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SECOND-GENERATION

SAMPLING STRATEGY EVALUATION REPORT

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16. Abstract

This report presents an evaluation of the new, or second-generation, sampling strategy designed for estimating wheat area and production in a country of interest with a precision level fixed in advance. The results of applying the new strategy to two states in the United States (Kansas and North Dakota) and three oblasts in the U.S.S.R. (Kurgan, Kustanai, and Tselinograd) are compared. The area and production estimates in the United States are also compared with the corresponding estimates provided by the Statistical Reporting Service and the first-generation sampling strategy estimates.

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ABBREVIATIONS AND SYMBOLS

Abbreviations:

AG	agricultural
APU	agrophysical unit
BSS	between-strata sum of squares
CAMS	Classification and Mensuration Subsystem
CAS	Crop Assessment Subsystem
CCEA	Center for Climatic and Environmental Assessment
CRD	crop reporting district
CV	coefficient of variation
D	deleted segment
FAS	Foreign Agricultural Service
JSC	Lyndon B. Johnson Space Center
KS	Kansas
KST	Kustanai Oblast
KUR	Kurgan Oblast
LACIE	Large Area Crop Inventory Experiment
LAD	Landsat acquisition data
Landsat	Land Satellite
MIX	mixture of first- and second-generation segments in the United States
NASA	National Aeronautics and Space Administration
ND	North Dakota
NEW	second-generation segments
NSS	subset of first-generation segments used in the U.S.S.R.

Abbreviations: Continued

OLD	first-generation segments
S	screened segment
SRS	Statistical Reporting Service
T	thresholded segment
TSL	Tselinograd
USDA	U.S. Department of Agriculture
U.S.S.R.	Union of Soviet Socialist Republics
X	adjacent strata

Symbols:

I	random subset of m
I_k	number of first-generation selected segments in $\theta_k \cap S$
M	total number of segments in S
M_k	total number of segments in $\theta_k \cap S$
m	number of segments to be selected in S under the second-generation strategy
m_k	number of segments to be selected in θ_k
N_k	total number of segments in θ_k
n_k	number of selected segments in θ_k under the first-generation strategy
S	second-generation sample
S_o	first-generation sample
s_k	any potential segment in $\theta_k \cap S$

1. INTRODUCTION

1.1 OBJECTIVE

An objective in the Large-Area Crop Inventory Experiment (LACIE) is the design of a sampling strategy for estimating wheat area and production in a country of interest with a precision level fixed in advance. So far, two sampling strategies have been proposed. This report evaluates the sampling strategy referred to as the *new*, or *second-generation, sampling strategy*.

1.2 TWO SAMPLING STRATEGIES

The two sampling strategies in LACIE are based on stratification. The sampling strategy referred to as the *old* or *the first-generation sampling strategy* uses as strata the smallest political subdivision in a country for which information on wheat area and yield is available. In the United States, such strata are the counties, and in the Union of Soviet Socialist Republics (U.S.S.R.) they are the oblasts. The *second-generation sampling strategy* uses the agrophysical units (APUs) as strata. The APUs are strata that are homogeneous with respect to the agricultural density [as determined from Land Satellite (Landsat) imagery], soil, and climatic condition. In the new sampling strategy, the strata are classified into two groups, A and B. If the Classification and Mensuration Subsystem (CAMS) estimate of wheat density is available for three or more segments in a stratum, then the stratum is said to belong to Group A. If the CAMS estimate is available for less than three segments, the stratum is classified as Group B. The wheat area and production and their variances are directly estimated in a Group A stratum; but in a Group B stratum, the wheat area in the stratum in the epoch year is used to estimate it. *Epoch year data* refers to some historic data obtained from a previous census or from the Statistical Reporting Service (SRS) of the U. S. Department of Agriculture (USDA) or a similar agency in some past year.

From the political subdivision level data, stratum level wheat area is estimated by an apportioning procedure.

1.3 NEW SAMPLING STRATEGY REQUIREMENT

According to the new sampling strategy plan, the new sampling strategy can provide wheat area and production estimates with a preassigned precision only if the following requirements are met:

1. Good stratification: The strata should be homogeneous with respect to wheat density and yield.
2. Good apportioned estimates: The apportioned estimate of wheat area in a stratum should be close to its true wheat area in the epoch year.
3. Good CAMS estimate: The error in the CAMS estimate of wheat area in a segment should be small.

1.4 NEW SAMPLING STRATEGY PERFORMANCE EVALUATION

In the performance evaluation of the new sampling strategy in a country, it should be determined

1. Whether the requirements cited in section 1.3 have been met.
2. Whether, once the requirements have been met, the estimates of wheat area and production have the preassigned precision.
3. How precise the estimates are if the requirements have not been fully met.

In a testing mode, the new sampling strategy has been applied to two states in the United States (Kansas and North Dakota) and three oblasts in the U.S.S.R. (Kurgan, Kustanai, and Tselinograd). The strata used there have been obtained by intersecting the APUs with the state or oblast. The resulting strata are referred

to as the *refined strata*. In connection with the new sampling strategy, the following tasks have been performed:

1. The quality of the stratification in both the United States and the U.S.S.R. has been evaluated. Six states in the United States and 36 APUs in the U.S.S.R. have been used in the stratification study.

2. The quality of the current apportioning procedure has been evaluated.

3. Estimates of wheat area, production, and their variances have been obtained at different times in the growing season in the two states in the United States and the three oblasts in the U.S.S.R. The area and production estimates in the United States have been compared with the corresponding SRS estimates and the first-generation sampling strategy estimates.

2. STRATIFICATION QUALITY EVALUATION

According to the new sampling strategy, all strata in a good stratification are homogeneous with respect to wheat density and yield. The APUs, or the constituent refined strata, are believed to be homogeneous with respect to agricultural density, soil, and climatic condition. It has been assumed that if any stratum is homogeneous with respect to agricultural density, it will be homogeneous with respect to wheat density also; and if a stratum is homogeneous with respect to soil and climatic condition, then it will be homogeneous with respect to yield. However,

- With respect to agricultural density, a refined stratum in an APU may be homogeneous, whereas the APU itself may not be.
- A refined stratum may be homogeneous with respect to agricultural density but not with respect to wheat density; or it may also be homogeneous with respect to soil and climatic condition but not with respect to yield.
- Administrative strata (such as the CRD) may be more homogeneous with respect to agricultural density, wheat density, or yield than the refined strata.

To evaluate the quality of the current agrophysical stratification, the following tests have been conducted.

1. APU Homogeneity Test: If an APU is as homogeneous as its refined strata with respect to agricultural density, the mean, standard deviation, and coefficient of variation (CV) of agricultural density in the APU will be close to those in each refined stratum. Thus, for testing the homogeneity of agricultural density in an APU, its mean, standard deviation, and CV are compared with those in each refined stratum.

2. Correlation Test: In a stratum, homogeneity of agricultural density implies homogeneity of wheat density if the agricultural density and the wheat density are highly correlated (correlation coefficient close to +1 or -1). Estimates of coefficients of correlation between agricultural and wheat densities are obtained for the refined strata. A refined stratum cannot be homogeneous with respect to wheat density if the estimate of correlation coefficient is not significantly different from zero.

3. Variance Reduction Test: A stratification is better than another stratification if it has smaller within-strata variation of wheat density and yield. With respect to agricultural density, a stratification is better than another if it has smaller within-strata variation of agricultural density. Again, the larger the between-strata variation, the smaller the variation within strata. So, the variations between strata of those variables for the administrative and the agrophysical stratifications are compared. The one with the larger between-strata variation is the better one.

2.1 APU HOMOGENEITY TEST

This test was conducted in 36 APUs in the U.S.S.R. The mean, the standard deviation, and the CV of the agricultural density are computed for each APU and its constituent refined strata (see table 1). Very few APUs are actually homogeneous, but some APUs are more heterogeneous than the others. For example, the second APU appears to be more heterogeneous than any other APU. Based on such empirical evidence, it should be decided how much heterogeneity can be tolerated. Only then can a decision rule be made. If many strata are heterogeneous, a readjustment of the strata boundary may be necessary.

TABLE 1.— MEAN, STANDARD DEVIATION, AND CV OF AGRICULTURAL DENSITY IN APUs AND REFINED STRATA

APU	Refined strata	Mean	Standard deviation	CV
1	Dnepropetrovsk	0.83	0.26	0.313
	Zaporozhye	.85	.20	.235
	Odessa	.83	.25	.301
	Nikolayev	.89	.20	.225
	Kherson	.78	.30	.385
	Krym	.78	.27	.346
	Total:	.819	.256	.313
2	Zaporozhye	.92	.06	.065
	Dnepropetrovsk	.79	.29	.367
	Rostov	.78	.25	.321
	Ternopol	.91	.15	.165
	Khmelnitski	.94	.10	.106
	Zhitomir	.94	.12	.128
	Vinnitsa	.93	.16	.171
	Kiyev	.69	.26	.377
	Cherkassy	.80	.28	.350
	Kirovograd	.97	.10	.103
	Poltava	.83	.24	.289
	Sumy	.90	.18	.200
	Chernigov	.81	.24	.296
	Moldavia	.89	.19	.213
	Odessa	.91	.17	.187
	Nikolayev	.97	.07	.072
	Donetsk	.76	.25	.329
	Kharkov	.75	.25	.333
	Voroshilovgrad	.65	.29	.446
	Belgorod	.79	.23	.291
	Voronezh	.78	.23	.295

TABLE 1.– Continued.

APU	Refined strata	Mean	Standard deviation	CV
2	Kursk	0.78	0.26	0.333
	Total:	.833	.237	.284
4	Lvov	.63	.25	.397
	Ivano-Frankovsk	.70	.26	.371
	Ternopol	.76	.18	.237
	Chernovtsy	.60	.31	.517
	Total:	.651	.263	.404
5	Volyn	.69	.25	.362
	Lvov	.52	.28	.538
	Rovno	.62	.27	.435
	Khmelnitski	.50	.35	.700
	Zhitomir	.71	.28	.394
	Kiyev	.51	.30	.492
	Total:	.655	.283	.432
6	Volyn	.39	.24	.615
	Rovno	.27	.22	.815
	Brest	.39	.23	.590
	Zhitomir	.18	.13	.722
	Gomel	.48	.31	.646
	Chernigov	.60	.30	.500
	Bryansk	.70	.28	.400
	Mogilev	.68	.30	.441
	Smolensk	.76	.23	.303
	Minsk	.49	.30	.612
	Sumy	.54	.29	.537
	Belgorod	.78	.26	.333
	Voronezh	.72	.27	.375
	Kursk	.79	.24	.304
	Orel	.92	.16	.174

TABLE 1.— Continued.

APU	Refined strata	Mean	Standard deviation	CV
6	Lipetsk	0.87	0.21	0.241
	Total	.770	.289	.376
7	Latvia	.77	.32	.416
	Grodno	.78	.27	.346
	Minsk	.64	.29	.453
	Mogilev	.66	.34	.515
	Vitebsk	.58	.34	.586
	Smolensk	.72	.28	.389
	Lithuania	.56	.32	.571
	Bryansk	.59	.28	.475
	Kursk	.86	.18	.209
	Orel	.89	.23	.258
	Kaluga	.45	.28	.622
	Lipetsk	.96	.11	.115
	Tula	.97	.10	.103
	Ryazan	.97	.08	.082
	Total:	.737	.308	.418
8	Smolensk	.61	.29	.475
	Kalinin	.57	.36	.632
	Moscow	.66	.34	.515
	Yaroslavl	.29	.23	.793
	Novgorod	0	0	
	Kaluga	.56	.31	.554
	Tula	.75	.25	.333
	Ryazan	.96	.12	.125
	Orel	.81	.28	.346
	Total:	.636	.335	.527
9	Brest	.74	.29	.392
	Minsk	.78	.29	.372

TABLE 1.— Continued.

APU	Refined strata	Mean	Standard deviation	CV
9	Grodno	0.78	0.28	0.359
	Lithuania	.78	.29	.372
	Kaliningrad	.76	.28	.368
	Total:	.766	.286	.374
10	Latvia	.54	.37	.685
	Lithuania	.82	.25	.305
	Total:	.726	.324	.447
11	Pskov	.66	.38	.576
	Kalinin	.73	.37	.507
	Total:	.681	.378	.556
12	Latvia	.41	.32	.780
	Estonia	.45	.36	.800
	Pskov	.56	.38	.679
	Novgorod	.34	.31	.912
	Leningrad	.42	.35	.833
	Karelia	0	0	
	Total:	.456	.359	.787
13	Kostroma	.23	.22	
	Ivanovo	0	0	
	Yaroslavl	.42	.35	
	Vologda	.35	.31	
	Kalinin	.49	.34	
14	Vologda	.26	.25	.962
	Kostroma	.69	.38	.551
	Arkhangelsk	.23	.23	1.000
	Komi	.40	.25	.625
	Kirov	.57	.31	.544
	Total:	.426	.339	.797

TABLE 1.– Continued.

APU	Refined strata	Mean	Standard deviation	CV
15	Ryazan	0.66	0.32	0.485
	Gorki	.63	.32	.508
	Mari	.53	.32	.604
	Ivanovo	.39	.30	.769
	Moscow	.27	.22	.815
	Kostroma	.40	.33	.825
	Vladimir	.51	.36	.706
	Yaroslavl	.48	.33	.688
	Total:	.523	.342	.654
16	Bashkir	.48	.36	.750
	Gorki	.68	.31	.456
	Kirov	.73	.27	.370
	Mari	.63	.33	.524
	Udmurt	.62	.33	.532
	Perm	.66	.29	.439
	Ryazan	.85	.26	.306
	Mordva	.52	.32	.615
	Lipetsk	.96	.11	.115
	Penza	.35	.26	.743
	Chuvash	.67	.31	.463
	Tatar	.71	.29	.408
	Tambov	1.00	0	0
	Total:	.659	.321	.487
17	Rostov	.66	.39	.591
	Mordva	.76	.31	.408
	Tambov	.85	.25	.294
	Lipetsk	.81	.27	.333

TABLE 1.— Continued.

APU	Refined strata	Mean	Standard deviation	CV
17	Penza	0.72	0.31	0.431
	Voronezh	.75	.26	.347
	Saratov	.79	.24	.304
	Volgograd	.78	.24	.308
	Ulyanovsk	.53	.34	.642
	Ryazan	1.00	0	0
	Total:	.775	.275	.355
18	Chuvash	.85	.25	.294
	Tatar	.81	.25	.309
	Ulyanovsk	.54	.30	.556
	Penza	.41	.31	.756
	Saratov	.50	.25	.500
	Kuibyshev	.47	.25	.532
	Total:	.577	.307	.532
19	Kuibyshev	.89	.16	.180
	Uralsk	.62	.27	.435
	Saratov	.77	.21	.273
	Volgograd	.70	.27	.386
	Total:	.671	.295	.440
20	Rostov	.83	.24	.289
	Volgograd	.76	.28	.368
	Voroshilovgrad	.83	.14	.169
	Total:	.814	.249	.305
21	Saratov	.47	.33	.702
	Volgograd	.61	.31	.508
	Total:	.598	.314	.525
22	Volgograd	.36	.20	.556
	Uralsk	.20	.07	.350

TABLE 1.— Continued.

APU	Refined strata	Mean	Standard deviation	CV
22	Kalmyk	0.17	0.19	1.118
	Astrakhan	.23	.24	1.043
	Total:	.209	.220	1.054
23	Aktyubinsk	.27	.28	1.037
	Kustanai	.66	.34	.515
	Orenburg	.36	.29	.806
	Saratov	.75	.23	.307
	Volgograd	.86	.23	.267
	Uralsk	.47	.26	.553
	Total:	.480	.341	.711
24	Orenburg	.68	.31	.456
	Bashkir	.55	.34	.618
	Kuibyshev	.61	.26	.426
	Ulyanovsk	.65	.31	.477
	Tatar	.64	.27	.422
	Total:	.633	.305	.482
25	Orenburg	.63	.33	.524
	Saratov	.66	.27	.409
	Kuibyshev	.80	.22	.275
	Uralsk	.52	.31	.596
	Total:	.696	.294	.422
26	Volgograd	.87	.21	.241
	Rostov	.77	.22	.286
	Kalmyk	.49	.34	.694
	Stavropol	.72	.33	.458
	Dagestan	.45	.31	.689
	Total:	.648	.335	.517
27	Rostov	.93	.12	.129

TABLE 1.- Continued.

APU	Refined strata	Mean	Standard deviation	CV
27	Stavropol	0.86	0.19	0.221
	Adygei	.68	.30	.441
	Krasnodar	.80	.24	.300
	Total:	.823	.231	.281
28	Krasnodar	.82	.17	.207
	Karachayevo-Cherkess	.57	.36	.632
	Stavropol	.83	.23	.277
	Rostov	.99	.03	.030
	Kalmyk	.68	.34	.500
	Kabardino-Balkar	.73	.32	.438
	Severo-Osetin	.67	.29	.433
	Checheno-Ingush	.57	.28	.491
	Total:	.765	.279	.365
29	Yugo-Osetin	.45	.29	.644
	Georgia	.22	.20	.909
	Aterbaijan	.56	.32	.571
	Nagorno-Karabakh	.25	.27	1.080
	Total:	.493	.328	.666
30	Karakalpak	.33	.22	.667
	Tashauz	.20	.18	.900
	Khorezm	.25	.14	.560
	Total:	.471	.347	.736
31	Aktyubinsk	.33	.26	.788
	Chelyabinsk	.58	.35	.603
	Orenburg	.39	.32	.821
	Bashkir	.47	.34	.723
	Total:	.468	.343	.732
32	Kustanai	.60	.34	.567

TABLE 1.– Concluded.

APU	Refined strata	Mean	Standard deviation	CV
32	Chelyabinsk	0.76	0.23	0.303
	Total:	.622	.332	.533
33	Bashkir	.50	.32	.640
	Tatar	.55	.30	.546
	Total:	.516	.315	.609
34	Kokchetav	.90	.16	.178
	Kustanai	.65	.32	.492
	Severo-Kazakhstan	.49	.33	.653
	Kurgan	.33	.28	.849
	Chelyabinsk	.42	.35	.833
	Total:	.533	.343	.643
35	Turgay	.64	.37	.578
	Tselinograd	.51	.38	.745
	Kokchetav	.40	.35	.875
	Kustanai	.48	.36	.750
	Karaganda	.63	.30	.476
	Pavlodar	.44	.26	.591
	Total:	.547	.368	.672
36	Bashkir	.37	.33	.892
	Sverdlovsk	.73	.31	.425
	Total:	.559	.367	.656
37	Omsk	.78	.30	.385
	Pavlodar	.73	.30	.411
	Kokchetav	.53	.37	.698
	Severo-Kazakhstan	.59	.34	.576
	Total:	.467	.419	.897
39	Perm	.67	.32	.478
	Sverdlovsk	.81	.29	.358
	Total:	.760	.308	.406

2.2 CORRELATION TEST

The coefficient of correlation between county-level agricultural density (as determined from Landsat imagery) and wheat density (in 1976 SRS report) was computed for 43 refined strata in six U.S. Great Plains states: Texas, Oklahoma, Kansas, Nebraska, South Dakota, and Minnesota. Each estimate was tested for its significant difference from zero at a significance level of 0.05. The results are presented in table 2.

Table 2 shows that the county-level agricultural and wheat densities are often uncorrelated; they are correlated in only eight strata out of a total of 43. Most of the refined strata, then, cannot be expected to be homogeneous with respect to wheat density. Thus, the current agrophysical strata or refined strata may not fulfill the requirement of the new sampling strategy.

Agricultural density was used as one of the stratification variables in defining the agrophysical strata. Such strata may be homogeneous with respect to agricultural density but not with respect to wheat density. If segment-level wheat and agricultural densities in a stratum are highly correlated, then the stratum can be expected to be homogeneous with respect to segment-level wheat density whenever it is homogeneous with respect to segment-level agricultural density. Since segment-level agricultural density data are not available in distinguishable form, the correlation coefficient of segment-level wheat and agricultural densities cannot be estimated. However, the correlation coefficient can be estimated from county-level data. The segment- and the county-level correlation coefficients will be the same if the wheat and agricultural densities are equally correlated in all counties in the same refined stratum. In a homogeneous stratum, county and segment level correlation can be expected to be equal.

TABLE 2.- COEFFICIENT OF CORRELATION BETWEEN COUNTY-LEVEL WHEAT AND AGRICULTURAL DENSITY

Refined stratum		Correlation coefficient	Number of counties	Significant from 0 (level 0.05)
State	APU			
Texas	3	-0.02	9	No
	2	-.71	5	No
	5	.39	10	No
	1-1	-.36	14	No
	4	.39	22	No
	Lower 6	.06	14	No
	Lower 6	-.30	6	No
	9	-.24	6	No
Oklahoma	9	-1.00	2	No
	Upper 6	-.46	11	No
	7	-.59	22	Yes
	3	-.25	5	No
	1-2	-.43	34	Yes
Kansas	9	.45	13	No
	8	.81	8	Yes
	Upper 6	-.32	3	No
	7	.41	9	No
	1-2	-.39	7	No
	13	.06	18	No
	14	.61	11	Yes
	12	.63	16	Yes
	15	-1.00	2	No
	11	-.05	18	No
	10	0	1	No
Nebraska	11	.65	15	Yes
	15	.30	40	No
	14	.05	10	No
	10	.81	7	Yes

TABLE 2.– Concluded.

Refined stratum		Correlation coefficient	Number of counties	Significant from 0 (level 0.05)
State	APU			
Nebraska	1-4	0	1	No
	17	1.00	2	No
	16	.35	3	No
	1-3	.51	14	No
South Dakota	1-4	.67	5	No
	17	.05	10	No
	16	.006	21	No
	15	-.56	7	No
	18	.85	5	No
	21	1.00	2	No
	19	.16	12	No
Minnesota	19	.72	16	Yes
	15	.41	16	No
	20	.67	12	Yes

2.3 VARIANCE REDUCTION TEST FOR COMPARISON OF TWO STRATIFICATIONS

The between-strata sum of squares of county-level agriculture density (as determined from the Landsat imagery), county-level wheat density (as in the 1976 SRS report), and county-level yield (as in the 1976 SRS report) are computed for the agrophysical stratification of each state and for the administrative stratification of each state (into CRD strata). This is repeated for six states in the U.S. Great Plains (Texas, Oklahoma, Kansas, Nebraska, South Dakota, and Minnesota). The results are presented in table 3.

With respect to wheat density, the agrophysical stratification is uniformly better than the CRD stratification in all six states because it has a larger between-strata variation than the CRD stratification. The between-strata sum of squares of agricultural density in CRD strata is larger than that in the APU strata only in Minnesota. With respect to agricultural density, then CRD strata may be more homogeneous than the refined strata in Minnesota only. With respect to yield, the CRD strata may be more homogeneous than the refined strata in Texas, South Dakota, and Minnesota.

TABLE 3.— BETWEEN-STRATA VARIATIONS OF CRD AND AGROPHYSICAL STRATIFICATIONS

[Relative difference = {(APU - BSS) - (CRD - BSS)} ÷ (CRD - BSS)]

(a) County agricultural density.

State	APU - BSS	CRD - BSS	Relative difference
Texas	2.6405	1.5115	0.7469
Oklahoma	1.8797	1.6136	.1649
Kansas	1.1350	.1808	5.2776
Nebraska	3.3260	2.8884	.1515
South Dakota	3.1952	2.7640	.1560
Minnesota	.1224	3.4307	-.9643

(b) County wheat density.

State	APU - BSS	CRD - BSS	Relative difference
Texas	0.1870	0.1144	0.6346
Oklahoma	1.4420	1.2840	.1231
Kansas	.7770	.7549	.0293
Nebraska	.1658	.1361	.2182
South Dakota	.0994	.0841	.1819
Minnesota	.3641	.2969	.2263

(c) County yield.

State	APU - BSS	CRD - BSS	Relative difference
Texas	2033.3372	2446.8123	-0.1690
Oklahoma	647.5715	537.0007	.2059
Kansas	2366.9094	1236.7139	.9139
Nebraska	1925.0559	851.1799	1.2616
South Dakota	1104.0264	1223.3467	-.0975
Minnesota	1653.4575	3047.5610	-.4574

3. APPORTIONING PROCEDURE EVALUATION

3.1 APPORTIONING PROCEDURE

In estimating current-year wheat area in a refined stratum from Group B, according to the new (second-generation) sampling strategy, one has to know the epoch year's wheat area in the refined stratum. Since this information is not directly available from the census, the SRS, or the Foreign Agricultural Service (FAS), it is obtained from the state's or the oblast's wheat area in the epoch year by the apportioning procedure. According to the apportioning procedure currently in use, the estimate of the stratum's wheat area in the epoch year is given by the formula,

$$\begin{matrix}\text{stratum} \\ \text{wheat area}\end{matrix} = \frac{\text{stratum agricultural area}}{\text{state agricultural area}} \times \begin{pmatrix}\text{epoch year state} \\ \text{wheat area}\end{pmatrix};$$

where the agricultural area is estimated from the Landsat imagery. It has been assumed that the precision of the estimates of wheat area and variance from Group B strata will increase with the increase in the accuracy of the apportioned estimates. If this assumption is valid, then once an epoch year has been selected, a good apportioning procedure is expected to give apportioned estimates close to the true epoch year wheat area in the strata.

3.2 PERFORMANCE EVALUATION

In order to evaluate the performance of the current apportioning procedure, the following test was conducted. County wheat areas in 1976 as given by the SRS were used as the epoch year data. Exact wheat area in the epoch year in a state or a CRD was obtained by adding the wheat areas in all counties in the state or the CRD. The CRD and the state wheat areas were determined for six U.S. Great Plains states (Texas, Oklahoma, Kansas, Nebraska, South Dakota, and Minnesota). Agriculture area in

each county in those states was estimated from the Landsat imagery. The current apportioning procedure was used to estimate the CRD wheat area from the state wheat area and state and CRD agriculture area. The apportioned estimate in each CRD was compared with the true area, and their relative difference was computed by the following formula:

Relative difference = (Apportioned - True)/True.

The results of the test are presented in table 4. These results show that the current apportioning procedure is not performing well. The apportioned estimates are sometimes overestimates and sometimes underestimates. The deviation of the estimates from the true area is often large and in some cases (5 out of 49) very large.

TABLE 4.– 1976 SRS AND APPORTIONED WHEAT AREA ESTIMATES FOR CRD STRATA

State	CRD	True wheat (1000 acres)	Apportioned wheat (1000 acres)	Relative difference
Texas	1	427.4	615.5	0.44
	2	553.8	454.9	-.18
	3	467.2	501.2	.07
	4	460.3	518.2	.12
	5	448.7	885.6	.97
	6	1676.3	1058.3	-.36
Oklahoma	1	747.0	1175.7	.57
	2	1981.0	1175.7	-.41
	3	150.1	342.9	1.28
	4	1026.0	776.8	-.24
	5	796.0	748.8	-.06
	6	18.3	342.9	17.74
	7	1388	1098.7	-.21
	8	106.5	468.8	3.40
	9	8.6	91.0	9.58
Kansas	1	1177.0	1016.1	-.14
	2	1404.0	1203.9	-.14
	3	414.0	872.5	1.11
	4	1160.0	1154.2	-.01
	5	1921.0	1209.4	-.37
	6	516.0	1209.4	1.34
	7	1126.0	1546.3	.37
	8	2656.0	1562.8	-.41
	9	726.0	1325.4	.82

TABLE 4.— Concluded.

State	CRD	True wheat (1000 acres)	Apportioned wheat (1000 acres)	Relative difference
Nebraska	1	910.0	477.2	-0.48
	2	11.8	420.6	34.65
	3	22.0	351.7	14.99
	4	517.7	355.2	-.31
	5	100.0	332.3	2.32
	6	305.0	355.2	.16
	7	330.0	201.5	-.39
	8	596.0	298.7	-.50
South Dakota	1	511.4	499.6	-.02
	2	939.6	432.4	-.54
	3	512.9	310.0	-.40
	4	250.4	406.8	.62
	5	347.7	361.3	.04
	6	99.5	272.5	1.74
	7	118.4	185.6	.57
	8	227.9	341.6	.50
	9	56.7	254.7	3.49
Minnesota	1	1869.5	1154.0	-.38
	2	0	0	0
	3	0	0	0
	4	1078.4	886.8	-.18
	5	276.9	886.8	2.20
	6	0	0	0
	7	181.2	494.0	1.73
	8	92.5	76.9	-.17

4. EVALUATION OF THE NEW SAMPLING STRATEGY AGGREGATION PROCEDURE

4.1 SIMULATION TECHNIQUE

The new sampling strategy provides wheat area and production estimates with preassigned precision only if the three requirements (good stratification, good apportioned estimate, and good CAMS estimates) are met. Because it is impossible to meet all the requirements in any country, including the United States, the aggregation procedure is best evaluated by the simulation technique.

The evaluation plan includes the simulation of a state with 10 refined strata. In each stratum, the actual wheat area in each segment is obtained as a normal random number from a normal population; the mean and the variance of the population determine the mean and variance of the per-segment wheat area in the stratum. For each stratum, two different sets of normal random numbers are generated. Each set has different population mean and variance; one set corresponds to the epoch year data and the other to the current year data. Epoch year data are used for sample segment allocation and estimation in Group B strata. From the current year data in each stratum, the allocated number of normal random numbers is randomly selected. These numbers represent the CAMS error-free estimate of wheat area in the sample segments. These error-free CAMS estimates are used to obtain the state wheat area estimate by the new sampling strategy aggregation procedure. Then, the estimates of wheat area and variance are compared with the actual wheat area and the actual expected value of the sampling variance. The respective mean and standard deviations of segment wheat proportions in each stratum are as follows.

Stratum	Number of agricultural segments	Epoch year		Current year	
		Mean	Standard	Mean	Standard
1	300	0.7321	0.2314	0.70	0.251
2	200	.3575	.1351	.38	.142
3	250	.2646	.1422	.30	.153
4	225	.4896	.1821	.47	.201
5	150	.2043	.1135	.17	.109
6	125	.1538	.0953	.18	.112
7	100	.1938	.0912	.12	.081
8	50	.0835	.085	.09	.091
9	75	.0972	.1012	.08	.121
10	90	.0714	.1211	.05	.095

The simulated state is shown in figure 1. The results of wheat area and variance estimates in each stratum obtained by means of the new sampling strategy are given in tables 5 and 6. Because of a time constraint, only two runs were made, each with a different number of sample segments.

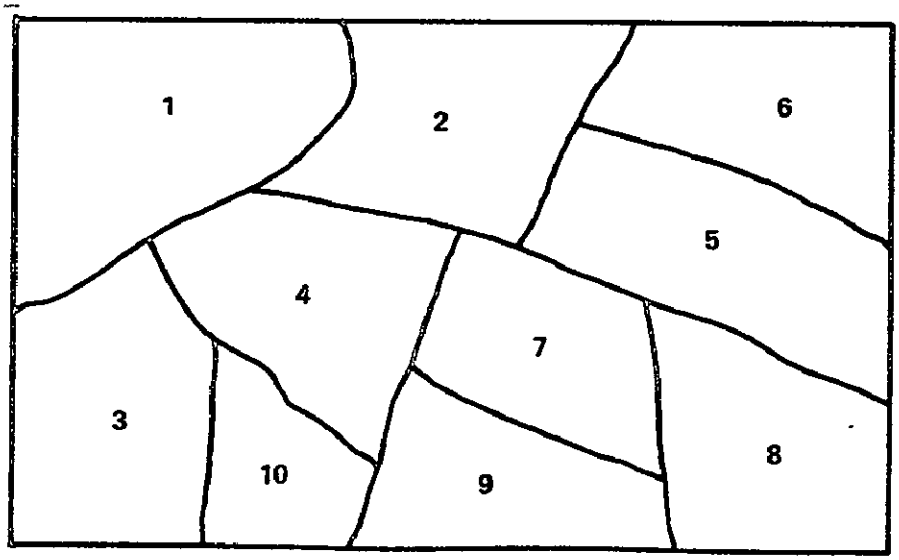


Figure 1.– Simulated state.

TABLE 5.— RESULTS OF WHEAT AREA ESTIMATES OBTAINED BY MEANS OF THE NEW SAMPLING STRATEGY

Stratum	No. of sample segments used	Wheat area, acres	Estimated wheat area, acres	Relative difference	No. of sample segments used	Wheat area, acres	Estimated wheat area, acres	Relative difference
1	37	4 609 448.0	4 941 638.0	0.072	15	4 609 448.0	5 138 678.0	0.115
2	15	1 951 588.0	1 591 353.0	-.185	6	1 951 588.0	1 660 344.0	-.149
3	26	1 948 183.0	2 050 491.0	.053	11	1 948 183.0	2 160 087.0	.109
4	17	2 752 359.0	2 841 288.0	.032	7	2 752 359.0	3 014 118.0	.095
5	16	726 440.0	731 802.9	.007	6	726 440.0	788 218.5	.085
6	7	595 715.1	631 119.4	.059	3	595 715.1	809 407.9	.359
7	4	324 441.9	235 830.0	-.273	1	324 441.9	399 015.4	.230
8	1	152 013.0	86 864.9	-.429	0	152 013.0	146 075.5	-.039
9	6	244 102.4	214 853.2	-.120	2	244 102.4	244 725.6	.003
10	6	230 067.0	147 981.7	-.357	2	230 067.0	156 218.9	-.321
Total	135	12 938 643.4	13 473 219.0		53	12 938 643.4	14 516 885.0	

TABLE 6.— RESULTS OF VARIANCE ESTIMATES OBTAINED BY MEANS OF THE NEW SAMPLING STRATEGY

Stratum	No. of sample segments used	Estimated wheat variance, acres^2	True sampling variance, acres^2	Relative difference	No. of sample segments used	Estimated wheat variance, acres^2	True sampling variance acres^2	Relative difference
1	37	78 483 × 10^6	10 921 × 10^6	6.186	15	175 187 × 10^6	29 194 × 10^6	5.001
2	15	28 433	60 290	-.528	6	34 547	158 059	-.781
3	26	32 240	32 420	-.006	11	83 062	81 760	.016
4	17	67 744	36 862	.838	7	108 621	93 826	.158
5	16	8 575	28 330	-.697	6	32 570	81 187	-.599
6	7	18 743	12 896	.453	3	63 581	31 112	1.044
7	4	1 744	16 648	-.895	1	673	68 677	-.990
8	1	50	7 684	-.993	0	1 119	0	-
9	6	1 839	3 292	-.441	2	4 547	10 452	-.565
10	6	2 114	5 612	-.623	2	753	17 638	-.957
Total	135	241 529	214 955		53	555 347	571 905	

4.2 AGGREGATION PROCEDURE

Aggregations were performed in the states of Kansas and North Dakota and in the oblasts of Kurgan, Kustanai, and Tselinograd. Second-generation sampling strategy aggregation formulae were used as documented in the LACIE Level 3 baseline requirements document (ref. 1) for the Crop Assessment Subsystem (CAS). Inputs to the aggregation formulae are as follows:

a. Allocation and segment selection.

b. Wheat estimate for each allocated segment. If an allocated segment has no wheat estimate, no estimate is used in the aggregation. A zero-percent wheat estimate is included in the aggregation.

c. Historic wheat acreage for each stratum.

d. Per-segment wheat proportion for each stratum.

e. Number of segments with at least 5-percent agriculture in each stratum.

f. List of adjacent refined strata in a political subdivision.

g. Yield and yield variance.

The allocation data sets are defined as follows:

- NEW — Allocations for both the United States and the U.S.S.R. were performed, using the second-generation allocation methods described in reference 1. Segments chosen specifically for this allocation are referred to as second-generation segments in text and "NEW" in the tables and figures.

- MIX — Because the number of second-generation segments that CAMS could process was limited, a scheme was devised for fulfilling the second-generation allocation requirements (see appendix A) by using a mixture of first- and second-generation segments. This choice of segments for the United States is referred to as "mixed" in text and "MIX" in the tables and figures.

- NSS – No second-generation segments were processed in the U.S.S.R. The mixed segments are a subset of the first-generation segments and are referred to as "NSS" in the tables and figures.
- OLD – Aggregations of all available first-generation segments using second-generation formulae are referred to as "OLD" in the tables and figures.
- CAS – Aggregations using Phase III (first-generation) formulae and first-generation segments were made by CAS and are therefore referred to as "CAS." The segment estimate histories for all segments used in these aggregations are given in appendix B.

4.2.1 AGGREGATIONS IN KANSAS AND NORTH DAKOTA

4.2.1.1 Allocation

The allocation of sample segments to the states of Kansas and North Dakota and their refined strata (universal strata intersected with political subdivision boundaries) is reported in reference 2, and the number of segments allocated to each area is given in the aggregation report (appendix C). The sample segments used in the mixed aggregations are given in appendix A. (The segment numbers for Kansas are taken from reference 3 and for North Dakota from reference 4.)

4.2.1.2 Wheat Estimates

Ratioed wheat estimates from CAS area estimates and Landsat acquisition data (LAD) report are used for first-generation segments. Winter wheat estimates are given for Kansas and spring wheat estimates for North Dakota. The winter wheat to winter grain ratio of 1.00 was used to determine winter wheat estimates in Kansas.[1] The ratio was applied to CAMS small grain

[1]The ratio of 1.00 was recommended by C. R. Hallum of NASA/JSC.

estimates for second-generation segments that were not ratioed by CAS. In North Dakota, the spring wheat to spring grain ratios for each first-generation segment were retrieved from the Historical Ratio Data File Generation/Diagnostic Listing 77US6 History File Dump provided by CAS. This data dump lists first-generation segment numbers and their respective ratios. A second-generation segment was assigned the same ratio as a first-generation segment in the same county (see appendix D for the second-generation ratio list). The appropriate ratio was applied to second-generation segments prior to aggregation.

Throughout the year, several first-generation segments were dropped from the LAD report and CAS aggregations because of screening, thresholding, and deletion procedures. The segments were also omitted from the aggregations of the second-generation sampling strategy. The procedures were not applied to second-generation segments. Screening, thresholding, and deletion of segments are indicated in the segment history by S, T, and D, respectively.

The historic wheat acreage was ratioed from the 1974 state census wheat figure using the formula,

$$\text{refined stratum wheat acres} = \frac{\text{state wheat acres}}{\text{state agricultural acres}} \times \text{refined stratum agricultural acre.}$$

The agricultural areas were generated to support the allocation report (ref. 2) based on the raw data in reference 5, a listing of agricultural percentages per segment. The segment proportion variances are taken from the allocation report (ref. 2). The number of agricultural segments is taken from reference 5. An agricultural segment is defined as being one with more than 5 percent agriculture.

4.2.1.3 Adjacent Refined Strata

The following tables of adjacent refined strata were determined from the U.S. Great Plains universal strata map current in March 1977. An "X" indicates adjacent strata.

KANSAS

STRATUM	1-2	6	7	8	9	10	11	12	13	14	15
1–2			X					X	X		
6			X	X	X						
7	X	X		X				X			
8		X	X		X		X	X			X
9		X		X		X	X				
10					X		X				
11				X	X	X					X
12	X		X	X					X	X	X
13	X							X		X	
14								X	X		
15							X	X			

NORTH DAKOTA

STRATUM	19	20	21	22
19		X	X	
20	X	X		
21	X		X	X
22			X	X

4.2.1.4 Yield

The following yield figures from the Center for Climatic and Environmental Assessment (CCEA) are provided by the USDA in bushels per acre. The CCEA yields are state level (Kansas).

State	Date	CCEA yield, bu/acre	CCEA yield variance, $bu/acre^2$
Kansas	June	28.3	7.9524
	July	28.8	7.7841
	August	28.8	7.7841
	September	28.8	7.7841
	October	28.8	7.7841

Feyerherm yield figures, provided by the USDA for Kansas at the refined stratum using information available up to July for all the Feyerherm yield runs, are as follows:

State	Refined stratum	Date	Feyerherm yield, bu/acre	Feyerherm yield variance, $bu/acre^2$
Kansas	1-2	July	39.4	29.574
Kansas	6	July	22.1	18.508
Kansas	7	July	32.7	17.238
Kansas	8	July	24.3	25.510
Kansas	9	July	22.8	14.562
Kansas	10	July	21.6	11.967
Kansas	11	July	24.1	12.263
Kansas	12	July	29.6	19.314
Kansas	13	July	35.2	15.688
Kansas	14	July	32.0	20.635
Kansas	15	July	31.3	32.568

Yield figures for the two CCEA strata that intersect refined strata are as follows:

Refined stratum	Yield stratum	Date	CCEA yield, bu/acre	CCEA yield variance, $bu/acre^2$
ND 19	Y1	August, December	19.5	14.44
ND 19	Y2	August, December	31.4	12.96
ND 20	Y1	August, December	19.5	14.44
ND 20	Y2	August, December	31.4	12.96
ND 21	Y1	August, December	19.5	14.44
ND 22	Y2	August, December	19.5	12.96

4.2.2 AGGREGATIONS IN KURGAN, KUSTANAI, AND TSELINOGRAD

4.2.2.1 Allocation

The allocation of sample segments to each of the three oblasts in the U.S.S.R. and their refined strata is reported in reference 6. The number of segments allocated appears on each aggregation report sheet in appendix C. The subset of first-generation segments used in the "NSS" aggregations was reported in reference 7 (see appendix A). Each segment was assigned to a refined stratum by maximizing the segment area in a refined stratum. The segments were chosen at random from the first-generation segment set. If not enough first-generation segments were available to fill the allocation in a refined stratum, the remainder were chosen from second-generation segments. However, since no second-generation segment estimates were received, the mixed set defaulted to a subset of old segments.

4.2.2.2 Wheat Estimates

Ratioed spring wheat estimates from the CAS area estimates and LAD report (appendix B) were used. (Note that the LAD report

contains only first-generation segments.) Aggregation dates follow the LAD dates; segment estimates up to that date are included.

Discrepancies were noted and resolved as follows:

- Segment 8090 was aggregated with Kurgan and listed in stratum KUR 11. It appeared in the LAD report under Kustanai.
- Segments 8115, 8306, and 8316 are categorized with the non-agricultural refined strata in Tselinograd and were not included in the September and October aggregations.

Historic spring wheat was computed using 1971 figures provided by USDA for each oblast. The formula,

$$\text{agricultural acres in refined stratum} \times \frac{\text{acres wheat in oblast}}{\text{agricultural acres in oblast}} = \text{acres wheat in refined stratum}$$

was solved for wheat acres in each refined stratum using the 1971 historic wheat provided by the USDA and the agricultural acres for the allocation report (ref. 6). The segment proportion variances, taken from reference 6, were computed in accordance with the CAS Level 3 baseline requirements. The number of agricultural segments, a list of per-segment agriculture percentages at the refined strata level, was also taken from reference 6. A segment was considered to be an agricultural segment if at least 5 percent was agricultural.

The data base resulting from the historic wheat estimates, the segment proportion variances, and the number of agricultural segments is as follows.

Refined stratum	Historic wheat, acres	Segment proportion variance	No. of agricultural segments
KUR 9	3 006 099	0.0182	76
KUR 11	2 381 175	.0078	143
KST 8	4 019 453	.0423	510
KST 9	4 217 131	.0038	493
TSL 3	20 697	.0015	9
TSL 4	48 293	.0099	11
TSL 7	3 568 750	.0143	110
TSL 8	3 021 176	.0500	574

4.2.2.3 Adjacent Refined Strata

The tables of adjacent refined strata were determined from the version of the U.S.S.R. spring wheat indication region that was current in March 1977.

KURGAN

STRATUM	9	11
9		X
11	X	

KUSTANAI

STRATUM	8	9
8		X
9	X	

TSELINOGRAD

STRATUM	3	4	7	8
3		X	X	X
4	X		X	
7	X	X		X
8	X		X	

In Tselinograd, only stratum 8 was Group A. Strata 7 and 3 adjoin 8; stratum 4 does not. However, to provide a Group A stratum for use in the calculation of the ratio estimate for stratum 4, strata 8 and 4 were labeled as touching.

4.2.2.4 Yield

The following CCEA yield figures were provided by the USDA in quintals per hectare.

Oblast	Date	Yield, q/ha	Yield variance, q/ha^2
Kurgan	Aug.	12.9	7.84
	Sept.	12.9	7.84
	Oct.	11.6	6.25
Kustanai	Aug.	4.5	5.29
	Sept.	4.8	3.24
	Oct.	4.8	3.24
Tselinograd	Aug.	5.1	5.76
	Sept.	5.1	3.61
	Oct.	5.1	3.61

Because yield figures were available only at the oblast level, the production calculation was reduced to

$$\text{Production} = \text{area} \times \text{yield}$$

$$\begin{aligned}\text{Production variance} = {} & (\text{area})^2 \times \text{area variance} \\ & + (\text{yield})^2 \times \text{area variance} \\ & - \text{area variance} \times \text{yield variance}\end{aligned}$$

Area was converted to hectares (2.471 acres = 1 hectare), and production was converted to metric tons (10 quintals = 1 metric ton).

4.3 AGGREGATION RESULTS

Tables 7 to 12 and figures 2 to 7 present the aggregation results. The tables display end-of-season results, and the figures show the development of the estimates throughout the growth season.

4.3.1 WHEAT ESTIMATES

To ensure uniformity of the input data, identical CAMS processing procedures were requested for first- and second-generation segments before the study began. Because of operational difficulties, this requirement was not met.

First-generation sample segment wheat estimates were updated throughout the growing season. Hence, the monthly aggregations reflect the real-time changes in the wheat estimates. Second-generation segments were updated less frequently.

Tables 7 and 8 chart the segment update histories for Kansas and North Dakota, respectively. An examination of the tables shows that the second-generation segments were updated much less frequently than the first-generation.

a. Estimates for Kansas were provided in June and updated considerably for the July aggregation (table 7). One more segment was received in September, but the most appropriate date for comparisons of area estimates is July (fig. 2). Figure 3 gives the production estimates for Kansas (old, mixed, and new segments).

TABLE 7.— COMPARISON OF SAMPLE SEGMENT ESTIMATE ACQUISITION AND UPDATES FOR STRATEGIES IN KANSAS

Date	Strategy	No. of segments used in allocation	No. updated from previous aggregation	No. deleted from previous aggregation	No. added from previous aggregation
6/8	CAS	112	0	0	0
	OLD	112	0	0	0
	MIX	67	0	0	0
	NEW	49	0	0	0
7/13	CAS	111	41	4	5
	OLD	111	41	4	5
	MIX	75	21	9	1
	NEW	74	8	0	25
8/10	CAS	113	30	0	2
	OLD	113	30	0	2
	MIX	76	17	0	1
	NEW	74	0	0	0
9/19	CAS	107	13	2	8
	OLD	107	13	2	8
	MIX	70	10	7	1
	NEW	76	0	0	2
10/11	CAS	108	35	0	1
	OLD	108	35	0	1
	MIX	70	15	0	0
	NEW	76	0	0	0

TABLE 8.— COMPARISON OF SAMPLE SEGMENT ESTIMATE ACQUISITION AND UPDATES FOR STRATEGIES IN NORTH DAKOTA

Date	Strategy	No. of segments used in aggregation	No. updated from previous aggregation	No. deleted from previous aggregation	No. added from previous aggregation
8/10	CAS	60	0	0	0
8/10	MIX	51	0	0	0
8/10	NEW[a]	34	0	0	0
9/9	CAS	60	20	16	16
9/9	MIX	47	19	10	6
9/9	NEW[a]	34	0	0	0
10/11	CAS	70	11	0	9
10/11	MIX	51	16	0	4
10/11	NEW[a]	34	0	0	0

[a]The NEW strategy was not updated.

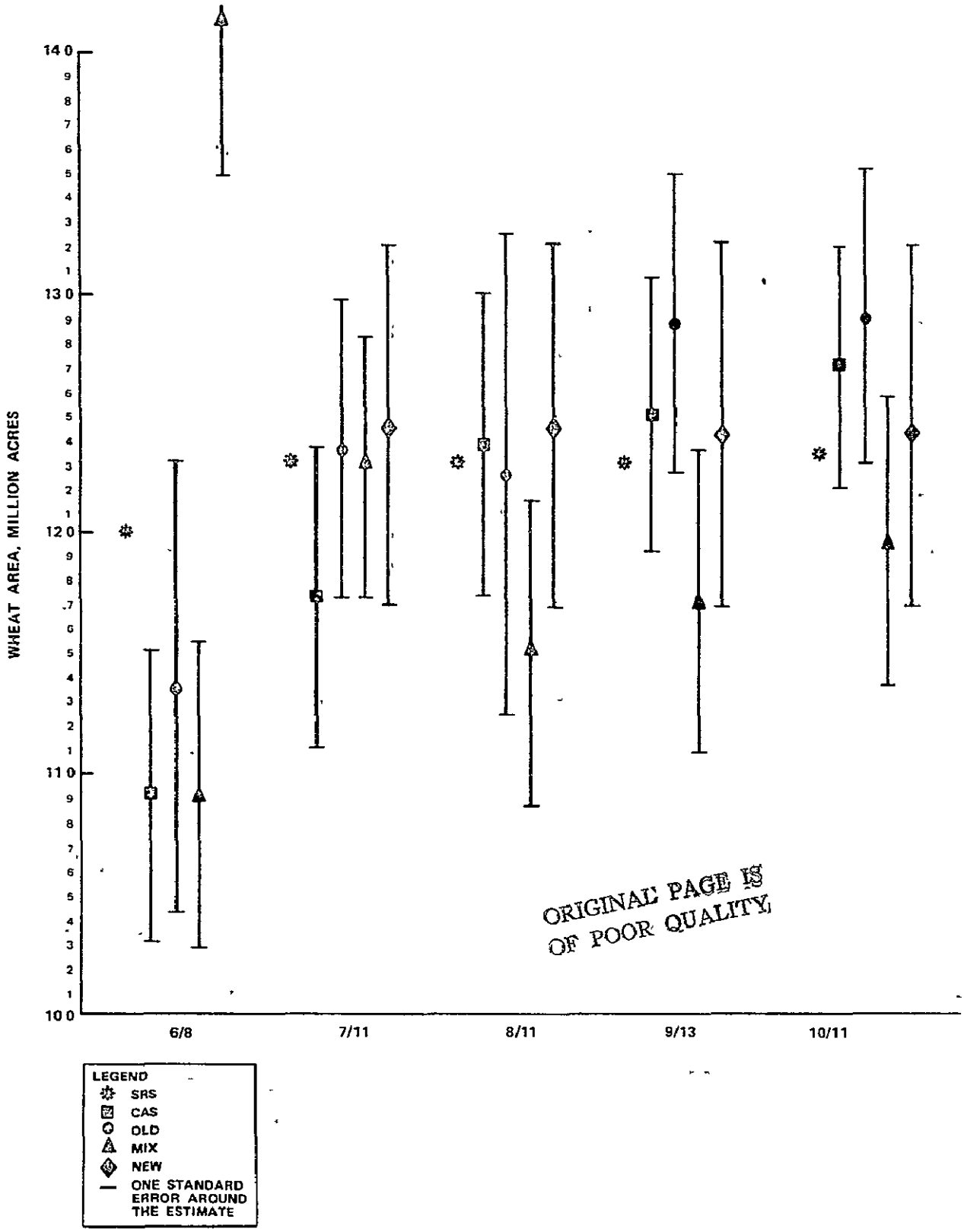
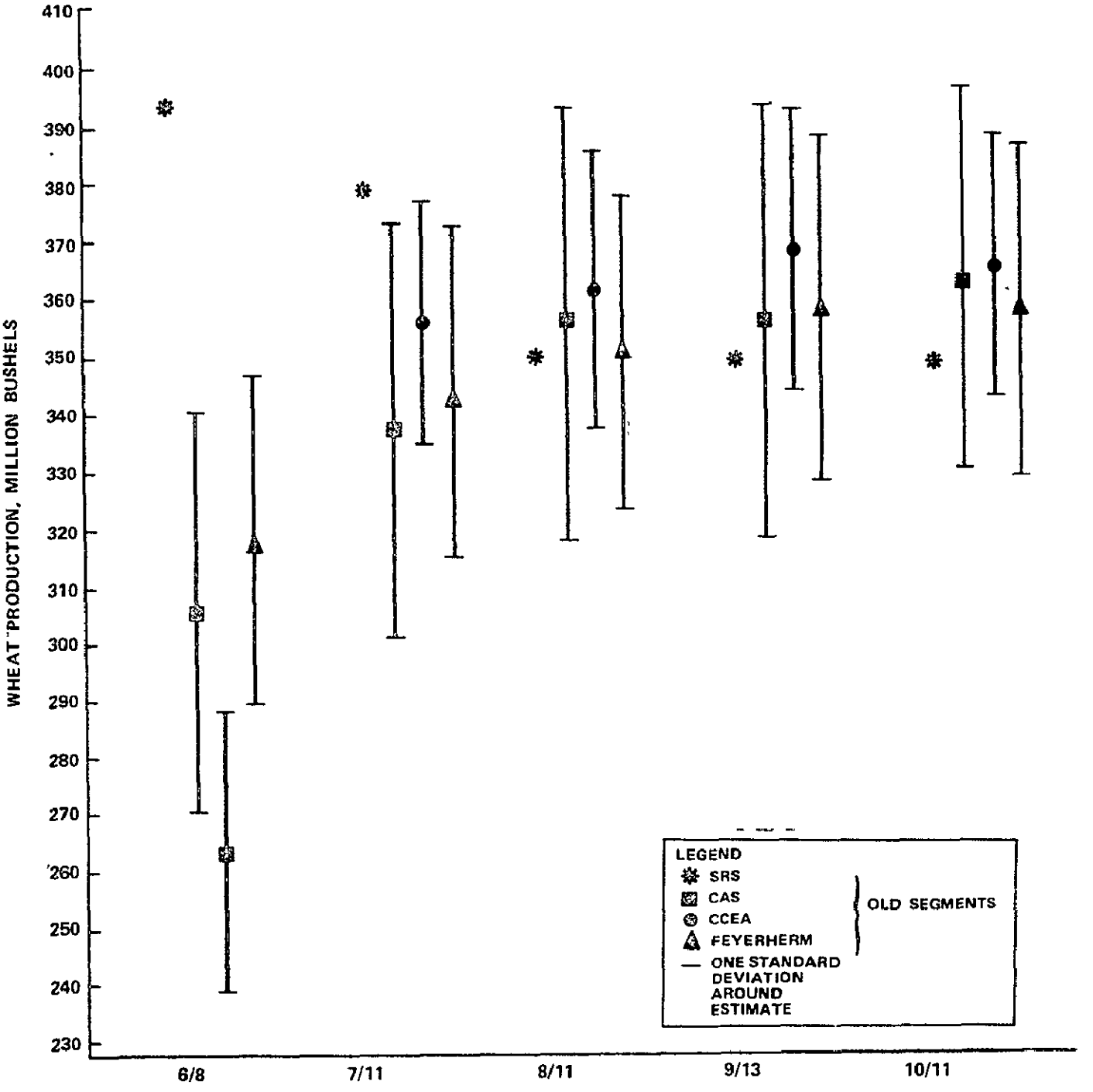
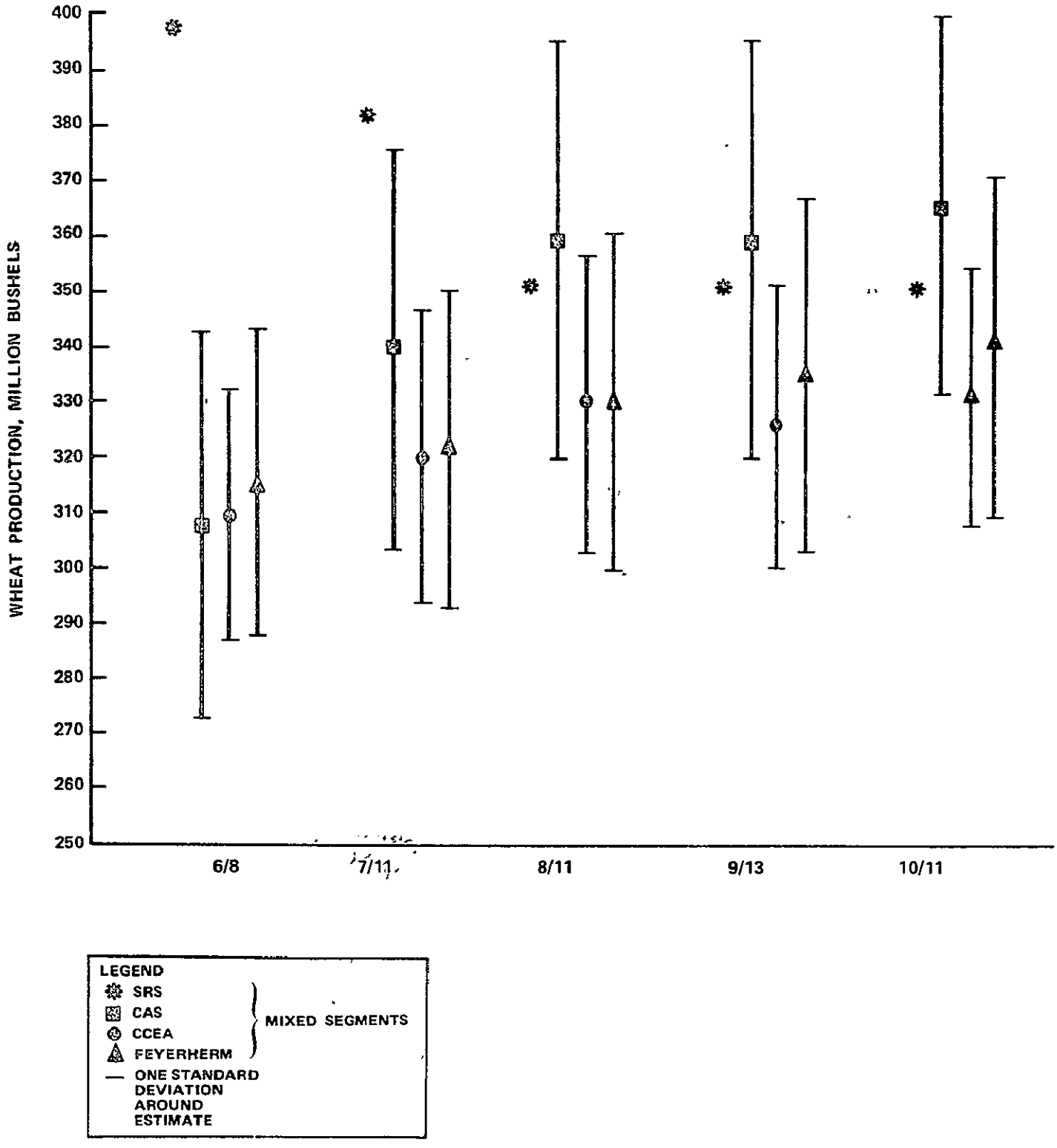


Figure 2.— Area estimates for Kansas.



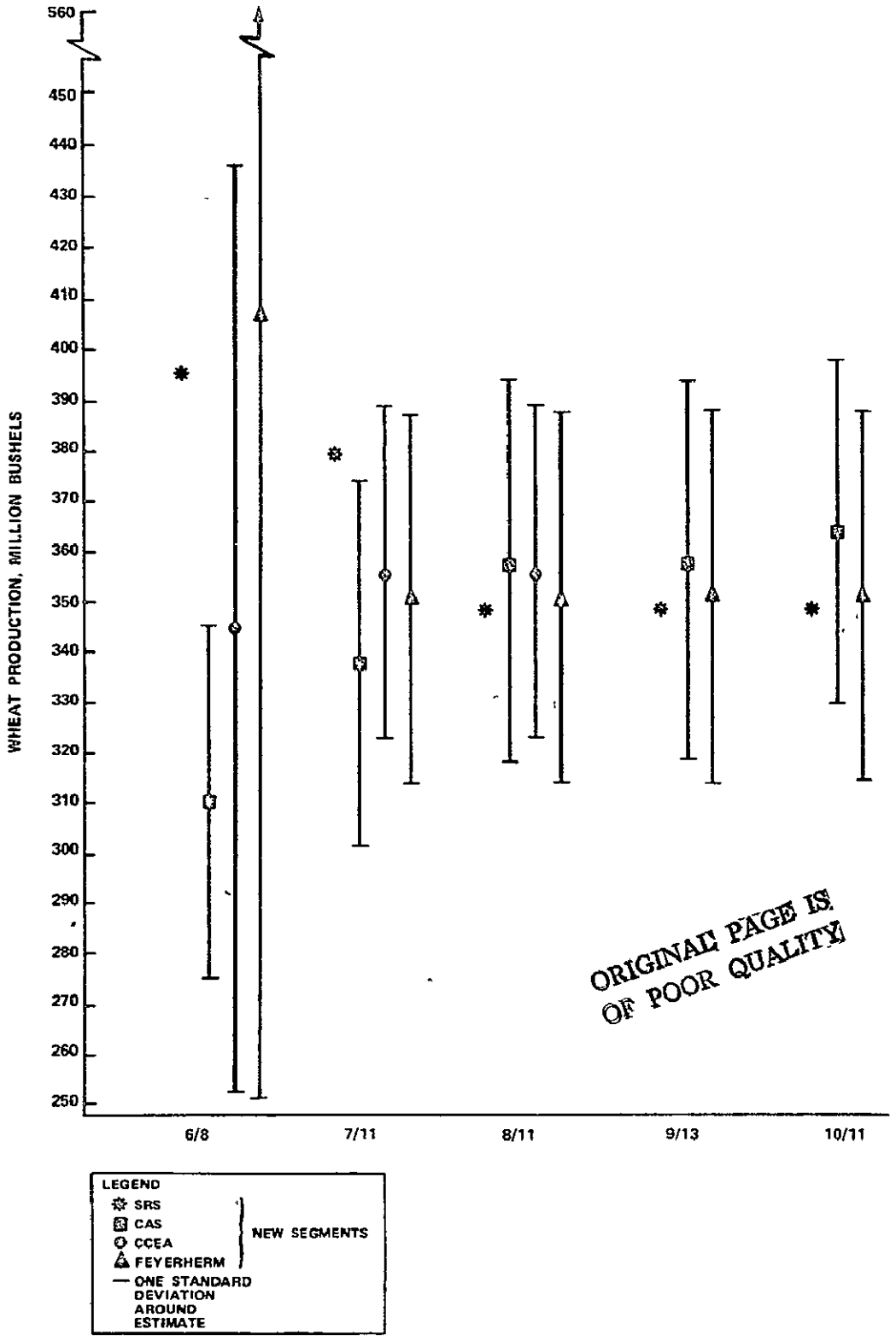
(a) Old segments.

Figure 3.— Production estimates for Kansas.



(b) Mixed segments.

Figure 3.— Continued.



(c) New segments.

Figure 3.– Concluded.

b. North Dakota estimates were provided for the August aggregation (table 8) and were updated in December (table 9). The data set contained only 34 segment estimates out of 83 allocated. These have average wheat estimates lower than estimates of approximately the same Julian date and stratum from the first-generation set. This anomaly may be due to choice of sample or to differences in planting dates. (Note that figure 4 shows low, constant NEW estimates, reflecting the lack of updating.)

4.3.2 YIELD ESTIMATES

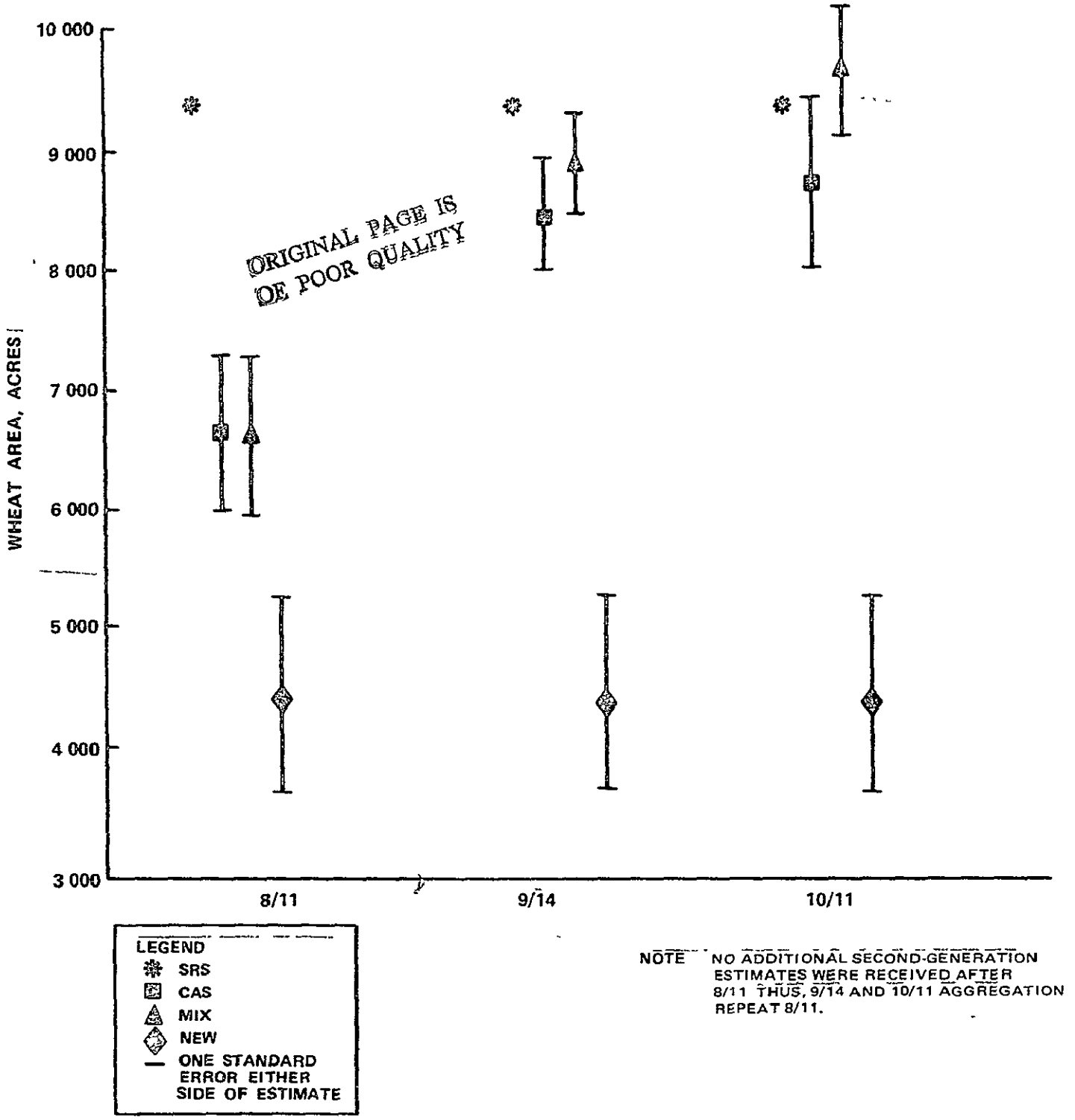
A study of the behavior of the Feyerherm yield model and a comparison of the production estimates using Feyerherm yields with those using CCEA yields (tables 10 and 11) were proposed. The Feyerherm yield figures were generated only for Kansas and only for the July aggregation; they utilized meteorological information acquired up until July. These figures were used in previous and subsequent aggregations. The CCEA yield model figures remained constant after July; so the use of July Feyerherm figures may be acceptable. However, comparison is inappropriate because the CCEA yield model was updated and the Feyerherm yield model was not.

If the assumption is made that the input data to the aggregation are comparable for all the schemes, the superior estimate will be close to the true figure with a small CV (CV is the estimate divided by the standard error) and will be a measure of the variability of the estimate. The input data are not comparable because of the difference in segment processing and yield model generation. In the United States, the SRS estimates are the ground-truth standard; no such standard is currently available for the U.S.S.R. The FAS estimates are comparable to the SRS in scope but are not currently available. Relative difference was computed in the United States for all estimates relative to the SRS (tables 10 and 11).

TABLE 9.— SUMMARY OF DECEMBER AGGREGATION RESULTS FOR NORTH DAKOTA USING THE CCEA YIELD MODEL

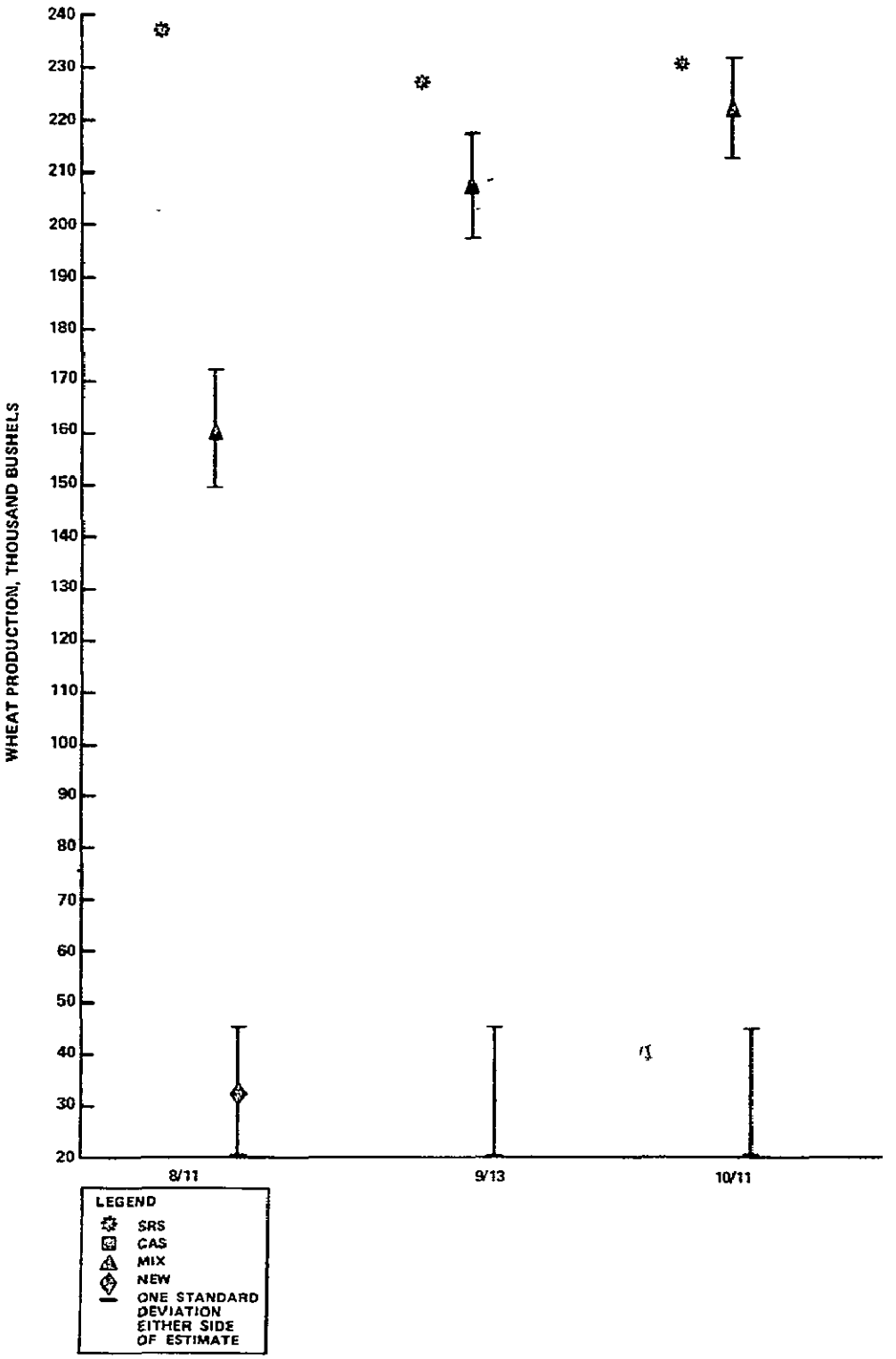
Strategy	Production, million bu	Production standard error, million bu	CV for production	Production relative difference with respect to SRS	Area, thousand acres	Area standard error, thousand acres	CV for area	Area relative difference with respect to SRS
Mix	222	3742	1.7	-3.6	9602	434	4.5	-0.75
New	194	5663	2.9	-18.6	8333	546	6.5	14.3
SRS[a]	230				9530			

[a]The SRS data were obtained in October.



(a) Area.

Figure 4.– North Dakota estimates.



(b) Production.

Figure 4.– Concluded.

TABLE 10.— SUMMARY OF OCTOBER 11, 1977, AGGREGATION RESULTS FOR THE UNITED STATES USING THE CCEA YIELD MODEL

State	Strategy	Production (millions of bushels) (b)	Production standard error (millions of bushels)	CV for production, %	Production relative difference with respect to SRS, % (b)	Area, thousand acres	Area standard error, thousand acres	CV for area, %	Area relative difference with respect to SRS, % (c)
Kansas	OLD	372	23.1	6.3	5.64	12 924	590	4.6	4 82
Kansas	MIX	332	25.7	7.7	-5.72	11 914	757	6.4	-3.40
Kansas	NEW	347	31 5	9.1	-1.15	12 448	845	6.8	1.20
Kansas	CAS	365	38 5	6.6	3.83	12 669	535	4.2	-2.91
Kansas	SRS	351				12 300			
North Dakota	MIX	223	8.3	4 2	-3.04	9 644	436	4.5	1.18
North Dakota	NEW[a]								
North Dakota	CAS	211	27.7	5.6	-9 00	9 173	403	4.4	-3.89
North Dakota	SRS	230				9 530			

[a] No additional segment estimates were available from August 11 to December 1977.

[b] Production using CCEA yields.

[c] Relative difference = $\frac{\text{estimate - SRS}}{\text{estimate}}$

TABLE 11.— SUMMARY OF OCTOBER 11, 1977, PRODUCTION AGGREGATION USING FEYERHERM AND CCEA YIELD MODELS

State	Strategy	Feyerherm				CCEA			
		Production, million bushels	Production standard error, million bushels	CV for production, %	Relative difference with SRS, %	Production, million bushels	Production standard error, billion bushels	CV for production, %	Production relative difference with respect to SRS, %
Kansas	OLD	359	29 7	8.3	2.23	372	23.1	6.3	5.64
Kansas	MIX	341	31.3	9.2	-2.93	332	25 7	7.7	-5 72
Kansas	NEW	353	41.0	11.6	.57	347	31 5	9.1	-1 15
Kansas	CAS	365	38.5	6.6	3.83	365	38.5	6.6	3 83
Kansas	SRS	351	—	—	—	351	—	—	—

The desired estimates for area and production in the U.S.S.R. (figs. 5 to 7) ideally are very close to the true figures and have small standard errors relative to the size of the estimate. In a few cases, such as the oblasts of Kurgan and Tselinograd (table 12), the sample sizes are so small that the change, addition, or deletion of even one segment wheat estimate can change the aggregated area estimates and/or standard errors appreciably. The amount of changes in the aggregation is highly dependent upon the actual value of the sgement wheat estimate in question. In these oblasts, many refined strata are categorized in Group B (they have two or fewer segment estimates). The Group B refined strata estimates are calculated using the actual CAMS estimates and ratios of historical wheat and wheat estimates from surrounding Group A strata. So, Group B refined strata estimates are "smoothed" in a fashion. Group A refined strata with the minimal number of segments have estimates highly dependent on the specific value used; and in turn, these estimates affect the surrounding Group B estimates. Variance estimates vary similarly.

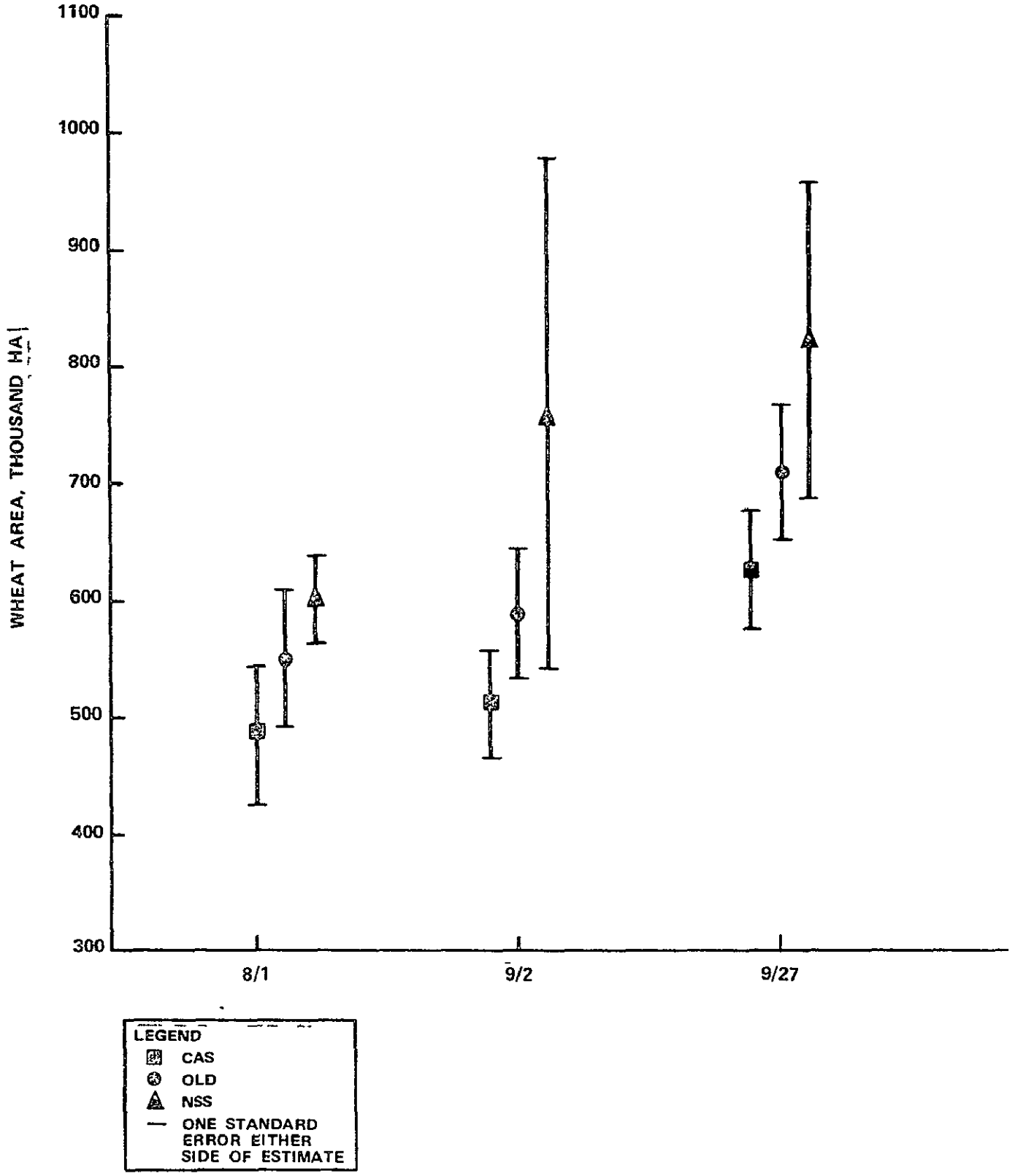
4.4 INTERPRETATION OF THE RESULTS

Study of the tables, graphs, and detailed aggregation results is inconclusive because no one strategy uniformly outperforms another. The most obvious conclusion is that in some cases a particular strategy is superior, and in others another strategy is preferable. In other areas, all strategies tested have equally good performance. For example, in Kustanai, all strategies produce essentially the same results but differ quite a bit in Kurgan. Some reasons for this difference in performance are given in section 3. Based on the results presented here, pragmatism seems to be the best guide; that is, the processing time for a political subdivision should be weighed against the quality of the estimates. A choice of strategies should be determined from these practical considerations.

TABLE 12.— SUMMARY OF SEPTEMBER 27, 1977, AGGREGATION RESULTS FOR THE U.S.S.R.

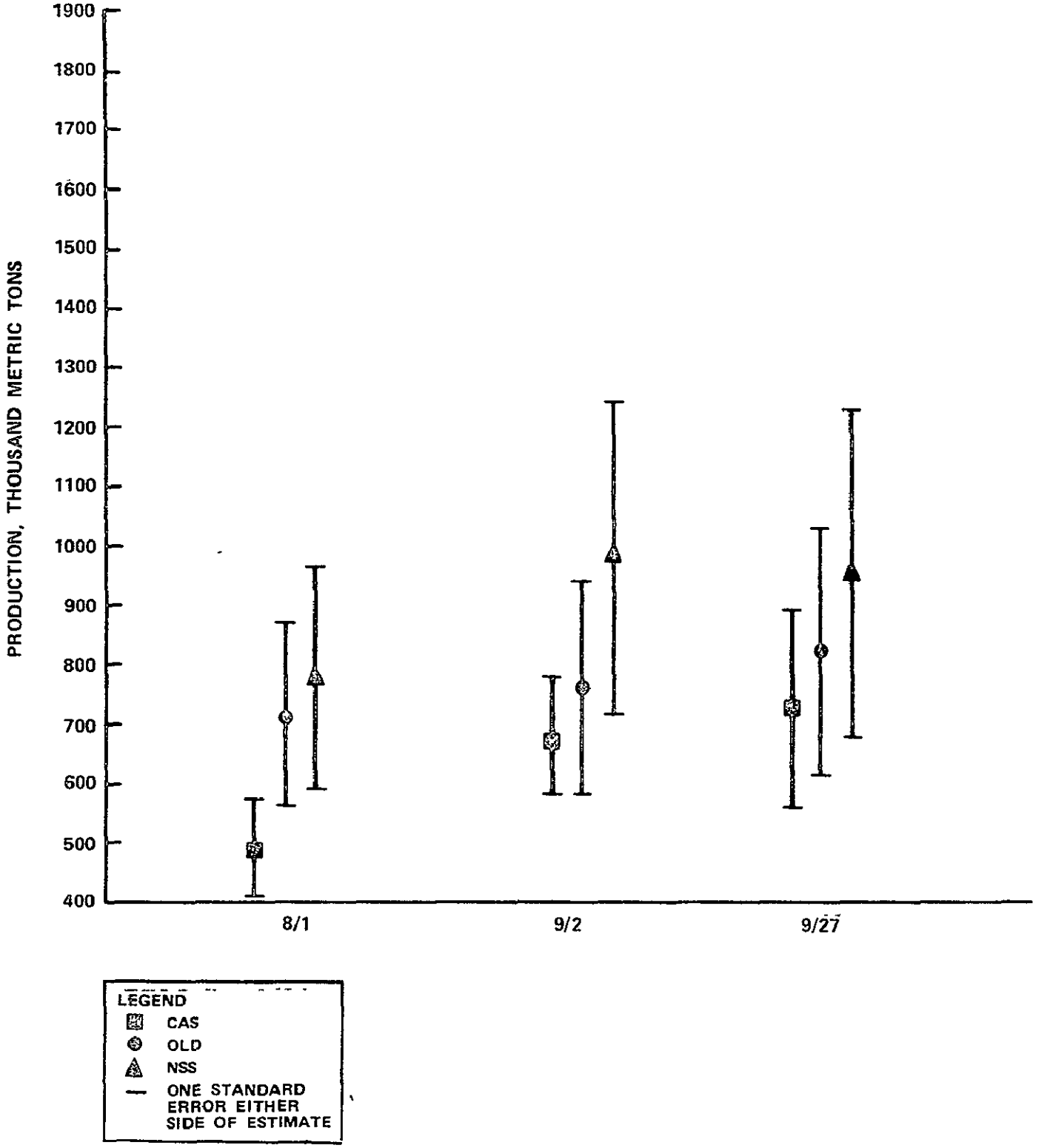
Oblast	Strategy	Production,* thousand metric tons	Production* standard error, thousand metric tons	CV for production, %	Production relative difference with respect to CAS, %	Area, thousand ha	Area standard error, thousand ha	CV for area, %	Area relative difference with respect to CAS, %
Kurgan	OLD	820	208	25 3	11.46	707	55	7.8	11.46
Kurgan	NSS	953	272	28 6	23.82	821	130	15 8	23.75
Kurgan	CAS	726	165	22 7		626	46	7 3	
Kustanai	OLD	1676	639	38 2	06	3493	258	7.4	.11
Kustanai	NSS	1663	636	38 2	72	3465	277	8.0	69
Kustanai	CAS	1675	650	38 8		3489	263	7 5	
Tselinograd	OLD	906	356	39 3	1 88	1777	238	13 4	-1 80
Tselinograd	NSS	999	392	39 3	8 39	1959	264	13 5	7 77
Tselinograd	CAS	923	365	39.5		1809	274	15.2	

*CCEA yield model



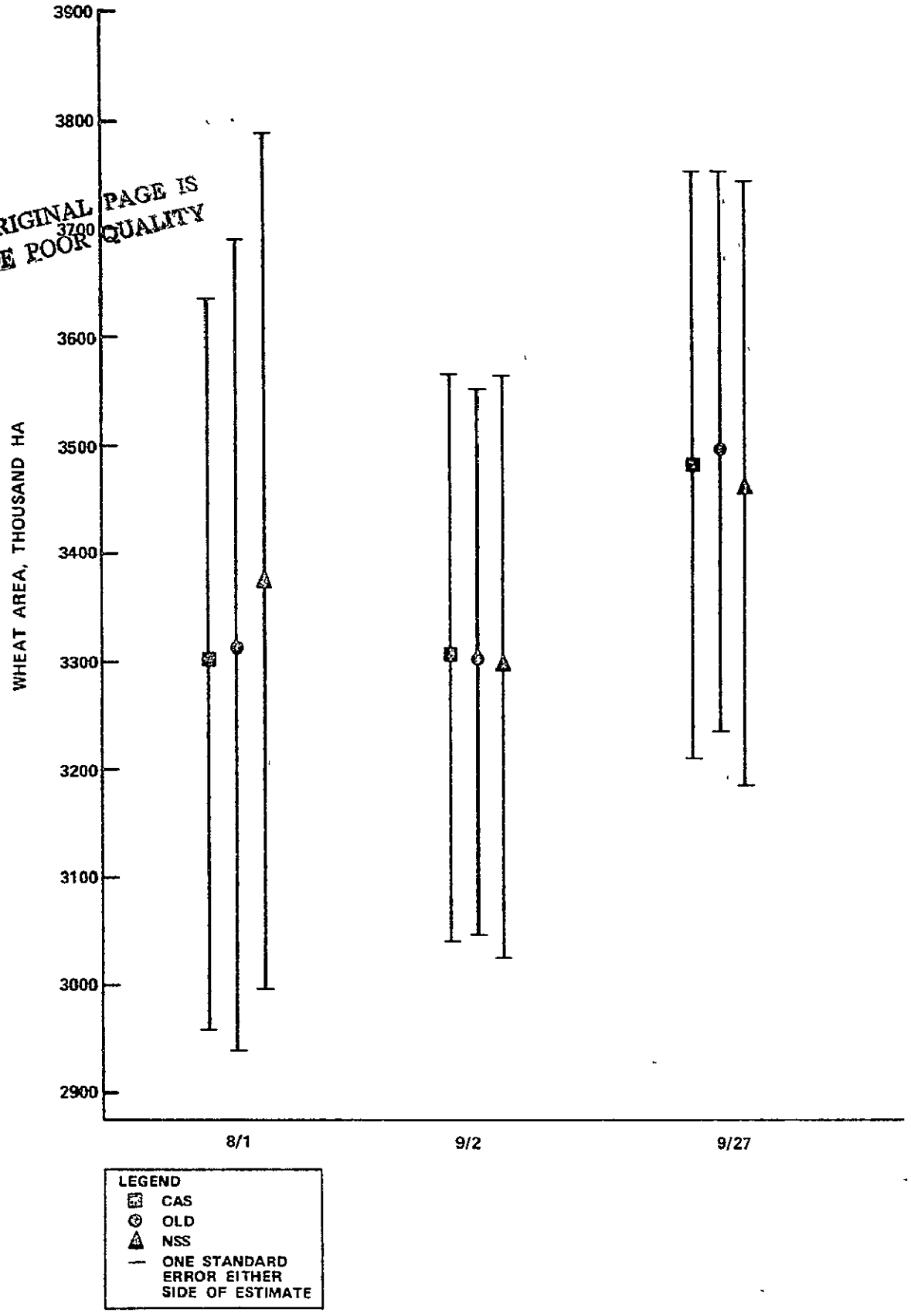
(a) Area.

Figure 5.— Kurgan estimates.



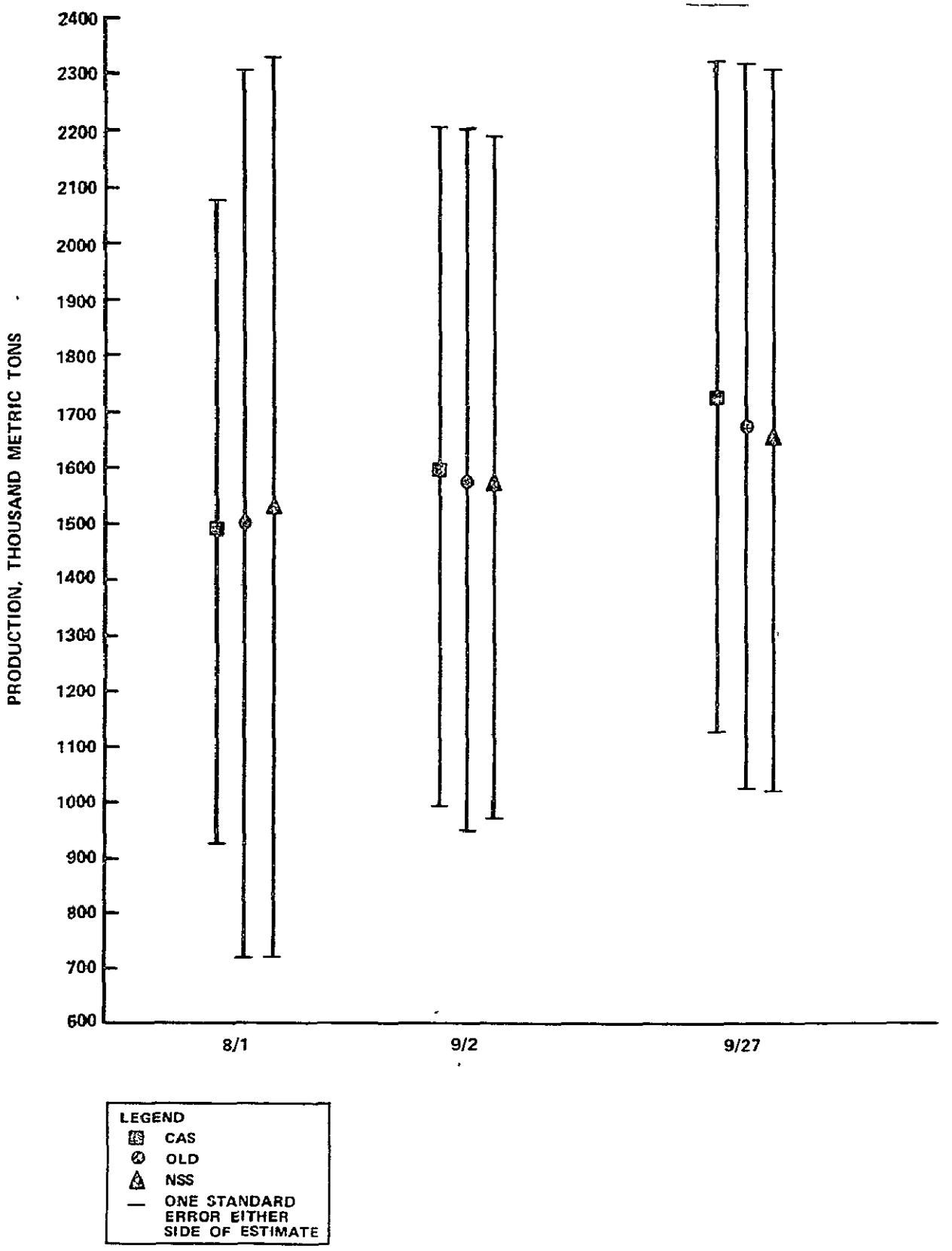
(b) Production.

Figure 5.– Concluded.



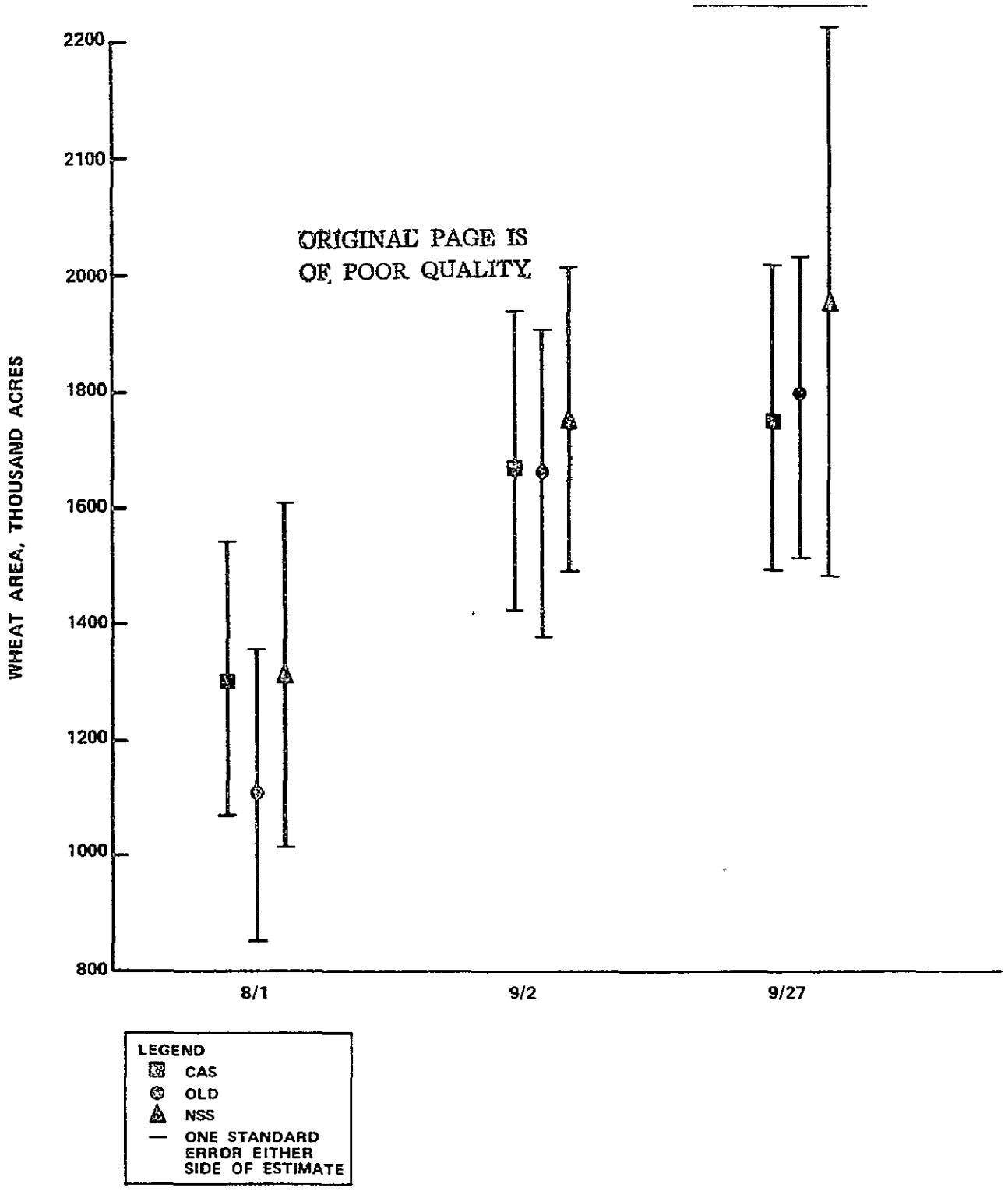
(a) Area.

Figure 6.— Kustanai estimates.



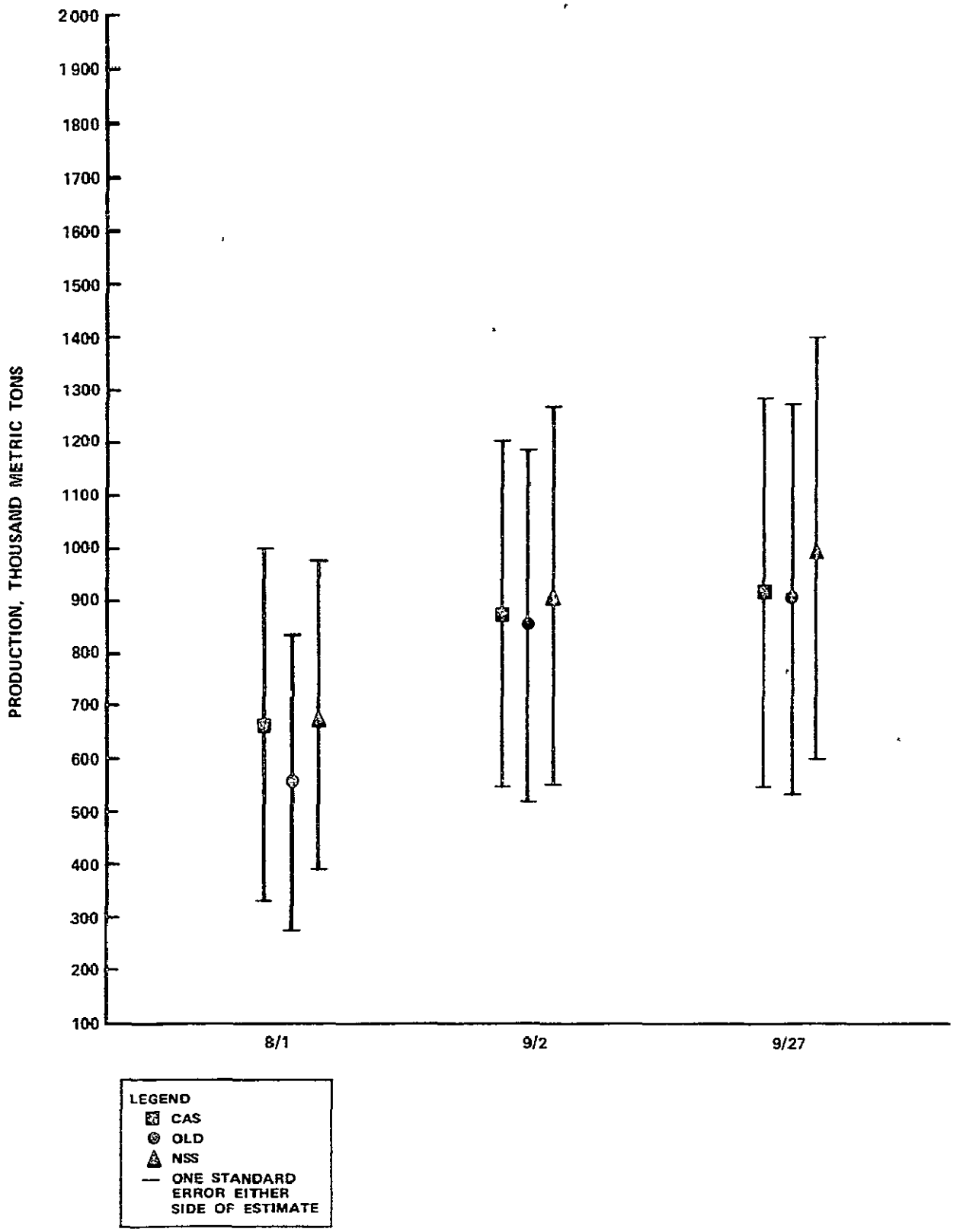
(b) Production.

Figure 6.— Concluded.



(a) Area.

Figure 7.— Tselinograd estimates.



(b) Production.

Figure 7.– Concluded.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 TEST RESULTS

The results of the tests and experiments conducted in Phase III with the new sampling strategy are as follows:

- Stratification: (1) Correlation test results indicate that an agrophysical stratum may be homogeneous with respect to agricultural density but not with respect to wheat density. (2) Agrophysical unit homogeneity test results indicate that with respect to agricultural density many agrophysical units are not homogeneous, but removal of one or more refined strata from any such current agrophysical unit can make the strata homogeneous.
- Apportioning Procedure: (1) The results presented in table 4 indicate that the current apportioning procedure is not performing well and that the apportioned estimates of refined strata wheat area are often unreliable. (2) The data base effect study (reported in the July report) indicates that increase in the accuracy of the apportioned estimates may not increase the precision of the wheat area and production estimates.
- New Sampling Estimates: The aggregation results indicate that no conclusion can be made as to which sampling strategy performs uniformly best. The new sampling strategy estimates are sometimes closer to the estimates of the Statistical Reporting Service as compared to the old strategy.

5.1.2 PROBLEM AREAS

In the course of experimentation with the new sampling strategy, the following problem areas were identified.

- Stratification Quality Evaluation: (1) So far, no quantitative measure of homogeneity has been defined. It has not been decided how much heterogeneity in a stratum can be tolerated. (2) Data necessary for conducting many tests for strata evaluation are not available. For example, in the U.S.S.R., wheat area and yield data were not available at any level lower than that of an oblast.

- Allocation and Aggregation: According to the new sampling strategy, a stratum receives a small number of sample segments if the estimate of segment-to-segment wheat area variance is small. Thus, a stratum may have high wheat density and variance but receive no segments (or at most a few segments) because of poor wheat area variance estimate. In this way, many strata may be inappropriately assigned to Group B; consequently, the precision of the wheat area and production estimates will be low.

- CAMS/CAS Error: *CAMS error* refers to the error in the estimates of wheat area proportions in sample segments. *CAS error* refers to the error in estimating wheat proportion from small grains proportion in sample segments as given by CAMS. The CAS errors result from the use of inappropriate ratioing methods.

- Missing Data: When an estimate on a sample segment is not available because of cloud cover or some other reason, the usual practice in LACIE is to aggregate the available estimates as if the segment without an estimate did not belong to the sample. The problem here is the same as the nonresponse problem in the traditional sample survey. Mere elimination of the segment from the aggregation may make any statistical statement about the precision of the wheat area estimates inaccurate.

- Bad Data: Often, in early season and sometimes late in growing season, the CAMS estimates are suspected to be inaccurate. The CAMS estimates are then subjected to some

screening procedure, and some estimates are thus eliminated from aggregation. Elimination of sample segments may adversely affect the precision of the wheat area estimates.

5.2 RECOMMENDATIONS

The following recommendations are offered as possible remedies to the problems mentioned in section 5.1.1.

5.2.1 STRATIFICATION

The boundaries of the current agrophysical strata need to be adjusted. All new stratification should be evaluated before delivery to the user.

The sampling strategy team and the partitioning team should decide jointly how much heterogeneity in a homogeneous stratum can be tolerated and what constitutes a good quantitative measure of homogeneity. The criterion should be used in future evaluation of the agrophysical strata.

5.2.2 DATA BASE FOR STRATA EVALUATION, ALLOCATION, AND AGGREGATION

A data base is needed for each LACIE country in order to have a means of evaluating the agrophysical stratification, verifying the appropriateness of the allocation, and improving stratum wheat area and production estimates. The sampling strategy team and the partitioning team should determine what the important parameters are and what should be included in the data base.

Much of the data in foreign countries is at such a gross scale in comparison with county-level data that there needs to be a means of creating or reducing data meaningfully to a scale where regional variations can be seen in relation to remotely sensed data. Data such as agricultural density, soil types, or meteorological inputs can be as specific as the data base will allow.

5.2.3 SIMULATION STUDY

Based on all wheat-related information in a LACIE country and in the United States, the LACIE country can be simulated for evaluation of a sampling strategy. The simulation study will show the relationship of the true and estimated precision of the sample estimates. The major advantage of a simulation study is that it does not involve the expensive operations of actual location of sample segments, data acquisition, photo interpretation, and wheat proportion estimation. The parameters that affect the precision of the sample estimates can also be varied in a controlled fashion. Therefore, more simulation studies should be made in order to evaluate the new sampling strategy in the foreign countries, study the effect of modifications and changes introduced in the strategy on the precision of the sample estimates, and thus to design the most efficient sampling strategy for each LACIE country.

5.2.4 CAMS ERROR ANALYSIS

A study similar to the blind site study should be undertaken to analyze CAMS error in the new samples.

APPENDIX A

DETERMINATION OF FIRST- AND SECOND-GENERATION SEGMENT MIXTURE

APPENDIX A

DETERMINATION OF FIRST- AND SECOND-GENERATION SEGMENT MIXTURE

A.1 MOTIVATION

Because of cost and time constraints, it may not be possible to order or, even if ordered, to process all second-generation sample segments. To obtain an estimate of wheat production with precision comparable to the precision specified in the sampling plan, it is necessary to process a certain minimum number of sample segments. One way to fulfill the sample size requirement is to supplement the list of available second-generation segments with the available first-generation segments. Unless caution is taken in preserving the randomness of the distribution of sample segments in each refined stratum (second-generation strategy strata), any statistical statement concerning the sample estimates made according to the second-generation strategy will be invalid. A scheme has been devised for the selection of supplementary first-generation segments preserving the randomness of distribution in each refined stratum.

A.2 METHOD FOR SELECTING SUPPLEMENTARY FIRST-GENERATION SEGMENTS

The method of selecting supplementary first-generation segments is as follows:

- Segments chosen under the first-generation strategy and segments chosen under the second-generation strategy (second-generation segments) are available, labeled with both county name and strata number.
- Count the number of second-generation segments in each unit (county intersection strata).
- Count the number of first-generation segments in each unit.

- For each unit, perform the following operation:
  a. If the number of first-generation segments is greater than or equal to the number of second-generation, randomly replace each second-generation segment with a first-generation segment.
  b. Otherwise, randomly replace second-generation segments by first-generation segments until all first-generation segments in the unit have been used. Some second-generation segments will remain.
- Note that step b differs from the theoretical proposal. Theoretically, all first-generation segments should be used, and the remaining number necessary for the unit should be selected at random from all segments possible within the Goddard constraints. However, the second-generation segments have already been chosen and must be used.
- Check the spacing between segments. When the first-generation and second-generation segments were chosen, the segment density in each case was constrained by Goddard. The same constraint should be presented in the composite allocation.

A.3 RESULTS

Composite allocations for Kansas, North Dakota, and the three oblasts in the U.S.S.R. can be found in sections A.5 to A.7, respectively.

A.4 METHOD FOR UTILIZING FIRST-GENERATION SAMPLE SEGMENTS IN THE SECOND-GENERATION SAMPLING SCHEME

The method for utilizing first-generation segments in the second-generation scheme was developed by A. H. Feiveson of JSC. The following definitions apply to this procedure:

S = new stratum

$\{\Theta_k\}_{k=1}^{L}$ = collection of first-generation strata which intersect S

N_k = total number of segments in Θ_k

n_k = number of selected segments in Θ_k under the first-generation strategy

M_k = total number of segments in $\Theta_k \cap S$

m = number of segments to be selected in S under the second-generation strategy

M = total number of segments in S

m_k = number of segments to be selected in Θ_k

The steps in the procedure are as follows:

- Generate $\{m_k\}_{k=1}^{L}$

  1. Let $T_0 = 0$, $T_1 = M_1$, $T_2 = M_1 + M_2$, $\cdots$, $T_L = M_1 + M_2 + \cdots + M_L$

     Define $J_k = \{T_{k-1} + 1, T_{k-1} + 2, \cdots, T_{k-1} + T_k\}$

  2. Choose a random subset of m from the integers 1, 2, $\cdots$, M. Let I be that random subset.

  3. Let m_k = cardinality of $I \cap J_k$.

Note that m_k has a hypergeometric distribution.

Hence,

$$\alpha_{kj} = P\{m_k = j\} \frac{\binom{M_k}{j}\binom{M - M_k}{m - j}}{\binom{M}{m}} \qquad \text{(B-1)}$$

and

$$E(m_k) = \frac{m\ M_k}{M} \qquad \text{(B-2)}$$

- Let I_k = number of first-generation selected segments in $\Theta_k \cap S$.

  a. If $I_k \geq m_k$, choose m_k segments at random among the I_k originally selected ones.

  b. If $I_k < m_k$, choose all of the I_k originally selected segments plus $m_k - I_k$ additional ones randomly selected from the remaining $M_k - I_k$ in $\Theta_k \cap S$.

- Prove that this procedure selects m segments out of M with equal probability:

  Let $\Theta_{kl} = Pr\{I_k = l\}$, $l = 0, 1, \cdots, M_k$.

  S = second-generation sample.

  S_o = first-generation sample.

  s_k = any potential segment in $\Theta_k \cap S$.

  Then

$$P(s_k \varepsilon S) = \sum_{l=0}^{M_k} \Theta_{kl} P\{s_k \varepsilon S / I_k = l, m_k = j\} \qquad \text{(B-3)}$$

$$P(s_k \varepsilon S/I_k = 1) = \sum_{j=0}^{M_k} \alpha_{kj} P\{s_k \varepsilon S/I_k = \imath,\ m_k = j\} \qquad \text{(B-4)}$$

$$P(s_k \varepsilon S/I_k = \imath, m_k = j) = P(s_k \varepsilon S/I_k = \imath, m_k = j, s_k \varepsilon S_o) P(s_k \varepsilon S_o/I_k = i, m_k = j) + P(s_k \varepsilon S/I_k = \imath, m_k = j, s_k \notin S_o) P(s_k \notin S_o/I_k = \imath, m_k = j) \qquad \text{(B-5)}$$

$$P(s_k \varepsilon S/I_k = i, m_k = j, s_k \varepsilon S_o) = \begin{cases} 1 & 1 \leq i \leq j \\ j/\imath & \imath \geq j \\ 0 & \imath = 0 \end{cases} \qquad \text{(B-6)}$$

$$P(s_k \varepsilon S_o/m_k = j, I_k = i) = i/M_k \qquad \text{(B-7)}$$

$$P(s_k \varepsilon S/I_k = \imath, m_k = j, s_k \notin S_o) = \begin{cases} 0 & j \leq \imath \\ (j - 1)/(M_k - 1) & j > i \end{cases} \qquad \text{(B-8)}$$

$$P(s_k \varepsilon S_o/m_k = j, I_k = i) = (M_k - \imath)/M_k \qquad \text{(B-9)}$$

$$P(s_k \varepsilon S/I_k = i, m_k = j) = \begin{cases} 0 + j/M_k & \imath = 0 \\ \imath/m_k + (j - i)/M_k & i \leq j \\ j/M_k + 0 & \imath > j \end{cases}$$

$$= j/M_k \quad \imath = 0, 1, \cdots, M_k \qquad \text{(B-10)}$$

Thus, $P(s_k \varepsilon S/I_k = i, M_k = j)$ only depends on j, not i.

Hence,

$$P(s_k \varepsilon S/I_k = \imath) = \sum_{j=0}^{M_k} \alpha_{kj} (j/M_k) = \frac{E(m_k)}{M_k} = \frac{m}{M}$$

$$= P(s_k \varepsilon S) = \frac{m}{M} \sum_{i=0}^{M_k} \theta_{k\imath} = \frac{m}{M} \qquad \text{(B-11)}$$

A.5 SAMPLE SEGMENTS

The sample segments in Kansas (from ref. 3) selected prior to the application of the Goddard constraint are the following:

Segment number	County	Stratum
803	Cowley	3C
1170	Harper	3C
1173	Kiowa	3C
800	Kingman	3C
1174	Pratt	3C
1892	Reno	3C
1175	Sedgwick	3C
1893	Stafford	3C
1176	Sumner	3C
1033	Clark	4B
1168	Barber	4B
812	Kiowa	4B
1035	Ford	5A
1292	Hodgeman	5A
822	Pawnee	5A
825	Pawnee	5A
823	Trego	5A
821	Finney	5B
1857	Grant	5B
1025	Greeley	5B
818	Greeley	5B
819	Greeley	5B
1859	Hamilton	5B
1861	Kearney	5B
1284	Lane	5B
1864	Stanton	5B
833	Bourbon	6
829	Bourbon	6
1180	Cherokee	6
1345	Franklin	6
839	Franklin	6
837	Linn	6
830	Miami	6
834	Miami	6
1353	Montgomery	6
828	Montgomery	6
836	Osage	6
840	Osage	6
1184	Wilson	6
832	Wilson	6
842	Lincoln	7A
1154	Mitchell	7A
1349	Butler	7B

Segment number	County	Stratum
847	Chase	7B
857	Chase	7B
846	Clay	7B
1151	Clay	7B
1879	Dickinson	7B
1297	Dickinson	7B
1881	Ellsworth	7B
853	Marshall	7B
1884	McPherson	7B
1347	Morris	7B
1876	Ottawa	7B
852	Pottawatomie	7B
843	Republic	7B
1888	Saline	7B
1348	Wabaunsee	7B
1158	Washington	7B
1016	Cheyenne	8
1017	Decatur	8
1880	Ellis	8
1024	Gove	8
1153	Jewell	8
1027	Logan	8
1019	Norton	8
1155	Phillips	8
1020	Rawlins	8
1281	Rawlins	8
1877	Rooks	8
864	Rooks	8
1887	Russell	8
1022	Sheridan	8
863	Sheridan	8
1021	Sherman	8
1282	Sherman	8
1157	Smith	8
1296	Smith	8
1023	Thomas	8
1031	Wallace	9

The sample segments chosen for North Dakota (from ref. 4) are as follows.

Universal strata	First-generation segments					New sample segments
14A(S-20) (15)	1462	1621	1624	1620	1619	881
	1464	1645	1644	1473	1641	
	1642	1663	1899	1618		
14B(S-19) (33)	1604	1611	1460	1610	1897	
	1613	1898	1615	1614	1612	
	1609	1459	1622	1466	1467	
	1623	1617	1616	1465	1632	
	1904	1643	1639	1470	1640	
	1910	1636	1472	1924	1659	
	1658	1664	1475			
15(S-21) (34)	1601	1456	1458	1627	1602	
	1605	1895	1902	1626	1469	
	1625	1629	1630	1628	1631	
	1915	1653	1638	1909	1660	
	1925	1661	1917	1916	1657	
	1920	1918	1656	1646	1650	
	1913	1652	1648	1651		
16(S-22) (1)	1912					

The sample segments in the U.S.S.R. are as follows:

Oblasts	First-generation segments				New sample strategy segments	
Tselinograd						
S-7 (6)	8409	8412	8415	8367		
	8122	8400				
S-8 (44)	8344	8312	8308	8324	6927	6950
	8114	8116	8342	8105	6944	6935
	8313	8310	8324	8101	6945	6935

Oblasts	First-generation segments				New sample strategy segments
S-8 (44)	8109	8104	8341	8335	
	8103	8108	8305	8353	
	8402	9080	8102	8304	
	8321	8336	8360	8370	
	8356	8123	8354	8380	
	8322	8354	8315	8110	
	8332	8347			
Kurgan					
S-9 (3)	8047	8234	8038		
S-11 (4)	8029	8030	8090	8045	
Kustanai					
S-8 (35)	8215	8212	8085	8203	
	8249	8255	8202	8258	
	8241	8083	8207	8087	
	8231	8201	8235	8206	
	8257	8213	8081	8254	
	8261	8208	8247	8037	
	8224	8524	8209	8082	
	8211	8221	8077	8086	
	8225	8238	8229		
S-9 (33)	8233	8240	8089	8248	
	8011	8237	8078	8080	
	8214	8251	8076	8204	
	8200	8245	8263	8256	
	8084	8232	8079	8210	
	8252	8239	8230	8218	
	8253	8236	8252	8262	
	8205	8260	8088	8219	
	8216				

APPENDIX B

SAMPLE SEGMENT HISTORY OF CAMS RATIOED WHEAT ESTIMATES

APPENDIX B

SAMPLE SEGMENT HISTORY OF CAMS RATIOED WHEAT ESTIMATES

A history of sample segments through the 1977 crop year follows. CAMS ratioed estimates are averaged on each date for each universal stratum. When a segment is deleted by CAMS, D replaces the estimate, S the screened segment, and T the thresholded segment. If the estimates are blank, then no figure has been received.

The strategies are denoted as follows:

- OLD for all first-generation segments.
- NEW for all second-generation segments.
- MIX for the mixture of first- and second-generation segments in the United States.
- NSS for the subset of first-generation segments used in the U.S.S.R.

The strata are denoted as follows:

KS – Kansas

KST – Kustanai

KUR – Kurgan

ND – North Dakota

TSL – Tselinograd

STRATUM KS 1-2 OLD

Segment	Aggregation date					
	6/8	6/20	7/13	8/10	9/13	10/11
1350	7.0	7.0	10.5	7.0	7.0	7.0
1181	24.8	24.8	24.8	29.0	29.0	23.0
1351	14.0	14.0	11.3	11.3	11.3	13.0
1352	14.4	14.4	3.1	11.9	11.9	11.9
n =	4	4	4	4	4	4
Average	15.05	15.05	12.43	14.80	14.80	13.73

STRATUM KS 6 OLD

Segment	Aggregation date					
	6/8	6/10	7/13	8/10	9/9	10/11
1168	13.3	13.3	17.6	4.0	S	
1335	45.9	45.9	45.9	43.5	43.5	42.5
1033	5.1	5.1	5.1	2.0	S	
1288	35.2	35.2	35.2	8.0	8.0	14.9
1169	3.5	3.5	3.5	22.1	22.1	25.2
1293	10.6	10.6	10.8	10.8	10.8	10.8
n =	6	6	6	6	4	4
Average	18.93	18.93	19.68	15.07	21.1	23.35

STRATUM KS 7 OLD

Segment	Aggregation date					
	6/8	6/20	7/13	8/10	9/9	10/11
1889	34.7	34.7	34.7	38.2	38.2	38.2
1170	70.2	70.2	70.2	63.9	63.9	62.9
1336	36.1	36.1	37.6	34.9	34.9	34.9
1172	58.3	58.3	58.3	46.7	46.7	41.7
1173	27.1	27.1	27.1	27.1	27.1	27.1
1337	16.7	16.7	16.7	16.7	17.6	17.6
1890	33.8	33.8	33.8	33.8	33.8	33.8
1891	21.7	21.7	21.7	21.7	21.7	27.2
1174	33.9	33.9	33.9	38.6	38.6	38.6
1892	28.7	28.7	28.7	43.1	43.1	43.1
1175	32.0	32.0	40.4	40.4	40.4	40.4
1338	63.7	63.7	63.7	68.8	68.8	67.8
1893	15.5	15.5	15.5	15.5	18.6	18.6
1176	59.7	59.7	59.7	63.9	63.9	63.9
1177	50.5	50.5	50.5	72.9	72.9	72.9
1339	66.3	66.3	66.3	62.5	62.5	62.5
1340	23.9	23.9	55.4	45.7	45.7	45.7
n =	17	17	17	17	17	17
Average	39.58	39.58	41.92	43.20	43.43	43.35

STRATUM KS 8 OLD

Segment	Aggregation date					
	6/8	6/20	7/13	8/10	9/9	10/11
1878						
1856	34.5	34.5	34.5	34.5	34.5	34.5
1035	18.6	18.6	15.0	15.0	15.0	15.0
1290	42.4	42.4	42.4	42.4	42.4	42.4
1858	40.8	40.8	44.8	44.8	44.8	44.8
1292	29.5	29.5	29.5	29.5	29.5	29.5
1860	31.9	31.9	D	20.8	20.8	17.4
1852	38.4	38.4	26.2	26.8	26.8	30.0
1041	23.6	23.6	40.5	40.5	40.5	40.5
1286	8.5	8.5	8.5	8.5	8.5	8.5
1853	29.3	29.3	D		25.9	25.9
1886						
n =	10	10	8	9	10	10
Average	29.75	29.75	30.75	29.20	28.87	28.85

STRATUM KS 9 OLD

Segment	Aggregation date					
	6/8	6/20	7/13	8/10	9/9	10/11
1289	23.9	23.9	41.8	41.8	44.5	45.3
1857	27.0	27.0	38.8	44.9	44.9	44.9
1025	39.9	39.9	39.9	51.9	51.9	51.9
1291	33.7	33.7	35.4	35.4	35.4	44.7
1859	24.1	24.1	24.1	24.1	T	
1866	44.1	44.1	49.0	49.0	49.0	49.0
1861	20.0	20.0	20.0	18.0	18.0	22.8
1284	18.4	18.4	31.0	28.3	28.3	25.8
1294	33.9	33.9	43.9	43.9	43.9	43.9
1862						
1863	19.5	19.5	19.5	19.5	19.5	19.5
1854	37.1	37.1	37.1	37.1	37.1	37.1
1865	14.4	14.4	20.5	20.5	20.5	17.0
1032	3.5	3.5	23.5	47.5	40.4	40.4
1864	31.1	31.1	30.8	30.5	30.5	30.5
n =	14	14	14	14	13	13
Average	26.47	26.47	32.52	35.17	35.68	36.37

STRATUM KS 10 OLD

Segment	Aggregation date					
	6/8	6/20	7/13	8/10	9/9	10/11
1031	4.2	4.2	4.2	4.2	T	
1287	36.4	36.4	36.4	36.4	29.1	31.6
n =	2	2	2	2	1	1
Average	20.3	20.3	20.3	20.3	29.1	31.6

STRATUM KS 11 OLD

Segment	Aggregation date					
	6/8	6/20	7/7	8/10	9/9	10/11
1016	13.4	13.4	22.6	15.9	14.6	14.6
1278	28.3	28.3	28.3	28.3	31.8	31.8
1279	21.4	21.4	21.4	21.4	21.4	22.5
1017	14.8	14.8	14.8	22.1	22.1	13.3
1880	8.8	8.8	8.8	8.8	19.4	19.4
1024	9.2	9.2	26.9	32.9	24.9	24.9
1280	14.2	14.2	14.2	14.2	14.2	14.2
1851	42.3	42.3	23.4	23.4	23.4	23.4
1153	4.2	4.2	4.2	21.0	21.0	21.0
1027	28.2	28.2	28.2	28.2	21.1	21.1
1285	22.9	22.9	22.9	22.9	22.9	22.9
1019	21.4	21.4	21.4	21.4	30.1	30.1
1295	4.0	4.0	4.0	29.2	29.2	29.2
1875	14.8	14.8	D	22.8	21.8	21.8
1155	3.7	3.7	3.7	3.7	T	
1020	28.4	28.4	29.8	25.6	25.6	29.8
1281	48.2	48.2	48.2	48.2	28.8	27.6
1877	45.7	45.7	34.5	34.5	26.9	34.4
1887	3.7	3.7	D		S	
n =						
Average						

STRATUM KS 11 OLD, Concl.

Segment	Aggregation date					
	6/8	6/20	7/7	8/10	9/9	10/11
1022	16.3	16.3	16.3	16.3	16.3	16.3
1021	24.6	24.6	24.6	24.6	24.6	24.6
1282	11.6	11.6	11.8	15.0	15.0	23.9
1296	24.3	24.3	24.3	24.3	T	
1157	21.8	21.8	21.8	9.9	9.9	13.3
1023	29.7	29.7	29.7	29.7	29.7	25.9
1283	43.9	43.9	43.9	26.9	26.9	26.9
1855	16.3	16.3	16.3	16.3	16.3	16.3
n =	27	27	25	26	24	24
Average	20.97	20.97	21.84	22.59	22.41	22.88

STRATUM KS 12 OLD

Segment	Aggregation date					
	6/8	6/20	7/13	8/10	9/9	10/11
1179	17.4	17.4	17.4	19.9	19.9	19.9
1349	16.0	16.0	16.0	16.0	16.0	16.0
1151	32.9	32.9	32.9	19.0	19.0	16.5
1152	48.2	48.2	48.2	38.9	38.9	38.9
1297			11.4	11.4	11.4	15.0
1879	11.5	11.5	24.0	24.0	24.0	33.4
1881	14.8	14.8	14.8	14.8	25.4	25.4
1346	2.4	2.4	2.4	2.4	S	2.4
1882	15.3	15.3	45.5	45.5	45.5	49.5
1883	5.2	5.2	5.2	7.0	7.0	7.0
1884	27.8	27.8	27.8	30.0	30.0	30.0
1299	1.5	1.5	1.5	30.8	30.8	30.8
1347	8.8	8.8	7.9	5.0	5.0	6.2
1876	21.4	21.4	21.4	10.0	10.0	18.3
1885	39.5	39.5	39.0	52.8	52.8	44.7
1343	14.2	14.2	14.2	10.9	10.9	10.9
1300	39.2	39.2	39.2	39.2	D	
1888	.5	.5	44.9	63.9	63.9	63.9
1348	3.5	3.5	1.6	1.0	1.0	2.0
1158	2.6	2.6	16.1	17.9	17.9	17.9
n =	19	19	20	20	18	19
Average	16.98	16.98	21.57	23.02	23.27	23.62

STRATUM KS 13 OLD

Segment	Aggregation date					
	6/8	6/20	7/13	8/10	9/9	10/11
1344	17.2	17.2	24.1	17.1	17.1	12.7
1180	42.3	42.3	28.6	26.3	26.3	26.3
1163	14.3	14.3	14.3	11.4	11.4	11.4
1345	18.8	18.8	11.8	18.8	18.8	18.8
1183	10.2	10.2	10.2	6.0	6.0	6.0
1166	7.1	7.1	10.5	6.2	6.2	7.0
1353	11.5	11.5	17.8	17.8	17.8	17.8
1354	8.3	8.3	3.0	5.0	5.0	5.0
1184	1.2	1.2	11.4	11.4	11.4	11.4
1167			5.1	5.0	5.0	2.0
n =	9	9	10	10	10	10
Average	14.54	14.54	13.68	12.50	12.50	11.84

STRATUM KS 14 OLD

Segment	Aggregation date					
	6/8	6/20	7/13	8/10	9/9	10/11
1341						
1161	33.0	33.0	33.0	30.0	30.0	30.0
1342			26.2	26.2	26.2	26.2
1162	12.8	12.8	12.8	12.9	12.9	12.9
1159	7.2	7.2	7.2	5.0	5.0	5.0
n =	3	3	4	4	4	4
Average	17.67	17.67	19.80	18.53	18.53	18.53

STRATUM KS 15 OLD

Segment	Aggregation date					
	6/8	6/20	7/13	8/10	9/9	10/11
1154					25.8	30.7
1156	20.0	20.0	29.9	29.9	29.9	29.9
n =	1	1	1	1	2	2
Average	20.0	20.0	29.9	29.9	27.85	30.3

C - 2

STRATUM KS 1-2 MIX

[No segments allocated.]

Segment	Aggregation date					
n =						
Average						

C-2

STRATUM KS 6 MIX

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/9	10/11
1033	5.1	5.1	5.1	2.0	S	
1168	13.3	13.3	17.6	4.0	S	
812	5.0	5.0	5.0	5.0	5.0	5.0
n =	3	3	3	3	1	1
Average	7.8	7.8	7.8	3.67	5.0	5.0

STRATUM KS 7 MIX

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/9	10/11
803			11.4	11.4	11.4	11.4
1170	70.2	70.2	70.2	63.9	63.9	62.9
1173	27.1	27.1	27.1	27.1	27.1	27.1
800	38.1	38.1	38.1	38.1	38.1	38.1
1174	33.9	33.9	33.9	38.6	38.6	38.6
1892	28.7	28.7	28.7	43.1	43.1	43.1
1175	32.0	32.0	40.4	40.4	40.4	40.4
1893	15.5	15.5	15.5	15.5	18.6	18.6
1176	59.7	59.7	59.7	63.9	63.9	63.9
n =	8	8	9	9	9	9
Average	38.15	38.15	36.11	38.0	38.3	38.2

STRATUM KS 8 MIX

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/9	10/11
1035	18.6	18.6	15.0	15.0	15.0	15.0
1292	29.5	29.5	29.5	29.5	29.5	29.5
822						
825	23.5	23.5	23.5	23.5	23.5	23.5
823		21.1	21.1	21.1	21.1	21.1
n =	3	4	4	4	4	4
Average	23.87	23.18	22.27	22.27	22.27	22.27

STRATUM KS 9 MIX

Segment	Aggregation date					
	6/8	6/20	7/11	8/14	9/14	10/11
821	17.5	17.5	17.5	17.5	17.5	17.5
1857	27.0	27.0	38.8	49.9	49.9	44.9
1025	39.9	39.9	39.9	51.9	51.9	51.9
818		29.3	29.3	29.3	29.3	29.3
819		7.0	7.0	7.0	7.0	7.0
1859	24.1	24.1	24.1	24.1	T	
1861	20.0	20.0	20.0	18.0	18.0	22.8
1284	18.4	18.4	31.0	28.3	28.3	25.8
1864	31.1	31.1	30.8	30.5	30.5	30.5
n =	7	9	9	9	8	8
Average	25.43	23.81	26.49	28.5	29.05	28.71

STRATUM KS 10 MIX

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	10/11
1031	4.2	4.2	4.2	4.2	T	
n =	1	1	1	1	0	0
Average	4.2	4.2	4.2	4.2		

STRATUM KS 11 MIX

Segment	Aggregation date					
	6/8	6/20	7/11	8/14	9/14	10/11
1016	13.4	13.4	22.6	15.9	14.6	14.6
1017	14.8	14.8	14.8	22.1	22.1	13.3
1880	8.8	8.8	8.8	8.8	19.4	19.4
1024	9.2	9.2	26.9	32.9	24.9	24.9
1153	4.2	4.2	4.2	21.0	21.0	21.0
1027	28.2	28.2	28.2	28.2	21.1	21.1
1019	21.4	21.4	21.4	21.4	30.1	30.1
1155	3.7	3.7	3.7	3.7	T	
1020	28.4	28.4	29.8	29.8	25.6	29.8
1281	48.2	48.2	48.2	48.2	28.8	27.6
1877	45.7	45.7	34.5	34.5	26.9	34.4
864					1.0	1.0
1887	3.7	3.7	D	34.5	S	
1022	16.3	16.3	16.3	16.3	16.3	16.3
863	30.8	30.8	30.8	30.8	30.8	30.8
1021	24.6	24.6	24.6	24.6	24.6	24.6
1282	11.8	11.8	11.8	15.0	15.0	23.9
1157	21.8	21.8	21.8	9.9	9.9	9.9
n =						
Average						

STRATUM KS 11 MIX, Concl.

Segment	Aggregation date					
	6/8	6/20	7/11	8/14	9/14	10/11
1296	24.3	24.3	24.3	24.3	T	
1023	29.7	29.7	29.7	29.7	29.7	25.9
n =	19	19	18	19	17	17
Average	20.47	20.47	22.36	23.77	21.28	21.39

STRATUM KS 13 MIX

Segment	Aggregation date					
	6/8	6/20	7/11	8/14	9/14	10/11
833	5.9	5.9	5.9	5.9	5.9	5.9
829	10.5	10.5	10.5	10.5	10.5	10.5
1180	42.3	42.3	28.6	26.3	26.3	26.3
1345	18.8	18.8	18.8	18.8	18.8	18.8
839	32.6	32.6	32.6	32.6	32.6	32.6
837						
830		21.0	21.0	21.0	21.0	21.0
834	27.6	21.7	21.7	21.7	21.7	21.7
1353	11.5	11.5	17.8	17.8	17.8	17.8
828		10.2	10.2	10.2	10.2	10.2
836		8.7	8.7	8.7	8.7	8.7
840	11.1	11.1	11.1	11.1	11.1	11.1
1184	1.2	1.2	11.4	11.4	11.4	11.4
832	20.0	20.0	20.0	20.0	20.0	20.0
n =	10	13	13	13	13	13
Average	18.15	16.58	16.79	16.62	16.62	15.85

STRATUM KS 14 MIX

[No segments allocated.]

Segment	Aggregation date					
n =						
Average						

STRATUM KS 15 MIX

Segment	Aggregation date					
	6/8	6/20	7/11	8/14	9/14	10/11
842		20.6	20.6	20.6	20.6	20.6
1154					25.8	30.7
n =	0	1	1	1	2	2
Average		20.6	20.6	20.5	23.2	25.65

STRATUM KS 1-2 NEW

[No segments allocated.]

Segment	Aggregation date					
n =						
Average						

STRATUM KS 6 NEW

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	10/11
810						
811	23.7	23.7	23.7	23.7	23.7	23.7
812	5.0	5.0	5.0	5.0	5.0	5.0
n =	2	2	2	2	2	2
Average	14.35	14.35	14.35	14.35	14.35	14.35

STRATUM KS 7 NEW

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	
800	38.1	38.1	38.1	38.1	38.1	
801	38.7	38.7	38.7	38.7	38.7	
802	30.5	30.5	30.5	30.5	30.5	
803			11.4	11.4	11.4	
804	65.1	65.1	65.1	65.1	65.1	
805	27.2	27.2	27.2	27.2	27.2	
806	5.8	5.8	5.8	5.8	5.8	
807	44.4	44.4	44.4	44.4	44.4	
808		33.7	33.7	33.7	33.7	
809	77.4	77.4	77.4	77.4	77.4	
n =	8	9	10	10	10	
Average	40.9	40.1	37.23	37.23	37.23	

STRATUM KS 8 NEW

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	
822						
823		21.1	21.1	21.1	21.1	
824	49.6	49.6	49.6	49.6	49.6	
825	23.5	23.5	23.5	23.5	23.5	
826		14.3	14.3	14.3	14.3	
n =	2	4	4	4	4	
Average	36.55	27.13	27.13	27.13	27.13	

STRATUM KS 9 NEW

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	
813		19.7	19.7	19.7	19.7	
814		37.4	37.4	37.4	37.4	
815	27.9	38.2	38.2	38.2	38.2	
816	22.1	22.1	22.1	22.1	22.1	
817	28.6	28.6	28.6	28.6	28.6	
818		29.3	29.3	29.3	29.3	
819		7.0	7.0	7.0	7.0	
820	42.3	53.6	53.6	53.6	53.6	
821	17.5	17.5	17.5	17.5	17.5	
n =	5	9	9	9	9	
Average	27.68	28.16	28.16	28.16	28.16	

STRATUM KS 10 NEW

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	
880			15.6	15.6	15.6	
n =			1	1	1	
Average			15.6	15.6	15.6	

STRATUM KS 11 NEW

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	
860						
861	35.7	35.7	35.7	35.7	35.7	
862	18.5	18.5	18.5	18.5	18.5	
863	30.8	30.8	30.8	30.8	30.8	
864					1.0	
865	29.6	29.6	29.6	29.6	29.6	
866	16.7	16.7	16.7	16.7	16.7	
867	21.7	21.7	21.7	21.7	21.7	
868	20.1	20.1	20.1	20.1	20.1	
869					23.7	
870	32.0	32.0	32.0	32.0	32.0	
871	33.9	33.9	33.9	33.9	33.9	
872	8.7	8.7	8.7	8.7	8.7	
873		26.2	26.2	26.2	26.2	
874	27.3	27.3	27.3	27.3	27.3	
875		24.7	24.7	24.7	24.7	
876		26.6	26.6	26.6	26.6	
877		22.9	22.9	22.9	22.9	
n =						
Average						

STRATUM KS 11 NEW, Concl.

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	
878						
879	36.2	36.2	36.2	36.2	36.2	
n =	12	16	16	16	18	
Average	25.93	25.73	25.73	25.73	24.24	

STRATUM KS 12 NEW

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	10/11
1349	16.0	16.0	16.0	16.0	16.0	16.0
847	27.2	27.2	27.2	27.2	27.2	27.2
857	22.6	22.6	22.6	22.6	22.6	22.6
846	7.4	7.4	7.4	7.4	7.4	7.4
1151	32.9	32.9	32.9	19.0	19.0	16.5
1879	11.5	11.5	11.5	24.0	24.0	33.4
1297			11.4	11.4	11.4	15.0
1881	14.8	14.8	14.8	14.8	25.4	25.4
853	13.8	12.8	12.8	12.8	12.8	12.8
1884	27.8	27.8	27.8	30.0	30.0	30.0
1347	8.8	8.8	7.9	5.0	5.0	6.2
1876	21.4	21.4	21.4	10.0	10.0	18.3
852	0	0	0	0	0	0
843	18.7	18.0	18.0	18.0	18.0	18.0
1888	.5	.5	44.9	63.9	63.9	63.9
1348	3.5	3.5	1.6	1.0	1.0	2.0
1158	2.6	2.6	16.1	17.9	17.9	17.9
n =	16	16	17	17	17	17
Average	14.34	14.34	17.32	17.71	18.33	18.39

STRATUM KS 12 NEW, Concl.

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	
843	18.7	18.7	18.7	18.7	18.7	
844	32.3	32.3	32.3	23.3	23.3	
845	44.0	44.0	44.0	44.0	44.0	
846	7.4	7.4	7.4	7.4	7.4	
847	27.2	27.2	27.2	27.2	27.2	
848	38.0	38.0	38.0	38.0	38.0	
849		3.6	3.6	3.6	3.6	
850	3.0	3.0	3.0	3.0	3.0	
851	38.6	38.6	38.6	38.6	38.6	
852	0	0	0	0	0	
853	13.8	12.8	12.8	12.8	12.8	
854		6.1	6.1	6.1	6.1	
855	14.6	13.3	13.3	13.3	13.3	
856	21.2	21.2	21.2	21.2	21.2	
857		22.6	22.6	22.6	22.6	
858	11.5	11.5	11.5	11.5	11.5	
859	43.2	43.2	43.2	43.2	43.2	
n =	14	17	17	17	17	
Average	22.39	19.61	19.61	17.61	17.61	

STRATUM KS 13 NEW

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	
827	20.2	20.2	20.2	20.2	20.2	
828		10.2	10.2	10.2	10.2	
829		10.5	10.5	10.5	10.5	
830		21.0	21.0	21.0	21.0	
831		14.2	14.2	14.2	14.2	
832	20.0	20.0	20.2	20.2	20.2	
833		5.9	5.9	5.9	5.9	
834	27.6	21.7	21.7	21.7	21.7	
835	13.9	14.1	14.1	14.1	14.1	
836		8.7	8.7	8.7	8.7	
837						
838	12.7	12.7	17.0	17.0	17.0	
839	32.6	32.6	32.6	32.6	32.6	
840	11.1	11.1	11.1	11.1	11.1	
n =	7	13	13	13	13	
Average	19.73	15.61	15.94	15.94	15.94	

STRATUM KS 14 NEW

[No segments allocated.]

Segment	Aggregation date					
n =						
Average						

STRATUM KS 15 NEW

Segment	Aggregation date					
	6/8	6/20	7/11	8/10	9/13	
841	28.1	28.1	28.1	28.1	28.1	
842		20.6	20.6	20.6	20.6	
n =	1	2	2	2	2	
Average	28.1	24.35	24.35	24.35	24.35	

STRATUM ND 19 MIX

Segment	Aggregation date					
	8/10	9/9	10/11			
1459	8.8	30.1	34.5			
1460		21.0	29.7			
1465						
1466	23.4	23.4	23.4			
1467	30.1	33.4	33.4			
1470	24.9	T				
1472	25.5	27.9	27.9			
1475	8.5	16.7	16.7			
1604	28.8	T				
1609						
1610						
1611						
1612						
1613	18.2	T	20.7			
1614	14.4	12.4	12.4			
1615						
1616	15.7	27.1	34.2			
1617	24.9	24.9	24.9			
1622	24.6	24.6	24.6			
n =						
Average						

STRATUM ND 19 MIX, Concl.

Segment	Aggregation date					
	8/10	9/9	10/11			
1623		18.2	18.2			
1632	14.7	14.7	14.7			
1636	16.9	29.4	29.4			
1639	10.3	D				
1640	4.8	29.1	29.1			
1643						
1658	28.9	28.9	28.9			
1659	22.3	22.3	27.2			
1664	30.9	30.9	21.9			
1897	18.9	18.9	29.7			
1898	0	D				
1904	40.8	40.8	35.6			
1910	19.8	19.8	25.8			
1924	22.7	22.7	19.8			
n =	24	21	22			
Average	19.9	24.6	25.6			

STRATUM ND 20 MIX

Segment	Aggregation date					
	8/10	9/9	10/11			
881						
1462						
1464						
1473						
1618	32.0	32.0	32.0			
1619	29.3	30.1	30.1			
1620	6.1	D				
1621	17.7	20.1	22.5			
1624	39.5	39.5	36.4			
1641	36.5	37.2	38.8			
1642	29.8	29.8	34.6			
1644	9.1	9.1				
1645	36.4	36.4	36.4			
1663	22.7	22.7	22.7			
1899	39.5	37.0	37.0			
n =	11	10	9			
Average	27.1	29.4	32.3			

STRATUM ND 21 MIX

Segment	Aggregation date					
	8/10	9/9	10/11			
1456	10.7	13.6	13.6			
1458			31.1			
1469		20.4	20.4			
1601			31.3			
1602	7.4	21.4	21.4			
1605		12.3	12.3			
1625		8.9	15.0			
1626	0	S	14.6			
1627						
1628						
1629	0	18.6	18.6			
1630	12.6	8.2	8.2			
1631						
1638						
1646	3.7	14.0	14.0			
1648	25.5	25.5	25.5			
1650	6.1	D				
1651	17.7	17.7	18.4			
1652		17.0	17.0			
n =						
Average						

STRATUM ND 21 MIX, Concl.

Segment	Aggregation date					
	8/10	9/9	10/11			
1653	16.7	16.7	16.7			
1656						
1657	1.3	D				
1660	13.1	13.1	19.3			
1611						
1895	28.6	30.3	30.3			
1902	.7	T	5.2			
1909						
1913	12.8	16.3	16.3			
1915						
1916						
1917						
1918						
1920						
1925						
n =	15	15	19			
Average	10.4	16.9	18.4			

STRATUM ND 22 MIX

Segment	Aggregation date					
	8/10	9/9	10/11			
1912	4.4	4.4	5.9			
n =	1	1	1			
Average	4.4	4.4	5.9			

STRATUM ND 19 NEW

Segment	Aggregation date					
	8/10, 9/9, 10/11					
896	22.6					
897						
898	29.1					
899						
900						
901	13.0					
902						
903						
904	0					
905						
906						
907	11.3					
908						
909						
910	25.1					
911						
912						
913						
914	14.9					
n =						
Average						

STRATUM ND 19 NEW, Concl.

Segment	Aggregation date					
	8/10, 9/9, 10/11					
915						
916	11.5					
917						
918						
919						
920	1.3					
921	6.1					
922	10.7					
923	16.2					
924	4.2					
925	8.0					
926	18.3					
927	23.1					
928						
n =	16					
Average	13.5					

STRATUM ND 20 NEW

Segment	Aggregation date					
	8/10, 9/9, 10/11					
881						
882						
883						
884	15.7					
885	16.4					
886	2.5					
887						
888	4.4					
889						
890	13.6					
891						
892						
893	28.2					
894	19.4					
895						
n =	7					
Average	14.3					

STRATUM ND 21 NEW

Segment	Aggregation date					
	8/10, 9/9, 10/11					
929						
930	9.7					
931						
932						
933						
934						
935						
936						
937	3.7					
938						
939	25.9					
940	7.9					
941	5.1					
942						
943						
944						
945						
946						
947						
n =						
Average						

STRATUM ND 21 NEW, Concl.

Segment	Aggregation date					
	8/10, 9/9, 10/11					
948						
949						
950	0.8					
951						
952	9.6					
953	0					
954						
955	12.2					
956	14.8					
957						
958						
959						
960						
961	5.9					
962						
n =	11					
Average	8.7					

STRATUM ND 22 NEW

Segment	Aggregation date					
	8/10, 9/9, 10/11					
963						
n =	0					
Average						

STRATUM KUR 9 OLD

Segment	Aggregation date					
	8/1	9/2	9/27			
8028	27.8	27.8	27.8			
8031	30.1	30.1	31.7			
8049	19.8	19.8	19.8			
8038			49.2			
8234			33.3			
n =	3	3	5			
Average	25.9	25.9	32.0			

STRATUM KUR 11 OLD

Segment	Aggregation date					
	8/1	9/1	9/27			
8027	37.3	37.3	37.3			
8029	16.7	16.7	40.4			
8030	18.8	26.5	26.5			
8032	27.8	27.8	27.8			
8090	19.0	19.0	19.0			
8045		30.1	30.1			
8044			34.9			
n =	5	6	7			
Average	23.9	26.2	30.9			

STRATUM KUR 9 NSS

Segment	Aggregation date					
	8/1	9/2	9/27			
8038			49.2			
8234			33.3			
n =			2			
Average			41.2			

STRATUM KUR 11 NSS

Segment	Aggregation date					
	8/1	9/2	9/27			
8029	16.7	16.7	40.4			
8030	18.8	26.5	26.5			
8090	19.0	19.0	19.0			
8045		30.1	30.1			
n =	3	4	4			
Average	18.2	23.1	29.0			

STRATUM KST 8 OLD

Segment	Aggregation date					
	8/1	9/2	9/27			
8083	63.8	63.8	63.8			
8207	14.1	14.1	14.1			
8209	8.3	38.1	38.1			
8212	37.0	37.0	37.0			
8215	27.3	27.3	27.3			
8224	7.5	7.5	7.5			
8225	31.8	31.8	31.8			
8238	58.0	58.0	58.0			
8241	31.5	31.5	31.5			
8247	6.6	6.6	6.6			
8258	43.9	43.9	43.9			
8086	72.9	73.7	73.7			
8016	22.7	22.7	22.7			
8226	12.0	12.0	12.0			
8228	48.9	48.9	48.9			
8255	25.7	25.7	25.7			
8211		42.2	42.2			
8077		31.5	31.5			
8208		20.7	20.7			
n =						
Average						

STRATUM KST 8 OLD, Concl.

Segment	Aggregation date					
	8/1	9/2	9/27			
8206		14.1	14.1			
8221		54.6	54.6			
8203		47.2	57.1			
8037		0	0			
8201		0	0			
8213		14.1	14.1			
8229		54.6	54.6			
8254			61.3			
8235			0			
n =	16	26	29			
Average	32.0	31.6	30.8			

STRATUM KST 9 OLD

Segment	Aggregation date					
	8/1	9/2	9/27			
8076	36.4	36.4	36.4			
8078	29.8	29.8	54.5			
8079	39.7	39.7	39.7			
8080	18.2	18.2	18.2			
8084	18.2	13.2	13.2			
8089	53.8	53.8	53.8			
8205	62.9	58.0	58.0			
8214	24.0	24.0	24.0			
8218	31.5	31.5	31.5			
8237	38.7	38.7	38.7			
8239	28.2	28.2	28.2			
8251	16.6	16.6	16.6			
8256	20.7	20.7	45.5			
8250		53.0	53.0			
8204		22.6	22.6			
8260		34.8	45.0			
8219		44.7	44.7			
8216		7.5	7.5			
8088		33.9	33.9			
n =						
Average						

STRATUM KST 9 OLD, Concl.

Segment	Aggregation date					
	8/1	9/2	9/27			
8236		33.9	33.9			
8245		31.5	31.5			
8263		43.9	43.9			
8240			54.6			
8262			32.3			
n =	13	22	24			
Average	32.2	32.5	35.9			

STRATUM KST 8 NSS

Segment	Aggregation date					
	8/1	9/2	9/27			
8083	63.8	63.8	63.8			
8207	14.1	14.1	14.1			
8209	8.3	38.1	38.1			
8212	37.0	37.0	37.0			
8215	27.3	27.3	27.3			
8224	7.5	7.5	7.5			
8225	31.8	31.8	31.8			
8238	58.0	58.0	58.0			
8241	31.5	31.5	31.5			
8247	6.6	6.6	6.6			
8258	43.9	43.9	43.9			
8086	72.9	73.7	73.7			
8255		25.7	25.7			
8211		42.2	42.2			
8077		31.5	31.5			
8208		20.7	20.7			
8206		14.1	41.1			
8221		54.6	54.6			
n =						
Average						

STRATUM KST 8 NSS, Concl.

Segment	Aggregation date					
	8/1	9/2	9/27			
8037		0	0			
8201		0	0			
8213		14.1	14.1			
8229		54.6	54.6			
8254			61.3			
8253			0			
n =	12	22	24			
Average	33.6	31.4	31.3			

STRATUM KST 9 NSS

Segment	Aggregation date					
	8/1	9/2	9/27			
8076	36.4	36.4	36.4			
8078	29.8	29.8	54.5			
8079	39.7	39.7	39.7			
8080	18.2	18.2	18.2			
8084	18.2	13.2	13.2			
8089	53.8	53.8	53.8			
8205	62.9	58.0	58.0			
8214	24.0	24.0	24.0			
8218	31.5	31.5	31.5			
8237	38.7	38.7	38.7			
8239	28.2	28.2	28.2			
8251	16.6	16.6	16.6			
8256	20.7	20.7	45.5			
8250		53.0	53.0			
8204		22.6	22.6			
8260		34.8	45.0			
8219		44.7	44.7			
8216		7.5	7.5			
8088		33.9	33.9			
8236		33.9	33.9			
n =						
Average						

STRATUM KST 9 NSS, Concl.

Segment	Aggregation date					
	8/1	9/2	9/27			
8245		31.5	31.5			
8263		43.9	43.9			
8240			54.6			
8262			32.3			
n =	13	22	24			
Average	32.2	32.5	35.9			

STRATUM TSL 3 OLD

Segment	Aggregation date					
	8/1	9/1	9/27			
8113		6.4	6.4			
n =						
Average		6.4	6.4			

STRATUM TSL 7 OLD

Segment	Aggregation date					
	8/1	9/1	9/27			
8339		4.8	4.8			
n =						
Average		4.8	4.8			

STRATUM TSL 8 OLD

Segment	Aggregation date					
	8/1	9/1	9/27			
8109	30.3	30.3	30.3			
8321	17.5	40.6	40.6			
8332	31.1	31.1	31.1			
8347	14.3	14.3	14.3			
8308	5.6	43.8	43.8			
8315	19.9	19.9	19.9			
8326	0	0	0			
8318	15.9	9.6	9.6			
8314	3.2	3.2	3.2			
8325	11.2	11.2	11.2			
8111	13.5	13.5	13.5			
8323	42.2	44.6	39.8			
9493	10.4	10.4	10.4			
8101		2.4	2.4			
8102		27.9	56.6			
8110		22.3	22.3			
8312		56.6	56.6			
8341		22.3	22.3			
8322		19.9	19.9			
n =						
Average						

Segment	Aggregation date					
	8/1	9/1	9/27			
8305		31.7	31.7			
8116		14.3	14.3			
8330		57.4	57.4			
8309		62.2	62.2			
8328		19.1	19.1			
8103			52.6			
8336			18.3			
n =	13	24	26			
Average	16.5	25.4	27.1			

STRATUM TSL 3 NSS

Segment	Aggregation date					
	8/1	9/1	9/27			
8113		6.4	6.4			
n =	0	0	1			
Average		6.4	6.4			

STRATUM TSL 7 NSS

Segment	Aggregation date					
	8/1	9/1	9/27			
8339		4.8	4.8			
n =	0	1	1			
Average		4.8	4.8			

STRATUM TSL 8 NSS

Segment	Aggregation date					
	8/1	9/1	9/27			
8109	30.3	30.3	30.3			
8321	17.5	40.6	40.6			
8332	31.1	31.1	31.1			
8347	14.3	14.3	14.3			
8308	5.6	43.8	43.8			
8315	19.9	19.9	19.9			
8101		2.4	2.4			
8102		27.9	56.6			
8110		22.3	22.3			
8312		56.6	56.6			
8341		22.3	22.3			
8322		19.9	19.9			
8305		31.7	31.7			
8116		14.3	14.3			
8103			52.6			
8336			18.3			
n =	6	14	16			
Average	19.8	27.0	29.8			

APPENDIX C

AREA AND PRODUCTION AGGREGATIONS

APPENDIX C

AREA AND PRODUCTION AGGREGATIONS

The following tables (C-1 to C-14) give the area and production aggregations on yield models (taken from ref. 2). The yield models are those derived by the Center for Climatic and Environmental Assessment (CCEA) unless the Feyerherm label appears on the table title.

TABLE C-1.- KS OLD FEYERHERM YIELDS

(a) June 8.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	4	0
6	434177.0	76	0.00800	6	3
7	1166852.0	215	0.01310	17	10
8	1042027.0	192	0.00610	10	5
9	1411078.0	259	0.01460	14	9
10	108544.0	20	0.01480	2	1
11	2122045.0	390	0.01520	27	20
12	1611885.0	297	0.01380	19	17
13	1373088.0	253	0.01480	9	14
14	808657.0	149	0.00160	3	0
15	92263.0	32	0.00490	1	2
TOTAL	10925000.0	2004	0.01716	112	81

STRATUM	WHEAT AREA ACRES	STANDARD WHEAT ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	463027.4	112828.3	12730228736.0	24.368
6	365869.2	137664.3	1895145881 6.0	37.627
7	2163516.0	239250.8	57240932 352.0	11.058
8	1452355.0	162574.8	26430554112.0	11.194
9	1743258.0	193693.9	37517344768.0	11.111
10	107964.2	77257.6	5968732160.0	71.559
11	2079114.0	247223.3	61119356928.0	11.891
12	1282584.0	249394.3	62197497856.0	19.445
13	935625.1	251008.4	63005196288.0	26.828
14	669308.0	296841.3	88114724864.0	44.350
15	109619.9	5815.0	33814784.0	5.305
TOTAL	11372239.0	662882.4	439413112832.0	5.829

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	18243264.0	14005052.0	196141492731904.0	76.768
6	8085705.0	6972631.0	48617586950144.0	86.234
7	70746960.0	37882576.0	1435089502208000.0	53.547
8	35292208.0	37028064.0	1371077041192959.0	104.918
9	39746256.0	25611744.0	655961496748031.9	64.438
10	2332025.0	1897175.0	3599274868736.0	81.353
11	50106624.0	26006960.0	676361786097663.9	51.903
12	37964464.0	25395584.0	644935778828287.9	66.893
13	32934000.0	16673497.0	278005481996288.0	50.627
14	21417856.0	15603149.0	243458258239488.0	72.851
15	3431102.0	3569717.0	12742882754560.0	104.040
TOTAL	320299776.0	28086144.0	788831410323455.9	8.769

TABLE C-1.- Continued.

(b) July 13.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG. SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754382.0	121	0.01670	4	0
6	434177.0	76	0.00800	6	3
7	1166852.0	215	0.01310	17	10
8	1042027.0	192	0.00610	8	5
9	1411078.0	259	0.01460	14	9
10	108544.0	20	0.01480	2	1
11	2122045.0	390	0.01520	25	20
12	1611885.0	297	0.01380	20	17
13	1373088.0	253	0.01480	10	14
14	808657.0	149	0.00160	4	0
15	92263.0	32	0.00490	1	2
TOTAL	10925000.0	2004	0.01216	111	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	382267.1	139034.5	19330596864.0	36.371
6	380362.0	135998.4	1849557812.0	35.755
7	2296646.0	235522.9	55471013888.0	10.255
8	1473102.0	226456.6	51282575360.0	15.373
9	2141678.0	171801.0	29515583488.0	8.022
10	112931.1	77243.9	5966622720.0	68.399
11	2165716.0	221422.3	49027805184.0	10.224
12	1628887.0	260437.4	67827662848.0	15.989
13	880017.6	161489.1	26078732288.0	18.351
14	750130.1	224921.3	5058958131?.0	29.984
15	143601.4	5662.3	32061440.0	3.943
TOTAL	12355338.0	615704.9	3790925332?8.0	4.983

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	15061319.0	11870455.0	140907693211648.0	78.814
6	8405996.0	7228811.0	52255709462528.0	85.996
7	75100304.0	40126848.0	1610163375046656.0	53.431
8	35796384.0	37537696.0	1409078374957056.0	104.864
9	48830224.0	31332416.0	981720002199551.9	64.166
10	2439311.0	1937967.0	3755717165056.0	79.447
11	52193728.0	26952528.0	726438957285375.9	51.639
12	48215040.0	31998064.0	1023876179951616.0	66.365
13	30976608.0	14713668.0	216492037636096.0	47.499
14	24004160.0	16427400.0	269859455762432.0	68.436
15	4494721.0	4676529.0	21869923139584.0	104.045
TOTAL	345517312.0	29009088.0	841527169384447.9	8.396

TABLE C-1.– Continued.

(c) August 10.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	SEGMENTS ALLOCATED
1-2	754382.0	121	0.01670	4	0
6	434177.0	76	0.00800	6	3
7	1166852.0	215	0.01310	17	10
8	1042027.0	192	0.00610	9	5
9	1411078.0	259	0.01460	14	9
10	108544.0	20	0.01480	2	1
11	2122045.0	390	0.01520	26	20
12	1611885.0	297	0.01380	20	17
13	1373088.0	253	0.01480	10	14
14	808657.0	149	0.00160	4	0
15	97263.0	32	0.00490	1	2
TOTAL	10925000.0	2004	0.01216	113	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	455336.2	149444.7	22333718528.0	32.821
6	291149.4	123193.6	15176671232.0	42.313
7	2361604.0	238740.3	56996933632.0	10.109
8	1425505.0	205831.3	42366533632.0	14.439
9	2316191.0	206464.6	42627620864.0	8.914
10	115486.1	77240.8	5966131200.0	66.883
11	2240698.0	176672.4	31213121536.0	7.885
12	1738386.0	295012.3	87032266752.0	16.970
13	804108.9	147978.0	21897482240.0	18.403
14	730240.1	239794.6	57501417472.0	32.838
15	146640.3	5695.5	32438608.0	3.884
TOTAL	12625343.0	623347.9	388562550784.0	4.937

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	17940240.0	14016862.0	196472406540288.0	78.131
6	6434398.0	5590225.0	31250618253312.0	86.880
7	77224432.0	41246288.0	1701255873298431.0	53.411
8	34639744.0	36329488.0	1319831638900736.0	104.878
9	52809120.0	33922304.0	1150722670329855.0	64.236
10	2494497.0	1959371.0	3839134531584.0	78.548
11	54000800.0	27721072.0	768457427648511.9	51.335
12	51456208.0	34221040.0	1171080010006528.0	66.505
13	28304624.0	13449061.0	180877246070784.0	47.515
14	23367680.0	16169622.0	261456671014912.0	69.197
15	4589839.0	4775504.0	22805437480960.0	104.045
TOTAL	353261312.0	29783808.0	887074760687615.9	8.431

TABLE C-1.- Concluded.

(d) October 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	4	0
6	434177.0	76	0.00800	4	3
7	1166853.0	215	0.01910	17	10
8	1042027.0	192	0.00610	10	5
9	1411078.0	259	0.01460	13	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	24	20
12	1611885.0	297	0.01380	19	17
13	1373088.0	253	0.01480	10	14
14	808657.0	149	0.00160	4	0
15	92263.0	32	0.00490	2	2
TOTAL	10925000.0	2004	0.01216	108	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	409187.2	104988.1	11022499840.0	25.658
6	451217.1	136533.6	18641436672.0	30.259
7	2369643.0	226550.3	51325034496.0	9.561
8	1408418.0	189294.1	35832250368.0	13.440
9	2395072.0	216508.8	46876037120.0	9.040
10	140094.4	5198.2	27020928.0	3.486
11	2269176.0	122494.5	15004901376.0	5.398
12	1783378.0	290995.9	84678606848.0	16.317
13	761652.2	150913.8	22774964224.0	19.817
14	730240.1	239794.6	57501417472.0	32.838
15	197735.0	4022.2	16177858.0	2.034
TOTAL	12924812.0	589815.1	347881865216.0	4.563

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	16121972.0	12406113.0	153911646224384.0	76.952
6	9971892.0	8512363.0	72460326141952.0	85.364
7	77487312.0	41330112.0	1708178286837760.0	53.338
8	34224528.0	35898656.0	1288713795534848.0	104.892
9	54607600.0	35083248.0	1230834547818496.0	64.246
10	3220438.0	1786659.0	3192149508096.0	55.479
11	54687120.0	27942688.0	780794184335359.9	51.096
12	52787968.0	35057136.0	1229003012702208.0	66.411
13	26810144.0	12860312.0	165387631067136.0	47.968
14	23367680.0	16169622.0	261456671014912.0	69.197
15	6189103.0	6439729.0	41470107058176.0	104.049
TOTAL	359475200.0	29760496.0	885687217815551.9	8.279

TABLE C-2.— KS OLD

(a) June 8.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	4	0
6	434177.0	76	0.00800	6	3
7	1166853.0	215	0.01310	17	10
8	1042027.0	192	0.00610	10	5
9	1411078.0	259	0.01460	14	9
10	108544.0	20	0.01480	2	1
11	2122045.0	390	0.01520	27	20
12	1611885.0	297	0.01380	19	17
13	1373088.0	253	0.01480	9	14
14	808657.0	149	0.00160	3	0
15	92263.0	32	0.00490	1	2
TOTAL	10925000.0	2004	0.01216	112	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	463027.4	112828.3	12730228736.0	24.368
6	365869.2	137664.3	18951458816.0	37.627
7	2163516.0	239250.8	57240932352.0	11.058
8	1452355.0	162574.8	26430554112.0	11.194
9	1743258.0	193693.9	37517344768.0	11.111
10	107964.2	77257.6	5968732160.0	71.559
11	2079114.0	247223.3	61119356928.0	11.891
12	1282584.0	249394.3	62197497856.0	19.445
13	935625.1	251008.4	63005396288.0	26.828
14	669308.0	296841.3	88114724864.0	44.350
15	109619.9	5815.0	33814784.0	5.305
TOTAL	11372239.0	662897.4	439413112832.0	5.829

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	13103670.0	4790497.0	22948865900544.0	36.558
6	10354093.0	4732135.0	22393103843328.0	45.703
7	61227 50.0	17053712.0	290878878610432.0	278.530
8	41101616.0	12364955.0	152897111585280.0	30.084
9	49334176.0	14827664.0	219859627540480.0	30.056
10	3056385.0	2267151.0	5139974848512.0	74.202
11	58838896.0	17845328.0	318455450435584.0	30.329
12	36297104.0	12243860.0	149912092147712.0	33.732
13	26478176.0	10091390.0	101836157616128.0	38.112
14	18941408.0	9660629.0	93327760293888.0	51.003
15	3102242.0	885932.5	784876371968.0	28.558
TOTAL	266729488.0	21818768.0	476058738491392.0	8.180

TABLE C-2.— Continued.

(b) July 13.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	SEGMENTS ALLOCATED
1-2	754382.0	121	0.01670	4	0
6	434177.0	76	0.00800	6	3
7	1166852.0	215	0.01310	17	10
8	1042027.0	192	0.00610	8	5
9	1411078.0	259	0.01460	14	9
10	108544.0	20	0.01480	2	1
11	2122045.0	390	0.01520	25	20
12	1611885.0	297	0.01380	20	17
13	1373088.0	253	0.01480	10	14
14	808657.0	149	0.00160	4	0
15	92263.0	32	0.00490	1	2
TOTAL	10925000.0	2004	0.01216	111	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	382267.1	139034.5	19330596864.0	36.371
6	380362.8	135991.4	18495578112.0	35.755
7	2296646.0	235522.9	55471013888.0	10.255
8	1473102.0	226456.6	51282575360.0	15.373
9	2141678.0	171801.0	29515583488.0	8.022
10	117931.1	77243.9	5966622720.0	68.399
11	2165716.0	221422.3	49027805184.0	10.224
12	1628887.0	260437.4	67827662848.0	15.989
13	880017.6	161489.1	26078732288.0	18.351
14	750130.1	224921.3	50589581312.0	29.984
15	143601.4	5662.3	32061440.0	3.943
TOTAL	12355338.0	615704.9	379092533248.0	4.983

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	11009286.0	4869956.0	23716473864192.0	44.235
6	10954420.0	4794417.0	22986430087168.0	43.767
7	66143376.0	19032754.0	362246668550144.0	28.775
8	42425344.0	13073463.0	170915438526464.0	30.815
9	61680288.0	17338298.0	300616035536192.0	28.110
10	3252415.0	2315206.0	5360176857088.0	71.184
11	62372592.0	17941344.0	321891692707840.0	28.765
12	46911920.0	14591664.0	212916661911552.0	31.104
13	25344496.0	8183825.0	66974948593536.0	32.290
14	21603728.0	8543449.0	72990519721984.0	39.546
15	4135717.0	1128779.0	1274142523392.0	27.293
TOTAL	355833088.0	22903856.0	5245865002270719.0	6.437

TABLE C-2.- Continued.

(c) August 10.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754382.0	121	0.01670	4	0
6	434177.0	76	0.00800	6	3
7	1166852.0	215	0.01310	17	10
8	1042027.0	192	0.00610	9	5
9	1411078.0	259	0.01460	14	9
10	108544.0	20	0.01480	2	1
11	2122045.0	390	0.01520	26	20
12	1611885.0	297	0.01380	20	17
13	1373088.0	253	0.01480	10	14
14	808657.0	149	0.00160	4	0
15	92263.0	32	0.00490	1	2
TOTAL	10925000.0	2004	0.01216	113	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	455336.2	149444.7	22333718528.0	32.821
6	291149.4	123193.6	15176671732.0	42.313
7	2361604.0	238740.3	56996933632.0	10.109
8	1425505.0	205831.3	42366533632.0	14.439
9	2316191.0	206464.6	42627620864.0	8.914
10	115486.1	77240.8	5966131200.0	66.883
11	2240698.0	176672.4	31213121536.0	7.885
12	1738386.0	295017.3	87032266752.0	16.970
13	804108.9	147978.0	21897482240.0	18.403
14	730740.1	239794.6	57501417472.0	32.838
15	146640.3	5695.5	32438608.0	3.884
TOTAL	12625343.0	623347.9	388567550784.0	4.937

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	13113676.0	5452875.0	29733840486400.0	41.582
6	8385098.0	4099366.0	16804809859984.0	48.889
7	68014160.0	19538544.0	381754678444032.0	28.727
8	41054512.0	12478004.0	155705839899248.0	30.394
9	66706272.0	18916544.0	357835468701696.0	28.358
10	3325997.0	2322748.0	5395159449600.0	69.836
11	64532064.0	18116704.0	328214689873920.0	28.074
12	50065488.0	15812121.0	250023182860288.0	31.583
13	23158320.0	7484261.0	56014158168064.0	32.318
14	21030896.0	8747603.0	76520563408896.0	41.594
15	4223239.0	1152335.0	1327875751936.0	27.286
TOTAL	363609088.0	23382976.0	5467632954245 11.9	6.431

TABLE C-2.– Continued.

(d) September 9.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	4	0
6	434177.0	76	0.00800	4	3
7	1166853.0	215	0.01310	17	10
8	1042027.0	192	0.00610	10	5
9	1411078.0	259	0.01460	13	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	24	20
12	1611885.0	297	0.01380	18	17
13	1373088.0	253	0.01480	10	14
14	808657.0	149	0.00160	4	0
15	97263.0	22	0.00490	2	2
TOTAL	10925000.0	2004	0.01216	107	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	455336.2	149444.7	22333718528.0	32.821
6	407738.1	155841.6	24286593024.0	38.221
7	2374467.0	233859.2	54690107392.0	9.849
8	1409395.0	184804.6	34152747008.0	13.112
9	2349987.0	209670.5	43961712640.0	8.922
10	142977.1	5032.3	25324032.0	3.520
11	2222487.0	11779.8	138739630O8.0	5.300
12	1801485.0	306412.6	93888708608.0	17.009
13	804108.9	147978.0	21897482240.0	18.403
14	730740.1	239794.6	57501417472.0	32.838
15	184210.0	15956.6	254611456.0	8.662
TOTAL	12882430.0	609110.0	371014959104.0	4.728

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	13113676.0	5452875.0	29733840486400.0	41.582
6	11742851.0	5361542.0	28746132226048.0	45.658
7	68384608.0	19587568.0	383672649777152.0	28.643
8	40590544.0	12108599.0	146618170498784.0	29.831
9	67679584.0	19194176.0	368416120635392.0	28.360
10	4117737.0	1121660.0	1258120282112.0	27.240
11	64007584.0	17605648.0	309958662946816.0	27.506
12	51882736.0	16395999.0	268828781051904.0	31.602
13	23158320.0	7484261.0	56014158168064.0	32.318
14	21030896.0	8747603.0	76520563408896.0	41.594
15	5305245.0	1500617.0	2251850514432.0	28.286
TOTAL	371012864.0	23390912.0	5471345416601S9.9	6.305

TABLE C-2.— Concluded.

(e) October 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	4	0
6	434177.0	76	0.00800	4	3
7	1166853.0	215	0.01310	17	10
8	1042027.0	192	0.00610	10	5
9	1411078.0	259	0.01460	13	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	24	20
12	1611885.0	297	0.01380	19	17
13	1373088.0	253	0.01480	10	14
14	808657.0	149	0.00160	4	0
15	92263.0	32	0.00490	2	2
TOTAL	10925000.0	2004	0.01216	108	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	409187.2	104986.1	11022499840.0	25.658
6	451217.1	136533.6	18641436672.0	30.259
7	2369643.0	226550.3	51325034496.0	9.561
8	1408418.0	189294.1	35832250368.0	13.440
9	2395072.0	216508.8	46876037120.0	9.040
10	149094.4	5198.2	27020928.0	3.486
11	2269176.0	122494.5	15004901376.0	5.398
12	1783378.0	290995.9	84678606848.0	16.317
13	761652.2	150913.8	22774964224.0	19.814
14	730240.1	239794.6	57501417472.0	32.838
15	197735.0	4027.2	16177858.0	2.034
TOTAL	12924812.0	589815.1	347881865216.0	4.563

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	11784586.0	4315066.0	18619790524416.0	36.616
6	12995045.0	5164132.0	26668777340928.0	39.740
7	68245680.0	19485856.0	379698462851072.0	28.553
8	40562416.0	12154945.0	147742680678400.0	29.966
9	68978032.0	19586208.0	383619499556864.0	28.395
10	4293917.0	1169411.0	1367685988352.0	27.236
11	65352240.0	17987088.0	323535054569472.0	27.523
12	51361764.0	16056604.0	257814521970688.0	31.262
13	21935568.0	7256778.0	52660828897280.0	33.082
14	21030896.0	8747603.0	76520563408896.0	41.594
15	5694765.0	1543223.0	2381538394112.0	27.099
TOTAL	372233984.0	23170976.0	536893997449215.9	6.225

TABLE C-3.— KS MIX FEYERHERM YIELDS

(a) June 8.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	3	3
7	1166853.0	215	0.01310	8	10
8	1042027.0	192	0.00610	3	5
9	1411078.0	259	0.01460	7	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	19	20
12	1611885.0	297	0.01380	16	17
13	1373088.0	253	0.01480	10	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	0	2
TOTAL	10925000.0	2004	0.01091	67	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	787899.3	86452.4	7474012160.0	10.973
6	150727.8	53144.1	2824295680.0	35.258
7	2085537.0	348197.8	121241665536.0	16.696
8	1165140.0	153871.4	23676407808.0	13.206
9	1674582.0	200044.5	40017805312.0	11.946
10	82998.4	7366.7	54267728.0	8.876
11	2030229.0	294647.1	86816915456.0	14.513
12	1083187.0	193194.9	37324292096.0	17.836
13	1167566.0	260422.1	67819683840.0	22.305
14	609749.9	87844.8	7716700160.0	14.407
15	82654.1	7427.3	55164544.0	8.986
TOTAL	10920268.0	620459.9	384970522624.0	5.682

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	31043216.0	23409760.0	548016889004031.9	75.410
6	3331081.0	2862553.0	8194210398208.0	85.935
7	68197040.0	37229696.0	1386050639364096.0	54.591
8	28312880.0	29698704.0	882012604858367.9	104.895
9	38180448.0	24636512.0	606957530513407.9	64.527
10	1792764.0	1002035.9	1004076007424.0	55.893
11	48928496.0	25636176.0	657213748150271.9	52.395
12	32062320.0	21364752.0	456452749656064.0	66.635
13	41098304.0	20070960.0	402843504738304.0	48.836
14	19511984.0	12764306.0	162927503998976.0	65.418
15	2587071.0	2691047.0	7241731145728.0	104.019
TOTAL	315094864.0	28027728.0	785553544970239.9	8.896

TABLE C-3.— Continued.

(b) July 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754382.0	121	0.01670	0	0
6	434177.0	76	0.00800	3	3
7	1166853.0	215	0.01310	9	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	299	0.01460	9	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	18	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	1	2
TOTAL	10925000.0	2004	0.01091	75	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	792503.0	78245.7	6122389504.0	9.873
6	178425.7	80840.9	6535258112.0	45.308
7	1974077.0	347975.4	12108686950 4.0	17.627
8	1087437.0	146461.2	2145088307 2.0	13.468
9	1744408.0	231102.3	53408239616.0	13.248
10	88250.5	7221.3	52146544.0	8.183
11	2216840.0	261476.1	68369776640.0	11.795
12	1307320.0	209279.1	43797757952.0	16.008
13	1080227.0	143389.9	20560678912.0	13.274
14	646808.7	68726.9	4723380224.0	10.626
15	115262.2	4744.9	22514432.0	4.117
TOTAL	11231557.0	586301.8	343749820416.0	5.220

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	31224608.0	2352580 8.0	5534639812771 83.9	75.344
6	3943206.0	3443610.0	11858450841600.0	87.330
7	64552304.0	35376208.0	1251476160643072.0	54.802
8	26424704.0	27717184.0	768242410848255.9	104.891
9	39772480.0	2572358 4.0	661702525845503.9	64.677
10	1906209.0	1064046.0	113219469312 0.0	55.820
11	53425808.0	27721072.0	768457696083967.9	51.887
12	38696656.0	2568220 8.0	659575980 1630 71.9	66.368
13	38023984.0	17538592.0	307602068078592.0	46.125
14	20697872.0	13452324.0	180965007687680.0	64.994
15	3607705.0	3753615.0	14089622388736.0	104.044
TOTAL	322275328.0	28309472.0	801426401918975.9	8.784

TABLE C-3.- Continued.

(c) August 10.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	3	3
7	1166853.0	215	0.01310	9	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	9	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	19	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	1	2
TOTAL	10925000.0	2004	0.01091	76	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	814604.8	81987.6	6721974272.0	10.065
6	70854.9	17042.2	290437632.0	24.052
7	2077337.0	335159.6	112331915264.0	16.134
8	1087437.0	146461.2	21450883072.0	13.468
9	1840263.0	303700.9	92234252288.0	16.503
10	93083.3	8053.9	64864560.0	8.652
11	2356945.0	244667.8	59862319104.0	10.381
12	1337083.0	268375.3	72025309184.0	20.072
13	1068845.0	138742.1	19249381376.0	12.98 4
14	651788.3	81846.3	6698811892.0	12.557
15	117449.9	5077.9	25785280.0	4.323
TOTAL	11515688.0	622692.6	387746037760.0	5.407

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	32095408.0	24185472.0	584937233186815.9	75.355
6	1565893.0	1327436.0	1762086879232.0	84.772
7	67928912.0	37000368.0	1369027804921856.0	54.469
8	26424704.0	27717184.0	768242410848255.9	104.891
9	41957968.0	27322448.0	746516050345983.9	65.119
10	2010597.0	1123302.0	1261807075328.0	55.869
11	56802352.0	29345552.0	861161612378111.9	51.663
12	39577632.0	26516736.0	703137417527295.9	66.999
13	37623328.0	17328592.0	300280222580736.0	46.058
14	20857216.0	13597797.0	184900070146047.9	65.195
15	3676179.0	3824833.0	14629349621760.0	104.044
TOTAL	330519552.0	29679088.0	880848400285695.9	8.980

TABLE C-3.– Continued.

(d) September 9.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	1	3
7	1166853.0	215	0.01310	9	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	8	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	17	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	0	2
TOTAL	10925000.0	2004	0.01742	70	81

STRATUM	WHEAT AREA ACRES	STANDARD WHEAT ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	826581.2	81074.5	6573076480.0	9.808
6	436444.8	39637.5	1571132160.0	9.082
7	2096166.0	326950.1	106896359424.0	15.598
8	1087437.0	146461.2	21450883072.0	13.468
9	1871910.0	342489.8	117299216384.0	18.296
10	88682.3	8111.7	65799776.0	9.147
11	2110418.0	192423.6	37026836480.0	9.118
12	1384169.0	270094.1	72950808576.0	19.513
13	1068845.0	138742.1	19249381376.0	12.981
14	664544.3	82260.2	6766735360.0	12.378
15	86348.9	8196.3	67147040.0	9.490
TOTAL	11721544.0	649999.4	422499254272.0	5.545

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	32567280.0	24536240.0	602027176493055.9	75.340
6	9645424.0	8091888.0	65478655475712.0	83.894
7	68544608.0	37258304.0	1388181480013824.0	54.356
8	26424704.0	27171834.0	738242410848255.9	104.891
9	42679520.0	27913120.0	779142500974591.9	65.402
10	1915535.0	1071237.0	1147548991488.0	55.924
11	50861040.0	26186144.0	685714345820159.9	51.486
12	40971376.0	27411696.0	751400770338815.9	66.904
13	37623328.0	17328592.0	300280222580736.0	46.058
14	21765408.0	13859669.0	192090415824896.0	63.675
15	2707720.0	2811244.0	7903092146176.0	104.015
TOTAL	335200512.0	31218208.0	9745769347 15391.9	9.313

TABLE C-3.— Concluded.

(e) October 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	1	3
7	1166853.0	215	0.01310	9	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	8	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	17	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	0	2
TOTAL	10925000.0	2004	0.01742	70	81

STRATUM	WHEAT AREA ACRES	STANDARD ERROR WHEAT ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	842427.5	80655.1	6505234432.0	9.574
6	437473.0	39022.3	1522736128.0	8.920
7	2090092.0	323746.6	104813855872.0	15.490
8	1087437.0	146461.2	21450883072.0	13.468
9	1890843.0	334386.4	111814246400.0	17.684
10	89887.4	8115.7	65864672.0	9.029
11	2150084.0	206558.8	42666524672.0	9.607
12	1477454.0	270148.7	72980299776.0	18.285
13	1068845.0	138742.1	19249381376.0	12.981
14	689816.1	82273.3	6768898048.0	11.927
15	89634.1	8402.9	70608368.0	9.375
TOTAL	11913987.0	647555.8	419328491520.0	5.435

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	33191632.0	25002256.0	625112894144511.9	75.327
6	9668149.0	8110451.0	65779420626944.0	83.888
7	68346000.0	37135120.0	1379016556675072.0	54.334
8	26424704.0	27717184.0	768242410848256.9	104.891
9	43111184.0	28152464.0	792560784113663.9	65.302
10	1941459.0	1085477.0	1178260733952.0	55.910
11	51816992.0	26712464.0	713555397574655.9	51.552
12	43732624.0	29171808.0	850994619482 111.9	66.705
13	37629328.0	17328592.0	300280272580736.0	46.058
14	27074112.0	14375876.0	206665806774272.0	65.125
15	2805545.0	2918221.0	8516016275456.0	104.016
TOTAL	340734976.0	31300064.0	979694119813119.9	9.186

TABLE C-4.— KS MIX

(a) June 8.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	3	3
7	1166853.0	215	0.01310	8	10
8	1042027.0	192	0.00610	3	5
9	1411078.0	259	0.01460	7	9
10	108544.0	20	0.01480	1	1
11	2127045.0	390	0.01570	19	20
12	1611885.0	297	0.01380	16	17
13	1373088.0	253	0.01480	10	14
14	808657.0	149	0.00160	0	0
15	92763.0	32	0.00490	0	7
TOTAL	10925000.0	2004	0.01091	67	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	787899.3	86452.4	7474012160.0	10.973
6	150727.8	53144.1	2824295680.0	35.258
7	2085637.0	348197.8	121241665536.0	16.696
8	1165140.0	153871.4	23676407808.0	13.206
9	1674682.0	200044.5	40017805312.0	11.946
10	82998.4	7366.7	54267728.0	8.876
11	2030229.0	294647.1	86816915456.0	14.513
12	1083187.0	193194.9	37324292096.0	17.836
13	1167566.0	260422.1	67819688960.0	22.305
14	609749.9	87844.8	7716700160.0	14.407
15	82654.1	7427.3	55164464.0	8.986
TOTAL	10920268.0	745812.8	556234734464.0	6.830

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	22297536.0	6691191.0	44772030939136.0	30.009
6	4265593.0	1973799.0	3911121084416.0	43.928
7	59020656.0	19043200.0	362643416154112.0	32.265
8	32973440.0	10164509.0	103317250244609.0	30.826
9	47390640.0	14382620.0	206860036603904.0	30.349
10	2348952.0	689694.3	475678176328.0	29.363
11	57455440.0	18019632.0	324707312205823.9	31.363
12	30654176.0	10086231.0	101732054990848.0	32.903
13	33042096.0	11672076.0	136237352484864.0	35.325
14	17255904.0	5404141.0	29204737425408.0	31.318
15	2339108.0	687555.6	472732663808.0	29.394
TOTAL	309042944.0	23806368.0	5667429464145 91.9	7.703

TABLE C-4.– Continued.

(b) July 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	3	3
7	1166853.0	215	0.01310	9	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	9	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	18	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	10	9
15	92263.0	32	0.00490	1	2
TOTAL	10925000.0	2004	0.01091	75	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	792503.0	78245.7	6122389504.0	9.873
6	178425.7	80840.9	6535258112.0	45.308
7	1974077.0	347975.4	121086869504.0	17.627
8	1087437.0	146461.2	21450883072.0	13.468
9	1744408.0	231102.3	53408239616.0	13.248
10	88250.5	7221.3	52146544.0	8.183
11	2216840.0	261476.1	68369776640.0	11.795
12	1307320.0	209279.1	43797757952.0	16.008
13	1080227.0	143389.9	20560678912.0	13.274
14	646808.7	68726.9	4723380224.0	10.626
15	115262.2	4744.9	22514432.0	4.117
TOTAL	11231557.0	586301.8	343749820416.0	5.220

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	22824064.0	6539323.0	42762741219328.0	28.651
6	5138657.0	2636970.0	6953608675328.0	51.316
7	56853392.0	18144512.0	329223470317568.0	31.915
8	31318160.0	9388497.0	88143868985344.0	29.978
9	50238928.0	15014736.0	225442296496128.0	29.887
10	2541613.0	715537.4	511993774080.0	28.153
11	63844960.0	18717328.0	350338334851072.0	29.317
12	37650800.0	11714562.0	137230966325248.0	31.114
13	31110512.0	9301205.0	86512418947072.0	29.897
14	18628080.0	5383399.0	28980979695616.0	28.899
15	3319549.0	906807.5	822299787264.0	27.317
TOTAL	323468032.0	23215856.0	53897598284595 1.9	7.177

TABLE C-4.– Continued.

(c) August 10.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754382.0	121	0.01670	0	0
6	434177.0	76	0.00800	3	3
7	1166852.0	215	0.01310	9	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	9	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	19	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	1	2
TOTAL	10925000.0	2004	0.01091	76	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	814604.8	81987.6	6721974272.0	10.065
6	70854.9	17042.2	290437632.0	24.052
7	2077337.0	335159.6	112331915264.0	16.134
8	1087437.0	146461.2	21450883072.0	13.468
9	1840263.0	303700.9	92234252288.0	16.503
10	93082.3	8053.9	64864560.0	8.652
11	2356945.0	244667.8	59862319104.0	10.381
12	1337083.0	268375.3	72025309184.0	20.072
13	1068845.0	138742.1	19249381376.0	12.981
14	651788.3	81846.3	6698811392.0	12.557
15	117449.9	5077.9	25785280.0	4.323
TOTAL	11515688.0	622692.6	387746037760.0	5.407

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	23460592.0	6736168.0	45375960383488.0	28.713
6	2040621.0	726292.1	527500247040.0	35.592
7	59827280.0	18650496.0	347841079803904.0	31.174
8	31318160.0	9388497.0	88143868985344.0	29.978
9	52999536.0	16616660.0	276113397907456.0	31.352
10	2680796.0	758202.8	57487)371776.0	28.283
11	67879984.0	19560816.0	382625483063296.0	28.817
12	38507968.0	12794631.0	163702577823744.0	33.226
13	30782720.0	9166357.0	84022109667328.0	29.778
14	18771488.0	5558019.0	30891569053696.0	29.609
15	3382554.0	925020.1	855662133248.0	27.347
TOTAL	331651072.0	24693008.0	609744964288511.9	7.445

TABLE C-4.– Continued.

(d) September 9.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	1	3
7	1166853.0	215	0.01310	9	10
8	1042027.0	142	0.00610	4	5
9	1411078.0	259	0.01460	5	5
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	17	20
12	1611885.0	207	0.01360	17	17
13	1373048.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	0	2
TOTAL	10925000.0	2004	0.01742	70	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	826581.2	81074.5	6573076480.0	9.808
6	436644.8	39637.5	1571132160.0	9.082
7	2096166.0	326950.1	106906356424.0	15.596
8	1087437.0	146461.2	21450883072.0	13.468
9	1871910.0	342489.8	117259216384.0	18.296
10	88682.3	8111.7	65799776.0	9.147
11	2110418.0	192429.6	37026836480.0	9.118
12	1354169.0	270094.1	72950808576.0	19.514
13	1068846.0	138742.1	19249381376.0	12.981
14	664544.3	82260.2	6766735360.0	12.378
15	86348.9	8194.3	67147040.0	9.490
TOTAL	11721544.0	759934.4	577500348416.0	6.483

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	23805520.0	6815526.0	46451396706304.0	28.630
6	12569603.0	3570645.0	12749508706304.0	28.407
7	60369552.0	18665920.0	348416605421568.0	30.919
8	31318160.0	9388400.0	88142057046016.0	29.977
9	42679520.0	16315082.0	266181906712449.0	38.227
10	2554047.0	726021.8	527107554378.0	28.426
11	60780000.0	17272240.0	298320307429352.0	28.418
12	39864048.0	13121552.0	172175122236392.0	32.916
13	30782720.0	9166262.0	84020364836864.0	29.777
14	19133864.0	5653366.0	31960546148352.0	29.539
15	2486848.0	709505.4	503397041248.0	28.530
TOTAL	326348544.0	25596640.0	6551881341992959.0	7.843

TABLE C-4.– Concluded.

(e) October 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	1	3
7	1166853.0	215	0.01310	9	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	8	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	17	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00400	0	2
TOTAL	10925000.0	2004	0.01742	70	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	842427.5	80655.1	6505234432.0	9.574
6	437673.0	39022.3	1522736129.0	8.920
7	2090092.0	323746.6	104813558772.0	15.490
8	1087437.0	146461.2	21450883072.0	13.468
9	1890843.0	334386.4	111814246400.0	17.684
10	89882.4	8115.7	65866672.0	9.029
11	2150084.0	206551.8	42666524672.0	9.607
12	1477454.0	270149.7	72980299776.0	18.287
13	1068845.0	138742.1	19249321876.0	12.981
14	689816.1	82273.3	6768498048.0	11.927
15	89634.1	8402.9	70608368.0	9.375
TOTAL	11913987.0	757473.1	573765451776.0	6.358

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	24261888.0	6928321.0	480017289052l6.0	28.556
6	12599217.0	3573058.0	12766739955712.0	28.359
7	60194624.0	18581536.0	345273494667264.0	30.869
8	31319160.0	9388400.0	88142057046016.0	29.977
9	43111184.0	16370077.0	267979434491904.0	37.972
10	2588613.0	734944.0	540142665721.0	28.391
11	61922384.0	17689152.0	312958158l8240.0	28.567
12	42550656.0	13724877.0	188372249214976.0	32.255
13	30787720.0	9166262.0	84020364836864.0	29.777
14	19866688.0	5834043.0	34036055539712.0	29.366
15	2581459.0	735587.0	541088219136.0	28.495
TOTAL	331776769.0	25651848.0	65801965453271.9	7.732

TABLE C-5.— KS NEW FEYERHERM YIELDS AND YIELD VARIANCES

(a) June 8.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	2	3
7	1166853.0	215	0.01310	8	10
8	1042027.0	192	0.00610	2	5
9	1411078.0	259	0.01460	4	9
10	108544.0	20	0.01480	0	1
11	2122045.0	390	0.01520	13	20
12	1611885.0	297	0.01380	13	17
13	1373088.0	253	0.01480	6	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	1	2
TOTAL	11755367.0	2004	0.01091	49	81

STRATUM	WHEAT AREA ACRES	STANDARD WHEAT ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	921619.4	103951.1	10805825536.0	11.279
6	422133.4	172778.6	29852229632.0	40.930
7	2235869.0	430365.0	185214042112.0	19.248
8	1650158.0	601671.3	362008281088.0	36.461
9	1990449.0	281886.9	79460237312.0	14.162
10	140217.7	11151.3	124350960.0	7.953
11	2573658.0	228672.6	52291162112.0	8.885
12	1570159.0	298147.6	88891981824.0	18.988
13	1266205.0	230649.3	53199097856.0	18.216
14	768397.4	102119.1	10428313600.0	13.290
15	75881.7.8	61895.7	3831445248.0	8.157
TOTAL	14297681.0	989870.3	979843219456.0	6.923

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	36311792.0	2738996A.0	75021052752691 1.9	75.430
6	9329145.0	8086308.0	65394853281792.0	86.682
7	73112896.0	40354512.0	1628687047708672.0	55.195
8	40098816.0	41835552.0	1750713668634623.0	104.331
9	45382208.0	29403776.0	864581748523007.9	64.791
10	3028700.0	1689923.0	2855838679040.0	55.797
11	62025120.0	31915344.0	1018588806774784.0	51.456
12	46476688.0	31054656.0	964391956643839.9	66.818
13	44570400.0	21152064.0	447409696014336.0	47.458
14	24588704.0	16051379.0	257646766587904.0	65.279
15	23750976.0	24706880.0	610430011572223.9	104.025
TOTAL	408674304.0	154635536.0	23912148816101370.0	37.838

TABLE C-5.– Continued.

(b) July 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER USED	OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	2	3
7	1166853.0	215	0.01310	10	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	9	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01570	16	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	2	2
TOTAL	10925000.0	2004	0.01091	74	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	826263.3	86706.6	7518023680.0	10.494
6	393306.9	172096.4	29617160192.0	43.756
7	2035243.0	376018.4	141389856768.0	18.475
8	1324207.0	377897.9	142806810624.0	28.538
9	1854166.0	301037.5	90623574016.0	16.236
10	116665.8	7315.4	53515728.0	6.270
11	2550965.0	185522.2	34418483200.0	7.273
12	1485895.0	264384.8	69899321344.0	17.795
13	1026290.3	128177.6	16429494272.0	12.489
14	680574.3	79597.9	6335823872.0	11.696
15	166603.8	28944.3	837769984.0	17.373
TOTAL	12460177.0	751386.3	564581367808.0	6.030

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	32554752.0	2453992 0.0	602207833554943.9	75.380
6	8692078.0	7570242.0	57308570714112.0	87.094
7	66552432.0	36606336.0	1340023890771968.0	55.004
8	32178208.0	33652864.0	1132515230220288.0	104.583
9	42274960.0	27512032.0	756911750250495.9	65.079
10	2519980.0	1402323.0	1966508867584.0	55.648
11	61478224.0	31518368.0	993467950389247.9	51.268
12	43982464.0	29304864.0	858775221174271.9	66.629
13	36125408.0	16599321.0	275537436082176.0	45.949
14	21778368.0	14177940.0	201013982134272.0	65.101
15	5214697.0	5419694.0	29373080010752.0	103.931
TOTAL	353350656.0	41048432.0	16849741891502 08.0	11.617

TABLE C-5.– Continued.

(c) August 10.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	2	3
7	1166853.0	215	0.01310	10	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	9	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	16	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	2	2
TOTAL	10925000.0	2004	0.01091	74	81

STRATUM	WHEAT AREA ACRES	STANDARD WHEAT ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	826263.3	86706.6	7518023680.0	10.494
6	393306.9	172096.4	29617160192.0	43.756
7	2035243.0	376018.4	141389856768.0	18.475
8	1324707.0	377897.9	142806810624.0	28.538
9	1854166.0	301037.5	90623574016.0	16.236
10	116665.8	7315.4	53515728.0	6.270
11	2550965.0	185522.2	34418483200.0	7.273
12	1485895.0	264384.8	69899321344.0	17.793
13	1026290.3	128177.6	16429494272.0	12.489
14	680574.3	79597.9	6335823872.0	11.696
15	166603.8	28944.3	837769984.0	17.373
TOTAL	12460177.0	751396.3	564581367808.0	6.030

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION PER CENT
1-2	32554752.0	24639920.0	602207833554943.9	75.380
6	8692078.0	7570242.0	57308570714112.0	87.094
7	66552432.0	36606336.0	1340023890771968.0	55.004
8	32178708.0	33652864.0	1132515230220288.0	104.583
9	42274960.0	27512032.0	756911750250495.9	65.079
10	2519980.0	1402323.0	1966508867584.0	55.648
11	61478224.0	31518368.0	993407950389247.9	51.268
12	43982464.0	29304864.0	858775221174271.9	66.629
13	36125408.0	16599321.0	275537436082176.0	45.949
14	21778368.0	14177940.0	201013982134272.0	65.101
15	5214697.0	5419694.0	29373080010752.0	103.931
TOTAL	353350656.0	41048432.0	168497418915020R.0	11.617

TABLE C-5.— Concluded.

(d) September 13 and October 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	2	3
7	1166853.0	215	0.01310	10	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	9	9
10	108544.0	20	0.01480	1	1
11	2127045.0	390	0.01520	17	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92265.0	92	0.00490	2	2
TOTAL	10925000.0	2004	0.01091	75	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	826263.3	86706.6	7518023680.0	10.494
6	393306.9	172096.4	29617160192.0	43.756
7	2035243.0	376018.4	141369856768.0	18.475
8	1324207.0	377897.9	142806810624.0	28.538
9	1854166.0	301037.5	90623574016.0	16.236
10	11642.9	7702.5	59375696.0	6.186
11	2539153.0	174667.8	30508818432.0	6.879
12	1485895.0	264384.8	69899321344.0	17.793
13	1026290.3	128177.6	16429494272.0	12.489
14	680574.3	79597.9	6336823872.0	11.696
15	166527.8	28941.5	837607936.0	17.379
TOTAL	12448047.0	845458.5	714800037888.0	6.792

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION PER CENT
1-2	32554752.0	24539920.0	602207833554944.9	75.380
6	8692078.0	7570242.0	57318570714112.0	87.094
7	66552432.0	36606336.0	1340023809077196[illegible].0	55.004
8	32178208.0	33652864.0	1132515230220288.0	104.583
9	42274960.0	27512032.0	756911750250495.9	65.079
10	2514754.0	1399251.0	1957902155776.0	55.642
11	61193552.0	31347776.0	982683148615679.9	51.227
12	43982464.0	29304864.0	858775271174271.9	66.629
13	36125408.0	16599321.0	275537446082176.0	45.949
14	21778368.0	14177940.0	201013982234272.0	65.101
15	5217316.0	5417215.0	29346219687936.0	103.831
TOTAL	353059560.0	41005584.0	16814582215475520.0	11.614

TABLE C-6.– KS NEW

(a) June 8.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	2	3
7	1166853.0	215	0.01310	8	10
8	1042027.0	192	0.00610	2	5
9	1411078.0	259	0.01460	4	9
10	108544.0	20	0.01480	0	1
11	2122045.0	390	0.01520	13	20
12	1611885.0	297	0.01380	13	17
13	1373088.0	253	0.01480	6	14
14	808657.0	149	0.00160	0	0
15	922630.0	32	0.00490	1	2
TOTAL	11755367.0	2004	0.01091	49	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	921619.4	103951.1	10805825536.0	11.279
6	422133.4	172778.0	29852729637.0	40.930
7	2235869.0	430365.0	185214042112.0	19.248
8	1650158.0	601671.3	362008281088.0	36.461
9	1990449.0	281886.9	79460237312.0	14.162
10	140217.7	11151.3	124350960.0	7.953
11	2573658.0	228672.6	52291162112.0	8.885
12	1570159.0	298147.6	88891981824.0	18.988
13	1266205.0	230649.3	53199097856.0	18.216
14	768397.4	102119.1	10428313600.0	13.290
15	758817.8	61898.7	3831445248.0	8.157
TOTAL	14297681.0	988870.3	979843219456.0	6.923

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	26081808.0	7854066.0	61686350348288.0	30.113
6	11946371.0	5763924.0	33222813548544.0	48.248
7	6327509.0	17430064.0	303867196037120.0	275.465
8	46699440.0	20958064.0	439240131346432.0	44.879
9	56329680.0	17583120.0	309165973045248.0	31.215
10	3968158.0	1155465.0	1335100440576.0	29.118
11	72834480.0	21388320.0	457459919486976.0	29.366
12	44435472.0	14882354.0	221484450578432.0	33.492
13	35833584.0	11858935.0	140634325254144.0	33.094
14	21745632.0	6710578.0	45031859683328.0	30.859
15	21474528.0	6264221.0	39240465383424.0	29.170
TOTAL	347675904.0	87628256.0	7678710035513344.0	25.204

TABLE C-6.— Continued.

(b) July 11 and August 10.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	2	3
7	1166853.0	215	0.01310	10	10
8	1047027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	9	9
10	108544.0	20	0.01480	1	1
11	2122045.0	390	0.01520	16	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	92263.0	32	0.00490	2	2
TOTAL	10925000.0	2004	0.01091	74	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	826263.3	86706.6	7518023680.0	10.494
6	393306.9	172096.4	29617160192.0	43.756
7	7035243.0	376018.4	141389856768.0	18.475
8	1324707.0	377897.9	142806810624.0	28.538
9	1854166.0	301037.5	90623574016.0	16.236
10	116665.8	7315.4	53515728.0	6.270
11	2550965.0	185522.2	34418483200.0	7.273
12	1458595.0	264384.8	69899321344.0	17.793
13	1026290.3	128177.6	16429494272.0	12.489
14	680574.3	79597.9	6335823872.0	11.696
15	166603.8	28944.3	837769984.0	17.373
TOTAL	12460177.0	751386.3	564581367808.0	6.030

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION CV PER CENT
1-2	23796368.0	6866377.0	47147131076608.0	28.855
6	11327233.0	5669574.0	32144072114176.0	50.053
7	58614960.0	18965568.0	3596927736217 60.0	32.356
8	38137136.0	14698518.0	21604641800192 0.0	38.541
9	53399952.0	16672950.0	27798772453624 96.0	31.223
10	3359973.0	930516.1	865860255744.0	27.694
11	73467760.0	20512464.0	420761302990848.0	27.920
12	42793744.0	13693881.0	187522382561280.0	32.000
13	29557136.0	8743671.0	76451776823296.0	29.582
14	19600528.0	5739025.0	32936409694208.0	29.280
15	4798187.0	1525111.0	2325962817536.0	31.785
TOTAL	358852096.0	32063840.0	1028090079739904.0	8.935

TABLE C-6.— Concluded.

(c) September 13 and October 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
1-2	754383.0	121	0.01670	0	0
6	434177.0	76	0.00800	2	3
7	1166853.0	215	0.01310	10	10
8	1042027.0	192	0.00610	4	5
9	1411078.0	259	0.01460	9	9
10	108564.0	20	0.01480	1	1
11	2122065.0	390	0.01520	17	20
12	1611885.0	297	0.01380	17	17
13	1373088.0	253	0.01480	13	14
14	808657.0	149	0.00160	0	0
15	9226[illegible].0	2	0.00490	2	2
TOTAL	10925000.0	2004	0.01091	75	81

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
1-2	826263.3	86706.6	7518023660.0	10.494
6	393306.9	172096.4	29617160192.0	43.756
7	2035243.0	376018.4	141398956768.0	18.475
8	1324207.0	377897.9	142806810624.0	28.538
9	1854166.0	301037.5	90623574016.0	16.236
10	116425.9	7202.5	51875696.0	6.186
11	2539153.0	174667.8	30508838432.0	6.879
12	1485895.0	264384.8	69899221344.0	17.793
13	1026290.3	128177.6	16429404272.0	12.489
14	680574.3	79597.9	6335823872.0	11.696
15	166527.8	28941.5	837607936.0	17.379
TOTAL	12448047.0	845456.5	714806043888.0	6.792

STRATUM	WHEAT PRODUCTION BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE SQUARE BUSHELS	PRODUCTION PER CENT
1-2	23796368.0	6866300.0	47146074112000.0	28.854
6	11327235.0	5669556.0	32143887564800.0	50.052
7	58614960.0	18965392.0	359686331170816.0	32.356
8	38137136.0	14698432.0	216043934573952.0	38.541
9	42274960.0	15809022.0	249925170364416.0	37.396
10	3353006.0	927987.8	861163259008.0	27.676
11	73127568.0	20349504.0	414102274633856.0	27.827
12	42793744.0	13693759.0	187519043895296.0	31.999
13	29557136.0	8743579.0	76450166210560.0	29.582
14	19600528.0	5738965.0	32935772829352.0	29.280
15	4795997.0	1524553.0	2324260978688.0	31.785
TOTAL	347377920.0	31530080.0	9941461478943[illegible].9	9.077

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TABLE C-7.— ND MIX

(a) August 10.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
19	3263028.0	540	0.02050	24	33
20	1335591.0	279	0.01260	11	15
21	4970485.0	842	0.01580	15	34
22	408532.0	41	0.07800	1	1
TOTAL	9977636.0	1662	0.04392	51	83

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
19	2739182.2	261904.4	6859390976O.0	9.561
20	1649604.3	216113.8	46705147904.0	13.101
21	2239381.0	497885.8	247890313216.0	22.233
22	137595.2	27383.8	749874432.0	19.844
TOTAL	6766162.0	625383.9	391105085440.0	9.243

STRATUM	WHEAT PRODUCTION 10^3 BUSHELS	WHEAT PRODUCTION STANDARD ERROR 10^3 BUSHELS	WHEAT PRODUCTION VARIANCE 10^6 SQUARE BUSHELS	PRODUCTION CV PER CENT
19	70038.59	4839.59864	23421715.04	6.910
20	43749.04	4325.907882	18713478.76	9.888
21	43666.35	9524.341762	90713086.14	21.81
22	2690.99	525.6205856	276277.06	19.54
TOTAL	160144.97	11963.23664	143119030.6	7.470

TABLE C-7.-- Continued.

(b) September 9.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER USED	OF SAMPLE SEGMENTS ALLOCATED
19	3263028.0	540	0.02050	21	33
20	1335591.0	239	0.01260	10	15
21	4970485.0	842	0.01580	15	34
22	408532.0	41	0.07800	1	1
TOTAL	9977636.0	1662	0.04397	47	83

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
19	3381563.0	202975.1	411989911488.0	6.002
20	1786002.0	183483.9	33666351104.0	10.273
21	3625257.0	325199.1	105754460160.0	8.970
22	213933.4	17975.6	323122432.0	8.402
TOTAL	9006755.0	43878.5.0	1925322506?4.0	4.872

STRATUM	WHEAT PRODUCTION 10^3 BUSHELS	WHEAT PRODUCTION STANDARD ERROR 10^3 BUSHELS	WHEAT PRODUCTION VARIANCE 10^6 SQUARE BUSHELS	PRODUCTION CV PER CENT
19	86464.13	3753.841233	14091324.05	4.3405
20	47366.51	3673.869894	13497320.28	7.7543
21	70691.4	6224.015183	38738364.95	8.8045
22	4171.05	348.2542175	121281.93	8.3433
TOTAL	208693.09	8409.799344	70724725.21	4.0298

TABLE C-7.— Concluded.

(c) October 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	SEGMENTS ALLOCATED
19	3263028.0	540	0.02050	22	33
20	1335591.0	239	0.01260	9	15
21	4970485 0	842	0 01580	19	34
22	408532 0	41	0.07800	1	1
TOTAL	9977636 0	1662	0 04392	51	83

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
19	3511823 0	191400.0	36633952256 0	5 450
20	1961490 0	123292 8	15201124352.0	6 286
21	3934748.0	352416.5	124197404672 0	8 957
22	236104.2	19455.0	378496000.0	8 240
TOTAL	9644165.0	435914.6	190021500928.0	4 520

STRATUM	WHEAT PRODUCTION	WHEAT PRODUCTION STANDARD ERROR	WHEAT PRODUCTION VARIANCE	PRODUCTION CV
	10^3 BUSHELS	10^3 BUSHELS	10^6 SQUARE BUSHELS	PER CENT
19	89793.22	3540.742719	12536859 56	3 9435
20	52020.94	2471.841217	6109999 699	4.7520
21	76726.65	6744.588053	45489467 96	8 7909
22	4603.95	376.6470496	141863 37	8 1885
TOTAL	223144 76	8323.626193	69282753 09	3.7303

(d) December [T4].

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	SEGMENTS ALLOCATED
19	3263028.0	540	0.02050	22	33
20	1335591.0	239	0 01260	10	15
21	4970485.0	842	0 01580	19	34
22	408532.0	41	0 07800	1	1
TOTAL	9977636 0	1662	0 04392	52	83

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PER CENT
19	3511823 0	191400.0	36633952256 0	5 450
20	1920303.0	117717.3	13857357824.0	6 130
21	3934748.0	352416.5	124197404672 0	8 957
22	236104.2	19455.0	378496000.0	8 240
TOTAL	9602978.0	434370 5	188677750784 0	4 523

STRATUM	WHEAT PRODUCTION 10^3 BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE 10^6 SQUARE BUSHELS	PRODUCTION CV PER CENT
19	89793	38801792 0	12626687	4 0
20	50928	21242064.0	5571694	4 6
21	76727.	43799936.0	45489468	8 8
22	4603.	2623463 0	141868	8.2
TOTAL	222051	22202608.0	14002648	1 7

TABLE C-8.- ND NEW

(a) August 10, September 9, October 11.

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
19	3263028.0	540	0.02050	26	33
20	1335591.0	239	0.01260	15	15
21	4970485 0	842	0.01580	25	34
22	408532 0	41	0 07800	1	1
TOTAL	9977636.0	1662	0 04392	67	83

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCE SQUARE ACRES	AREA CV PERCENT
19	3242976 0	309644.1	95879495680.0	9 548
20	1658995 0	150340.3	22602203136.0	9.062
21	3243036 0	401889 8	161515372544.0	12.392
22	187777.4	22148.1	490540288.0	11.795
TOTAL	8332784 0	546065 7	298187751424 0	6.553

STRATUM	WHEAT PRODUCTION 10^3 BUSHELS	WHEAT PRODUCTION STANDARD ERROR BUSHELS	WHEAT PRODUCTION VARIANCE 10^6 SQUARE BUSHELS	PRODUCTION CV PERCENT
19	82920	41087792 0	32730497	6 9
20	43998	20991312.0	9067771	6 8
21	63239.	41461248.0	59130777.	2 2
22	3662	2395698 0	182142	1.7
TOTAL	193819	22504416 0	31954440.	2 9

(b) December [T4].

STRATUM	HISTORIC WHEAT AREA ACRES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
19	3263028.0	540	0 02050	16	33
20	1335591.0	239	0 01260	7	15
21	4970485.0	842	0 01580	11	34
22	408532.0	41	0 07800	0	1
TOTAL	9977636.0	1662	0 04392	34	83

STRATUM	WHEAT AREA ACRES	WHEAT STANDARD ERROR ACRES	WHEAT VARIANCES SQUARE ACRES	AREA CV PERCENT
19	1848435 0	294571.5	86772285440 0	15 936
20	869866 3	201837.9	40738541568 0	23.203
21	1825606.0	470362.3	221240623104.0	25.765
22	150049.4	38659.8	1494578688 0	25.765
TOTAL	4693956.0	621782.9	386613968896 0	13.246

STRATUM	WHEAT PRODUCTION 10^3 BUSHELS	WHEAT PRODUCTION STANDARD ERROR 10^3 BUSHELS	WHEAT PRODUCTION VARIANCE 10^6 SQUARE BUSHELS	PRODUCTION CV PERCENT
19	47262	5441.19996	29606657.27	11 5
20	23071	4039 195836	16315103 44	17 5
21	35599	8996 357096	80934441 14	25.3
22	2925	740 881232	548905.67	25 3
TOTAL	108857	11864 73565	140771952.6	5 5

TABLE C-9.— KUR OLD

(a) August 1.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
9	1216551.0	76	0.01820	3	3
11	963448.4	143	0.00780	5	4
TOTAL	2180200.0	219	0.07970	8	7

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
9	202546.9	24410.7	595881728.0	12.052
11	351973.1	56668.2	3211288320.0	16.100
TOTAL	554519.7	61702.3	3807170048.0	11.127

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
9	261785.5	64507.9	4161267200.0	24.689
11	454045.2	121674.6	14804705280.0	26.798
TOTAL	715830.7	173621.4	30144376832.0	24.271

(b) September 2.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
9	1216551.0	76	0.01820	3	3
11	963648.4	143	0.00780	6	4
TOTAL	2180200.0	219	0.07970	9	7

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
9	202546.9	24410.7	595881728.0	12.052
11	386012.6	45706.3	2043604992.0	11.711
TOTAL	588559.3	51375.9	2639486720.0	8.729

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
9	261785.5	64507.9	4161267200.0	24.689
11	497956.2	122158.0	14922575872.0	24.532
TOTAL	759741.7	177040.5	31343329280.0	23.318

TABLE C-9.– Concluded.

(c) September 27.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
9	1216551.0	76	0.01820	5	3
11	963448.4	143	0.00780	7	4
TOTAL	2180200.0	219	0.07970	12	7

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
9	253066.3	37645.5	1417186304.0	14.876
11	454050.2	40515.6	1641510912.0	8.923
TOTAL	707116.2	55305.5	3058697216.0	7.821

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
9	293556.9	82563.9	6816788480.0	28.125
11	526698.1	135067.3	18243153920.0	25.644
TOTAL	820254.9	207549.9	43076976640.0	25.303

TABLE C-10.— KUR NSS

(a) August 1.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
9	1216551.0	76	0.01820	0	3
11	963648.4	143	0.00780	3	4
TOTAL	2180200.0	219	0.07970	3	7

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
9	337470.3	13664.8	186726400.0	4.049
11	267315.2	10824.1	117160896.0	4.049
TOTAL	604785.1	24478.9	599704832.0	4.049

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
9	435336.6	96045.6	9224761344.0	22.062
11	344836.5	76079.1	5788033024.0	22.062
TOTAL	780173.1	172124.6	29626892288.0	22.062

(b) September 2.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
9	1216551.0	76	0.01820	0	3
11	963648.4	143	0.00780	4	4
TOTAL	2180200.0	219	0.07970	4	7

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
9	428449.1	58332.7	3402705920.0	13.608
11	339529.4	46206.3	2135017472.0	13.609
TOTAL	768118.3	104538.9	10928394240.0	13.609

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
9	552957.3	140715.6	19800866816.0	25.448
11	438005.8	111462.9	12423979008.0	25.448
TOTAL	990963.0	252178.5	63593984000.0	25.448

TABLE C-10.– Concluded.

(c) September 27.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
9	1216651.0	76	0.01820	2	3
11	963648.4	143	0.00780	4	4
TOTAL	2180200.0	219	0.07970	6	7

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
9	394630.8	64764.6	4194453504.0	16.411
11	426723.2	65451.0	4283839488.0	15.338
TOTAL	821353.8	130215.6	16956308800.0	15.854

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
9	457771.6	132310.8	17524682752.0	28.919
11	494998.8	140372.8	19704512512.0	28.358
TOTAL	952770.3	272721.6	74377068544.0	28.624

TABLE C-11.- KST OLD

(a) August 1.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
8	1626650.0	510	0.04320	16	35
9	1706649.0	493	0.00380	13	33
TOTAL	3333300.0	1003	0.04371	29	68

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
8	1679315.0	272862.5	74453942772.0	16.248
9	1633873.0	198241.3	39299624960.0	12.133
TOTAL	3313189.0	337273.7	113753622176.0	10.180

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
8	755691.7	400401.4	160321306624.0	52.984
9	735242.8	383533.3	147097780224.0	52.164
TOTAL	1490934.0	773118.3	597711781888.0	51.855

(b) September 2.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
8	1626650.0	510	0.04320	26	35
9	1706649.0	493	0.00380	22	33
TOTAL	3333300.0	1003	0.04371	48	68

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
8	1658324.0	207877.5	43213062144.0	12.535
9	1647780.0	143750.9	20664336384.0	8.724
TOTAL	3306104.0	252739.8	63877398528.0	7.645

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
8	795995.3	312501.7	97657290752.0	39.259
9	790934.2	146343.9	22005927936.0	18.756
TOTAL	1586929.0	605631.6	366789656576.0	38.164

TABLE C-11.– Concluded.

(c) September 27.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
8	1626650.0	510	0.04320	28	35
9	1706649.0	493	0.00380	24	33
TOTAL	3333300.0	1003	0.04371	52	68

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
8	1673318.0	213257.9	45478932480.0	12.745
9	1820337.0	146138.8	21356560384.0	8.028
TOTAL	3493655.0	258575.6	66835496960.0	7.400

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
8	803192.5	315791.8	99724427264.0	39.317
9	873761.6	161217.4	2599 1053312.0	18.451
TOTAL	1676954.0	639292.6	40869494784 0.0	38.122

TABLE C-12.— KST NSS

(a) August 1.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
8	1626650.0	510	0.06320	12	35
9	1706649.0	493	0.00380	13	33
TOTAL	3333300.0	1003	0.04371	25	68

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
8	1761094.0	343257.6	117825798144.0	19.491
9	1633873.0	198241.3	39299624960.0	12.133
TOTAL	3394968.0	396390.4	157125443584.0	11.676

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
8	792492.3	426254.8	1816931860480.0	53.787
9	735242.8	383533.3	1470977802240.0	52.164
TOTAL	1527735.0	795751.6	6332205629440.0	52.087

(b) September 2.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
8	1626650.0	510	0.04320	22	35
9	1706649.0	493	0.00380	22	33
TOTAL	3333300.0	1003	0.04371	44	68

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
8	1647829.0	234084.3	54795464704.0	14.206
9	1647780.0	143750.9	20664336384.0	8.724
TOTAL	3295609.0	274699.4	75459788800.0	8.335

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
8	790957.7	314366.6	9882638745 6.0	39.745
9	790934.2	148343.9	22005927936.0	18.756
TOTAL	1581891.0	605671.6	366838153216.0	38.288

TABLE C-12.– Concluded.

(c) September 27.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG-SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
8	1626650.0	510	0.04320	24	35
9	1702561.0	493	0.00380	24	33
TOTAL	3329212.0	1003	0.04371	48	68

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
8	1644548.0	235032.6	55240339456.0	14.292
9	1820337.0	146138.8	21356560384.0	8.028
TOTAL	3464886.0	276761.4	76596903936.0	7.988

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
8	789382.9	313949.8	98564440064.0	39.779
9	873761.6	161217.4	25991053312.0	18.451
TOTAL	1663144.0	635721.2	404141441024.0	38.224

TABLE C-13.— TSL OLD

(a) August 1.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
3	8376.0	9	0.00150	0	0
4	19543.9	11	0.00990	0	0
7	145184.1	110	0.01430	0	6
8	1222653.0	574	0.05000	13	44
TOTAL	1395757.0	704	0.04727	13	50

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
3	6695.0	1345.2	1809429.0	20.092
4	15621.7	3138.7	9851344.0	20.092
7	116047.7	23316.1	543639552.0	20.092
8	977283.8	196356.0	38554882048.0	20.092
TOTAL	1115647.0	224153.8	50244939776.0	20.092

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
3	3414.5	1717.0	2948224.0	50.287
4	7967.1	4006.4	16051479.0	50.287
7	59184.3	29762.2	885788416.0	50.287
8	488641.8	249861.4	62430736384.0	51.134
TOTAL	559207.6	285236.6	81359929344.0	51.007

(b) September 2.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
3	8376.0	9	0.00150	1	0
4	19543.9	11	0.00990	0	0
7	145184.1	110	0.01430	1	6
8	1222653.0	574	0.05000	24	44
TOTAL	1395757.0	704	0.04727	26	50

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
3	8816.1	986.1	972441.6	11.185
4	23941.6	3420.0	11696243.0	14.285
7	136678.6	16942.1	287033856.0	12.396
8	1497767.0	213951.4	45775204352.0	14.285
TOTAL	1667203.0	235299.5	55365865472.0	14.113

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
3	4496.2	1738.9	3023651.0	38.674
4	12710.2	4824.3	23312384.0	38.543
7	69706.1	27178.7	738680320.0	38.990
8	763861.0	302054.4	91236859904.0	39.543
TOTAL	850273.4	335773.9	112744136704.0	39.490

TABLE C-13.- Concluded.

(c) September 27.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
3	8376.0	9	0.00150	1	0
4	19543.9	11	0.00990	0	0
7	145184.1	110	0.01430	1	6
8	1222453.0	574	0.05000	26	44
TOTAL	1395757.0	704	0.04727	28	50

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
3	9273.5	999.6	999217.3	10.779
4	25542.3	3467.6	12024246.0	13.576
7	144606.4	17177.8	295078400.0	11.879
8	1597911.0	216930.6	47058898944.0	13.576
TOTAL	1777333.0	238575.6	56918347776.0	13.423

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
3	4729.5	1824.4	3328322.0	38.574
4	13026.6	5123.0	26245440.0	39.327
7	73749.2	28652.8	820982528.0	38.852
8	814934.5	320493.2	102715883520.0	39.327
TOTAL	906439.7	356070.6	126786273280.0	39.282

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TABLE C-14.- TSL NSS

(a) August 1.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
3	8376.0	9	0.00150	0	0
4	19543.9	11	0.00990	0	0
7	145184.1	110	0.01430	0	6
8	1222653.0	574	0.05000	1	44
TOTAL	1396757.0	704	0.04727	1	50

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
3	8004.9	1610.3	2592990.0	20.116
4	18678.1	3757.3	14117396.0	20.116
7	138752.0	27911.6	779057920.0	20.116
8	1168486.0	235054.9	55250784256.0	20.116
TOTAL	1333920.0	268334.0	72003092480.0	20.116

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
3	4082.5	1701.2	2894044.0	41.670
4	9525.8	3969.4	15756474.0	41.670
7	70763.5	29487.4	869509120.0	41.670
8	595927.7	248325.6	61665579008.0	41.670
TOTAL	680299.4	283483.4	80362864640.0	41.670

(b) September 2.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
3	8376.0	9	0.00150	0	0
4	19543.9	11	0.00990	0	0
7	145184.1	110	0.01430	1	6
8	1222653.0	574	0.05000	14	44
TOTAL	1396757.0	704	0.04727	15	50

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
3	10007.6	1489.6	2218968.0	14.887
4	23451.0	3478.8	12081057.0	13.657
7	174154.2	17218.4	2964718080.0	11.866
8	1594220.0	217442.5	47281229824.0	13.643
TOTAL	1777717.0	239626.1	57420709888.0	13.477

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
3	5562.9	2189.1	4792056.0	39.347
4	12980.0	5107.8	26090080.0	39.347
7	73518.6	28573.9	816581632.0	38.866
8	917021.9	356563.5	102100037120.0	38.892
TOTAL	904083.3	355396.4	126306615296.0	39.310

TABLE C-14.— Concluded.

(c) September 27.

STRATUM	HISTORIC WHEAT AREA HECTARES	NUMBER OF AG SEGMENTS	HISTORIC WHEAT VARIANCE SQUARE PROPORTION	NUMBER OF SAMPLE SEGMENTS USED	NUMBER OF SAMPLE SEGMENTS ALLOCATED
3	8376.0	9	0.00150	0	0
4	19543.[illegible]	11	0.00990	0	0
7	145184.[illegible]	110	0.01430	1	6
8	1222653.[illegible]	574	0.05000	16	44
TOTAL	1396757.0	704	0.04727	17	50

STRATUM	WHEAT AREA HECTARES	WHEAT STANDARD ERROR HECTARES	WHEAT VARIANCE SQUARE HECTARES	AREA CV PER CENT
3	12063.0	1640.8	2692253.0	13.602
4	28146.9	3826.6	14657833.0	13.602
7	157505.2	18965.0	3596705[illegible].0	12.041
8	1760850.0	239511.8	57365872640.0	13.602
TOTAL	1958564.0	263946.0	69667454976.0	13.477

STRATUM	WHEAT PRODUCTION METRIC TONS	WHEAT PRODUCTION STANDARD ERROR METRIC TONS	WHEAT PRODUCTION VARIANCE SQUARE METRIC TONS	PRODUCTION CV PER CENT
3	6152.1	2419.9	5856143.0	39.335
4	14354.9	5646.5	31883424.0	39.335
7	80327.6	31243.1	976179024.0	38.895
8	898033.3	353243.8	124781199360.0	39.335
TOTAL	998867.8	392535.3	154083983360.0	39.298

APPENDIX D

SPRING-WHEAT TO SPRING-GRAIN RATIOS FOR SECOND-GENERATION SEGMENTS IN NORTH DAKOTA

APPENDIX D

SPRING-WHEAT TO SPRING-GRAIN RATIOS FOR SECOND-GENERATION SEGMENTS IN NORTH DAKOTA

Second-generation segments in North Dakota (ND) with spring-wheat to spring-grain ratio, strata, and county names are tabulated as follows:

Ratio	Segment number	Stratum	County
0.606	881	ND/US-20	Cass
.606	882	ND/US-20	Cass
.606	883	ND/US-20	Cass
.627	884	ND/US-20	Grand Forks
.606	885	ND/US-20	Traill
.627	886	ND/US-20	Cavalier
.627	887	ND/US-20	Grand Forks
.627	888	ND/US-20	Pembina
.627	889	ND/US-20	Pembina
.567	890	ND/US-20	Ransom
.606	891	ND/US-20	Walsh
.627	892	ND/US-20	Grand Forks
.567	893	ND/US-20	Richland
.627	894	ND/US-20	Grand Forks
.606	895	ND/US-20	Steele
.627	896	ND/US-19	Ramsey
.655	897	ND/US-19	Pierce
.627	898	ND/US-19	Cavalier
.822	899	ND/US-19	Renville
.606	900	ND/US-19	Griggs
.567	901	ND/US-19	LaMoure
.655	902	ND/US-19	Rolette
.676	903	ND/US-19	Foster
.676	904	ND/US-19	Stutsman

Ratio	Segment number	Stratum	County
0.567	905	ND/US-19	Sargent
.606	906	ND/US-19	Griggs
.627	907	ND/US-19	Towner
.655	908	ND/US-19	McHenry
.655	909	ND/US-19	Benson
.822	910	ND/US-19	Ward
.655	911	ND/US-19	Bottineau
.606	912	ND/US-19	Barnes
.567	913	ND/US-19	LaMoure
.676	914	ND/US-19	Stutsman
.655	915	ND/US-19	McHenry
.676	916	ND/US-19	Stutsman
.676	917	ND/US-19	Wells
.655	918	ND/US-19	Bottineau
.822	919	ND/US-19	Renville
.627	920	ND/US-19	Ramsey
.676	921	ND/US-19	Eddy
.627	922	ND/US-19	Ramsey
.655	923	ND/US-19	Benson
.606	924	ND/US-19	Barnes
.655	925	ND/US-19	Pierce
.822	926	ND/US-19	Ward
.627	927	ND/US-19	Nelson
.567	928	ND/US-19	Sargent
.641	929	ND/US-21	Emmons
.567	930	ND/US-21	Dickey
.741	931	ND/US-21	Dunn
.641	932	ND/US-21	Grant
.741	933	ND/US-21	McLean
.641	934	ND/US-21	Sioux
.741	935	ND/US-21	Mercer
.741	936	ND/US-21	McKenzie
.739	937	ND/US-21	Hettinger

Ratio	Segment number	Stratum	County
0.741	938	ND/US-21	Mercer
.641	939	ND/US-21	Emmons
.567	940	ND/US-21	Logan
.641	941	ND/US-21	Burleigh
.739	942	ND/US-21	Slope
.741	943	ND/US-21	McLean
.822	944	ND/US-21	Ward
.822	945	ND/US-21	Divide
.822	946	ND/US-21	Williams
.641	947	ND/US-21	Sioux
.567	948	ND/US-21	Morton
.822	949	ND/US-21	Mountrail
.395	950	ND/US-21	Sheridan
.641	951	ND/US-21	Grant
.567	952	ND/US-21	McIntosh
.676	953	ND/US-21	Kidder
.822	954	ND/US-21	Mountrail
.641	955	ND/US-21	Burleigh
.741	956	ND/US-21	McLean
.741	957	ND/US-21	Dunn
.822	958	ND/US-21	Williams
.822	959	ND/US-21	Williams
.822	960	ND/US-21	Mountrail
.741	961	ND/US-21	McKenzie
.567	962	ND/US-21	Morton
.739	963	ND/US-22	Bowman

APPENDIX E

REFERENCES

APPENDIX E

REFERENCES

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