

**Growth analysis and pod and seed
set of winter oilseed rape
(*Brassica napus* L.)
Experimental results**

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**CABO-verslag 166
1992**

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Preface

A research project started at the Centre for Agrobiological Research (CABO-DLO) in collaboration with the Department of Theoretical Production Ecology of the Agricultural University in Wageningen (TPE) at 1-3-1988 to study yield formation and stability of winter oilseed rape. Till 1-1-1991 research was financed by the Netherlands Grain Centre in Wageningen. Research facilities and assistance were provided by CABO-DLO. In 1991 and part of 1992, the research was financed by CABO-DLO. In this report experimental data of two field experiments carried out in 1988/89 and 1989/90 are presented and documented. Part of these data and further results of this project are shown and discussed in three publications (Habekotté, in prep.). The authors wish to thank J.H. Hartholt, M. C. Albers and M. ten Broeke for their assistance with field sampling, F.H.M. de Bekker and W. de Jager for advise and carrying out of crop protection measurements and fertilization, the personnel of the chemical laboratory of CABO-DLO for the chemical analyses, ing. J.C.M. Withagen for help with statistical analyses, ir. W.J.M. Meijer and dr.ir. A.J. Haverkort for valuable advise and correction of the English and miss J.P. Huisman for editing the layout of this report.

1 Introduction

The area grown with oilseed rape has increased from about 700 to 1700 thousand hectares in the European Community during the last decade (LEI, 1989). This increase is mainly the result of the support measures of the EC to stimulate domestic oilseed production for edible markets. Besides these support measures, yield level and yield stability are basic requirements for the economic success of the crop. Seed yields of winter oilseed rape are still relatively low and variable compared to for example winter wheat (Leterme, 1985; Daniels, 1986) also when taking into account the higher energy content of the rape seeds compared to the grains of wheat. Two field experiments were carried out to increase the quantitative insight in the yield formation processes of winter oilseed rape (variety Jet Neuf). In this report the objectives of the experiments and materials and methods are described, the experimental data are presented in tables (mean values and LSD.05) and reference is made to the original computer data files. The objectives of the first field experiment (1988/89) were:

- a. To analyse the influence of assimilate availability on pod and seed set and seed filling.
- b. To analyse the influence of the position of the pods in the canopy (height and branch) and of the moment of flower opening during flowering on seed set per pod.
- c. To analyse light interception, total dry matter production, distribution of dry matter to various plant organs, the area indices of leaves, stems and pods and the oil content of the seeds.
- d. To analyse formation and redistribution of reserve carbohydrates.
- e. To measure contents of nitrogen, carbon and ash of various plant organs to calculate growth and maintenance respiration (Vertregt & Penning de Vries, 1987; Penning de Vries & Van Laar, 1982).

In the second field experiment (1989/90) additional data were obtained for the objectives (a) and (c).

2 Materials and methods

2.1 Location, trial design and crop husbandry

Two field experiments were carried out in 1988/89 (Experiment 1) and in 1989/90 (Experiment 2) with the variety Jet Neuf on a heavy clay soil near Wageningen at the experimental farm De Bouwing in Randwijk, Netherlands (5 ° 40' E, 51 ° 58' N). The experiments were laid down in a split plot design with the treatments in the main plots and the harvest dates in sub-plots. Details of the experiments are presented in Table 1. Treatments were such that the amount of intercepted radiation and the number of pods per m² varied through varying seed rates, plant densities, sowing dates and the application of shading. The first experiment consisted of four treatments and five replicates. Low plant density was obtained by thinning by hand in autumn and again in early spring. Experiment 2 consisted of four treatments and four replicates. Only the first treatment was carried out with eight replicates. Shading took place with black plastic netting. Fertilization took place according to the current recommendations for optimal yields and several treatments were carried out to protect the crop against pests and diseases (Table 2). Crop damage due to pests and diseases was negligible in both years. Irrigation (25 mm) was carried out twice in the first growing season to prevent the crop of drought. Bird netting was placed during seed ripening.

2.2 Crop growth analyses, light interception and crop development

Gross sub-plot sizes were 8.64 m² of which 1.92 m² (net) was harvested periodically from early spring till early July to record total dry weight of the crop and the number of plants per m². Total fresh weight of the crop (without roots) of the whole sub-plot was measured. A sample was taken to determine the standing dry weight of the harvested plants and to calculate the ratio between fresh and dry weight and the total standing dry weight of the crop per sub-plot. Dry weight was determined after a drying period of 24 hours at 105 °C.

Five plants per plot were taken at random to collect data of the division of dry matter into various plant organs and the green area index of leaves, stems and pods. The dry weights per m² of roots, green leaves, dead leaves (yellow coloured (parts of) leaves), main stem, side branches, flower buds, flowers, pod hulls and seeds were calculated as the organ weight of five plants divided by the total weight of five plants, multiplied with the total weight of the crop per m². The pods were threshed by hand and the seeds separated and weighed to determine mean seed weight. Dry weight of the pod hull (pod wall + septum) was calculated from the difference between total pod dry weight and total seed dry weight.

Table 1. Details of the field trials

Detail	Experiment 1	Experiment 2
Treatments :	1) Low plant density (lpd) 2) High plant density (hpd) 3) Low plant density and removal at flowering of all side branches except the highest (rsb) 4) Low plant density and shading, leaving 40 percent of full light from the first week of flowering till final harvest (sha)	1) Low seed rate (lsr) 2) High seed rate (hsr) 3) Low seed rate and later sowing (lso) 4) Low seed rate and shading (sha, see Treatment4, exp.1)
Sowing dates :	August 23, 1988	August 24, 1989 (early) September 9, 1989 (late)
Sowing rates :	10 kg/ha	6 kg/ha (low seed rate) 10 kg/ha (high seed rate)
Date of start of shading:	20- 4-1989	24- 4-1990
Row distance :	24 cm	24 cm
Plant density in spring :	tr. 1 : ca. 24 (n/m ²) tr. 2 : ca. 68 (n/m ²) tr. 3 : ca. 23 (n/m ²) tr. 4 : ca. 27 (n/m ²)	tr. 1 : ca. 42 (n/m ²) tr. 2 : ca. 50 (n/m ²) tr. 3 : ca. 57 (n/m ²) tr. 4 : ca. 41 (n/m ²)
Harvest dates:	13-3, 28-3, 10-4, 24-4, 8-5, 16-5, 22-5, 29-5, 5-6, 12-6, 19-6, 26-6, 3-7, 10-7	22-3, 18-4, 1-5, 14-5, 28-5, 18-6, 9-7
Soil type :	40 % lutum 1.9 % humus 0.1 % lime pH-KCL=6.8	52 % lutum 2.5 % humus 0.8 % lime pH-KCL= 7.4
Soil reserves:	35 kg/ha N (1-100 cm)	36 kg/ha N (0-60 cm)
Fertiliser :	13-3-1989: - 180 kg/ha N	13-3-1989: - 150 kg/ha N
Crop protection:	against: weeds (2.5 kg/ha Butisan S), stem flea beetle (2 l/ha Di-thios), slugs (1.5 kg/ha Methio-carb), pollen beetle and stem weevil (0.2 l/ha Deltamethrin), sclerotinia and botrytus (1kg/ha Vinchozolin), altenaria (1 kg/ha Rovral), cylindrosporium (1kg/ha Prochloraz)	
Irrigation :	27-5-'89 and 26-6-'89: 25 mm	

The area and weight of samples of green leaves, side branches and pods were recorded to determine the specific area of these plant organs (Specific area = area/weight). The areas were measured with a Licor 3100 area meter (Li-Cor Inc., Lincoln, Nebraska, USA). The length and cross section (in the middle) of the main stem was measured to determine the flat area of the main stem (length x cross section). The area indices of these plant organs were calculated by the product of the specific area and the organ dry weight per square meter. In the first experiment two crop layers were distinguished (A: above 60 cm height; B: below 60 cm height). For the measurement and calculation of dry weight, specific area and area indices of green leaves, different leaf-groups were distinguished in Experiment 1 (Figure 1) :

Crop layer-B (0 - 60 cm height):

- the lowest two leaves of the main stem
- the highest young leaves of the main stem (about 4 leaves, when the plants are lower than 60 cm height)
- the leaves of the main stem between the lowest and highest leaves
- the leaves of the side branches

Crop layer-A (> 60 cm height):

- all leaves of the main stem and side branches

Per crop layer-A and B, the dry weight, specific area and area index of the main stem and side branches were measured and calculated.

Per five plants also the number of pods with seeds, pods without seeds (aborted pods), the number of peduncles (aborted flower buds, flowers or pods) and the number of open pods (shattered) were counted. The potential number of pods was defined as the sum of pods, peduncles and open pods. The (potential) number of pods per m² was calculated as the (potential) number of pods per five plants divided by the dry weight of pods per five plants, multiplied with the total pod dry weight per m².

The number of seeds per m² was calculated by dividing total seed weight by individual seed weight and the number of seeds per pod was calculated by dividing total number of seeds per m² by total number of pods per m².

The percentage light interception of the crop was measured periodically at noon, at 5 cm above the ground in both experiments and in the first experiment also at 60 cm above ground (just under the crop layer with pods and flowers) with a portable tube solarimeter (TFDL, Wageningen) which measures only photosynthetically active radiation (PAR) between 400 and 700 nm. In the shading treatments also the light interception of the netting was recorded. Crop development was recorded periodically, according the development scale of Habekotté (1978). After flowering the development stages were also recorded according the development scale of Sylvester-Bradley (1984).

Data file information of crop growth analysis and light measurements are shown in the appendices 3, 4, 8 and 9.

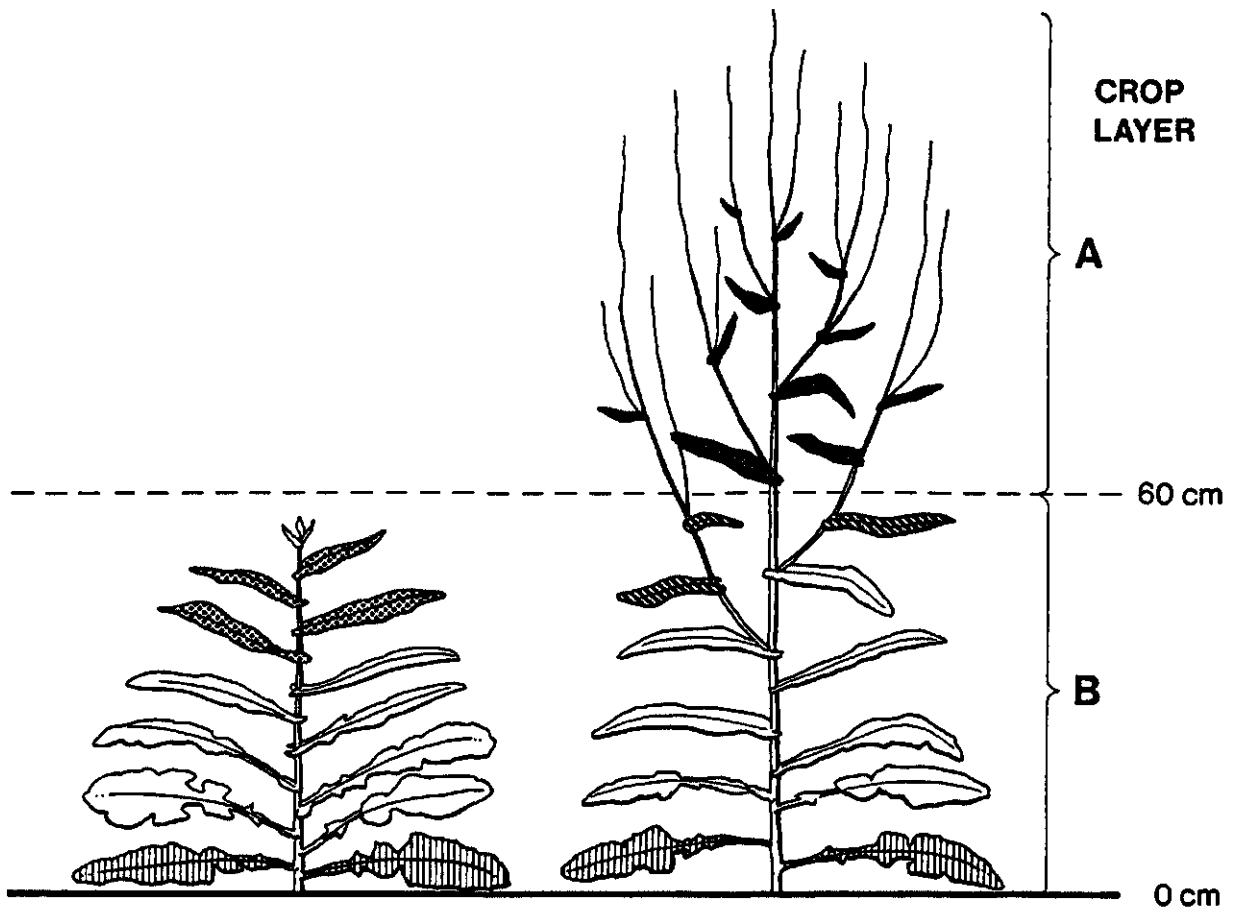


Figure 1 Crop layers and leaf-groups distinguished in experiment 1.

Crop layer-B (0-60) cm height): - the lowest two leaves of the main stem

- the highest young leaves of the main stem (about 4 leaves, when the plants are lower than 60 cm height)

- the leaves of the main stem between the lowest and highest leaves

- the leaves of the side branches

Crop layer-A (> 60 cm height): - all leaves of the main stem and side branches



2.3 Number of pods and seeds per pod and position in the canopy

In Experiment 1 the (potential) number of pods and seeds was also counted per branch in successive groups of 15 peduncles (after flowering, whether a pod was present or not; Figure 2). Two plants per sub plot were taken at 29-5-'89 and 26-6-'89 to determine the height in the canopy of the peduncle groups (Figure 2). A crop layer was recorded if more than 60 percent of the peduncles were present between the bounds of the layer. When 50 percent of the peduncles were present in one layer, and 50 percent in an other crop layer, two crop layers were recorded. The mean height per peduncle-group was determined as the average of two harvest dates, four treatments, five replicates and two plants per sub plot, because there were only small differences between the harvest dates and treatments, (Appendix 1). Three periods between the successive harvests during flowering were distinguished and per treatment and peduncle-group the period was determined in which more than 50 percent of the peduncles were counted. The periods of flower opening of the peduncle-groups were determined by the harvest dates minus the duration of flowering of an individual flower (data not shown: 64.5 degree days per flower; Table 2; Appendix 2). Data file information is presented in Appendix 6.

Table 2. Periods of flower opening during flowering in Experiment 1.

Period	Julian Harvest	day number flower opening	duration per period	
			days	degree days
Period 1	before 128	104 - 122	18	120
Period 2	128 - 136	123 - 130	8	79
Period 3	after 136	131 - 142	11	192

2.4 Measurements of individual pod and seed growth

In Experiment 1, two plants per sub plot were marked with coloured wire on the main stem and first two primary branches at the onset of flowering of individual buds (Figure 3) at three dates during flowering of the whole crop: 21st April, 28st April and 3rd May. Each week two plants were harvested and the first 4 pods above the marker were taken to measure pod hull dry weight, seed dry weight, mean seed dry weight and number of seeds per pod. Data file information can be found in Appendix 4.

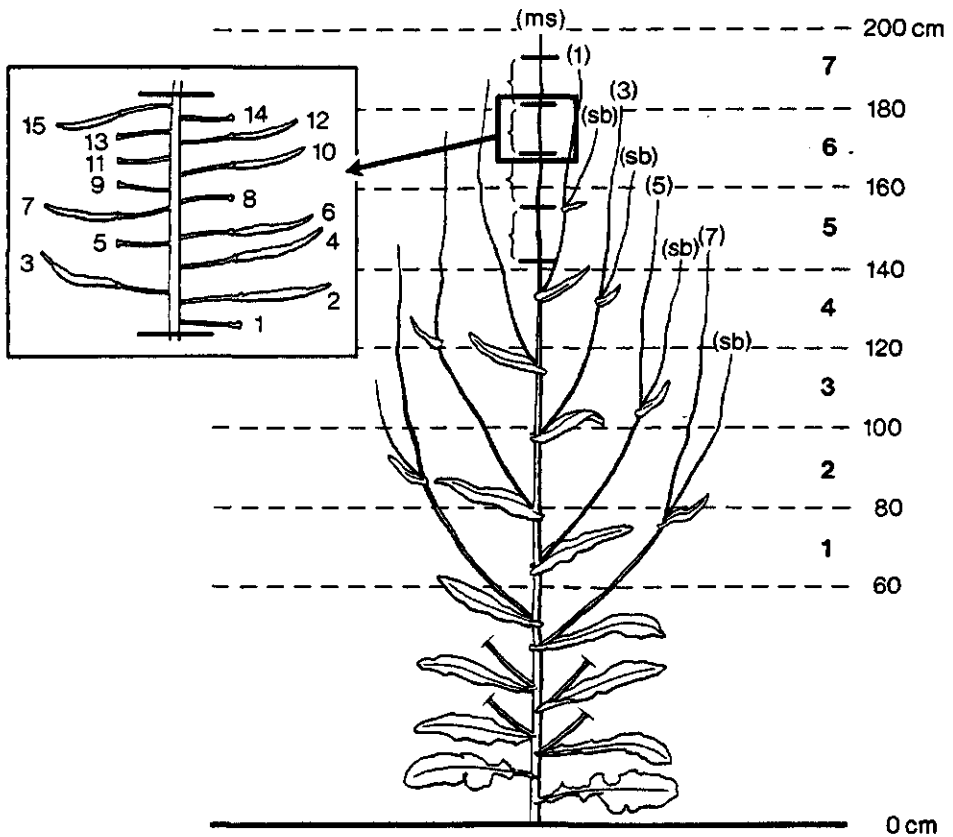


Figure 2. Distinguished groups of 15 peduncles (with or without a pod) on the main stem (ms) and odd primary branches (1,3,5,....) and height (in cm above soil level) in the canopy for measurements for the (potential) number of pods and seeds per pod on different positions in the canopy (sb: secondary branches; see 2.3; Experiment 1)

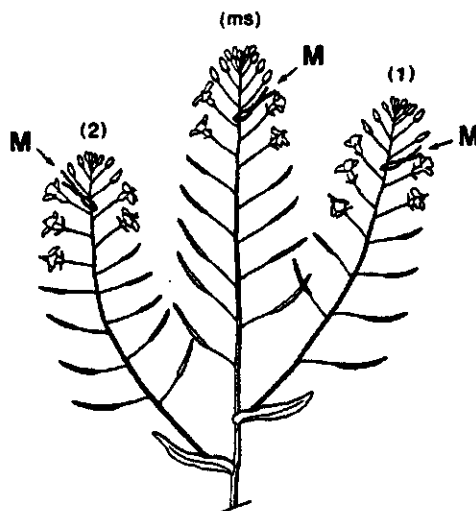


Figure 3. Marking with (m) coloured wire on the main stem (ms) and first two primary branches at the onset of flowering of individual buds for measurements of individual pod and seed growth (Experiment 1)

2.5 Chemical analysis

Reserve carbohydrates (starch and sugars) were measured in the first experiment only, in roots, leaves, stems and pod hulls. Sugars were analysed according to Shaeffer & Somogyi, 1970 (NEN 3574). Starch after enzymatic hydrolysis was analysed similarly to sugars. The oil content of the seed was determined by the Soxhlet method with petroleum ether extraction at 40-60 °C. Total N and C concentration of the plant material was determined with the Heraeus C and N rapid method. N-nitrate content was determined with an auto-analyser with sulfanilamide. The ash concentration was determined after drying for one hour at 550 °C. Data file information can be found in Appendix 7.

2.6 Soil water content and weather conditions

From early spring onwards, the moisture content of two soil layers (0-20 cm and 20-40 cm depth) was measured periodically. A pF-curve of a similar soil type was used to estimate the water availability of the crop (Appendix 10). The depth of the ground water level was recorded with vertical soil tubes.

Maximum and minimum daily temperature and daily global solar radiation, were obtained from the meteorological weather station in Wageningen (Haarweg) situated about 10 km from the location of the experimental farm, de Bouwing (Appendix 11). At the location of the field experiments, the temperature and humidity of the air were measured continuously in the open air and under the black plastic netting for shading (Appendix 5). These data were used to get an idea of the influence of these nettings on the weather conditions experienced by the crop.

2.7 Statistical methods

Analyses of variance (ANOVA) were carried out with the statistical program package GENSTAT (Payne et al., 1987). The analyses were carried out per harvest date and for the combined harvests (see Chapter 3).

The standard error of differences of means (SED) and the lowest significant difference (LSD_x) are calculated according to the following formulae:

$$\text{SED} = \sqrt{\left(\frac{\delta^2}{r_x} + \frac{\delta^2}{r_y} \right)}$$

δ^2 : residual mean square, per analysis of variance
 $r_{x,y}$: number of replicates per mean value

$$\text{LSD}_{.05} = t_{.05} * \text{SED}$$

t_x : t-test for a given number of degrees of freedom and a given level of significance (= 0.05).

3 Crop growth analysis and field measurements

3.1 Crop development

Table 3.1.1 Crop development according the development scale of Habekotte (1978) and seed development of the lowest third part of the main stem according to Sylvester Bradley (1984) in 1988/89 (Experiment 1). The temperature sum (in degree days) was calculated with a basic temperature of 0 °C

Date	Julian day-number	Temperature sum (from 1-1-'89)	Habekotté	Development stage	Sylvester-Bradley
23- 8-'88	235	-	0	(sowing)	-
31- 8	243	-	1	(emergence)	-
22- 9	265	-	2+	(2-5 leaves)	-
15-10	288	-	3	(rosette)	-
5- 3'89	64	299	5	(stem elongation)	-
11- 3	70	355	6	(flower buds are visible)	-
30- 3	89	501	7 1/2	(# 1 % flowering)	-
10- 4	100	575	8 -	(25 % flowering)	-
14- 4	104	614	8	(50 % flowering)	-
18- 4	108	646	8 +	(#70 % flowering)	-
11- 5	131	842	9	(full flowering)	-
22- 5	142	1005	10	(end of flowering)	6.2
12- 6	163	1284	13	(seeds green)	6.3
19- 6	170	1413	14 -	(seeds green-brown mottled)	6.4
26- 6	177	1535	14 +	(most seeds brown)	6.5
6- 7	187	1697	15	(tr. 1,2,3; seeds black, soft)	6.7
10- 7	191	1780	15 1/2	(tr. 1,2,3) (seeds black, hard)	6.7/6.8
24- 7	205	2008	15 1/2	(tr.4)	6.7/6.8
moisture content of the seeds at final harvest:				tr.1: 14.4 %	tr.3: 15.0 %
				tr.2: 16.5 %	tr.4: 20.4 %

Table 3.1.2 Crop development of the early sowings (Treatment 1,2,4) according to the development scale of Habekotté (1978) and seed development of the lowest third of the main stem according to Sylvester Bradley (1984) in 1989/90 (Experiment 2). The temperature sum (in degree days) was calculated with a basic temperature of 0 °C

Date	Julian day-number	Temperature		Development stage	
		sum (from 1-1-'89)	Habekotté		Sylvester-Bradley
24- 8-'89	236	-	0	(sowing)	-
2- 9	245	-	1	(emergence)	-
18- 9	265	-	2+	(2-5 leaves)	-
6-10	283	-	3	(rosette)	-
20- 2-'90	64		5 +	(stem elongation)	-
15- 3	74		6	(flower buds are visible)	-
28- 3	87	591	7	(growth of side branches)	-
5- 4	95	653	8 -	(1.5 % flowering)	-
13- 4	103	697	8	(50 % flowering)	-
21- 4	111	754	8 +	(#90 % flowering)	-
14- 5	134	1056	10	(end of flowering)	6.1
24- 5	144	1179	11 +	(seeds green)	6.3
31- 5	151	1250	12	(,,)	6.3
8- 6	159	1364	13	(,,)	6.3
25- 6	176	1599	14	(seeds green mottled)	6.4
4- 7	185	1748	15	(seeds black, soft)	6.7
9- 7	190	1820		(final harvest)	

Table 3.1.3 Crop development of the late sowing (Treatment 3) according the development scale of Habekotté (1978) and seed development of the lowest third of the main stem according to Sylvester Bradley (1984) in 1989/90 (Experiment 2). The temperature sum (in degree days) was calculated with a basic temperature of 0 °C

Date	Julian day-number	Temperature		Development stage	
		sum (from 1-1-'89)	Habekotté		Sylvester-Bradley
8- 9'89	251	-	0	(sowing)	-
19- 9	262	-	1	(emergence)	-
6-10	279	-	2+	(2-5 leaves)	-
1-11	305	-	3	(rosette)	-
28- 2-'90	59		5	(stem elongation)	-
15- 3	74		6 -	(flower buds are visible)	-
28- 3	87		6 +	(flower buds are visible)	-
5- 4	95	591	7 1/2	(growth of side branches)	-
13- 4	103	653	8	(50 % flowering)	-

see Table 3.1.2 for the following stages

3.2 Plant density and plant height

Table 3.2.1 Plant density (m²) per treatment and harvest (Experiment 1)

Treat-ment	Harvest														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	39	21	24	20	23	23	21	23	24	24	21	24	21	22	
2	84	79	83	71	66	64	59	63	62	61	62	70	62	68	
3	39	21	25	23	24	22	21	24	22	23	24	24	23	21	
4	42	22	22	25	22	24	23	22	25	28	23	22	24	23	23

LSD.05 (all harvests) 8.46

Table 3.2.2 Crop height (cm), per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	28	68	109	141	154	151	158	157	159	
2	-	27	64	105	139	154	150	154	155	160	
3	-	23	74	113	143	163	169	175	175	183	
4	-	26	67	102	137	159	158	158	160	160	162
LSD.05		7	9	9	8	8	9	7	10	6	
LSD.05 (all harvests) 7.45											

Table 3.2.3 Plant density (m⁻²) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	43	44	44	41	40	41	41
2	58	54	48	51	49	43	44
3	59	64	58	60	56	48	54
4	41	44	38	39	42	41	41
LSD.05	6	10	7	6	8	10	6 a
LSD.05	8	12	9	7	9	11	7 b
LSD.05 (all harvests) 7 a, 9 b							

a: for comparison with Treatment 1

b: for comparison with the other treatments

Table 3.2.4 Crop height (cm), per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	128	154	167	168	168	168
2	-	119	150	167	162	166	166
3	-	89	125	138	142	144	143
4	-	115	157	180	176	174	180
LSD.05		4	5	10	7	7	9 a
LSD.05		5	6	11	9	8	10 b
LSD.05 (all harvests) 7 a, 8 b							

3.3 Total dry matter production, seed yield and mean seed weight

Table 3.3.1 Total dry matter (kg/ha) per treatment and harvest (Experiment 1)

Treat- ment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	1423	1721	3069	4037	6029	8468	10795	12077	12162	11647	
2	1687	2495	4160	5972	7000	9325	10630	12756	12826	12791	
3	1290	1462	2883	4050	5251	7264	9449	10875	11433	10072	
4	1202	1316	2454	3806	4444	5678	5796	6507	6966	6829	6336
LSD.05	317	731	706	482	1395	938	1738	2388	1295	1283	
LSD.05 (all harvests)	1179										

Table 3.3.2 Total dry matter (kg/ha), including dead leaves and removed side branches in Treatment 3, per treatment and harvest (Experiment 1)

Treat- ment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	1423	1721	3069	4176	6351	9167	11689	13313	13449	12926	
2	1687	2495	4199	6216	7539	10394	11943	14336	14471	14448	
3	1290	1462	2883	4491	5802	8281	10755	12384	12991	11652	
4	1202	1316	2454	3846	4726	6239	6493	7375	7957	7922	7460
LSD.05	317	731	710	501	1144	931	1556	2254	1345	1175	
LSD.05 (all harvests)	1128										

Table 3.3.3 Total above ground dry matter (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1097	1449	2692	3707	5552	6265	7898	9466	10182	10867	11470	11572	11603	10991	
2	1270	2083	3706	5407	6382	7136	8712	10385	10057	11595	12153	13352	12204	12112	
3	1001	1243	2559	3524	4636	5846	6600	7769	8673	9842	10231	10485	10807	9500	
4	939	1112	2170	3436	4061	3831	5212	4941	5402	6079	6127	5919	6544	6421	5936
LSD.05	235	636	617	429	1278	1236	876	815	1627	2175	2253	2153	1231	1246	
LSD.05 (all harvests)	1206														

Table 3.3.4 Dry weight of seeds (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	673	1654	2471	3746	4215	4466	3971	
2	-	-	-	-	-	-	-	902	1657	2072	3878	4661	4553	4616	
3	-	-	-	-	-	-	-	323	1244	1820	2829	3357	3859	3251	
4	-	-	-	-	-	-	-	221	526	904	1494	1701	2239	2350	1962
LSD.05								212	320	505	876	762	532	461	
LSD.05 (all harvests)	516														

Table 3.3.5 Mean seed weight (g) per treatment and harvest (Experiment 1)

Treatment	Harvest														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	1.08	1.66	2.61	3.33	4.44	4.72	4.44	
2	-	-	-	-	-	-	-	1.00	1.58	2.47	3.29	4.53	4.88	4.59	
3	-	-	-	-	-	-	-	0.90	1.48	2.50	3.12	4.21	4.53	4.60	
4	-	-	-	-	-	-	-	0.56	1.02	1.98	2.79	4.06	4.35	4.53	4.11
LSD.05								0.196	0.273	0.375	0.406	0.543	0.182	0.551	
LSD.05 (all harvests)	0.360														

Table 3.3.6 Total dry matter (kg/ha) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	4459	8497	9674	9838	12647	14529	14414
2	5436	9606	9706	11075	14191	14294	14800
3	1843	5986	8800	9021	11999	11741	12051
4	3903	8132	8140	7789	8763	9024	9097
LSD.05	626	846	1041	1100	1962	1199	1831 a
LSD.05	722	1197	1202	1270	2266	1384	2114 b
LSD.05 (all harvests) 1311 a							

a: for comparison with Treatment 1

b: for comparison with the other treatments

Table 3.3.7 Total dry matter, including dead leaves (kg/ha) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	4459	8647	10528	11547	14618	16892	17007
2	5436	9606	10552	12791	16199	16661	17393
3	1843	5986	8928	10007	13322	13546	14072
4	3903	8132	9247	9653	10856	11386	11707
LSD.05	626	966	1122	1200	1929	1148	1885 a
LSD.05	722	1115	1296	1385	2228	1325	2176 b
LSD.05 (all harvests) 1207 a, 1555 b							

Table 3.3.8 Total above ground dry matter (kg/ha) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	3830	7606	8795	8987	11830	13652	13553
2	4670	8537	8814	10064	13259	13438	13849
3	1637	5371	8146	8315	11385	11174	11475
4	3314	7293	7335	6956	7966	8210	8241
LSD.05	505	871	1025	947	1867	1129	1805 a
LSD.05	582	1006	1183	1093	2156	1303	2084 b
LSD.05 (all harvests) 1226 a 1415 b							

Table 3.3.9 Dry weight of seeds (kg/ha) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	-	-	795	2419	3641
2	-	-	-	-	1044	2693	3697
3	-	-	-	-	728	2647	3716
4	-	-	-	-	244	985	1516
LSD.05					155	558	515 a
LSD.05					179	644	594 b
LSD.05 (all harvests) 468 a, 540 b							

Table 3.3.10 Mean seed weight (g) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	-	-	1.38	4.23	5.13
2	-	-	-	-	1.44	4.33	5.02
3	-	-	-	-	1.11	4.23	5.16
4	-	-	-	-	1.11	3.88	5.34
LSD.05					0.168	0.306	0.248 a
LSD.05					0.193	0.353	0.287 b
LSD.05 (all harvests) 0.242 a 0.279							

3.4 Dry weight of various plant organs

Table 3.4.1 Dry weight of roots (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	326	273	377	330	476	570	614	607	558	656	
2	417	413	453	566	618	613	573	603	621	679	
3	289	219	323	527	615	665	775	645	626	572	
4	263	204	284	371	383	466	393	381	422	407	400
LSD.05	91.7	99.3	100	74.3	164	113	141	153	98.9	119	
LSD.05 (all harvests) 113											

Table 3.4.2 Dry weight of green leaves (kg/ha) per treatment and harvest (Experiment 1)

Treat- ment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	803	870	1277	1154	975	599	404	61.6	10.2	18.7	
2	914	1258	1585	1416	1120	589	346	79.1	13.5	2.0	
3	741	805	1181	1034	1042	577	287	84.3	35.2	13.2	
4	719	686	1017	1097	872	593	457	286.0	164.0	61.9	29.9
LSD.05	161	386	329	120	347	148	201	55.8	78.8	22.5	
LSD.05 (all harvests)	199										

Table 3.4.3 Dry weight of the lowest two leaves of the main stem (kg/ha) per treatment and harvest (Experiment 1)

Treat- ment	Harvest				
	1	2	3	4	5
1	179	131	161	182	176
2	204	214	220	311	233
3	143	131	138	198	240
4	165	108	139	194	182
LSD.05	41.7	66.2	42.8	55.7	56.0
LSD.05 (all harvests)	48.9				

Table 3.4.4 Dry weight of the leaves of the main stem in beneath 60 cm (crop layer B) per treatment and harvest (Experiment 1)

Treat- ment	Harvest									
	1	2	3	4	5	7	9	11	13	
1	803	870	1277	709	421	63.5	29.4			
2	914	1258	1585	960	484	66.1	14.7			
3	741	805	1181	870	720	205.8	26.5			
4	719	686	1017	711	381	100.5	32.2	10.9	2.8	
LSD.05	161	386	329	101	236	60.7	37.1			
LSD.05 (all harvests)	202									

Table 3.4.5 Dry weight of leaves of the side branches in beneath 60 cm (crop layer B), per treatment and harvest (Experiment 1)

Treatment	Harvest									
	1	2	3	4	5	7	9	11	13	
1	-	-	-	214.8	177.4	91.7	28.6	0.61		
2	-	-	-	108.7	109.4	57.4	14.5	3.31		
3	-	-	-	60.9	136.8	119.9	68.0	20.95	6.15	
4	-	-	-	186.6	229.8	154.7	97.6	39.70	26.69	
LSD.05				61.9	78.8	66.9	50.9	24.8		
LSD.05 (all harvests) 53.9										

Table 3.4.6 Dry weight of green leaves above 60 cm (crop layer A) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	229	376	444	346	61.0	10.2	18.7	
2	-	-	-	346	526	466	316	75.8	13.5	2.0	
3	-	-	-	100	185	251	192	63.3	29.0	13.2	
4	-	-	-	198	261	338	327	235.4	134.5	61.9	29.9
LSD.05					88.2	145.9	111	135	43	62.7	22.5
LSD.05 (all harvests) 89.8											

Table 3.4.7 Dry weight of the stems (kg/ha), per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	12	14	15
1	293	579	1288	2222	3872	5016	4942	4976	4453	4715	
2	356	824	1959	3527	4558	5477	5044	5053	4878	5038	
3	260	438	1264	2336	3244	4336	4617	4595	4308	4037	
4	220	426	1047	2022	2706	3383	2924	2863	2748	2690	2695
LSD.05	82.5	268	335	307	869	708	843	880	525	860	
LSD.05 (all harvests) 596											

Table 3.4.8 Dry weight of the main stem (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	12	14	15
1	293	579	1188	1595	2099	2640	2540	2604	2257	2447	
2	356	824	1907	3092	3290	3558	3214	3262	3240	3104	
3	260	438	1187	2237	2521	2813	2914	2742	2668	2494	
4	220	426	975	1605	1656	1826	1714	1716	1738	1658	1605
LSD.05	82.5	268	305	372	715	615	641	871	366	555	
LSD.05 (all harvests)	483										

Table 3.4.9 Dry weight of the main stem, crop layer-B (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	293	579	1188	1340	1553	1862	1808	1833	1611	1761	-
2	356	824	1907	2394	2171	2324	2144	2108	2105	2085	-
3	260	438	1187	1814	1813	1916	1904	1734	1679	1563	-
4	220	426	975	1364	1314	1392	1258	1262	1292	1254	1201
LSD.05	82.5	268	305	275	421	368	438	476	192	361	
LSD.05 (all harvests)	309										

Table 3.4.10 Dry weight of the main stem, crop layer-A (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	254	546	779	733	771	646	686	
2	-	-	-	695	1119	1233	1069	1154	1135	1020	
3	-	-	-	418	708	897	1010	1007	989	931	
4	-	-	-	239	342	434	456	454	446	405	404
LSD.05				158	337	259	245	438	210	218	
LSD.05 (all harvests)	254										

Table 3.4.11 Dry weight of side branches (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	99.7	629	1773	2376	2401	2372	2196	2268	
2	-	-	52.3	438	1268	1919	1830	1792	1638	1934	
3	-	-	77.0	105	723	1523	1703	1854	1640	1543	
4	-	-	72.7	419	1050	1557	1210	1146	1010	1032	1090
LSD.05			52.8	153	298	453	381	485	475	478	
LSD.05 (all harvests)			344								

Table 3.4.12 Dry weight of the side branches, crop layer-B (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	100	268	331	291	263	191	219	236	
2	-	-	52	107	97	60	121	90	62	81	
3	-	-	77	45	338	302	548	520	595	431	
4	-	-	73	186	280	296	176	150	157	125	129
LSD.05			52.8	74.7	137	153	127	154	144	86.2	
LSD.05 (all harvests)			106.2								

Table 3.4.13 Dry weight of the side branches, crop layer-A (kg/ha) per and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	361	1442	2085	2138	2181	1977	2032	
2	-	-	-	331	1170	1859	1709	1701	1576	1853	
3	-	-	-	60	385	1221	1155	1334	1045	1112	
4	-	-	-	233	770	1261	1034	997	853	906	961
LSD.05				138	226	383	337	384	394	410	
LSD.05 (all harvests)				315							

Table 3.4.14 Dry weight of flower buds and flowers (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest					
	1	2	3	4	5	7
1	-	-	127.1	329.1	474.0	4.28
2	-	-	162.8	461.0	529.7	2.48
3	-	-	113.5	148.6	209.6	99.16
4	-	-	105.8	314.7	384.9	3.64
LSD.05			53.9	76.7	113.9	35.2
LSD.05 (harvests) 67.6						

Table 3.4.15 Dry weight of flower buds (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest					
	1	2	3	4	5	7
1	-	-	127.1	262.5	221.4	0.0
2	-	-	162.8	362.8	241.3	0.0
3	-	-	113.5	94.1	122.3	29.4
4	-	-	105.8	254.3	167.5	0.0
LSD.05			53.9	53.3	59.3	
LSD.05 (harvests) 49.3						

Table 3.4.16 Dry weight of flowers (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest					
	1	2	3	4	5	7
1	-	-	-	66.3	253.0	4.29
2	-	-	-	97.8	287.3	2.48
3	-	-	-	54.1	86.8	69.73
4	-	-	-	60.1	216.2	3.64
LSD.05				31.0	66.6	
LSD.05 (all harvests) 50.2						

Table 3.4.17 Dry weight of pods (hull + seed) (kg/ha) per treatment and harvest (Experiment 1)

Treat- ment	Harvest														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	3.41	231	926	2279	3890	4776	5639	6375	6898	7105	6222	
2	-	-	-	4.69	176	885	2643	4493	4604	5545	6958	7850	7256	7035	
3	-	-	-	8.10	141	726	1588	2750	3726	4885	5508	6045	6433	5429	
4	-	-	-	2.89	99	308	1233	1622	1965	2658	2878	2988	3553	3600	3178
LSD.05				4.00	57.5	225	327	367	699	1160	1414	1275	788	641	
LSD.05 (all harvests) 711															

Table 3.4.18 Dry weight of the pod hull (kg/ha) per treatment and harvest (Experiment 1)

Treat- ment	Harvest														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	3.41	231	926	2279	3217	3122	3168	2629	2683	2639	2252	
2	-	-	-	4.69	176	885	2643	3591	2947	3474	3080	3189	2703	2419	
3	-	-	-	8.10	141	726	1588	2426	2482	3065	2679	2688	2574	2178	
4	-	-	-	2.89	99	308	1233	1400	1439	1754	1384	1287	1314	1250	1216
LSD.05				4.00	57.5	225	327	427	470	743	610	557	294	281	
LSD.05 (all harvests) 383															

Table 3.4.19 Dry weight of aborted pods, still attached to the plants (kg/ha) per treatment and harvest (Experiment 1)

Treat ment	Harvest														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	-	-	-	80.0	59.9	61.5	57.7	63.4	35.2	36.2	
2	-	-	-	-	-	-	-	83.2	63.2	82.5	62.8	75.0	57.1	37.3	
3	-	-	-	-	-	-	-	43.5	43.4	40.2	43.4	39.9	30.5	22.0	
4	-	-	-	-	-	-	-	31.3	55.5	68.1	100.0	102.3	78.7	71.3	32.9
LSD.05								20.9	19.8	13.2	26.5	31.5	35.2	16.2	
LSD.05 (all harvests) 23.2															

Table 3.4.20 Dry weight of roots (kg/ha) per treatment and harvest (Experiment 2)

Treat- ment	Harvest						
	1	2	3	4	5	6	7
1	529	891	879	851	817	877	862
2	766	1069	892	1011	932	856	952
3	206	614	654	706	614	567	576
4	589	839	805	833	797	814	857
LSD.05	200	217	125	154	144	113	91 a
LSD.05	230	251	144	178	166	130	105 b
LSD.05 (all harvests) 157 a, 182 b							

a: for comparison with Treatment 1

b: for comparison with the other treatments

Table 3.4.21 Dry weight of green leaves (kg/ha) per treatment and harvest (kg/ha) (Experiment 2)

Treat- ment	Harvest						
	1	2	3	4	5	6	7
1	2304	2562	1858	1004	741	350	119
2	2731	2688	1842	971	681	320	95
3	1178	1991	2029	1170	834	352	136
4	2062	2659	1553	795	566	297	49
LSD.05	384	375	326	142	175	132	86 a
LSD.05	444	433	376	164	202	152	100 b
LSD.05 (all harvests) 252 a, 291 b							

Table 3.4.22 Dry weight of stems (kg/ha) per treatment and harvest (Experiment 2)

Treat- ment	Harvest						
	1	2	3	4	5	6	7
1	1526	4706	6043	6145	6174	6212	5867
2	1939	5415	6044	6814	6765	6117	6154
3	459	3109	5297	5299	5497	4302	4203
4	1252	4326	5118	5441	5231	4900	4990
LSD.05	239	511	803	651	1036	534	705 a
LSD.05	276	590	927	753	1196	617	814 b
LSD.05 (all harvests) 641 a, 740 b							

Table 3.4.23 Dry weight of the main stem (kg/ha) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	1526	4471	4733	4525	4238	4120	3851
2	1939	5111	4696	4980	4580	4238	4154
3	459	2941	4109	3324	3171	2686	2352
4	1252	4078	4377	4323	3901	3532	3647
LSD.05	239	528	858	550	721	463	551 a
LSD.05	276	610	991	635	833	534	636 b
LSD.05 (all harvests) 548 a, 632 b							

Table 3.4.24 Dry weight of side branches per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	236	1310	1619	1936	2092	2016
2	-	304	1348	1834	2186	1879	2000
3	-	168	1188	1975	2326	1616	1851
4	-	248	741	1118	1330	1368	1342
LSD.05		100	253	236	418	269	225 a
LSD.05		116	292	273	483	311	260 b
LSD.05 (all harvests) 244 a, 282 b							

Table 3.4.25 Dry weight of flowers and flower buds per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	338	685	-	-	-	-
2	-	434	677	-	-	-	-
3	-	271	662	-	-	-	-
4	-	308	553	-	-	-	-
LSD.05		62	86 a				
LSD.05		71	100 b				
LSD.05 (all harvests) 82 a, 95 b							

Table 3.4.26 Dry weight of pods (hull + seeds) (kg/ha) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	209	1839	4728	6688	7324
2	-	-	251	2279	5605	6669	7403
3	-	-	158	1846	4949	6341	7025
4	-	-	112	721	1940	2716	2898
LSD.05			56	342	727	737	1016 a
LSD.05			65	395	839	851	1173 b
LSD.05 (all harvests) 681 a, 786 b							

Table 3.4.27 Dry weight of pod hulls (kg/ha) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	209	1839	3933	4269	3682
2	-	-	251	2279	4561	3976	3706
3	-	-	158	1846	4221	3694	3309
4	-	-	112	721	1695	1732	1382
LSD.05			56	342	681	360	587 a
LSD.05			65	395	786	509	677 b
LSD.05 (all harvests) 453 a, 524 b							

Table 3.4.28 Dry weight of aborted pods (kg/ha), still attached to the plants (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	-	-	187	402	244
2	-	-	-	-	208	331	197
3	-	-	-	-	105	179	112
4	-	-	-	-	229	297	304
LSD.05					79	85	68 a
LSD.05					91	99	78 b
LSD.05 (all harvests) 73 a, 84 b							

3.5 Senescence of leaves

Table 3.5.1 Dry weight of yellow (part of) leaves, still attached to the plants per treatment and harvest (Experiment 1)

Treatment	Harvest														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	84.0	57.7	41.2	33.3	68.9	53.4	39.7	40.0	46.1	41.2	46.4	24.9	8.5	21.9	
2	100.4	62.9	46.0	80.3	111.1	113.4	56.0	69.0	58.6	48.8	27.0	27.0	21.9	13.9	
3	49.6	31.1	45.6	37.1	112.9	99.9	91.5	88.8	94.8	73.9	29.3	27.4	24.7	18.2	
4	75.6	28.9	36.8	25.0	98.6	69.0	29.9	28.9	30.3	39.7	53.2	56.4	93.4	84.7	45.4

Table 3.5.2 Number of scars of leaves per plant, treatment and harvest (Experiment 1)

Treatment	Harvest			
	1	2	3	4
1	6.8	8.6	11.2	10.6
2	6.8	8.0	9.8	10.4
3	7.1	8.3	11.4	11.3
4	6.1	8.4	9.7	13.7
LSD.05	1.46	1.24	1.71	2.34
LSD.05 (all harvests)	1.62			

Table 3.5.3 Loss of leaves (kg/ha) per period between successive harvests, calculated by the product of the difference in the number of scars (Table 3.5.2) and the dry weight per old leaf (Table 3.4.3) (Experiment 1)

Treatment	perioden		
	1-2	2-3	3-4
1	140	190	-
2	125	195	79.8
3	82.2	209	-
4	158	80.6	334

3.6 Specific area of leaves, stems and pods

Table 3.6.1 Specific area of leaves of the main stem, without the lowest two leaves (harvest 1,2,3,4,5; Table 3.6.2) and without the highest young leaves (harvest 2 and 3; Table 3.6.3) crop layer-B (cm²/g), per treatment and harvest (Experiment 1)

trial	Harvest								
	1	2	3	4	5	7	9	11	13
1	95.7	118	135	190	205	184	215		
2	102.0	129	164	234	229	186	377		
3	97.0	115	127	173	154	142	197		
4	97.8	115	133	205	230	195	263	239	223
LSD.05	7.45	9.95	16.5	20.8	18.5	21.9	-)		
LSD.05 (all harvests) 15.6									

Table 3.6.2 Specific leaf area of the oldest and lowest two leaves of the main stem, crop layer-B (cm²/g) per treatment and harvest (Experiment 1)

trial	Harvest				
	1	2	3	4	5
1	106	112	110	155	170
2	104	115	143	207	207
3	116	104	107	151	141
4	103	106	110	167	175
LSD.05	15.5	23.8	11.4	17.4	13.9
LSD.05 (all harvests) 16.9					

Table 3.6.3 Specific leaf area of the highest and young leaves of the main stem, in crop layer-B (cm²/g) per treatment and harvest (Experiment 1)

Treatment	Harvest		
	1	2	3
1	-	140	177
2	-	145	169
3	-	141	173
4	-	136	177
LSD.05		12.0	17.0
LSD.05 (all harvests) 15.4			

Table 3.6.4 Specific leaf area of leaves of the side branches, crop layer-B (cm²/g) per treatment and harvest (Experiment 1)

Treatment	Harvest									
	1	2	3	4	5	7	9	11	13	
1	-	-	-	300	268	207	290	213		
2	-	-	-	346	324	276	320	277		
3	-	-	-	302	215	210	268	268	262	
4	-	-	-	340	315	275	368	330	329	
LSD.05				27.3	26.6	34.0	-)	-)		
LSD.05 (all harvests)	29.1									

Table 3.6.5 Specific leaf area, crop layer-A (cm²/g) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	217	200	158	242	186	194	164	
2	-	-	-	222	212	189	235	197	205	197	
3	-	-	-	181	141	152	190	216	222	205	
4	-	-	-	241	261	243	304	284	288	263	189
LSD.05				18.6	12.0	28.6	25.8	27.7	-)	-)	
LSD.05 (all harvests)	21.6										

Table 3.6.6 Specific stem area of the main stem, crop layer-B (cm²/g) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	9.10	11.73	9.10	9.05	8.51	8.65	8.70	7.93	7.74	
2	-	11.77	15.70	12.66	11.81	10.55	10.74	11.40	11.89	9.77	
3	-	9.30	11.25	7.57	6.63	7.07	9.44	8.05	8.11	7.58	
4	-	9.96	15.69	10.48	10.52	9.37	10.96	11.08	15.06	9.62	10.84
LSD.05		2.82	7.14	1.29	1.71	1.41	3.68	1.96	5.93	1.21	
LSD.05 (all harvests)	3.40										

Table 3.6.7 Specific stem area of the main stem, crop layer-A (cm²/g) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	22.6	15.2	14.4	15.8	18.0	12.1	16.0	
2	-	-	-	21.3	16.5	14.7	16.0	20.1	15.5	16.0	
3	-	-	-	16.3	13.2	11.5	11.5	14.0	11.2	12.5	
4	-	-	-	22.6	22.5	18.0	21.9	23.2	19.6	25.1	19.4
LSD.05				2.07	4.08	1.50	3.27	5.54	2.99	8.89	
LSD.05 (all harvests) 4.21											

Table 3.6.8 Specific area of side branches, crop layer-B (cm²/g) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	31.5	24.0	26.8	30.8	27.0	25.1	26.5	
2	-	-	-	38.7	42.7	45.1	30.8	32.4	51.8	31.5	
3	-	-	-	42.0	25.4	28.4	26.4	26.5	26.2	29.8	
4	-	-	-	40.0	35.7	34.0	36.8	45.7	39.7	37.6	36.2
LSD.05				15.0	6.97	10.7	11.7	13.2	17.7	6.07	
LSD.05 (all harvests) 11.3											

Table 3.6.9 Specific area of side branches, crop layer-A (cm/g) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	38.0	32.2	37.8	34.7	34.3	33.3	39.3	
2	-	-	-	39.4	37.0	39.5	39.6	37.1	39.5	33.7	
3	-	-	-	43.3	28.8	35.8	33.8	34.1	36.1	32.1	
4	-	-	-	44.2	46.7	55.2	50.7	52.5	64.0	50.8	35.8
LSD.05				12.8	3.18	4.79	4.77	4.11	17.2	11.8	
LSD.05 (all harvests) 9.14											

Table 3.6.10 Specific pod area (cm²/g) per treatment and harvest (Experiment 1)

Treat- ment	Harvest													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	-	-	-	-	62.0	59.8	55.9	33.6	27.4	21.4	19.8	16.2	18.47	18.48
2	-	-	-	-	66.6	67.7	63.5	35.3	28.2	25.9	19.6	17.8	18.53	18.51
3	-	-	-	-	58.8	57.0	51.7	43.9	30.6	26.3	20.9	17.9	19.23	19.06
4	-	-	-	-	80.8	75.1	57.8	47.5	39.0	29.5	29.4	22.7	23.57	22.26
LSD.05	-	-	-	-	5.45	7.03	14.9	6.32	4.05	3.99	3.19	2.01	2.84	0.561
LSD.05 (all harvests) 7.28														

Table 3.6.11 Specific leave area (cm²/g) per treatment and harvest (Experiment 2)

trial	Harvest						
	1	2	3	4	5	6	7
1	144	169	195	208	181	174	159
2	141	160	194	196	176	163	144
3	147	179	177	264	223	189	171
4	145	154	232	242	232	187	196
LSD.05	12	14	32	26	25	17	20 a
LSD.05	14	16	37	30	28	19	23 b
LSD.05 (all harvests) 21 a, 23 b							

a: for comparison with Treatment 1

b: for comparison with the other treatments

Table 3.6.12 Specific area of the main stem (cm²/g) per treatment and harvest (Experiment 2)

Treat- ment	Harvest						
	1	2	3	4	5	6	7
1	-	10.6	10.2	10.4	8.75	8.97	8.39
2	-	10.5	10.5	9.74	8.68	9.52	8.09
3	-	13.2	13.1	10.6	9.35	9.94	8.62
4	-	9.90	11.5	12.0	9.66	9.51	9.44
LSD.05		0.81	2.0	0.76	0.74	0.68	0.76 a
LSD.05		0.94	2.3	0.88	0.86	0.79	0.88 b
LSD.05 (all harvests) 0.97 a, 1.12 b							

Table 3.6.13 Specific area of side branches (cm²/g) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	39.5	37.7	44.8	33.7	38.9	23.1
2	-	39.4	37.9	42.4	32.5	40.3	22.7
3	-	45.0	40.7	41.8	32.7	35.7	22.4
4	-	37.6	48.9	61.0	48.3	52.5	32.9
LSD.05		4.6	4.6	2.9	3.9	3.1	1.6 a
LSD.05		5.3	5.3	3.4	4.6	3.6	1.9 b
LSD.05 (all harvests) 3.3 a, 3.8 b							

Table 3.6.14 Specific pod area (cm²/g) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	51.7	51.1	31.3	27.4	21.8
2	-	-	51.1	46.8	29.5	25.5	20.2
3	-	-	52.6	52.0	33.1	25.8	19.7
4	-	-	59.9	67.7	34.9	29.4	23.1
LSD.05			4.4	4.6	4.7	3.5	1.8 a
LSD.05			5.1	5.3	5.4	4.0	2.1 b
LSD.05 (all harvests) 3.8 a, 4.4 b							

3.7 Area indices of leaves stems and pods

Table 3.7.1 Total area index (m^2/m^2) of the crop (leaves, stems, pods) per treatment and harvest (Experiment 1)

trial	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	0.787	1.092	1.92	2.82	2.94	3.45	3.40	2.49	2.23	2.29	
2	0.934	1.703	2.86	3.92	3.54	4.07	3.22	2.65	2.43	2.33	
3	0.749	0.978	1.71	2.08	2.11	2.49	2.56	2.21	2.09	1.78	
4	0.705	0.834	1.58	2.88	2.93	3.16	3.02	2.48	2.18	1.68	1.36
LSD.05	0.187	0.472	0.517	0.448	0.845	0.688	0.731	0.598	0.461	0.340	
LSD.05 (all harvests) 0.492											

Table 3.7.2 Total area index of the crop (leaves, stems, pods) in crop layer-B (m^2/m^2) per treatment and harvest (Experiment 1)

trial	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	0.787	1.092	1.92	2.12	1.49	0.545	0.392	0.211	0.182	0.198	
2	0.934	1.703	2.86	2.88	1.69	0.549	0.356	0.281	0.276	0.230	
3	0.749	0.978	1.71	1.80	1.56	0.761	0.554	0.327	0.306	0.246	
4	0.705	0.834	1.58	2.24	1.74	0.851	0.634	0.356	0.354	0.164	0.178
LSD.05	0.187	0.472	0.517	0.379	0.543	0.204	0.237	0.136	0.133	0.046	
LSD.05 (all harvests) 0.295											

Table 3.7.3 Total area index (m^2/m^2) of the crop (leaves, stems, pods) in crop layer-A per treatment and harvest (Experiment 1)

trail	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	0.693	1.44	2.90	3.01	2.27	2.05	2.09	
2	-	-	-	1.041	1.84	3.52	2.86	2.36	2.16	2.10	
3	-	-	-	0.275	0.54	1.73	2.00	1.89	1.78	1.53	
4	-	-	-	0.640	1.19	2.31	2.38	2.13	1.82	1.52	1.19
LSD.05				0.255	0.427	0.573	0.675	0.520	0.367	0.322	
LSD.05 (all harvests) 0.445											

Table 3.7.4 Area index of green leaves (m^2/m^2) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	0.787	1.042	1.79	2.42	2.03	1.018	0.999	0.115	0.020	0.031	
2	0.934	1.609	2.55	3.31	2.52	1.157	0.830	0.163	0.027	0.004	
3	0.749	0.936	1.58	1.83	1.62	0.925	0.601	0.189	0.080	0.027	
4	0.705	0.794	1.42	2.51	2.18	1.449	1.425	0.824	0.501	0.163	0.056
LSD.05	0.187	0.455	0.484	0.400	0.732	0.361	0.560	0.132	-)	-)	
LSD.05 (all harvests)	0.396										

Table 3.7.5 Area index of green leaves, crop layer-B (m^2/m^2) per treatment and harvest (Experiment 1)

Treatment	Harvest								
	1	2	3	4	5	7	9	11	13
1	0.787	1.042	1.79	1.92	1.27	0.311	0.156	0.001	
2	0.934	1.609	2.55	2.54	1.40	0.277	0.090	0.009	
3	0.749	0.936	1.58	1.65	1.36	0.543	0.240	0.055	0.016
4	0.705	0.794	1.42	2.03	1.50	0.621	0.430	0.156	0.102
LSD.05	0.187	0.455	0.484	0.349	0.493	0.192	-)	-)	
LSD.05 (all harvests)	0.335								

Table 3.7.6 Area index of green leaves (m^2/m^2), crop layer-A per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	0.503	0.756	0.707	0.842	0.114	0.020	0.031	
2	-	-	-	0.771	1.117	0.880	0.739	0.154	0.027	0.004	
3	-	-	-	0.181	0.258	0.382	0.361	0.134	0.063	0.027	
4	-	-	-	0.484	0.682	0.828	0.995	0.668	0.399	0.163	0.056
LSD.05				0.219	0.349	0.269	0.364	0.086	-)	-)	
LSD.05 (all harvests)	0.254										

Table 3.7.7 Area index of the main stem and the side branches (m^2/m^2) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	12	14	15
1	-	0.051	0.138	0.397	0.765	1.141	1.092	1.103	0.917	1.111	
2	-	0.094	0.300	0.609	0.901	1.180	1.104	1.149	1.063	1.022	
3	-	0.041	0.133	0.248	0.407	0.755	0.822	0.865	0.775	0.715	
4	-	0.041	0.161	0.370	0.670	1.001	0.826	0.825	0.840	0.721	0.600
LSD.05		0.0206	0.0954	0.0557	0.148	0.189	0.103	0.217	0.153	0.297	
LSD.05 (all harvests)		0.149									

Table 3.7.8 Area index of the main stem, crop layer-B (m^2/m^2) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	0.051	0.138	0.122	0.141	0.162	0.155	0.160	0.127	0.136	
2	-	0.094	0.300	0.301	0.256	0.245	0.230	0.243	0.250	0.204	
3	-	0.041	0.133	0.137	0.118	0.135	0.172	0.135	0.135	0.118	
4	-	0.041	0.161	0.142	0.138	0.131	0.139	0.141	0.194	0.120	0.131
LSD.05		0.0206	0.0954	0.0364	0.0437	0.0481	0.0572	0.0714	0.0845	0.0391	
LSD.05 (all harvests)		0.0549									

Table 3.7.9 Area index of the main stem, crop layer-A (m^2/m^2) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	0.056	0.081	0.115	0.116	0.138	0.078	0.116	
2	-	-	-	0.143	0.176	0.182	0.173	0.219	0.176	0.165	
3	-	-	-	0.067	0.092	0.103	0.116	0.136	0.109	0.115	
4	-	-	-	0.054	0.076	0.078	0.099	0.107	0.085	0.101	0.079
LSD.05				0.0215	0.0289	0.0399	0.0045	0.0600	0.0292	0.0730	
LSD.05 (all harvests)		0.0388									

Table 3.7.10 Area index of the side branches, crop layer-B (m^2/m^2) per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	13	14	15
1	-	-	-	0.083	0.078	0.073	0.082	0.051	0.054	0.059	
2	-	-	-	0.037	0.037	0.024	0.035	0.030	0.025	0.025	
3	-	-	-	0.018	0.086	0.084	0.140	0.136	0.155	0.127	
4	-	-	-	0.074	0.100	0.100	0.066	0.060	0.059	0.046	0.047
LSD.05				0.0218	0.0376	0.0319	0.0354	0.0378	0.0378	0.0210	
LSD.05 (all harvests)	0.0283										

Table 3.7.11 Area index of the side branches (m^2/m^2), crop layer-A per treatment and harvest (Experiment 1)

Treatment	Harvest										
	1	2	3	4	5	7	9	11	12	14	15
1	-	-	-	0.136	0.464	0.791	0.739	0.753	0.658	0.800	
2	-	-	-	0.128	0.433	0.729	0.665	0.634	0.612	0.627	
3	-	-	-	0.025	0.110	0.434	0.390	0.458	0.377	0.354	
4	-	-	-	0.101	0.356	0.692	0.523	0.535	0.502	0.455	0.344
LSD.05				0.0468	0.0889	0.156	0.105	0.178	0.133	0.265	
LSD.05 (all harvests)	0.140										

Table 3.7.12 Area index of the pods (m^2/m^2) per treatment and harvest (Experiment 1)

Treatment	Harvest														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	-	-	-	-	0.144	0.554	1.290	1.30	1.31	1.21	1.27	1.12	1.294	1.15	
2	-	-	-	-	0.118	0.598	1.733	1.58	1.28	1.43	1.36	1.40	1.343	1.30	
3	-	-	-	-	0.082	0.413	0.814	1.21	1.13	1.26	1.16	1.08	1.236	1.03	
4	-	-	-	-	0.080	0.230	0.713	0.77	0.76	0.77	0.83	0.67	0.839	0.80	0.707
LSD.05					0.0351	0.134	0.477	0.214	0.265	0.307	0.321	0.240	0.189	0.123	
LSD.05 (all harvests)	0.255														

Table 3.7.13 Total area index (m^2/m^2) of the crop (leaves, stems, pods) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1 (-)	2	3	4	5	6	7
1	3.32	4.87	4.70	4.22	3.85	3.62	2.58
2	3.85	4.95	4.71	4.23	3.98	3.38	2.41
3	1.72	4.05	4.57	5.23	4.60	3.15	2.24
4	2.99	4.58	4.54	3.63	3.01	2.40	1.55
LSD.05	0.60	0.71	0.71	0.60	0.89	0.44	0.45 a
LSD.05	0.70	0.82	0.82	0.69	1.02	0.51	0.52 b
LSD.05 (all harvests) 0.61 a, 0.70 b							

a: for comparison with Treatment 1

b: for comparison with the other treatments

-): The area of the main stem is not measured at the first harvest.

Table 3.7.14 Area index of green leaves (m^2/m^2) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	3.32	4.31	3.63	2.09	1.34	0.61	0.19
2	3.85	4.29	3.58	1.91	1.21	0.53	0.13
3	1.72	3.58	3.45	3.09	1.88	0.67	0.23
4	2.99	4.09	3.60	1.94	1.31	0.55	0.09
LSD.05	0.60	0.65	0.70	0.45	0.40	0.24	0.14 a
LSD.05	0.70	0.75	0.81	0.52	0.46	0.28	0.17 b
LSD.05 (all harvests) 0.47 a, 0.54 b							

Table 3.7.15 Area index of the main stem (m^2/m^2) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	0.473	0.476	0.472	0.372	0.371	0.323
2	-	0.539	0.496	0.485	0.398	0.405	0.336
3	-	0.392	0.549	0.353	0.296	0.267	0.205
4	-	0.405	0.507	0.522	0.379	0.338	0.345
LSD.05		0.082	0.130	0.070	0.079	0.056	0.054 a
LSD.05		0.095	0.150	0.080	0.091	0.065	0.062 b
LSD.05 (all harvests) 0.079 a, 0.091 b							

Table 3.7.16 Area index (m^2/m^2) of the side branches per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	0.091	0.491	0.725	0.654	0.812	0.467
2	-	0.120	0.506	0.776	0.713	0.758	0.453
3	-	0.073	0.480	0.824	0.768	0.578	0.415
4	-	0.093	0.362	0.681	0.642	0.720	0.441
LSD.05		0.035	0.078	0.107	0.182	0.127	0.502 a
LSD.05		0.041	0.090	0.123	0.210	0.146	0.081 b
LSD.05 (all harvests) 0.099 a, 0.114 b							

Table 3.7.17 Area index (m^2/m^2) of the pods per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	0.108	0.933	1.48	1.83	1.60
2	-	-	0.128	1.06	1.66	1.69	1.49
3	-	-	0.083	0.963	1.66	1.64	1.39
4	-	-	0.067	0.486	0.673	0.795	0.668
LSD.05			0.029	0.137	0.330	0.220	0.275 a
LSD.05			0.033	0.158	0.381	0.254	0.317 b
LSD.05 (all harvests) 0.223 a, 0.258 b							

3.8 Light interception

Table 3.8.1 The percentage light interception at 5 cm above ground per treatment and harvest (Experiment 1)

Treatment	Harvest											
	2	3	4	5	6	7	8	9	10	11	12	14
1	45.9	24.9	6.62	2.55	3.94	5.75	5.13	6.09	7.56	15.1	23.5	22.1
2	21.6	6.60	2.02	0.97	2.83	4.05	2.63	3.16	3.60	9.16	14.6	15.0
3	45.9	26.1	18.71	9.02	10.29	10.38	8.21	10.64	9.16	15.7	25.1	23.4
4	45.9	28.5	6.61	1.83	5.08	6.99	6.16	6.79	8.84	11.2	15.5	24.7
LSD.05 (all harvests) 4.02												

Table 3.8.2 The percentage light interception at 60 cm above ground per treatment and harvest (Experiment 1)

Treat- ment	Harvest									
	4	5	6	7	8	9	10	11	12	14
1	41.4	16.4	7.64	8.09	5.39	6.20	7.28	15.85	23.7	22.8
2	32.4	6.78	4.35	5.73	3.94	3.11	3.07	8.91	12.0	15.7
3	70.8	53.0	30.47	22.27	14.78	14.68	12.16	17.96	20.7	24.4
4	46.1	19.1	12.39	14.75	7.40	7.42	8.99	11.45	15.3	25.0

LSD.05 (all harvests) 5.17

Table 3.8.3 The percentage light interception at 5 cm above ground per treatment and date (Experiment 2)

Treat- ment	date												
	28-3	8-4	13-4	23-4	2-5	9-5	14-5	23-5	28-5	12-6	25-6	3-7	13-7
1	2.51	0.63	0.93	0.61	0.39	0.82	1.60	1.47	2.08	3.64	6.80	8.14	12.75
2	2.48	1.44	0.87	0.49	0.18	1.06	1.57	1.47	3.28	3.33	6.57	8.16	9.82
3	15.04	7.17	4.61	1.67	0.77	0.62	0.61	0.39	1.08	1.73	5.50	6.03	7.63
4	2.61	1.85	1.15	0.75	0.14	1.59	3.46	4.44	5.95	7.70	12.46	15.41	16.29

LSD.05 (all harvests) 2.33 a, 2.68 b

a: for comparison with Treatment 1

b: for comparison with the other treatments

Table 3.8.4 The percentage light interception at 60 cm above ground per treatment and date (Experiment 2)

Treat- ment	date							
	9-5	14-5	23-5	28-5	12-6	25-6	3-7	13-7
1	0.52	1.09	1.17	2.13	3.00	6.29	7.50	11.44
2	1.07	1.37	1.42	3.06	2.70	6.32	8.00	11.31
3	1.01	0.95	0.60	0.71	1.43	5.87	6.32	5.84
4	1.59	3.09	5.10	6.12	7.26	13.60	16.36	14.47

LSD.05 (all harvests) 1.98 a, 2.28 b

3.9 Soil water content

Table 3.9.1 Soil water content (percentage by volume) per soil layer (0-20 cm and 20-40 cm), per treatment and date of measurement and the average ground water level (cm depth) per date of measurement (Experiment 1)

date	0 - 20 cm				20 - 40 cm				ground water level(cm)
	t.1	t.2	t.3	t.4	t.1	t.2	t.3	t.4	
12-5	24.2	26.1	24.2	26.8	25.7	28.4	27.0	29.6	
16-5	25.2	26.6	28.8	32.1	27.4	28.4	30.6	33.4	
22-5	21.6	24.4	22.2	28.7	21.5	25.2	23.0	32.4	
26-5	19.8	23.7	19.2	26.8	19.7	24.3	19.7	31.0	128
29-5	25.4	24.9	28.5	30.6	21.3	23.8	28.2	32.1	127
05-6	28.4	29.8	29.2	30.3	25.7	27.9	28.2	27.6	120
12-6	23.7	25.8	30.2	31.0	21.0	25.2	29.6	34.1	120
19-6	24.4	27.4	23.1	26.7	26.1	25.1	24.6	29.6	122
26-6	16.2	20.0	22.2	25.7	15.5	19.2	24.4	25.2	127
03-7	25.5	26.1	28.4	30.8	19.0	21.6	29.8	30.3	125
10-7	29.7	30.9	31.0	30.0	29.4	30.3	31.7	31.0	125
17-7			28.5					31.8	125
24-7			27.3					30.3	130

-) mean soil density : 1.50 (g cm⁻³).

Table 3.9.2 Soil water content (percentage by volume) per soil layer (0-20 cm and 20-40 cm), per Treatment 1,3 and 4 and date of measurement and the average ground water level (cm depth) per date of measurement (Experiment 2)

date	0 - 20 cm			20 - 40 cm			ground water level(cm)
	t.1	t.3	t.4	t.1	t.3	t.4	
24-3	36.0	36.3	36.0	33.4	36.4	33.4	
05-4	35.0	32.8	35.0	33.9	33.6	33.9	
13-4	28.5	29.8	28.5	29.1	30.3	29.1	
18-4	38.6	37.2	38.6	36.0	36.2	36.0	
02-5	28.2	30.6	31.5	30.8	30.9	32.8	
08-5	29.2	30.3	31.7	29.2	30.0	31.2	
14-5	37.7	36.0	37.5	33.4	35.0	35.0	
23-5	29.8	29.7	32.4	29.2	30.2	33.6	
28-5	26.4	27.8	27.9	27.2	28.0	29.1	
06-6	32.2	32.6	36.0	32.1	29.6	34.1	
11-6	33.0	33.8	33.3	29.7	30.6	30.9	
25-6	32.8	33.0	35.6	30.9	31.5	33.6	126
02-7	35.7	36.8	37.5	37.4	35.4	37.5	104
09-7	34.1	34.8	36.0	34.2	35.1	35.4	120

-) mean soil density: 1.50 (g cm⁻³)

4 Pod and seed set and seed filling

4.1 The number of pods

Table 4.1.1 The number of pods (open and not open; 1/m²) per treatment and harvest (Experiment 1)

trial	Harvest										
	5	6	7	8	9	10	11	12	13	14	15
1	3743	6860	-	5783	-	5780	-	5286	-	5652	-
2	4050	8211	-	7558	-	6878	-	7101	-	6571	-
3	1345	2309	-	2686	-	4315	-	4482	-	3992	-
4	3090	4646	-	3945	-	4390	-	3692	-	3702	3844
LSD.05	288	908		484		693		642		350	
LSD.05 (all harvests) 572											

Table 4.1.2 The number of open pods (1/m²) per treatment and harvest (Experiment 1)

trial	Harvest										
	5	6	7	8	9	10	11	12	13	14	15
1	0	0	-	0	-	0	-	70	-	570	-
2	0	0	-	1	-	0	-	41	-	683	-
3	0	2	-	0	-	0	-	70	-	427	-
4	0	0	-	0	-	0	-	12	-	79	868
LSD.05								33		105	

Table 4.1.3 The potential number of pods (1/m²; Experiment 1)

trial	harvest										
	5	6	7	8	9	10	11	12	13	14	15
1	3997	8234	-	12374	-	11285	-	10510	-	9960	-
2	4256	9118	-	14099	-	12881	-	13953	-	10992	-
3	1562	2439	-	3879	-	7956	-	8582	-	7716	-
4	3493	5457	-	7991	-	9545	-	8832	-	8292	7143
LSD.05	261	1094		960		963		1055		727	
LSD.05 (all harvests) 891											

Table 4.1.4 The number of pods ($1/m^2$) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	-	-	7698	7314	7262
2	-	-	-	-	8611	7189	7603
3	-	-	-	-	8030	5214	5519
4	-	-	-	-	5409	4513	4351
LSD.05					2006	666	805 a
LSD.05					2317	770	930 b
LSD.05 (all harvests) 1232 a, 1497 b							

a: or comparison with Treatment 1

b: for comparison with the other treatments

Table 4.1.5 The potential number of pods ($1/m^2$) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	-	11790	13348	13207	12626
2	-	-	-	11373	15022	13475	12993
3	-	-	-	10588	13172	9532	9515
4	-	-	-	8678	11722	10409	10948
LSD.05				1313	2901	1434	1324 a
LSD.05				1515	3349	1656	1529 b
LSD.05 (all harvests) 1866 a, 2156 b							

4.2 Distribution of pods over the canopy

Table 4.2.1 Distribution of the pods over the branches : main stem (ms), the odd primary side branches (1-13) and the secondary branches (sb) (in percentages of the total number of pods; mean values of Harvest 10, 12 and 14, Experiment 1)

Treatment	ms	branch									total
		1	3	5	7	9	11	13	sb	even	
1	22.8	9.3	10.9	10.5	7.1	2.6	0.7	0.2	2.2	33.7	100
2	33.1	10.4	12.7	9.5	3.5	0.4	0.2	0.0	0.5	29.9	100
3	37.6	20.6	0.0	0.0	0.0	0.0	0.0	0.0	41.9	(*)	100
4	27.2	9.9	10.4	9.1	5.1	1.9	0.8	0.1	1.7	33.8	100

(*) No pods were recorded on the even branches in the third treatment, only the main stem, the first side branch and the other branches.

Table 4.2.2 The distribution of the pods over the height in the canopy (in percentage of the total number of pods; mean values of Harvest 10, 12 and 14, Experiment 1)

trial	height (cm)						total
	100-120	120-140	140-160	160-180	180-200	200-220	
1	0.8	48.7	44.9	5.5	0.2	0.0	100.0
2	0.1	51.1	44.4	4.3	0.0	0.0	100.0
3 (ms,sb1)	0.0	16.0	24.5	14.8	2.3	0.6	58.1(*)
4	0.7	44.4	47.2	7.6	0.2	0.0	100.0

(*): only the main stem and first primary branch in Treatment 3.

Table 4.2.3 Distribution of the numbers of pods over the periods of flower opening (in percentage of the total number of pods; mean values of Harvest 10, 12 and 14, Experiment 1)

trial	period			total
	1	2	3	
1	49.9	35.0	15.1	100.0
2	43.7	34.8	21.5	100.0
3	22.1	30.1	47.8	100.0
4	35.0	33.9	31.1	100.0

Table 4.2.4 Distribution of the potential number of pods over the branches: main stem (ms), the odd primary side branches (1-13) and the secondary branches (sb) (in percentages of the total potential number of pods; mean values of Harvest 10, 12 and 14, Experiment 1)

trial	ms	branch									total
		1	3	5	7	9	11	13	sb	even	
1	15.4	8.5	8.9	8.7	6.4	2.7	0.7	0.2	11.6	36.9	100
2	22.6	11.6	12.7	9.3	3.4	1.0	0.2	0.0	4.5	34.7	100
3	24.8	15.1	0.0	0.0	0.0	0.0	0.0	0.0	60.1	(*)	100
4	16.8	8.9	9.3	8.6	5.7	2.6	0.9	0.2	8.5	38.5	100

(*): No pods were recorded on the even branches in the third treatment, only the main stem, the first side branch and the other branches.

Table 4.2.5 The distribution of the potential number of pods over the height in the canopy (in percentage of the total potential number of pods; mean values of Harvest 10, 12 and 14, Experiment 1)

Treatment	height (cm)						total
	100-120	120-140	140-160	160-180	180-200	200-220	
1	0.7	52.8	37.7	8.6	0.2	0.0	100.0
2	0.2	48.3	46.1	5.4	0.0	0.0	100.0
3 (ms,sb1)	0.0	15.6	14.4	11.3	2.4	0.9	44.6 (*)
4	0.8	50.7	39.4	8.9	0.2	0.0	100.0

(*): only the main stem and first primary branch in Treatment 3.

Table 4.2.6 The distribution of the potential number of pods over the periods of flower opening (in percentage of the total potential number of pods; mean values of Harvest 10, 12 and 14, Experiment 1)

Treatment	period			total
	1	2	3	
1	32.8	32.0	35.2	100.0
2	31.3	31.0	37.7	100.0
3	14.5	17.8	67.7	100.0
4	25.9	22.3	51.8	100.0

4.3 The number of seeds

Table 4.3.1 The number of seeds ($1/m^2 \times 10E-3$) per treatment and harvest (Experiment 1)

Treatment	Harvest							
	8	9	10	11	12	13	14	15
1	61.4	99.4	95.8	113.6	95.2	94.7	90.4	-
2	91.7	104.6	84.7	116.8	104.7	93.4	101.6	-
3	37.7	85.1	71.9	91.3	79.3	84.8	70.8	-
4	41.1	52.5	45.8	53.6	42.0	51.7	52.1	47.8
LSD.05	12.4	10.1	10.3	12.3	10.3	4.8	7.5	
LSD.05 (all harvests)	9.8							

Table 4.3.2 The number of seeds per number (open and not open) of pods per treatment and harvest (Experiment 1)

Treatment	Harvest							
	8	9	10	11	12	13	14	15
1	10.9	-	16.7	-	18.2	-	16.0	
2	12.1	-	12.5	-	14.8	-	15.5	
3	15.1	-	16.6	-	17.7	-	17.7	
4	10.1	-	10.5	-	11.7	-	14.1	12.3
LSD.05	3.6		1.3		0.9		1.2	
LSD.05 (all harvests) 2.0								

Table 4.3.3 The number of seeds ($1/m^2 \times 10E-3$) per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	-	-	57.3	57.2	71.0
2	-	-	-	-	72.5	62.1	73.8
3	-	-	-	-	65.7	62.5	71.8
4	-	-	-	-	21.9	25.4	28.4
LSD.05					10.5	12.0	10.4 a
LSD.05					12.1	13.9	12.0 b
LSD.05 (all harvests) 12.2 a, 14.0 b							

a: for comparison with Treatment 1

b: for comparison with the other treatments

Table 4.3.4 The number of seeds per pod per treatment and harvest (Experiment 2)

Treatment	Harvest						
	1	2	3	4	5	6	7
1	-	-	-	-	7.66	7.86	9.79
2	-	-	-	-	8.59	8.61	9.74
3	-	-	-	-	8.77	12.19	13.04
4	-	-	-	-	4.05	5.67	6.56
LSD.05					2.10	1.81	1.26 a
LSD.05					2.43	2.10	1.45 b
LSD.05 (all harvests) 1.79 a, 2.07 b							

4.4 The number of seeds per pod and pod position

Table 4.4.1 The number of seeds per pod, per branch: main stem (ms), primary odd side branches (1-13), secondary branches (sb) (mean values of Harvest 10, 12 and 14, Experiment 1)

Treatment	branch								
	ms	1	3	5	7	9	11	13	sb
1	17.1	14.1	16.0	16.8	16.3	15.5	12.7	7.5	13.4
2	14.8	11.8	13.1	13.0	13.5	9.7	6.4	-	13.7
3	17.5	17.4	-	-	-	-	-	-(rest)	12.3
4	12.4	10.1	11.6	11.0	11.2	8.9	8.8	2.9	9.1

Table 4.4.2 The number of seeds per pod and height of the pods in the canopy (mean values of Harvest 10, 12 and 14, Experiment 1)

Treatment	height (cm)						mean (m)
	80-100 ^(*)	100-120m	120-140m	140-160m	160-180 ^(*)	180-200 ^(*)	
1	15.6	15.5	15.4	16.4	13.3	-	15.8
2	9.4	13.0	13.2	13.4	10.0	-	13.2
4	8.2	10.5	10.9	11.0	12.4	-	10.8
Mean	-	13.0	13.2	13.6	-	-	13.3
3 ^(*)	15.3	19.6	17.7	15.2	11.6	-	

LSD.05: 2.0 (all); 1.5 (treatments); 1.1 (height) (only for treatment 1,2,4)

(*): not enough units for statistical analysis

Table 4.4.3 The number of seeds per pod and period of flower opening (average of Harvest 10, 12 and 14, Experiment 1)

Treatment	period			
	1	2	3	mean
1	16.6	15.3	14.6	15.5
2	13.2	13.9	12.8	13.3
4	10.7	12.9	9.9	11.2
mean	13.5	14.0	12.4	13.3
3 ^(*)	16.6	20.4	13.5	

LSD.05 1.9 (all), 1.7 (treatments), 0.8 (period); only Treatment 1,2,4

(*): no analyses with Treatment 3

Table 4.4.4 The number of seeds per pod, per branch, peduncle-group (see 2.3) and per treatment (Harvest 14; Experiment 1)

Treatment	branch			peduncle-group						
	1	2	3	4	5	6	7	8	9	
1	1	13.3	13.1	14.2	18.9	17.2	14.6	8.3	*	*
	2	12.0	13.3	12.9	*	*	*	*	*	*
	3	12.3	15.0	14.0	19.6	*	*	*	*	*
	4	15.9	15.9	15.5	11.2	*	*	*	*	*
	5	16.7	15.7	14.3	22.0	*	*	*	*	*
	6	18.1	16.2	12.0	*	*	*	*	*	*
	7	15.8	13.2	11.2	*	*	*	*	*	*
	8	*	*	*	*	*	*	*	*	*
	9	*	11.0	11.1	*	*	*	*	*	*
2	1	13.5	15.0	17.3	17.4	16.6	15.5	*	*	*
	2	13.1	14.3	15.8	*	*	*	*	*	*
	3	13.2	14.9	15.3	*	*	*	*	*	*
	4	14.0	14.5	14.4	7.0	*	*	*	*	*
	5	12.4	11.9	12.2	*	*	*	*	*	*
	6	12.3	8.6	10.6	*	*	*	*	*	*
	7	*	*	*	*	*	*	*	*	*
	8	*	*	*	*	*	*	*	*	*
	9	*	15.3	14.5	*	*	*	*	*	*
3	1	14.7	15.3	18.1	21.4	22.7	21.3	18.4	16.4	*
	2	18.1	21.0	19.4	17.7	18.6	*	*	*	*
	9	*	16.5	*	*	*	13.7	*	*	*
4	1	11.2	9.3	12.7	16.0	15.1	13.8	*	*	*
	2	8.8	12.7	13.5	*	*	*	*	*	*
	3	12.4	13.7	13.1	17.0	*	*	*	*	*
	4	13.3	13.9	12.0	8.6	*	*	*	*	*
	5	16.0	16.6	13.6	10.6	*	*	*	*	*
	6	9.2	6.4	4.8	*	*	*	*	*	*
	7	*	*	*	*	*	*	*	*	*
	8	*	*	*	*	*	*	*	*	*
	9	*	5.3	14.0	*	*	*	*	*	*

4.5 Mean seed weight and pod position

Table 4.5.1 Mean seed weight (g) per branch, peduncle-group (see 2.3) and per treatment (Harvest 14, Experiment 1)

trial	branch	peduncle-group								
		1	2	3	4	5	6	7	8	9
9	1	4.9	4.9	4.9	4.8	5.0	5.1	2.3	*	*
	2	4.9	5.2	5.2	*	*	*	*	*	*
	3	4.8	4.9	5.1	3.4	*	*	*	*	*
	4	4.6	4.8	4.8	2.7	*	*	*	*	*
	5	4.7	4.8	5.2	2.0	*	*	*	*	*
	6	4.7	4.7	4.1	*	*	*	*	*	*
	7	3.8	3.8	3.1	*	*	*	*	*	*
	8	*	*	*	*	*	*	*	*	*
	9	*	2.5	4.8	*	*	*	*	*	*
2	1	5.0	5.0	5.0	5.0	4.9	3.0	*	*	*
	2	4.9	4.8	3.9	*	*	*	*	*	*
	3	5.0	5.0	5.3	*	*	*	*	*	*
	4	5.0	5.0	5.4	2.4	*	*	*	*	*
	5	5.2	5.1	5.1	*	*	*	*	*	*
	6	3.3	3.5	2.2	*	*	*	*	*	*
	7	*	*	*	*	*	*	*	*	*
	8	*	*	*	*	*	*	*	*	*
	9	*	2.0	4.0	*	*	*	*	*	*
3	1	6.0	6.1	5.7	5.4	5.2	5.2	5.2	4.2	*
	2	5.2	4.9	4.8	4.9	3.5	*	*	*	*
	9	*	4.9	*	5.6	*	5.2	*	*	*
4	1	4.8	5.1	5.1	4.9	4.9	4.9	*	*	*
	2	5.0	4.8	4.7	*	*	*	*	*	*
	3	4.9	5.0	5.1	3.7	*	*	*	*	*
	4	5.0	5.1	4.9	2.2	*	*	*	*	*
	5	4.7	4.7	4.4	2.0	*	*	*	*	*
	6	4.5	3.9	0.9	*	*	*	*	*	*
	7	*	*	*	*	*	*	*	*	*
	8	*	*	*	*	*	*	*	*	*
	9	*	2.9	4.1	*	*	*	*	*	*

4.6 Individual pod and seed growth

Table 4.6.1 The length per pod (mm), treatment, period and measurement (Experiment 1)

Treatment	period		measurement							
			1	2	3	4	5	6	7	8
1	1		27.7	52.7	38.2	51.8	49.0	-	-	-
	2		27.0	63.6	63.3	72.3	65.3	-	-	-
	3		-	47.3	63.6	67.1	66.0	68.4	-	-
2	1		26.8	46.9	51.6	50.6	55.2	-	-	-
	2		26.3	59.3	60.4	63.8	63.5	-	-	-
	3		-	43.8	50.6	63.9	58.9	60.9	-	-
3	1		32.1	55.4	53.7	60.9	55.5	-	-	-
	2		30.5	64.3	73.1	66.1	70.1	-	-	-
	3		-	49.9	69.8	71.8	69.3	72.2	-	-
4	1		22.5	31.7	41.8	47.0	42.3	-	-	-
	2		21.9	44.1	55.0	55.8	56.3	-	-	-
	3		-	42.3	62.7	66.9	64.9	68.8	-	-

Table 4.6.2 The cross-section per pod (mm), treatment, period and measurement (Experiment 1)

Treatment	period		measurement								
			1	2	3	4	5	6	7	8	9
1	1		1.40	2.18	3.03	3.52	3.88	4.25	4.13	4.04	-
	2		1.43	2.12	3.32	3.84	4.28	4.16	4.37	4.17	-
	3		-	1.65	2.87	3.67	4.21	4.23	4.28	4.52	-
2	1		1.52	2.17	3.18	3.54	4.07	3.67	4.16	4.54	-
	2		1.44	2.11	3.10	3.86	4.26	3.96	4.40	4.62	-
	3		-	1.71	2.17	3.69	4.44	3.94	4.39	4.49	-
3	1		1.68	2.41	3.22	4.37	4.10	3.86	4.57	4.66	-
	2		1.61	2.31	3.68	4.35	4.59	4.24	4.80	4.91	-
	3		-	1.87	3.22	4.73	4.94	4.83	5.39	5.06	-
4	1		1.32	1.64	2.59	3.34	3.88	3.73	4.13	4.24	-
	2		1.28	1.83	2.55	3.71	3.85	3.79	4.48	4.65	-
	3		-	1.66	2.36	3.33	3.99	4.21	4.55	4.88	-

Table 4.6.3 The weight per pod (mg), per treatment, period and measurement (Experiment 1)

Treatment	period	measurement									
		1	2	3	4	5	6	7	8	9	10
1	1	6.8	24.5	29.3	54.6	62.4	76.5	91.8	68.1	83.0	78.2
	2	6.7	29.8	53.5	89.2	90.0	109.4	122.9	135.7	124.2	114.2
	3	3.7	16.5	45.8	76.9	91.6	106.2	129.3	144.7	134.2	120.9
2	1	6.7	20.3	40.2	45.2	68.1	67.9	79.0	81.1	78.8	58.4
	2	6.5	26.0	44.5	73.5	93.4	94.8	107.0	114.7	127.5	112.7
	3	3.2	14.6	33.4	70.8	84.3	88.2	112.2	116.5	139.1	117.5
3	1	10.9	31.8	45.3	82.1	85.2	89.4	100.4	121.0	109.0	113.6
	2	9.4	37.6	69.0	99.8	118.2	127.0	167.6	182.1	178.2	170.0
	3	4.0	23.4	56.9	108.1	125.5	146.6	163.6	198.8	175.9	187.0
4	1	3.5	9.3	17.8	32.7	35.7	41.5	41.1	38.8	51.1	45.1
	2	3.7	12.5	26.2	42.7	57.2	68.1	74.5	76.0	76.7	73.6
	3	1.9	11.0	27.9	55.8	66.7	86.2	100.6	97.9	112.2	88.6

Table 4.6.4 The weight of the pod hull per pod (mg), per treatment, period and measurement (Experiment 1)

Treatment	period	measurement								
		2	3	4	5	6	7	8	9	10
1	1	-	-	37.6	37.0	41.7	37.3	27.8	33.5	29.7
	2	-	-	62.5	53.6	58.4	51.2	51.4	49.0	37.2
	3	-	-	58.0	58.2	60.6	55.6	55.5	54.3	40.9
2	1	-	-	30.4	39.3	35.9	34.7	33.6	29.8	22.8
	2	-	-	52.2	56.5	49.9	46.1	47.2	50.1	41.8
	3	-	-	43.7	56.7	51.8	50.1	49.5	56.2	44.2
3	1	-	-	58.6	53.4	49.1	48.8	54.2	45.9	46.1
	2	-	-	72.2	74.4	70.9	76.3	78.4	73.0	66.6
	3	-	-	82.0	87.7	84.0	79.6	83.2	79.6	70.2
4	1	-	-	26.1	24.1	25.5	20.0	17.6	23.0	18.6
	2	-	-	34.8	40.3	38.5	36.7	35.5	32.2	30.1
	3	-	-	45.6	50.1	51.3	48.8	43.9	43.6	35.6

Table 4.6.5 Thousand seed weight (g), per treatment, period and measurement
(Experiment 1)

Treatment	period		measurement							
	2	3	4	5	6	7	8	9	10	
1	1	-	-	1.55	2.37	3.16	3.85	4.40	4.37	4.25
	2	-	-	1.42	2.21	2.96	3.83	4.19	4.17	4.38
	3	-	-	1.12	2.05	2.58	3.59	4.09	4.31	4.72
2	1	-	-	1.49	2.23	3.10	3.95	4.57	4.57	4.70
	2	-	-	1.33	2.02	2.95	3.83	4.41	4.28	4.77
	3	-	-	1.06	1.64	2.48	3.54	4.42	4.44	5.06
3	1	-	-	1.83	2.58	3.63	4.95	5.45	4.74	5.38
	2	-	-	1.52	2.35	3.24	4.41	5.15	4.67	5.06
	3	-	-	1.12	2.01	2.54	3.63	4.83	4.49	4.64
4	1	-	-	1.03	1.54	2.63	3.48	4.60	4.28	4.35
	2	-	-	0.86	1.49	2.21	3.42	4.36	3.98	4.68
	3	-	-	0.77	1.25	1.85	3.10	3.89	3.91	4.97

Table 4.6.6 The number of seeds per pod, per treatment, period and measurement
(Experiment 1)

Treatment	period		measurement							
	2	3	4	5	6	7	8	9	10	
1	1	-	-	10.79	10.58	10.95	13.98	9.34	11.33	11.40
	2	-	-	18.66	16.43	17.45	18.72	20.11	18.05	17.77
	3	-	-	17.03	16.92	18.32	20.57	21.65	18.61	17.33
2	1	-	-	9.50	12.59	10.33	11.12	10.58	10.76	7.71
	2	-	-	15.66	18.07	15.25	15.82	15.33	18.22	15.08
	3	-	-	26.73	16.85	14.58	17.48	15.08	18.71	14.42
3	1	-	-	12.96	12.35	11.26	10.47	12.40	13.14	12.51
	2	-	-	18.16	18.73	17.48	20.20	20.22	22.38	20.47
	3	-	-	23.47	19.83	24.62	23.26	24.02	21.58	25.25
4	1	-	-	5.89	8.17	6.13	6.12	4.71	6.63	9.50
	2	-	-	10.28	11.39	13.26	11.45	9.49	11.32	9.47
	3	-	-	13.54	13.62	18.60	17.23	13.90	17.70	11.27

Table 4.6.7 Harvest data and temperature sum per harvest date since flower opening (data :I, II and III; see 2.4; Experiment 1)

number	Harvest date	period		
		I (21-4)	II (28-4)	III (3-5)
1	8-5	144.9	100.1	59.3
2	15-5	223.5	178.7	137.9
3	22-5	344.1	299.3	258.5
4	29-5	466.3	421.5	380.7
5	5-6	535.8	491.0	450.2
6	12-6	623.3	578.5	537.7
7	19-6	752.3	707.5	666.7
8	26-6	874.0	829.2	788.4
9	3-7	978.8	934.0	893.2
10	10-7	1118.9	1074.1	1033.3

Table 4.6.8 Mean day temperature ($(T_{min} + T_{max})/2$) per period between given day numbers measured at the site of field Experiment 1, in Treatment 1 (open field) and in Treatment 4 (under the netting for shading), and the differences in mean temperature per period between Treatment 1 and Treatment 4

Treat- ment	daynumber									
	128-134	135-141	142-148	149-155	156-162	163-169	170-176	177-183	184-191	mean
1	12.75	19.04	18.86	11.11	13.36	19.96	20.29	16.21	21.71	17.03
4	13.89	18.86	18.68	11.79	13.79	20.07	20.43	16.46	22.04	17.33
1-4	-1.14	0.18	0.18	-0.68	-0.43	-0.11	-0.14	-0.25	-0.32	-0.30

5 Chemical analyses

5.1 Reserve carbohydrates

5.1.1 Sugar content of various plant organs

Table 5.1.1.1 Sugar content (as percentage of dry weight) of green leaves per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	4	5	7	9	11	14
1	16.3	6.51	4.05	6.10	4.00	5.69	1.89	6.85
2	16.2	5.46	4.83	5.43	3.36	5.18	3.23	4.54
3	17.1	6.92	6.91	10.94	6.38	4.92	2.68	2.93
4	16.5	6.24	3.16	3.01	2.97	2.50	2.28	2.17
LSD.05	1.84	2.58	1.52	2.52	2.57	2.60	1.39	
LSD.05 (all harvests) 2.02								

Table 5.1.1.2 Sugar content (as percentage of dry weight) of yellow leaves per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	4	5	7	9	11	14
1	5.56	1.43	2.53	1.73	4.33	3.47	1.28	1.18
2	5.69	1.15	1.95	2.82	-	3.92	2.04	1.35
3	4.46	0.96	2.02	3.49	4.04	3.72	1.31	1.25
4	3.53	1.13	1.28	1.26	2.27	1.78	1.00	1.16

Table 5.1.1.3 Sugar content (as percentage of dry weight) of the main stem per treatment and harvest (Experiment 1)

Treatment	Harvest								
	1	3	4	5	7	9	11	14	15
1	16.8	19.2	14.0	7.58	6.12	5.66	1.91	1.73	
2	18.4	18.8	14.0	7.73	6.06	5.52	3.32	1.87	
3	18.3	19.6	17.4	13.90	7.76	5.97	3.09	1.24	
4	17.5	18.6	12.3	4.47	2.96	2.56	1.65	1.64	0.61
LSD.05	1.93	2.16	2.03	1.17	1.04	0.78	1.17	0.41	
LSD.05 (all harvests) 1.47									

Table 5.1.1.4 Sugar content (as percentage of dry weight) of side branches per treatment and harvest (Experiment 1)

Treatment	Harvest								
	1	3	4	5	7	9	11	14	15
1	-	13.0	23.6	14.3	7.58	7.11	1.42	1.36	
2	-	9.2	24.0	15.2	7.74	6.94	2.68	1.43	
3	-	13.4	19.6	16.5	8.86	8.41	4.10	1.65	
4	-	13.9	21.4	9.9	4.70	4.98	2.74	1.92	0.97
LSD.05			2.78	1.01	1.15	1.26	1.19	0.543	
LSD.05 (all harvests) 1.42									

Table 5.1.1.5 Sugar content (as percentage of dry weight) of pod hulls per treatment and harvest (Experiment 1)

Treatment	Harvest								
	1	3	4	5	7	9	11	14	15
1	-	-	8.22	12.60	20.28	17.26	4.94	0.373	
2	-	-	8.22	8.51	20.99	18.64	5.50	0.508	
3	-	-	8.22	11.87	19.32	19.16	8.01	0.706	
4	-	-	8.22	7.23	17.03	16.84	8.69	0.805	0.911
LSD.05					3.10	1.42	1.20	0.244	
LSD.05 (all harvests) 1.58									

5.1.2 Starch content of various plant organs

Table 5.1.2.1 Starch content (as percentage of dry weight) of green leaves per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	4	5	7	9	11	14
1	1.085	0.371	0.389	0.416	0.220	1.304	0.315	0.935
2	1.012	0.259	0.342	0.185	0.233	0.995	0.716	1.062
3	1.009	0.372	0.659	0.979	0.669	1.536	0.463	0.748
4	0.937	0.213	0.315	0.214	0.217	0.373	0.288	0.359
LSD.05	0.137	0.210	0.314	0.467	0.376	1.034	0.292	
LSD.05 (all harvests)	0.432							

Table 5.1.2.2 Starch content (as percentage of dry weight) of yellow leaves per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	4	5	7	9	11	14
1	0.828	0.230	0.308	0.384	0.639	0.622	0.688	0.776
2	0.722	0.535	0.408	0.366	-	0.609	0.757	0.833
3	0.920	0.598	0.515	0.630	0.745	0.718	0.671	0.702
4	0.642	0.426	0.462	0.437	0.565	0.485	0.534	0.630

Table 5.1.2.3 Starch content (as percentage of dry weight) of the main stem per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	4	5	7	9	11	15
1	2.487	0.245	0.232	0.258	0.255	0.188	0.194	
2	2.616	0.396	0.149	0.166	0.147	0.178	0.269	
3	2.711	0.290	0.160	0.236	0.191	0.143	0.240	
4	2.273	0.406	0.170	0.194	0.132	0.141	0.669	0.196
LSD.05	0.858	0.215	0.109	0.116	0.041	0.063	0.157	
LSD.05 (all harvests)	0.324							

Table 5.1.2.4 Starch content (as percentage of dry weight) of the side branches per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	4	5	7	9	11	15
1	-	0.479	0.204	0.184	0.345	0.199	0.213	
2	-	0.242	0.287	0.203	0.268	0.258	0.340	
3	-	0.264	0.481	0.362	0.290	0.315	0.314	
4	-	0.413	0.296	0.338	0.318	0.187	0.236	0.322
LSD.05	0.168	0.224	0.102	0.0778	0.130			
LSD.05 (all harvests) 0.132								

Table 5.1.2.5 Starch content (as percentage of dry weight) of the pod hulls per treatment and harvest (Experiment 1)

Treatment	Harvest								
	1	3	4	5	7	9	11	14	15
1	-	-	0.772	2.112	3.687	1.408	0.735	0.484	
2	-	-	0.772	2.561	4.070	1.250	0.679	0.559	
3	-	-	0.772	1.973	3.297	1.814	0.661	0.448	
4	-	-	0.772	0.700	2.806	0.542	0.206	0.179	0.248
LSD.05					1.37	0.319	0.287	0.194	
LSD.05 (all harvests) 0.713									

Table 5.1.2.6 Starch content (as percentage of dry weight) of the aborted pods per treatment and harvest (Experiment 1)

Treatment	Harvest								
	1	3	4	5	7	9	11	14	15
1	-	-	-	-	-	2.05	-	1.76	
2	-	-	-	-	-	1.69	-	2.49	
3	-	-	-	-	-	1.89	-	1.78	
4	-	-	-	-	-	0.878	-	0.879	-

Table 5.1.2.7 Starch content (as percentage of dry weight) of the roots per treatment and harvest (Experiment 1)

Treatment	Harvest								
	1	3	4	5	7	9	11	14	15
1	5.53	1.13	0.274	0.145	0.150	0.206	0.120	-	
2	6.82	1.19	0.466	0.232	0.188	0.182	0.120	-	
3	5.66	1.19	0.657	2.552	0.266	0.161	0.128	-	
4	5.59	1.05	0.283	0.187	0.233	0.172	0.165	-	0.201
LSD.05	0.923	0.582	0.340	1.579	0.0875	0.0736	0.0202		
LSD.05 (all harvests)	0.670								

5.1.3 Quantity of sugars and starch in the crop

Table 5.1.3.1 Quantity of sugars in the crop (kg/ha) per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	4	5	7	9	11	14
1	253	353	436	513	843	912	229	98.3
2	313	486	635	544	962	898	353	118.0
3	243	358	527	644	726	834	400	79.4
4	217	281	338	217	364	367	198	64.4
LSD.05	62	77	86	110	142	156	124	24.2
LSD.05 (all harvests)	102							

Table 5.1.3.2 Quantity (kg/ha) of starch in the whole crop per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	4	5	7	9	11	14
1	33.3	11.3	10.2	18.4	98.9	62.6	30.0	11.9
2	47.0	17.1	12.9	16.3	120.4	53.3	37.6	14.5
3	30.6	12.0	14.0	35.2	67.0	60.8	31.8	10.3
4	26.7	9.19	8.55	10.0	43.9	15.5	19.1	3.92
LSD.05	9.6	4.71	4.38	8.41	31.5	15.3	13.8	4.9
LSD.05 (all harvests)	12.8							

5.2 Oil content of the seeds

Table 5.2.1 Oil content (as percentage of dry weight) of seeds per treatment and harvest (Experiment 1)

treat- ment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	-	-	37.0	49.0	38.6	
2	-	-	-	-	36.3	47.6	37.3	
3	-	-	-	-	31.5	43.6	37.1	
4	-	-	-	-	26.9	42.7	38.7	29.6
LSD.05					3.01	2.47	4.27	
LSD.05 (all harvests)	3.17							

Table 5.2.2 Quantity of oil (kg/ha) in the seeds per treatment and Harvest (Experiment 1)

Treat- ment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	-	-	616	1834	1531	
2	-	-	-	-	605	1837	1724	
3	-	-	-	-	398	1231	1195	
4	-	-	-	-	143	640	909	578
LSD.05 (all harvests)	0.324							

Table 5.2.3 Oil content (as percentage of dry weight) of the seeds in the lowest two peduncle-groups of the mainstem (1-2) (Experiment 1)

Treat- ment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	-	-	40.5	39.4	29.7	
2	-	-	-	-	40.3	45.5	31.2	
3	-	-	-	-	41.2	42.0	33.2	
4	-	-	-	-	37.8	42.0	28.6	26.0
LSD.05					1.86	3.60	4.28	
LSD.05 (all harvests)	3.53							

Table 5.2.4 Oil content (as percentage of dry weight) of the seeds of the peduncle-groups of the mainstem (5-6) (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	-	-	-	-	36.6	
2	-	-	-	-	-	-	30.8	
3	-	-	-	-	-	-	36.3	
4	-	-	-	-	-	-	37.1	29.3
LSD.05							5.12	

5.3 Carbon content of various plant organs

Table 5.3.1 The carbon content (as percentage of dry weight) of green leaves per treatment and harvest (Experiment 1)

Treatment	Harvest						
	1	3	5	7	9	11	14
1	44.2	41.6	42.5	43.0	41.5	40.3	39.8
2	44.2	41.6	42.7	41.9	40.0	38.9	38.8
3	43.8	41.1	42.0	41.2	39.5	37.4	36.8
4	44.5	41.3	41.1	41.2	39.7	39.0	37.4
LSD.05	1.45	0.797	0.862	1.19	0.932	1.77	
LSD.05 (all harvests)	1.16						

Table 5.3.2 The carbon content (as percentage of dry weight) of yellow leaves per treatment and harvest (Experiment 1)

Treatment	Harvest						
	1	3	5	7	9	11	14
1	37.6	35.1	36.9	41.8	41.6	40.3	41.7
2	34.3	34.3	39.4	39.8	41.3	39.7	43.0
3	36.0	35.1	37.4	38.2	39.8	38.2	38.7
4	36.1	32.7	35.6	39.3	39.3	39.4	39.9

Table 5.3.3 The carbon content (as percentage of dry weight) of the main stem per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	42.7	42.9	42.8	45.0	44.0	45.0	44.5	
2	41.9	42.3	42.2	44.4	44.2	44.9	44.6	
3	42.0	42.9	43.5	45.2	44.5	44.9	44.3	
4	41.6	43.1	40.9	42.6	42.4	42.1	41.8	41.0
LSD.05	1.49	0.56	0.915	0.547	0.799	0.784	1.381	
LSD.05 (all harvests) 0.932								

Table 5.3.4 The carbon content (as percentage of dry weight) of the side branches per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	44.6	45.9	46.6	46.4	46.2	45.7	
2	-	44.9	45.8	46.4	46.1	46.2	45.7	
3	-	44.5	45.9	45.5	46.3	45.7	45.6	
4	-	44.6	44.7	44.4	45.2	45.2	44.7	44.9
LSD.05			0.299	1.200	0.557	0.486	0.590	
LSD.05 (all harvests) 0.683								

Table 5.3.5 The carbon content (as perc. of dry weight) of flower buds per treatment and harvest (Experiment 1)

Treatment	Harvest		
	1	3	5
1	-	50.6	50.7
2	-	49.9	50.7
3	-	49.9	49.9
4	-	50.0	50.3
LSD.05	0.856	0.408	
LSD.05 0.689 (voor beide harvest)			

Table 5.3.6 The carbon content (as perc. of dry weight) of flowers per treatment and harvest (Experiment 1)

Treatment	Harvest		
	1	3	5
1	-	-	48.81
2	-	-	48.57
3	-	-	49.06
4	-	-	48.90
LSD.05			0.371

Table 5.3.7 The carbon content (as percentage of dry weight) of pod hulls per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	47.6	45.5	46.3	44.2	44.6	
2	-	-	47.4	45.1	46.0	44.0	44.5	
3	-	-	46.9	45.6	45.7	43.8	44.4	
4	-	-	46.8	45.3	46.2	43.4	43.2	43.5
LSD.05				0.410	0.349	0.666	0.882	
LSD.05 (all harvests)				0.562				

Table 5.3.8 The carbon content (as percentage of dry weight) of seeds per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	-	-	58.3	62.1	61.2	
2	-	-	-	-	58.0	62.1	61.1	
3	-	-	-	-	56.6	60.5	59.8	
4	-	-	-	-	54.8	60.3	59.8	58.4
LSD.05					0.825	1.08	2.65	
LSD.05 (all harvests)				1.62				

Table 5.3.9 The carbon content (as percentage of dry weight) of roots per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	43.0	41.6	44.3	45.0	43.7	45.0	44.5	
2	42.2	42.3	43.4	44.0	43.7	45.9	44.9	
3	42.7	41.5	45.0	44.6	43.8	45.3	45.0	
4	42.5	42.3	43.5	42.4	42.7	43.1	43.2	42.0
LSD.05	1.17	0.780	1.43	1.67	1.43	1.23	1.04	
LSD.05 (all harvests)	1.21							

5.4 Ash content of various plant organs

Table 5.4.1 Ash content (as percentage of dry weight) of green leaves in per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	
1	12.4	19.7	20.5	22.9	24.7	32.5	29.7	
2	12.8	19.7	20.0	24.5	27.0	33.8	31.8	
3	12.4	20.3	20.9	23.8	25.5	36.0	34.5	
4	13.4	19.8	22.9	23.0	24.8	32.1	32.2	
LSD.05	0.878	1.35	1.54	1.84	2.33	3.18		
LSD.05 (all harvests)	1.84							

Table 5.4.2 Ash content (as percentage of dry weight) of yellow leaves per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	
1	29.1	35.6	30.5	23.2	26.5	31.7	24.7	
2	34.0	35.0	27.1	26.6	25.9	32.7	23.0	
3	28.7	38.7	30.0	29.1	28.5	34.5	29.4	
4	32.0	34.6	30.6	26.8	29.5	32.3	28.9	

Table 5.4.3 Ash content (as percentage of dry weight) of main stem per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	12.1	13.9	11.9	9.71	9.61	9.19	9.64	
2	12.5	14.3	13.0	10.79	9.95	9.02	9.81	
3	12.0	13.6	10.4	8.86	9.43	9.14	10.19	
4	12.6	13.3	14.5	12.46	11.94	12.07	12.12	13.26
LSD.05	1.50	0.847	1.45	1.00	1.17	0.760	1.42	
LSD.05 (all harvests)	1.10							

Table 5.4.4 Ash content (as percentage of dry weight) of side branches per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	12.1	7.58	7.89	7.89	6.95	8.33	
2	-	11.4	7.97	8.58	8.89	7.64	8.36	
3	-	12.2	7.30	7.72	7.98	8.09	8.95	
4	-	11.6	9.75	10.40	9.87	9.53	10.72	8.97
LSD.05			0.202	0.313	0.340	0.227	0.243	
LSD.05 (all harvests)	0.612							

Table 5.4.5 Ash content (as percentage of dry weight) of flower buds per treatment and harvest (Experiment 1)

Treatment	Harvest		
	1	3	5
1	-	8.32	8.51
2	-	8.73	8.52
3	-	8.35	8.02
4	-	8.23	9.28
LSD.05		0.441	0.532
LSD.05 (all harvests)	0.482		

Table 5.4.6 Ash content (as percentage of dry weight) of flowers per treatment and harvest (Experiment 1)

Treatment	Harvest		
	1	3	5
1	-	-	8.97
2	-	-	9.20
3	-	-	8.88
4	-	-	9.92
LSD.05			0.271

Table 5.4.7 Ash content (as percentage of dry weight) of pod hulls per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	8.68	7.39	8.98	12.3	13.3	
2	-	-	8.75	7.78	9.33	12.7	13.0	
3	-	-	8.67	8.21	9.19	12.1	14.3	
4	-	-	10.00	8.86	9.39	12.2	16.1	13.72
LSD.05				0.545	0.749	1.24	1.76	
LSD.05 (all harvests)	1.04							

Table 5.4.8 Ash content (as percentage of dry weight) of seeds per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	-	-	5.00	4.39	4.78	
2	-	-	-	-	4.90	4.33	4.68	
3	-	-	-	-	4.91	4.85	4.67	
4	-	-	-	-	5.59	5.09	4.86	5.65
LSD.05					0.275	0.291	0.219	
LSD.05 (all harvests)	0.244							

Table 5.4.9 Ash content (as percentage of dry weight) of aborted pods per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	-	-	14.3	13.1	29.0	
2	-	-	-	-	12.7	14.4	13.2	
3	-	-	-	-	13.1	15.5	18.4	
4	-	-	-	-	16.6	15.2	16.6	-

Table 5.4.10 Ash content (as percentage of dry weight) of roots per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	8.47	14.8	9.65	8.62	9.70	8.74	11.2	
2	7.93	13.1	11.05	10.35	10.37	9.82	10.3	
3	7.97	14.4	9.02	8.11	9.58	9.54	12.0	
4	9.10	13.3	10.62	12.35	11.54	12.85	11.9	11.7
LSD.05	1.04	1.23	1.78	2.04	1.90	1.57	1.72	
LSD.05 (all harvests)	1.62							

5.5 Total nitrogen content of various plant organs

Table 5.5.1 Total nitrogen content (as percentage of dry weight) of green leaves per treatment and harvest (Experiment 1)

Treatment	Harvest						
	1	3	5	7	9	11	14
1	4.46	5.31	4.30	3.58	2.73	2.25	1.86
2	4.37	5.55	4.46	3.48	2.58	1.95	1.98
3	4.36	5.02	3.70	3.07	2.75	2.44	1.99
4	4.55	5.38	5.13	4.28	3.79	3.24	2.61
LSD.05	0.358	0.534	0.412	0.342	0.379	0.328	
LSD.05 (all harvests)	0.364						

Table 5.5.2 Total nitrogen content (as percentage of dry weight) of yellow leaves per treatment and harvest (Experiment 1)

Treatment	Harvest						
	1	3	5	7	9	11	14
1	2.76	2.31	2.11	1.94	1.57	1.54	1.35
2	2.16	2.37	2.41	2.01	1.68	1.42	1.72
3	2.54	2.34	1.71	1.51	1.55	1.71	1.55
4	2.41	2.18	2.73	2.23	2.16	2.05	1.98

Table 5.5.3 Total nitrogen content (as percentage of dry weight) of main stem per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	3.61	3.10	1.61	1.23	0.873	0.638	0.837	
2	3.57	3.02	1.75	1.36	0.920	0.552	0.833	
3	3.81	2.96	1.52	1.05	0.835	0.519	0.742	
4	3.73	3.16	2.45	2.06	1.772	1.501	1.531	1.80
LSD.05	0.365	0.484	0.375	0.244	0.352	0.316	0.133	
LSD.05 (all harvests)	0.326							

Table 5.5.4 Total nitrogen content (as percentage of dry weight) of side branches per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	5.50	1.92	1.59	1.10	0.733	0.509	
2	-	6.15	2.12	1.69	1.18	0.730	0.575	
3	-	5.55	2.19	1.55	1.11	0.785	0.724	
4	-	5.18	3.15	2.70	1.93	1.571	1.139	0.849
LSD.05	0.300	0.248	0.224	0.260	0.119			
LSD.05 (all harvests)	0.241							

Table 5.5.5 Total nitrogen content (as percentage of dry weight) of flower buds per treatment and harvest (Experiment 1)

Treatment	Harvest		
	1	3	5
1	-	6.82	5.67
2	-	6.53	5.90
3	-	7.01	6.11
4	-	6.90	6.54
LSD.05		0.374	0.307
LSD.05 0.319 (two harvests)			

Table 5.5.6 Total nitrogen content (as percentage of dry weight) of flowers per treatment and harvest (Experiment 1)

Treatment	Harvest		
	1	3	5
1	-	-	4.30
2	-	-	4.37
3	-	-	4.82
4	-	-	5.36
LSD.05	0.341		

Table 5.5.7 Total nitrogen content (as percentage of dry weight) of pod hulls per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	5.39	2.85	1.63	1.10	0.566	
2	-	-	6.07	2.84	1.65	0.99	0.509	
3	-	-	5.31	2.79	1.76	1.17	0.661	
4	-	-	6.95	4.10	2.61	2.04	1.140	1.27
LSD.05				0.277	0.260	0.160	0.139	
LSD.05 (all harvests) 0.194								

Table 5.5.8 Total nitrogen content (as percentage of dry weight) of seeds per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	-	-	3.67	3.20	3.24	
2	-	-	-	-	3.60	3.19	3.29	
3	-	-	-	-	3.66	3.34	3.24	
4	-	-	-	-	4.14	4.00	3.97	4.27
LSD.05					0.158	0.149	0.234	
LSD.05 (all harvests)	0.167							

Table 5.5.9 Total nitrogen content (as percentage of dry weight) of roots per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	2.70	2.26	1.43	1.02	0.893	0.512	1.12	
2	2.37	2.27	1.67	1.21	0.820	0.660	1.02	
3	2.62	2.33	1.31	0.90	0.827	0.669	0.80	
4	2.62	2.49	1.82	1.77	1.459	1.466	1.46	1.89
LSD.05	0.327	0.390	0.329	0.304	0.307	0.295	0.157	
LSD.05 (all harvests)	0.285							

5.6 Nitrate content of various plant organs

Table 5.6.1 Nitrate content (as percentage of dry weight) of green leaves per treatment and harvest (Experiment 1)

Treatment	Harvest						
	1	3	5	7	9	11	14
1	0.119	0.433	0.110	0.054	0.020	0.055	0.007
2	0.126	0.554	0.116	0.036	0.018	0.016	0.041
3	0.104	0.374	0.047	0.026	0.008	0.015	0.011
4	0.079	0.442	0.491	0.340	0.349	0.202	0.149
LSD.05	0.0974	0.202	0.137	0.0899	0.139	0.0799	
LSD.05 (all harvests)	0.120						

Table 5.6.2 Nitrate content (as percentage of dry weight) of yellow leaves per treatment and harvest (Experiment 1)

Treatment	Harvest						
	1	3	5	7	9	11	14
1	0.396	0.421	0.481	0.058	0.009	0.025	0.003
2	0.222	0.489	0.407	0.237	0.010	0.029	0.005
3	0.359	0.299	0.066	0.012	0.002	0.154	0.005
4	0.239	0.319	0.862	0.309	0.194	0.144	0.089

Table 5.6.3 Nitrate content (as percentage of dry weight) of the main stem per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	0.072	0.556	0.373	0.269	0.150	0.117	0.110	
2	0.055	0.688	0.526	0.313	0.150	0.086	0.118	
3	0.059	0.493	0.186	0.122	0.099	0.072	0.076	
4	0.040	0.552	0.898	0.662	0.632	0.659	0.635	0.765
LSD.05	0.072	0.239	0.282	0.164	0.215	0.175	0.129	
LSD.05 (all harvests)		0.178						

Table 5.6.4 Nitrate content (as percentage of dry weight) of side branches per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	0.112	0.050	0.098	0.037	0.033	0.023	
2	-	0.065	0.063	0.084	0.037	0.023	0.017	
3	-	0.117	0.031	0.044	0.017	0.018	0.024	
4	-	0.162	0.286	0.354	0.254	0.165	0.152	0.121
LSD.05			0.0627	0.0738	0.0934	0.0745	0.0424	
LSD.05 (all harvests)		0.0686						

Table 5.6.5 Nitrate content (as percentage of dry weight) of pod hulls per treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	0.0011	0.013	0.019	-	0.0054	
2	-	-	0.0011	0.014	0.014	-	0.0077	
3	-	-	0.0000	0.009	0.004	-	0.0047	
4	-	-	0.0111	0.081	0.096	-	0.1101	0.123
LSD.05				0.0126	0.0248		0.0277	
LSD.05 (all harvests) 0.0213								

Table 5.6.6 Nitrate content (as percentage of dry weight) of seeds treatment and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	-	-	-	-	0.0011	-	0.0004	
2	-	-	-	-	0.0009	-	0.0005	
3	-	-	-	-	0.0005	-	0.0004	
4	-	-	-	-	0.0093	-	0.0007	-
LSD.05					0.00319		0.000115	
LSD.05 (all harvests) 0.0022								

Table 5.6.7 Nitrate content (as percentage of dry weight) of roots and harvest (Experiment 1)

Treatment	Harvest							
	1	3	5	7	9	11	14	15
1	0.026	0.249	0.183	0.176	0.118	0.091	0.106	
2	0.013	0.325	0.282	0.228	0.096	0.033	0.109	
3	0.016	0.256	0.052	0.045	0.060	0.051	0.100	
4	0.012	0.292	0.418	0.376	0.454	0.450	0.471	0.516
LSD.05	0.0144	0.112	0.119	0.111	0.180	0.115	0.0588	
LSD.05 (all harvests) 0.109								

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Appendix 1

The crop layer of the peduncle-groups (see 2.3)

pedg branch	1	2	3	4	5	6	7	8	9
1	3	3	4	4	5	5	6	7	7
2	3	4	4	5	5	6	6		
3	3	4	4	5					
4	3	4	4	5					
5	3	3	4	5	5				
6	3	3	4	4					
7	2	3	4	4	5				
8	2	2	3						
9*	-	3	3						

Appendix 2

Period of flower opening per peduncle-group (pedg), per branch and treatment
(see 2.3).

Period 4: no peduncles are found in this peduncle group.

Treatment	pedg branch	1	2	3	4	5	6	7	8	9
1	1	1	1	1	1	2	2	3	3	4
	2	1	2	2	3	3	4	4	4	4
	3	1	1	2	2	3	4	4	4	4
	4	1	2	3	3	3	4	4	4	4
	5	2	3	3	3	3	4	4	4	4
	6	1	2	3	3	4	4	4	4	4
	7	2	2	2	4	4	4	4	4	4
	8	2	2	2	2	4	4	4	4	4
	9	4	3	3	4	4	4	4	4	4
2	1	1	1	1	2	2	3	3	4	4
	2	1	2	3	3	4	4	4	4	4
	3	1	2	3	3	4	4	4	4	4
	4	2	3	3	3	4	4	4	4	4
	5	3	3	3	3	4	4	4	4	4
	6	3	3	3	3	4	4	4	4	4
	7	3	3	3	4	4	4	4	4	4
	8	4	4	4	4	4	4	4	4	4
	9	4	3	3	4	4	4	4	4	4
3	1	1	1	1	2	2	2	3	3	3
	2	1	2	2	2	2	2	4	4	4
	3	4	4	4	4	4	4	4	4	4
	4	4	4	4	4	4	4	4	4	4
	5	4	4	4	4	4	4	4	4	4
	6	4	4	4	4	4	4	4	4	4
	7	4	4	4	4	4	4	4	4	4
	8	4	4	4	4	4	4	4	4	4
	9	4	3	4	4	4	3	4	4	4
4	1	1	1	1	2	3	3	3	4	4
	2	1	2	3	3	4	4	4	4	4
	3	1	2	3	3	3	4	4	4	4
	4	1	2	3	3	3	4	4	4	4
	5	3	3	3	3	3	4	4	4	4
	6	3	3	3	3	4	4	4	4	4
	7	3	3	3	3	4	4	4	4	4
	8	3	3	3	3	4	4	4	4	4
	9	4	3	3	4	4	4	4	4	4

Appendix 3 Crop growth analysis, Experiment 1

Experimental data of Experiment 1 (file information)

file-naam exp1a.dat
 number of rows: 285
 number of columns 77

column	experimental data		
1	harvest number (1 - 15)		
2	block number (1 - 5)		
3	treatment number (1 - 4)		
4	total above ground dry matter		(kg/ha)
5	dry weight of the roots	per 5 plants	(kg/5pl)
6	dry weight of the main stem (crop layer-B)	"	"
7	dry weight of the main stem (crop layer-A)	"	"
8	dry weight of the side branches (crop layer-B)	"	"
9	dry weight of the side branches (crop layer-A)	"	"
10	dry weight of the green leaves of the main stem (crop layer-B, without c12 and c16)	"	"
11	dry weight of green leaves of crop layer-A	"	"
12	dry weight of the lowest two leaves of the main stem	"	"
13	dry weight of green leaves of the side branches (crop layer-B)	"	"
14	dry weight of yellow (part of) leaves	"	"
15	dry weight of the highest, young leaves of the main stem (crop layer-B)	"	"
16	plant density		(n/m ²)
17	dry weight of flowers	"	(kg/ha)
18	dry weight of flower buds	"	"
19	dry weight of pods (pod hull + seeds)	"	"
20	dry weight of seeds	"	"
21	dry weight of the pod hull	"	"
22	dry weight of aborted pods (attached to the plants)	"	"
23	total above ground dry weight of 5 plants		"
24	yellow leaves (c14/c23)*c4		(kg/ha)
25	total above ground dry weight minus yellow leaves		"
26	total above ground dry weight of 5 plants, without yellow leaves		(kg/5pl)
27	total dry weight of the crop (c25 + c35)		(kg/ha)
28	dry weight of the main stem $c25*(c6+c7)/c26$		"
29	dry weight of the side branches		"
30	dry weight of green leaves $c25*(c10+c11+c12+c13+c16)/c26$		"
31	dry weight of flowers and flower buds		"
32	dry weight of the pod hulls		"
33	dry weight of the seeds		"
34	dry weight of the aborted pods, attached to the plants		"
35	dry weight of the roots		"
36	dry weight of flower buds		"
	dry weight of flowers		"

continuation of Appendix 3

38	dry weight of the green leaves of the main stem (crop layer-B, without c12 and c16)	▪
39	dry weight of green leaves of crop layer-A	▪
40	dry weight of the lowest two leaves of the main stem	▪
41	dry weight of green leaves of the side branches (crop layer-B)	▪
42	dry weight of the highest, young leaves of the main stem (crop layer-B)	▪
43	dry weight of green leaves of the main stem c38+c40+c42	▪
44	dry weight of the main stem (crop layer-B)	▪
45	dry weight of the main stem (crop layer-A)	▪
46	dry weight of the side branches (crop layer-B)	▪
47	dry weight of the side branches (crop layer-A)	▪
48	specific area of the main stem, crop layer-A	(cm ² /g)
49	specific area of the main stem, crop layer-B	▪
50	area index of the main stem, crop layer-B	(cm ² /cm ²)
51	area index of the main stem, crop layer-A	▪
52	specific area of the side branches, crop layer-A	(cm ² /g)
53	specific area of the side branches, crop layer-B	▪
54	area index of the side branches, crop layer-B	(cm ² /cm ²)
55	area index of the side branches, crop layer-A	▪
	specific area of leaves:	
56	the lowest two leaves of the main stem, crop layer-B	(cm ² /g)
57	the youngest, highest leaves of the main stem, crop layer-B	▪
58	the leaves of the main stem, without c56, c57, crop layer-B	▪
59	the leaves of the side branches, crop layer-B	▪
60	the leaves of crop layer-A	▪
61	area index of leaves of crop layer-B	(cm ² /cm ²)
62	area index of leaves of crop layer-A	▪
63	specific area of the pods	(cm ² /g)
64	area index of pods	(cm ² /cm ²)
65	area index of the whole crop, crop layer-B	▪
66	area index of the whole crop, crop layer-A	▪
67	maximum weight of leaves (kept constant after maximum weight, per treatment and harvest)	(kg/ha)
68	weight of side branches, including the cut side branches of Treatment 3	▪
69	total dry weight of the crop, including dead leaves (c66), the cut side branches of Treatment 3 (c67) and roots	▪
70	number of pods	(n/m ²)
71	number of open pods	(n/m ²)
72	number of pods (+open pods; c69+c70)	(n/m ²)
73	number of potential pods	▪
74	number of seeds	▪
75	number of seeds per pod (c74/c70)	(n/n)
76	number of seeds per (pod+open pods) (c74/c72)	(n/n)
77	mean seed weight	(g)

Appendix 4 Light interception, Experiment 1

Experimental data of Experiment 1 (file information)

file-naam	exp1b.dat
number of rows:	260
number of columns:	11
column	experimental data
1	harvest number (1,2,3,4,5,6,7,8,9,10,12,14)
2	blok number (1-5)
3	treatment number (1-4)
4	light interception (%) under the netting above the crop (only Treatment 4)
5	plight interception (%) at 60 cm above ground (for Treatment 4, percentage of light compared to light intensity above the crop, under the netting)
6	light interception (%) at 5 cm above ground (for Treatment 4, percentage of light compared to light intensity above the crop, under the netting)
7	light interception (%) at 5 cm above ground (Harvest 11,12,14; compared to light intensity above the crop, above the netting)

Individual pod and seed growth, Experiment 1

Experimental data of Experiment 1 (file information)

file-name	exp1c.dat
number of rows	600
number of columns	28
column	experimental data
1	block number (1 - 5)
2	treatment number (1 - 4)
3	period number (1 - 3)
4	measurement number (1 - 10)
5	length of the pods (mm)
6	cross section of the pods (mm)
7	mean flat surface per pod (cm ² /pod)
8	mean weight per pod (mg/pod)
9	mean weight of the pod hull -
10	mean seed weight per pod -
11	thousand kernel weight (g)
12	number of seeds per pod (n/n)

Appendix 5 Mean day temperature in the open field and under the netting for shading, Experiment 1

Experimental data of Experiment 1 (file information)

file-name exp1d.dat

number of rows 77

number of columns 9

column experimental data

- 1 Day number (since 1-1-1989)
- 2 Minimum temperature per day (C) measured in Treatment 1 (open field)
- 3 Maximum temperature per day (C) measured in Treatment 1 (open field)
- 4 Minimum temperature per day (C) measured in Treatment 4 (under netting for shading)
- 5 Maximum temperature per day (C) measured in Treatment 4 (under netting for shading)
- 6 Period number
- 7 Mean temperature per day in Treatment 1 ($(c2 + c3)/2$)
- 8 Mean temperature per day in Treatment 4 ($(c4 + c5)/2$)
- 9 The differene in mean temperature per day ($c7-c8$)

Appendix 6 Pod and seed set and growth and the position in the canopy, Experiment 1

Experimental data of Experiment 1 (file information)

file-name exp1H5.dat t/m exp1H15.dat

number of rows 1620

number of columns 21 for H7,9,11 and H13
25 for H5,6,8,10,12,14 and H15

column experimental data

1	harvest number (5,6,7,8,9,10,11,12,14,15)	
2	block number (1 - 5)	
3	treatment number (1 - 4)	
4	branch number (1 - 9)	
5	peduncle group (pedg) (1 - 9)	
6	height in the canopy (1 - 8)	
7	weight of the pods per dg, per 5 plants	(g/pedg,5p)
8	weight of the pod hull per dg, per 5 plants	•
9	weight of the seeds per dg, per 5 plants	•
10	number of pods per dg, per 5 plants	(n/pedg,5p)
11	number of potential pods per dg, per 5 plants	•
12	number of open pods per dg, per 5 plants	•
13	flat surface of the pods per dg, per 5 plants	(cm ²)
14	weight of 100 seeds per dg	(g)
15	total weight of the pods per 5 plants	(g/5p)
16	total weight of the seeds per 5 plants	•
17	total weight of the pods per m ²	(g/m ²)
18	total weight of the seeds per m ²	•
19	number of plants per m ²	(n/m ²)
20	total weight of pods of even and odd branches divided by the pods of the odd branches, per 5 plants	(g/g)
21	total weight of seeds of even and odd branches divided by the seeds of the odd branches, per 5 plants	(g/g)

only for H5,6,8,10,12,14 and H15 :

22	total number of pods per 5 plants	(n/5p)
23	total potential pods per 5 plants „	•
24	total number of seeds per 5 plants „	•
25	total number of pods per m ²	(n/m ²)

continuation of Appendix 6

Per block and treatment:

branch (column 4)	peduncle groups (column 5)
1 main stem	(1 - 9)
2 primary side branch number 1	(1 - 9)
3 primary side branch number 3	(1 - 9)
4 primary side branch number 5	(1 - 9)
5 primary side branch number 7	(1 - 9)
6 primary side branch number 9	(1 - 9)
7 primary side branch number 11	(1 - 9)
8 primary side branch number 13	(1 - 9)
9 \longrightarrow	no peduncle groups in column 5
	1 : even branches
	2 : secondary branches of the prim. side branches 1 and 3
	3 : secondary branches of the prim. odd side branches > 3
	4 : open pods of the other branches
	5 : sub sample of even pods for flat surface and weight
	6 : rest branches (Treatment 3): secondary and primary branches, others than the main stem and the first prim.branch
	7 : rest odd branches, H7,9,11,13 secondary and primary odd branches others than the main stem and prim. branches 1,3,5,7.
	8 : ..
	9 : ..

Appendix 7 Chemical analyses of various plant organs, Experiment 1

file-information

file-name: chemx.dat : roots(x=a), leaves(x=b), yellow leaves(x=c)
 main stem (x=d), side branches(x=e),
 flower buds(x=f), flowers(x=g), pod hulls(x=h),
 seeds(x=i), aborted pods(x=j)

number of rows 285

number of columns 25

experimental data

column

1	harvest number (1 - 15)	
2	block number (1 - 5)	
3	treatment number (1 - 4)	
4	weight of plant organ	(kg/ha)
5	content of carbon	(%)
6	content of ash	•
7	content of total nitrogen	•
8	content of nitrate	•
9	content of starch	•
10	content of sugars	•
11	content of oil	•
12	quantity of carbon	(kg/ha)
13	quantity of ash	•
14	quantity of total nitrogen	•
15	quantity of nitrate	•
16	quantity of starch	•
17	quantity of sugars	•
18	quantity of oil	•

continuation of Appendix 7

file-information (starch and sugars)

file-name: chemk.dat

number of rows 285

number of columns 21

column experimental data

1	harvest number (1 - 15)	
2	block number (1 - 5)	
3	treatment number (1 - 4)	
4	quantity of starch in the leaves	(kg/ha)
5	quantity of sugars in the leaves	▪
6	quantity of starch in the main stem	▪
7	quantity of sugars in the main stem	▪
8	quantity of starch in the side branches	▪
9	quantity of sugars in the side branches	▪
10	quantity of starch in the flowers	▪
11	quantity of sugars in the flowers	▪
12	quantity of starch in the flowers buds	▪
13	quantity of sugars in the flowers buds	▪
14	quantity of starch in aborted pods	▪
15	quantity of sugars in aborted pods	▪
16	quantity of starch in the pod hulls	▪
17	quantity of sugars in the pod hulls	▪
18	quantity of starch in the roots	▪
19	quantity of sugars in the roots	▪
20	quantity of starch in the whole crop	▪
21	quantity of sugars in the whole crop	▪

Appendix 8 Crop growth analysis, Experiment 2

Experimental data of Experiment 2 (file information)

file-naam	exp2a.dat	
number of rows :	140	
number of columns :	53	
column	experimental data	
1	harvest number (1 - 7)	
2	block number (1 - 4)	
3	treatment number (1 - 4)	
4	fresh dry weight (kg) of the crop without roots per sub plot (1,92 m ²)	
5	percentage dry weight of column 4	
6	total above ground dry matter (kg/ha)	
7	number of plants per sub plot (1.92 m ²)	
8	plantdensity (n/m ²)	
9	dry weight of the green leaves per 5 plants	(kg/5pl)
10	dry weight of the yellow leaves per 5 plants	"
11	dry weight of the main stem per 5 plants	"
12	dry weight of the side branches per 5 plants	"
13	dry weight of the rootsper 5 plants	"
14	dry weight of the flower buds and flowersper 5 plants	"
15	dry weight of the pods (pod hull + seeds) per 5 plants	"
16	dry weight of the seeds per 5 plants	"
17	dry weight of the aborted pods per 5 plants	"
18	dry weight of the pod hullsper 5 plants	"
19	total above ground dry weight of 5 plants ..	"
20	dry weight of yellow leaves	(kg/ha)
21	total above ground dry weight without yellow leaves	(")
22	total above ground dry weight without yellow leaves per 5 plants	(kg/5pl).
23	dry weight of the green leaves	(kg/ha)
24	dry weight of the main stem	(kg/ha)
25	dry weight of the side branches	(kg/ha)
26	dry weight of the flower buds and flowers	(kg/ha)
27	dry weight of the pods (pod hull and seeds)	(kg/ha)
28	dry weight of the pod hulls	(kg/ha)
29	dry weight of the seeds	(kg/ha)
30	dry weight of the aborted pods	(kg/ha)
31	dry weight of the roots	(kg/ha)
32	number of pods per 5 plants	(n/5pl)
33	number of potential pods per 5 plants	(n/5pl)
34	number of pods	(n/m ²)
35	number of potential pods	(n/m ²)
36	mean seed weight (g)	
37	number of seeds per pod	(n/n)
38	number of seeds (n/m ²)	

continuation of Appendix 8

39	maximum dry weight of leaves (kept constant after maximum weight, per treatment and harvest)	(kg/ha)
40	total dry weight of crop (c21-c23+c39+c31) with maximum dry weight of leaves	(kg/ha)
41	specific area of the leaves	(cm ² /g)
42	specific area of the side branches	(cm ² /g)
43	specific area of the pods	(cm ² /g)
44	mean length of the main stem	(cm)
45	mean cross section of the main stem	(mm)
46	dry weight of the main stem, per 5 plants	(g/5 pl)
47	surface of the main stem, per 5 plants	(cm ² /5 pl)
48	specific area of the main stem	(cm ² /g)
49	area index of the green leaves	(cm ² /cm ²)
50	area index of the main stem	(°)
51	area index of the side branches	(°)
52	area index of the pods	(°)
53	area index of leaves, stems and pods	(°)

Appendix 9 Light interception, Experiment 2

Experimental data of Experiment 2 (file information)

file-naam exp2b.dat

number of rows : 260

number of columns : 8

column experimental data

1 treatment number

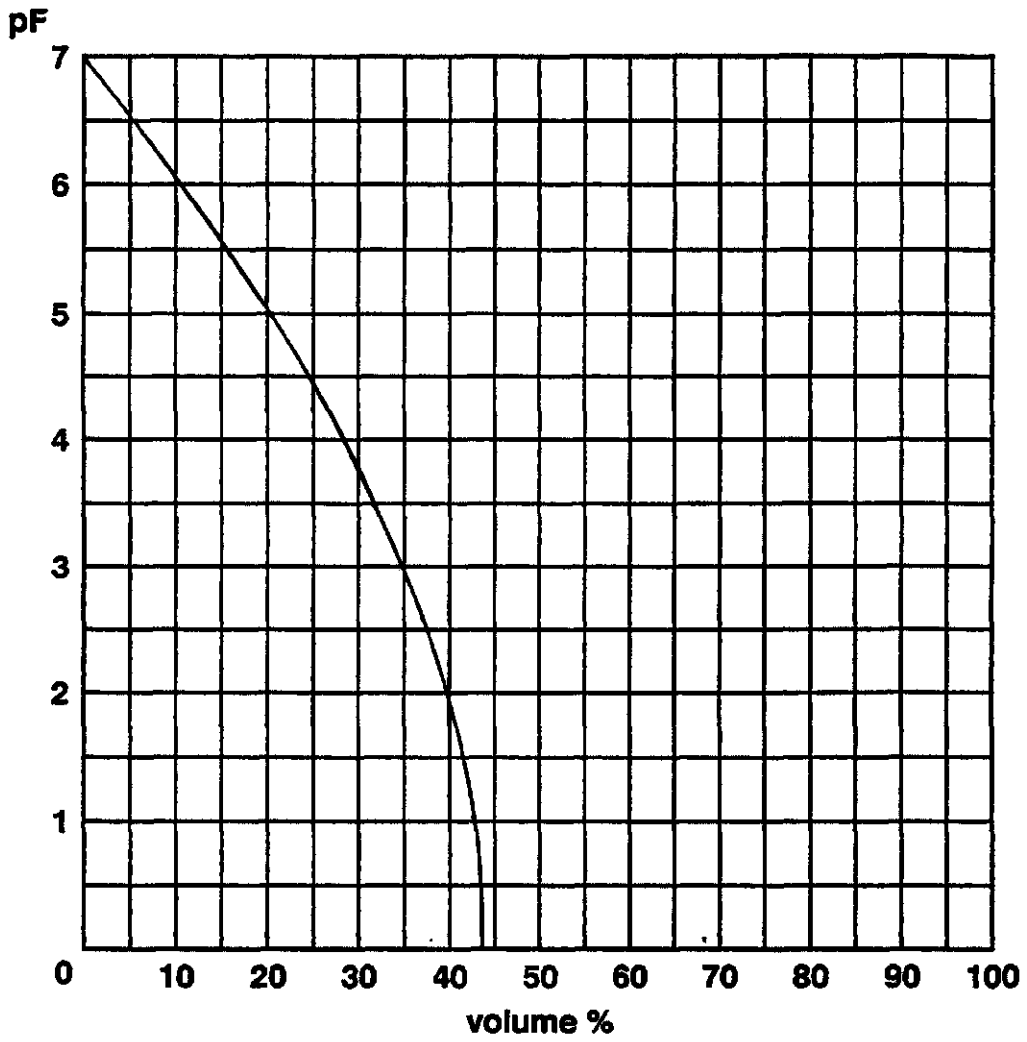
2 block number

3 date of measurement of light interception

4 light interception (%) at 60 cm above ground
(for Treatment 4, percentage of light compared to light intensity
above the crop, under the netting)

5 light interception (%) at 5 cm above ground
(for Treatment 4, percentage of light compared to light intensity
above the crop, under the netting)

Appendix 10 Soil water content: pF-curve



Appendix 11 Weather data of the meteorological station in Wageningen

column	data	1	2	3	4	5	6	7	8
1	day number	287	8.0	16.1	12.1	9000	1.16	2.4	0.0
2	minimum temperature per day, at 1.5 m	288	6.4	19.9	13.1	8430	1.32	2.3	0.0
3	maximum temperature per day, at 1.5 m	289	13.8	14.9	14.4	1590	0.93	2.9	0.0
4	mean temperature per day, at 1.5 m	290	11.1	14.8	13.0	2700	0.97	3.6	0.0
5	global radiation per day	291	10.7	14.3	12.5	3350	1.22	3.2	0.0
6	vapour pressure	292	10.0	15.0	12.5	3980	1.31	4.5	0.0
7	mean wind-velocity	293	10.8	14.2	12.5	1550	1.31	3.8	3.9
8	precipitation	294	10.1	14.6	12.4	2200	1.37	2.2	4.9
		295	10.6	14.3	12.5	1720	1.44	2.2	0.1
		296	6.2	15.4	10.8	6460	1.20	1.4	0.0
		297	4.1	12.6	8.4	3970	1.08	1.5	0.0
		298	10.3	13.3	11.8	2290	1.28	1.3	0.7
		299	9.0	13.9	11.4	3760	1.24	2.2	0.0
		300	9.0	14.1	11.6	4910	1.15	3.9	0.0
		301	10.5	17.8	14.1	4740	1.20	4.7	0.0
		302	4.8	14.5	9.7	3930	1.08	3.1	0.0
		303	1.8	10.5	6.2	6300	0.72	1.4	0.0
		304	-0.5	8.9	4.2	5970	0.67	1.1	0.0
		305	2.3	9.9	6.1	3110	0.82	2.0	0.4
		306	3.7	11.2	7.4	4500	0.90	3.3	0.2
		307	-2.0	11.0	4.5	5730	0.80	2.6	1.2
		308	-4.7	6.0	0.7	8000	0.47	2.0	0.0
		309	-3.0	5.2	1.1	7410	0.42	3.3	0.0
		310	-2.9	6.1	1.6	6830	0.46	1.3	0.0
		311	-1.7	7.2	2.8	3520	0.69	1.3	0.0
		312	-0.3	4.5	2.1	1860	0.70	2.3	0.0
		313	2.3	10.2	6.3	5090	0.73	3.8	0.0
		314	4.1	10.9	7.5	2970	0.84	3.2	0.1
		315	9.2	13.6	11.4	2130	1.25	2.9	1.6
		316	12.3	13.6	13.0	900	1.45	1.7	8.6
		317	10.0	12.9	11.4	520	1.32	1.6	3.3
		318	5.2	11.0	8.1	4640	0.90	2.9	0.6
		319	4.7	11.2	7.9	2550	0.99	2.9	0.0
		320	6.7	11.7	9.2	1680	1.09	1.5	0.1
		321	3.2	11.3	7.3	3280	0.93	1.5	0.0
		322	3.3	9.0	6.2	4040	0.89	3.3	0.2
		323	5.3	11.5	8.4	1600	1.03	4.4	2.0
		324	2.6	7.5	5.1	3360	0.72	2.0	0.6
		325	-2.7	4.4	0.9	2540	0.62	1.9	1.7
		326	-6.0	2.6	-1.7	5710	0.43	1.0	0.0
		327	-7.1	5.7	-0.7	1690	0.58	2.5	0.7
		328	1.9	7.9	4.9	2610	0.83	1.2	0.0
		329	5.0	8.0	6.5	1730	0.89	1.4	0.5
		330	4.1	9.8	7.0	2010	0.83	1.3	0.6
		331	4.5	8.3	6.4	1870	0.81	0.9	0.0
		332	3.6	9.4	6.5	2750	0.84	1.2	0.5
		333	3.2	8.6	5.9	870	0.77	5.7	0.2
		334	0.3	10.2	5.3	2980	0.82	4.0	0.2
		335	3.9	11.7	7.8	590	0.96	3.3	20.0
		336	-1.0	4.0	1.5	590	0.59	3.6	4.1
		337	-0.9	1.0	0.1	750	0.59	2.4	0.7
		338	0.2	6.9	3.5	1460	0.72	3.2	1.1
		339	6.1	9.2	7.7	620	0.89	5.0	9.4
		340	3.0	7.9	5.5	2250	0.70	5.4	1.2
		341	1.2	7.5	4.3	2020	0.73	4.1	6.2
		342	0.2	7.4	3.8	2810	0.73	1.8	0.3
		343	1.4	7.8	4.6	1400	0.90	3.6	1.4
		344	2.5	9.7	6.1	2800	0.97	2.1	2.2
		345	9.3	11.3	10.3	960	1.10	3.9	1.8
		346	8.2	10.1	9.2	760	0.95	4.8	0.4
		347	4.5	9.8	7.2	1700	0.84	3.7	1.8

1	2	3	4	5	6	7	8
223	16.7	25.2	21.0	13270	2.01	1.3	8.1
224	14.7	20.4	17.5	16260	0.82	3.1	0.6
225	14.2	21.8	18.0	11350	0.68	3.6	0.0
226	13.3	20.3	16.8	19810	0.64	3.5	0.0
227	13.3	26.3	19.8	20680	0.60	2.3	0.0
228	8.2	19.7	14.0	14480	0.89	2.9	0.0
229	6.8	21.2	14.0	16630	0.78	1.4	0.0
230	5.0	23.0	14.0	21540	0.54	0.8	0.0
231	8.0	26.7	17.4	19470	0.52	2.4	0.0
232	15.0	22.7	18.9	9670	0.81	3.7	3.6
233	14.1	20.2	17.2	12390	1.07	4.7	0.9
234	14.2	18.1	16.1	7780	1.06	4.4	14.8
235	11.6	18.9	15.3	12810	0.90	2.9	5.8
236	11.4	17.5	14.4	10590	0.88	2.0	0.0
237	10.2	17.8	14.0	5900	0.83	3.0	3.8
238	12.9	18.0	15.4	12590	0.82	5.0	6.7
239	11.6	18.8	15.2	10480	0.77	4.2	0.0
240	12.8	21.9	17.4	5700	0.76	2.2	2.9
241	16.2	27.1	21.7	13760	0.83	3.7	16.6
242	11.4	18.4	14.9	13400	0.87	3.4	0.0
243	10.9	19.3	15.1	12790	0.86	2.8	0.0
244	12.0	21.7	16.9	14480	0.80	2.5	2.8
245	12.8	20.2	16.5	4950	1.50	3.8	2.6
246	10.9	17.0	13.9	11530	1.26	4.6	1.6
247	10.5	17.5	14.0	11330	1.22	2.5	0.1
248	9.4	19.1	14.3	15420	1.25	1.7	0.0
249	10.8	18.9	14.9	5080	1.51	1.7	10.4
250	9.8	21.0	15.4	15950	1.42	1.2	0.1
251	11.7	21.7	16.7	17950	1.29	2.5	0.0
252	12.3	21.7	17.0	18010	1.23	3.1	0.0
253	12.2	24.3	18.3	16900	1.36	1.4	0.0
254	11.8	18.0	14.9	6550	1.50	1.5	0.0
255	8.9	19.4	14.1	7140	1.44	2.7	0.5
256	7.9	16.6	12.3	8670	1.18	3.8	3.2
257	10.2	16.1	13.2	11420	1.17	3.9	10.1
258	8.7	17.3	13.0	12410	1.23	1.9	1.4
259	8.9	17.1	13.0	10820	1.23	1.8	2.1
260	11.9	15.1	13.5	3740	1.37	2.2	4.2
261	11.4	17.2	14.3	6480	1.36	1.9	0.4
262	12.4	16.7	14.6	4820	1.43	2.0	0.1
263	11.8	17.7	14.8	7880	1.37	1.9	0.0
264	12.2	14.6	13.4	3880	1.21	1.4	0.0
265	11.6	17.1	14.4	7360	1.31	2.0	0.0
266	9.8	20.6	15.2	11040	1.41	2.9	0.0
267	11.3	15.5	13.4	5990	1.18	6.7	5.3
268	10.2	14.4	12.3	3070	1.22	4.8	13.8
269	10.5	17.1	13.8	4380	1.53	2.5	0.7
270	15.2	16.6	15.9	2100	1.62	5.8	5.0
271	14.9	17.3	16.1	2950	1.65	3.7	1.4
272	11.8	17.6	14.7	5040	1.39	5.4	2.9
273	7.1	14.7	10.9	10760	1.02	4.3	0.4
274	2.7	13.8	8.3	9650	0.86	1.0	0.0
275	0.9	15.0	7.9	13540	0.80	1.4	0.0
276	3.7	17.5	10.6	12310	1.01	1.7	0.0
277	3.1	15.5	9.3	7030	1.08	1.3	0.0
278	8.4	17.7	13.1	9490	1.34	1.8	0.0
279	10.2	16.0	13.1	3520	1.23	3.1	0.3
280	10.5	13.9	12.2	1800	1.20	5.9	3.5
281	8.3	14.4	11.4	6540	0.95	7.7	13.6
282	8.8	13.3	11.1	7850	0.99	7.3	11.6
283	12.1	13.8	13.0	980	1.34	6.8	6.0

1	2	3	4	5	6	7	8
284	5.5	13.6	9.6	9650	0.96	4.6	9.9
285	2.0	12.4	7.2	6150	0.96	4.0	0.2
286	9.6	14.8	12.2	4250	1.28	2.7	0.0
287	8.0	16.1	12.1	9000	1.16	2.4	0.0
288	6.4	19.9	13.1	8430	1.32	2.3	0.0
289	13.8	14.9	14.4	1590	0.93	2.9	0.0
290	11.1	14.8	13.0	2700	0.97	3.6	0.0
291	10.7	14.3	12.5	3350	1.22	3.2	0.0
292	10.0	15.0	12.5	3980	1.31	4.5	0.0
293	10.8	14.2	12.5	1550	1.31	3.8	3.9
294	10.1	14.6	12.4	2200	1.37	2.2	4.9
295	10.6	14.3	12.5	1720	1.44	2.2	0.1
296	6.2	15.4	10.8	6460	1.20	1.4	0.0
297	4.1	12.6	8.4	3970	1.08	1.5	0.0
298	10.3	13.3	11.8	2290	1.28	1.3	0.7
299	9.0	13.9	11.4	3760	1.24	2.2	0.0
300	9.0	14.1	11.6	4910	1.15	3.9	0.0
301	10.5	17.8	14.1	4740	1.20	4.7	0.0
302	4.8	14.5	9.7	3930	1.08	3.1	0.0
303	1.8	10.5	6.2	6300	0.72	1.4	0.0
304	-0.5	8.9	4.2	5970	0.67	1.1	0.0
305	2.3	9.9	6.1	3110	0.82	2.0	0.4
306	3.7	11.2	7.4	4500	0.90	3.3	0.2
307	-2.0	11.0	4.5	5730	0.80	2.6	1.2
308	-4.7	6.0	0.7	8000	0.47	2.0	0.0
309	-3.0	5.2	1.1	7410	0.42	3.3	0.0
310	-2.9	6.1	1.6	6830	0.46	1.3	0.0
311	-1.7	7.2	2.8	3520	0.69	1.3	0.0
312	-0.3	4.5	2.1	1860	0.70	2.3	0.0
313	2.3	10.2	6.3	5090	0.73	3.8	0.0
314	4.1	10.9	7.5	2970	0.84	3.2	0.1
315	9.2	13.6	11.4	2130	1.25	2.9	1.6
316	12.3	13.6	13.0	900	1.45	1.7	8.6
317	10.0	12.9	11.4	520	1.32	1.6	3.3
318	5.2	11.0	8.1	4640	0.90	2.9	0.6
319	4.7	11.2	7.9	2550	0.99	2.9	0.0
320	6.7	11.7	9.2	1680	1.09	1.5	0.1
321	3.2	11.3	7.3	3280	0.93	1.5	0.0
322	3.3	9.0	6.2	4040	0.89	3.3	0.2
323	5.3	11.5	8.4	1600	1.03	4.4	2.0
324	2.6	7.5	5.1	3360	0.72	2.0	0.6
325	-2.7	4.4	0.9	2540	0.62	1.9	1.7
326	-6.0	2.6	-1.7	5710	0.43	1.0	0.0
327	-7.1	5.7	-0.7	1690	0.58	2.5	0.7
328	1.9	7.9	4.9	2610	0.83	1.2	0.0
329	5.0	8.0	6.5	1730	0.89	1.4	0.5
330	4.1	9.8	7.0	2010	0.83	1.3	0.6
331	4.5	8.3	6.4	1870	0.81	0.9	0.0
332	3.6	9.4	6.5	2750	0.84	1.2	0.5
333	3.2	8.6	5.9	870	0.77	5.7	0.2
334	0.3	10.2	5.3	2980	0.82	4.0	0.2
335	3.9	11.7	7.8	590	0.96	3.3	20.0
336	-1.0	4.0	1.5	590	0.59	3.6	4.1
337	-0.9	1.0	0.1	750	0.59	2.4	0.7
338	0.2	6.9	3.5	1460	0.72	3.2	1.1
339	6.1	9.2	7.7	620	0.89	5.0	9.4
340	3.0	7.9	5.5	2250	0.70	5.4	1.2
341	1.2	7.5	4.3	2020	0.73	4.1	6.2
342	0.2	7.4	3.8	2810	0.73	1.8	0.3
343	1.4	7.8	4.6	1400	0.90	3.6	1.4
344	2.5	9.7	6.1	2800	0.97	2.1	2.2

1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
101	-1.7	9.3	3.8	17520	0.57	4.6	0.2	162	11.0	20.6	15.8	7980	1.63	1.3	0.0
102	0.5	11.8	6.2	9010	0.83	2.7	0.0	163	10.8	19.6	15.2	11700	1.35	2.8	0.0
103	-1.7	15.3	6.8	20430	0.71	3.2	0.1	164	10.1	21.3	15.7	24630	1.66	4.4	0.0
104	-0.9	10.3	4.7	19620	0.55	3.3	0.0	165	11.3	24.7	18.0	29750	2.10	2.7	0.0
105	-2.9	14.0	5.6	21800	0.55	3.2	0.0	166	7.7	21.2	14.5	29670	1.27	2.4	0.0
106	7.0	17.3	12.1	19970	0.69	3.1	0.0	167	13.4	20.1	16.8	18610	1.38	2.2	0.0
107	11.2	17.6	14.4	8230	1.22	2.2	3.6	168	12.8	17.7	15.3	13230	1.18	1.8	0.0
108	5.2	17.2	11.2	8340	1.27	1.9	0.8	169	12.2	21.2	16.7	20360	1.28	1.8	0.0
109	4.7	21.1	12.9	20180	1.29	1.8	0.0	170	8.6	19.3	13.9	17120	1.27	2.3	0.0
110	13.0	24.5	18.8	19040	1.39	2.4	0.0	171	10.5	15.5	13.0	9880	1.11	2.0	0.0
111	7.9	17.2	12.6	10000	1.20	4.4	2.0	172	11.6	19.6	15.6	17550	1.32	1.9	0.6
112	7.1	13.5	10.3	9790	1.08	3.2	0.0	173	11.6	22.9	17.3	16920	1.52	1.9	2.9
113	1.7	12.1	6.9	23770	0.67	2.8	0.0	174	7.8	17.5	12.7	16640	1.24	3.2	2.0
114	-0.1	9.7	4.8	25070	0.43	3.8	0.0	175	6.9	17.9	12.4	11160	1.17	2.2	0.2
115	-1.0	11.2	5.1	25390	0.40	3.3	0.0	176	12.3	16.2	14.3	6640	1.45	2.0	1.1
116	-1.9	11.3	4.7	22860	0.50	2.5	0.0	177	12.5	20.2	16.4	15000	1.50	2.1	0.6
117	-2.3	12.6	5.2	18120	0.56	1.7	0.2	178	13.0	17.1	15.1	5220	1.52	1.5	0.1
118	3.9	16.0	9.9	23860	1.17	3.2	0.0	179	10.8	21.1	16.0	15850	1.62	1.7	0.0
119	4.1	15.0	9.6	15140	1.12	2.7	6.5	180	10.9	21.9	16.4	19780	1.54	2.0	0.0
120	2.6	15.1	8.9	16080	0.85	1.6	0.0	181	10.7	20.6	15.7	15800	1.53	1.9	0.0
121	9.0	20.7	14.9	21080	1.65	2.0	0.0	182	11.6	26.2	18.9	18660	1.98	2.1	8.1
122	8.3	20.7	14.5	16800	1.62	2.5	4.9	183	11.7	20.8	16.3	9590	1.67	3.2	8.6
123	9.5	19.4	14.4	20380	1.17	3.1	2.6	184	9.8	17.1	13.5	11510	1.28	2.7	5.1
124	9.8	16.2	13.0	13090	1.15	3.3	2.8	185	11.5	18.5	15.0	13980	1.40	4.8	7.0
125	9.2	14.2	11.7	11490	1.22	4.0	2.8	186	14.4	22.1	18.3	16950	1.45	4.5	0.1
126	3.7	16.3	10.0	15550	1.23	2.4	0.0	187	12.6	18.1	15.4	5910	1.53	1.7	6.4
127	0.6	19.5	10.1	24150	0.89	2.0	0.0	188	12.4	22.0	17.2	19300	1.47	3.1	1.5
128	7.6	22.0	14.8	21890	1.92	4.4	0.0	189	13.6	19.7	16.7	17330	1.48	2.7	11.8
129	14.4	19.5	17.0	10330	1.87	4.3	0.1	190	13.0	17.8	15.4	12740	1.40	2.6	0.8
130	14.2	23.8	19.0	15180	2.01	2.0	7.8	191	10.6	18.7	14.7	12950	1.29	3.3	0.6
131	7.8	17.2	12.5	12170	1.50	2.1	0.0	192	10.6	24.4	17.5	27230	1.44	2.8	0.0
132	8.7	22.0	15.4	24060	1.82	3.3	0.0	193	11.6	20.8	16.2	14450	1.49	2.5	1.3
133	11.1	23.8	17.5	25660	1.14	4.1	0.0	194	11.6	19.5	15.6	16830	1.41	2.3	0.0
134	15.5	26.0	20.8	26240	1.05	4.7	0.0	195	12.2	16.9	14.6	4850	1.49	2.4	3.9
135	15.0	25.3	20.1	23470	1.09	4.5	0.0	196	12.3	18.4	15.4	9500	1.48	3.8	20.9
136	15.4	26.3	20.9	23390	0.98	4.3	0.0	197	12.7	18.4	15.6	8050	1.49	4.2	6.0
137	11.4	27.3	19.4	22380	1.08	2.9	0.0	198	12.6	14.0	13.3	3440	1.45	6.0	9.6
138	9.1	19.3	14.2	25140	1.17	2.8	0.0	199	11.9	16.8	14.3	8430	1.58	2.5	6.0
139	5.4	13.5	9.4	9050	0.83	1.7	0.0	200	12.5	16.5	14.5	5790	1.45	2.7	0.9
140	3.7	10.3	7.0	3660	0.90	2.1	1.6	201	10.8	19.1	15.0	13530	1.47	2.2	0.0
141	2.2	12.9	7.5	14740	0.77	1.9	0.3	202	10.8	19.6	15.2	12450	1.55	1.7	0.2
142	-0.9	16.3	7.7	20820	0.71	1.3	0.0	203	15.0	20.7	17.9	7940	1.86	1.7	0.5
143	1.6	18.9	10.3	28820	0.72	2.8	0.0	204	18.0	22.4	20.2	6080	2.05	3.3	2.6
144	8.9	21.8	15.3	26240	1.73	3.8	0.0	205	18.3	27.6	23.0	17650	2.15	2.9	9.2
145	8.8	20.1	14.5	21540	1.28	2.8	1.4	206	12.6	20.4	16.5	15740	1.55	3.5	2.6
146	8.8	26.3	17.5	23620	1.20	2.4	0.0	207	11.5	23.2	17.4	22710	1.38	3.3	0.0
147	14.2	25.0	19.6	17630	1.54	2.8	0.0	208	12.7	19.0	15.9	4790	1.60	2.0	10.0
148	13.7	17.2	15.5	7080	1.54	2.8	4.8	209	10.6	19.6	15.1	19300	1.31	2.4	0.0
149	11.6	14.5	13.1	3000	1.42	1.9	2.5	210	12.0	20.7	16.4	17640	1.40	2.8	5.6
150	10.2	16.5	13.4	13600	1.46	2.8	3.2	211	12.7	18.9	15.8	23420	1.25	5.0	1.5
151	9.8	17.3	13.6	15330	1.50	4.2	3.5	212	10.5	19.6	15.1	19900	1.20	3.9	0.0
152	9.2	15.3	12.3	10830	1.41	4.1	0.0	213	10.9	19.8	15.3	16340	1.30	2.9	0.0
153	9.8	17.7	13.8	18100	1.29	4.0	0.0	214	10.3	21.9	16.1	21520	1.41	1.5	0.0
154	10.8	18.9	14.9	13980	1.56	3.5	0.6	215	8.9	19.4	14.1	14600	1.32	1.1	1.1
155	11.7	18.2	15.0	19640	1.66	3.9	0.8	216	8.1	19.5	13.8	20300	1.18	1.4	0.0
156	8.6	17.1	12.9	16740	1.21	3.5	0.7	217	9.1	19.9	14.5	13250	1.39	2.6	0.0
157	7.3	15.9	11.6	13600	1.07	2.1	0.9	218	11.9	21.1	16.5	11710	1.57	1.5	0.0
158	6.9	15.0	10.9	11110	1.31	1.7	0.0	219	10.7	24.7	17.7	19260	1.66	1.1	0.0
159	6.8	14.0	10.4	6500	0.59	2.1	0.0	220	10.5	26.8	18.6	22240	1.63	1.5	0.0
160	8.8	18.7	13.8	11220	1.38	1.2	0.0	221	16.1	26.3	21.2	19270	1.79	2.0	0.0
161	8.8	16.9	12.9	8970	1.46	1.3	0.9	222	13.5	23.6	18.6	17460	1.91	2.0	0.0

1	2	3	4	5	6	7	8
348	5.4	8.6	7.0	1080	0.91	1.9	0.2
349	4.3	7.8	6.1	930	0.83	2.6	0.1
350	3.6	8.2	5.9	870	0.94	2.8	1.4
351	3.0	6.4	4.7	550	0.80	1.9	1.1
352	0.8	6.3	3.6	1980	0.79	1.6	0.7
353	4.8	9.2	7.0	860	0.93	5.8	11.0
354	4.9	10.2	7.6	1120	0.93	6.8	15.6
355	3.3	6.2	4.8	1800	0.73	2.2	0.0
356	4.1	9.6	6.9	550	1.00	3.9	1.1
357	8.4	9.9	9.1	1020	0.95	5.9	0.0
358	7.8	10.7	9.3	550	0.96	6.3	0.8
359	3.1	9.6	6.4	1240	0.86	4.8	6.5
360	4.5	10.1	7.3	900	1.06	2.2	0.1
361	-0.9	11.4	5.3	2570	1.03	3.3	0.0
362	6.8	10.6	8.7	2790	1.01	3.4	0.9
363	6.7	10.9	8.8	640	1.11	2.1	0.0
364	5.2	9.3	7.3	790	0.94	2.6	0.0
365	4.6	5.9	5.3	490	0.85	2.6	0.0

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1	6.6	10.9	8.8	880	0.94	6.0	7.9
1	6.6	10.9	8.8	880	0.94	6.0	7.9
2	8.4	13.1	10.8	330	1.10	7.8	7.3
3	6.6	9.2	7.9	860	0.84	7.7	3.4
4	5.1	10.2	7.7	2120	0.83	7.5	1.3
5	6.9	11.5	9.2	420	0.73	5.2	6.7
6	8.0	10.8	9.4	1880	0.87	6.9	9.8
7	2.9	8.3	5.6	470	0.79	4.9	2.5
8	2.1	6.0	4.1	1270	0.73	2.6	0.1
9	2.2	7.8	5.0	580	0.78	4.4	0.5
10	6.1	9.8	8.0	820	1.05	2.0	11.6
11	2.2	6.7	4.4	3150	0.74	4.0	1.8
12	1.2	7.1	4.2	3480	0.67	3.0	0.0
13	1.7	8.4	5.0	2670	0.67	3.8	0.0
14	-0.6	8.7	4.0	1460	0.79	2.5	0.2
15	-1.6	6.0	2.2	630	0.73	1.4	0.0
16	3.0	5.7	4.3	360	0.72	1.1	0.0
17	1.1	6.2	3.6	380	0.79	1.8	0.0
18	1.0	5.9	3.5	2370	0.66	1.9	0.0
19	3.0	9.5	6.3	3690	0.78	2.6	0.0
20	4.6	7.6	6.1	460	0.79	3.9	1.3
21	1.6	5.9	3.8	1250	0.73	3.1	0.2
22	0.2	3.3	1.8	210	0.64	3.9	11.9
23	0.0	3.8	1.9	4070	0.66	3.1	4.4
24	3.5	10.9	7.2	1440	0.94	4.6	7.0
25	5.6	10.0	7.8	570	0.92	5.1	13.6
26	3.7	7.9	5.8	460	0.88	3.8	3.6
27	2.2	6.9	4.6	2360	0.74	1.6	0.2
28	4.1	9.4	6.8	670	0.92	4.0	13.1
29	3.6	9.9	6.8	1870	0.90	5.4	7.2
30	4.0	6.5	5.3	1310	0.77	4.3	1.6
31	2.4	6.5	4.5	2010	0.72	4.4	0.1
32	2.3	8.5	5.4	1200	0.79	6.5	10.7
33	3.9	8.7	6.3	3000	0.75	7.9	3.3
34	3.9	8.5	6.2	3370	0.79	5.7	2.9
35	4.3	9.2	6.8	2700	0.83	6.5	2.7
36	4.8	8.3	6.6	5100	0.81	4.5	2.0
37	1.3	9.0	5.2	3200	0.72	3.5	8.4
38	1.3	5.9	3.6	3600	0.62	4.0	1.2
39	1.3	5.2	3.3	3100	0.61	6.5	8.0

1	2	3	4	5	6	7	8
40	3.0	9.4	6.2	2800	0.67	7.0	1.4
41	0.8	5.9	3.4	960	0.63	8.0	7.3
42	1.2	7.4	4.3	5270	0.65	4.9	0.1
43	-0.7	6.0	2.7	4590	0.62	2.3	2.9
44	-0.5	7.6	3.5	8290	0.60	3.7	0.0
45	3.3	9.2	6.3	6130	0.55	4.0	0.0
46	1.2	8.5	4.8	7720	0.54	2.6	0.0
47	0.1	7.7	3.9	4120	0.64	3.5	0.0
48	1.1	7.2	4.2	4470	0.74	4.6	0.7
49	3.8	7.4	5.6	3830	0.83	4.1	2.1
50	4.2	8.3	6.3	7080	0.77	4.3	1.0
51	3.5	8.6	6.1	6010	0.84	2.0	0.1
52	3.0	7.9	5.5	1900	0.86	1.7	0.0
53	-0.4	8.8	4.2	5030	0.73	2.9	0.0
54	1.4	6.7	4.0	5810	0.70	4.6	6.6
55	0.2	3.8	2.0	4700	0.57	2.9	0.0
56	-0.4	2.6	1.1	4770	0.54	3.0	0.0
57	-0.1	1.4	0.6	2560	0.55	4.0	0.2
58	-1.9	2.9	0.5	2100	0.56	2.2	0.0
59	0.5	6.4	3.5	5310	0.65	5.5	2.5
60	0.5	6.0	3.3	6650	0.63	5.6	4.5
61	-2.0	3.8	0.9	7180	0.59	2.7	4.6
62	-3.5	5.9	1.2	8080	0.59	2.4	1.9
63	1.0	3.8	2.4	2840	0.62	4.9	0.0
64	-1.8	6.2	2.2	7200	0.58	1.6	5.2
65	-1.8	3.6	0.9	7400	0.58	3.0	0.0
66	0.3	6.2	3.3	4120	0.74	3.8	3.2
67	-1.7	7.1	2.7	7800	0.41	2.5	12.2
68	-2.5	6.2	1.8	19980	0.52	1.4	0.6
69	-1.9	5.5	1.8	4330	0.63	2.4	0.0
70	2.7	8.3	5.5	3870	0.80	3.2	4.3
71	1.3	7.5	4.4	6620	0.80	6.7	4.8
72	0.8	6.4	3.6	6770	0.64	3.3	1.3
73	0.5	4.1	2.3	4780	0.64	2.2	3.9
74	-0.1	6.4	3.2	11760	0.57	1.2	0.2
75	2.2	9.5	5.8	2470	0.89	6.0	8.6
76	3.7	8.5	6.1	3800	0.79	6.1	0.6
77	-1.7	7.8	3.1	13740	0.56	2.5	0.1
78	-3.3	8.6	2.7	14790	0.52	1.8	0.2
79	3.2	8.9	6.0	1910	0.79	4.1	4.7
80	8.0	12.2	10.1	4920	1.08	4.3	9.2
81	7.2	10.8	9.0	2850	1.06	3.7	7.8
82	5.0	12.1	8.6	14130	0.92	3.8	0.0
83	4.7	10.0	7.3	5060	0.90	3.8	9.3
84	2.5	10.4	6.4	4400	0.84	5.3	5.4
85	4.4	7.4	5.9	3820	0.83	3.6	7.4
86	4.5	9.2	6.8	9130	0.80	5.8	5.5
87	2.2	9.0	5.6	6680	0.77	4.8	2.9
88	1.4	8.0	4.7	5370	0.83	3.2	3.1
89	6.1	9.2	7.7	5460	0.90	2.6	6.9
90	5.5	12.3	8.9	7330	0.88	3.4	1.4
91	5.6	9.1	7.4	5450	0.83	2.8	0.0
92	2.0	11.4	6.7	12360	0.71	2.4	0.0
93	2.3	13.7	8.0	16410	0.73	1.5	0.0
94	-0.4	14.1	6.9	15310	0.75	2.0	0.1
95	4.1	12.0	8.1	17080	0.77	3.7	0.0
96	3.9	10.6	7.3	13070	0.79	4.2	0.0
97	3.7	14.2	8.9	18320	0.82	4.3	0.0
98	4.8	16.4	10.6	15160	0.90	2.8	0.0
99	3.9	11.0	7.5	6520	0.84	2.9	0.0
100	-1.6	6.5	2.5	8360	0.60	1.6	4.7

1	2	3	4	5	6	7	8
345	9.3	11.3	10.3	960	1.10	3.9	1.8
346	8.2	10.1	9.2	760	0.95	4.8	0.4
347	4.5	9.8	7.2	1700	0.84	3.7	1.8
348	5.4	8.6	7.0	1080	0.91	1.9	0.2
349	4.3	7.8	6.1	930	0.83	2.6	0.1
350	3.6	8.2	5.9	870	0.94	2.8	1.4
351	3.0	6.4	4.7	550	0.80	1.9	1.1
352	0.8	6.3	3.6	1980	0.79	1.6	0.7
353	4.8	9.2	7.0	860	0.93	5.8	11.0
354	4.9	10.2	7.6	1120	0.93	6.8	15.6
355	3.3	6.2	4.8	1800	0.73	2.2	0.0
356	4.1	9.6	6.9	550	1.00	3.9	1.1
357	8.4	9.9	9.1	1020	0.95	5.9	0.0
358	7.8	10.7	9.3	550	0.96	6.3	0.8
359	3.1	9.6	6.4	1240	0.86	4.8	6.5
360	4.5	10.1	7.3	900	1.06	2.2	0.1
361	-0.9	11.4	5.3	2570	1.03	3.3	0.0
362	6.8	10.6	8.7	2790	1.01	3.4	0.9
363	6.7	10.9	8.8	640	1.11	2.1	0.0
364	5.2	9.3	7.3	790	0.94	2.6	0.0
365	4.6	5.9	5.3	490	0.85	2.6	0.0

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1	6.6	10.9	8.8	880	0.94	6.0	7.9
2	8.4	13.1	10.8	330	1.10	7.8	7.3
3	6.6	9.2	7.9	860	0.84	7.7	3.4
4	5.1	10.2	7.7	2120	0.83	7.5	1.3
5	6.9	11.5	9.2	420	0.73	5.2	6.7
6	8.0	10.8	9.4	1880	0.87	6.9	9.8
7	2.9	8.3	5.6	470	0.79	4.9	2.5
8	2.1	6.0	4.1	1270	0.73	2.6	0.1
9	2.2	7.8	5.0	580	0.78	4.4	0.5
10	6.1	9.8	8.0	820	1.05	2.0	11.6
11	2.2	6.7	4.4	3150	0.74	4.0	1.8
12	1.2	7.1	4.2	3480	0.67	3.0	0.0
13	1.7	8.4	5.0	2670	0.67	3.8	0.0
14	-0.6	8.7	4.0	1460	0.79	2.5	0.2
15	-1.6	6.0	2.2	630	0.73	1.4	0.0
16	3.0	5.7	4.3	360	0.72	1.1	0.0
17	1.1	6.2	3.6	380	0.79	1.8	0.0
18	1.0	5.9	3.5	2370	0.66	1.9	0.0
19	3.0	9.5	6.3	3690	0.78	2.6	0.0
20	4.6	7.6	6.1	460	0.79	3.9	1.3
21	1.6	5.9	3.8	1250	0.73	3.1	0.2
22	0.2	3.3	1.8	210	0.64	3.9	11.9
23	0.0	3.8	1.9	4070	0.66	3.1	4.4
24	3.5	10.9	7.2	1440	0.94	4.6	7.0
25	5.6	10.0	7.8	570	0.92	5.1	13.6
26	3.7	7.9	5.8	460	0.88	3.8	3.6
27	2.2	6.9	4.6	2360	0.74	1.6	0.2
28	4.1	9.4	6.8	670	0.92	4.0	13.1
29	3.6	9.9	6.8	1870	0.90	5.4	7.2
30	4.0	6.5	5.3	1310	0.77	4.3	1.6
31	2.4	6.5	4.5	2010	0.72	4.4	0.1
32	2.3	8.5	5.4	1200	0.79	6.5	10.7
33	3.9	8.7	6.3	3000	0.75	7.9	3.3
34	3.9	8.5	6.2	3370	0.79	5.7	2.9
35	4.3	9.2	6.8	2700	0.83	6.5	2.7
36	4.8	8.3	6.6	5100	0.81	4.5	2.0
37	1.3	9.0	5.2	3200	0.72	3.5	8.4

1	2	3	4	5	6	7	8
38	1.3	5.9	3.6	3600	0.62	4.0	1.2
39	1.3	5.2	3.3	3100	0.61	6.5	8.0
40	3.0	9.4	6.2	2800	0.67	7.0	1.4
41	0.8	5.9	3.4	960	0.63	8.0	7.3
42	1.2	7.4	4.3	5270	0.65	4.9	0.1
43	-0.7	6.0	2.7	4590	0.62	2.3	2.9
44	-0.5	7.6	3.5	8290	0.60	3.7	0.0
45	3.3	9.2	6.3	6130	0.55	4.0	0.0
46	1.2	8.5	4.8	7720	0.54	2.6	0.0
47	0.1	7.7	3.9	4120	0.64	3.5	0.0
48	1.1	7.2	4.2	4470	0.74	4.6	0.7
49	3.8	7.4	5.6	3830	0.83	4.1	2.1
50	4.2	8.3	6.3	7080	0.77	4.3	1.0
51	3.5	8.6	6.1	6010	0.84	2.0	0.1
52	3.0	7.9	5.5	1900	0.86	1.7	0.0
53	-0.4	8.8	4.2	5030	0.73	2.9	0.0
54	1.4	6.7	4.0	5810	0.70	4.6	6.6
55	0.2	3.8	2.0	4700	0.57	2.9	0.0
56	-0.4	2.6	1.1	4770	0.54	3.0	0.0
57	-0.1	1.4	0.6	2560	0.55	4.0	0.2
58	-1.9	2.9	0.5	2100	0.56	2.2	0.0
59	0.5	6.4	3.5	5310	0.65	5.5	2.5
60	0.5	6.0	3.3	6650	0.63	5.6	4.5
61	-2.0	3.8	0.9	7180	0.59	2.7	4.6
62	-3.5	5.9	1.2	8080	0.59	2.4	1.9
63	1.0	3.8	2.4	2840	0.62	4.9	0.0
64	-1.8	6.2	2.2	7200	0.58	1.6	5.2
65	-1.8	3.6	0.9	7400	0.58	3.0	0.0
66	0.3	6.2	3.3	4120	0.74	3.8	3.2
67	-1.7	7.1	2.7	7800	0.41	2.5	12.2
68	-2.5	6.2	1.8	19980	0.52	1.4	0.6
69	-1.9	5.5	1.8	4330	0.63	2.4	0.0
70	2.7	8.3	5.5	3870	0.80	3.2	4.3
71	1.3	7.5	4.4	6620	0.80	6.7	4.8
72	0.8	6.4	3.6	6770	0.64	3.3	1.3
73	0.5	4.1	2.3	4780	0.64	2.2	3.9
74	-0.1	6.4	3.2	11760	0.57	1.2	0.2
75	2.2	9.5	5.8	2470	0.89	6.0	8.6
76	3.7	8.5	6.1	3800	0.79	6.1	0.6
77	-1.7	7.8	3.1	13740	0.56	2.5	0.1
78	-3.3	8.6	2.7	14790	0.52	1.8	0.2
79	3.2	8.9	6.0	1910	0.79	4.1	4.7
80	8.0	12.2	10.1	4920	1.08	4.3	9.2
81	7.2	10.8	9.0	2850	1.06	3.7	7.8
82	5.0	12.1	8.6	14130	0.92	3.8	0.0
83	4.7	10.0	7.3	5060	0.90	3.8	9.3
84	2.5	10.4	6.4	4400	0.84	5.3	5.4
85	4.4	7.4	5.9	3820	0.83	3.6	7.4
86	4.5	9.2	6.8	9130	0.80	5.8	5.5
87	2.2	9.0	5.6	6680	0.77	4.8	2.9
88	1.4	8.0	4.7	5370	0.83	3.2	3.1
89	6.1	9.2	7.7	5460	0.90	2.6	6.9
90	5.5	12.3	8.9	7330	0.88	3.4	1.4
91	5.6	9.1	7.4	5450	0.83	2.8	0.0
92	2.0	11.4	6.7	12360	0.71	2.4	0.0
93	2.3	13.7	8.0	16410	0.73	1.5	0.0
94	-0.4	14.1	6.9	15310	0.75	2.0	0.1
95	4.1	12.0	8.1	17080	0.77	3.7	0.0
96	3.9	10.6	7.3	13070	0.79	4.2	0.0
97	3.7	14.2	8.9	18320	0.82	4.3	0.0
98	4.8	16.4	10.6	15160	0.90	2.8	0.0

1	2	3	4	5	6	7	8
99	3.9	11.0	7.5	6520	0.84	2.9	0.0
100	-1.6	6.5	2.5	8360	0.60	1.6	4.7
101	-1.7	9.3	3.8	17520	0.57	4.6	0.2
102	0.5	11.8	6.2	9010	0.83	2.7	0.0
103	-1.7	15.3	6.8	20430	0.71	3.2	0.1
104	-0.9	10.3	4.7	19620	0.55	3.3	0.0
105	-2.9	14.0	5.6	21800	0.55	3.2	0.0
106	7.0	17.3	12.1	19970	0.69	3.1	0.0
107	11.2	17.6	14.4	8230	1.22	2.2	3.6
108	5.2	17.2	11.2	8340	1.27	1.9	0.8
109	4.7	21.1	12.9	20180	1.29	1.8	0.0
110	13.0	24.5	18.8	19040	1.39	2.4	0.0
111	7.9	17.2	12.6	10000	1.20	4.4	2.0
112	7.1	13.5	10.3	9790	1.08	3.2	0.0
113	1.7	12.1	6.9	23770	0.67	2.8	0.0
114	-0.1	9.7	4.8	25070	0.43	3.8	0.0
115	-1.0	11.2	5.1	25390	0.40	3.3	0.0
116	-1.9	11.3	4.7	22860	0.50	2.5	0.0
117	-2.3	12.6	5.2	18120	0.56	1.7	0.2
118	3.9	16.0	9.9	23860	1.17	3.2	0.0
119	4.1	15.0	9.6	15140	1.12	2.7	6.5
120	2.6	15.1	8.9	16080	0.85	1.6	0.0
121	9.0	20.7	14.9	21080	1.65	2.0	0.0
122	8.3	20.7	14.5	16800	1.62	2.5	4.9
123	9.5	19.4	14.4	20380	1.17	3.1	2.6
124	9.8	16.2	13.0	13090	1.15	3.3	2.8
125	9.2	14.2	11.7	11490	1.22	4.0	2.8
126	3.7	16.3	10.0	15550	1.23	2.4	0.0
127	0.6	19.5	10.1	24150	0.89	2.0	0.0
128	7.6	22.0	14.8	21890	1.92	4.4	0.0
129	14.4	19.5	17.0	10330	1.87	4.3	0.1
130	14.2	23.8	19.0	15180	2.01	2.0	7.8
131	7.8	17.2	12.5	12170	1.50	2.1	0.0
132	8.7	22.0	15.4	24060	1.82	3.3	0.0
133	11.1	23.8	17.5	25660	1.14	4.1	0.0
134	15.5	26.0	20.8	26240	1.05	4.7	0.0
135	15.0	25.3	20.1	23470	1.09	4.5	0.0
136	15.4	26.3	20.9	23390	0.98	4.3	0.0
137	11.4	27.3	19.4	22380	1.08	2.9	0.0
138	9.1	19.3	14.2	25140	1.17	2.8	0.0
139	5.4	13.5	9.4	9050	0.83	1.7	0.0
140	3.7	10.3	7.0	3660	0.90	2.1	1.6
141	2.2	12.9	7.5	14740	0.77	1.9	0.3
142	-0.9	16.3	7.7	20820	0.71	1.3	0.0
143	1.6	18.9	10.3	28820	0.72	2.8	0.0
144	8.9	21.8	15.3	26240	1.73	3.8	0.0
145	8.8	20.1	14.5	21540	1.28	2.8	1.4
146	8.8	26.3	17.5	23620	1.20	2.4	0.0
147	14.2	25.0	19.6	17630	1.54	2.8	0.0
148	13.7	17.2	15.5	7080	1.54	2.8	4.8
149	11.6	14.5	13.1	3000	1.42	1.9	2.5
150	10.2	16.5	13.4	13600	1.46	2.8	3.2
151	9.8	17.3	13.6	15330	1.50	4.2	3.5
152	9.2	15.3	12.3	10830	1.41	4.1	0.0
153	9.8	17.7	13.8	18100	1.29	4.0	0.0
154	10.8	18.9	14.9	13980	1.56	3.5	0.6
155	11.7	18.2	15.0	19640	1.66	3.9	0.8
156	8.6	17.1	12.9	16740	1.21	3.5	0.7
157	7.3	15.9	11.6	13600	1.07	2.1	0.9
158	6.9	15.0	10.9	11110	1.31	1.7	0.0
159	6.8	14.0	10.4	6500	0.59	2.1	0.0

1	2	3	4	5	6	7	8
160	8.8	18.7	13.8	11220	1.38	1.2	0.0
161	8.8	16.9	12.9	8970	1.46	1.3	0.9
162	11.0	20.6	15.8	7980	1.63	1.3	0.0
163	10.8	19.6	15.2	11700	1.35	2.8	0.0
164	10.1	21.3	15.7	24630	1.66	4.4	0.0
165	11.3	24.7	18.0	29750	2.10	2.7	0.0
166	7.7	21.2	14.5	29670	1.27	2.4	0.0
167	13.4	20.1	16.8	18610	1.38	2.2	0.0
168	12.8	17.7	15.3	13230	1.18	1.8	0.0
169	12.2	21.2	16.7	20360	1.28	1.8	0.0
170	8.6	19.3	13.9	17120	1.27	2.3	0.0
171	10.5	15.5	13.0	9880	1.11	2.0	0.0
172	11.6	19.6	15.6	17550	1.32	1.9	0.6
173	11.6	22.9	17.3	16920	1.52	1.9	2.9
174	7.8	17.5	12.7	16640	1.24	3.2	2.0
175	6.9	17.9	12.4	11160	1.17	2.2	0.2
176	12.3	16.2	14.3	6640	1.45	2.0	1.1
177	12.5	20.2	16.4	15000	1.50	2.1	0.6
178	13.0	17.1	15.1	5220	1.52	1.5	0.1
179	10.8	21.1	16.0	15850	1.62	1.7	0.0
180	10.9	21.9	16.4	19780	1.54	2.0	0.0
181	10.7	20.6	15.7	15800	1.53	1.9	0.0
182	11.6	26.2	18.9	18660	1.98	2.1	8.1
183	11.7	20.8	16.3	9590	1.67	3.2	8.6
184	9.8	17.1	13.5	11510	1.28	2.7	5.1
185	11.5	18.5	15.0	13980	1.40	4.8	7.0
186	14.4	22.1	18.3	16950	1.45	4.5	0.1
187	12.6	18.1	15.4	5910	1.53	1.7	6.4
188	12.4	22.0	17.2	19300	1.47	3.1	1.5
189	13.6	19.7	16.7	17330	1.48	2.7	11.8
190	13.0	17.8	15.4	12740	1.40	2.6	0.8