

INSTRUMENTED TESTING DEVICE FOR ESTABLISHING CROP CONDITION

by

DAVID CORN

B.S., Kansas State University, 1976

A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Agricultural Engineering

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1977

Approved by:


Major Professor

LD
2668
T4
1977
C67
C.2
Document

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
LITERATURE REVIEW.	3
INVESTIGATION.	8
Research Objectives	8
Materials and Equipment	9
Procedure	15
DISCUSSION AND RESULTS	19
CONCLUSIONS.	45
SUMMARY.	46
SUGGESTIONS FOR FUTURE WORK.	47
ACKNOWLEDGEMENTS	48
REFERENCES	49
APPENDICES	51

LIST OF TABLES

	<u>Page</u>
Table 1. Analysis of Variance Results for Grain Variables, Reconstituted Samples	23
Table 2. Analysis of Variance Results for Grain Variables, Harvest Samples	25
Table 3. Analysis of Variance Results for Ratios of Grain Weights, Reconstituted Samples	26
Table 4. Analysis of Variance Results for Ratios of Grain Weights, Harvest Samples	28
Table 5. Analysis of Variance Results for MOG Variables, Reconstituted Samples	29
Table 6. Analysis of Variance Results for MOG Variables, Harvest Samples	31
Table 7. Analysis of Variance Results for Ratios of MOG Weights, Reconstituted Samples	32
Table 8. Analysis of Variance Results for Ratios of MOG Weights, Harvest Samples	34
Table 9. Analysis of Variance Results for Energy Variables, Reconstituted Samples	35
Table 10. Analysis of Variance Results for Energy Variables, Harvest Samples	35
Table 11. Analysis of Variance Results for Sieving Analysis, Reconstituted Samples.	36
Table 12. Analysis of Variance Results for Sieving Analysis, Harvest Samples.	37
Table 13. Values of R^2 for Multiple Regression Analysis.	43

LIST OF FIGURES

	<u>Page</u>
Figure 1. Basic Design of Experimental Threshing Unit	10
Figure 2. Experimental Threshing Unit	11
Figure 3. Open-Grate Concave.	11
Figure 4. Feeding Mechanism	12
Figure 5. Partitions for Material Analysis.	12
Figure 6. Drive Mechanism	13
Figure 7. Vertical Air Separator.	13
Figure 8. Experimental Design	16

INTRODUCTION

Performance testing of combines and combine components is vital to the development of new machines. Unfortunately, this testing is very expensive and time consuming.

A combine being field tested is often transported over a very large area to get as much operating time as possible under a variety of different conditions. However, each time an experimental combine is tested in the field another combine must be taken along to establish a standard for comparison. Both machines must then be operated under identical field conditions. Since no mechanical changes are made in the standard combine the effect of any changes in the setting of the experimental combine can be detected in its performance. With two combines required to test the performance of an experimental combine the testing is fifty per cent efficient at best.

Another facet of combine testing occurs in the laboratory. Here combine components can be tested year round using crop material that is stored until needed at which time it may be reconstituted to the desired moisture content. A well equipped laboratory allows components to be isolated and instrumented completely. Components may be subjected to many more hours of testing than could be accomplished in the field. Tests can also be repeated under closely controlled conditions for good statistical analysis of the data. A standard for comparison must also be maintained in the laboratory testing program.

A small testing machine should be developed that would eliminate the need for the second combine. Rather than thresh large volumes of wheat with the second combine a few small samples could be threshed periodically

with a test stand to establish the threshing characteristics of the crop. This would save a great deal of time and resources.

The development of such a testing device will probably be an evolution of thoughts and devices of which this will only be a beginning. At this time it will look very much like a combine with the variables being measured being machine-crop interactions. In the end it should measure much more basic properties of the crop and may look nothing like a combine.

It is time to take a serious look at the testing of combines and what can be done to improve it. Increasing the efficiency of testing can mean greater product reliability, earlier production of machines and a more efficient combine.

LITERATURE REVIEW

Threshing of small grain crops has been studied for many years. The food, fuel and general economic crises of recent times have made these studies even more important. The careers of many people have been and will continue to be devoted to improving the performance of harvesting machines.

For many years the rasp bar cylinder has been the basis of the threshing process. Different types of machines are being studied but the rasp bar cylinder remains predominant. The hard wearing simplicity, flexibility and high level of efficiency make it of continuing importance (1).

A fairly complete review of literature published on threshing is contained in the masters thesis by Saleem Zaidi (1974). The work to be done here is another phase of the studies begun by Zaidi's development of a small, instrumented test stand for threshing studies.

To evaluate the effect of material volume on component efficiency it is necessary to determine the division of material flow. Mark (1963) found that up to ninety per cent of the grain penetrates the concave leaving the rest to be separated by the straw walkers. Mark also found that as the moisture content of the material increased more grain was carried over to the straw walkers within a denser mat of straw.

The study of the threshing process is a very complex task due to the number of variables involved. Mark stated that the minimum number of variables required to describe the process as:

1. Straw and chaff feed rate
2. Grain and straw moisture contents
3. Grain to straw weight ratio

Through the design and test process combine engineers are attempting to make their product conform to the nature of the machine-crop system which remains undefined. Cervinka (1974) listed the variables important to threshing as:

A. Machine Parameters

1. Straw walker area
2. Cleaning shoe area
3. Cylinder width
4. Cylinder diameter

B. Crop Parameters

1. Type of crop
2. Grain moisture content

C. Machine-Crop Parameters

1. Throughput rate
2. Grain final quality
3. Unthreshed grain losses
4. Loose grain losses

D. Additional Variables

1. Straw moisture content
2. Threshability (variety differences)
3. Crop lodging
4. Crop maturity
5. Variation in density
6. Soil conditions

Many times engineers attempt to define threshing characteristics in terms of variables derived from a machine-crop interaction. This should be

a step towards the goal of describing the crop in terms of its basic properties. DeKoning (1973) described these as:

1. The attachment of the kernal to the ear
2. Breaking of the stem just under the ear
3. Breaking of leaves and stem parts during threshing
4. Variations of the first three with time

The performance of a combine can be viewed as three different phases. They are the threshing of the grain, handling of the material other than grain and the material transportation or energy consumption. Arnold (1964) found that the grain condition could best be related to the grain moisture content while the efficiency of threshing depended on the straw moisture content. Generally, wetter grain can be associated with wetter straw, but the situation can be altered because of different wetting and drying rates.

Mark (1963) found that loss curves (grain loss versus feed rate) vary significantly with straw moisture content. An increase in moisture content displaced the curve towards that of a higher feed rate (increased losses). In the work by Cervinka (1974), the grain moisture content did not contribute to the loose grain losses. He also found straw walker area more important than cylinder width (capacity) in the threshing of wheat. Harrison (1975) found that grain damage decreased with increasing moisture content. He theorized that there is a greater energy requirement to damage a wet kernal than a dry one due to its increased pliability. Lamp and Buchele (1960) discovered that a higher moisture content reduces the peak per cent of chaff removed and requires higher speeds for chaff removal. Johnson (1959) showed that rack losses increase at both ends of the

moisture content range. He also found that an increase in moisture content reduces the shoe load significantly.

Nyborg (1969) showed that as the grain-to-straw weight ratio decreased the losses increased. There was a negative correlation between the per cent loss and grain-to-straw weight ratio for rack loss, shoe loss and cylinder loss.

According to Arnold (1964), the threshing cylinder requires up to eighty per cent of the total power required. Heads first feeding of the crop required 1.8 times as much power as parallel feeding. His work also showed that the characteristics of the material stream greatly affect power requirements. Less power was required to thresh a thin, fast moving stream of material than a thick, slow moving one. He showed the torque variation to be a function of cylinder construction, speed and feedrate characteristics. He found the fluctuations in torque to increase as the moisture content increased.

Lamp and Buchele (1960) found three methods for applying the threshing force.

1. Mechanical methods such as rolling and stripping
2. Impact or impulsive acceleration such as when a cylinder bar strikes
3. Non-impulsive acceleration

They showed that under normal conditions a centrifugal force of 0.2 pounds was sufficient to obtain ninety-eight per cent of the grain and that this force can be reduced by fifty per cent if the force is applied so that it bends the rachilla. Arnold (1964) stated that a surface against which the beaters can rub the material was not of prime importance as long as some

means existed for bringing the heads into their path. He found the amount of broken straw to be closely related to the grain damage and thus, the severity of threshing.

Zaidi (1974) found the amount of grain threshed in the first part of the concave to be most important in predicting both unthreshed and clean grain losses. A correlation between this position and grain losses could be important in predicting the separation load to be placed on the straw walkers and cleaning shoe. His studies also showed that easier threshing varieties of wheat will thresh a significantly higher amount of grain in the first part of the concave than the harder threshing varieties.

Many people have been involved in the development and improvement of the combine. More people will become involved in the future. It is a very important subject and worthy of continued research.

INVESTIGATION

Research Objectives

The goal of this research was to find a minimum number of variables that would describe the threshing characteristics of wheat. These few variables were selected from a large number of variables measured with an experimental threshing cylinder. They are:

A. Grain Threshing Variables

1. Distribution of threshed and unthreshed grain beneath the concave.
2. Threshed and unthreshed grain passing over the concave
3. All possible ratios of grain weights in the various positions (Fig. 1)

B. Material Other Than Grain (MOG) Handling Variables

1. Distribution of MOG beneath the concave
2. MOG passing over the concave
3. All possible ratios of MOG weights in the various positions

C. Transportation or Energy Variables

1. Peak torque on the cylinder
2. Span of the torque-time graph
3. Area under the torque-time graph

After these variables had been tested and the best ones selected, multiple regression techniques were applied to determine functional relationships between them for predicting the response of an actual combine. The response variables selected to describe the performance of a combine were:

1. Grain threshing measured as the per cent of the total grain

passing over the concave

2. MOG distribution measured as the amount of MOG falling through the concave during threshing
3. Energy consumption measured as the energy required per ton of MOG passing through the combine.

The R^2 values determined by the multiple regression analysis will also give an indication of how much of the variation in threshability is accounted for by the variables selected.

Materials and Equipment

The test stand used for this study (Fig. 2) was designed and developed at Kansas State University by Saleem Zaidi (1974). Complete details of the construction are included in his thesis.

The aluminum cylinder end plates are twelve inches in diameter. Aluminum was used to keep the inertia as low as possible. The rasp bars were taken from an actual combine and shortened to a length of 7 1/8 inches. With four rasp bars mounted on the disks the cylinder was 7 1/8 inches wide and approximately 12 3/4 inches in diameter.

The concave was an open grate style with a radius of curvature approximately 3/8 inch larger than the cylinder (Fig. 3). The arc length of the concave was approximately 130 degrees.

The area beneath the concave was partitioned into six compartments using sheet metal dividers (Fig. 1). These six divisions match those of a box placed directly below to catch the threshed material. After a sample is threshed this box can be removed (Fig. 5) for analysis of grain and MOG distributions. A perforated box is attached to the frame of the threshing unit directly behind the cylinder (Fig. 1 and 5). It catches the material

**THIS BOOK
CONTAINS
NUMEROUS PAGES
WITH DIAGRAMS
THAT ARE CROOKED
COMPARED TO THE
REST OF THE
INFORMATION ON
THE PAGE.**

**THIS IS AS
RECEIVED FROM
CUSTOMER.**

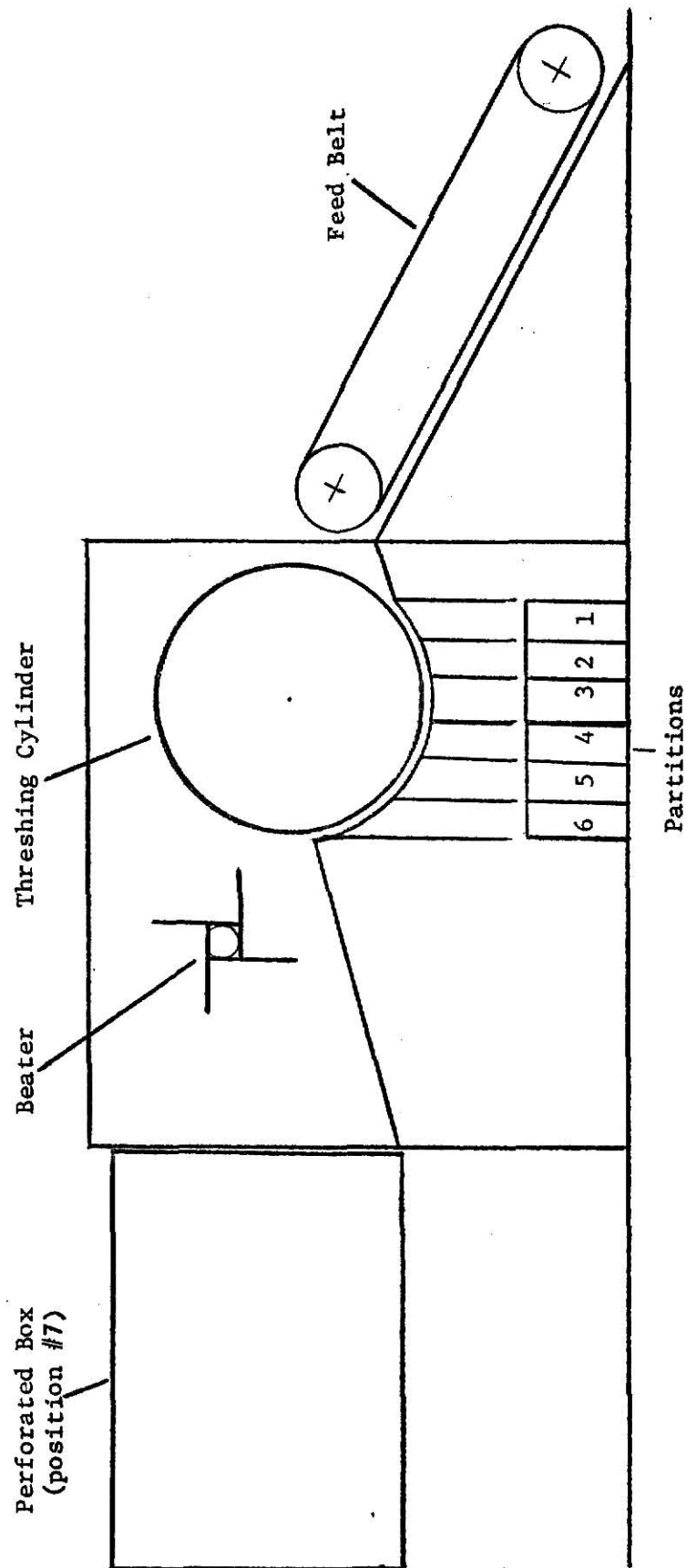


Figure 1: Basic Design of Experimental Threshing Unit

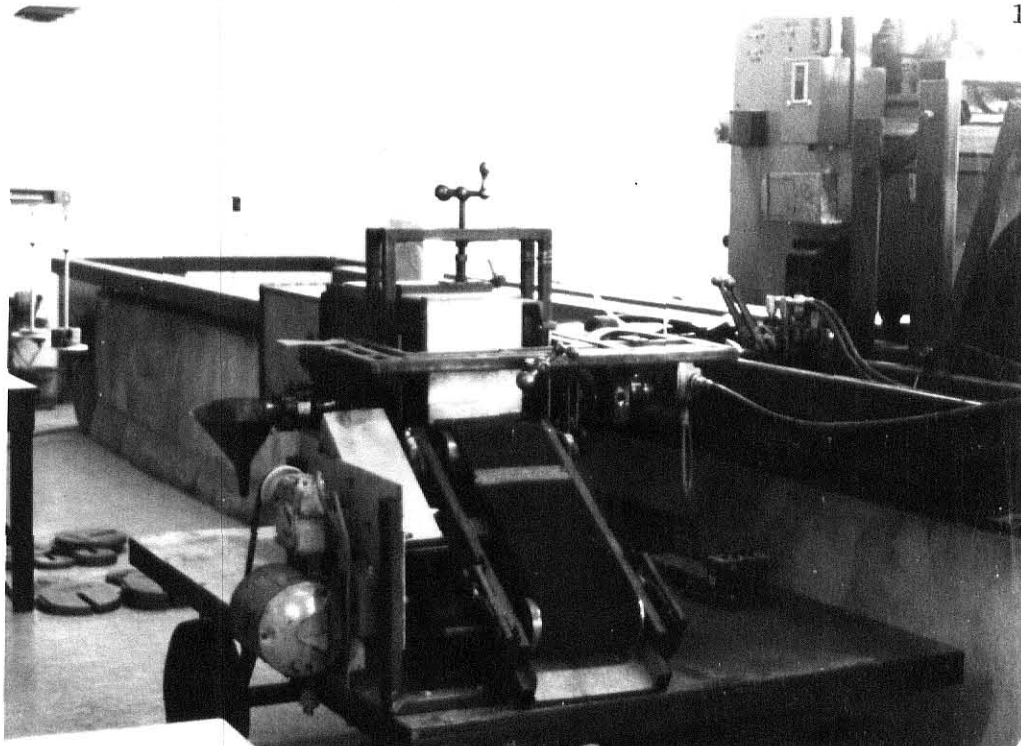


Figure 2: Experimental Threshing Unit

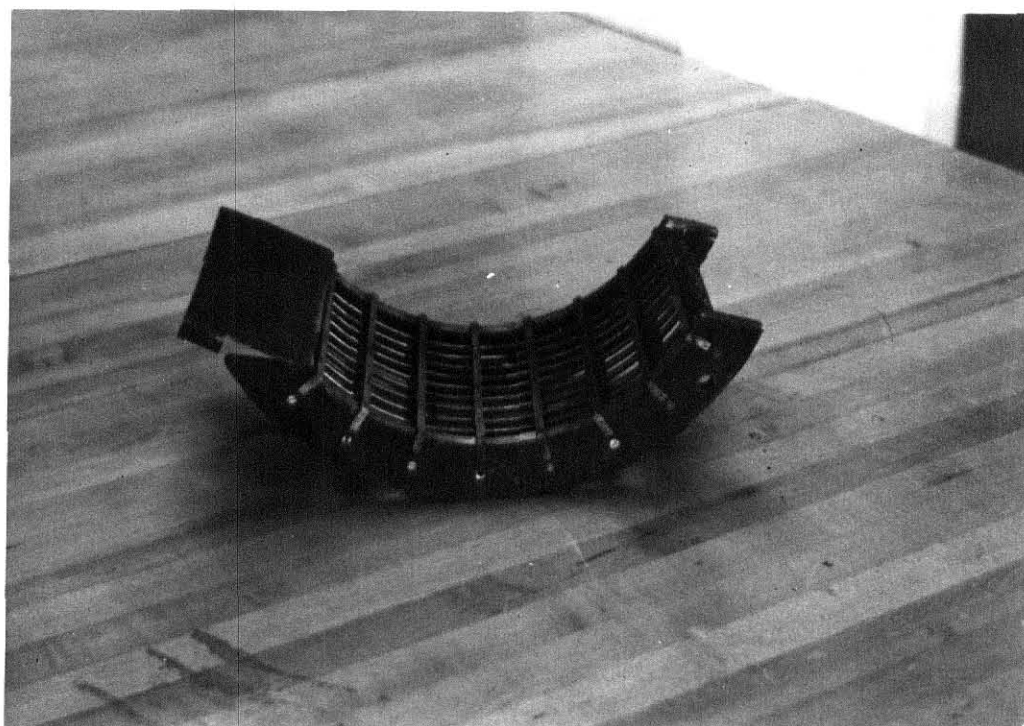


Figure 3: Open-Grate Concave

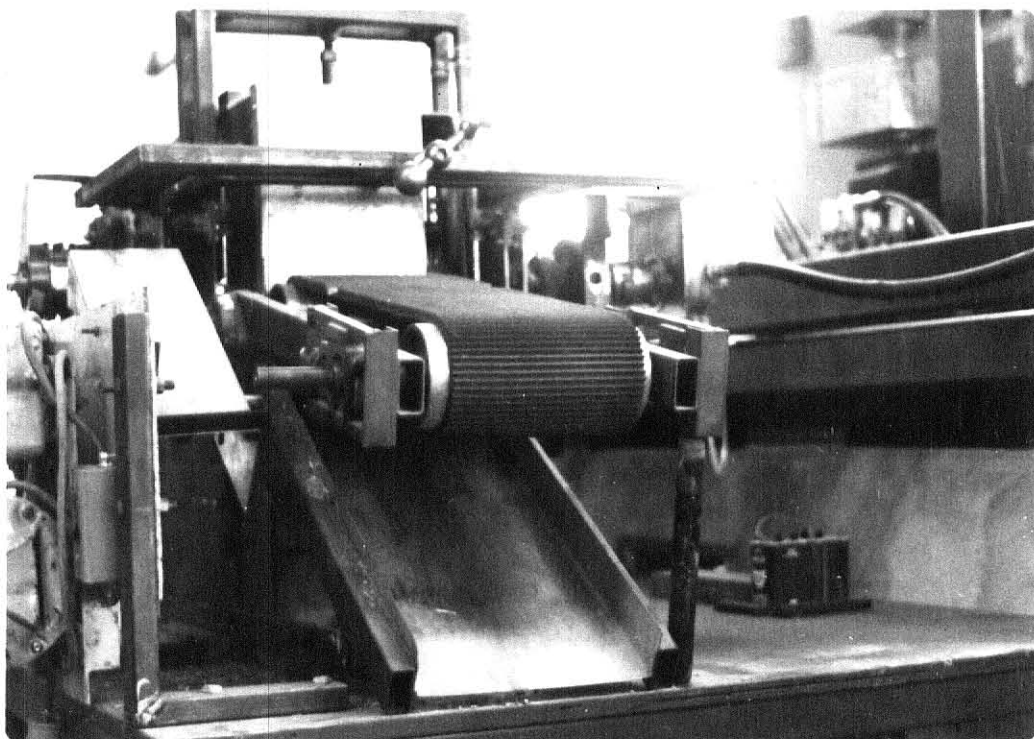


Figure 4: Feeding Mechanism

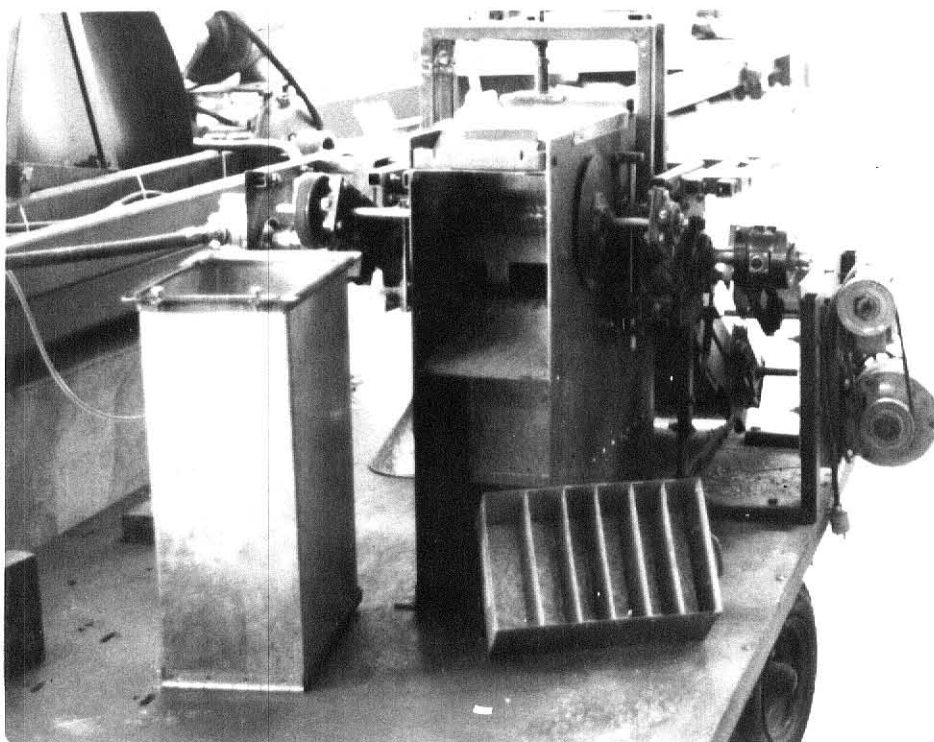


Figure 5: Partitions for Material Analysis

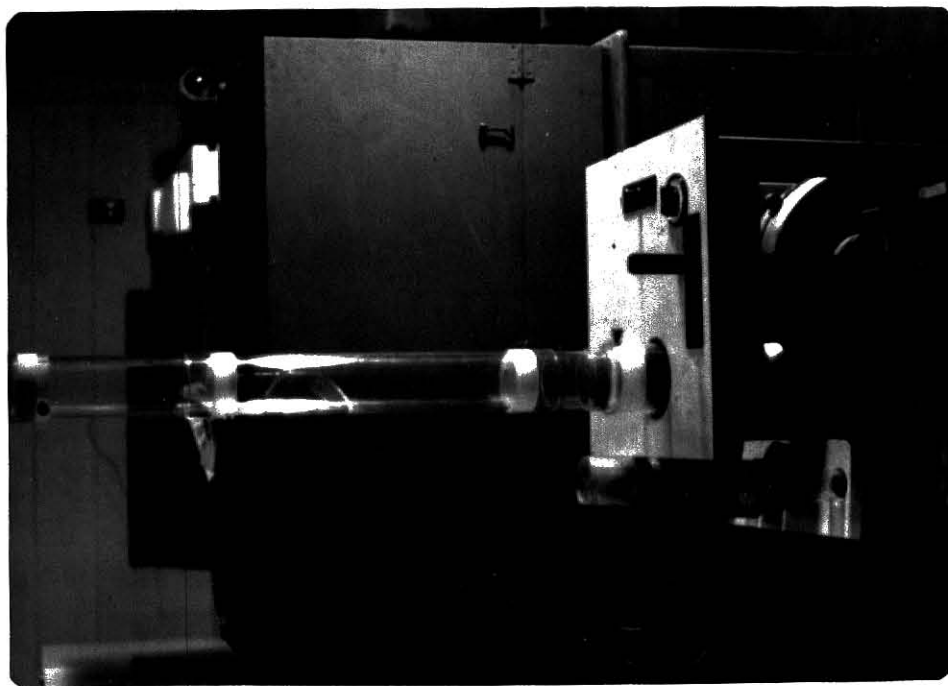


Figure 7: Vertical Air Separator



Figure 6: Drive Mechanism

passed over the concave and is easily removed for analysis.

Behind the cylinder is a beater mechanism to keep the material moving back and prevent recirculation. It is the same width as the cylinder and is powered by a v-belt from the threshing cylinder shaft (Fig. 6).

The cylinder-to-concave clearance is set by moving the cylinder while the concave remains fixed. The cylinder is supported both vertically and horizontally by a framework which moves along linear bearings (Fig. 2 and Fig. 6). The clearance is adjusted and maintained by two adjustment screws.

Samples are fed into the cylinder by a ribbed rubber conveyor belt (Fig. 2). The sample is placed heads first beneath the belt (Fig. 4) which moves at approximately twenty-two feet per minute.

Initially the threshing cylinder was powered by a three horsepower electric motor. Power was transmitted by a variable diameter sheave through a rubber belt to the cylinder shaft. Unfortunately, the belt drive produced undesirable levels of vibration considering the magnitude of the torques to be measured. To avoid this problem a small hydraulic motor (supplied by a variable volume pump) was used to drive the cylinder directly (Fig. 6). This improved the quality of the torque trace considerably.

The cylinder shaft was specially designed for sensitive measurement of torque. One-inch diameter cold rolled steel was used for the shaft with approximately six inches of the center section reduced to a 1/4 inch square section. This was done by mounting a 1/4 inch square tool steel bar into broached holes in the ends of two, one inch shafts. Strain gages were mounted on the reduced section with the wires carried out through a hole drilled in the center of the shaft to a slip ring (Fig. 5). A two-inch

outside diameter steel tube was fitted over the reduced section and keyed to absorb unavoidable overloads that might damage the shaft.

The torque signal was fed into an amplifying and light beam recording system that produced a graph of the torque applied to the shaft versus time. The torque transducer was calibrated statically.

After each sample was threshed, the grain and MOG had to be separated with all material saved for weighing. This was accomplished with a vertical air-flow separator (Fig. 7). This removed the chaff from the grain very cleanly and quickly.

Procedure

As shown in Fig. 8, a variety of samples were threshed that would reflect a wide range of threshing conditions. This method of obtaining a variety of conditions was selected because threshability differences are generally attributed to these three factors:

1. Moisture content variation
2. Differences between varieties
3. Maturity

For the purpose of this study moisture content was used to reflect the date or maturity of the wheat when harvested. For samples threshed immediately after harvest the maturity and moisture content mean the same thing. For samples that were stored and later reconstituted there is both a moisture content and maturity factor. It is probable that there are other factors affecting the threshing characteristics of wheat. However, here the interest lies in being able to detect differences in crop conditions with a test machine regardless of what causes the different conditions to occur.

A combination of three varieties, three maturities and six

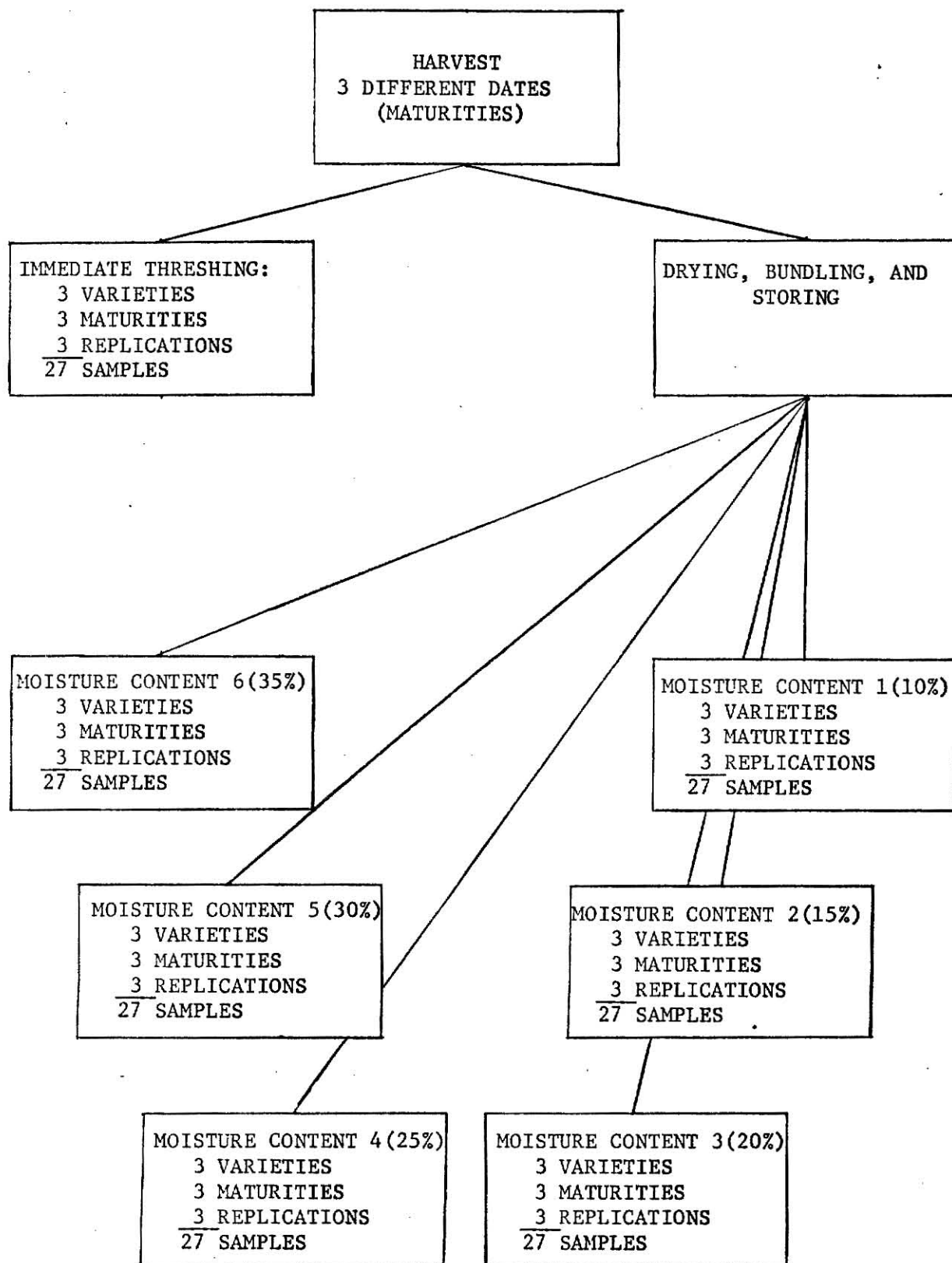


Figure 8: Experimental Design

reconstituted moisture contents was selected (Fig. 8). Each test was repeated three times. The three varieties chosen were Parker, Centurk and Eagle. The selection was made on the basis of known threshability differences between the three. The three harvest moisture contents, or maturities, were approximately thirty, twenty and twelve per cent grain moisture content (w.b.). The desired reconstituted moisture contents ranged from ten to thirty-five per cent total moisture content (grain and MOG, w.b.) in increments of five per cent.

Each sample consisted of a bundle of sixty heads with the straw cut to a length of nine inches from the base of the head. Each sample was fed into the cylinder with the heads first.

As shown in Fig. 8 each time wheat samples were collected for immediate threshing six times as much was saved for later use. These samples were spread out and allowed to dry at room temperature for approximately one week. Then they were cut to length, bundled and stored in sealed cans until needed. When these samples were reconstituted water was applied to the surface in a fine mist. The amount of water added was calculated on the basis of the actual weight, the estimated dry weight and the desired moisture content. After the water was applied the wheat was sealed in containers and stored in a cool environment to retard mold growth. The samples were left for at least two days in this condition before being removed for threshing.

During the threshing tests all machine variables were held constant. A mean cylinder-to-concave clearance of $1/4$ inch and a cylinder speed of 1480 rpm were used along with the feedrate of twenty-two feet per minute. The 1480 corresponds to a peripheral speed of 4650 feet per minute. The

material from each of the seven partitions was emptied into a labelled sack after each sample was threshed. The grain and MOG were separated and weighed later as time permitted. After the separation and weighing, the MOG from all seven positions for each sample was collected as a single sample for sieve analysis. Using a series of sieves, a size distribution of the MOG was obtained. The sieves used were:

<u>Tyler Sieve Number</u>	<u>Opening Size, inches</u>	<u>Opening size, cm.</u>
4	0.187	0.475
6	0.131	0.333
8	0.093	0.236
10	0.065	0.165
16	0.0469	0.119
20	0.0328	0.083
Pan	0.0000	0.000

This analysis was performed to determine the change in straw size distribution with different crop conditions.

DISCUSSION AND RESULTS

An analysis of variance was performed to test the significance of the variables measured with respect to the different crop parameters, variety, maturity and moisture content. Due to the volume of data involved the AARDVARK computer program was used.

Actually, to correctly analyze the data and compensate for the variety of moisture contents, a covariance analysis had to be used. If six precise moisture content levels had been obtainable a three-way analysis of variance would have been appropriate for the reconstituted samples (variety, maturity and moisture content) and a two-way analysis (variety and moisture content) for the samples threshed at harvest. In the actual analysis a two-way and a one-way analysis were used with the moisture content being a covariate. The analysis of covariance corrects all of the data to a single, average moisture content and then performs an analysis of variance on the corrected data. The regression coefficient, β , of the variable being analyzed versus moisture content is estimated from the error variance line. A slight loss in power (one error degree of freedom for each regression coefficient) is incurred by this estimation.

The F values obtained from the analysis can be regarded as basic criteria for comparison of significance of the measured variables. An F value is calculated for each source of variation in the analysis, variety and maturity. The response of each variable to changes in moisture content can be measured by the t-test performed on the regression coefficient, β . The alpha hat values accompanying each value of F and t indicate the level of protection that each value carries against making a type I error. A

question arises as to whether grain, MOG or total moisture content should be used as the covariate in the analysis. A single grain moisture content could be accompanied by a full range of different MOG moisture contents due to different wetting and drying rates. MOG moisture content was chosen as the covariate, hypothesizing that it affects the threshing characteristics the most. This would be especially true for the reconstituted samples where true equilibrium probably never existed. The straw absorbed the water much faster than the grain. As higher total moisture contents were attained the grain moisture content leveled off while the MOG moisture content continued to rise sharply.

The data from the seven positions was analyzed separately. This eliminated the occurrence of any interaction of position with other sources of variation. This was not a factor in analyzing the energy variables (torque, span and area) since there is only one value for the entire sample. Likewise, this consideration did not affect the analysis of the ratios of weights in two positions.

The statistical model used for the rewetted samples was:

$$\begin{aligned}
 X1, X2, X3, X4, X5, X6, X7, &= V(I) + M(J) + VM(IJ) + B1 \times H2O \\
 X8, X9, G1, G2, G3, G4, G5, &+ B2 \times H2O2 + E(IJK) \\
 G6, G7, G8, G9, G10, G11, & \\
 G12, G13, G14, G15, G16, & \\
 G17, G18, G19, G20, G21, & \\
 S1, S2, S3, S4, S5, S6, S7, & \\
 S8, S9, S10, S11, S12, S13, & \\
 S14, S15, S16, S17, S18, & \\
 S19, S20, S21 &
 \end{aligned}$$

where,

- X1 = Grain weight in the n^{th} position ($n=1$ to 7)
 X2 = Per cent grain in position n of total grain
 X3 = Per cent grain in position n of total material
 X4 = MOG weight in the n^{th} position
 X5 = Per cent MOG in position n of total MOG
 X6 = Per cent MOG in position n of total material
 X7 = Peak torque on the threshing cylinder shaft
 X8 = Span of the torque-time graph
 X9 = Area under the torque-time graph
 V(I) = Variety effect
 M(J) = Maturity effect
 VM(IJ) = Two way interaction between variety and maturity effects
 B1 x H20 = Linear regression with moisture content
 B2 x H202 = Quadratic regression with moisture content
 E(IJK) = Random error

For the rest of the variables G signifies grain weight and S signifies MOG weight.

<u>Grain Variable</u>	<u>MOG Variable</u>	<u>Ratio of Partitions</u>
G1	S1	1 : 2
G2	S2	1 : 3
G3	S3	1 : 4
G4	S4	1 : 5
G5	S5	1 : 6
G6	S6	1 : 7

<u>Grain Variable</u>	<u>MOG Variable</u>	<u>Ratio of Partitions</u>
G7	S7	2 : 3
G8	S8	2 : 4
G9	S9	2 : 5
G10	S10	2 : 6
G11	S11	2 : 7
G12	S12	3 : 4
G13	S13	3 : 5
G14	S14	3 : 6
G15	S15	3 : 7
G16	S16	4 : 5
G17	S17	4 : 6
G18	S18	4 : 7
G19	S19	5 : 6
G20	S20	5 : 7
G21	S21	6 : 7

The quantity of unthreshed grain recorded in any position was too small to be useful and was not included in the statistical model. The quadratic regression term was included in case the regression of each variable with moisture content was not linear.

The terms on the left side of the equation were the same for the samples threshed at harvest. The right side of the equation became:

$$= V(I) + B1 \times H20 + B2 \times H202 + E(IJ)$$

since there was no maturity effect and thus no interaction term.

Table 1: Analysis of Variance Results For Grain Variables, Reconstituted Samples

VARIABLE	POSITION	VARIETY		MATURITY		VARIETY X MATURITY		MOISTURE CONTENT	
		F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	T	ALPHA HAT
Grain Weight	1	23.285	0.000	12.506	0.000	0.679	0.607	0.519	0.605
	2	49.146	0.000	19.845	0.000	1.053	0.382	0.156	0.876
	3	114.456	0.000	65.039	0.000	4.365	0.002	0.071	0.943
	4	84.091	0.000	29.200	0.000	0.657	0.623	-2.941	0.004
	5	44.787	0.000	24.075	0.000	1.726	0.147	-0.782	0.436
	6	82.771	0.000	41.260	0.000	0.865	0.486	-0.622	0.535
	7	58.588	0.000	51.273	0.000	1.803	0.131	-0.292	0.770
% Grain of	1	29.828	0.000	6.898	0.001	0.743	0.564	0.251	0.802
	2	0.738	0.480	0.161	0.852	0.887	0.473	0.073	0.942
	3	1.676	0.191	1.196	0.305	3.770	0.006	0.027	0.978
	4	4.394	0.014	0.108	0.898	0.579	0.678	-1.263	0.209
	5	1.727	0.181	1.455	0.237	1.766	0.139	-0.273	0.785
	6	4.998	0.008	2.621	0.076	0.264	0.901	-0.234	0.815
	7	5.169	0.007	12.320	0.000	0.382	0.821	-0.097	0.923
Total Grain	1	23.285	0.000	12.506	0.000	0.679	0.607	0.519	0.605
	2	49.146	0.000	19.845	0.000	1.053	0.382	0.156	0.876
	3	114.456	0.000	65.039	0.000	4.365	0.002	0.071	0.943
	4	84.091	0.000	29.200	0.000	0.657	0.623	-2.941	0.004
	5	44.787	0.000	24.075	0.000	1.726	0.147	-0.782	0.436
	6	82.771	0.000	41.260	0.000	0.865	0.486	-0.622	0.535
	7	58.588	0.000	51.273	0.000	1.803	0.131	-0.292	0.770

Table 1: Continued

VARIABLE	POSITION	VARIETY		MATURITY		VARIETY X MATURITY		MOISTURE CONTENT	
		F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	T	ALPHA HAT
% Grain of	1	19.791	0.000	5.526	0.005	0.719	0.580	0.350	0.727
Total Material	2	20.515	0.000	0.917	0.402	0.634	0.639	0.130	0.897
	3	34.833	0.000	6.999	0.001	4.464	0.002	0.050	0.961
	4	30.493	0.000	0.495	0.611	1.055	0.381	-1.991	0.048
	5	7.070	0.001	1.901	0.153	1.543	0.193	-0.446	0.656
	6	0.254	0.776	1.439	0.240	0.971	0.425	-0.085	0.932
	7	18.282	0.000	13.653	0.000	0.991	0.415	-0.187	0.852

Table 2: Analysis of Variance Results For Grain Variables, Harvest Samples

VARIABLE	POSITION	VARIETY		MOISTURE CONTENT	
		F	ALPHA HAT	T	ALPHA HAT
Grain Weight	1	11.171	0.000	-0.217	0.830
	2	13.224	0.000	0.087	0.932
	3	15.749	0.000	-0.244	0.810
	4	15.099	0.000	0.769	0.450
	5	16.088	0.000	0.291	0.773
	6	13.730	0.000	0.031	0.976
	7	21.450	0.000	0.005	0.996
% Grain of	1	5.675	0.010	-0.241	0.811
Total Grain	2	0.678	0.518	0.066	0.948
	3	1.391	0.270	-0.174	0.863
	4	0.223	0.802	0.387	0.702
	5	0.462	0.636	0.161	0.874
	6	0.143	0.867	0.027	0.979
	7	2.954	0.073	0.004	0.997
% Grain of	1	4.399	0.025	-0.308	0.761
Total Material	2	1.787	0.191	0.109	0.914
	3	1.158	0.333	-0.247	0.807
	4	1.734	0.200	0.575	0.571
	5	2.268	0.127	0.242	0.811
	6	2.272	0.127	0.035	0.973
	7	7.855	0.003	0.006	0.995

Table 3: Analysis of Variance Results For Ratios of Grain Weights, Reconstituted Samples

VARIABLE	POSITION	VARIETY		MATURITY		VARIETY X MATURITY		MOISTURE CONTENT	
		F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	T	ALPHA HAT
G1	1 / 2	4.218	0.017	0.953	0.388	1.375	0.245	1.780	0.077
G2	1 / 3	23.106	0.000	7.010	0.001	3.380	0.011	1.874	0.063
G3	1 / 4	17.845	0.000	2.837	0.062	0.609	0.657	1.107	0.270
G4	1 / 5	10.234	0.000	3.546	0.031	1.691	0.155	0.715	0.476
G5	1 / 6	17.822	0.000	4.191	0.017	0.247	0.911	1.137	0.257
G6	1 / 7	8.454	0.000	9.988	0.000	0.901	0.465	1.150	0.252
G7	2 / 3	1.069	0.346	2.050	0.132	1.939	0.107	0.639	0.524
G8	2 / 4	1.055	0.351	0.030	0.970	0.119	0.976	0.349	0.730
G9	2 / 5	1.205	0.302	0.762	0.468	1.434	0.225	0.252	0.802
G10	2 / 6	4.386	0.014	0.547	0.580	1.781	0.136	0.420	0.675
G11	2 / 7	2.792	0.064	6.912	0.001	1.312	0.268	0.417	0.677
G12	3 / 4	0.703	0.496	0.714	0.491	1.746	0.143	0.521	0.603
G13	3 / 5	0.520	0.595	0.081	0.922	3.317	0.012	0.093	0.926
G14	3 / 6	2.305	0.103	1.471	0.233	2.600	0.038	0.150	0.881
G15	3 / 7	1.774	0.173	4.830	0.009	1.216	0.307	0.140	0.889

Table 3: Continued

VARIABLE	POSITION	VARIETY		MATURITY		VARIETY X MATURITY		MOISTURE CONTENT	
		F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	T	ALPHA HAT
G16	4 / 5	1.798	0.169	0.595	0.553	1.013	0.402	0.122	0.903
G17	4 / 6	4.120	0.018	0.471	0.625	0.878	0.479	0.202	0.840
G18	4 / 7	2.907	0.058	6.945	0.001	1.262	0.287	0.216	0.830
G19	5 / 6	0.189	0.828	0.743	0.477	1.437	0.224	-6.913	0.000
G20	5 / 7	0.339	0.713	3.616	0.029	1.252	0.292	-9.077	0.000
G21	6 / 7	0.425	0.655	4.852	0.009	0.718	0.581	-7.022	0.000

Table 4: Analysis of Variance Results For Ratios of Grain Weights, Harvest Samples

VARIABLE	POSITION	VARIETY		MOISTURE CONTENT	
		F	ALPHA HAT	T	ALPHA HAT
G1	1 / 2	1.393	0.270	-2.213	0.038
G2	1 / 3	3.668	0.042	-1.285	0.212
G3	1 / 4	1.251	0.306	-0.782	0.443
G4	1 / 5	1.757	0.196	-0.504	0.619
G5	1 / 6	2.219	0.132	-1.323	0.200
G6	1 / 7	4.211	0.028	-1.485	0.152
G7	2 / 3	1.142	0.337	0.512	0.614
G8	2 / 4	0.324	0.726	0.302	0.766
G9	2 / 5	0.713	0.501	0.213	0.833
G10	2 / 6	0.230	0.796	0.487	0.631
G11	2 / 7	2.390	0.115	0.753	0.459
G12	3 / 4	0.752	0.483	0.367	0.717
G13	3 / 5	1.029	0.374	-0.652	0.521
G14	3 / 6	0.525	0.599	-1.251	0.224
G15	3 / 7	1.468	0.252	-1.971	0.062
G16	4 / 5	0.243	0.786	-0.671	0.509
G17	4 / 6	0.095	0.910	-1.379	0.182
G18	4 / 7	1.192	0.323	-2.155	0.043
G19	5 / 6	0.072	0.931	3.885	0.001
G20	5 / 7	0.183	0.834	5.388	0.000
G21	6 / 7	1.292	0.295	6.283	0.000

Table 5: Analysis of Variance Results for MOG Variables, Reconstituted Samples

VARIABLE	POSITION	VARIETY		MATURITY		VARIETY X MATURITY		MOISTURE CONTENT	
		F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	T	ALPHA HAT
MOG Weight	1	3.607	0.029	3.092	0.048	2.367	0.055	3.216	0.002
	2	5.485	0.005	3.930	0.022	2.460	0.048	0.649	0.517
	3	4.728	0.010	8.756	0.000	1.820	0.128	0.185	0.854
	4	3.212	0.043	21.130	0.000	1.724	0.148	-7.065	0.000
	5	3.006	0.052	15.093	0.000	0.942	0.441	-2.539	0.012
	6	4.012	0.020	41.541	0.000	1.541	0.193	-1.466	0.145
	7	57.194	0.000	42.299	0.000	1.552	0.190	-0.171	0.865
% MOG of	1	14.554	0.000	22.698	0.000	1.981	0.100	0.632	0.529
Total MOG	2	17.610	0.000	8.490	0.000	2.006	0.096	0.131	0.896
	3	13.837	0.000	1.201	0.304	1.599	0.178	0.039	0.969
	4	10.320	0.000	1.393	0.251	1.381	0.243	-1.447	0.150
	5	8.820	0.000	0.693	0.502	0.826	0.519	-0.537	0.592
	6	11.065	0.000	5.923	0.003	1.561	0.187	-0.320	0.749
	7	15.018	0.000	1.309	0.273	1.438	0.224	-0.050	0.961

Table 5: Continued

VARIABLE	POSITION	VARIETY		MATURITY		VARIETY X MATURITY		MOISTURE CONTENT	
		F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	T	ALPHA HAT
% MOG of	1	7.461	0.001	2.312	0.103	0.836	0.504	0.330	0.742
Total Material	2	22.346	0.000	7.162	0.001	2.307	0.061	0.239	0.811
	3	30.126	0.000	0.150	0.851	2.280	0.063	0.069	0.945
	4	44.002	0.000	0.827	0.439	1.934	0.108	-4.000	0.000
	5	39.595	0.000	0.294	0.745	0.916	0.456	-1.416	0.159
	6	6.226	0.003	2.039	0.134	1.364	0.249	-0.181	0.856
	7	31.091	0.000	3.946	0.021	1.788	0.134	-0.111	0.912

Table 6: Analysis of Variance Results For MOG Variables, Harvest Samples

VARIABLE	POSITION	VARIETY		MOISTURE CONTENT	
		F	ALPHA HAT	T	ALPHA HAT
MOG Weight	1	3.074	0.066	-0.900	0.378
	2	11.602	0.000	0.374	0.712
	3	11.835	0.000	-0.843	0.409
	4	10.865	0.001	2.552	0.019
	5	7.903	0.003	0.688	0.499
	6	11.087	0.000	0.079	0.938
	7	18.588	0.000	0.005	0.966
% MOG of Total MOG	1	2.465	0.108	-0.242	0.811
	2	0.465	0.640	0.111	0.913
	3	1.257	0.304	-0.255	0.801
	4	0.195	0.824	0.676	0.506
	5	0.896	0.423	0.179	0.860
	6	0.504	0.611	0.024	0.981
	7	0.519	0.602	0.001	0.999
% MOG of Total Material	1	2.812	0.082	-0.878	0.390
	2	1.693	0.207	0.047	0.963
	3	2.099	0.146	-0.848	0.406
	4	3.526	0.047	2.118	0.046
	5	3.344	0.054	0.429	0.672
	6	3.034	0.069	0.076	0.940
	7	4.061	0.032	0.002	0.998

Table 7: Analysis of Variance Results For Ratios of MOG Weights, Reconstituted Samples

VARIABLE	POSITION	VARIETY			MATURITY			VARIETY X MATURITY			MOISTURE CONTENT		
		F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	T	T	ALPHA HAT	T
S1	1 / 2	3.499	0.033	13.646	0.000	1.021	0.398	-7.929	0.000				
S2	1 / 3	3.843	0.024	28.477	0.000	0.461	0.764	-5.798	0.000				
S3	1 / 4	5.260	0.006	46.421	0.000	0.679	0.608	-5.344	0.000				
S4	1 / 5	5.037	0.008	25.198	0.000	0.599	0.664	-1.000	0.319				
S5	1 / 6	6.805	0.001	55.585	0.000	1.107	0.356	-1.630	0.105				
S6	1 / 7	7.970	0.001	10.480	0.000	1.384	0.242	-12.202	0.000				
S7	2 / 3	0.921	0.400	6.331	0.002	0.612	0.655	-2.270	0.025				
S8	2 / 4	2.312	0.103	20.363	0.000	0.993	0.413	-2.209	0.029				
S9	2 / 5	3.487	0.033	12.650	0.000	0.835	0.505	-1.590	0.114				
S10	2 / 6	5.846	0.004	38.750	0.000	1.424	0.229	-1.802	0.074				
S11	2 / 7	10.381	0.000	3.646	0.028	1.355	0.252	-12.030	0.000				
S12	3 / 4	0.123	0.884	5.467	0.005	1.212	0.308	-1.784	0.076				
S13	3 / 5	0.684	0.506	3.096	0.048	0.816	0.517	-1.259	0.210				
S14	3 / 6	2.198	0.115	21.161	0.000	1.784	0.135	-2.275	0.024				
S15	3 / 7	8.797	0.000	0.304	0.738	1.087	0.365	-13.655	0.000				

Table 7: Continued

VARIABLE	POSITION	VARIETY		MATURITY		VARIETY X MATURITY		MOISTURE CONTENT	
		F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	T	ALPHA HAT
S16	4 / 5	0.441	0.644	0.310	0.734	0.294	0.881	-1.676	0.096
S17	4 / 6	1.379	0.255	5.270	0.006	0.557	0.694	-2.853	0.005
S18	4 / 7	5.937	0.003	2.076	0.129	0.932	0.447	-15.247	0.000
S19	5 / 6	0.254	0.776	9.719	0.000	0.388	0.817	-3.540	0.001
S20	5 / 7	5.746	0.004	1.191	0.307	0.588	0.672	-19.624	0.000
S21	6 / 7	6.340	0.002	4.148	0.018	0.763	0.551	-14.675	0.000

Table 8: Analysis of Variance Results For Ratios of MOG Weights, Harvest Samples

VARIABLE	POSITION	VARIETY		MOISTURE CONTENT	
		F	ALPHA HAT	T	ALPHA HAT
S1	1 / 2	3.130	0.064	2.593	0.017
S2	1 / 3	2.580	0.099	1.915	0.069
S3	1 / 4	3.032	0.069	1.942	0.065
S4	1 / 5	3.608	0.044	0.425	0.675
S5	1 / 6	4.523	0.023	1.256	0.222
S6	1 / 7	1.648	0.215	4.349	0.000
S7	2 / 3	0.171	0.844	0.782	0.443
S8	2 / 4	0.134	0.875	1.020	0.319
S9	2 / 5	1.112	0.347	0.585	0.564
S10	2 / 6	0.119	0.889	0.262	0.796
S11	2 / 7	0.604	0.555	1.156	0.260
S12	3 / 4	0.457	0.639	0.163	0.872
S13	3 / 5	2.740	0.087	0.155	0.879
S14	3 / 6	0.040	0.961	0.222	0.827
S15	3 / 7	1.288	0.296	1.334	0.196
S16	4 / 5	0.757	0.481	0.026	0.979
S17	4 / 6	0.142	0.868	0.060	0.953
S18	4 / 7	0.280	0.759	0.323	0.750
S19	5 / 6	1.240	0.309	0.051	0.960
S20	5 / 7	0.521	0.601	0.286	0.778
S21	6 / 7	0.513	0.606	0.202	0.842

Table 9: Analysis of Variance Results For Energy Variables, Reconstituted Samples

VARIETY		MATURITY		VARIETY X MATURITY		MOISTURE CONTENT	
VARIABLE	F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	T
Peak Torque	14.380	0.000	0.966	0.383	0.707	0.588	0.639
Span of Graph	2.778	0.065	0.115	0.891	0.231	0.920	1.472
Area of Graph	7.709	0.001	1.762	0.175	0.663	0.619	1.243
							0.216

Table 10: Analysis of Variance Results For Energy Variables, Harvest Samples

VARIETY		MOISTURE CONTENT	
VARIABLE	F	ALPHA HAT	T
Peak Torque	8.813	0.002	-0.245
Span of Graph	3.818	0.038	-0.712
Area of Graph	9.550	0.001	-0.740

Table 11: Analysis of Variance Results For Sieving Analysis, Reconstituted Samples

VARIABLE	VARIETY			MATURITY			VARIETY X MATURITY			MOISTURE CONTENT		
	F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	F	ALPHA HAT	T	ALPHA HAT	T	ALPHA HAT
% retained in #4 sieve	5.183	0.007	1.378	0.255	1.769	0.138	-0.242	0.809				
% retained in #6 sieve	0.646	0.526	4.069	0.019	2.122	0.081	-0.645	0.520				
% retained in #8 sieve	14.921	0.000	5.757	0.004	0.778	0.541	-0.426	0.671				
% retained in #10 sieve	10.733	0.000	1.089	0.339	0.697	0.595	-1.119	0.265				
% retained in #16 sieve	16.762	0.000	1.251	0.289	2.162	0.076	-2.962	0.004				
% retained in #20 sieve	11.361	0.000	3.379	0.037	2.822	0.027	-4.693	0.000				
% retained in pan	1.140	0.322	26.444	0.000	1.277	0.282	-5.658	0.000				
Amt. above #4/ amt. below	10.181	0.000	4.235	0.016	2.666	0.035	355.390	0.000				
Amt. above #6/ amt. below	11.028	0.000	3.274	0.041	1.800	0.132	253.893	0.000				
Amt. above #8/ amt. below	11.992	0.000	0.252	0.778	2.473	0.047	72.537	0.000				
Amt. above #10/amt. below	4.662	0.011	9.080	0.000	3.061	0.019	21.999	0.000				
Amt. above #16/ amt. below	1.048	0.353	14.403	0.000	2.403	0.052	8.751	0.000				
Amt. above #20/ amt. below	0.295	0.745	18.340	0.000	1.521	0.199	4.470	0.000				

Table 12: Analysis of Variance Results For Sieving Analysis, Harvest Samples

VARIABLE	VARIETY		MOISTURE CONTENT	
	F	ALPHA HAT	T	ALPHA HAT
% retained in #4 sieve	0.609	0.553	-0.005	0.996
% retained in #6 sieve	8.405	0.002	-0.014	0.989
% retained in #8 sieve	1.100	0.350	-0.008	0.994
% retained in #10 sieve	2.622	0.095	-0.038	0.970
% retained in #16 sieve	2.397	0.114	-0.063	0.950
% retained in #20 sieve	0.876	0.431	-0.003	0.998
% retained in pan	9.647	0.001	-0.143	0.888
Amt. above #4/ amt. below	1.400	0.268	-177.871	0.000
Amt. above #6/ amt. below	0.235	0.793	-130.160	0.000
Amt. above #8/ amt. below	0.453	0.642	-13.462	0.000
Amt. above #10/ amt. below	1.203	0.319	-4.083	0.001
Amt. above #16/ amt. below	2.110	0.145	-1.430	0.167
Amt. above #20/ amt. below	3.105	0.065	-0.221	0.827

The statistical models used to analyze the data from the sieving analysis are identical to these two models with the variables on the left side of the equality being:

X1 = Per cent of total MOG retained in the #4 sieve

X2 = Per cent of total MOG retained in the #6 sieve

X3 = Per cent of total MOG retained in the #8 sieve

X4 = Per cent of total MOG retained in the #10 sieve

X5 = Per cent of total MOG retained in the #16 sieve

X6 = Per cent of total MOG retained in the #20 sieve

X7 = Per cent of total MOG retained in the pan

X8 = Weight retained above the #4 sieve divided by the weight passed through it

X9 = Weight retained above the #6 sieve divided by the weight passed through it

X10 = Weight retained above the #8 sieve divided by the weight passed through it

X11 = Weight retained above the #10 sieve divided by the weight passed through it

X12 = Weight retained above the #16 sieve divided by the weight passed through it

X13 = Weight retained above the #20 sieve divided by the weight passed through it

The data in table 11 shows a definite variation in the size distribution of the resorted MOG with all three treatment sources of variation. The results of the harvest studies (table 12) were not as conclusive. Some

significance was found when forming a ratio of the amount of MOG larger than a certain size to the amount that was smaller. This significance was mainly limited to the effects of moisture content. The greater response of the reconstituted crop than the original to different crop conditions reflects the basic differences between the two. Storing the wheat for a period of time undoubtedly deteriorates it in some manner. Also, the distribution of the moisture through the plant is altered by the rewetting process. However, the data does show a variation in the MOG that must be handled by a combine as crop conditions vary.

Results beyond this from the size distribution of the straw and chaff are impossible. The Tyler sieves used are only eight inches in diameter with 2 1/4 inches between screens. This is fairly restricting to the movement of the larger material. Also, the screen sizes should have been somewhat larger to get a better analysis.

Tables 1 through 10 show the results of the covariance analysis for all grain, MOG and energy variables. There are many which are significantly influenced by one or more independent variables. The goal now is to eliminate a number of these variables until a minimum number is obtained that remain capable of indicating the crop threshability. The F and t values obtained are only one of many criteria available for either retaining or discarding a variable. Another major consideration was the ease of measurement. For this reason all variables expressed as the per cent grain or MOG in one position of some sample total (grain, MOG or total material) were discarded. These would require the separation and weighing of the material in every position, a process too long to be desirable. All variables expressed strictly as a weight (grain or MOG) were discarded. These variables

tend to be influenced by differences in yield and plant formation between varieties. This left only variables expressed as a ratio of grain or MOG weights between two positions to represent the grain threshing and MOG handling phases of threshing. From these the F and t values were examined with these considerations:

1. A ratio of two positions should be significant for both grain and MOG so as few positions as possible need be analyzed.
2. A ratio of two positions should be significant for both actual harvest and reconstituted samples
3. A variable(s) must be selected from each of the three categories, grain threshing, MOG handling and energy consumption
4. If more than one variable is selected from each category they should be such that a minimum number of positions have to be analyzed.

On this basis these variables were selected as best representing the threshing characteristics of the wheat.

A. Grain Threshing Variables

1. Grain weight in position 1 divided by grain weight in position 7 (G6)
2. Grain weight in position 6 divided by grain weight in position 7 (G21)

B. MOG Handling Variables

1. MOG weight in position 1 divided by MOG weight in position 7 (S6)

2. MOG weight in position 6 divided by MOG weight in position 7 (S21)

C. Transportation or Energy Variables

1. Peak torque on the cylinder shaft
2. Span of the torque-time curve

It is apparent that the threshing occurring at the beginning and end of the concave and the material carried over the concave varies most with changing crop conditions.

There could be many criteria applied to the selection of the best variables. The reasons used are certainly valid but arrive at a subset that is only one of many possible subsets of variables.

The measurements generally made to describe the operation of an actual combine are:

1. The amount of grain (%) passing over the concave
2. The amount of MOG allowed to fall through the concave to indicate the amount of straw breakage.
3. The energy requirement in terms of energy per ton of MOG

Multiple regression techniques were used to develop functional relationships between the six variables chosen to predict these combine response variables. In the absence of data from an actual combine these response variables were calculated from the data collected with the test stand. The statistical model was of the form:

$$\text{Grain, MOG, Energy} = f(G6, G21, S6, S21, \text{Torque, Span})$$

where,

Grain = grain threshing response variable

MOG = MOG distribution response variable

Energy = Energy response variable measured in (joules per metric ton) $\times 10^{-6}$ or joules per gram of MOG

Two different regression techniques, both of which were done on the computer, were employed for a comparison of results. The first method begins with all six variables in the model and proceeds to selectively remove non-significant terms until those remaining are all significant at the level of alpha selected. The second method has no variables in the model initially and proceeds to add significant variables until no significant terms are excluded. Both methods are stepwise procedures where only one term can be added or removed at one time. After each step all values are recalculated. Also, after a variable had been added to the model by the second method it could be removed in a later step if it became non-significant.

There are many multiple regression techniques available of which these are only two. No single method is superior to the rest. However, in this case both methods yielded the same results which indicates some strength in them. The equations arrived at were:

A. Reconstituted Samples

$$\text{Energy} = 12.7951 (S6) + 0.762188 (\text{Torque}) + 3.34801 (\text{Span}) - 8.95276$$

$$\text{Grain} = -0.0273804 (G6) + 0.00267159 (\text{Torque}) + 0.2072$$

$$\text{MOG} = 0.0128014 (G6) - 0.0316302 (G21) + 0.845030 (S6) + 1.16839 (S21) + 0.11016$$

B. Harvest Samples

$$\text{Energy} = 0.614166 (\text{Torque}) + 1.06988 (\text{Span}) - 0.42483$$

$$\text{Grain} = -0.0463176 (\text{G6}) - 0.0331764 (\text{G21}) + 0.26656$$

$$\text{MOG} = 0.447988 (\text{S6}) + 0.767059 (\text{S21}) + 0.21126$$

Each variable has the same meaning and is measured in the same units stated before.

As evidenced by the nature of the equations, a combine would respond differently to reconstituted crop conditions than to natural harvest conditions. The variables describing the threshability in harvest conditions are exactly the ones expected. There was no cross-over between classes of variables. There was interaction between the classes of variables when threshing the rewetted samples. This can be attributed to the different nature of the reconstituted samples. This also affected the size distribution of the MOG as discussed earlier. The moisture distribution is much different with the ratio of MOG moisture content to grain moisture content being much higher in some of the reconstituted material than in normally harvested wheat. Deterioration of the samples during storage could also be a factor in this difference.

Table 13: Values of R^2 for Multiple Regression Analysis

<u>Response Variable</u>	<u>Harvest</u>	<u>Reconstituted</u>
Energy	0.70054	0.40930
Grain	0.92208	0.73350
MOG	0.88898	0.96516

The R^2 values shown in table 13 indicate the proportion of the total

variation about the mean explained by the regression. In most cases the regression accounted for a very large part of the variation. There are some factors affecting the threshing characteristics which are not accounted for by the six variables selected. The regression accounts for enough variation to make these six variables very useful in predicting combine response.

If a test stand were to replace the combine presently used as a standard, it would be calibrated to the response characteristics of that combine by these same regression techniques. Both machines would have to be tested in the same crop conditions initially. Then, with the results of the test stand calibrated to predict the response of the actual combine, the combine would no longer be needed. Of course, it would still be operated occasionally until sufficient confidence was developed in the test stand results. For this study the response variables were calculated from the test stand data in the absence of any combine performance data. This gave an indication of the validity of the six variables selected.

CONCLUSIONS

1. The six variables:

1. Grain weight in position 1 divided by grain weight in position 7
2. Grain weight in position 6 divided by grain weight in position 7
3. MOG weight in position 1 divided by MOG weight in position 7
4. MOG weight in position 6 divided by MOG weight in position 7
5. Peak torque on the cylinder shaft
6. Span of the torque-time graph

were found to be most significant in predicting combine response while also being easily measurable.

2. The threshing being done at both ends of the concave and the material carried over the concave is most significant in describing the threshing process.
3. The size distribution of the MOG and therefore the amount of straw breakage varies significantly with the condition of the crop. This is especially true for reconstituted material.
4. As evidenced by the regression equations, the threshing characteristics of reconstituted wheat are quite different from natural harvest conditions. This is due to the altered moisture distribution throughout the plant and the probable deterioration of the wheat during storage.

SUMMARY

There seems to be great promise in being able to use a test stand such as the one used here to aid in the testing of combines. Rather than spending hours harvesting tons of material with a combine whose adjustments remain fixed, the experimental combine could be compared to the results of a few small bundles of wheat threshed in a test stand. Presently, this testing machine looks very much like a combine and measurements are taken that are common to the machine-crop system. In the future this testing device should be revised until finally it measures the most basic properties of the crop and looks nothing like a combine. It may require only one wheat plant. The amount of force require to bend the stem and to remove a grain from the head may be enough to predict the threshing characteristics of that crop.

SUGGESTIONS FOR FUTURE WORK

1. The first step in continuing this work should be to actually calibrate a test stand to predict the performance of a combine. Trials should be conducted to determine how well the test stand performs under actual conditions.
2. Research should continue towards the goal of measuring more basic properties of the crop. Eventually, these basic properties may be correlated to the threshing process.

ACKNOWLEDGEMENTS

I would like to thank Deere and Company who, because of a need for this type of information, financed this project. I would especially like to thank two of their engineers, Dr. Lyle Stephens and Mr. Dave Rabe, for the help and guidance they gave me throughout the project. The members of my committee, Professor G. E. Fairbanks, Dr. H. S. Walker and Dr. S. J. Clark, my major professor, deserve many thanks for help given me with this project and in classes throughout my college years. I would also like to thank my wife, Sheila, for helping me in the project, collecting data, proofreading and just listening when needed.

REFERENCES

1. Arnold, R. E. 1964. Experiments With Rasp Bar Threshing Drums. I. Some Factors Affecting Performance. Journal of Agricultural Engineering Research. 9(2): 24 - 28.
2. Arnold, R. E. and J. R. Lake 1964. Experiments With Rasp Bar Threshing Drums. III. Power Requirements. Journal of Agricultural Engineering Research. 9(4): 348 - 55.
3. Cervinka, V. 1974. Multiple Regression Analysis of Combine Harvester Design and Operational Parameters. Transactions of the ASAE. 17(2): 221-4.
4. DeKoning, K. 1973. Measurement of Some Parameters of Different Spring Wheat Varieties Affecting Combine Harvesting Losses. Journal of Agricultural Engineering Research. (18): 107 - 115.
5. Harrison, H. P. 1975. Effects of Moisture Content of Wheat on Threshing. Canadian Agricultural Engineering. 17(1): 55 - 58.
6. Hamdy, M. Y., A. K. Srivastava, G. L. Nelson, W. L. Roller and S. G. Huber 1974. Centrifugal Grain-Straw Separation: Part I - Theoretical Analysis. Transactions of the ASAE. 17(2): 198 - 201.
7. Johnson, William H. 1959. Efficiency in Combining Wheat. Agricultural Engineering. 40(1): 16 - 20, 29.
8. Lamp, B. J. and W. F. Buchele 1960. Centrifugal Threshing of Small Grains. Transactions of the ASAE. 3(2): 24 - 28.
9. Mark, A. H., K. J. M. Godlewski and J. L. Coleman 1963. Evaluating Combine performance: A Global Approach. Agricultural Engineering 44(3): 136 - 7, 143.
10. Neal, Allan E. and Geoffrey F. Cooper 1968. Performance Testing of Combines in the Lab. Agricultural Engineering. 49(7): 397 - 99.

11. Nyborg, E. O., H. F. McColly and R. T. Hinkle 1969. Grain Combine Loss Characteristics. Transactions of the ASAE. 12(6): 727 - 32.
12. Zaidi, Saleem Haider 1974. A Comparison of Five Wheat Threshability Parameters Using An Instrumented Laboratory Cylinder. M. S. Thesis. Kansas State University, Manhattan, Kansas.

APPENDICES

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	1	9.60	1	1	9.92	0.08	2.42
PARKER	1	9.60	1	2	3.83	0.00	2.03
PARKER	1	9.60	1	3	3.47	0.00	1.73
PARKER	1	9.60	1	4	2.51	0.00	1.67
PARKER	1	9.60	1	5	1.82	0.00	1.32
PARKER	1	9.60	1	6	2.76	0.00	1.70
PARKER	1	9.60	1	7	4.96	0.00	11.83
PARKER	1	9.60	2	1	6.32	0.00	1.85
PARKER	1	9.60	2	2	2.98	0.00	1.62
PARKER	1	9.60	2	3	2.65	0.00	1.33
PARKER	1	9.60	2	4	1.86	0.00	1.36
PARKER	1	9.60	2	5	1.62	0.00	1.12
PARKER	1	9.60	2	6	1.57	0.00	1.50
PARKER	1	9.60	2	7	3.67	0.00	9.14
PARKER	1	9.60	3	1	8.23	0.07	2.30
PARKER	1	9.60	3	2	3.70	0.00	1.68
PARKER	1	9.60	3	3	2.69	0.00	1.47
PARKER	1	9.60	3	4	2.25	0.00	1.45
PARKER	1	9.60	3	5	2.00	0.00	1.04
PARKER	1	9.60	3	6	3.26	0.00	1.70
PARKER	1	9.60	3	7	3.83	0.00	10.80

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	2	8.24	1	1	6.06	0.00	1.66
PARKER	2	8.24	1	2	3.64	0.00	1.61
PARKER	2	8.24	1	3	2.80	0.00	1.40
PARKER	2	8.24	1	4	1.96	0.00	1.26
PARKER	2	8.24	1	5	1.62	0.00	1.04
PARKER	2	8.24	1	6	2.31	0.00	1.60
PARKER	2	8.24	1	7	2.54	0.00	9.62
PAPKER	2	8.24	2	1	7.20	0.00	1.74
PARKER	2	8.24	2	2	3.17	0.00	1.14
PARKER	2	8.24	2	3	2.39	0.00	1.28
PARKER	2	8.24	2	4	2.03	0.00	1.11
PARKER	2	8.24	2	5	1.48	0.00	0.78
PARKER	2	8.24	2	6	2.49	0.00	1.37
PARKER	2	8.24	2	7	3.49	0.00	9.76
PARKER	2	8.24	3	1	6.88	0.00	1.91
PARKER	2	8.24	3	2	2.81	0.00	1.43
PARKER	2	8.24	3	3	3.00	0.00	1.41
PARKER	2	8.24	3	4	2.09	0.00	1.33
PARKER	2	8.24	3	5	1.62	0.00	1.05
PARKER	2	8.24	3	6	2.50	0.00	1.60
PARKER	2	8.24	3	7	4.25	0.00	9.72

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

<u>VARIETY</u>	<u>MATURITY</u>	<u>MOISTURE</u> <u>CONTENT</u>	<u>REP</u>	<u>PCS</u>	<u>GRAIN</u> <u>WEIGHT</u>	<u>UNTHRESHED</u> <u>GRAIN WT.</u>	<u>MOG</u> <u>WEIGHT</u>
PARKER	3	7.47	1	1	5.05	0.00	1.60
PARKER	3	7.47	1	2	2.25	0.00	1.17
PARKER	3	7.47	1	3	1.76	0.00	1.12
PARKER	3	7.47	1	4	1.49	0.00	0.99
PARKER	3	7.47	1	5	1.22	0.00	0.82
PARKER	3	7.47	1	6	1.52	0.00	1.20
PARKER	3	7.47	1	7	2.52	0.00	8.00
PARKER	3	7.47	2	1	7.35	0.00	2.43
PARKER	3	7.47	2	2	3.31	0.00	1.31
PARKER	3	7.47	2	3	2.36	0.00	1.26
PARKER	3	7.47	2	4	2.36	0.00	1.06
PARKER	3	7.47	2	5	1.53	0.00	0.80
PARKER	3	7.47	2	6	1.83	0.00	1.43
PARKER	3	7.47	2	7	4.13	0.00	8.10
PARKER	3	7.47	3	1	6.45	0.00	1.77
PARKER	3	7.47	3	2	2.72	0.00	1.37
PARKER	3	7.47	3	3	2.57	0.00	1.04
PARKER	3	7.47	3	4	1.56	0.00	0.88
PARKER	3	7.47	3	5	1.40	0.00	0.89
PARKER	3	7.47	3	6	2.24	0.00	1.24
PARKER	3	7.47	3	7	3.17	0.00	7.76

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	1	9.20	1	1	11.78	0.00	2.24
CENTURK	1	9.20	1	2	6.10	0.00	1.71
CENTURK	1	9.20	1	3	5.65	0.00	1.50
CENTURK	1	9.20	1	4	3.54	0.00	1.59
CENTURK	1	9.20	1	5	3.25	0.00	1.50
CENTURK	1	9.20	1	6	1.91	0.00	1.78
CENTURK	1	9.20	1	7	6.68	0.00	9.95
CENTURK	1	9.20	2	1	9.69	0.00	2.08
CENTURK	1	9.20	2	2	5.32	0.00	1.59
CENTURK	1	9.20	2	3	4.32	0.00	1.47
CENTURK	1	9.20	2	4	3.32	0.00	1.42
CENTURK	1	9.20	2	5	2.74	0.00	0.90
CENTURK	1	9.20	2	6	3.24	0.00	1.84
CENTURK	1	9.20	2	7	5.34	0.00	9.41
CENTURK	1	9.20	3	1	10.09	0.00	1.89
CENTURK	1	9.20	3	2	5.73	0.00	1.77
CENTURK	1	9.20	3	3	4.52	0.00	1.40
CENTURK	1	9.20	3	4	3.46	0.00	1.42
CENTURK	1	9.20	3	5	2.80	0.00	1.22
CENTURK	1	9.20	3	6	4.59	0.00	1.74
CENTURK	1	9.20	3	7	8.38	0.00	10.65

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	2	9.09	1	1	9.40	0.00	1.86
CENTURK	2	9.09	1	2	4.87	0.00	1.40
CENTURK	2	9.09	1	3	3.18	0.00	1.28
CENTURK	2	9.09	1	4	2.75	0.00	1.18
CENTURK	2	9.09	1	5	1.74	0.00	0.80
CENTURK	2	9.09	1	6	3.18	0.00	1.55
CENTURK	2	9.09	1	7	5.84	0.00	9.51
CENTURK	2	9.09	2	1	9.13	0.00	1.80
CENTURK	2	9.09	2	2	4.75	0.00	1.39
CENTURK	2	9.09	2	3	3.81	0.00	1.29
CENTURK	2	9.09	2	4	3.05	0.00	0.95
CENTURK	2	9.09	2	5	2.28	0.00	0.88
CENTURK	2	9.09	2	6	3.38	0.00	1.33
CENTURK	2	9.09	2	7	4.47	0.00	9.24
CENTURK	2	9.09	3	1	11.20	0.00	2.11
CENTURK	2	9.09	3	2	4.92	0.00	1.50
CENTURK	2	9.09	3	3	3.20	0.00	1.19
CENTURK	2	9.09	3	4	2.56	0.00	1.46
CENTURK	2	9.09	3	5	1.92	0.00	0.76
CENTURK	2	9.09	3	6	3.68	0.00	1.46
CENTURK	2	9.09	3	7	6.13	0.00	9.55

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MCISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	3	8.36	1	1	7.96	0.00	1.80
CENTURK	3	8.36	1	2	3.35	0.00	1.20
CENTURK	3	8.36	1	3	2.97	0.00	1.03
CENTURK	3	8.36	1	4	1.80	0.00	1.03
CENTURK	3	8.36	1	5	1.86	0.00	0.70
CENTURK	3	8.36	1	6	2.58	0.00	0.97
CENTURK	3	8.36	1	7	4.04	0.00	7.32
CENTURK	3	8.36	2	1	7.05	0.00	1.65
CENTURK	3	8.36	2	2	3.65	0.00	1.14
CENTURK	3	8.36	2	3	2.05	0.00	0.85
CENTURK	3	8.36	2	4	1.92	0.00	0.74
CENTURK	3	8.36	2	5	1.68	0.00	0.68
CENTURK	3	8.36	2	6	2.17	0.00	0.87
CENTURK	3	8.36	2	7	3.35	0.00	6.92
CENTURK	3	8.36	3	1	9.36	0.00	2.00
CENTURK	3	8.36	3	2	3.66	0.00	1.25
CENTURK	3	8.36	3	3	3.03	0.00	1.13
CENTURK	3	8.36	3	4	3.00	0.00	1.02
CENTURK	3	8.36	3	5	3.70	0.00	0.67
CENTURK	3	8.36	3	6	2.42	0.00	1.06
CENTURK	3	8.36	3	7	3.16	0.00	8.13

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	1	8.86	1	1	10.07	0.22	1.84
EAGLE	1	8.86	1	2	5.59	0.00	1.49
EAGLE	1	8.86	1	3	4.47	0.12	1.45
EAGLE	1	8.86	1	4	1.37	0.00	1.97
EAGLE	1	8.86	1	5	2.44	0.00	1.24
EAGLE	1	8.86	1	6	4.06	0.00	1.66
EAGLE	1	8.86	1	7	6.02	0.00	9.10
EAGLE	1	8.86	2	1	12.52	0.00	2.55
EAGLE	1	8.86	2	2	6.61	0.00	2.11
EAGLE	1	8.86	2	3	5.41	0.00	2.00
EAGLE	1	8.86	2	4	3.80	0.00	1.90
EAGLE	1	8.86	2	5	2.99	0.00	1.40
EAGLE	1	8.86	2	6	4.16	0.00	2.27
EAGLE	1	8.86	2	7	7.26	0.00	10.80
EAGLE	1	8.86	3	1	12.68	0.12	2.64
EAGLE	1	8.86	3	2	6.10	0.00	1.97
EAGLE	1	8.86	3	3	5.82	0.12	2.00
EAGLE	1	8.86	3	4	3.40	0.00	1.90
EAGLE	1	8.86	3	5	3.46	0.00	1.41
EAGLE	1	8.86	3	6	4.98	0.00	2.28
EAGLE	1	8.86	3	7	6.42	0.00	10.59

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

<u>VARIETY</u>	<u>MATERIAL</u>	<u>MOISTURE</u> <u>CONTENT</u>	<u>REP</u>	<u>PCS</u>	<u>GRAIN</u> <u>WEIGHT</u>	<u>UNTHRESHED</u> <u>GRAIN WT.</u>	<u>MOG</u> <u>WEIGHT</u>
EAGLE	2	8.12	1	1	10.16	0.00	2.26
EAGLE	2	8.12	1	2	6.11	0.00	1.61
EAGLE	2	8.12	1	3	4.94	0.00	1.69
EAGLE	2	8.12	1	4	3.37	0.00	1.37
EAGLE	2	8.12	1	5	2.76	0.00	1.13
EAGLE	2	8.12	1	6	3.93	0.00	1.47
EAGLE	2	8.12	1	7	6.46	0.00	11.53
EAGLE	2	8.12	2	1	9.32	0.20	1.84
EAGLE	2	8.12	2	2	5.40	0.00	1.60
EAGLE	2	8.12	2	3	3.88	0.00	1.55
EAGLE	2	8.12	2	4	3.08	0.00	1.38
EAGLE	2	8.12	2	5	3.03	0.00	1.17
EAGLE	2	8.12	2	6	4.49	0.00	1.87
EAGLE	2	8.12	2	7	6.44	0.00	10.31
EAGLE	2	8.12	3	1	9.38	0.11	2.22
EAGLE	2	8.12	3	2	5.79	0.00	1.53
EAGLE	2	8.12	3	3	3.75	0.00	1.37
EAGLE	2	8.12	3	4	3.28	0.00	1.45
EAGLE	2	8.12	3	5	1.89	0.00	1.19
EAGLE	2	8.12	3	6	4.07	0.00	1.76
EAGLE	2	8.12	3	7	6.63	0.00	10.30

RECCONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	3	6.60	1	1	9.82	0.00	2.43
EAGLE	3	6.60	1	2	4.74	0.00	1.58
EAGLE	3	6.60	1	3	3.36	0.00	1.24
EAGLE	3	6.60	1	4	2.56	0.00	1.13
EAGLE	3	6.60	1	5	1.68	0.00	0.75
EAGLE	3	6.60	1	6	3.10	0.00	1.34
EAGLE	3	6.60	1	7	5.34	0.00	9.00
EAGLE	3	6.60	2	1	6.63	0.00	2.16
EAGLE	3	6.60	2	2	3.25	0.00	1.41
EAGLE	3	6.60	2	3	3.33	0.00	1.04
EAGLE	3	6.60	2	4	1.96	0.00	0.87
EAGLE	3	6.60	2	5	0.93	0.00	0.83
EAGLE	3	6.60	2	6	2.46	0.00	1.25
EAGLE	3	6.60	2	7	3.61	0.00	7.52
EAGLE	3	6.60	3	1	8.25	0.00	2.30
EAGLE	3	6.60	3	2	4.05	0.00	1.55
EAGLE	3	6.60	3	3	3.20	0.00	1.00
EAGLE	3	6.60	3	4	2.30	0.00	1.05
EAGLE	3	6.60	3	5	1.25	0.00	0.81
EAGLE	3	6.60	3	6	2.85	0.00	1.33
EAGLE	3	6.60	3	7	4.50	0.00	8.37

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	1	15.34	1	1	9.46	0.04	1.91
PARKER	1	15.34	1	2	3.44	0.00	1.37
PARKER	1	15.34	1	3	3.13	0.00	1.04
PARKER	1	15.34	1	4	2.52	0.00	1.12
PARKER	1	15.34	1	5	1.79	0.00	0.85
PARKER	1	15.34	1	6	2.66	0.00	1.43
PAPKER	1	15.34	1	7	4.50	0.00	12.74
PARKER	1	15.34	2	1	8.87	0.07	2.05
PARKER	1	15.34	2	2	4.32	0.00	1.42
PARKER	1	15.34	2	3	3.61	0.00	1.57
PARKER	1	15.34	2	4	2.53	0.00	1.08
PARKER	1	15.34	2	5	2.11	0.00	0.96
PARKER	1	15.34	2	6	3.55	0.00	1.50
PARKER	1	15.34	2	7	6.08	0.00	13.85
PARKER	1	15.34	3	1	7.09	0.07	1.77
PARKER	1	15.34	3	2	4.14	0.08	1.37
PARKER	1	15.34	3	3	3.30	0.05	1.15
PARKER	1	15.34	3	4	2.68	0.00	1.22
PARKER	1	15.34	3	5	2.06	0.00	0.92
PARKER	1	15.34	3	6	3.57	0.00	1.36
PARKER	1	15.34	3	7	5.01	0.00	10.18

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	2	21.72	1	1	10.93	0.00	0.91
PARKER	2	21.72	1	2	4.11	0.00	1.01
PARKER	2	21.72	1	3	3.63	0.00	0.73
PARKER	2	21.72	1	4	1.96	0.00	0.75
PARKER	2	21.72	1	5	1.82	0.00	0.57
PARKER	2	21.72	1	6	2.34	0.00	0.90
PARKER	2	21.72	1	7	3.70	0.00	12.20
PARKER	2	21.72	2	1	9.46	0.09	0.83
PARKER	2	21.72	2	2	5.39	0.00	0.69
PARKER	2	21.72	2	3	3.18	0.00	0.72
PARKER	2	21.72	2	4	2.54	0.04	0.65
PARKER	2	21.72	2	5	1.83	0.00	0.50
PARKER	2	21.72	2	6	2.73	0.00	0.85
PARKER	2	21.72	2	7	5.55	0.00	15.50
PARKER	2	21.72	3	1	8.91	0.00	0.72
PARKER	2	21.72	3	2	5.09	0.09	0.64
PARKER	2	21.72	3	3	3.42	0.00	0.74
PARKER	2	21.72	3	4	2.27	0.00	0.77
PARKER	2	21.72	3	5	1.49	0.00	0.49
PARKER	2	21.72	3	6	2.68	0.00	0.92
PARKER	2	21.72	3	7	5.18	0.00	14.70

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	3	12.16	1	1	9.36	0.03	1.56
PARKER	3	12.16	1	2	5.00	0.00	1.22
PARKER	3	12.16	1	3	3.14	0.00	1.14
PARKER	3	12.16	1	4	3.08	0.00	0.94
PARKER	3	12.16	1	5	2.35	0.00	0.78
PARKER	3	12.16	1	6	3.23	0.00	1.15
PARKER	3	12.16	1	7	4.76	0.00	12.21
PARKER	3	12.16	2	1	6.52	0.02	1.35
PARKER	3	12.16	2	2	2.95	0.00	0.88
PARKER	3	12.16	2	3	2.20	0.00	0.70
PARKER	3	12.16	2	4	1.07	0.00	0.72
PARKER	3	12.16	2	5	1.28	0.00	0.64
PARKER	3	12.16	2	6	2.05	0.00	0.71
PARKER	3	12.16	2	7	2.82	0.00	9.97
PARKER	3	12.16	3	1	6.16	0.06	1.26
PARKER	3	12.16	3	2	2.97	0.00	0.91
PARKER	3	12.16	3	3	1.98	0.00	0.91
PARKER	3	12.16	3	4	1.81	0.00	0.68
PARKER	3	12.16	3	5	1.58	0.00	0.59
PARKER	3	12.16	3	6	1.90	0.00	0.84
PARKER	3	12.16	3	7	3.44	0.00	9.11

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	1	20.98	1	1	12.16	0.00	0.77
CENTURK	1	20.98	1	2	6.89	0.00	0.68
CENTURK	1	20.98	1	3	4.70	0.00	0.63
CENTURK	1	20.98	1	4	3.23	0.00	0.70
CENTURK	1	20.98	1	5	2.32	0.00	0.53
CENTURK	1	20.98	1	6	3.35	0.00	0.91
CENTURK	1	20.98	1	7	6.30	0.00	15.35
CENTURK	1	20.98	2	1	16.00	0.00	1.49
CENTURK	1	20.98	2	2	7.09	0.00	0.82
CENTURK	1	20.98	2	3	5.22	0.00	0.69
CENTURK	1	20.98	2	4	3.33	0.00	0.85
CENTURK	1	20.98	2	5	2.38	0.00	0.52
CENTURK	1	20.98	2	6	3.11	0.00	0.99
CENTURK	1	20.98	2	7	6.38	0.00	14.91
CENTURK	1	20.98	3	1	13.13	0.00	0.92
CENTURK	1	20.98	3	2	6.25	0.00	1.07
CENTURK	1	20.98	3	3	4.66	0.00	0.73
CENTURK	1	20.98	3	4	3.24	0.00	0.86
CENTURK	1	20.98	3	5	2.38	0.00	0.69
CENTURK	1	20.98	3	6	3.82	0.00	1.11
CENTURK	1	20.98	3	7	5.88	0.00	15.86

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	2	11.81	1	1	9.83	0.38	1.33
CENTURK	2	11.81	1	2	4.31	0.00	0.86
CENTURK	2	11.81	1	3	3.76	0.00	0.86
CENTURK	2	11.81	1	4	3.28	0.00	0.74
CENTURK	2	11.81	1	5	2.16	0.00	0.62
CENTURK	2	11.81	1	6	3.00	0.00	0.93
CENTURK	2	11.81	1	7	4.97	0.00	11.18
CENTURK	2	11.81	2	1	10.93	0.13	1.39
CENTURK	2	11.81	2	2	4.64	0.00	1.12
CENTURK	2	11.81	2	3	4.16	0.00	1.04
CENTURK	2	11.81	2	4	2.55	0.00	1.02
CENTURK	2	11.81	2	5	2.42	0.00	0.78
CENTURK	2	11.81	2	6	3.72	0.00	1.12
CENTURK	2	11.81	2	7	5.34	0.00	12.92
CENTURK	2	11.81	3	1	7.76	0.08	1.09
CENTURK	2	11.81	3	2	3.36	0.00	0.78
CENTURK	2	11.81	3	3	2.82	0.02	0.77
CENTURK	2	11.81	3	4	1.91	0.00	0.77
CENTURK	2	11.81	3	5	2.27	0.00	0.60
CENTURK	2	11.81	3	6	2.54	0.00	0.84
CENTURK	2	11.81	3	7	4.04	0.00	9.81

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	3	10.62	1	1	7.75	0.00	1.45
CENTURK	3	10.62	1	2	4.14	0.00	1.13
CENTURK	3	10.62	1	3	3.30	0.06	0.94
CENTURK	3	10.62	1	4	2.68	0.00	0.76
CENTURK	3	10.62	1	5	1.90	0.00	0.72
CENTURK	3	10.62	1	6	2.70	0.00	1.00
CENTURK	3	10.62	1	7	4.46	0.00	10.17
CENTURK	3	10.62	2	1	8.45	0.02	1.45
CENTURK	3	10.62	2	2	4.99	0.00	1.17
CENTURK	3	10.62	2	3	3.52	0.00	0.96
CENTURK	3	10.62	2	4	2.40	0.00	0.88
CENTURK	3	10.62	2	5	2.33	0.00	0.73
CENTURK	3	10.62	2	6	2.21	0.00	0.90
CENTURK	3	10.62	2	7	4.02	0.00	10.37
CENTURK	3	10.62	3	1	8.05	0.00	1.78
CENTURK	3	10.62	3	2	3.54	0.00	1.06
CENTURK	3	10.62	3	3	2.62	0.00	1.02
CENTURK	3	10.62	3	4	2.60	0.00	0.80
CENTURK	3	10.62	3	5	1.13	0.00	0.51
CENTURK	3	10.62	3	6	2.07	0.00	0.82
CENTURK	3	10.62	3	7	3.56	0.00	9.73

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	1	14.46	1	1	10.86	0.15	1.26
EAGLE	1	14.46	1	2	6.08	0.08	1.38
EAGLE	1	14.46	1	3	4.38	0.00	1.02
EAGLE	1	14.46	1	4	3.01	0.04	0.93
EAGLE	1	14.46	1	5	3.20	0.02	1.00
EAGLE	1	14.46	1	6	3.92	0.00	1.38
EAGLE	1	14.46	1	7	7.04	0.00	16.47
EAGLE	1	14.46	2	1	12.69	0.06	1.36
EAGLE	1	14.46	2	2	7.78	0.08	1.27
EAGLE	1	14.46	2	3	5.36	0.10	0.88
EAGLE	1	14.46	2	4	3.58	0.03	1.05
EAGLE	1	14.46	2	5	2.40	0.00	0.82
EAGLE	1	14.46	2	6	3.47	0.05	1.47
EAGLE	1	14.46	2	7	9.20	0.00	21.90
EAGLE	1	14.46	3	1	13.64	0.08	1.21
EAGLE	1	14.46	3	2	6.34	0.02	1.21
EAGLE	1	14.46	3	3	4.55	0.00	0.90
EAGLE	1	14.46	3	4	3.14	0.00	1.22
EAGLE	1	14.46	3	5	3.05	0.00	0.76
EAGLE	1	14.46	3	6	3.52	0.00	1.25
EAGLE	1	14.46	3	7	8.52	0.00	17.89

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATERIAL	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	2	11.07	1	1	11.10	0.31	1.70
EAGLE	2	11.07	1	2	5.55	0.00	1.25
EAGLE	2	11.07	1	3	4.43	0.08	1.21
EAGLE	2	11.07	1	4	3.39	0.00	0.99
EAGLE	2	11.07	1	5	2.27	0.00	0.96
EAGLE	2	11.07	1	6	3.90	0.06	1.35
EAGLE	2	11.07	1	7	6.30	0.00	12.89
EAGLE	2	11.07	2	1	10.45	0.00	1.80
EAGLE	2	11.07	2	2	4.51	0.00	1.25
EAGLE	2	11.07	2	3	4.27	0.00	1.15
EAGLE	2	11.07	2	4	3.56	0.00	1.06
EAGLE	2	11.07	2	5	3.12	0.00	0.84
EAGLE	2	11.07	2	6	2.70	0.00	1.40
EAGLE	2	11.07	2	7	5.51	0.00	10.62
EAGLE	2	11.07	3	1	9.62	0.00	1.64
EAGLE	2	11.07	3	2	4.76	0.00	1.14
EAGLE	2	11.07	3	3	3.38	0.06	1.33
EAGLE	2	11.07	3	4	3.00	0.00	1.05
EAGLE	2	11.07	3	5	1.93	0.00	0.93
EAGLE	2	11.07	3	6	3.20	0.00	1.28
EAGLE	2	11.07	3	7	5.42	0.00	12.62

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	3	11.11	1	1	10.30	0.10	1.51
EAGLE	3	11.11	1	2	4.44	0.00	1.14
EAGLE	3	11.11	1	3	3.48	0.00	0.94
EAGLE	3	11.11	1	4	2.59	0.00	0.88
EAGLE	3	11.11	1	5	2.36	0.00	0.86
EAGLE	3	11.11	1	6	2.88	0.00	1.18
EAGLE	3	11.11	1	7	5.22	0.00	11.47
EAGLE	3	11.11	2	1	9.31	0.00	1.85
EAGLE	3	11.11	2	2	4.24	0.00	1.36
EAGLE	3	11.11	2	3	3.73	0.04	1.13
EAGLE	3	11.11	2	4	3.06	0.00	1.14
EAGLE	3	11.11	2	5	2.09	0.00	0.83
EAGLE	3	11.11	2	6	3.06	0.00	1.23
EAGLE	3	11.11	2	7	5.69	0.06	12.73
EAGLE	3	11.11	3	1	8.43	0.00	1.88
EAGLE	3	11.11	3	2	4.80	0.00	1.03
EAGLE	3	11.11	3	3	3.65	0.00	1.14
EAGLE	3	11.11	3	4	2.55	0.00	0.93
EAGLE	3	11.11	3	5	1.57	0.00	0.77
EAGLE	3	11.11	3	6	3.09	0.00	1.11
EAGLE	3	11.11	3	7	5.24	0.00	9.89

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	1	23.08	1	1	10.65	0.13	0.94
PARKER	1	23.08	1	2	3.43	0.05	1.03
PARKER	1	23.08	1	3	2.11	0.00	0.74
PARKER	1	23.08	1	4	2.06	0.00	0.89
PARKER	1	23.08	1	5	1.66	0.00	0.66
PARKER	1	23.08	1	6	2.66	0.00	0.96
PARKER	1	23.08	1	7	4.29	0.00	12.24
PARKER	1	23.08	2	1	11.27	0.00	1.12
PARKER	1	23.08	2	2	4.40	0.00	0.89
PARKER	1	23.08	2	3	2.95	0.00	0.88
PARKER	1	23.08	2	4	2.06	0.00	0.81
PARKER	1	23.08	2	5	1.86	0.00	0.56
PARKER	1	23.08	2	6	2.53	0.00	1.09
PARKER	1	23.08	2	7	4.96	0.00	14.38
PARKER	1	23.08	3	1	12.19	0.00	0.97
PARKER	1	23.08	3	2	4.39	0.00	1.00
PARKER	1	23.08	3	3	3.10	0.00	0.86
PARKER	1	23.08	3	4	2.00	0.00	0.76
PARKER	1	23.08	3	5	1.87	0.00	0.60
PARKER	1	23.08	3	6	2.79	0.00	0.95
PARKER	1	23.08	3	7	3.72	0.00	13.85

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	2	24.59	1	1	9.19	0.13	0.93
PARKER	2	24.59	1	2	4.03	0.08	1.10
PARKER	2	24.59	1	3	2.84	0.00	0.80
PARKER	2	24.59	1	4	2.26	0.06	0.87
PARKER	2	24.59	1	5	1.70	0.00	0.66
PARKER	2	24.59	1	6	2.43	0.00	0.89
PARKER	2	24.59	1	7	4.46	0.00	14.10
PARKER	2	24.59	2	1	7.75	0.14	0.97
PARKER	2	24.59	2	2	3.84	0.16	0.96
PARKER	2	24.59	2	3	2.59	0.00	0.85
PARKER	2	24.59	2	4	2.31	0.00	0.97
PARKER	2	24.59	2	5	1.49	0.00	0.50
PARKER	2	24.59	2	6	2.24	0.00	0.80
PARKER	2	24.59	2	7	3.68	0.00	13.04
PARKER	2	24.59	3	1	8.97	0.00	0.73
PARKER	2	24.59	3	2	4.48	0.00	0.80
PARKER	2	24.59	3	3	3.34	0.00	0.86
PARKER	2	24.59	3	4	2.29	0.00	0.75
PARKER	2	24.59	3	5	2.22	0.00	0.73
PARKER	2	24.59	3	6	2.58	0.00	1.30
PARKER	2	24.59	3	7	6.12	0.00	15.28

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	3	13.21	1	1	5.43	0.10	1.27
PARKER	3	13.21	1	2	2.46	0.00	0.74
PARKER	3	13.21	1	3	1.98	0.02	0.81
PARKER	3	13.21	1	4	1.49	0.00	0.63
PARKER	3	13.21	1	5	1.31	0.00	0.65
PARKER	3	13.21	1	6	1.75	0.00	0.75
PARKER	3	13.21	1	7	2.50	0.00	9.62
PARKER	3	13.21	2	1	7.01	0.00	1.84
PARKER	3	13.21	2	2	2.43	0.00	1.08
PARKER	3	13.21	2	3	1.68	0.00	0.85
PARKER	3	13.21	2	4	1.67	0.00	0.93
PARKER	3	13.21	2	5	1.60	0.00	0.52
PARKER	3	13.21	2	6	1.95	0.00	0.92
PARKER	3	13.21	2	7	3.79	0.00	10.67
PARKER	3	13.21	3	1	8.92	0.00	1.64
PARKER	3	13.21	3	2	4.06	0.00	1.16
PARKER	3	13.21	3	3	2.62	0.00	0.92
PARKER	3	13.21	3	4	1.91	0.00	0.79
PARKER	3	13.21	3	5	1.54	0.00	0.71
PARKER	3	13.21	3	6	2.47	0.00	1.20
PARKER	3	13.21	3	7	3.83	0.00	11.93

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	1	23.75	1	1	15.40	0.17	0.80
CENTURK	1	23.75	1	2	7.29	0.00	0.67
CENTURK	1	23.75	1	3	4.70	0.00	0.70
CENTURK	1	23.75	1	4	3.54	0.00	0.66
CENTURK	1	23.75	1	5	2.31	0.00	0.62
CENTURK	1	23.75	1	6	2.88	0.00	0.98
CENTURK	1	23.75	1	7	7.98	0.00	15.20
CENTURK	1	23.75	2	1	14.08	0.10	0.76
CENTURK	1	23.75	2	2	6.77	0.09	0.80
CENTURK	1	23.75	2	3	5.65	0.03	0.70
CENTURK	1	23.75	2	4	3.81	0.00	0.77
CENTURK	1	23.75	2	5	3.14	0.00	0.73
CENTURK	1	23.75	2	6	3.90	0.05	1.12
CENTURK	1	23.75	2	7	7.79	0.00	15.88
CENTURK	1	23.75	3	1	18.51	0.08	0.81
CENTURK	1	23.75	3	2	7.29	0.00	0.71
CENTURK	1	23.75	3	3	5.40	0.00	0.83
CENTURK	1	23.75	3	4	3.65	0.00	0.80
CENTURK	1	23.75	3	5	2.36	0.00	0.62
CENTURK	1	23.75	3	6	3.19	0.00	0.99
CENTURK	1	23.75	3	7	5.13	0.00	16.17

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PQS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	2	23.10	1	1	10.08	0.44	0.78
CENTURK	2	23.10	1	2	7.12	0.25	0.73
CENTURK	2	23.10	1	3	4.63	0.23	0.81
CENTURK	2	23.10	1	4	3.19	0.19	0.79
CENTURK	2	23.10	1	5	2.51	0.00	0.66
CENTURK	2	23.10	1	6	3.31	0.00	0.99
CENTURK	2	23.10	1	7	6.87	0.13	15.81
CENTURK	2	23.10	2	1	10.50	0.00	0.78
CENTURK	2	23.10	2	2	4.43	0.00	0.58
CENTURK	2	23.10	2	3	3.16	0.00	0.53
CENTURK	2	23.10	2	4	2.56	0.00	0.36
CENTURK	2	23.10	2	5	1.45	0.00	0.29
CENTURK	2	23.10	2	6	2.40	0.00	0.67
CENTURK	2	23.10	2	7	5.80	0.00	11.90
CENTURK	2	23.10	3	1	10.22	0.47	0.67
CENTURK	2	23.10	3	2	4.80	0.07	0.62
CENTURK	2	23.10	3	3	3.04	0.10	0.66
CENTURK	2	23.10	3	4	3.13	0.00	0.47
CENTURK	2	23.10	3	5	1.90	0.00	0.47
CENTURK	2	23.10	3	6	2.86	0.00	0.66
CENTURK	2	23.10	3	7	5.48	0.00	11.78

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	3	18.21	1	1	11.26	0.04	0.96
CENTURK	3	18.21	1	2	4.74	0.00	0.79
CENTURK	3	18.21	1	3	3.40	0.00	0.64
CENTURK	3	18.21	1	4	2.27	0.00	0.60
CENTURK	3	18.21	1	5	1.76	0.00	0.42
CENTURK	3	18.21	1	6	2.42	0.00	0.67
CENTURK	3	18.21	1	7	4.18	0.00	9.64
CENTURK	3	18.21	2	1	11.73	0.00	1.07
CENTURK	3	18.21	2	2	6.02	0.00	0.74
CENTURK	3	18.21	2	3	4.57	0.00	0.57
CENTURK	3	18.21	2	4	3.39	0.00	0.59
CENTURK	3	18.21	2	5	2.54	0.00	0.66
CENTURK	3	18.21	2	6	3.56	0.00	0.77
CENTURK	3	18.21	2	7	5.91	0.00	12.26
CENTURK	3	18.21	3	1	13.00	0.16	1.04
CENTURK	3	18.21	3	2	4.50	0.00	0.85
CENTURK	3	18.21	3	3	3.36	0.00	0.66
CENTURK	3	18.21	3	4	3.26	0.00	0.63
CENTURK	3	18.21	3	5	1.33	0.00	0.40
CENTURK	3	18.21	3	6	2.79	0.00	0.78
CENTURK	3	18.21	3	7	5.25	0.03	12.81

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	1	23.05	1	1	10.78	0.15	0.60
EAGLE	1	23.05	1	2	1.95	0.00	0.57
EAGLE	1	23.05	1	3	4.86	0.00	0.69
EAGLE	1	23.05	1	4	3.99	0.00	0.76
EAGLE	1	23.05	1	5	6.26	0.04	0.62
EAGLE	1	23.05	1	6	3.11	0.00	0.96
EAGLE	1	23.05	1	7	5.44	0.00	20.58
EAGLE	1	23.05	2	1	15.30	0.10	0.77
EAGLE	1	23.05	2	2	6.92	0.02	0.70
EAGLE	1	23.05	2	3	5.78	0.00	0.76
EAGLE	1	23.05	2	4	3.98	0.00	0.64
EAGLE	1	23.05	2	5	2.14	0.00	0.53
EAGLE	1	23.05	2	6	3.96	0.00	0.89
EAGLE	1	23.05	2	7	7.01	0.00	19.25
EAGLE	1	23.05	3	1	11.50	0.18	0.53
EAGLE	1	23.05	3	2	6.19	0.04	0.54
EAGLE	1	23.05	3	3	5.23	0.00	0.62
EAGLE	1	23.05	3	4	3.20	0.00	0.61
EAGLE	1	23.05	3	5	3.56	0.00	0.50
EAGLE	1	23.05	3	6	3.60	0.00	0.76
EAGLE	1	23.05	3	7	8.49	0.00	20.40

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	2	17.70	1	1	8.43	0.25	0.61
EAGLE	2	17.70	1	2	5.60	0.04	0.65
EAGLE	2	17.70	1	3	4.23	0.00	0.71
EAGLE	2	17.70	1	4	3.09	0.03	0.58
EAGLE	2	17.70	1	5	2.53	0.00	0.40
EAGLE	2	17.70	1	6	3.00	0.05	0.73
EAGLE	2	17.70	1	7	5.85	0.00	16.86
EAGLE	2	17.70	2	1	12.99	0.00	0.77
EAGLE	2	17.70	2	2	6.89	0.00	0.63
EAGLE	2	17.70	2	3	4.38	0.00	0.66
EAGLE	2	17.70	2	4	4.01	0.00	0.68
EAGLE	2	17.70	2	5	3.00	0.00	0.52
EAGLE	2	17.70	2	6	3.62	0.00	0.90
EAGLE	2	17.70	2	7	6.81	0.00	18.04
EAGLE	2	17.70	3	1	7.34	0.16	0.43
EAGLE	2	17.70	3	2	4.91	0.00	0.46
EAGLE	2	17.70	3	3	3.91	0.00	0.54
EAGLE	2	17.70	3	4	3.30	0.00	0.43
EAGLE	2	17.70	3	5	2.81	0.00	0.38
EAGLE	2	17.70	3	6	3.57	0.00	0.65
EAGLE	2	17.70	3	7	6.64	0.00	18.23

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	3	20.79	1	1	10.69	0.36	0.74
EAGLE	3	20.79	1	2	5.69	0.39	0.72
EAGLE	3	20.79	1	3	4.21	0.06	0.71
EAGLE	3	20.79	1	4	3.35	0.08	0.71
EAGLE	3	20.79	1	5	2.75	0.01	0.67
EAGLE	3	20.79	1	6	2.84	0.07	0.94
EAGLE	3	20.79	1	7	5.32	0.09	15.00
EAGLE	3	20.79	2	1	8.46	0.34	0.86
EAGLE	3	20.79	2	2	5.19	1.40	0.72
EAGLE	3	20.79	2	3	4.34	0.00	0.60
EAGLE	3	20.79	2	4	3.00	0.00	0.64
EAGLE	3	20.79	2	5	2.39	0.00	0.54
EAGLE	3	20.79	2	6	3.28	0.00	0.78
EAGLE	3	20.79	2	7	5.68	0.00	14.68
EAGLE	3	20.79	3	1	10.60	0.20	0.80
EAGLE	3	20.79	3	2	5.22	0.00	0.72
EAGLE	3	20.79	3	3	3.25	0.00	0.62
EAGLE	3	20.79	3	4	2.95	0.00	0.56
EAGLE	3	20.79	3	5	2.11	0.00	0.45
EAGLE	3	20.79	3	6	3.35	0.00	0.73
EAGLE	3	20.79	3	7	5.34	0.00	17.80

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	1	28.19	1	1	10.11	0.00	0.77
PARKER	1	28.19	1	2	4.97	0.00	0.76
PARKER	1	28.19	1	3	3.43	0.00	0.77
PARKER	1	28.19	1	4	2.05	0.00	0.83
PARKER	1	28.19	1	5	2.14	0.00	0.67
PARKER	1	28.19	1	6	2.23	0.00	1.03
PARKER	1	28.19	1	7	5.03	0.00	16.46
PARKER	1	28.19	2	1	13.60	0.00	1.28
PARKER	1	28.19	2	2	5.29	0.00	1.07
PARKER	1	28.19	2	3	3.63	0.00	1.09
PARKER	1	28.19	2	4	2.29	0.00	1.17
PARKER	1	28.19	2	5	1.64	0.00	0.74
PARKER	1	28.19	2	6	2.59	0.00	1.19
PARKER	1	28.19	2	7	4.11	0.00	14.66
PARKER	1	28.19	3	1	9.36	0.00	0.80
PARKER	1	28.19	3	2	4.54	0.00	0.81
PARKER	1	28.19	3	3	2.99	0.00	0.68
PARKER	1	28.19	3	4	2.05	0.00	0.66
PARKER	1	28.19	3	5	2.11	0.00	0.67
PARKER	1	28.19	3	6	2.96	0.00	0.99
PARKER	1	28.19	3	7	5.32	0.00	13.20

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	BEP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	2	19.97	1	1	8.24	0.12	0.95
PARKER	2	19.97	1	2	3.85	0.00	0.88
PARKER	2	19.97	1	3	3.17	0.08	0.87
PARKER	2	19.97	1	4	1.45	0.00	0.82
PARKER	2	19.97	1	5	1.62	0.00	0.57
PARKER	2	19.97	1	6	2.06	0.00	0.84
PARKER	2	19.97	1	7	3.02	0.00	10.79
PARKER	2	19.97	2	1	9.01	0.14	1.02
PARKER	2	19.97	2	2	3.32	0.00	0.88
PARKER	2	19.97	2	3	2.60	0.00	0.80
PARKER	2	19.97	2	4	1.75	0.00	0.75
PARKER	2	19.97	2	5	0.65	0.00	0.67
PARKER	2	19.97	2	6	1.65	0.00	0.92
PARKER	2	19.97	2	7	3.20	0.00	14.57
PARKER	2	19.97	3	1	8.80	0.10	1.10
PARKER	2	19.97	3	2	3.79	0.00	0.96
PARKER	2	19.97	3	3	3.25	0.14	0.76
PARKER	2	19.97	3	4	2.12	0.00	0.84
PARKER	2	19.97	3	5	1.80	0.35	0.65
PARKER	2	19.97	3	6	2.69	0.00	0.99
PARKER	2	19.97	3	7	3.99	0.00	16.17

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	3	16.89	1	1	8.89	0.00	1.07
PARKER	3	16.89	1	2	4.28	0.00	0.92
PARKER	3	16.89	1	3	2.27	0.00	0.91
PARKER	3	16.89	1	4	2.25	0.00	0.89
PARKER	3	16.89	1	5	1.62	0.00	0.60
PARKER	3	16.89	1	6	2.09	0.00	0.86
PARKER	3	16.89	1	7	4.36	0.00	11.54
PARKER	3	16.89	2	1	9.77	0.22	1.11
PARKER	3	16.89	2	2	3.64	0.00	1.10
PARKER	3	16.89	2	3	2.77	0.00	0.97
PARKER	3	16.89	2	4	1.90	0.00	0.65
PARKER	3	16.89	2	5	1.58	0.00	0.48
PARKER	3	16.89	2	6	1.52	0.00	0.74
PARKER	3	16.89	2	7	2.69	0.00	7.70
PARKER	3	16.89	3	1	7.42	0.00	0.82
PARKER	3	16.89	3	2	3.26	0.00	0.86
PARKER	3	16.89	3	3	2.23	0.00	0.59
PARKER	3	16.89	3	4	1.74	0.00	0.67
PARKER	3	16.89	3	5	1.48	0.00	0.53
PARKER	3	16.89	3	6	2.05	0.01	0.74
PARKER	3	16.89	3	7	3.33	0.00	10.96

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	1	25.36	1	1	9.07	0.09	0.58
CENTURK	1	25.36	1	2	5.85	0.00	0.58
CENTURK	1	25.36	1	3	4.58	0.00	0.62
CENTURK	1	25.36	1	4	2.68	0.00	0.55
CENTURK	1	25.36	1	5	2.81	0.00	0.57
CENTURK	1	25.36	1	6	2.89	0.00	0.85
CENTURK	1	25.36	1	7	5.94	0.00	13.65
CENTURK	1	25.36	2	1	8.23	0.10	0.70
CENTURK	1	25.36	2	2	5.79	0.00	0.64
CENTURK	1	25.36	2	3	4.68	0.00	0.70
CENTURK	1	25.36	2	4	3.56	0.00	0.61
CENTURK	1	25.36	2	5	3.28	0.07	0.52
CENTURK	1	25.36	2	6	4.43	0.00	0.87
CENTURK	1	25.36	2	7	9.76	0.00	17.33
CENTURK	1	25.36	3	1	7.43	0.24	0.74
CENTURK	1	25.36	3	2	5.49	0.00	0.70
CENTURK	1	25.36	3	3	4.66	0.00	0.60
CENTURK	1	25.36	3	4	3.02	0.00	0.58
CENTURK	1	25.36	3	5	2.18	0.00	0.52
CENTURK	1	25.36	3	6	3.35	0.00	0.75
CENTURK	1	25.36	3	7	8.13	0.00	15.57

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	2	17.95	1	1	12.90	0.17	0.82
CENTURK	2	17.95	1	2	4.55	0.00	0.63
CENTURK	2	17.95	1	3	2.70	0.00	0.54
CENTURK	2	17.95	1	4	2.98	0.00	0.52
CENTURK	2	17.95	1	5	1.92	0.00	0.39
CENTURK	2	17.95	1	6	2.47	0.00	0.58
CENTURK	2	17.95	1	7	4.27	0.00	11.48
CENTURK	2	17.95	2	1	14.96	0.10	0.76
CENTURK	2	17.95	2	2	5.78	0.09	1.30
CENTURK	2	17.95	2	3	4.70	0.03	0.67
CENTURK	2	17.95	2	4	2.96	0.00	0.63
CENTURK	2	17.95	2	5	1.89	0.00	0.65
CENTURK	2	17.95	2	6	3.17	0.05	1.07
CENTURK	2	17.95	2	7	4.42	0.00	13.30
CENTURK	2	17.95	3	1	9.59	0.08	0.72
CENTURK	2	17.95	3	2	5.07	0.00	0.73
CENTURK	2	17.95	3	3	3.69	0.00	0.72
CENTURK	2	17.95	3	4	2.82	0.00	0.65
CENTURK	2	17.95	3	5	2.25	0.00	0.55
CENTURK	2	17.95	3	6	3.44	0.00	0.87
CENTURK	2	17.95	3	7	7.54	0.00	13.97

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	3	17.66	1	1	11.45	0.00	1.39
CENTURK	3	17.66	1	2	4.39	0.00	0.95
CENTURK	3	17.66	1	3	2.88	0.00	0.95
CENTURK	3	17.66	1	4	2.59	0.00	0.83
CENTURK	3	17.66	1	5	1.79	0.00	0.54
CENTURK	3	17.66	1	6	2.25	0.00	0.90
CENTURK	3	17.66	1	7	3.53	0.00	10.66
CENTURK	3	17.66	2	1	12.88	0.51	1.28
CENTURK	3	17.66	2	2	4.96	0.27	1.08
CENTURK	3	17.66	2	3	4.11	0.32	0.84
CENTURK	3	17.66	2	4	2.81	0.00	0.83
CENTURK	3	17.66	2	5	2.29	0.00	0.56
CENTURK	3	17.66	2	6	2.49	0.06	0.88
CENTURK	3	17.66	2	7	2.38	0.14	11.63
CENTURK	3	17.66	3	1	12.66	0.00	1.81
CENTURK	3	17.66	3	2	5.50	0.00	1.06
CENTURK	3	17.66	3	3	3.82	0.00	0.84
CENTURK	3	17.66	3	4	2.51	0.00	0.83
CENTURK	3	17.66	3	5	1.48	0.00	0.65
CENTURK	3	17.66	3	6	2.30	0.00	0.78
CENTURK	3	17.66	3	7	4.53	0.00	10.61

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	1	29.46	1	1	9.65	0.00	0.60
EAGLE	1	29.46	1	2	6.95	0.00	0.72
EAGLE	1	29.46	1	3	5.16	0.00	0.84
EAGLE	1	29.46	1	4	3.47	0.00	0.65
EAGLE	1	29.46	1	5	3.59	0.00	0.47
EAGLE	1	29.46	1	6	4.28	0.00	0.90
EAGLE	1	29.46	1	7	7.87	0.00	20.93
EAGLE	1	29.46	2	1	9.77	0.17	0.33
EAGLE	1	29.46	2	2	6.44	0.28	0.44
EAGLE	1	29.46	2	3	4.87	0.16	0.62
EAGLE	1	29.46	2	4	3.50	0.05	0.41
EAGLE	1	29.46	2	5	3.27	0.00	0.51
EAGLE	1	29.46	2	6	4.40	0.09	0.72
EAGLE	1	29.46	2	7	7.62	0.19	21.59
EAGLE	1	29.46	3	1	11.05	0.00	0.79
EAGLE	1	29.46	3	2	2.12	0.00	0.70
EAGLE	1	29.46	3	3	4.00	0.00	0.75
EAGLE	1	29.46	3	4	3.86	0.00	0.67
EAGLE	1	29.46	3	5	3.04	0.00	0.61
EAGLE	1	29.46	3	6	4.12	0.00	0.73
EAGLE	1	29.46	3	7	6.82	0.00	17.65

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	2	25.89	1	1	10.53	0.00	0.79
EAGLE	2	25.89	1	2	6.43	0.00	0.70
EAGLE	2	25.89	1	3	4.40	0.00	0.75
EAGLE	2	25.89	1	4	2.71	0.00	0.67
EAGLE	2	25.89	1	5	3.20	0.00	0.67
EAGLE	2	25.89	1	6	3.73	0.00	0.73
EAGLE	2	25.89	1	7	7.83	0.00	17.65
EAGLE	2	25.89	2	1	8.02	0.39	0.59
EAGLE	2	25.89	2	2	5.23	0.17	0.61
EAGLE	2	25.89	2	3	4.71	0.32	0.43
EAGLE	2	25.89	2	4	3.27	0.23	0.55
EAGLE	2	25.89	2	5	1.86	0.14	0.44
EAGLE	2	25.89	2	6	3.32	0.26	0.69
EAGLE	2	25.89	2	7	6.99	0.41	16.10
EAGLE	2	25.89	3	1	10.16	0.47	0.56
EAGLE	2	25.89	3	2	4.86	0.12	0.61
EAGLE	2	25.89	3	3	4.58	0.15	0.60
EAGLE	2	25.89	3	4	2.69	0.00	0.61
EAGLE	2	25.89	3	5	2.44	0.10	0.42
EAGLE	2	25.89	3	6	3.53	0.09	0.87
EAGLE	2	25.89	3	7	4.85	0.11	16.20

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	3	15.11	1	1	11.92	0.74	1.06
EAGLE	3	15.11	1	2	5.63	0.18	0.94
EAGLE	3	15.11	1	3	5.01	0.14	0.67
EAGLE	3	15.11	1	4	2.67	0.12	0.73
EAGLE	3	15.11	1	5	3.09	0.06	0.59
EAGLE	3	15.11	1	6	3.26	0.07	0.92
EAGLE	3	15.11	1	7	5.80	0.00	18.52
EAGLE	3	15.11	2	1	10.99	0.00	1.20
EAGLE	3	15.11	2	2	6.02	0.00	0.92
EAGLE	3	15.11	2	3	4.37	0.00	0.94
EAGLE	3	15.11	2	4	3.20	0.00	0.66
EAGLE	3	15.11	2	5	3.05	0.00	0.64
EAGLE	3	15.11	2	6	3.63	0.00	0.84
EAGLE	3	15.11	2	7	5.83	0.00	14.05
EAGLE	3	15.11	3	1	13.10	1.74	0.94
EAGLE	3	15.11	3	2	6.40	0.94	0.88
EAGLE	3	15.11	3	3	5.18	0.51	0.86
EAGLE	3	15.11	3	4	4.21	0.30	0.90
EAGLE	3	15.11	3	5	2.55	0.16	0.82
EAGLE	3	15.11	3	6	3.55	0.52	1.14
EAGLE	3	15.11	3	7	7.13	0.41	17.74

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	1	34.39	1	1	9.81	0.04	1.05
PARKER	1	34.39	1	2	3.59	0.00	1.05
PARKER	1	34.39	1	3	2.48	0.00	0.96
PARKER	1	34.39	1	4	2.05	0.00	0.86
PARKER	1	34.39	1	5	1.82	0.00	0.85
PARKER	1	34.39	1	6	2.23	0.00	1.16
PARKER	1	34.39	1	7	3.97	0.00	13.11
PARKER	1	34.39	2	1	10.05	0.17	0.89
PARKER	1	34.39	2	2	4.68	0.00	1.08
PARKER	1	34.39	2	3	4.15	0.00	0.97
PARKER	1	34.39	2	4	3.06	0.00	0.95
PARKER	1	34.39	2	5	1.89	0.00	0.79
PARKER	1	34.39	2	6	2.27	0.00	1.20
PARKER	1	34.39	2	7	7.24	0.00	18.61
PARKER	1	34.39	3	1	11.95	0.35	0.92
PARKER	1	34.39	3	2	5.23	0.00	0.99
PARKER	1	34.39	3	3	4.23	0.00	1.23
PARKER	1	34.39	3	4	2.82	0.00	0.95
PARKER	1	34.39	3	5	2.24	0.00	0.84
PARKER	1	34.39	3	6	3.28	0.00	1.40
PARKER	1	34.39	3	7	6.25	0.00	17.47

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	2	41.74	1	1	8.81	0.27	0.92
PARKER	2	41.74	1	2	2.98	0.08	0.86
PARKER	2	41.74	1	3	2.85	0.00	0.82
PARKER	2	41.74	1	4	2.19	0.00	0.65
PARKER	2	41.74	1	5	1.90	0.00	0.62
PARKER	2	41.74	1	6	2.05	0.00	0.87
PARKER	2	41.74	1	7	3.05	0.00	13.27
PARKER	2	41.74	2	1	10.60	0.10	1.00
PARKER	2	41.74	2	2	3.81	0.00	0.88
PARKER	2	41.74	2	3	2.68	0.00	0.76
PARKER	2	41.74	2	4	1.84	0.08	0.69
PARKER	2	41.74	2	5	1.20	0.00	0.55
PARKER	2	41.74	2	6	1.66	0.00	0.79
PARKER	2	41.74	2	7	3.80	0.00	12.42
PARKER	2	41.74	3	1	8.61	0.31	0.91
PARKER	2	41.74	3	2	3.75	0.08	0.98
PARKER	2	41.74	3	3	2.66	0.00	0.73
PARKER	2	41.74	3	4	2.05	0.00	0.70
PARKER	2	41.74	3	5	1.47	0.00	0.58
PARKER	2	41.74	3	6	2.28	0.00	0.79
PARKER	2	41.74	3	7	4.41	0.00	14.52

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	BEP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	3	33.01	1	1	9.11	0.10	1.06
PARKER	3	33.01	1	2	2.91	0.06	0.96
PARKER	3	33.01	1	3	2.49	0.00	0.75
PARKER	3	33.01	1	4	1.57	0.00	0.59
PARKER	3	33.01	1	5	1.30	0.00	0.51
PARKER	3	33.01	1	6	1.83	0.00	0.66
PARKER	3	33.01	1	7	2.56	0.00	10.48
PARKER	3	33.01	2	1	9.70	0.38	1.00
PARKER	3	33.01	2	2	4.07	0.25	1.06
PARKER	3	33.01	2	3	3.11	0.08	0.83
PARKER	3	33.01	2	4	1.72	0.23	0.88
PARKER	3	33.01	2	5	1.96	0.00	0.86
PARKER	3	33.01	2	6	2.19	0.00	0.94
PARKER	3	33.01	2	7	3.75	0.00	10.53
PARKER	3	33.01	3	1	8.12	0.00	0.93
PARKER	3	33.01	3	2	3.51	0.05	0.72
PARKER	3	33.01	3	3	2.59	0.00	0.67
PARKER	3	33.01	3	4	1.71	0.01	0.54
PARKER	3	33.01	3	5	1.30	0.00	0.46
PARKER	3	33.01	3	6	1.41	0.00	0.60
PARKER	3	33.01	3	7	2.94	0.00	13.60

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	1	38.01	1	1	13.30	0.06	0.90
CENTURK	1	38.01	1	2	6.03	0.00	0.71
CENTURK	1	38.01	1	3	5.39	0.02	0.69
CENTURK	1	38.01	1	4	4.10	0.00	0.80
CENTURK	1	38.01	1	5	3.08	0.00	0.60
CENTURK	1	38.01	1	6	3.92	0.00	0.89
CENTURK	1	38.01	1	7	6.56	0.06	17.63
CENTURK	1	38.01	2	1	11.97	0.08	0.70
CENTURK	1	38.01	2	2	6.29	0.01	0.66
CENTURK	1	38.01	2	3	5.58	0.00	0.84
CENTURK	1	38.01	2	4	3.63	0.00	0.73
CENTURK	1	38.01	2	5	4.00	0.00	0.60
CENTURK	1	38.01	2	6	4.43	0.00	1.00
CENTURK	1	38.01	2	7	10.29	0.22	17.79
CENTURK	1	38.01	3	1	15.55	0.19	1.09
CENTURK	1	38.01	3	2	7.10	0.03	0.92
CENTURK	1	38.01	3	3	5.10	0.06	0.98
CENTURK	1	38.01	3	4	3.67	0.00	0.89
CENTURK	1	38.01	3	5	2.53	0.00	0.69
CENTURK	1	38.01	3	6	3.67	0.00	1.20
CENTURK	1	38.01	3	7	5.85	0.00	15.52

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	2	30.52	1	1	10.88	0.70	1.01
CENTURK	2	30.52	1	2	6.91	0.17	1.08
CENTURK	2	30.52	1	3	4.56	0.26	1.09
CENTURK	2	30.52	1	4	2.82	0.17	1.04
CENTURK	2	30.52	1	5	3.22	0.10	0.90
CENTURK	2	30.52	1	6	3.62	0.10	1.12
CENTURK	2	30.52	1	7	5.71	0.08	13.64
CENTURK	2	30.52	2	1	11.82	0.70	0.90
CENTURK	2	30.52	2	2	3.60	0.04	0.73
CENTURK	2	30.52	2	3	3.09	0.00	0.74
CENTURK	2	30.52	2	4	2.49	0.00	0.75
CENTURK	2	30.52	2	5	2.01	0.00	0.59
CENTURK	2	30.52	2	6	2.84	0.00	0.80
CENTURK	2	30.52	2	7	5.22	0.00	12.19
CENTURK	2	30.52	3	1	11.11	0.22	0.87
CENTURK	2	30.52	3	2	5.25	0.00	0.86
CENTURK	2	30.52	3	3	3.97	0.16	0.90
CENTURK	2	30.52	3	4	3.52	0.00	0.76
CENTURK	2	30.52	3	5	2.26	0.00	0.62
CENTURK	2	30.52	3	6	2.96	0.13	0.86
CENTURK	2	30.52	3	7	5.96	0.09	14.56

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	3	34.99	1	1	9.23	0.66	1.29
CENTURK	3	34.99	1	2	4.72	0.00	0.94
CENTURK	3	34.99	1	3	3.25	0.00	0.74
CENTURK	3	34.99	1	4	2.70	0.00	0.63
CENTURK	3	34.99	1	5	2.29	0.00	0.59
CENTURK	3	34.99	1	6	2.89	0.06	0.76
CENTURK	3	34.99	1	7	6.59	0.00	10.67
CENTURK	3	34.99	2	1	10.48	0.45	1.10
CENTURK	3	34.99	2	2	5.10	0.06	1.06
CENTURK	3	34.99	2	3	3.78	0.00	0.83
CENTURK	3	34.99	2	4	2.62	0.03	0.66
CENTURK	3	34.99	2	5	1.85	0.02	0.63
CENTURK	3	34.99	2	6	2.35	0.00	0.75
CENTURK	3	34.99	2	7	5.34	0.00	11.11
CENTURK	3	34.99	3	1	9.10	0.82	1.14
CENTURK	3	34.99	3	2	5.00	0.18	0.92
CENTURK	3	34.99	3	3	3.33	0.04	0.76
CENTURK	3	34.99	3	4	1.85	0.00	0.70
CENTURK	3	34.99	3	5	1.70	0.03	0.67
CENTURK	3	34.99	3	6	2.35	0.04	0.77
CENTURK	3	34.99	3	7	3.40	0.00	11.07

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	1	36.53	1	1	7.96	0.29	0.69
EAGLE	1	36.53	1	2	5.88	0.25	0.94
EAGLE	1	36.53	1	3	4.35	0.00	0.95
EAGLE	1	36.53	1	4	4.09	0.19	0.79
EAGLE	1	36.53	1	5	2.96	0.00	0.69
EAGLE	1	36.53	1	6	4.39	0.05	1.12
EAGLE	1	36.53	1	7	10.09	0.26	18.14
EAGLE	1	36.53	2	1	8.85	0.37	0.82
EAGLE	1	36.53	2	2	7.05	0.15	0.91
EAGLE	1	36.53	2	3	5.81	0.06	0.79
EAGLE	1	36.53	2	4	4.19	0.09	0.89
EAGLE	1	36.53	2	5	2.80	0.06	0.67
EAGLE	1	36.53	2	6	4.69	0.00	1.09
EAGLE	1	36.53	2	7	9.20	0.00	21.77
EAGLE	1	36.53	3	1	9.62	0.27	0.93
EAGLE	1	36.53	3	2	5.21	0.19	1.00
EAGLE	1	36.53	3	3	4.73	0.00	0.66
EAGLE	1	36.53	3	4	4.37	0.00	0.73
EAGLE	1	36.53	3	5	2.38	0.00	0.62
EAGLE	1	36.53	3	6	3.76	0.14	0.84
EAGLE	1	36.53	3	7	7.90	0.00	22.12

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	2	28.97	1	1	13.85	0.65	0.75
EAGLE	2	28.97	1	2	5.77	0.23	0.76
EAGLE	2	28.97	1	3	3.83	0.00	0.75
EAGLE	2	28.97	1	4	3.40	0.00	0.82
EAGLE	2	28.97	1	5	2.16	0.06	0.66
EAGLE	2	28.97	1	6	2.96	0.00	0.97
EAGLE	2	28.97	1	7	5.96	0.00	17.00
EAGLE	2	28.97	2	1	6.33	0.52	0.40
EAGLE	2	28.97	2	2	4.26	0.09	0.44
EAGLE	2	28.97	2	3	3.40	0.20	0.43
EAGLE	2	28.97	2	4	2.59	0.06	0.45
EAGLE	2	28.97	2	5	2.59	0.09	0.39
EAGLE	2	28.97	2	6	1.98	0.00	0.51
EAGLE	2	28.97	2	7	3.38	0.20	13.87
EAGLE	2	28.97	3	1	6.53	0.82	0.62
EAGLE	2	28.97	3	2	9.16	0.23	0.69
EAGLE	2	28.97	3	3	3.23	0.00	1.03
EAGLE	2	28.97	3	4	2.42	0.13	0.53
EAGLE	2	28.97	3	5	2.17	0.00	0.38
EAGLE	2	28.97	3	6	3.27	0.15	0.70
EAGLE	2	28.97	3	7	4.25	0.00	15.22

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	3	30.39	1	1	10.01	1.41	0.88
EAGLE	3	30.39	1	2	4.54	0.22	0.72
EAGLE	3	30.39	1	3	3.67	0.20	0.72
EAGLE	3	30.39	1	4	2.02	0.05	0.65
EAGLE	3	30.39	1	5	1.70	0.04	0.42
EAGLE	3	30.39	1	6	2.70	0.00	0.72
EAGLE	3	30.39	1	7	4.80	0.30	16.57
EAGLE	3	30.39	2	1	11.53	1.49	1.69
EAGLE	3	30.39	2	2	4.87	0.12	1.53
EAGLE	3	30.39	2	3	3.37	0.00	1.07
EAGLE	3	30.39	2	4	2.46	0.00	0.94
EAGLE	3	30.39	2	5	2.02	0.03	0.71
EAGLE	3	30.39	2	6	3.06	0.00	0.93
EAGLE	3	30.39	2	7	4.52	0.00	12.59
EAGLE	3	30.39	3	1	9.19	0.84	1.01
EAGLE	3	30.39	3	2	3.79	0.29	0.86
EAGLE	3	30.39	3	3	3.38	0.35	0.72
EAGLE	3	30.39	3	4	1.98	0.18	0.75
EAGLE	3	30.39	3	5	1.60	0.04	0.64
EAGLE	3	30.39	3	6	2.90	0.07	0.72
EAGLE	3	30.39	3	7	5.87	0.00	14.58

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	1	46.37	1	1	10.30	0.00	0.75
PARKER	1	46.37	1	2	5.10	0.00	1.00
PARKER	1	46.37	1	3	2.98	0.00	0.94
PARKER	1	46.37	1	4	2.26	0.00	0.86
PARKER	1	46.37	1	5	1.96	0.00	0.66
PARKER	1	46.37	1	6	2.09	0.00	1.26
PARKER	1	46.37	1	7	5.49	0.00	17.96
PARKER	1	46.37	2	1	13.36	0.00	1.27
PARKER	1	46.37	2	2	5.13	0.00	1.29
PARKER	1	46.37	2	3	3.29	0.00	1.10
PARKER	1	46.37	2	4	2.32	0.00	1.05
PARKER	1	46.37	2	5	1.66	0.00	0.73
PARKER	1	46.37	2	6	2.22	0.00	1.03
PARKER	1	46.37	2	7	3.68	0.00	12.45
PARKER	1	46.37	3	1	10.97	0.00	0.99
PARKER	1	46.37	3	2	5.42	0.00	0.92
PARKER	1	46.37	3	3	3.30	0.00	1.00
PARKER	1	46.37	3	4	2.04	0.00	1.05
PARKER	1	46.37	3	5	2.00	0.00	0.74
PARKER	1	46.37	3	6	2.38	0.00	1.28
PARKER	1	46.37	3	7	3.85	0.00	15.15

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	2	30.82	1	1	6.75	0.20	0.97
PARKER	2	30.82	1	2	3.18	0.07	0.92
PARKER	2	30.82	1	3	2.59	0.04	0.83
PARKER	2	30.82	1	4	1.03	0.00	0.65
PARKER	2	30.82	1	5	1.43	0.00	0.55
PARKER	2	30.82	1	6	1.55	0.00	0.75
PARKER	2	30.82	1	7	3.68	0.00	14.36
PARKER	2	30.82	2	1	7.27	0.16	0.95
PARKER	2	30.82	2	2	3.13	0.06	0.87
PARKER	2	30.82	2	3	2.65	0.00	0.85
PARKER	2	30.82	2	4	1.80	0.00	0.76
PARKER	2	30.82	2	5	1.83	0.00	0.93
PARKER	2	30.82	2	6	2.20	0.00	0.88
PARKER	2	30.82	2	7	2.73	0.00	13.77
PARKER	2	30.82	3	1	9.50	0.34	1.50
PARKER	2	30.82	3	2	3.83	0.00	1.03
PARKER	2	30.82	3	3	2.56	0.00	1.00
PARKER	2	30.82	3	4	1.58	0.00	0.86
PARKER	2	30.82	3	5	1.54	0.00	0.68
PARKER	2	30.82	3	6	2.37	0.00	1.00
PARKER	2	30.82	3	7	3.55	0.00	12.37

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	BEP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	3	41.08	1	1	10.22	0.32	1.22
PARKER	3	41.08	1	2	3.87	0.17	1.09
PARKER	3	41.08	1	3	2.87	0.15	0.70
PARKER	3	41.08	1	4	1.88	0.00	0.65
PARKER	3	41.08	1	5	1.72	0.00	0.63
PARKER	3	41.08	1	6	1.65	0.00	0.81
PARKER	3	41.08	1	7	3.86	0.00	11.52
PARKER	3	41.08	2	1	7.86	0.66	1.26
PARKER	3	41.08	2	2	2.50	0.00	1.00
PARKER	3	41.08	2	3	2.47	0.00	0.72
PARKER	3	41.08	2	4	1.56	0.00	0.68
PARKER	3	41.08	2	5	1.48	0.00	0.46
PARKER	3	41.08	2	6	1.66	0.00	0.59
PARKER	3	41.08	2	7	3.18	0.00	10.59
PARKER	3	41.08	3	1	8.61	0.17	0.90
PARKER	3	41.08	3	2	3.69	0.19	0.82
PARKER	3	41.08	3	3	2.45	0.00	0.85
PARKER	3	41.08	3	4	1.62	0.00	0.66
PARKER	3	41.08	3	5	1.47	0.00	0.57
PARKER	3	41.08	3	6	2.07	0.00	0.80
PARKER	3	41.08	3	7	1.74	0.00	10.71

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	1	48.03	1	1	11.87	0.29	0.67
CENTURK	1	48.03	1	2	4.68	0.00	0.57
CENTURK	1	48.03	1	3	4.83	0.08	0.64
CENTURK	1	48.03	1	4	2.49	0.00	0.55
CENTURK	1	48.03	1	5	2.30	0.00	0.50
CENTURK	1	48.03	1	6	3.05	0.06	0.87
CENTURK	1	48.03	1	7	6.29	0.15	16.20
CENTURK	1	48.03	2	1	14.17	0.30	0.67
CENTURK	1	48.03	2	2	6.18	0.00	0.65
CENTURK	1	48.03	2	3	4.29	0.06	0.69
CENTURK	1	48.03	2	4	3.27	0.00	0.77
CENTURK	1	48.03	2	5	2.52	0.07	0.59
CENTURK	1	48.03	2	6	2.98	0.00	0.93
CENTURK	1	48.03	2	7	5.22	0.00	13.22
CENTURK	1	48.03	3	1	13.19	0.68	0.58
CENTURK	1	48.03	3	2	5.38	0.19	0.68
CENTURK	1	48.03	3	3	4.18	0.00	0.69
CENTURK	1	48.03	3	4	3.10	0.00	0.77
CENTURK	1	48.03	3	5	1.81	0.00	0.54
CENTURK	1	48.03	3	6	2.59	0.09	0.74
CENTURK	1	48.03	3	7	5.36	0.00	13.39

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	2	45.45	1	1	12.44	0.54	1.06
CENTURK	2	45.45	1	2	3.65	0.30	0.94
CENTURK	2	45.45	1	3	3.23	0.00	0.88
CENTURK	2	45.45	1	4	2.76	0.00	0.71
CENTURK	2	45.45	1	5	2.29	0.00	0.66
CENTURK	2	45.45	1	6	2.70	0.09	0.85
CENTURK	2	45.45	1	7	4.65	0.10	12.87
CENTURK	2	45.45	2	1	9.92	0.43	0.60
CENTURK	2	45.45	2	2	4.60	0.22	0.62
CENTURK	2	45.45	2	3	3.03	0.05	0.53
CENTURK	2	45.45	2	4	2.06	0.04	0.45
CENTURK	2	45.45	2	5	1.75	0.00	0.45
CENTURK	2	45.45	2	6	2.35	0.05	0.55
CENTURK	2	45.45	2	7	3.57	0.00	12.82
CENTURK	2	45.45	3	1	12.64	0.40	0.75
CENTURK	2	45.45	3	2	6.24	0.00	0.77
CENTURK	2	45.45	3	3	4.69	0.00	0.69
CENTURK	2	45.45	3	4	3.00	0.00	0.89
CENTURK	2	45.45	3	5	3.03	0.00	0.63
CENTURK	2	45.45	3	6	3.45	0.00	0.88
CENTURK	2	45.45	3	7	6.69	0.00	13.86

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	3	31.94	1	1	9.55	1.13	0.77
CENTURK	3	31.94	1	2	5.96	0.56	0.81
CENTURK	3	31.94	1	3	4.21	0.12	0.89
CENTURK	3	31.94	1	4	3.51	0.10	0.77
CENTURK	3	31.94	1	5	2.43	0.00	0.68
CENTURK	3	31.94	1	6	3.08	0.18	0.92
CENTURK	3	31.94	1	7	5.57	0.41	12.07
CENTURK	3	31.94	2	1	13.74	1.05	1.00
CENTURK	3	31.94	2	2	4.58	0.34	0.97
CENTURK	3	31.94	2	3	3.52	0.15	0.90
CENTURK	3	31.94	2	4	2.12	0.00	0.68
CENTURK	3	31.94	2	5	1.76	0.00	0.70
CENTURK	3	31.94	2	6	2.48	0.08	0.82
CENTURK	3	31.94	2	7	5.15	0.20	11.77
CENTURK	3	31.94	3	1	10.73	1.23	0.94
CENTURK	3	31.94	3	2	4.46	0.20	0.73
CENTURK	3	31.94	3	3	3.54	0.12	0.62
CENTURK	3	31.94	3	4	2.26	0.00	0.64
CENTURK	3	31.94	3	5	1.37	0.09	0.49
CENTURK	3	31.94	3	6	2.58	0.00	0.81
CENTURK	3	31.94	3	7	1.03	0.18	10.47

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	1	48.74	1	1	9.52	0.34	0.41
EAGLE	1	48.74	1	2	5.55	0.10	0.54
EAGLE	1	48.74	1	3	4.71	0.07	0.53
EAGLE	1	48.74	1	4	3.23	0.05	0.64
EAGLE	1	48.74	1	5	2.64	0.00	0.48
EAGLE	1	48.74	1	6	3.00	0.00	0.84
EAGLE	1	48.74	1	7	8.37	0.17	19.14
EAGLE	1	48.74	2	1	12.85	0.59	0.59
EAGLE	1	48.74	2	2	6.21	0.10	0.65
EAGLE	1	48.74	2	3	4.62	0.10	0.64
EAGLE	1	48.74	2	4	3.15	0.00	0.70
EAGLE	1	48.74	2	5	2.50	0.10	0.61
EAGLE	1	48.74	2	6	3.42	0.05	0.85
EAGLE	1	48.74	2	7	7.94	0.11	22.98
EAGLE	1	48.74	3	1	13.90	0.44	0.66
EAGLE	1	48.74	3	2	6.79	0.00	0.80
EAGLE	1	48.74	3	3	4.50	0.00	0.71
EAGLE	1	48.74	3	4	3.40	0.14	0.72
EAGLE	1	48.74	3	5	3.17	0.00	0.75
EAGLE	1	48.74	3	6	3.93	0.00	1.14
EAGLE	1	48.74	3	7	6.93	0.00	19.80

RECCNSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	2	39.69	1	1	11.36	0.86	1.03
EAGLE	2	39.69	1	2	3.73	0.25	0.88
EAGLE	2	39.69	1	3	3.54	0.05	0.70
EAGLE	2	39.69	1	4	2.66	0.03	0.65
EAGLE	2	39.69	1	5	2.50	0.00	0.46
EAGLE	2	39.69	1	6	2.74	0.00	0.64
EAGLE	2	39.69	1	7	5.16	0.00	16.36
EAGLE	2	39.69	2	1	9.73	0.36	0.82
EAGLE	2	39.69	2	2	5.38	0.07	0.70
EAGLE	2	39.69	2	3	3.66	0.15	0.64
EAGLE	2	39.69	2	4	2.51	0.00	0.60
EAGLE	2	39.69	2	5	2.54	0.00	0.46
EAGLE	2	39.69	2	6	3.46	0.06	0.75
EAGLE	2	39.69	2	7	8.35	0.07	21.66
EAGLE	2	39.69	3	1	10.35	0.73	1.00
EAGLE	2	39.69	3	2	4.80	0.30	0.98
EAGLE	2	39.69	3	3	3.78	0.00	0.98
EAGLE	2	39.69	3	4	2.73	0.00	0.68
EAGLE	2	39.69	3	5	2.79	0.00	0.74
EAGLE	2	39.69	3	6	2.88	0.00	0.96
EAGLE	2	39.69	3	7	6.94	0.22	19.62

RECONSTITUTED SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	3	38.25	1	1	11.43	1.53	1.13
EAGLE	3	38.25	1	2	4.96	0.39	0.96
EAGLE	3	38.25	1	3	3.35	0.35	0.88
EAGLE	3	38.25	1	4	2.40	0.00	0.74
EAGLE	3	38.25	1	5	2.10	0.00	0.74
EAGLE	3	38.25	1	6	3.24	0.10	1.00
EAGLE	3	38.25	1	7	3.11	0.39	14.47
EAGLE	3	38.25	2	1	11.50	1.32	1.07
EAGLE	3	38.25	2	2	5.25	0.46	0.92
EAGLE	3	38.25	2	3	3.36	0.18	0.81
EAGLE	3	38.25	2	4	2.83	0.04	0.87
EAGLE	3	38.25	2	5	2.58	0.05	0.56
EAGLE	3	38.25	2	6	3.37	0.00	0.79
EAGLE	3	38.25	2	7	5.09	0.00	13.16
EAGLE	3	38.25	3	1	11.40	1.00	0.83
EAGLE	3	38.25	3	2	5.20	0.30	0.80
EAGLE	3	38.25	3	3	4.53	0.25	0.75
EAGLE	3	38.25	3	4	3.80	0.15	0.76
EAGLE	3	38.25	3	5	2.73	0.07	0.64
EAGLE	3	38.25	3	6	3.22	0.15	0.92
EAGLE	3	38.25	3	7	4.42	0.00	13.24

HARVEST SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MCISTURE CONTENT	REP	POS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	15.94	1	1	1.33	0.00	2.35
PARKER	15.94	1	2	0.69	0.00	1.87
PARKER	15.94	1	3	0.59	0.00	1.78
PARKER	15.94	1	4	0.36	0.00	1.43
PARKER	15.94	1	5	0.30	0.00	1.58
PARKER	15.94	1	6	0.51	0.00	2.46
PARKER	15.94	1	7	0.64	0.00	14.29
PARKER	15.94	2	1	1.29	0.00	2.19
PARKER	15.94	2	2	0.81	0.00	2.03
PARKER	15.94	2	3	0.57	0.00	1.83
PARKER	15.94	2	4	0.37	0.00	1.32
PARKER	15.94	2	5	0.40	0.00	1.27
PARKER	15.94	2	6	0.46	0.00	1.83
PARKER	15.94	2	7	0.74	0.00	14.35
PARKER	15.94	3	1	1.36	0.00	3.17
PARKER	15.94	3	2	0.80	0.00	2.23
PARKER	15.94	3	3	0.52	0.00	1.42
PARKER	15.94	3	4	0.45	0.00	1.64
PARKER	15.94	3	5	0.20	0.00	1.09
PARKER	15.94	3	6	0.50	0.00	2.44
PARKER	15.94	3	7	0.81	0.00	12.48

HARVEST SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MCISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	17.24	1	1	1.17	0.00	1.91
CENTURK	17.24	1	2	0.84	0.00	1.63
CENTURK	17.24	1	3	0.53	0.00	1.29
CENTURK	17.24	1	4	0.41	0.00	1.43
CENTURK	17.24	1	5	0.35	0.00	0.85
CENTURK	17.24	1	6	0.49	0.00	1.73
CENTURK	17.24	1	7	0.80	0.00	12.63
CENTURK	17.24	2	1	1.42	0.00	2.30
CENTURK	17.24	2	2	0.80	0.00	1.87
CENTURK	17.24	2	3	0.62	0.00	1.32
CENTURK	17.24	2	4	0.40	0.00	1.25
CENTURK	17.24	2	5	0.32	0.00	1.09
CENTURK	17.24	2	6	0.57	0.00	2.09
CENTURK	17.24	2	7	0.80	0.00	10.77
CENTURK	17.24	3	1	1.54	0.00	2.38
CENTURK	17.24	3	2	0.96	0.00	2.01
CENTURK	17.24	3	3	0.59	0.00	1.71
CENTURK	17.24	3	4	0.51	0.00	1.42
CENTURK	17.24	3	5	0.36	0.00	1.22
CENTURK	17.24	3	6	0.67	0.00	2.43
CENTURK	17.24	3	7	0.95	0.00	13.47

HARVEST SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	17.22	1	1	1.71	0.00	3.18
EAGLE	17.22	1	2	0.92	0.00	2.35
EAGLE	17.22	1	3	0.67	0.00	2.13
EAGLE	17.22	1	4	0.56	0.00	1.59
EAGLE	17.22	1	5	0.43	0.00	1.93
EAGLE	17.22	1	6	0.74	0.00	2.84
EAGLE	17.22	1	7	1.07	0.00	14.63
EAGLE	17.22	2	1	1.55	0.00	2.54
EAGLE	17.22	2	2	0.92	0.00	2.27
EAGLE	17.22	2	3	0.78	0.00	1.92
EAGLE	17.22	2	4	0.56	0.00	1.58
EAGLE	17.22	2	5	0.44	0.00	1.42
EAGLE	17.22	2	6	0.64	0.00	2.78
EAGLE	17.22	2	7	1.13	0.00	17.90
EAGLE	17.22	3	1	1.67	0.00	2.89
EAGLE	17.22	3	2	0.99	0.00	2.65
EAGLE	17.22	3	3	0.81	0.00	2.23
EAGLE	17.22	3	4	0.49	0.00	1.75
EAGLE	17.22	3	5	0.51	0.00	1.84
EAGLE	17.22	3	6	0.73	0.00	2.97
EAGLE	17.22	3	7	1.01	0.00	15.29

HARVEST SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	14.52	1	1	0.79	0.00	1.51
PARKER	14.52	1	2	0.39	0.00	1.32
FARKER	14.52	1	3	0.37	0.00	1.07
PARKER	14.52	1	4	0.23	0.00	0.98
PARKER	14.52	1	5	0.15	0.00	0.85
PARKER	14.52	1	6	0.27	0.00	1.37
PARKER	14.52	1	7	0.41	0.00	11.35
PARKER	14.52	2	1	0.93	0.00	1.44
PARKER	14.52	2	2	0.51	0.00	1.43
PARKER	14.52	2	3	0.30	0.00	1.24
PARKER	14.52	2	4	0.21	0.00	1.02
PARKER	14.52	2	5	0.21	0.00	1.71
PARKER	14.52	2	6	0.27	0.00	1.70
PARKER	14.52	2	7	0.36	0.00	12.68
PARKER	14.52	3	1	0.74	0.00	1.59
PARKER	14.52	3	2	0.40	0.00	1.35
PARKER	14.52	3	3	0.27	0.00	1.33
FARKER	14.52	3	4	0.25	0.00	1.06
PARKER	14.52	3	5	0.19	0.00	1.03
PARKER	14.52	3	6	0.30	0.00	1.45
PARKER	14.52	3	7	0.48	0.00	15.00

HARVEST SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	19.34	1	1	1.15	0.00	1.72
CENTURK	19.34	1	2	0.75	0.00	1.66
CENTURK	19.34	1	3	0.45	0.00	0.93
CENTURK	19.34	1	4	0.41	0.00	1.14
CENTURK	19.34	1	5	0.21	0.00	0.91
CENTURK	19.34	1	6	0.48	0.00	1.86
CENTURK	19.34	1	7	0.68	0.00	11.97
CENTURK	19.34	2	1	1.16	0.00	1.53
CENTURK	19.34	2	2	0.70	0.00	1.66
CENTURK	19.34	2	3	0.46	0.00	1.00
CENTURK	19.34	2	4	0.35	0.00	1.16
CENTURK	19.34	2	5	0.28	0.00	0.95
CENTURK	19.34	2	6	0.44	0.00	1.59
CENTURK	19.34	2	7	0.51	0.00	11.30
CENTURK	19.34	3	1	1.07	0.00	1.52
CENTURK	19.34	3	2	0.60	0.00	1.24
CENTURK	19.34	3	3	0.43	0.00	0.99
CENTURK	19.34	3	4	0.46	0.00	1.06
CENTURK	19.34	3	5	0.30	0.00	0.83
CENTURK	19.34	3	6	0.35	0.00	1.47
CENTURK	19.34	3	7	0.47	0.00	9.94

HARVEST SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	11.14	1	1	1.00	0.00	1.49
EAGLE	11.14	1	2	0.63	0.00	1.61
EAGLE	11.14	1	3	0.41	0.00	0.95
EAGLE	11.14	1	4	0.35	0.00	1.01
EAGLE	11.14	1	5	0.24	0.00	0.81
EAGLE	11.14	1	6	0.38	0.00	1.93
EAGLE	11.14	1	7	0.64	0.00	12.70
EAGLE	11.14	2	1	1.06	0.00	1.91
EAGLE	11.14	2	2	0.68	0.00	1.65
EAGLE	11.14	2	3	0.45	0.00	1.38
EAGLE	11.14	2	4	0.45	0.00	1.58
EAGLE	11.14	2	5	0.37	0.00	1.12
EAGLE	11.14	2	6	0.50	0.00	2.01
EAGLE	11.14	2	7	0.70	0.00	10.77
EAGLE	11.14	3	1	1.09	0.00	1.68
EAGLE	11.14	3	2	0.63	0.00	1.54
EAGLE	11.14	3	3	0.51	0.00	1.69
EAGLE	11.14	3	4	0.43	0.00	1.21
EAGLE	11.14	3	5	0.30	0.00	1.13
EAGLE	11.14	3	6	0.38	0.00	1.86
EAGLE	11.14	3	7	0.72	0.00	12.00

HARVEST SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
PARKER	12.29	1	1	0.64	0.00	1.82
PARKER	12.29	1	2	0.40	0.00	1.32
PARKER	12.29	1	3	0.30	0.00	1.18
PARKER	12.29	1	4	0.23	0.00	1.18
PARKER	12.29	1	5	0.20	0.00	1.17
PARKER	12.29	1	6	0.24	0.00	1.77
PARKER	12.29	1	7	0.43	0.00	10.28
PARKER	12.29	2	1	0.82	0.00	1.92
PARKER	12.29	2	2	0.47	0.00	1.35
PARKER	12.29	2	3	0.36	0.00	1.23
PARKER	12.29	2	4	0.18	0.00	1.02
PARKER	12.29	2	5	0.21	0.00	0.91
PARKER	12.29	2	6	0.34	0.00	1.61
PARKER	12.29	2	7	0.50	0.00	9.08
PARKER	12.29	3	1	0.95	0.00	1.81
PARKER	12.29	3	2	0.46	0.00	1.64
PARKER	12.29	3	3	0.38	0.00	1.27
PARKER	12.29	3	4	0.32	0.00	1.01
PARKER	12.29	3	5	0.21	0.00	1.23
PARKER	12.29	3	6	0.40	0.00	2.32
PARKER	12.29	3	7	0.53	0.00	10.68

HARVEST SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MOISTURE CONTENT	REP	PCS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
CENTURK	10.51	1	1	0.90	0.00	1.75
CENTURK	10.51	1	2	0.44	0.00	0.94
CENTURK	10.51	1	3	0.40	0.00	1.04
CENTURK	10.51	1	4	0.27	0.00	0.86
CENTURK	10.51	1	5	0.21	0.00	0.83
CENTURK	10.51	1	6	0.29	0.00	1.50
CENTURK	10.51	1	7	0.46	0.00	8.51
CENTURK	10.51	2	1	0.97	0.00	1.76
CENTURK	10.51	2	2	0.49	0.00	1.16
CENTURK	10.51	2	3	0.29	0.00	1.08
CENTURK	10.51	2	4	0.39	0.00	0.85
CENTURK	10.51	2	5	0.22	0.00	0.80
CENTURK	10.51	2	6	0.37	0.00	1.40
CENTURK	10.51	2	7	0.49	0.00	7.80
CENTURK	10.51	3	1	1.08	0.00	1.87
CENTURK	10.51	3	2	0.56	0.00	1.33
CENTURK	10.51	3	3	0.37	0.00	1.09
CENTURK	10.51	3	4	0.33	0.00	0.96
CENTURK	10.51	3	5	0.28	0.00	0.73
CENTURK	10.51	3	6	0.41	0.00	1.52
CENTURK	10.51	3	7	0.56	0.00	8.51

HARVEST SAMPLES

MATURITY 1 INDICATES EARLIEST HARVEST DATE

WITH MATURITY 3 HARVESTED LAST

VARIETY	MOISTURE CONTENT	REP	PQS	GRAIN WEIGHT	UNTHRESHED GRAIN WT.	MOG WEIGHT
EAGLE	9.75	1	1	1.02	0.00	1.96
EAGLE	9.75	1	2	0.59	0.00	1.35
EAGLE	9.75	1	3	0.44	0.00	1.26
EAGLE	9.75	1	4	0.40	0.00	1.22
EAGLE	9.75	1	5	0.23	0.00	0.95
EAGLE	9.75	1	6	0.42	0.00	2.17
EAGLE	9.75	1	7	0.70	0.00	11.85
EAGLE	9.75	2	1	1.10	0.00	1.83
EAGLE	9.75	2	2	0.76	0.00	1.82
EAGLE	9.75	2	3	0.54	0.00	1.57
EAGLE	9.75	2	4	0.35	0.00	1.62
EAGLE	9.75	2	5	0.30	0.00	1.36
EAGLE	9.75	2	6	0.43	0.00	2.07
EAGLE	9.75	2	7	0.69	0.00	11.52
EAGLE	9.75	3	1	0.93	0.00	1.34
EAGLE	9.75	3	2	0.49	0.00	1.14
EAGLE	9.75	3	3	0.43	0.00	1.33
EAGLE	9.75	3	4	0.30	0.00	1.20
EAGLE	9.75	3	5	0.24	0.00	1.08
EAGLE	9.75	3	6	0.41	0.00	1.76
EAGLE	9.75	3	7	0.52	0.00	10.28

ENERGY VARIABLES

HARVEST INDICATES SAMPLES THRESHED IMMEDIATELY. FOR RECONSTITUTED
 SAMPLES 1 WAS HARVESTED EARLIEST AND 3 LAST

VARIETY	MATURITY	MCISTURE CONTENT	REP	TORQUE IN-LBS	SPAN SEC	AREA, CM SQUARED
PARKER	1	9.60	1	3.22	3.13	1.05
PARKER	1	9.60	2	2.95	2.50	0.75
PARKER	1	9.60	3	2.95	2.89	0.99
PARKER	1	15.34	1	8.06	2.50	1.80
PARKER	1	15.34	2	8.32	3.28	2.30
PARKER	1	15.34	3	5.92	3.52	1.85
PARKER	1	23.08	1	4.55	4.61	1.91
PARKER	1	23.08	2	4.29	3.91	1.57
PARKER	1	23.08	3	4.29	3.20	1.23
PARKER	1	28.19	1	2.95	3.59	1.14
PARKER	1	28.19	2	5.36	4.30	1.12
PARKER	1	28.19	3	4.82	3.05	1.05
PARKER	1	34.39	1	8.04	3.67	2.42
PARKER	1	34.39	2	5.89	3.05	1.50
PARKER	1	34.39	3	7.77	3.76	2.38
PARKER	1	46.37	1	3.48	3.36	1.03
PARKER	1	46.37	2	4.29	4.92	1.54
PARKER	1	46.37	3	4.02	4.14	1.42
PARKER	2	8.24	2	3.22	2.58	0.72
PARKER	2	8.24	3	3.75	5.00	7.90
PARKER	2	21.72	2	6.16	3.75	1.50

ENERGY VARIABLES

HARVEST INDICATES SAMPLES THRESHED IMMEDIATELY. FCR RECONSTITUTED
 SAMPLES 1 WAS HARVESTED EARLIEST AND 3 LAST

VARIETY	MATURITY	MCISTURE CONTENT	REP	TORQUE IN-LBS	SPAN SEC	AREA, CM SQUARED
PARKER	2	24.59	1	4.02	3.28	1.20
PARKER	2	24.59	2	4.29	3.67	1.29
PARKER	2	24.59	3	5.63	3.67	1.55
PARKER	2	19.97	1	5.62	3.59	1.83
PARKER	2	19.97	2	7.50	3.30	2.06
PARKER	2	19.97	3	9.64	3.21	2.17
PARKER	2	41.74	1	4.55	4.06	1.35
PARKER	2	41.74	2	4.29	4.06	1.36
PARKER	2	41.74	3	5.63	3.98	1.50
PARKER	2	30.82	1	6.43	4.22	2.43
PARKER	2	30.82	2	7.24	3.52	2.24
PARKER	2	30.82	3	8.04	2.73	1.73
PARKER	2	8.24	1	3.22	2.97	1.08
PARKER	2	21.72	1	5.36	3.52	1.80
PARKER	2	21.72	3	5.36	3.20	1.58
PARKER	3	7.47	1	3.48	2.81	0.83
PARKER	3	7.47	2	3.48	2.50	0.65
PARKER	3	7.47	3	3.75	1.95	0.65
PARKER	3	12.16	1	6.43	3.13	1.56
PARKER	3	12.16	2	6.17	3.67	1.55
PARKER	3	12.16	3	3.47	3.28	1.10

ENERGY VARIABLES

HARVEST INDICATES SAMPLES THRESHED IMMEDIATELY. FOR RECONSTITUTED

SAMPLES 1 WAS HARVESTED EARLIEST AND 3 LAST

VARIETY	MATURITY	MCISTURE CONTENT	REP	TORQUE IN-LBS	SPAN SEC	AREA, CM SQUARED
PARKER	3	13.21	1	4.82	3.44	1.21
PARKER	3	13.21	2	5.36	3.13	1.29
PARKER	3	13.21	3	3.75	3.20	1.12
PARKER	3	16.89	1	6.97	3.20	1.30
PARKER	3	16.89	2	5.89	2.81	1.38
PARKER	3	16.89	3	5.09	3.05	1.30
PARKER	3	33.01	1	3.21	4.92	1.80
PARKER	3	33.01	2	5.09	4.30	1.91
PARKER	3	33.01	3	4.55	3.36	1.49
PARKER	3	41.08	1	3.48	4.45	1.09
PARKER	3	41.08	2	4.29	3.52	1.11
PARKER	3	41.08	3	4.82	3.59	1.39
CENTURK	1	9.20	1	4.02	2.81	1.01
CENTURK	1	9.20	2	4.55	3.13	1.03
CENTURK	1	9.20	3	2.41	3.05	0.72
CENTURK	1	20.98	1	4.82	3.05	1.39
CENTURK	1	20.98	2	4.82	3.36	1.21
CENTURK	1	20.98	3	5.09	4.69	1.62
CENTURK	1	23.75	1	4.55	2.89	1.19
CENTURK	1	23.75	2	5.09	5.39	1.78
CENTURK	1	23.75	3	5.09	4.14	1.79

ENERGY VARIABLES

HARVEST INDICATES SAMPLES THRESHED IMMEDIATELY. FOR RECONSTITUTED
SAMPLES 1 WAS HARVESTED EARLIEST AND 3 LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	TORQUE IN-LBS	SPAN SEC	AREA, CM SQUARED
CENTURK	1	25.36	1	8.32	3.13	1.92
CENTURK	1	25.36	2	8.06	3.13	1.78
CENTURK	1	25.36	3	8.06	2.89	1.58
CENTURK	1	38.01	1	5.36	4.45	2.09
CENTURK	1	38.01	2	5.62	4.75	2.34
CENTURK	1	38.01	3	5.36	5.94	2.70
CENTURK	1	48.03	1	3.22	2.81	0.82
CENTURK	1	48.03	2	4.82	3.67	1.34
CENTURK	1	48.03	3	3.48	3.05	0.88
CENTURK	2	9.09	1	4.29	2.97	1.26
CENTURK	2	9.09	2	4.02	2.97	0.93
CENTURK	2	9.09	3	4.29	2.97	1.15
CENTURK	2	11.81	1	4.03	3.75	1.42
CENTURK	2	11.81	2	3.21	4.06	1.32
CENTURK	2	11.81	3	4.84	3.28	1.36
CENTURK	2	23.10	1	4.82	2.89	1.19
CENTURK	2	23.10	2	5.09	2.89	1.21
CENTURK	2	23.10	3	4.82	3.59	1.42
CENTURK	2	17.95	1	4.29	3.75	1.46
CENTURK	2	17.95	2	5.63	3.59	1.49
CENTURK	2	17.95	3	5.89	3.44	1.80

ENERGY VARIABLES

HARVEST INDICATES SAMPLES THRESHED IMMEDIATELY. FOR RECONSTITUTED
SAMPLES 1 WAS HARVESTED EARLIEST AND 3 LAST

VARIETY	MATURITY	MCISTURE CONTENT	REP	TORQUE IN-LBS	SPAN SEC	AREA, CM SQUARED
CENTURK	2	30.52	1	8.32	3.91	2.47
CENTURK	2	30.52	2	5.89	3.75	1.74
CENTURK	2	30.52	3	5.62	3.44	1.84
CENTURK	2	45.45	1	3.22	3.00	0.93
CENTURK	2	45.45	2	4.55	3.20	0.90
CENTURK	2	45.45	3	4.55	3.20	1.06
CENTURK	3	8.36	1	3.22	3.36	0.74
CENTURK	3	8.36	2	2.14	2.27	0.50
CENTURK	3	8.36	3	2.95	2.97	0.50
CENTURK	3	10.62	1	5.36	2.58	1.12
CENTURK	3	10.62	2	4.29	3.28	1.15
CENTURK	3	10.62	3	4.29	3.20	1.07
CENTURK	3	18.21	1	4.02	3.67	1.43
CENTURK	3	18.21	2	4.82	4.45	1.96
CENTURK	3	18.21	3	4.82	3.75	1.96
CENTURK	3	17.66	1	5.36	3.65	1.78
CENTURK	3	17.66	2	6.43	3.59	1.80
CENTURK	3	17.66	3	4.29	3.91	1.75
CENTURK	3	34.99	1	5.10	4.30	1.79
CENTURK	3	34.99	2	5.10	3.75	1.52
CENTURK	3	34.99	3	9.64	2.81	1.64

ENERGY VARIABLES

HARVEST INDICATES SAMPLES THRESHED IMMEDIATELY. FOR RECONSTITUTED
SAMPLES 1 WAS HARVESTED EARLIEST AND 3 LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	TORQUE IN-LBS	SPAN SEC	AREA, CM SQUARED
CENTURK	3	31.94	1	6.70	4.06	1.84
CENTURK	3	31.94	2	3.48	3.52	0.98
CENTURK	3	31.94	3	5.63	3.20	1.38
EAGLE	1	8.86	1	2.68	3.05	0.70
EAGLE	1	8.86	2	3.48	2.81	0.94
EAGLE	1	8.86	3	5.36	3.13	1.53
EAGLE	1	14.46	1	7.50	3.98	2.27
EAGLE	1	14.46	2	9.39	3.91	2.79
EAGLE	1	14.46	3	5.36	4.45	2.17
EAGLE	1	23.05	1	6.43	4.06	1.10
EAGLE	1	23.05	2	5.63	3.44	1.99
EAGLE	1	23.05	3	5.89	4.69	2.33
EAGLE	1	29.46	1	6.25	3.05	1.87
EAGLE	1	29.46	2	5.89	4.30	1.90
EAGLE	1	29.46	3	7.23	2.97	1.95
EAGLE	1	36.53	1	12.60	4.61	3.12
EAGLE	1	36.53	2	10.72	4.14	2.71
EAGLE	1	36.53	3	10.18	3.98	2.94
EAGLE	1	48.74	1	5.63	3.20	1.60
EAGLE	1	48.74	2	6.70	4.06	1.14
EAGLE	1	48.74	3	5.89	3.98	2.15

ENERGY VARIABLES

HARVEST INDICATES SAMPLES THRESHED IMMEDIATELY. FOR RECONSTITUTED
SAMPLES 1 WAS HARVESTED EARLIEST AND 3 LAST

VARIETY	MATURITY	MOISTURE CONTENT	REP	TORQUE IN-LBS	SPAN SEC	AREA, CM SQUARED
EAGLE	2	8.12	1	5.09	2.73	1.34
EAGLE	2	8.12	2	5.36	4.06	1.70
EAGLE	2	8.12	3	5.89	3.20	1.45
EAGLE	2	11.07	1	4.29	3.67	1.09
EAGLE	2	11.07	2	4.29	5.08	2.06
EAGLE	2	11.07	3	7.24	3.21	2.40
EAGLE	2	17.70	1	6.16	4.53	2.51
EAGLE	2	17.70	2	5.89	3.75	2.06
EAGLE	2	17.70	3	6.97	2.73	1.58
EAGLE	2	25.89	1	5.75	2.89	2.34
EAGLE	2	25.89	2	6.16	3.83	1.89
EAGLE	2	25.89	3	5.36	5.00	2.79
EAGLE	2	28.97	1	5.63	6.40	6.19
EAGLE	2	28.97	2	6.70	2.42	0.78
EAGLE	2	28.97	3	5.89	2.42	0.76
EAGLE	2	39.69	1	7.50	4.22	2.78
EAGLE	2	39.69	2	9.64	3.28	1.99
EAGLE	2	39.69	3	9.64	3.83	2.64
EAGLE	3	6.60	1	4.02	3.13	1.29
EAGLE	3	6.60	2	3.48	2.34	0.65
EAGLE	3	6.60	3	3.75	2.75	1.00

ENERGY VARIABLES

HARVEST INDICATES SAMPLES THRESHED IMMEDIATELY. FOR RECONSTITUTED
SAMPLES 1 WAS HARVESTED EARLIEST AND 3 LAST

VARIETY	MATURITY	MCISTURE CONTENT	REP	TORQUE IN-LBS	SPAN SEC	AREA, CM SQUARED
EAGLE	3	11.11	1	4.29	3.67	1.55
EAGLE	3	11.11	2	5.92	3.83	2.01
EAGLE	3	11.11	3	4.29	3.44	1.47
EAGLE	3	20.79	1	7.23	3.36	2.17
EAGLE	3	20.79	2	7.23	3.67	1.79
EAGLE	3	20.79	3	6.97	3.44	1.89
EAGLE	3	15.11	1	5.89	4.45	2.54
EAGLE	3	15.11	2	5.09	3.67	1.80
EAGLE	3	15.11	3	7.77	3.28	1.99
EAGLE	3	30.39	1	5.62	4.14	2.29
EAGLE	3	30.39	2	11.27	3.91	3.80
EAGLE	3	30.39	3	6.99	4.69	2.06
EAGLE	3	38.25	1	3.75	4.06	1.50
EAGLE	3	38.25	2	4.55	4.45	1.64
EAGLE	3	38.25	3	5.09	3.83	1.56
PARKER	HARVEST	15.94	1	8.05	2.89	2.05
PARKER	HARVEST	15.94	2	7.47	4.22	2.34
PARKER	HARVEST	15.94	3	7.18	2.89	1.85
PARKER	HARVEST	14.52	1	4.89	2.89	1.21
PARKER	HARVEST	14.52	2	6.61	3.91	1.63
PARKER	HARVEST	14.52	3	7.47	3.83	1.86

ENERGY VARIABLES

HARVEST INDICATES SAMPLES THRESHED IMMEDIATELY. FOR RECONSTITUTED
SAMPLES 1 WAS HARVESTED EARLIEST AND 3 LAST

VARIETY	MATURITY	MCISTURE CONTENT	REP	TORQUE IN-LBS	SPAN SEC	AREA, CM SQUARED
PARKER	HARVEST	12.29	1	8.04	3.59	2.00
PARKER	HARVEST	12.29	2	5.63	3.28	1.13
PARKER	HARVEST	12.29	3	5.89	2.73	1.56
CENTURK	HARVEST	19.34	1	6.61	3.67	1.55
CENTURK	HARVEST	19.34	2	7.47	2.58	1.41
CENTURK	HARVEST	19.34	3	8.05	2.97	1.44
CENTURK	HARVEST	17.24	1	8.05	2.97	1.83
CENTURK	HARVEST	17.24	2	8.91	2.97	1.76
CENTURK	HARVEST	17.24	3	6.32	3.59	1.49
CENTURK	HARVEST	10.51	1	5.09	2.19	0.84
CENTURK	HARVEST	10.51	2	5.63	2.81	1.17
CENTURK	HARVEST	10.51	3	5.63	2.19	0.88
EAGLE	HARVEST	17.22	1	10.34	3.36	3.00
EAGLE	HARVEST	17.22	2	11.49	3.75	3.53
EAGLE	HARVEST	17.22	3	13.22	4.69	4.13
EAGLE	HARVEST	11.14	1	6.32	2.58	1.07
EAGLE	HARVEST	11.14	2	6.32	3.59	1.40
EAGLE	HARVEST	11.14	3	4.60	2.66	0.93
EAGLE	HARVEST	9.75	1	9.11	3.75	1.37
EAGLE	HARVEST	9.75	2	9.91	3.59	1.85
EAGLE	HARVEST	9.75	3	8.84	2.66	1.06

SIEVE ANALYSIS

THE SIEVE NUMBERS CORRESPOND TO STANDARD TYLER SIEVES

WEIGHT RETAINED IN EACH SIEVE EXPRESSED IN GRAMS

		M.C.								
VARIETY	MATURITY	(WB.%)	REF.	NO. 4	NO. 6	NO. 8	NO. 10	NO. 16	NO. 20	PAN
PARKER	1	9.60	1	6.63	3.18	7.24	2.54	0.86	0.44	0.38
PARKER	1	9.60	2	4.94	2.30	5.99	2.26	0.80	0.35	0.29
PARKER	1	9.60	3	6.17	2.88	6.43	2.15	0.72	0.39	0.39
PARKER	1	15.34	1	8.13	2.38	6.00	1.36	0.57	0.33	0.29
PARKER	1	15.34	2	8.71	2.42	6.10	1.55	0.66	0.37	0.33
PARKER	1	15.34	3	9.54	2.36	2.41	3.10	0.46	0.21	0.23
PARKER	1	23.08	1	9.68	1.20	4.31	1.12	0.32	0.21	0.26
PARKER	1	23.08	2	11.11	1.87	4.76	0.94	0.30	0.16	0.20
PARKER	1	23.08	3	11.22	1.65	4.75	0.92	0.34	0.22	0.31
PARKER	1	28.19	1	12.12	1.93	4.42	0.97	0.38	0.03	0.24
PARKER	1	28.19	2	8.10	2.73	5.69	1.60	0.74	0.29	0.60
PARKER	1	28.19	3	10.42	1.23	4.30	0.68	0.48	0.13	0.32
PARKER	1	34.39	1	9.26	1.29	4.48	1.27	0.45	0.20	0.30
PARKER	1	34.39	2	14.90	1.32	4.79	1.03	0.35	0.16	0.26
PARKER	1	34.39	3	13.31	1.69	5.24	1.13	0.37	0.18	0.32
PARKER	1	46.37	1	12.10	2.09	4.78	1.04	0.27	0.15	0.21
PARKER	1	46.37	2	9.48	1.39	4.70	1.06	0.34	0.17	0.27
PARKER	1	46.37	3	11.67	1.94	4.64	0.94	0.31	0.15	0.25
PARKER	2	8.24	1	5.16	2.03	5.63	1.88	0.65	0.33	0.27
PARKER	2	8.24	2	4.96	2.46	6.03	2.33	0.74	0.38	0.34
PARKER	2	8.24	3	4.41	2.80	6.36	2.13	0.72	0.40	0.29

SIEVE ANALYSIS

THE SIEVE NUMBERS CORRESPOND TO STANDARD TYLER SIEVES

WEIGHT RETAINED IN EACH SIEVE EXPRESSED IN GRAMS

		M.C.								
VARIETY	MATURITY	(W.B.%)	REF	NO. 4	NO. 6	NO. 8	NO. 10	NO. 16	NO. 20	PAN
PARKER	2	21.72	1	10.44	1.00	3.79	0.92	0.30	0.15	0.18
PARKER	2	21.72	2	8.86	0.66	4.00	0.89	0.24	0.10	0.16
PARKER	2	21.72	3	12.14	1.43	3.64	0.73	0.19	0.11	0.15
PARKER	2	24.59	1	10.61	1.27	4.20	1.18	0.32	0.13	0.29
PARKER	2	24.59	2	10.41	1.11	3.54	1.22	0.20	0.08	0.09
PARKER	2	24.59	3	11.46	1.45	5.53	1.31	0.26	0.11	0.25
PARKER	2	19.97	1	8.52	1.24	4.36	1.21	0.29	0.12	0.15
PARKER	2	19.97	2	10.88	1.21	3.93	1.01	0.27	0.10	0.09
PARKER	2	19.97	3	11.91	1.36	4.44	1.16	0.38	0.15	0.18
PARKER	2	41.74	1	9.90	1.12	3.88	1.12	0.27	0.08	0.12
PARKER	2	41.74	2	9.22	1.44	3.77	0.97	0.26	0.10	0.20
PARKER	2	41.74	3	11.74	1.19	3.72	0.93	0.26	0.08	0.14
PARKER	2	30.82	1	11.42	1.18	3.48	1.14	0.29	0.08	0.12
PARKER	2	30.82	2	11.61	1.01	3.40	0.93	0.19	0.02	0.09
PARKER	2	30.82	3	10.57	1.11	3.90	1.28	0.28	0.11	0.18
PARKER	3	7.47	1	4.57	1.61	4.82	1.74	0.50	0.24	0.22
PARKER	3	7.47	2	3.27	2.69	5.91	1.94	0.64	0.32	0.26
PARKER	3	7.47	3	3.88	1.67	5.61	1.95	0.56	0.28	0.19
PARKER	3	12.16	1	8.51	1.97	5.00	1.04	0.46	0.19	0.18
PARKER	3	12.16	2	7.64	1.05	3.84	1.06	0.33	0.05	0.12
PARKER	3	12.16	3	7.86	1.05	4.33	0.83	0.26	0.09	0.08

SIEVE ANALYSIS

THE SIEVE NUMBERS CORRESPOND TO STANDARD TYLER SIEVES

WEIGHT RETAINED IN EACH SIEVE EXPRESSED IN GRAMS

		M.C.								
VARIETY	MATURITY	(WB.%)	REF.	NO. 4	NO. 6	NO. 8	NO. 10	NO. 16	NO. 20	PAN
PARKER	3	13.21	1	7.56	1.08	3.41	0.73	0.28	0.11	0.10
PARKER	3	13.21	2	8.20	0.92	4.21	1.11	0.42	0.19	0.21
PARKER	3	13.21	3	8.31	2.18	4.33	0.94	0.32	0.11	0.05
PARKER	3	16.89	1	8.59	1.04	4.65	1.21	0.38	0.18	0.20
PARKER	3	16.89	2	8.14	0.91	4.29	1.00	0.27	0.10	0.12
PARKER	3	16.89	3	11.88	1.66	4.23	0.87	0.23	0.11	0.25
PARKER	3	33.01	1	8.50	0.60	3.75	1.00	0.24	0.03	0.08
PARKER	3	33.01	2	8.11	1.05	4.38	0.98	0.32	0.16	0.12
PARKER	3	33.01	3	11.89	0.53	3.11	0.95	0.21	0.08	0.07
PARKER	3	41.08	1	8.32	1.46	4.38	0.84	0.26	0.07	0.16
PARKER	3	41.08	2	8.19	0.58	3.82	1.03	0.28	0.09	0.13
PARKER	3	41.08	3	7.87	1.26	3.72	0.93	0.30	0.14	0.20
CENTURK	1	9.20	1	5.54	3.09	5.33	1.55	0.50	0.29	0.30
CENTURK	1	9.20	2	4.07	2.71	6.07	1.90	0.62	0.30	0.30
CENTURK	1	9.20	3	5.07	4.06	5.27	1.24	0.44	0.26	0.29
CENTURK	1	20.98	1	11.31	1.79	4.47	0.67	0.21	0.19	0.18
CENTURK	1	20.98	2	11.91	1.83	4.52	0.82	0.25	0.13	0.27
CENTURK	1	20.98	3	12.32	1.44	4.51	0.86	0.23	0.12	0.19
CENTURK	1	23.75	1	13.52	1.46	2.91	0.44	0.26	0.26	0.29
CENTURK	1	23.75	2	13.16	1.37	4.08	0.91	0.29	0.20	0.36
CENTURK	1	23.75	3	12.21	1.60	4.78	0.90	0.28	0.26	0.37

SIEVE ANALYSIS

THE SIEVE NUMBERS CORRESPOND TO STANDARD TYLER SIEVES

WEIGHT RETAINED IN EACH SIEVE EXPRESSED IN GRAMS

		M.C.								
VARIETY	MATURITY	(WB.%)	REP	NO. 4	NO. 6	NO. 8	NO. 10	NO. 16	NO. 20	PAN
CENTURK	1	25.36	1	10.75	1.06	3.71	0.80	0.22	0.15	0.24
CENTURK	1	25.36	2	12.61	1.24	4.05	0.80	0.28	0.17	0.27
CENTURK	1	25.36	3	11.61	0.67	3.72	0.82	0.23	0.12	0.25
CENTURK	1	38.01	1	14.01	1.34	3.82	0.90	0.22	0.13	0.21
CENTURK	1	38.01	2	13.36	1.53	4.61	0.82	0.26	0.19	0.25
CENTURK	1	38.01	3	13.12	1.54	4.26	0.92	0.34	0.19	0.22
CENTURK	1	48.03	1	13.10	1.14	3.61	0.63	0.13	0.09	0.15
CENTURK	1	48.03	2	9.53	1.53	4.35	0.89	0.24	0.09	0.17
CENTURK	1	48.03	3	10.69	1.21	3.56	0.65	0.15	0.09	0.13
CENTURK	2	9.09	1	5.89	3.61	5.94	1.90	0.66	0.38	0.38
CENTURK	2	9.09	2	5.14	3.11	5.82	2.09	0.65	0.37	0.36
CENTURK	2	9.09	3	5.84	3.26	6.39	1.95	0.74	0.39	0.40
CENTURK	2	11.81	1	7.98	1.45	4.30	0.75	0.27	0.16	0.14
CENTURK	2	11.81	2	8.41	1.66	4.85	0.85	0.30	0.17	0.16
CENTURK	2	11.81	3	6.49	0.80	4.37	0.86	0.26	0.13	0.12
CENTURK	2	23.10	1	18.15	0.97	3.00	0.82	0.31	0.18	0.19
CENTURK	2	23.10	2	12.40	0.95	3.40	0.79	0.25	0.17	0.14
CENTURK	2	23.10	3	9.39	0.99	3.63	0.75	0.16	0.05	0.08
CENTURK	2	17.95	1	10.17	0.78	3.00	0.79	0.23	0.13	0.18
CENTURK	2	17.95	2	11.26	1.29	4.02	0.75	0.22	0.13	0.19
CENTURK	2	17.95	3	11.38	1.24	3.92	0.84	0.24	0.12	0.17

SIEVE ANALYSIS

THE SIEVE NUMBERS CORRESPOND TO STANDARD TYLER SIEVES

WEIGHT RETAINED IN EACH SIEVE EXPRESSED IN GRAMS

		M.C.								
VARIETY	MATURITY	(WB.%)	REF	NO 4	NO 6	NO 8	NO 10	NO 16	NO 20	PAN
CENTURK	2	30.52	1	11.00	2.06	5.03	0.95	0.28	0.15	0.20
CENTURK	2	30.52	2	9.83	1.19	3.57	0.75	0.15	0.02	0.12
CENTURK	2	30.52	3	11.49	1.76	3.87	0.82	0.24	0.07	0.13
CENTURK	2	45.45	1	9.95	0.77	4.69	1.55	0.34	0.22	0.35
CENTURK	2	45.45	2	9.47	0.53	3.84	1.33	0.20	0.08	0.19
CENTURK	2	45.45	3	10.74	1.14	1.00	1.02	0.29	0.16	0.23
CENTURK	3	8.36	1	4.25	3.25	4.54	1.22	0.33	0.19	0.15
CENTURK	3	8.36	2	4.32	1.67	4.33	1.15	0.35	0.17	0.18
CENTURK	3	8.36	3	4.45	2.41	5.27	1.36	0.46	0.22	0.11
CENTURK	3	10.62	1	7.00	1.66	4.48	0.84	0.31	0.19	0.14
CENTURK	3	10.62	2	6.54	2.12	4.21	0.66	0.27	0.10	0.10
CENTURK	3	10.62	3	5.89	1.99	0.21	0.81	0.26	0.14	0.08
CENTURK	3	18.21	1	8.83	0.86	3.75	0.74	0.15	0.09	0.13
CENTURK	3	18.21	2	9.60	1.16	3.36	0.66	0.18	0.11	0.12
CENTURK	3	18.21	3	10.68	1.07	4.07	0.78	0.22	0.15	0.17
CENTURK	3	17.66	1	8.80	0.92	4.25	0.80	0.24	0.10	0.15
CENTURK	3	17.66	2	9.05	0.88	4.36	0.83	0.26	0.13	0.16
CENTURK	3	17.66	3	8.21	1.13	4.48	0.73	0.18	0.05	0.14
CENTURK	3	34.99	1	8.09	1.15	4.43	0.77	0.20	0.04	0.13
CENTURK	3	34.99	2	8.39	1.71	4.45	0.76	0.25	0.07	0.06
CENTURK	3	34.99	3	8.61	1.30	5.04	1.05	0.29	0.15	0.16

SIEVE ANALYSIS

THE SIEVE NUMBERS CORRESPOND TO STANDARD TYLER SIEVES

WEIGHT RETAINED IN EACH SIEVE EXPRESSED IN GRAMS

		M.C.								
VARIETY	MATURITY	(WB.%)	REF	NO. 4	NO. 6	NO. 8	NO. 10	NO. 16	NO. 20	PAN
CENTURK	3	31.94	1	8.95	2.67	5.06	0.70	0.23	0.07	0.11
CENTURK	3	31.94	2	8.99	1.94	4.83	0.84	0.20	0.09	0.16
CENTURK	3	31.94	3	7.52	1.11	5.53	0.96	0.22	0.13	0.17
EAGLE	1	8.86	1	5.69	4.79	4.63	1.65	0.65	0.33	0.30
EAGLE	1	8.86	2	4.90	4.68	7.37	2.56	1.11	0.54	0.45
EAGLE	1	8.86	3	4.15	4.10	7.96	3.08	1.38	0.68	0.54
EAGLE	1	14.46	1	11.41	2.62	5.16	1.46	0.68	0.24	0.30
EAGLE	1	14.46	2	16.11	2.78	5.66	1.45	0.76	0.43	0.39
EAGLE	1	14.46	3	12.97	2.50	4.81	1.40	0.68	0.35	0.35
EAGLE	1	23.05	1	18.11	1.32	3.31	1.05	0.35	0.31	0.31
EAGLE	1	23.05	2	16.40	1.51	3.32	1.01	0.35	0.24	0.28
EAGLE	1	23.05	3	17.57	1.44	2.83	0.91	0.37	0.23	0.24
EAGLE	1	29.46	1	16.95	1.43	3.38	0.84	0.27	0.12	0.15
EAGLE	1	29.46	2	17.30	1.43	3.79	1.19	0.35	0.13	0.25
EAGLE	1	29.46	3	10.46	2.29	5.26	1.30	0.46	0.23	0.40
EAGLE	1	36.53	1	14.29	2.19	4.16	1.30	0.43	0.20	0.18
EAGLE	1	36.53	2	17.96	1.31	3.81	1.11	0.35	0.16	0.22
EAGLE	1	36.53	3	17.99	1.59	4.32	1.23	0.35	0.16	0.15
EAGLE	1	48.74	1	14.85	1.79	3.82	1.14	0.39	0.18	0.24
EAGLE	1	48.74	2	18.36	1.00	4.19	1.67	0.35	0.22	0.37
EAGLE	1	48.74	3	16.68	1.36	3.51	1.04	0.35	0.20	0.23

SIEVE ANALYSIS

THE SIEVE NUMBERS CORRESPOND TO STANDARD TYLER SIEVES

WEIGHT RETAINED IN EACH SIEVE EXPRESSED IN GRAMS

		M.C.								
VARIETY	MATURITY (W.B.T.)	REF	NO. 4	NO. 6	NO. 8	NO. 10	NO. 16	NO. 20	PAN	
EAGLE	2	8.12	1	5.68	3.61	6.44	2.38	1.25	0.67	0.47
EAGLE	2	8.12	2	5.70	2.77	5.96	2.21	1.11	0.58	0.44
EAGLE	2	8.12	3	5.90	3.33	5.90	2.16	1.14	0.54	0.38
EAGLE	2	11.07	1	14.66	1.28	3.17	0.80	0.20	0.06	0.16
EAGLE	2	11.07	2	7.03	2.35	4.36	2.66	0.51	0.24	0.19
EAGLE	2	11.07	3	9.09	1.38	4.73	1.59	0.68	0.29	0.27
EAGLE	2	17.70	1	14.91	1.08	3.00	0.91	0.25	0.20	0.20
EAGLE	2	17.70	2	15.09	1.14	3.09	0.98	0.40	0.16	0.23
EAGLE	2	17.70	3	16.30	0.99	3.01	0.96	0.26	0.14	0.23
EAGLE	2	25.89	1	12.40	1.13	4.51	0.72	0.22	0.12	0.12
EAGLE	2	25.89	2	13.41	0.86	2.86	0.74	0.16	0.07	0.15
EAGLE	2	25.89	3	12.82	1.03	3.51	1.06	0.27	0.22	0.16
EAGLE	2	28.97	1	12.62	1.54	4.85	1.37	0.42	0.23	0.24
EAGLE	2	28.97	2	10.47	1.42	3.29	1.32	0.45	0.58	0.12
EAGLE	2	28.97	3	12.94	1.39	3.60	0.83	0.20	0.10	0.09
EAGLE	2	39.69	1	11.97	1.87	4.66	1.12	0.35	0.08	0.14
EAGLE	2	39.69	2	18.99	1.51	3.43	0.91	0.15	0.14	0.12
EAGLE	2	39.69	3	15.91	1.62	5.24	1.48	0.41	0.21	0.19
EAGLE	3	6.60	1	4.94	2.46	5.38	1.96	0.91	0.50	0.27
EAGLE	3	6.60	2	5.00	2.60	4.73	1.53	0.70	0.36	0.09
EAGLE	3	6.60	3	4.90	2.50	5.50	1.75	0.80	0.44	0.15

SIEVE ANALYSIS

THE SIEVE NUMBERS CORRESPOND TO STANDARD TYLER SIEVES

WEIGHT RETAINED IN EACH SIEVE EXPRESSED IN GRAMS

		M.C.								
VARIETY	MATURITY	(WB.%)	REF.	NO. 4	NO. 6	NO. 8	NO. 10	NO. 16	NO. 20	PAN
EAGLE	3	11.11	1	7.72	1.88	4.42	1.18	0.58	0.28	0.16
EAGLE	3	11.11	2	8.71	2.33	4.33	1.36	0.68	0.48	0.20
EAGLE	3	11.11	3	5.83	2.02	4.66	1.31	0.65	0.45	0.22
EAGLE	3	20.79	1	12.36	1.07	3.72	1.16	0.37	0.20	0.15
EAGLE	3	20.79	2	12.57	1.07	3.48	0.86	0.37	0.25	0.20
EAGLE	3	20.79	3	10.15	0.93	3.54	0.95	0.37	0.23	0.14
EAGLE	3	15.11	1	15.52	0.86	4.61	1.27	0.42	0.25	0.25
EAGLE	3	15.11	2	10.75	1.09	4.68	1.16	0.43	0.20	0.22
EAGLE	3	15.11	3	15.09	1.02	4.09	1.13	0.40	0.26	0.23
EAGLE	3	30.39	1	12.20	1.80	5.09	1.00	0.29	0.06	0.11
EAGLE	3	30.39	2	10.54	2.14	4.78	1.41	0.51	0.26	0.18
EAGLE	3	30.39	3	12.45	1.68	4.63	1.20	0.40	0.13	0.15
EAGLE	3	38.25	1	10.51	2.79	5.37	1.27	0.50	0.18	0.19
EAGLE	3	38.25	2	10.17	2.13	5.12	1.12	0.41	0.21	0.23
EAGLE	3	38.25	3	9.65	1.99	4.61	1.10	0.45	0.15	0.18
PARKER	HARVEST	15.94	1	9.00	4.33	9.11	1.65	0.78	0.40	0.39
PARKER	HARVEST	15.94	2	8.70	4.40	9.52	1.51	0.64	0.34	0.41
PARKER	HARVEST	15.94	3	8.74	5.21	10.70	1.56	0.63	0.33	0.36
CENTURK	HARVEST	17.24	1	8.68	3.16	7.65	1.08	0.43	0.21	0.31
CENTURK	HARVEST	17.24	2	8.20	3.84	8.18	1.24	0.57	0.29	0.35
CENTURK	HARVEST	17.24	3	9.90	4.79	7.94	1.24	0.51	0.31	0.39

SIEVE ANALYSIS

THE SIEVE NUMBERS CORRESPOND TO STANDARD TYLER SIEVES

WEIGHT RETAINED IN EACH SIEVE EXPRESSED IN GRAMS

VARIETY	Maturity	M.C. (W.B.%)	REP	NO. 4	NO. 6	NO. 8	NO. 10	NO. 16	NO. 20	PAN
EAGLE	HARVEST	17.22	1	10.99	8.66	17.99	2.61	0.28	0.62	0.53
EAGLE	HARVEST	17.22	2	9.27	2.18	7.02	1.32	0.43	0.21	0.21
EAGLE	HARVEST	17.22	3	10.94	7.49	11.40	2.44	1.25	0.51	0.44
PARKER	HARVEST	14.52	1	8.39	1.99	8.20	1.10	0.28	0.09	0.05
PARKER	HARVEST	14.52	2	14.62	6.83	12.83	2.38	1.02	0.54	0.49
PARKER	HARVEST	14.52	3	9.81	1.67	6.39	1.25	0.38	0.18	0.15
CENTURK	HARVEST	19.34	1	9.13	2.42	6.86	1.04	0.39	0.19	0.19
CENTURK	HARVEST	19.34	2	9.22	1.82	6.76	0.86	0.31	0.16	0.16
CENTURK	HARVEST	19.34	3	7.75	2.32	6.61	0.74	0.20	0.08	0.10
EAGLE	HARVEST	11.14	1	12.21	1.88	8.37	1.55	0.48	0.25	0.16
EAGLE	HARVEST	11.14	2	9.12	2.33	6.89	1.28	0.49	0.29	0.08
EAGLE	HARVEST	11.14	3	9.46	2.71	8.44	1.65	0.62	0.29	0.29
PARKER	HARVEST	12.29	1	7.29	2.18	6.15	1.24	0.46	0.25	0.18
PARKER	HARVEST	12.29	2	7.26	2.13	6.50	0.95	0.35	0.15	0.07
PARKER	HARVEST	12.29	3	8.27	2.99	9.76	1.16	0.42	0.25	0.19
CENTURK	HARVEST	10.51	1	6.84	1.36	4.85	0.87	0.27	0.12	0.11
CENTURK	HARVEST	10.51	2	6.51	2.23	6.04	0.77	0.28	0.09	0.10
CENTURK	HARVEST	10.51	3	6.62	2.22	7.26	0.91	0.39	0.18	0.14
EAGLE	HARVEST	9.75	1	9.31	2.84	7.85	1.61	0.65	0.26	0.13
EAGLE	HARVEST	9.75	2	9.33	2.57	6.85	1.72	0.79	0.34	0.24
EAGLE	HARVEST	9.75	3	7.91	1.83	7.18	1.69	0.62	0.29	0.21

INSTRUMENTED TESTING DEVICE FOR ESTABLISHING CROP CONDITION

by

David Corn

B.S., Kansas State University, 1976

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Agricultural Engineering

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1977

ABSTRACT

Combine testing is vitally important to agricultural development and the improved harvesting of crops. However, in order to test a combine another combine must be operated in the same conditions to provide a standard for comparison. The operating characteristics of this machine are well known and remain fixed throughout the tests. When two combines are needed to test one the testing is fifty per cent efficient at best. A small test stand could replace this extra combine. Small samples could be threshed in minutes rather than spending hours harvesting large volumes of material. Variables that are measured with the test stand must correlate very well to actual combine operation.

A small, experimental threshing cylinder was used to thresh samples representing a variety of conditions. Combinations of variety, maturity and moisture content were used to achieve the different crop conditions. These factors were varied because of their known effect on threshability. A large number of variables were measured during the testing that pertained to all phases of combine operation. They were:

A. Grain Threshing Variables

1. Distribution of threshed and unthreshed grain beneath the concave.
2. Threshed and unthreshed grain passing over the concave.
3. All possible ratios of grain weights between two positions.

B. Material Other Than Grain (MOG) Handling Variables

1. Distribution of MOG beneath the concave
2. MOG passing over the concave
3. All possible ratios of MOG weights between two positions.

C. Transportation or Energy Variables

1. Peak torque on the cylinder shaft
2. Span of the torque-time graph
3. Area under the torque-time graph

From this list the best variables to measure in the future were selected on the basis of statistical significance and ease of measurement. The variables found to be most important were:

A. Grain Threshing Variables

1. Grain weight in position 1 divided by grain weight passing over the concave.
2. Grain weight in position 6 divided by grain weight passing over the concave.

B. MOG Handling Variables

1. MOG weight in position 1 divided by MOG weight passing over the concave.
2. MOG weight in position 6 divided by MOG weight passing over the concave.

C. Transportation or Energy Variables

1. Peak torque on the cylinder shaft
2. Span of the torque-time curve.

Multiple regression techniques were used to obtain regression equations that would calibrate test stand results to actual combine operation. The R^2 values obtained from the regression analysis that in most cases the variables chosen account for most of the variation in the response of the combine indicating that the choice of variables was very good.

In actual testing both the standard combine and the test stand would be operated initially. Then the combine could be replaced by the test stand for establishing the standard or threshing index for the test crop. This testing device is a first step in a process towards the ultimate goal of measuring the most basic properties of the crop with a device that may look nothing like a combine.