DRYING RATE KG/KG	DRYING RATE %RMAX
1	39.163	25.064	25.005	0.00908	45.93	0.00008	2.46
2	41.008	24.863	24.802	0.00917	46.91	0.00017	5.01
3	42.778	24.657	24.594	0.00925	47.95	0.00025	7.64
4	44.674	24.444	24.379	0.00934	49.03	0.00034	10.34
5	46.593	24.225	24.158	0.00944	50.17	0.00044	13.12
6	48.477	24.000	23.932	0.00953	51.35	0.00053	15.95
7	50.326	23.771	23.701	0.00962	52.58	0.00062	18.84
8	52.233	23.538	23.467	0.00972	53.86	0.00072	21.73
9	54.053	23.302	23.229	0.00982	55.19	0.00082	24.76
10	55.829	23.062	22.989	0.00992	56.55	0.00092	27.75

MEAN MOISTURE CONTENT= 47.5134% D.B.

TARGET MOISTURE REACHED
ITERATION= 791 TIME= 1582.00 MINUTES
EXPERIMENTAL TIME WAS 1380.00 MINUTES

**FINAL LAYER CONDITIONS

LAYER NO.	SEED M.C. D.B.	SEED TEMP DEGC	EXHAUST AIR TEMP DEGC	EXHAUST AIR HUMIDITY	EXHAUST AIR R.H.
1	35.228696	25.082	25.031	0.00907	45.80
2	36.979904	24.909	24.856	0.00914	46.65
3	38.617676	24.729	24.673	0.00922	47.55
4	40.375565	24.542	24.484	0.00930	48.50
5	42.165375	24.348	24.288	0.00938	49.49
6	43.936737	24.148	24.087	0.00946	50.53
7	45.687042	23.944	23.881	0.00955	51.62
8	47.499939	23.734	23.669	0.00964	52.76
9	49.245950	23.519	23.453	0.00973	53.94
10	50.962769	23.301	23.234	0.00982	55.16

MEAN MOISTURE CONTENT= 43.0759% D.B.

5.1.2. Radial flow: Differences between the parallel and radial flow programmes were slight. Some additional variables were introduced into the main programme and the data input file was slightly changed.

Additional variables in main programme

AIRATO	mass rate of flow of air/unit of time and mass of seed, kg/kg/h
MAXVEL	air velocity at inner bin wall
MINVEL	air velocity at outer bin wall
RAD	base radius for calculation of radii of layer centres
RGAIR	mass rate of flow per unit area of inner bin wall, kg/min m^2. This value was still input as GAIR but was stored as RGAIR since GAIR was adjusted in proportion to radius in each layer iteration
R1	radius of inner bin wall, m
R2	radius of outer bin wall, m

DSET5

The line in the parallel flow file beginning GAIR,.... was altered to: GAIR, R1, R2, TAIN, HUIN, RHI, ATHOS.

```
610       SIMULATION OF RADIAL BIN DRYING
C
C                S.I. UNITS VERSION
C
C  THE FOLLOWING VARIABLES ARE DEFINED
C
C            PROPERTIES OF THE AIR
C       GAIR=MASS RATE OF FLOW PER UNIT AREA OF INNER BIN WALL
C       VEL=MEAN AIR VELOCITY
C       MINVEL=VELOCITY AT OUTER BIN WALL
C       MAXVEL=VELOCITY AT INNER BIN WALL
C       AIRATO=RATE OF AIR MASS FLOW/MASS SEED
C       TAIN= INITIAL AIR TEMPERATURE
C       TEMPA=TEMPORARY VALUE OF AIR TEMPERATURE ENTERING LAYER
C       HUIN= INITIAL ABSOLUTE HUMIDITY
C       RHI= INITIAL RELATIVE HUMIDITY
C       HSAT= ABSOLUTE HUMIDITY AT SATURATION
C       HUMT= TRANSIENT ABSOLUTE HUMIDITY WITHIN BED
C       HUM(L)= HUMIDITY OF AIR ENTERING LAYER
C       EXTEMP(L)= TEMPERATURE OF AIR EXHAUSTING FROM LAYER
C       EXHUM(L)=HUMIDITY OF AIR EXHAUSTING FROM LAYER
C       RHL(L)= RELATIVE HUMIDITY WITHIN LAYER L
C       CPA= SPECIFIC HEAT OF DRY AIR
C       CPW= SPECIFIC HEAT OF WATER VAPOUR
C       LA= LATENT HEAT OF WATER VAPOUR
C       CPL= SPECIFIC HEAT OF WATER LIQUID
C       ATMOS=ATMOSPHERIC PRESSURE
C
C          PROPERTIES OF THE SEED OR GRAIN
C       RHOG= BULK DENSITY OF DRY MATTER
C       RHOW= BULK DENSITY OF WET MATERIAL
C       CPG= SPECIFIC HEAT OF DRY MATTER
C       LG= LATENT HEAT OF VAPOURISATION OF MOISTURE WITHIN SEED
C       IMC= INITIAL MOISTURE CONTENT , RATIO DRY BASIS
C       MC(L)= TRANSIENT MOISTURE CONTENT WITHIN LAYER. RATIO DRY BASIS
C       IGT= INITIAL GRAIN TEMPERATURE
C       GT(L)= TRANSIENT GRAIN TEMPERATURE
C       HS= HEAT TRANSFER COEFFICIENT
C       DEPTH= DEPTH OF BED
C       CONST= DRYING CONSTANT
C       ASYMP= ASYMPTOTIC MOISTURE VALUE
C       DP=+VE=EFFECTIVE PARTICLE DIAMETER,METRES
C       AND S=SPECIFIC SURFACE AREA PER METRE (CORRECTED FOR
C       POROSITY)
C       DP=-VE THEN S=MULTIPLIER FOR BOYCE  HEAT TRANSFER FQN.
C
C
C          PARAMETERS
C       DTIME = INCREMENTAL TIME
C       DZ= DEPTH OF THIN LAYER
C       Q(3)=CONSTANTS FOR DETERMINING K
C       R1 AND R2 = BIN RADII
C       RAD=RADIUS OF CENTRE OF LAYER 1
C       TMC= TARGET MOISTURE CONTENT, RATIO DRY BASIS
C       TLIM= TIME LIMIT
C       TEXP= EXPERIMENTAL TIME
C       KQ=1=EXP RELATION FOR K =2= ARRHENIUS RELATION
C       NS=1,2,3=SPHERE,SLAB OR SINGLE EXPONENTIAL
C       EMC=CONSTANTS IN MODIFIED SMITH EQUATION
C       NDIN=0=CONSTANT INLET =+VE=NO INLET OBSERVATIONS
C       LPLOT=0=NO PLOT OUTPUT =+VE=LAYER INTERVAL FOR PLOTTING
C       IF LPLOT=-1 THEN LPLOT=LMAX/12
C       IP=0 - FIRST 10 ITERATIONS NOT PRINTED
C       IM=LENGTH OF INITIAL M.C. ARRAY WC & DEPTHS WCD
C       IT=LENGTH OF INITIAL TEMPERATURE ARRAY ST & DEPTHS STD
C       X,Y,XVAL=ARRAYS USED IN MINIMISING SEARCH FOR DM
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```
      COMMON DHR(150),DTEMP(150),DHUM(150),NDIN
      REAL EMC(3),Q(3),TP(14)
      REAL MINVEL,MAXVEL
      REAL LA,LG,IMC,IGT
      REAL MC(200),GT(200),EXTEMP(200),EXHUM(200),RHL(200)
      REAL WC(20),ST(20),WCD(20),STD(20)
      REAL X(10),Y(10),XVAL(10,10)
      INTEGER TITLE(30)
      EXTERNAL SATPRE
      DATA CPA/1.005/,CPW/1.88/,CPL/4.187/,LA/2500.8/
C
C     READ MAX EXHAUST RH & RHMC
      READ(5,3) RHFX,RHMC,CPG
C     READ IN VALUES OF CONSTANTS
      READ(5,4) Q,KO,NS
 4    FORMAT(5G0.0)
      READ(5,3) EMC
      READ (5,521) DP,S
      READ(5,521) IM,IT
      IF(IM.NE.0)READ(5,522)(WC(I),I=1,IM),(WCD(I),I=1,IM)
      IF(IT.NE.0)READ(5,522) (ST(I),I=1,IT),(STD(I),I=1,IT)
 522  FORMAT(10G0.0)
      READ(5,521) NDIN,LPLOT
      IF(NDIN.EQ.0) GO TO 16
      READ(8,3) (DHR(I),DTEMP(I),DHUM(I),I=1,NDIN)
 3    FORMAT(3G0.0)
 16   READ(5,521) DZ,DTIME
      IF(DZ) 74,10,10
 521  FORMAT(2G0.0)
   10 READ(5,505) TITLE
 505  FORMAT(15A4/15A4)
      WRITE(9,510) TITLE
 510  FORMAT('1'//5X,'RADIAL BIN SIMULATION...',15A4//
     129X,15A4///)
C
C     READ INITIAL CONDITIONS. INSERTING A -VE VALUE FOR A COMPLEMENTARY
C     CONDITION WILL CAUSE ITS VALUE TO BE CALCULATED FROM THE COMPLEMEN
C     GAIR IN THIS CASE=MASS AIR PER UNIT AREA OF BIN WALL
C
      READ(5,515)RHOG,RHOW,IMC,TMC,IGT,GAIR,R1,R2,TAIN,HUIN,
     1RHI,ATMOS
 515  FORMAT(6G0.0/6G0.0)
C     CONVERT ATMOS TO NEWTONS/SQ.METRE
      ATMOS=ATMOS*100.0
C
C     CALCULATE DEPTH
      DEPTH=R2-R1
      READ(5,4)MAX,IPRINT,IP,TLIM,TEXP
C
      MAXVEL=(GAIR*287.0*(TAIN+273.2))/ATMOS
      MINVEL =MAXVEL*(R1/R2)
      VEL=MAXVEL*R1*ALOG(R2/R1)/DEPTH
      PVS=SATPRE(TAIN)
       IF (HUIN.LT.0.0) GO TO 11
   12 IF(RHI.LT.0.0) GO TO 13
   14 IF (RHOG.LT.0.0) RHOG= RHOW/(1+IMC)
      IF (RHOW.LT.0.0)  RHOW=RHOG*(1+IMC)
      AIRATO=(GAIR*60.0)/(RHOG*3.142*(R2*R2-R1*R1))
C     MAX. DRYING RATE ESTIMATED FROM WET BULB HUMIDITY
      CALL WTBULB(TAIN,TW,HUIN,1,ATMOS,HSAT,SATPRE)
      RMAX=HSAT-HUIN
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```
612
      GO TO 15
   11 PV= (RHI*0.01)* PVS
      HUIN=(0.622*PV)/(ATMOS-PV)
      GO TO 12
   13 PV= (HUIN*ATMOS)/(0.622+HUIN)
      RHI= PV/(PVS*0.01)
      GO TO 14

C     CALCULATE NO OF LAYERS AND AMENDED LAYER DEPTH
C     START OF COMPUTATIONS FOR ONE VALUE OF INCREMENTAL DEPTH & TIME
C
   15 DIV=DEPTH/DZ
      LMAX=IFIX(DIV+0.5)
      IF (LMAX.GT.200) GO TO 17
      DZ=DEPTH/LMAX
      IF(LPLOT.EQ.-1)LPLOT=LMAX/12
      IPLOT=IFIX(TEXP/(DTIME*100.0))
C
C     CALCULATE DRY AND WET WEIGHT IN THE LAYER
C
      DWT= RHOG*DZ
      WWT= RHOW*DZ
      RGTIME=RHOG/DTIME
      RGAIR=GAIR
      IMC=IMC*100.0
      TMC=TMC*100.0
C
C
      WRITE(9,530)IMC,TAIN,TMC,HUIN,RHOG,RHI,RHOW,GAIR,IGT,
     1VEL,DEPTH,TW,HSAT
  530 FORMAT('0','SEED',46X,'AIR'//' MOISTURE CONTENT %D.B. INITIAL',F10
     1.5,9X,'TEMPERATURE, DEG.C.',12X,F10.2/24X,'TARGET ',F10.5,9X,'HUMI
     2DITY,  KG/KG',16X,F10.5/' BULK DENSITY DRY,  KG/CU.M.   ',F10.2,9X
     3,'RELATIVE HUMIDITY %',12X,F10.2/13X,' WET,  KG/CU.M.   ',F10.2,9X
     4,'MASS FLOW, KG/MIN/SQ.M. ',7X,F10.4/' TEMPERATURE, DEG.C.',11X,F1
     50.2,9X,'VELOCITY, M/MIN. ',13X,F10.3/' DEPTH, M. ',20X,F10.2,
     69X,'WET BULB TEMPERATURE, DEG.C.',F8.2/
     750X,'HUMIDITY AT WET BULB, KG/KG',F12.5//)
      WRITE(9,8)R1,R2,MINVEL,MAXVEL,AIRATO
    8 FORMAT(' ','BIN RADII-INNER=',F10.3,' M    OUTER=',
     1F10.3/'MINIMUM VELOCITY=',F10.2,' M/MIN'/
     2'MAXIMUM VELOCITY=',F10.2,' M/MIN'/
     3'MASS AIR PER UNIT MASS SEED =',F10.4,' KG/KG/HR')
      IF(DP.GT.0.0)WRITE(9,88) DP,S
   88 FORMAT(' ',' ','EFFECTIVE PARTICLE',
     1'DIAMETER, METRES',15X,F10.6/
     2'SURFACE AREA, SQ.METRES',6X,F12.2//)
      IF(DP.LT.0.0) WRITE(9,99) S
   99 FORMAT(' ','SURFACE AREA IN RELATION TO BARLEY X',F10.2//)
      WRITE(9,531)DTIME,DZ,MAX,LMAX,IPRINT,DWT,WWT
  531 FORMAT(' RUN PARAMETERS'//' TIME INCREMENT,MIN.',11X,F10.2,9X,'DEP
     1TH INCREMENT,M. ',12X,F10.5//' MAX. NO OF ITERATIONS.',8X,I10,8X,'
     2 NUMBER OF LAYERS',15X,I10/' PRINTING INTERVAL',13X,I10,9X,'WEIGHT
     3/LAYER,'KG, DRY',10X,F10.4/68X,'WET',10X,F10.4/////)
      WRITE(9,7) Q,KQ,NS,EMC,NDIN,LPLOT
    7 FORMAT('0','ARRAY Q=  ',3(E12.4,5X),'KQ=',I3,'  NS=',I3/
     1'ARRAY EMC=  ',3(E12.4,5X)/'LENGTH OF INLET ARRAY=',I4/
     2'LAYER INTERVAL FOR PLOTTING OUTPUT=',I4/
     3////)
```

```
C     CALCULATE INTERSTITIAL HUMIDITY
C
      IMC=IMC*0.01
      REL=EQRH(IMC)
      PVS=SATPRE(IGT)
      PV=(REL*0.01)*PVS
      HUMT=(0.622*PV)/(ATMOS-PV)
C     INITIALISE LAYERS
C
      DO 20 L=1,LMAX
      RHL(L)=REL
      MC(L)=IMC
      GT(L)=IGT
      IF(IM.EQ.0) GO TO 20
      MC(L)=TERP(WC,WCD,IM,DZ,L)
      RHL(L)=EQRH(MC(L))
 20   IF(IT.NE.0) GT(L)=TERP(ST,STD,IT,DZ,L)
C
C     SET COUNTERS FOR PRINT COMMANDS AND DRYING TIME
C
      MCOUNT=0
      TIME=0.0
      IND=0.0
      IPL=0
      RAD=R1-0.5*DZ
C
C     LOOP TO ITERATE IN TIME
C
      DO 25 M=1,MAX
      TIME=TIME+DTIME
      IF(NDIN.EQ.0) GO TO 5
      CALL INLET(TIME,TAIN,HUIN)
      PVS=SATPRE(TAIN)
      PV=(HUIN*ATMOS)/(0.622+HUIN)
      RHI=PV/(PVS*0.01)
      CALL WTBULB(TAIN,TW,HUIN,1,ATMOS,HSAT,SATPRE)
      RMAX=HSAT-HUIN
 5    MCOUNT=MCOUNT + 1
      IPL=IPL+1
      TEMPA=TAIN
      HUMT=HUIN
      IF(M.GT.10) GO TO 30
      IF(IP.EQ.0) GO TO 30
C
C     THE FIRST 10 ITERATIONS ARE PRINTED OUT
C
C
 35   WRITE(9,535) M,TIME
535 FORMAT('1'///1X,' LAYER CONDITIONS IN ITERATION',I7,5X,'DRYING TIM
     1F=',F10.1,' MINUTES'//1X,'LAYER NO.',10X,'SEED',17X,'EXHAUST AIR',
     215X,'DRYING RATE'/11X,'M.C.%D.B. TEMP DEGC TEMP DEGC ',
     3'HUMIDITY    R.H.      KG/KG      %RMAX'/)
C
C     J = PARAMETER CONTROLLING PRINT COMMAND WITHIN LAYER ITERATION
C
      J=1
      GO TO 45
C     SUSEQUENT PRINTS OF THE ITERATIONS ARE CONTROLLEDBY IPRINT
 30   IF(MCOUNT.NE.IPRINT) GO TO 40
      MCOUNT=0
      GO TO 35
 40   J=0
 45   KZ=0
C
```

```
C
C       LOOP TO ITFRATE THE LAYERS
C
        DO 58 L=1,LMAX
C       ADJUST GAIR WITH RADIUS
        GAIR=RGAIR*R1/(RAD+(L*DZ))
        GATIME=GAIR*DTIME
        IF(KQ.EQ.1) GO TO 22
        CONST=Q(1)*EXP(Q(2)/(TEMPA+273))
        GO TO 23
C       IF Q(3)=0 EQUATION FOR K INDEPENDENT OF HUMIDITY
 22     CONST=Q(2)*TEMPA  - Q(3)*HUMT
        CONST=Q(1) * EXP(CONST)
 23     RH=RHI*0.01
        IF(L.NE.1) RH=RHL(L-1)*0.01
C       IF EMC(3)=0 EQUATION FOR ME INDEPENDENT OF TEMPERATURE
        IF(RH.GT.RHMC) RH=RHMC
        ASYMP=EMC(1) -EMC(2)*ALOG(1.0-RH) -EMC(3)*ALOG(TEMPA)
        ASER=SER(CONST,TIME,NS)*DTIME*CONST
        DM=-ASER*(MC(L)-ASYMP)/(1+ASER*0.5)
C
C       DM -VE FOR DRYING AND +VE FOR WETTING
C
C       SET COUNTER FOR SATURATION LOOP
        IRH=0
C
C
   53 A= 2*(TEMPA - GT(L))
        B=CPG+CPL*MC(L)
        F=CPW*TEMPA+LA-GT(L)*CPL
        HS=S*HTRANS(DP,GAIR,TEMPA,ATMOS)
        LG=LA*(1+(23.0*EXP(-40.0*MC(L))))
        YY=CPA*TEMPA+LG-CPL*GT(L)
C       CONDENSATION ROUTINE RETURNS TO THIS POINT
  153   E=CPA+CPW*(HUMT-(DM*DWT/GATIME))
        GRE=GAIR*E
        TOP=RGTIME*DM
        TOP=A+(TOP*((2*YY/HS)+(F*DZ/GRE)))
        BR=B+CPL*DM
        BOTTOM=1.0+(RGTIME*(2*B/HS+DZ*BB/GRE))
        DTG= TOP/BOTTOM
        DTA=-(DWT/(GATIME*E))*((DTG*BB)-(DM*F))
        T=TEMPA+DTA
        P=SATPRE(T)
        H=HUMT-(DM*DWT/GATIME)
        PS=(H*ATMOS)/(0.622+H)
        RHL(L)=(PS/P)*100.0
C
        IF(IRH.NE.0) GO TO 46
C
        IF(RHL(L)-RHEX)47,47,48
C
 48     IF(IND.EQ.0) LSAT=L
C
C       SEARCH FOR VALUE OF DM GIVING RHEX
C
 46     DIS=RHEX-RHL(L)
        IF(ABS(DIS).LE.0.1) GO TO 47
        IF(IRH.NE.0) GO TO 311
```

```
C       EVALUATE 2ND ESTIMATE OF DM BASED ON RHEX RH
C       AT OVERSHOOT TEMPERATURE
        X(1)=DM
        Y(1)=DIS
        P=R*RHEX*0.01
        SH=(0.622*P)/(ATMOS-P)
        DM=(HUMT-SH)*GATIME/DWT
        IRH=1
        GO TO 153
C
  311   IRH=IRH+1
        IF(IRH.EQ.11) GO TO 320
C
C       INSERT CURRENT DIS IN ASCENDING ORDER
C
        DO 313 I=2,IRH
        IF(DIS.GT.Y(I-1)) GO TO 313
        KV=IRH-I+1
C
C       MOVE ALL ARRAY ELEMENTS DOWN
C
        DO 317 K=1,KV
        IK=IRH-K
        IX=IK+1
        Y(IX)=Y(IK)
  317   X(IX)=X(IK)
C
C       INSERT NEW VALUE IN CORRECT POSITION
        Y(I-1)=DIS
        X(I-1)=DM
        GO TO 316
C
  313   CONTINUE
        Y(IRH)=DIS
        X(IRH)=DM
C
C       INDEX ARRAY XVAL
  316   DO 318 I=1,IRH
  318   XVAL(I,1)=X(I)
C
        DO 319 K=2,IRH
        DO 319 I=K,IRH
  319   XVAL(I,K)=(XVAL(K-1,K-1)*Y(I)-XVAL(I,K-1)*Y(K-1))
       1/(Y(I)-Y(K-1))
C
C       SET DM TO NEW ESTIMATE
        DM=XVAL(IRH,IRH)
        GO TO 158
C
  320   WRITE(9,321)DM,RHL(L),X,Y
  321   FORMAT('0','****CONDENSATION LOOP FAILED TO',
       1' CONVERGE**'/'DM=',F10.6,10X,'RH=',F8.2/
       210F10.6/10F10.4/)
C
   47 GT(L)=GT(L)+DTG
        TEMPA = TEMPA + DTA
        EXTEMP(L)=TEMPA
        MC(L) = MC(L) +DM
        HUMT=H
        EXHUM(L)=HUMT
        RATE= HUMT - HUIN
        IF(RATE.LT.0.00001) KZ=L
```

```
C
C       CHECK FOR TEMPERATURE OVERSHOOT
C
        IF ((GT(L) - TEMPA).LT.20) GO TO 54
        WRITE(9,540)TEMPA,GT(L),L,M
  540 FORMAT('0','*** AIR TEMPERATURE (',F6.1,') >20 DEG BELOW GRAIN (',
       1F6.1,') IN LAYER ',I5,' AT ITERATION ',I5/)
   54 RAP=RMAX-RATE
        RAQ = RATE/(RMAX*0.01)
        IF(J.NE.1) GOTO 58
        PMC=MC(L)*100.0
        WRITE(9,555)L,PMC,GT(L),TEMPA,HUMT,RHL(L),RATE,RAQ
  555   FORMAT(' ',I6,3F10.3,F10.5,F10.2,F10.5,F10.2)
C
   58 CONTINUE
```

```
C       CHECK FOR BASE OF DRYING ZONE
C
        IF(KZ.EQ.0.OR.IND.EQ.1.OR.IRH.EQ.0) GO TO 59
        DZONE=(LSAT-KZ)*DZ
        SPEED= DZONE/TIME
        WRITE(9,556) M,TIME,SPEED,DZONE
  556 FORMAT('0'//'***COMPLETE DRYING ZONE FORMED AT ITERATION',I7/1X,'
       1TIME=',F10.2,' MINUTES   SPEED=',F10.5,'M/MIN    DEPTH=',F10.5,'M
       2.')
        IND=1
C
C       CALCULATE AVERAGE MOISTURE CONTENT IN THE BED
C
   59 SUM=0.0
        DO 60 L=1,LMAX
   60 SUM=SUM +MC(L)
        AV=(SUM*100.0)/LMAX
C
C       CHECK MOISTURE CONTENT AGAINST TMC. IF REACHED JUMP OUT OF LOOP
C
        IF ((AV-TMC).LE.0.0) GO TO 65
C
C       CHECK COMPUTED TIME AGAINST TIME LIMIT
C
        IF(TIME.GE.TLIM) GO TO 76
        IF(J.NE.1) GO TO 255
        WRITE(9,561) AV
  561   FORMAT('0','MEAN MOISTURE CONTENT=',F10.4,'% D.B.')
  255   IF(LPLOT.EQ.0.OR.IPL.NE.IPLOT) GO TO 25
        IPL=0
        TP(1)=TIME/60.0
        TP(2)=TAIN
        DO 19 I=1,12
        JP=I*LPLOT
        TP(I+2)=EXTEMP(LMAX)
   19   IF(JP.LE.LMAX) TP(I+2)=EXTEMP(JP)
        WRITE(29,21) TP,AV
   21   FORMAT(' ',8F8.2/16X,7F8.2)
   25 CONTINUE
C
        GO TO 73
   76   WRITE(9,583)
  583 FORMAT('0','***LIMITING TIME EXCEEDED     ')
        GO TO 73
```

```
C       CHECK TIME AT WHICH TMC WAS REACHED
C
 65     WRITE(9,570) M,TIME,TEXP
  570 FORMAT('0','***TARGET MOISTURE REACHED***'/1X,'ITERATION=',I7,3X,
     1'TIME=',F10.2,' MINUTES'/1X,'EXPERIMENTAL TIME WAS ',F10.2,
     2' MINUTES')
 73     WRITE(9,581)
  581 FORMAT('0',30X,'**FINAL LAYER CONDITIONS'/1X,'LAYER NO.',10X,'SEED
     1',17X,'EXHAUST AIR'/11X,'M.C. D.B. TEMP DEGC TEMP DEGC HUMILITY
     2 R.H.')
       DO 56 L=1,LMAX
 56    MC(L)=MC(L)*100.0
       WRITE(9,582)(L,MC(L),GT(L),EXTEMP(L),EXHUM(L),RHL(L),L=1,LMAX)
  582  FORMAT(1X,I6,F10.6,F10.3,F10.3,F10.5,F10.2)
C
C
       WRITE(9,561) AV
C
       TMC=TMC*0.01
       GO TO 16
 17    WRITE(9,18) LMAX
 18    FORMAT('0','***',I4,' LAYERS REQUIRED ')
       GO TO 16
 74    CALL EXIT(5)
       STOP
       END
```