

Research Report No. 1

July, 1962

Stalk Strength of Mexican Strains of

MAIZE

D. L. THOMPSON

**Department of Crop Science
North Carolina State College
Raleigh, North Carolina**

TABLE OF CONTENTS

	Page
Introduction	1
Materials and Methods	2
Experimental Results	4
Means	4
Selections	5
Correlations	16
Seed Availability and Distribution	17
Discussion	17
Summary	20
Literature Cited	21
Appendix	22

ACKNOWLEDGEMENT

This is a joint contribution of the Department of Crop Science, North Carolina State College, North Carolina Agricultural Experiment Station; the Crops Research Division, Agricultural Research Service, USDA; and the Inter-American Maize Improvement Program sponsored by the Rockefeller Foundation in cooperation with the Mexican Ministry of Agriculture.

This study was possible primarily because of the efforts of Dr. E. J. Wellhausen and his Mexican collaborators. Dr. Wellhausen kindly made the strains available for study, provided necessary facilities for collecting, processing and evaluating the samples, and provided funds for travel. Dr. H. L. Everett of Cornell University assisted in the collection of the crushing pressure data and his help was appreciated. Mr. Osvaldo Trivelli of Santiago, Chile, was a valuable assistant and his help was gratefully appreciated. Credit is also due to Ingenieros Jose Jimenez and Mario Castro of the Inter-American Maize Program for planting and taking care of the plots at Tepalcingo. Much credit is also due to Ingeniero Emilio Gutierrez Roldan, who provided many of the facilities for the production of the maize at Tepalcingo, Morelos, Mexico. Dr. M. S. Zuber of the University of Missouri kindly loaned some of the laboratory equipment necessary for this endeavor.

STALK STRENGTH OF MEXICAN STRAINS OF MAIZE

D. L. Thompson^{1/}

INTRODUCTION

The development of lodging-resistant corn is important because corn which stands well can be harvested with minimum loss. Present-day hybrids have strong stalks in comparison with the open-pollinated farm varieties they replaced; nevertheless, there is need for further improvement. There is ample evidence that additional progress can be made by breeding. However, the speed with which further improvement can be accomplished and perhaps the strength level which can be attained may well depend upon the identification of exceptional stalk-strength types for breeding material.

The Rockefeller Foundation has sponsored intensive studies on corn and has been instrumental in assembling several large collections. In 1961, a large number of accessions of the Mexican corn collection were grown and classified by the Inter-American Maize Improvement Project in cooperation with the Mexican National Maize Commission in a winter nursery at Tepalcingo, Morelos, Mexico. An invitation was received to travel to Mexico and observe the various races and strains and, after seed harvest, to examine the plants for stalk strength.

The commonly used measure of stalk strength is lodging percentage as determined from field counts. As expected, very little lodging occurred in the Mexican plantings; consequently, stalk strength was measured by a laboratory technique developed by Zuber and Grogan (4). This laboratory

^{1/} Research Agronomist, Crops Research Division, ARS, USDA, Raleigh, N. C.

technique consists of determining crushing pressure and rind thickness of stalk sections cut from lower internodes. The necessary equipment was taken to Mexico for this purpose.

The primary purpose of this study was to examine some accessions of the Mexican maize collection and to identify those accessions which had exceptionally strong stalks and which would be useful as source material for breeding purposes.

MATERIALS AND METHODS

The 561 accessions examined during the course of this study represented the entire range of variation in maize below 1800 meters in Mexico. Most of the basic races involved have been described by Wellhausen et al. (2). The accessions were grown near Tepalcingo, in the state of Morelos, approximately 80 kilometers southeast of Mexico City in a neutral environment under irrigation. The nursery was planted January 15, 1961, and the stalk samples were collected June 7 and 8, 1961. Some of the stalks were partly green on the collection dates.

The accessions were grown in separate rows 10 meters long with 92 cm. between rows. Thirty kernels were planted per row for an approximate spacing of 30 cm. between plants in the row. About 95% of a perfect stand was obtained. Plants were slightly shorter for height than normal because of the shorter day length but growth was considered satisfactory for a winter nursery. Moisture was provided by surface irrigation. Stalk strength measurements were obtained for 561 of the 569 rows.

In most cases, stalk samples were obtained from the first 10 plants in each row and consisted of 1-meter sections cut from the lower portion of each plant immediately above the ground. Samples were placed in a hot

air drier for 7 days to remove excess moisture. After drying, a special circle saw was used to cut a 2-inch section from the third internode above the ground of each stalk sample.

The number of pounds required to crush each 2-inch section was recorded as crushing pressure. A hydraulic laboratory press was used with a gauge graduated from 0 to 5,000 pounds. Readings were recorded to the closest 50 pounds. The gauge was not sensitive below 100 pounds; therefore, an arbitrary minimum pressure of 100 pounds was recorded for those sections which failed to register when crushed.

A small portion of the rind of each crushed section was measured for rind thickness. Measurements were made with a thickness gauge and were recorded to the nearest .01 millimeter. The rind samples were dried for 3 days at approximately 50°C. before measurements were made.

In this study, the terms accession, row, and strain are synonyms. An average of 9.65 plants were sampled for each row for mean crushing pressure and rind-thickness calculations. An "average standard error for an accession mean" was calculated by the following:

$$\sqrt{\frac{\Sigma x^2}{(N-S)(k_o)}}$$

where Σx^2 is the pooled sum of squares within each accession; N is the total number of plants measured; S is the total number of accessions sampled; and k_o is the harmonic mean of the number of stalk sections measured per accession.

Fifty-nine strains were visually selected in the field as possible fiber types. Selection was based primarily on plant appearance, i.e., tall plants with large diameter stalks were selected as being the most promising types for high fiber yield.

EXPERIMENTAL RESULTS

Means

Mean crushing pressure for all 561 strains was 460.7 pounds with a range of 100.0 to 1890.0. Rind thickness averaged 1.309 mm. with a range of .590 to 2.153. Frequency distributions for crushing pressure and rind thickness are shown in Figures 1 and 2, respectively. The initial crushing pressure class (100 to 199.9 pounds) contained 33.2% of the accessions. The comparatively large proportion in this class was partly due to the fact that the minimum crushing pressure given any sample was 100 pounds. Many samples would have fallen below 100 pounds if a gauge sensitive in the lower range had been used.

Of the 561 accessions measured, 198 were typical of one or another of 21 previously named races. The others represented various amounts of mixtures between races. These 198 "more pure types" were pooled into 21 groups according to race. Race and subtype means are presented in Table 1. Tuxpeno was the strongest stalk race, averaging 986.7 pounds and 1.592 mm. for crushing pressure and rind thickness, respectively. Comiteco and Puebla Grueso also had high values for crushing pressure and rind thickness. In general, similar means were obtained for subtypes of the various races.

The strains of each of the 21 races were tabulated into 4 classes for crushing pressure and 4 classes for rind thickness. Classes were formed by dividing the range of each character into 4 equal increments. These tabulations are listed in Table 2 and were made to further characterize the strength of each race. Tuxpeno shows clearly as a strong stalk race having a high proportion of strains in classes 3 and 4 for both crushing pressure and rind thickness.

Of the 561 accessions measured, 558 were identified according to the state in which they were collected. The accessions for each state were tabulated into 4 classes for crushing pressure and 4 classes for rind thickness and are listed in Table 3. Accessions from many states were represented in classes 3 and 4, indicating that high strength types were collected from a wide area. Accessions from Chiapas, San Luis Potasi, and Veracruz occurred in class 4 for both crushing pressure and rind thickness, indicating that exceptional strength types were obtained from these 3 states.

Selections

Of the 561 accessions, the best 10% for crushing pressure and the best 10% for rind thickness were selected as meriting consideration in breeding programs for sources of stalk strength. The mean of the 56 accessions selected for crushing pressure was 1269.0 pounds with a range of 1060.0 to 1890.0. The mean of the 56 accessions selected for rind thickness was 1.773 mm. with a range of 1.637 to 2.153. The selected accessions are listed in Table 4 by crushing pressure rank. Because 34 accessions were common to both selection criteria, only 78 different accessions are involved. The rankings listed in Table 4 refer to the rank of each accession out of all 561 accessions measured.

Fifty-nine accessions were visually selected in the field on the basis of plant characteristics as being types which would give a high yield of fiber. Crushing pressure and rind thickness of these selections are shown in Table 5. Of the 59 accessions, 32 were common to the 78 selections listed in Table 4. Mean values for the 59 accessions were 933.3 pounds for crushing pressure and 1.588 mm. for rind thickness. These values were considerably above mean crushing pressure and rind thickness for all accessions measured,

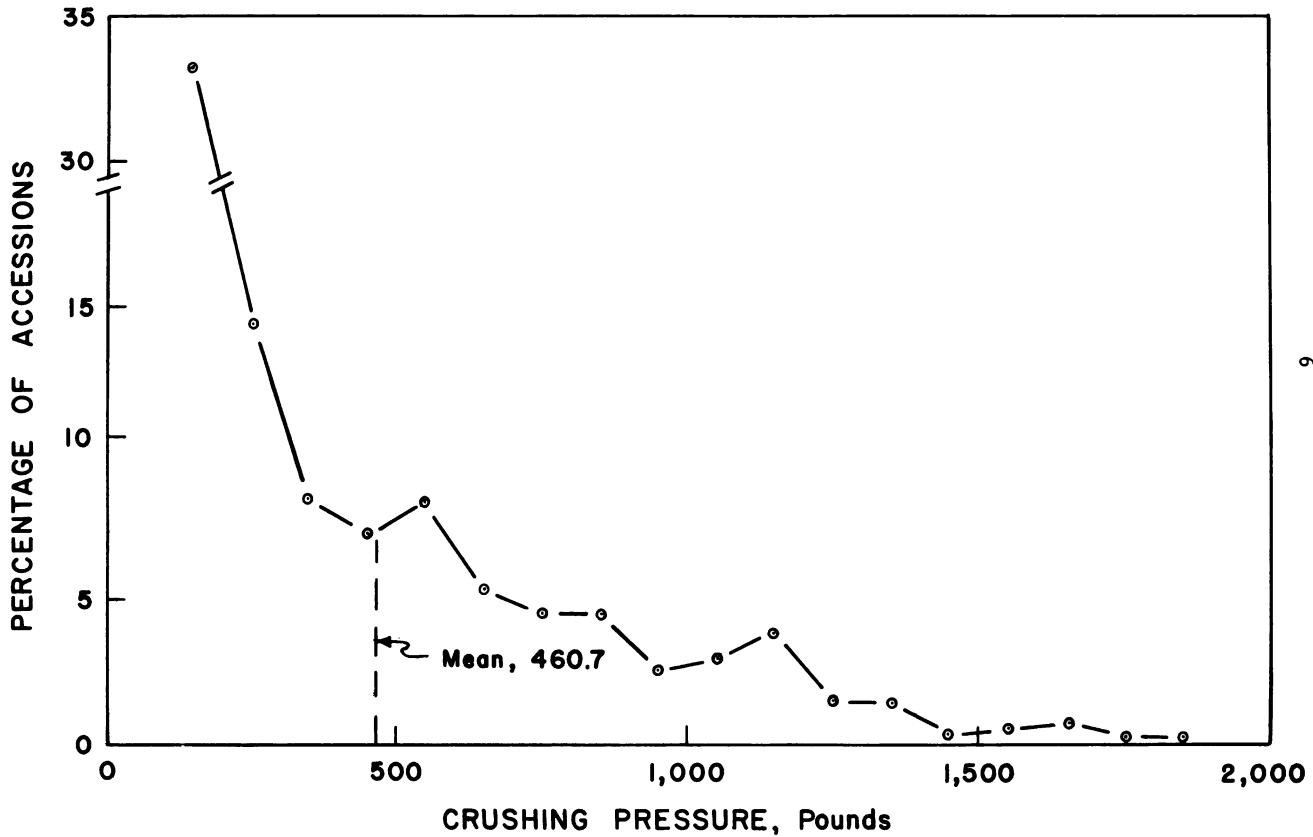


Figure 1. Frequency distribution of 561 accessions of corn evaluated for crushing pressure

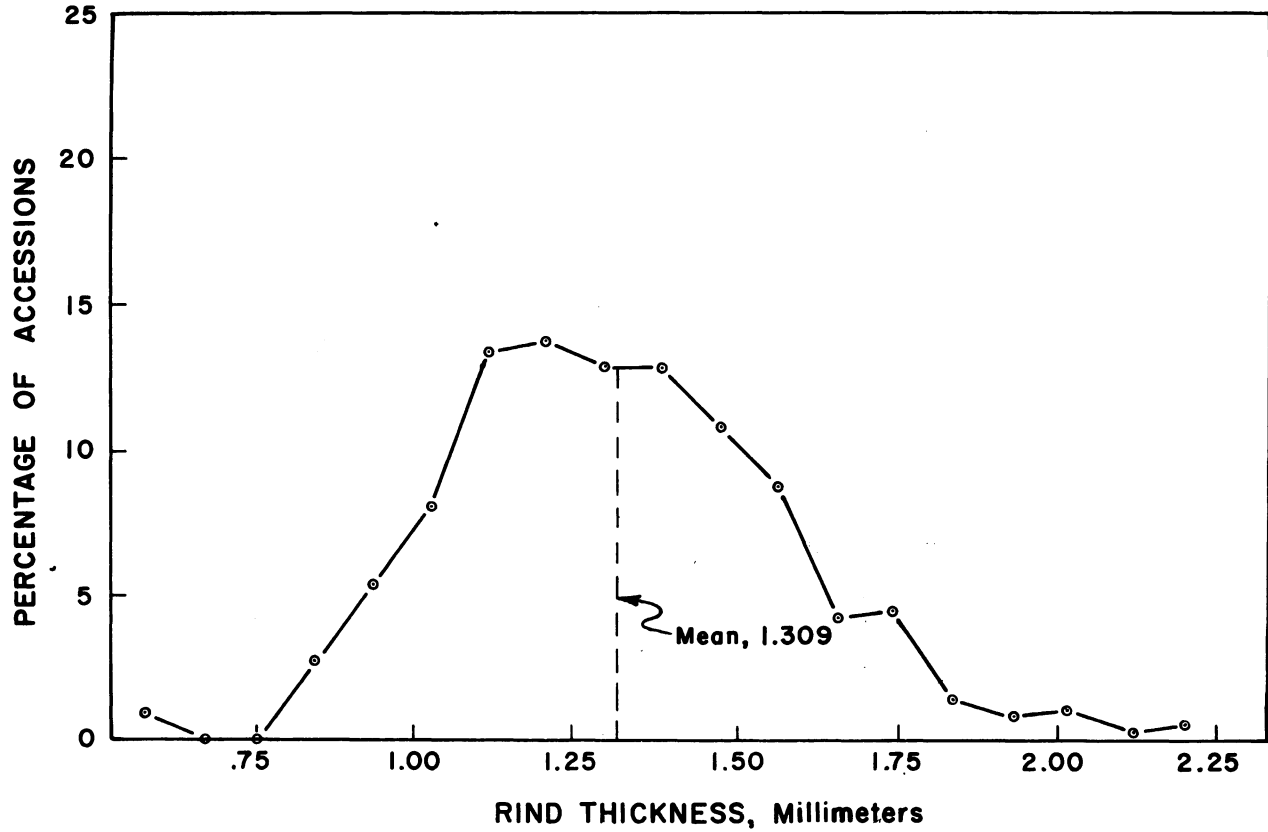


Figure 2. Frequency distribution of 561 accessions of corn evaluated for rind thickness

Table 1. Mean crushing pressure and rind thickness of 198 accessions grouped by race.

Race and Race Subtype*	Race Code**	Number	Crushing Pressure lbs.	Rind Thickness mm.
Tuxpeno	200	40	986.7	1.592
Comiteco Bl.	141	5	850.0	1.624
" Am.	142	4	<u>735.9</u>	<u>1.525</u>
			799.3	1.580
Puebla Grueso	310	4	780.0	1.585
Dzit-Bacal Bl.	291	3	673.3	1.502
" " Am.	292	4	<u>700.0</u>	<u>1.366</u>
			688.6	1.424
Vandeno	210	15	642.1	1.399
Olotillo Bl.	191	8	602.5	1.387
" Am.	192	2	752.5	1.570
" Bl. Fl.	193	3	<u>468.3</u>	<u>1.321</u>
			594.6	1.400
Celaya	230	10	571.0	1.338
" Arg.	234	7	<u>520.7</u>	<u>1.380</u>
			550.3	1.355
Zapalote Grande	170	6	539.2	1.404
Maizon	300	3	536.1	1.380
Blanco de Junio	270	5	532.0	1.264
Amarillo Zamorano	260	1	245.0	1.146
Bolita	250	3	221.7	1.123
" Am.	252	3	<u>265.0</u>	<u>1.340</u>
			243.3	1.231
Tabloncillo	110	8	185.5	1.114
Dulce	080	3	180.0	1.147
Nal-Tel	040	5	113.5	.952
" " Bl.	041	6	171.1	1.162
" " Am.	042	8	<u>194.4</u>	<u>1.108</u>
			165.6	1.084
Reventador	100	6	156.7	1.263

(continued)

Table 1(continued)

Race and Race Subtype*	Race Code**	Number	Crushing Pressure lbs.	Rind Thickness mm.
Conico Norteno	240	14	153.2	1.068
Zapalote Chico	160	4	168.9	1.080
" " Am.	162	4	<u>137.5</u> 153.2	<u>1.047</u> 1.064
Pepitilla	180	5	156.2	1.140
" Arroc.	184	2	<u>141.9</u> 152.1	<u>1.217</u> 1.162
Harinoso de Ocho	060	3	141.7	1.047
" " " +?	064	3	<u>153.3</u> 147.5	<u>1.230</u> 1.138
Dulcillo	280	1	100.0	.947

*Abbreviations: BL. = Blanco (white)
 Am. = Amarillo (yellow)
 Bl. Fl. = white with a flexible cob
 Arg. = Argentino
 Arroc. = Arrocillo (some)
 +? = plus some other unidentified type

**Corresponds to race code in Appendix table 1a. Final digit indicates subtype.

Table 2. Number of accessions for each race occurring in indicated crushing pressure and rind thickness class.*

Race	Code**	Number of Accessions	Crushing Pressure Class				Rind Thickness Class			
			1	2	3	4	1	2	3	4
Nal Tel	4	19	19				6	13		
Harinoso de Ocho	6	6	6				1	5		
Dulce	8	3	3					3		
Reventador	10	6	6				1	2	3	
Tabloncillo	11	8	8				2	5	1	
Comiteco	14	9	2	4	3			1	6	2
Zapalote Chico	16	8	8				1	7		
Zapalote Grande	17	6	2	4				2	4	
Pepitilla	18	7	7				1	5	1	
Olotillo	19	13	8	3	2			5	8	
Tuxpeno	20	40	6	13	16	5		3	30	7
Vandeno	21	15	7	5	3			8	6	1
Celaya	23	17	11	4	2			10	6	1
Conico Norteno	24	14	14				4	10		
Bolita	25	6	6					5	1	
Amarillo Zamorano	26	1	1					1		
Blanco de Junio	27	5	2	3				3	2	
Dulcillo	28	1	1				1			
Dzit-Bacal	29	7	2	4	1			1	6	
Maizon	30	3	2	1				1	2	
Puebla Grueso	31	4	2		2			3		1

*Crushing pressure class: 1, 100 to 547.9; 2, 548 to 995.9; 3, 996 to 1443.9; and 4, 1444 to 1890 pounds.

Rind thickness class: 1, .590 to .979; 2, .980 to 1.369; 3, 1.370 to 1.759; and 4, 1.760 to 2.053 mm.

**Corresponds to race code listed in Appendix 1a.

Table 3. Number of accessions from each state occurring in indicated crushing pressure and rind thickness class.*

State	Number of Accessions	Crushing Pressure Class				Rind Thickness Class			
		1	2	3	4	1	2	3	4
Campeche	19	11	6	2		2	8	9	
Chihuahua	26	22	4			1	13	12	
Chiapas	82	38	28	13	3	1	28	48	5
Coahuila	14	7	4	3			9	5	
Colima	3	3					2	1	
Guerrero	50	42	5	3		12	29	8	1
Guanajuato	29	28	1			5	24		
Jalisco	81	77	2	2		11	62	7	1
Michoacan	34	22	9	3		1	16	15	2
Morelos	6	6					3	3	
Nayarit	15	12	3			4	10	1	
Nuevo Leon	7	4	3				6	1	
Oaxaca	29	23	4	2		3	16	7	3
Puebla	8	3	2	3			1	6	1
Quintana Roo	12	10	2				10	2	
Queretaro	7	4	1	2			3	4	
San Luis Potasi	25	8	13	3	1		11	11	3
Sinaloa	2	2					2		
Sonora	20	20				5	15		
Tabasco	1			1				1	
Tamaulipas	10	4	5	1			7	3	
Veracruz	54	8	23	18	5		9	37	8
Yucatan	24	22	2			1	21	2	

*Crushing pressure class: 1, 1,100 to 547.9; 2, 548 to 995.9; 3, 996 to 1443.9; and 4, 1444 to 1890 pounds.

Rind thickness class: 1, .590 to .979; 2, .980 to 1.369; 3, 1.370 to 1.759; and 4, 1.760 to 2.053 mm.

Table 4. Mean crushing pressure and rind thickness of 78 accessions of corn meriting consideration in breeding programs as sources of stalk strength

Row Number	Accession	Group	Plants		Crushing Pressure		Rind Thickness	
			Measured	No.	Rank	lbs.	Rank	mm.
173	Ver	149	20	10	1	1890.0	42	1.695
198	Ver	226	37	10	2	1780.0	1	2.153
145	S L P	108	12	10	3	1665.0	2	2.050
195	Ver	221	35	9	4	1638.9	5	1.993
163	Ver	81	8	7	5	1620.0	28	1.739
285	Chis	161	61	10	6	1615.0	11	1.869
238	Chis	11	15	10	7	1530.0	103	1.535
241	Chis	19	16	10	8	1525.0	111	1.519
118	Tamps	41	5	10	9	1520.0	52	1.659
183	Ver	185	26	10	10	1455.0	3	2.033
190	Ver	206	31	10	11	1415.0	7	1.962
283	Chis	152	59	10	12	1380.0	16	1.809
284	Chis	155	60	10	13	1365.0	83	1.571
268	Chis	99	12	10	14	1360.0	27	1.742
184	Ver	187	48	10	15	1350.0	25	1.743
199	Ver	228	38	9	16	1350.0	50	1.662
141	S L P	72	6	10	17	1345.0	8	1.948
129	Jal	187	61	10	18	1335.0	14	1.842
186	Ver	191	28	10	19	1315.0	4	2.009
62	Pue	203	1	5	20	1290.0	20	1.776
178	Ver	174	25	10	21	1275.0	146	1.464
307	Chis	233	74	10	22	1275.0	29	1.735
257	Chis	66	3	10	23	1270.0	117	1.502
245	Chis	29	27	10	24	1235.0	13	1.849
3	Mich	163	1	4	25	1225.0	21	1.775
180	Ver	180	24	10	26	1220.0	12	1.852
248	Chis	35	29	9	27	1215.0	36	1.712
33	Gro	117	1	10	28	1175.0	60	1.625
63	Pue	204	1	10	29	1175.0	63	1.610
66	Pue	75	2	10	30	1165.0	43	1.692
168	Ver	123	15	10	31	1160.0	10	1.887
171	Ver	141	19	10	32	1160.0	24	1.762
174	Ver	162	21	10	33	1160.0	35	1.716
288	Chis	171	62	10	34	1160.0	61	1.617
265	Chis	88	52	10	35	1160.0	44	1.692
94	Coah	53	6	10	36	1160.0	164	1.437
135	S L P	36	12	10	37	1160.0	93	1.556
279	Chis	145	58	10	38	1150.0	40	1.700
130	Jal	190	62	10	39	1145.0	81	1.574
157	Ver	44	6	10	40	1140.0	47	1.685

(continued)

Table 5. Mean crushing pressure and rind thickness of 59 accessions of corn visually selected in the field as types which would give a high yield of fiber.

Row Number	Accession	Plants		Crushing Pressure		Rind Thickness	
		Measured No.	Rank	lbs.	Rank	mm.	
173	Ver 149	10	1	1890.0	42	1.695	
198	Ver 226	10	2	1780.0	1	2.153	
145	S L P 108	10	3	1665.0	2	2.050	
195	Ver 221	9	4	1638.9	5	1.993	
285	Chis 161	10	6	1615.0	11	1.869	
238	Chis 11	10	7	1530.0	103	1.535	
118	Tamps 41	10	9	1520.0	52	1.659	
183	Ver 185	10	10	1455.0	3	2.033	
283	Chis 152	10	12	1380.0	16	1.809	
141	S L P 72	10	17	1345.0	8	1.948	
186	Ver 191	10	19	1315.0	4	2.009	
307	Chis 233	10	22	1275.0	29	1.735	
257	Chis 66	10	23	1270.0	117	1.502	
245	Chis 29	10	24	1235.0	13	1.849	
265	Chis 88	10	35	1160.0	44	1.692	
94	Coah 53	10	36	1160.0	164	1.437	
135	S L P 36	10	37	1160.0	93	1.556	
279	Chis 145	10	38	1150.0	40	1.700	
124	Q R O 49	9	41	1130.0	169	1.431	
311	Tab 1	10	42	1130.0	84	1.569	
267	Chis 95	10	43	1125.0	6	1.977	
92	Coah 36	10	47	1105.0	100	1.541	
263	Chis 85	10	48	1105.0	53	1.657	
125	Q R O 50	10	50	1090.0	89	1.565	
165	Ver 101	10	52	1070.0	70	1.598	
189	Ver 200	10	53	1070.0	82	1.573	
201	Camp 5	9	62	1025.0	64	1.607	
149	Ver 3	10	64	1005.0	33	1.722	
176	Ver 165	10	65	1005.0	72	1.588	
161	Ver 75	10	67	980.0	128	1.491	
143	S L P 78	10	70	965.0	54	1.637	
215	Camp 159	6	71	960.0	143	1.468	
191	Ver 208	10	77	925.0	125	1.494	
210	Camp 46	8	90	865.0	152	1.455	
197	Ver 225	10	91	860.0	140	1.470	

(continued)

Table 5(continued)

Row Number	Accession	Plants		Crushing Pressure		Rind Thickness	
		Measured No.	Rank	lbs.	Rank	mm.	
138	S L P	58	10	101	810.0	30	1.735
179	Ver	179	10	106	790.0	71	1.596
74	Oax	130	9	115	761.1	104	1.527
259	Chis	75	10	118	760.0	218	1.372
446	Gto	65	10	122	740.0	235	1.351
260	Chis	77	10	125	720.0	66	1.603
387	Chih	25	10	163	595.0	153	1.455
72	Oax	7	9	170	580.0	87	1.568
68	Pue	1	10	173	570.0	34	1.718
541	S L P	86	10	174	570.0	245	1.339
273	Chis	120	10	181	550.0	15	1.823
84	Chih	30	10	200	515.0	94	1.556
196	Ver	222	10	201	515.0	124	1.495
89	Chih	80	10	230	440.0	168	1.432
287	Chis	167	10	231	440.0	116	1.504
64	Pue	208	10	236	430.0	199	1.399
463	Jal	12	10	260	360.0	246	1.335
451	Gto	79	10	261	360.0	366	1.186
430	Gto	2	10	282	322.2	322	1.241
314	Mich	30	10	290	305.0	344	1.209
511	Jal	179	10	307	280.0	451	1.104
253	Chis	56	10	341	235.0	56	1.637
470	Jal	25	10	348	225.0	350	1.200
65	Pue	205	10	352	225.0	95	1.556
					933.3		1.588
					167.6		.125

indicating that visual selection of promising fiber types tended to identify strong stalk types.

Correlations

Correlation coefficients between crushing pressure and rind thickness are shown in Table 6 for all accessions, for race means, and for fiber selections. All correlations were significant at the 1% level of probability, indicating a close relationship between these measurements.

The highest correlation was .939 obtained for the race means group. The 21 race means entering into the correlation calculations were, in most cases, more accurately estimated than were the means for the other groups. The correlation .939 is probably more representative of the relationship between crushing pressure and rind thickness in this material than are the correlations for either all accessions, .792, or fiber selections, .702.

Table 6. Correlations between crushing pressure and rind thickness for indicated groups

Group	No.	Correlation Coefficient
All accessions	561	.792**
Race means	21	.939**
Fiber selections	59	.702**

** , 1% level of significance

SEED AVAILABILITY AND DISTRIBUTION

Plans have been made to increase seed in North Carolina of the most promising selections and to distribute seed to interested corn breeders. Current plans are to have seed in sufficient quantity for distribution in 1964.

Seed is currently available in the Mexican Regional Germplasm Bank and may be obtained by writing to E. J. Wellhausen, Rockefeller Foundation, Londres 40, Mexico, D. F., Mexico. Seed requests for specific accessions must include complete accession identification, e.g., "Ver 149". For ease of seed multiplication, similar accessions have been crossed to form groups. The groups relating to the stalk-strength selections are listed in Table 4. In most cases seed supplies are more plentiful for the groups than for the individual accessions. Seed requests for grouped material must include the state relating to the accession identification and the group number, e.g., "Ver Group 20".

DISCUSSION

The 78 accessions listed in Table 4 represent the best of 561 accessions evaluated for stalk strength. These selections consist of the best 10% (56) for crushing pressure and the best 10% (56) for rind thickness (34 were among the best 10% for both characters). Although current information indicates that crushing pressure is a better measure of stalk strength than rind thickness, it was deemed desirable to base selection on both types of measurements.

For best results, stalks should be fully matured at the time of collection and stalk samples should be thoroughly dried before being crushed. In this study, some of the stalks were partly green when collected. All stalk samples were placed in a hot air drier to remove excess moisture. Some mechanical difficulty was experienced with the drier resulting in incompletely dried sections at the time of crushing. Although some of the crushing pressure

data are probably in error, the accessions were selected for each character independently; consequently, the 78 chosen should comprise the most promising material for stalk strength.

Crushing pressure and rind thickness as measures of stalk strength are recently developed techniques. Although the full potential of these techniques is probably not clear at present, current information indicates that crushing pressure and rind thickness are sufficiently correlated with field lodging to be useful for predictive purposes. The main advantage for these methods is that relative strengths of strains can be determined even though the amount of field lodging in a particular environment is negligible and for all practical purposes differentiation among strains is not possible. Without these or similar techniques it would not have been possible to rate the Mexican strains for stalk strength since very little field lodging occurred.

An average of 9.65 plants were measured per accession, probably an adequate number for preliminary screening as attempted in this study. Experience has indicated that for precise evaluation, 50 or more plants should be measured.

The fiber selections were made in the field and were identified primarily on the basis of estimated high stalk volume. The primary purpose for making the selections was to identify types which would have potential use in countries having limited fiber resources and limited economic means for importing wood pulp. Corn stalks have been used successfully as a fiber source for certain paper products (1)(3). It is doubtful that corn types grown specifically for fiber could compete successfully with wood pulp in the United States. On the other hand, the development of hybrids having high grain and fiber yield could justify consideration of corn as an

economically feasible fiber source, especially if stalks could be collected with little expense. It is felt that the fiber selections listed in Table 5 and the stalk strength selections listed in Table 4 (a total of 105 different accessions) would form a valuable base of source material for further research.

Accessions were grouped according to the state of Mexico in which they were collected (Table 3) in an attempt to identify areas contributing a high proportion of high stalk strength accessions. A few states contributed only weak stalk types and several states contributed exceptionally strong stalk types, but, in general, high strength types were obtained from a wide area. It would appear profitable in future collections and evaluations to consider maize from most areas.

The race summaries (Tables 1 and 2) identify the races having high strength. Tuxpeno had high crushing pressure and rind thickness and should be one of the most promising sources of strength. Only 198 of the 561 accessions could be included in these race summaries; therefore, it should be emphasized that many of the other 363 accessions also had high strength.

Tuxpeno was grown in North Carolina in 1961 and the following averages were obtained: crushing pressure, 2050 pounds; rind thickness, 1.95 mm.; lodging (stalk breakage below the ear), 10%; and ear height, 8.6 feet. The following comparable averages were obtained for one of the most lodging-resistant double crosses grown in the area: crushing pressure, 940 pounds; rind thickness, 1.70 mm.; lodging, 16%; and ear height, 4.3 feet.

In North Carolina, Tuxpeno was very late maturing, averaging approximately 120 days from planting to anthesis. Tehua was also grown and was taller and later maturing than Tuxpeno, averaging approximately 150 days from planting to anthesis. By resorting to special procedures, most strains can be crossed with types grown in North Carolina. For example, plants of

Tehua were removed from the field prior to frost and placed in the greenhouse. Eventually, Tehua produced pollen and was crossed with local stocks which had been planted in the greenhouse approximately 90 days later than the field planting of Tehua.

This study has served to identify Mexican strains of maize having strong stalks. The next step is to determine if the strength can be transferred to local corn and, concurrently, if the performance level for other agronomic traits can be maintained at the desired level. It is anticipated that considerable breeding effort will be required to utilize the strength of the strains identified herein for the improvement of local corn.

SUMMARY

Stalk strength of 561 accessions of the Mexican maize collection was determined by crushing pressure and rind-thickness measurements. Accessions were grown by The Inter-American Maize Improvement Program of The Rockefeller Foundation in cooperation with the Mexican National Maize Commission in a winter nursery near Tepalcingo in the state of Morelos, Mexico. An average of 9.65 plants were sampled for each accession.

Mean crushing pressure for all 561 accessions ranged from 100.0 to 1890.0 pounds with a mean of 460.7 pounds. Mean rind thickness ranged from .590 to 2.153 mm. with a mean of 1.309 mm. Three races, Tuxpeno, Comiteco, and Puebla Grueso were identified as having especially strong stalks. Seventy-eight accessions were selected on the basis of crushing pressure and rind thickness as promising breeding sources for stalk strength. Fifty-nine accessions were selected in the field as types meriting additional study as sources of fiber. The correlations between crushing pressure and

rind thickness were .792 for all 561 accessions, .939 for 21 race means (198 accessions grouped by race), and .702 for 59 accessions selected as possible fiber types. All correlations were significant at the 1% level.

LITERATURE CITED

1. Porphyre, J. A. Paper from cornstalks. *Papeterie* 77, No. 2:114. 1955. (In French) (In Bulletin of the Institute of Paper Chemistry 25:708. 1954-1955 English Abstract).
2. Wellhausen, E. J., Roberts, L. M., and Hernandez, X., E., in collaboration with P. C. Mangelsdorf. Races of maize in Mexico. Bussey Inst., Harvard Univ. (Cambridge). 1952.
3. Wells, Sidney D. and Steller, Roger L. Utilization of cornstalks in the manufacture of paper and paperboard. *Technical Association Papers (Technical Association of The Pulp & Paper Industry)* 26: 132-138. 1943.
4. Zuber, M. S. and Grogan, C. O. A new technique for measuring stalk strength in corn. *Crop Science* 1:378-380. 1961.

APPENDIX

Crushing pressure and rind thickness means for all 561 accessions evaluated are listed by nursery row number in Appendix Table 1a. Field notes recorded by Dr. E. J. Wellhausen are included and consist primarily of names of race components of each accession plus other supplementary information. Accessions are identified by the state in which collected and by a collection number. Abbreviations of states as used in accession identifications are listed on Page 23.

Descriptions of column headings of Table 1a are as follows:

Row No.	Nursery row number of accession
Accession	Identification includes state and number of collection
Race Code	Corresponds to Code listed in Table 1
F	Fiber selections (0, not selected; 1, selected)
No.	Number of plants evaluated
Crushing pressure, lbs.	Mean of plants evaluated
Rind thickness, mm.	Mean of plants evaluated
Notes	Field notes recorded by Dr. E. J. Wellhausen

STATES OF MEXICO AND ABBREVIATIONS

<u>State</u>	<u>Abbreviation</u>
Aguascalientes	Ags.
Baja California (Territorio Norte noy Estado)	B.C. T.N.
Baja California (Territorio Sur)	B.C. T.S.
*Campeche	Camp.
*Chihuahua	Chih.
*Chiapas	Chis.
*Coahuila	Coah.
*Colima	Col.
Distrito Federal	D.F.
Durango	Dgo.
*Guerrero	Gro.
*Guanajuato	Gto.
Hidalgo	Hgo.
*Jalisco	Jal.
Mexico	Mex.
*Michoacan	Mich.
*Morelos	Mor.
Nayarit	Nay.
*Nuevo Leon	N.L.
*Oaxaca	Oax.
*Puebla	Pue.
*Queretaro	Qro.
*Quintana Roo	Q.R.
*San Luis Potosi	S.L.P.
*Sinaloa	Sin.
*Sonora	Son.
*Tabasco	Tab.
*Tamaulipas	Tamps.
Tlaxcala	Tlax.
*Veracruz	Ver.
*Yucatan	Yuc.
Zacatecas	Zac.

*Maize accessions from these states were included in this study.

Table 1a. Mean crushing pressure and rind thickness for 561 accessions of corn listed in sequence by nursery row number

Row No.	Accession	Race Code	F No.	No.	Crushing Pressure lbs.	Rind Thickness mm.	Notes
1	MICH	166	200	0 10	775.0	1.791	TUXPENO SUPERIOR
2	MICH	162	200	0 6	1100.0	1.587	TUXPENO SUPERIOR
3	MICH	163	200	0 4	1225.0	1.775	TUXPENO SUPERIOR
4	MICH	182	200	0 10	1050.0	1.601	TUXPENO SUPERIOR
5	MICH	176	200	0 10	710.0	1.404	TUXPENO SUPERIOR
6	MICH	178	200	0 10	505.0	1.424	TUXPENO SUPERIOR
7	MICH	169	200	0 6	883.3	1.680	TUXPENO REGULAR
8	MICH	177	200	0 10	305.0	1.405	TUXPENO REGULAR
9	MICH	137		0 10	380.0	1.423	TUXPENO MEZCLADO
10	MICH	146		0 10	630.0	1.354	TUXPENO MEZCLADO
11	MICH	135		0 10	590.0	1.280	TUXPENO CELAYA
12	MICH	133		0 10	195.0	1.262	TUXPENO CELAYA
13	MICH	93	234	0 10	610.0	1.186	CELAYA
14	MICH	35	234	0 10	475.0	1.498	CELAYA
15	MICH	76	234	0 10	680.0	1.360	CELAYA
16	MICH	36	234	0 10	510.0	1.607	CELAYA
17	MICH	3	234	0 10	540.0	1.408	CELAYA
18	MICH	192	193	0 10	390.0	1.296	OLOTILLO PEPITILLA ELASTICO GRANO ANCHO
19	MICH	179	193	0 10	480.0	1.280	OLOTILLO PEPITILLA ELASTICO GRANO ANCHO
20	MICH	173		0 10	565.0	1.518	OLOTILLO PEPITILLA ELASTICO GRANO ANCHO
21	MICH	181	191	0 10	175.0	1.372	OLOTILLO FLEXIBLE OCHO ANCHO
22	MICH	170	100	0 10	175.0	1.523	REVENTADOR
23	MICH	156		0 10	195.0	1.278	REVENTADOR
24	MICH	157	100	0 10	200.0	1.220	REVENTADOR
25	MICH	102		0 9	190.0	1.152	AMARILLO Y BLANCO MEZCLA ALGO FLEXIBLE
26	GRO	200	210	0 10	1025.0	1.565	VANDENO
27	GRO	98	210	0 2	1050.0	1.235	VANDENO
28	GRO	96	210	0 10	520.0	1.406	VANDENO
29	GRO	91	210	0 6	658.3	1.450	VANDENO
30	GRO	183	210	0 7	928.6	1.637	VANDENO
31	GRO	194	210	0 10	885.0	1.766	VANDENO
32	GRO	159	210	0 10	800.0	1.307	VANDENO
33	GRO	117	210	0 10	1175.0	1.625	VANDENO
34	GRO	160		0 10	225.0	1.352	TUXPENO OLOTILLO OCHO DIEZ
35	GRO	170		0 10	340.0	1.360	TUXPENO OLOTILLO OCHO DIEZ
36	GRO	171		0 10	290.0	1.128	TUXPENO OLOTILLO OCHO DIEZ
37	GRO	210		0 10	290.0	1.169	TUXPENO PRECOZ
38	GRO	134		0 10	380.0	1.245	TUXPENO PRECOZ
39	GRO	193		0 8	100.0	883	TUXPENO PRECOZ
40	GRO	185	210	0 10	520.0	1.301	VANDENO
41	GRO	166		0 10	130.0	1.107	TUXPENO PLUS
42	GRO	150		0 10	455.0	1.136	TUXPENO CON AM GRANO ANCHO HARINOSO
43	GRO	158		0 10	265.0	1.164	TUXPENO ZAPALOTE GRANDE
44	GRO	184		0 10	170.0	1.205	TUXPENO ZAPALOTE GRANDE
45	GRO	192		0 10	200.0	1.138	TUXPENO ZAPALOTE ALGO MEZCLADO
46	GRO*	111		0 4	112.5	1.138	TUXPENO OLOTILLO PRECOZ
47	GRO	157		0 3	100.0	797	TUXPENO OLOTILLO PRECOZ
48	GRO	45		0 4	100.0	1.035	TUXPENO OLOTILLO PRECOZ
49	GRO	181		0 5	100.0	858	TUXPENO PLUS MAZ CHIGA DELG BASE ANCHA
50	GRO	62		0 9	100.0	918	TUXPENO PLUS MAZ CHIGA DELG BASE ANCHA
51	GRO	82		0 10	160.0	1.271	TUXPENO PLUS PLANTAS MORADAS
52	GRO	80		0 5	160.0	966	TUXPENO PLUS PRECOZ MAZORCA DELGADA

(continued)

Table 1a (continued)

Row No.	Accession	Race Code	F No.	Crushing Pressure lbs.	Rind Thickness mm.	Notes	
53	GRO	19	0	8	431.3	1.356 OLOTILLO PEPITILLA FLEXIBLE MEZCLA	
54	MOR	14	180	0	160.0	1.496 PEPITILLA GRUESO POCO TUXPENO	
55	MOR	17	180	0	170.0	1.138 PEPITILLA DELGADO	
56	MOR	1	180	0	133.3	983 PEPITILLA GRUESO	
57	GRO	4	180	0	9	127.8	950 PEPITILLA PLUS TUXPENO
58	PUE	99	184	0	10	115.0	1.223 PEPITILLA ARROCILLO
59	MOR	4	184	0	8	168.8	1.211 PEPITILLA ARROCILLO
60	MOR	16	0	10	320.0	1.436 PEPITILLA OLOTILLO	
61	GRO	106	0	10	325.0	1.430 PEPITILLA REVENTADOR ETC MEZCLA	
62	PUE	203	310	0	5	1290.0	1.776 MAZORCA GRUESA GRANO ANCHO
63	PUE	204	310	0	10	1175.0	1.610 PUEBLA GRUESO GRANO ANCHO
64	PUE	208	310	1	10	430.0	1.399 PUEBLA GRUESO GRANO ANCHO
65	PUE	205	310	1	10	225.0	1.556 PUEBLA GRUESO ALGO DE ROLITA
66	PUE	75	0	10	1165.0	1.692 PUEBLA MENOS GRUESO	
67	PUE	45	0	10	866.7	1.599 PUEBLA MENOS GRUESO	
68	PUE	1	1	10	570.0	1.718 PUEBLA MENOS GRUESO PLUS PEPITILLA	
69	OAX	170	191	0	10	305.0	1.354 OLOTILLO
70	OAX	6	200	0	10	470.0	1.743 TUXPENO
71	OAX	11	200	0	9	772.2	1.478 TUXPENO
72	OAX	7	200	1	9	580.0	1.568 TUXPENO
73	OAX	1	200	0	9	520.0	1.443 TUXPENO
74	OAX	130	1	9	761.1	1.527 PUEBLA GRUESO ALGO BOLITA	
75	OAX	134	0	10	530.0	1.386 TUXPENO PLUS	
76	OAX	131	0	10	555.0	1.423 TUXPENO PLUS	
77	OAX	71	0	8	1114.3	1.775 CAJETE	
78	OAX	75	0	10	1115.0	1.934 MUSHITO TARDIO	
79	SON	24	0	10	105.0	909 CRISTALINO DE SONORA	
80	SON	25	300	0	9	483.3	1.199 TUXPENO MAIZON
81	SON	32	0	10	100.0	1.005 HARINOSO DE SONORA	
82	SON	35	0	10	100.0	1.050 HARINOSO DE SONORA	
83	SON	57	0	6	100.0	935 CRISTALINO DE SONORA	
84	CHIH	30	1	10	515.0	1.556 TUXPENO PLUS	
85	CHIH	49	0	10	510.0	1.492 TUXPENO PLUS	
86	CHIH	55	0	10	440.0	1.463 TUXPENO	
87	CHIH	72	300	0	10	650.0	1.521 TUXPENO MAIZON
88	CHIH	73	0	10	535.0	1.431 TUXPENO PLUS	
89	CHIH	80	1	10	440.0	1.432 TUXPENO PLUS	
90	COAH	4	0	10	830.0	1.314 TUXPENO PLUS AMARILLO	
91	COAH	15	200	0	10	900.0	1.414 TUXPENO INTERMEDIO
92	COAH	36	200	1	10	1105.0	1.541 TUXPENO GRUESO TARDIO
93	COAH	50	200	0	9	766.7	1.374 TUXPENO INTERMEDIO
94	COAH	53	200	1	10	1160.0	1.437 TUXPENO INTERMEDIO
95	COAH	60	200	0	10	345.0	1.248 TUXPENO MUY TARDIO
96	COAH	64	200	0	10	1115.0	1.398 TUXPENO INTERMEDIO ALGO ARROCILLO
97	NAY	4	0	9	700.0	1.489 JALA PRECOZ	
98	NAY	15	0	8	120.0	1.056 REVENTADOR BLANCO Y ROJO	
99	NAY	21	0	3	100.0	1.343 TABLONCILLO ELOTES MORADOS	
100	NAY	49	0	7	183.3	1.024 REVENTADOR BLANCO	
101	NAY	59	0	6	535.7	1.040 JALA TUXPENO MAZORCA LARGA	
102	NAY	60	0	6	564.3	1.383 TUXPENO OLOTILLO ROJO	
103	NAY	61	0	10	665.0	1.315 TUXPENO OLOTILLO ROJO	
104	NAY	67	0	10	100.0	1.263 TABLONCILLO MEZCLA CON BL ELOTES MORADOS	

(continued)

Table 1a. (continued)

Row No.	Accession	Race Code	F No.	Crushing Pressure lbs.	Rind Thickness mm.	Notes
105	SIN	1	0 10	110.0	1.005	TABLONCILLO HARINOSO LARGO
106	N L	3 270	0 10	640.0	1.010	CELAYA MEZCLA
107	N L	5 270	0 10	560.0	1.326	CELAYA MEZCLA
108	N L	8 270	0 10	775.0	1.401	TUXPENO DELGADO OLOTE ROJO
109	N L	18 270	0 8	400.0	1.380	CELAYA
110	TAMPS	2	0 10	925.0	1.284	TUXPENO
111	TAMPS	8	0 10	670.0	1.463	TIPO CELAYA AMARILLO CRISTALINO DENTADO
112	TAMPS	21	0 10	405.0	1.351	TUXPENO
113	TAMPS	24	0 10	440.0	1.250	TUXPENO MEZCLA POCO MORADO
114	TAMPS	25	0 10	220.0	1.196	TUXPENO PRECOZ
115	TAMPS	28	0 10	950.0	1.343	TUXPENO MAZORCA CORTA
116	TAMPS	30	0 10	865.0	1.456	TUXPENO MAZORCA CORTA MAS DELGADA
117	TAMPS	39	0 10	755.0	1.353	TUXPENO
118	TAMPS	41 200	1 10	1520.0	1.659	TUXPENO TARDIO
119	Q R O	29	0 10	260.0	1.134	CONICO NORTENO PLUS ALGO AMARILLO
120	Q R O	32	0 10	105.0	1.186	CONICO NORTENO MAZ GRUESA TARDIO FASCIADO
121	Q R O	38 230	0 10	625.0	1.189	CELAYA TIERRA FRIA
122	Q R O	42 230	0 10	395.0	1.488	CELAYA TIERRA FRIA
123	Q R O	44	0 10	325.0	1.478	CONICO NORTENO OLOTE GRUESO FASCIADO
124	Q R O	49	1 9	1130.0	1.431	CELAYA OLOTILLO
125	Q R O	50 230	1 10	1090.0	1.565	CELAYA OLOTILLO
126	JAL	13	0 10	330.0	1.270	TABLONCILLO PLUS ARGENTINO
127	JAL	28	0 8	150.0	1.405	ARGENTINO MEZCLA
128	JAL	130	0 10	725.0	1.472	PINTO PRECOZ
129	JAL	187 230	0 10	1335.0	1.842	TUXPENO
130	JAL	190	0 10	1145.0	1.574	TUXPENO ARGENTINO
131	SLP	5	0 10	660.0	1.468	CELAYA NAL TEL MAZORCA CHIGA
132	SLP	14	0 10	855.0	1.325	CELAYA UNIFORME MAZORCA DELGADA
133	SLP	19	0 10	595.0	1.367	CELAYA PLUS QUIZAZ OLOTILLO
134	SLP	24	0 10	795.0	1.500	CELAYA TABLONCILLO U OLOTILLO MAZ DELG
135	SLP	36 200	1 10	1160.0	1.556	TUXPENO OLOTILLO
136	SLP	42	0 10	630.0	1.272	CELAYA OLOTILLO MAZORCA DELGADA
137	SLP	46	0 10	830.0	1.660	CELAYA OLOTILLO TABLONCILLO
138	SLP	58 200	1 10	810.0	1.735	TUXPENO
139	SLP	63	0 10	295.0	1.373	AMILACEO DENTADO ROJO
140	SLP	70	0 10	555.0	1.424	CELAYA PLUS
141	SLP	72 200	1 10	1345.0	1.948	CELAYA PLUS TUXPENO
142	SLP	73 200	0 10	1050.0	1.787	CELAYA PLUS TUXPENO
143	SLP	78 200	1 10	965.0	1.637	TUXPENO MEZCLA
144	SLP	105	0 10	470.0	1.526	OLOTILLO TUXPENO AMARILLO
145	SLP	108 200	1 10	1665.0	2.050	TUXPENO OLOTILLO
146	SLP	111	0 10	365.0	1.415	OLOTILLO AMARILLO
147	SLP	118	0 10	400.0	1.376	TUXPENO OLOTILLO PREGOZ
148	SLP	121	0 10	950.0	1.549	TUXPENO MORADO
149	VER	3	1 10	1005.0	1.722	TUXPENO ZAPALOTE
150	VER	8 200	0 10	225.0	1.300	TUXPENO AMILACEO
151	VER	13	0 10	975.0	1.293	TUXPENO OLOTILLO MEZCLA MAZORCA LARGA
152	VER	14	0 9	1060.0	1.708	TUXPENO CRISTALINO
153	VER	17	0 9	235.0	1.536	TUXPENO CRISTALINO
154	VER	22	0 10	490.0	1.499	TUXPENO AMILACEO MEZCLA
155	VER	25	0 10	640.0	1.551	PEPITILLA Y PEPITILLA MEZCLA
156	VER	42	0 10	695.0	1.578	MORADO PURPURA PERICARPIO OLOTE PURPURA

(continued)

Table 1a. (continued)

Row	Race	Crushing	Rind			
No.	Accession	Code	F No.	Pressure	Thickness	Notes
				lbs.	mm.	
157	VER	44	0 10	1140.0	1.685	TUXPEN0 DEL PALMAR MEZCLA DE COLORES
158	VER	48	0 10	840.0	1.522	TUXPEN0 LARGO
159	VER	56	0 10	665.0	1.675	ELOTES MORADOS
160	VER	73	0 10	880.0	1.404	
161	VER	75	200 1 10	980.0	1.491	TUXPEN0
162	VER	78	0 9	780.0	1.696	TUXPEN0
163	VER	81	0 7	1620.0	1.739	TUXPEN0
164	VER	83	0 10	825.0	1.725	LOS MEJORES AMARILLOS
165	VER	101	1 10	1070.0	1.598	TUXPEN0 ZAP CHICO
166	VER	119	0 10	690.0	1.587	TUXPEN0 900 TO 1000 METERS
167	VER	121	0			ROJO
168	VER	123	0 10	1160.0	1.887	TUXPEN0 SAN ANDRES TUXTLA ALGO AMARILLO
169	VER	126	0 10	830.0	1.565	TUXPEN0 ZAPALOTE MAZORCA CORTA Y GRUESA
170	VER	128	0 10	1060.0	1.629	TUXPEN0 MAZORCA LARGA TEXISTEPEC
171	VER	141	0 10	1160.0	1.762	TUXPEN0 DE TECOLUTA
172	VER	143	200 0 10	1060.0	1.345	TUXPEN0 DE TECOLUTA
173	VER	149	200 1 10	1890.0	1.695	TUXPEN0 DE PAPANTLA
174	VER	162	0 10	1160.0	1.716	TUXPEN0 PRECOZ AGRACATE PAPANTLA
175	VER	163	0 10	760.0	1.394	LOS MEJORES AMARILLOS
176	VER	165	200 1 10	1005.0	1.588	TUXPEN0 DE TEHUACAN
177	VER	168	0 10	430.0	1.281	LOS MEJORES AMARILLOS
178	VER	174	200 0 10	1275.0	1.464	TUXPEN0 MAIZ ANCHO PRECOZ
179	VER	179	200 1 10	790.0	1.596	TUXPEN0 TYPE
180	VER	180	200 0 10	1220.0	1.852	TUXPEN0
181	VER	181	0 10	680.0	1.565	LOS MEJORES AMARILLOS
182	VER	183	0 10	995.0	1.457	CRIOLLO DE TUXPAN
183	VER	185	200 1 10	1455.0	2.033	TUXPEN0 GRUESO GRANO ANCHO
184	VER	187	0 10	1350.0	1.743	LOS MEJORES AMARILLOS
185	VER	190	0 10	655.0	1.492	LOS MEJORES AMARILLOS
186	VER	191	1 10	1315.0	2.009	
187	VER	196	0 10	850.0	1.615	TUXPEN0 TAMIAHUA
188	VER	197	0 10	865.0	1.587	TUXPEN0 BLANCO ANCHO DE NARANJOS
189	VER	200	200 1 10	1070.0	1.573	TUXPEN0 BLANCO ANCHO DE NARANJOS
190	VER	206	0 10	1415.0	1.962	TUXPEN0 SAN BARTOLO
191	VER	208	1 10	925.0	1.494	TUXPEN0 OLOTE MORADO
192	VER	213	0 10	595.0	1.527	LOS MEJORES AMARILLOS
193	VER	215	0 10	570.0	1.601	TUXPEN0 DE TEMPORAL
194	VER	218	0 10	1070.0	1.435	TAMPICO ALTO MEZCLA CON MORADO
195	VER	221	1 9	1638.9	1.993	TUXPEN0 ANCHO MEZCLA CON AM Y MORADO
196	VER	222	1 10	515.0	1.495	TUXPEN0 VARIOS
197	VER	225	200 1 10	860.0	1.470	TUXPEN0 VARIOS
198	VER	226	1 10	1780.0	2.153	MAZORCA LARGA DELGADA
199	VER	228	200 0 9	1350.0	1.662	TUXPEN0 SAN RAFAEL
200	CAMP	4	41 0 9	166.7	1.192	NAL TEL TEPECINTLE HARINOSO DENTADO
201	CAMP	5	1 9	1025.0	1.607	TEPECINTLE
202	CAMP	9	291 0 10	685.0	1.485	DZIT BACAL
203	CAMP	11	0 7	114.3	973	AMARILLO TEPECINTLE NAL TEL MEZCLA
204	CAMP	20	291 0 8	470.0	1.566	DZIT BACAL
205	CAMP	22	0 9	688.9	1.414	TEPECINTLE DZIT BACAL NAL TEL
206	CAMP	31	292 0 10	150.0	1.409	
207	CAMP	36	0 8	287.5	1.293	TEPECINTLE DZIT BACAL NAL TEL
208	CAMP	38	0 10	420.0	1.260	TEPECINTLE MEZCLA

(continued)

Table 1a. (continued)

Row No.	Accession	Race Code F	Crushing No.	Pressure lbs.	Rind Thickness mm.	Notes
209	CAMP	42	0 10	435.0	1.286	NAL TEL TEPECINTLE HARINOSO DENTADO
210	CAMP	46 291 1	8	865.0	1.455	DZIT BACAL
211	CAMP	47 292 0	8	805.0	1.234	DZIT BACAL AMARILLO
212	CAMP	53	0 10	495.0	1.333	TEPECINTLE DZIT BACAL NAL TEL
213	CAMP	69 292 0	10	1065.0	1.406	DZIT BACAL AMARILLO MUY TARDIO
214	CAMP	77 292 0	10	780.0	1.413	DZIT BACAL AMARILLO MUY TARDIO
215	CAMP	159	1 6	960.0	1.468	DZIT BACAL AMARILLO MUY TARDIO
216	CAMP	160	0 9	483.3	1.188	BLANCO MUY TARDIO
217	YUC	4 41 0	10	100.0	1.056	NAL TEL BLANCO PRECOZ
218	YUC	33	0 10	255.0	1.210	NAL TEL BLANCO MAS TARDIO
219	YUC	35 42 0	9	100.0	949	NAL TEL ZAP CHICÓ AMARILLO
220	YUC	41	0 10	175.0	1.269	NAL TEL BLANCO MAS TARDIO
221	YUC	48	0 8	487.5	1.330	NAL TEL MAS TEPECINTLE HARINOSO
222	YUC	51	0 10	270.0	1.189	NAL TEL TEPECINTLE
223	YUC	55	0 10	505.0	1.428	NAL TEL TUXPENÓ MAS HARINOSO
224	YUC	56	0 10	185.0	1.087	NAL TEL MAS TEPECINTLE HARINOSO
225	YUC	62	0 10	760.0	1.332	NAL TEL MAS TEPECINTLE
226	YUC	81	0 10	635.0	1.141	FASCIADO TIPO TUXPENÓ
227	YUC	85	0 10	125.0	1.162	FASCIADO TIPO TUXPENÓ
228	YUC	108 42 0	10	155.0	1.001	NAL TEL MAS AMARILLO
229	YUC	118 42 0	10	405.0	1.242	NAL TEL MAS TUXPENÓ AMARILLO
230	YUC	127	0 10	250.0	1.359	NAL TEL BLANCO MAS TARDIO
231	YUC	134	0 10	340.0	1.254	NAL TEL BLANCO
232	YUC	138 42 0	9	395.0	1.176	NAL TEL AMARILLO MAS TEPECINTLE
233	YUC	151	0 10	490.0	1.579	TUXPENÓ
234	YUC	154	0 10	460.0	1.294	NAL TEL MAS TEPECINTLE HARINOSO
235	CHIS	1 170 0	10	595.0	1.433	ZAPALOTE TUXPENÓ
236	CHIS	2 191 0	10	1035.0	1.545	OLOTILLO BLANCO PRECOZ
237	CHIS	5 200 0	10	680.0	1.636	OLOTILLO TUXPENÓ
238	CHIS	11 200 1	10	1530.0	1.535	TUXPENÓ TARDIO
239	CHIS	13	0 10	470.0	1.410	AMARILLO CRISTALINO AMILACEO PRECOZ
240	CHIS	17	0 3	250.0	1.310	CONICO COMITECO
241	CHIS	19	0 10	1525.0	1.519	OLOTILLO TUXPENÓ HARINOSO DEVILLA VIEJA
242	CHIS	23	0 10	595.0	1.268	HARINOSO DE VILLA VIEJA GRANO ANCHO
243	CHIS	26	0 10	285.0	1.125	VANDENO OLOTE MORADO
244	CHIS	28	0 9	630.0	1.468	AMARILLO BLANCO MEZCLA TEHUA TUXPENÓ
245	CHIS	29	1 10	1235.0	1.849	TEHUA ALTO
246	CHIS	30 170 0	10	150.0	1.233	
247	CHIS	31	0 10	675.0	1.222	ZAPALOTE VANDENO
248	CHIS	35	0 9	1215.0	1.712	COMITECO
249	CHIS	38	0 10	250.0	1.287	BLANCO COMITECO
250	CHIS	42	0 10	880.0	1.711	COMITECO
251	CHIS	46 142 0	10	440.0	1.140	AMARILLO 1100 METERS BOCHIL
252	CHIS	54 191 0	10	975.0	1.475	OLOTILLO BLANCO TARDIO
253	CHIS	56 192 1	10	235.0	1.637	OLOTILLO AMARILLO
254	CHIS	57 191 0	10	525.0	1.399	OLOTILLO TUXPENÓ
255	CHIS	61	0 10	665.0	1.145	OLOTILLO TUXPENÓ
256	CHIS	62 210 0	10	355.0	1.188	VANDENO PRECOZ
257	CHIS	66 192 1	10	1270.0	1.502	OLOTILLO AMARILLO
258	CHIS	71 191 0	10	890.0	1.515	OLOTILLO BLANCO PRECOZ
259	CHIS	75 170 1	10	760.0	1.372	VANDENO TUXPENÓ INTERMEDIO CHICO
260	CHIS	77	1 10	720.0	1.603	TUXPENÓ

(continued)

Table 1a. (continued)

Row No.	Accession	Race		Crushing	Rind	Notes		
		Code	F No.	Pressure	Thickness			
				lbs.	mm.			
261	CHIS	78	0	10	310.0	1.266	NAL TEL VANDENO ALGO AM CRISTALINAS	
262	CHIS	79	0	10	645.0	1.281	MORADOS	
263	CHIS	85	142	1	1105.0	1.657	COMITECO AMARILLO DE COMITAN	
264	CHIS	87	0				COMITECO BLANCO MAS CRISTALINO	
265	CHIS	88	1	10	1160.0	1.692	COMITECO MAS BLANDO GRANO ANCHO	
266	CHIS	92	0	9	620.0	1.451	COMITECO MAS BLANDO GRANO ANCHO	
267	CHIS	95	1	10	1125.0	1.977	COMITECO BLANCO CRISTALINO	
268	CHIS	99	0	10	1360.0	1.742	OLOTILLO	
269	CHIS	101	0	10	350.0	1.290	TUXPENO OLOTILLO	
270	CHIS	107	0	10	445.0	1.569	VANDENO	
271	CHIS	109	210	0	10	255.0	VANDENO	
272	CHIS	116	0	10	725.0	1.462	COMITECO BLANCO AMILACEO	
273	CHIS	120	141	1	10	550.0	1.823	COMITECO BLANCO DE LAS MARGAITAS
274	CHIS	124	0	10	705.0	1.441	COMITECO TARDIO	
275	CHIS	127	141	0	10	400.0	1.469	COMITECO MEZCLADO
276	CHIS	137	0	10	910.0	1.687	COMITECO MAZORCA MAS GRUESA CORTA	
277	CHIS	138	0	10	290.0	1.254	COMITECO CRISTALINO MAZORCA LARGA	
278	CHIS	141	0	10	710.0	1.278	COMITECO CRISTALINO	
279	CHIS	145	1	10	1150.0	1.700	COMITECO BLANCO	
280	CHIS	146	0	10	770.0	1.491	COMITECO MAZORCA GRUESA HILERAS IRREG	
281	CHIS	148	141	0	10	555.0	1.446	COMITECO BLANCO DE JUNCANA
282	CHIS	150	0	10	110.0	1.183	AMARILLO PRECOZ TIPO ZAP CHICO	
283	CHIS	152	141	1	10	1380.0	1.809	COMITECO BLANCO DE JUNCANA
284	CHIS	155	141	0	10	1365.0	1.571	COMITECO BLANCO DE ZAPALUTA
285	CHIS	161	1	10	1615.0	1.869	TEHUA	
286	CHIS	162	0	10	260.0	1.475	ZAPALOTE GRANDE AMARILLO	
287	CHIS	167	1	10	440.0	1.504	TUXPENO TARDIO GRANO ANCHO	
288	CHIS	171	0	10	1160.0	1.617	AMILACEO GRANO ANCHO COMO MAIZON	
289	CHIS	172	0	10	540.0	1.381	AMARILLO GRANO ANCHO	
290	CHIS	174	0	10	310.0	1.517	CRISTALINO BLANCO COMITECO	
291	CHIS	180	0	10	585.0	1.520	AMARILLO MEZCLA CON OLOTON	
292	CHIS	182	0	10	450.0	1.498	OLOTON	
293	CHIS	184	0	10	850.0	1.588	OLOTON	
294	CHIS	188	0	10	350.0	1.481	OLOTON DE AQUACATALES 2300 METERS	
295	CHIS	191	0	10	465.0	1.483	COMITECO MEZCLA MAZORCA GRUESA	
296	CHIS	197	0	10	535.0	1.448	COMITECO TUXPENO AM MAZORCA CHICA	
297	CHIS	201	0	10	675.0	1.585	TUXPENO OLOTILLO COMITECO	
298	CHIS	204	0	9	533.3	1.569	COMITECO MAZORCA LARGA	
299	CHIS	206	142	0	7	528.6	1.576	COMITECO MAZORCA LARGA AM Y CRISTALINO
300	CHIS	208	210	0	10	825.0	1.631	VANDENO INTERMEDIO CHICO
301	CHIS	211	0	9	230.0	1.393	MAZORCA DELGADA LARGA AMARILLA	
302	CHIS	216	142	0	10	870.0	1.726	COMETICO BUENO
303	CHIS	225	170	0	10	755.0	1.692	TEPECINTLE VANDENO
304	CHIS	226	170	0	10	740.0	1.429	VANDENO OLOTILLO COMITFCO
305	CHIS	229	0	10	805.0	1.537	OLOTON CRISTALINO PRECOZ	
306	CHIS	230	0	6	360.0	1.407	MORADOS PINTO	
307	CHIS	233	200	1	10	1275.0	1.735	TUXPENO
308	Q R	1	0	10	885.0	1.504	BL CHIQUITO DE 8 TO 10 HILERAS TARDIO	
309	Q R	3	0	10	500.0	1.470	BL MEZCLA CON MAZ TIPO PALOMERO TARDIO	
310	Q R	4	0	10	225.0	1.233	NAL TEL TUXPENO AMARILLO	
311	TAB	1	1	10	1130.0	1.569	DENTADO TUXPENO DE TABASCO	
312	MICH	105	0	10	325.0	1.425	TUXPENO CELAYA	

(continued)

Table 1a. (continued)

Row No.	Accession	Race Code	F	No.	Crushing Pressure lbs.	Rind Thickness mm.	Notes	
313	MICH	55	234	0	10	525.0	1.395	CELAYA
314	MICH	30	234	1	10	305.0	1.209	CELAYA
315	MICH	183	193	0	9	535.0	1.388	ELASTICO GRANO ANCHO
316	MICH	201	191	0	10	585.0	1.184	AMARILLO CELAYA TABLONCILLO
317	MICH	29	260	0	10	245.0	1.146	AMARILLO ZAMORANO QUIZAS UN PORO CELAYA
318	MICH	118		0	10	195.0	1.188	PRECOZ OLOTILLO AMILACEO
319	MICH	147		0	10	100.0	929	PRECOZ CONICO NORTENO
320	MICH	103		0				OCHO CHICO
321	MICH	164		0	10	355.0	1.147	CELAYA TABLONCILLO AMARILLO
322	GRO	36		0	10	385.0	1.240	TUXPENO PRECOZ
323	GRO	153		0	10	690.0	1.281	TUXPENO ZAP GRANDE
324	GRO	202		0	10	235.0	1.397	TUXPENO ZAP GRANDE
325	GRO	39		0	10	190.0	1.174	TUXPENO OLOTILLO
326	GRO	212		0	10	470.0	1.317	TUXPENO OLOTILLO
327	GRO	32		0	10	315.0	1.109	TUXPENO OLOTILLO
328	GRO	139		0	10	135.0	965	TUXPENO OLOTILLO CRISTALINO
329	GRO	146		0	10	410.0	1.184	OLOTILLO
330	GRO	114		0	10	335.0	1.038	TUXPENO ZAPALOTE CRISTALINO
331	GRO	86		0	10	290.0	1.094	OLOTILLO TUXPENO CRISTALINO
332	GRO	60	191	0	10	330.0	1.251	OLOTILLO
333	GRO	6	180	0	10	190.0	1.135	PEPITILLA
334	MOR	10		0	10	545.0	1.444	TUXPENO PEPITILLA GRANO ANCHO
335	GRO	24		0	10	425.0	1.438	MORADO
336	GRO	145		0	9	210.0	1.350	MORADO MEZCLA
337	GRO	177	40	0	10	105.0	1.003	NAL TEL OLOTILLO PRECOZ BLANCO
338	GRO	121	40	0	10	125.0	972	NAL TEL OLOTILLO PRECOZ BL MAS CRIST
339	GRO	17	40	0	10	135.0	963	NAL TEL OLOTILLO PRECOZ BLANCO
340	GRO	168	40	0	10	100.0	972	NAL TEL OLOTILLO MUY PRECOZ BL CRIST
341	GRO	100	40	0	9	100.0	849	NAL TEL OLOTILLO MUY PRECOZ BL CRIST
342	OAX	127		0	10	220.0	1.228	TUXPENO OLOTILLO
343	OAX	31	250	0	10	160.0	1.134	TUXPENO OLOTILLO
344	OAX	40	250	0	10	280.0	1.116	TUXPENO OLOTILLO
345	OAX	63	250	0	10	225.0	1.118	TUXPENO OLOTILLO
346	OAX	30	162	0	10	105.0	1.137	ZAPALOTE CHICO BUEN AMARILLO
347	OAX	41	162	0	10	210.0	1.047	ZAPALOTE CHICO PLUS TUXPENO BUEN AM
348	OAX	146	162	0	10	100.0	1.022	ZAPALOTE CHICO PLUS PEPITILLA BUEN AM
349	OAX	47	162	0	9	135.0	982	ZAPALOTE CHICO PLUS
350	OAX	66	252	0	10	460.0	1.553	BOLITA AMARILLO
351	OAX	100	252	0	10	185.0	1.158	BOLITA AMARILLO
352	OAX	116	252	0	10	150.0	1.309	BOLITA AMARILLO BUEN AMARILLO
353	OAX	24		0	10	130.0	973	BLANCO Y AMARILLO MEZCLADOS
354	OAX	174		0	10	100.0	845	AMARILLO PRECOZ TIPO NAL TEL
355	OAX	158		0	10	100.0	863	AM PRECOZ TIPO NAL TEL MAZ MAS GRANDE
356	GRO	176		0	10	120.0	966	NAL TEL BL PLUS ALGO TUXPENO Y CRIST
357	OAX	88		0	10	160.0	1.049	NAL TEL BL PLUS ALGO TUXPENO Y CRIST
358	OAX	36	160	0	7	185.7	1.133	ZAPALOTE CHICO
359	OAX	48	160	0	10	180.0	1.219	ZAPALOTE CHICO
360	OAX	50	160	0	10	210.0	1.070	ZAPALOTE CHICO
361	OAX	84		0	10	540.0	1.784	
362	SON	21		0	10	150.0	1.236	AMARILLO CRISTALINO
363	SON	23		0	10	135.0	1.015	REVENTADOR
364	SON	27		0	10	120.0	1.126	CHAPALOTE

(continued)

Table 1a. (continued)

Row No.	Accession	Race Code	F No.	Crushing Pressure lbs.	Rind Thickness mm.	Notes
365	SON	28	0 10	145.0	1.113	MEZCLA HARINOSO DE 8 Y CRIST DENTADO
366	SON	29 60	0 10	105.0	927	HARINOSO DE SONORA
367	SON	36	0 10	200.0	1.110	MEZCLA HARINOSO DE 8 Y CRIST DENTADO
368	SON	37 100	0 10	135.0	1.243	REVENTADOR
369	SON	39 64	0 10	100.0	1.148	CRISTALINO DE SONORA
370	SON	43 280	0 10	100.0	947	DULCILLO DE SONORA MEZCLA
371	SON	46 60	0 10	220.0	1.145	HARINOSO CRISTALINO
372	SON	50 64	0 10	165.0	1.343	ONAVENO CRISTALINO GRUESO
373	SON	51 64	0 10	195.0	1.198	HARINOSO CRISTALINO
374	SON	54 60	0 9	100.0	1.069	HARINOSO DE OCHO
375	SON	55	0 10	110.0	944	CHAPALOTE MEZCLA
376	SON	56	0 10	265.0	1.163	ONAVENO REVENTADOR
377	CHIH	2	0 10	250.0	1.286	GRANO ANCHO MAZORCA LARGA
378	CHIH	4	0 9	120.0	1.139	MEDIO CRISTALINO
379	CHIH	14	0 10	160.0	1.372	FASCIADO GRANO ANCHO MAZCORRA CORTA
380	CHIH	15	0 9	140.0	992	TUXPENO MAZORCA CHICA
381	CHIH	18	0 10	245.0	1.175	HARINOSO DENTADO MEZCLA TUXPENO CONICO
382	CHIH	19	0 10	290.0	1.161	TUXPENO
383	CHIH	20	0 10	175.0	1.218	TUXPENO CONICO
384	CHIH	21	0 10	695.0	1.448	GRUESO HARINOSO MAIZON
385	CHIH	22	0 10	115.0	1.306	HARINOSO DENTADO MEZCLA TIPO TUXPENO
386	CHIH	23	0 10	100.0	889	CONICO NORTENO PRECOZ
387	CHIH	25	1 10	595.0	1.455	TUXPENO HARINOSO
388	CHIH	29	0 10	765.0	1.417	DENT GRANO ANCHO PRECOZ ALGO OLOTILLO
389	CHIH	40	0 9	135.0	1.266	TUXPENO CONICO NORTENO
390	CHIH	41 300	0 10	475.0	1.421	GRANO ANCHO MAIZON MEZCLA
391	CHIH	43	0 10	445.0	1.185	TUXPENO MAZORCA DELGADA
392	CHIH	68	0 10	335.0	1.371	TUXPENO HARINOSO
393	CHIH	74	0 10	195.0	1.289	HARINOSO DENTADO MEZCLA ALGO FASCIADO
394	CHIH	88	0 10	335.0	1.216	DENTADO CONICO MEZCLA
395	CHIH	89	0 10	290.0	1.256	DENTADO HARINOSO PRECOZ TIPO MAIZON
396	CHIH	91	0 10	160.0	1.013	CONICO NORTENO
397	COAH	3	0 10	105.0	1.105	CONICO NORTENO PRECOZ
398	COAH	7	0 10	605.0	1.379	TUXPENO PRECOZ ALGO MAIZON
399	COAH	12	0 10	420.0	1.367	TUXPENO MAIZON
400	COAH	19	0 9	275.0	1.156	TUXPENO PRECOZ
401	COAH	35	0			TUXPENO PRECOZ
402	COAH	47	0 10	200.0	1.199	TUXPENO ALGO CONICO
403	COAH	65	0 10	150.0	1.155	AMARILLO MEZCLA BLANCO
404	COAH	67	0 10	290.0	1.191	TUXPENO POCO CONICO
405	NAY	9 80	0 10	105.0	1.250	MAIZ DULCE
406	NAY	25	0 9	100.0	878	ELOTES MORADOS
407	NAY	26 100	0 10	100.0	832	REVENTADOR
408	NAY	32	0 10	105.0	912	ELOTES MORADOS
409	NAY	47	0 10	100.0	590	REVENTADOR MEZCLA
410	NAY	48 110	0 10	280.0	1.208	TABLONCILLO AMILACEO
411	NAY	50	0 10	165.0	1.035	TABLONCILLO CRISTALINO
412	SIN	2	0 10	105.0	1.046	CHAPALOTE
413	COL	6	0 10	340.0	1.420	ELOTES MORADOS MEZCLA CON BLANCO
414	COL	16	0 10	230.0	1.161	ELOTES MORADOS MEZCLA CON BLANCO
415	COL	24	0 10	120.0	1.191	ELOTES MORADOS MEZCLA CON BLANCO
416	N L	7 270	0 10	285.0	1.201	CELAYA ELOTE BLANCO Y ROJO

(continued)

Table 1a. (continued)

Row No.	Accession	Race		Crushing	Rind	Notes
		Code	F No.	Pressure	Thickness	
				lbs.	mm.	
417	N L	16	0 10	245.0	1.098	CONICO NORTENO CELAYA
418	N L	19	0 10	530.0	1.315	CELAYA PLUS
419	TAMPS	37	0 10	515.0	1.260	TUXPENO PRECOZ DE TAMPICO
420	Q R	9	0 9	188.9	1.394	CONICO NORTENO CELAYA
421	Q R	14	0 10	165.0	1.077	CONICO NORTENO
422	Q R	16	0 10	190.0	1.136	ELOTE ROJO
423	Q R	17	0 10	100.0	1.152	ELOTE MORADO
424	Q R	26	0 10	220.0	1.161	CONICO NORTENO
425	Q R	27	0 9	240.0	1.197	CONICO NORTENO
426	Q R	36	0 10	125.0	1.037	CONICO NORTENO
427	Q R	41	0 10	580.0	1.368	CONICO NORTENO CELAYA
428	Q R	58	0 10	200.0	1.058	CONICO NORTENO ELOTES MORADOS
429	GTO	1	0 10	120.0	1.289	ELOTES MORADOS ALGO TABLONCILLO
430	GTO	2	1 10	322.2	1.241	CELAYA CON POCO CONICO NORTENO
431	GTO	9	0 10	130.0	902	ELOTE ROJO
432	GTO	12	240 0 10	200.0	1.136	CONICO NORTENO PEPITILLA
433	GTO	21	240 0 10	225.0	871	CONICO NORTENO MEDIO
434	GTO	22	0 10	185.0	1.249	CONICO NORTENO CON POCO CELAYA
435	GTO	24	240 0 10	120.0	940	CONICO NORTENO PRECOZ
436	GTO	30	0 10	100.0	1.065	CONICO NORTENO PLUS CELAYA
437	GTO	31	0 10	115.0	1.037	ELOTE MORADO
438	GTO	34	240 0 10	115.0	1.039	CONICO NORTENO ALGO CELAYA
439	GTO	35	230 0 10	315.0	1.300	CELAYA PRECOZ
440	GTO	37	0 10	235.0	1.148	ELOTES MORADOS
441	GTO	40	0 9	133.3	1.037	CONICO NORTENO PLUS CELAYA MAZ CORTA
442	GTO	51	0 10	115.0	1.021	ELOTE ROJO
443	GTO	52	240 0			CONICO NORTENO ALGO CELAYA
444	GTO	56	240 0 10	100.0	1.159	CONICO NORTENO MEDIO
445	GTO	61	230 0 10	340.0	1.232	CELAYA
446	GTO	65	230 1 10	740.0	1.351	CELAYA
447	GTO	67	240 0 10	145.0	882	CONICO NORTENO MEDIO
448	GTO	68	240 0 10	100.0	998	CONICO NORTENO MEDIO QUIZA ALGO CELAYA
449	GTO	69	230 0 10	140.0	1.172	CELAYA
450	GTO	71	0 10	120.0	825	CONICO NORTENO X CELAYA
451	GTO	79	230 1 10	360.0	1.186	CELAYA TARDIO
452	GTO	85	230 0 10	370.0	1.052	CELAYA TARDIO
453	GTO	92	0 9	115.0	1.342	CONICO NORTENO CELAYA TARDIO
454	GTO	93	0 10	180.0	1.108	MAIZ DULCE MEZCLADO
455	GTO	95	240 0 9	155.0	1.113	CONICO NORTENO ALGO CELAYA
456	GTO	97	0 10	210.0	1.049	ELOTE ROJO
457	GTO	98	0 10	265.0	1.182	ELOTE ROJO
458	GTO	99	240 0 10	130.0	1.279	CONICO NORTENO MEDIO
459	JAL	1	110 0 10	300.0	1.110	TABLONCILLO DE AMECA
460	JAL	4	0 10	160.0	1.168	CELAYA CONICO NORTENO
461	JAL	8	0 10	120.0	992	MEZCLA TABLONCILLO CRISTALINO
462	JAL	11	110 0 10	150.0	1.145	TABLONCILLO DE AMECA
463	JAL	12	1 10	360.0	1.335	CELAYA TUXPENO
464	JAL	15	0 10	130.0	1.004	TABLONCILLO CRISTALINO
465	JAL	17	0 10	160.0	1.240	TABLONCILLO CELAYA MEZCLA PRECOZ
466	JAL	18	0 10	340.0	1.009	CELAYA CONICO NORTENO
467	JAL	19	240 0 8	375.0	1.184	CONICO NORTENO AMARILLO
468	JAL	22	0 10	275.0	1.371	CONICO NORTENO CELAYA TABLONCILLO

(continued)

Table 1a. (continued)

Row No.	Accession	Race Code	F No.	Crushing Pressure lbs.	Rind Thickness mm.	Notes		
469	JAL	24	110	0	10	125.0	957	TABLONCILLO DE TECOLOTLAN
470	JAL	25		1	10	225.0	1.200	ARGENTINO TABLONCILLO
471	JAL	38		0	10	135.0	1.282	CELAYA ALGO CONICO NORTENO
472	JAL	45	110	0	8	118.8	1.065	TABLONCILLO DE AUTLAN
473	JAL	46	110	0	10	190.0	866	TABLONCILLO DE AUTLAN
474	JAL	53		0	10	105.0	879	CONICO NORTENO
475	JAL	59		0	10	135.0	903	CELAYA MAZORCA DELGADA
476	JAL	62		0	9	180.0	1.138	TABLONCILLO MEZCLA DE UNION DE TULA
477	JAL	64		0	10	125.0	941	PEPITILLA ALGUNAS MAZ PLUS TABLONCILLO
478	JAL	66		0	10	160.0	1.109	TABLONCILLO PRECOZ
479	JAL	67	240	0	10	100.0	911	CONICO NORTENO
480	JAL	68		0	9	138.9	1.047	ELOTES MORADOS
481	JAL	73		0	10	105.0	950	ELOTES MORADOS ROJO
482	JAL	74		0	10	235.0	1.041	CELAYA TABLONCILLO
483	JAL	75	110	0	10	155.0	1.153	TABLONCILLO DE TUXPAN
484	JAL	76		0	10	375.0	1.245	TABLONCILLO ALGO CELAYA PRECOZ
485	JAL	78		0				MAIZ DULCE ALGO MEZCLAJO
486	JAL	84		0	7	414.3	1.241	TABLONCILLO CELAYA MEZCLA PRECOZ
487	JAL	86		0	10	330.0	1.394	CELAYA CONICO NORTENO
488	JAL	89		0	10	220.0	1.127	ELOTES MORADOS NEGRO
489	JAL	93		0	10	280.0	1.087	ELOTES MORADOS NEGRO
490	JAL	96	240	0	10	115.0	1.144	CONICO NORTENO PRECOZ
491	JAL	97	240	0	10	115.0	1.007	CONICO NORTENO PRECOZ
492	JAL	99		0	9	205.6	1.227	CELAYA CON ALGO DE PEPITILLA
493	JAL	101		0	9	194.4	1.074	CONICO NORTENO CELAYA AMARILLO
494	JAL	112		0	10	175.0	1.115	CONICO NORTENO CELAYA ALGO AMARILLO
495	JAL	119		0	9	161.1	1.052	TABLONCILLO GRANO ANGOSTA CRISTALINO
496	JAL	124		0	10	135.0	1.112	ELOTES MORADOS
497	JAL	126		0	10	130.0	1.104	ALGO CONICO NORTENO MEZCLA DE TAPALPA
498	JAL	134		0	10	100.0	1.028	AMARILLO MEZCLA DE TAPALPA
499	JAL	137		0	6	100.0	1.118	MEZCLA DE TAPALPA
500	JAL	138		0	10	100.0	1.070	MAIZ DE ALTURA JUANACATLAN 2200 METERS
501	JAL	147		0	9	172.2	1.202	CIVDAD GUZMAN
502	JAL	148		0	9	172.2	1.228	CIVDAD GUZMAN AMARILLO
503	JAL	149		0	9	100.0	1.304	CIVDAD GUZMAN MAS TUXPEÑO
504	JAL	152		0	10	120.0	1.143	MAIZ DE ALTURA JUANACATLAN AM DE MONTANA
505	JAL	153		0	6	100.0	997	MAIZ DE ALTURA JUANACATLAN AM DE MONTANA
506	JAL	161	100	0	10	120.0	1.384	REVENTADOR
507	JAL	163	100	0	10	210.0	1.376	REVENTADOR
508	JAL	168		0	10	170.0	1.109	MAIZ DE ALTURA JUANACATLAN AM DE MONTANA
509	JAL	171		0	10	215.0	1.138	MEZCLA DE ATENAYAC AMARILLO DE MONTANA
510	JAL	174		0	9	173.3	1.297	AMARILLO DE MONTANA
511	JAL	179		1	10	280.0	1.104	TABLONCILLO POCO CELAYA
512	JAL	181		0	10	300.0	945	TABLONCILLO CELAYA MEZCLA PRECOZ
513	JAL	182		0	10	175.0	1.128	CELAYA
514	JAL	183		0	10	175.0	1.000	TABLONCILLO PRECOZ
515	JAL	188	80	0	10	250.0	1.130	MAIZ DULCE ROJO PURO BUENO
516	JAL	189		0	10	300.0	1.065	TABLONCILLO CDA GUZMAN AHUMADO
517	JAL	191		0	10	330.0	1.055	TABLONCILLO CDA GUZMAN AHUMADO
518	JAL	192		0	9	238.9	1.237	TABLONCILLO MAS GRANO ANGOSTO
519	JAL	194		0	9	135.0	881	OLOTILLO FLEXIBLE AMARILLO CRISTALINO
520	JAL	194		0	5	100.0	1.166	OLOTILLO FLEXIBLE CON PEPITILLA

(continued)

Table 1a. (continued)

Row No.	Accession	Race Code	F No.	Crushing Pressure	Rind Thickness	Notes		
				lbs.	mm.			
521	JAL	195	0	10	200.0	1.077	ELOTES MORADOS	
522	JAL	197	0	6	300.0	1.152	TABLONCILLO AMARILLO OLOTILLO FLEXIBLE	
523	JAL	199	240	0	10	150.0	1.282	CONICO NORTENO
524	JAL	204	80	0	10	185.0	1.062	MAIZ DULCE ALGO MEZCLADO
525	JAL	205	0	10	105.0	936	TABLONCILLO CONICO	
526	JAL	206	0				TABLONCILLO CELAYA MEZCLA PRECOZ	
527	JAL	210	0	10	265.0	1.201	CONICO NORTENO QUIZA ALGO CELAYA	
528	JAL	211	0	10	110.0	916	CONICO NORTENO CON POCO CELAYA	
529	JAL	216	0	10	180.0	1.705	TABLONCILLO MAS OLOTILLO GRUESO	
530	JAL	223	0	10	155.0	1.452	TABLONCILLO CELAYA	
531	JAL	228	0	10	210.0	1.174	TABLONCILLO BUENO	
532	JAL	RIO	0	10	590.0	1.331	CHALGRENO	
533	JAL	233	110	0	10	165.0	1.411	TABLONCILLO DE TUXPAN ALGO CELAYA
534	JAL	239	0	9	155.0	1.091	TABLONCILLO ALGO CELAYA	
535	JAL	253	0	10	405.0	1.308	CELAYA ALGO TABLONCILLO	
536	JAL	261	0	10	220.0	1.275	TABLONCILLO PLUS CELAYA	
537	SLP	7	0	10	155.0	1.322	CONICO NORTENO PLUS CELAYA	
538	SLP	9	0	10	250.0	1.160	CELAYA	
539	SLP	12	0	10	570.0	1.372	CELAYA OLOTE ROJO	
540	SLP	22	0	10	360.0	1.106	AMILACEO ROJO	
541	SLP	86	1	10	570.0	1.339	AMILACEO TUXPENO	
542	SLP	100	0	10	100.0	1.269	TUXPENO MAZORCA DELGADA PRECOZ	
543	SLP	137	0	10	945.0	1.499	CONICO NORTENO PRECOZ	
544	VER	35	0	10	100.0	1.238	PALOMERO TOLUGUENO	
545	VER	45	0	9	225.0	1.300	TUXPENO PRECOZ MAZORCA CORTA	
546	VER	85	0	10	100.0	1.076	ARROCILLO AMARILLO	
547	CAMP	16	41	0	10	200.0	1.164	BL PRECOZ HARINOSO CRISTALINO MAZ CHICA
548	CAMP	39	42	0	10	100.0	817	NAL TEL AMARILLO PRECOZ
549	CAMP	48	0					NAL TEL PLUS TUXPENO AMARILLO
550	YUC	2	41	0	10	195.0	1.161	NAL TEL PLUS
551	YUC	7	42	0	10	100.0	1.340	NAL TEL AMARILLO
552	YUC	30	42	0	10	140.0	1.041	NAL TEL AMARILLO PLUS
553	YUC	93	41	0	10	260.0	1.282	NAL TEL BLANCO PRECOZ
554	YUC	126	41	0	10	105.0	1.119	NAL TEL BLANCO PRECOZ
555	YUC	153	42	0	10	160.0	1.297	NAL TEL AMARILLO PRECOZ
556	CHIS	24	210	0	10	155.0	1.304	VANDENO PARECIDO A CELAYA
557	CHIS	76	0	10	240.0	1.085	VANDENO PRECOZ	
558	CHIS	108	210	0	10	230.0	1.057	TEPECINTLE VANDENO
559	CHIS	110	160	0	10	100.0	899	ZAPALOTE CHICO PLUS
560	CHIS	169	0	10	110.0	1.081	ZAPALOTE CHICO AMARILLO PLUS	
561	CHIS	179	0	8	125.0	1.190	AMARILLO CRISIALINO DENTADO	
562	CHIS	196	170	0	10	235.0	1.267	ZAPALOTE GRANDE ZAPALOTE CHICO
563	CHIS	207	0	10	235.0	1.119	MEZCLA VANDENO PRECOZ	
564	CHIS	209	210	0	10	250.0	1.165	VANDENO PRECOZ
565	CHIS	218	0	9	172.2	1.140	OLOTON BLANCO CRISTALINO	
566	VER	36	0	9	105.6	1.122	ARROCILLO AMARILLO PLUS	
567			0	10	205.0	1.267	PEPITILLA TEPALCINGO	
568			0	10	190.0	1.294	PEPITILLA JALOSTOC	
569			0	10	195.0	1.074	PEPITILLA JONACATEPE	
MEAN				460.7	1.309			
Standard Error				121.1	.091			