INFLUENCE OF CHARACTERS OF EAR AND KERNEL UPON THE GERMINATION OF MAIZE.

by

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INTRODUCTION.

Problem Investigated:

A great amount of literature has been published upon the selection of types of seed corn which will produce the best yield of grain. It is the general opinion of most agriculturists that there are certain physical and chemical characteristics of the ear and kernel which have a marked influence upon the yield. This is so universal that we have score cards which set forth the ideal type of ear and give certain values to the different characters.

In general, the score cards are alike and all agree upon the characters which are desirable. They set forth a very similar type of ideal ear. No doubt the ear with the score card characters and type approaches that type of ideal ear which is the highest producer, but the question arises as to: How far should we carry on the selection for these characters? Is the extreme perfection the best or is it possible to carry the selection for a character beyond the point of best production and thereby decrease instead of increase the yield?

Many experiments have been made upon the effect of physical characters upon the yield of corn, but almost all of this work has been done in a general way. It is with the results of these investigations that we have developed the score cards. The investigations previously carried on have been by taking what we now consider an obviously poor type and comparing it with a type generally accepted to be good. For instance, a small wrinkled germ would be compared with a large, full, bright one, or an ear of very small circumference and tapering with one / cylindrical in shape, and otherwise conforming to the standard of an ideal ear.

In view of the above conditions, and knowing that the yield if largely influenced by the germination of the kernels and early vigor of the plants, the problem herein considered was begin in the spring of 1911.

The work of investigation of this problem was done in connection with the Adams Fund Experiment upon the Development of the Maize Plant, now being carried on by the Agronomy Department of the Agricultural College, University of Missouri under the supervision of Professor M. F. Miller. Due credit is hereby given to the University for all aid and assistance received from the use of data from the above experiment and appreciation shown for the valuable suggestions and assistance given by Professor Miller.

Problem Investigated.

The problem for investigation is :- The effect of certain physical and chemical characteristics of the ear and kernel of the maize plant upon the germination, growth and vigor of the young plants.

In this experiment the following physical characters of the ear and kernel were studied:-

The length of the individual ears.
the circumference of the individual ears
the weight of the individual ears.
The number of rows of kernels on the ears.
The straightness of the rows from butt to tip of the ear.
The shape of the ear.
The space between kernels upon the ear.
The indentation of the kernel.
The width of the kernel.
The depth of the kernel.

The size of the germs.

The composition of the endosperm of the kernel (horny or starchy.)

The per cent of corn to cob.

The weight of average kernel on each ear.

The high extreme and the low extreme and the intermediate class of each physical character was selected and their effects upon the germination, growth and vigor of the plants investigated.

By taking an equal number of grains from each ear falling within that division of a physical characteristic, a composite sample was obtained and a chemical analysis made of the sample. This was done to get an estimate of the effect of these characters upon the chemical composition of the kernel. By taking these analyses, the effect of the following compounds upon the germination, growth and vigor was studied:

The per cent moisture content of the kernel.

The per cent protein content of the kernel.

The per cent fat content of the kernel.

The per cent ash content of the kernel.

The per cent fiber content of the kernel.

The per cent nitrogen free extract in the kernel.

A correlated experiment was carried on in connection with the above investigations. It was the effect of horny and starchy endosperms of the kernel upon the germination, growth and vigor of the young plants, where the kernels were planted in soil which contained an excess of moisture. This was

investigated with the hope of finding a type of corn best adapted to a kind of soil common to Northeast Missouri. The land in this section is prairie land and a rather heavy soil with a sort of hard pan subsoil. The soil has poor drainage and often remains wet and cold until late in the spring. This causes the farmers of the section a great deal of difficulty in securing an early, strong and even stand of corn upon this land, often resulting in very unsatisfactory yields.

Work of Other Investigators

There was not any work found to have been done upon the same line of investigation as this problem but a considerable amount of correlated work was found. By far the greatest amount of correlated work was found to have been done by the Ohio Experiment Station.

Ohio Experiment Station, Bulletin 212, "Corn Judging: Studies of Prominent Ear Characters In Their Relation To Yield" - by C. G. Williams and F. A. Welton.

The result of five years study are given using from twenty-five to one-hundred ears in each group and growing the corn upon plots of one-tenth acre, all plots having had the same treatment for sixteen years.

The ears were selected which differed widely in one character only, giving no attention to other characters except to have all present.

The short ears were on an average of 2.2 inches shorter than the long ears and usually larger in circumference and

lighter in weight. They yielded 5.18 bushels per acre less than the long ears.

The tapering ears showed a combined average, for all tests, a gain of 0.87 bushels per acre over the cylindrical ears.

The crease-dented ears produced on an average, 2.8 bushels per acre more than the rough-dented ears. The crease-dented ears used the last year in the test averaged 1.2 ounces lighter, 0.2 inches shorter, 0.5 inches less in circumference and 3.5 less in shelling per cent.

In tests made for yields from ears shelling over 86% against ears shelling less than 81% there was an increase of three bushels in favor of ears of the lower shelling per cent.

Summary.

What the indications seem to show:-

1. That the selection of seed of less than normal length, for a given variety or locality will reduce the yield and, if the selection be continuous, gradually shorten the length of the ear.

2. The shape of ear as regards cylindricity is a matter of less importance than many other of the prominent ear characters. While the tapering ears have, upon the average, led slightly in yield, the variation is neither important nor consistent, and more evidence is needed before a pronouncement can be made for either type.

3. That the continuous selection of seed ears having

an inch to an inch and a half of bare cob at the tip will increase the average amount of bare cob tip, diminish the total number of ears having completely filled tips, and decrease the yield of shelled corn per acre.

4. That so far as indentation of kernels is concerned, ears comparatively smooth-crease-dented have proven somewhat superior in yield to the rough dented ears.

5. That conditions of growth being equal, weight of ear, as made up of slight increases in length, circumference, and amount and density of grain and cob, favor an increase in yield and is worthy of consideration in the final selection of seed corn.

6. That a knowledge of the previous conditions of growth is helpful in estimating the value of seed corn. And further, that seed for use under general conditions would better be selected under slightly inferior, rather than very much superior environment.

7. That a maximum yield of corn can hardly be secured under good soil conditions in this state with less than 12000 plants per acre. This stand may be had with three plants per hill in hills thirty-six inches by forty-two inches.

Bulletin 78, Ohio Agricultural Experiment Station:- "Color and productiveness do not appear to bear any relation to each other in corn."

Bulletin 140, Ohio Station, "Selecting Seed":- "In selecting corn the aim should be to choose thoroughly matured ears of medium size, uniform in type, cylindrical or slowly tapering, with a large number of straight, closely-

set rows rounding at butt and running clear to tip with kernels medium to long,wedge in shape and rough dented and for the reason that this is the sort of ear that will yield the most shelled corn."

Bulletin 77, Iowa Agricultural Experiment Station gives somewhat similar data to above summary as results of their work in corn breeding.

Bulletin 91, Nebraska Agricultural Experiment Station:- "Varieties with medium sized ears yielded better under average Nebraska conditions than did large or small-eared varieties.

Bulletin 119, Illinois Agricultural Experiment Station:- "Type and Variability of Corn" gives some very valuable data upon effects of certain physical characters upon variability of corn also some on effect of fertility and thickness of planting upon physical characters of the ear.

V. M. Shoesmith of the Ohio University gives four rules for seed corn selection:-

I. Select ears of a medium size for your locality.

II. Select ears that are very high for their size.

III. Select ears of a bright healthy color.

IV. Select ears with grains of uniform size and shape.

Georgia Agricultural Experiment Station, Bulletin 84:- Yield from long vs. short ears: Seed corn from long ears produced a yield of 1.76 bushels per acre less than seed from short ears. Variety used in this test was Marlboro's Prolific.

Kansas State Agricultural College, Bulletin 147:- This station advises against selecting ears of long, slender type,

or ears with poorly shaped or too smoothly indented kernels but prefers ears nine to eleven inches long and seven to nine inches in circumference, according to variety, and kernels running in straight, even rows from butt to tip, medium rough indented, and slightly wedge shaped.

United States Department of Agriculture, Farmers' Bulletin 415:-

Late maturing with ears heavy because of excess amount of sap should be ignored; sappiness greatly increases the weight and is likely to destroy the quality.

J. W. Reed, in Research Thesis presented at the University of Missouri gives the following:-

1. Corn, husked and stored early in autumn in warm seed house in racks gave best germination tests.

2. Kernels with high protein content germinated stronger than ones with low protein content.-

3. Large germs germinated better than smaller germs.

4. Short kernels germinated better than long kernels.

5. High moisture content injures vitality of seeds if they are exposed to a low temperature.

6. Conformation and composition show a decided influence upon germination, vigor of growth, and yield per acre.

Virginia Agricultural Experiment Station, Bulletin 165:-

"Selection for Protein Content in Corn"--"Many of the best yielding ears did not contain as high per cent protein as the undesirable ones, this indicating the necessity of not basing selection upon a high protein content alone."

Illinois Agricultural Experiment Station, Bulletin 87:-

"Composition of Corn"-- High and low protein content -

	% Protein.	% Oil.	% Ash.	% Carbo-hydrates.
Low Protein	9.28	4.20	1.41	85.11
Med.Protein	10.95	4.33	1.55	83.17
High Protein	12.85	5.36	1.67	80.12

It will be noticed that there is a high per cent of ash and oil in the high protein ear and a low per cent of carbo hydrates. In the high protein ear about 25% of the protein was in the horny endosperm, and 7 to 8% in the starchy endosperm. The germ contains about 35% oil and horny gluten about 5% oil.

Oil Content.

	Oil %.	Protein %.
High Oil	7.00	9.98
Low Oil	2.52	11.31

Examples relating to effect of perfect stand upon yield, Illinois Bulletin 13 page 410 - (Three years results.)

Rate of Planting	Weight of 100 ears in pounds	Weight of 100 stalks (stover) pounds	Wt. Shelled maize per acre bu.	Tons Stover per acre.
47520	24	29	59	4.8
23760	39	40	76	3.7
15840	51	45	77	3.1
11880	59	51	81	3.0
9504	62	55	72	2.9
5940	66	66	55	2.5

Missouri Bulletin 32 -

At the Missouri station, on good land, the largest yield (seventy bushels) was obtained by leaving four stalks in a hill three feet nine inches apart each way, or 12960 stalks per acre, while on poor land the largest yield (thirty-six bushels per acre) was from two stalks per hill or 6480 stalks per acre.

Other investigations have been carried on as to the number of stalks desired per acre and for the principal maize belt, planting at the rate of one grain every twelve inches or approximately four grains per hill in rows three feet eight inches apart, has given the best yields where grain alone was desired. Where stover and grain are desired, one stalk every nine inches; stover alone, one grain every six inches. It is needless to say that unless you have a good germination of kernels you will not have a good, even stand of stalks as is shown by the above experiments.

Upon the care of seed corn:---

Missouri Experiment Station found the following as to care of seed corn:

Selection	Germination.
Field gathered carefully stored- - - - - - -	96%
Seed selected at gathering time - - - - - - --	89.10%
Seed selected from crib - - - - - - - - - - - -	83.30%
Seed selected from shock - - - - - - - - - - -	53.70%

Vigor as effected by proper drying of seed:-

New York Station, Report of 1886:

"While in germination, in one trial, the vitality as expressed in per cents was precisely the same between two lots of five-hundred seeds each, the one corn from the crib and the other thoroughly dried over a radiator, viz: 94%, yet when the same corn was planted in the earth, the difference became very marked, the corn from the crib giving but 20% vegetation and the same corn kiln dried giving 80% vegetation. The difference was even more marked in the growth, the corn from the crib attaining a height of only three incheswhile that from the kiln dried seed had reached the height of five inches in the same time."

PLAN OF EXPERIMENT.

History of Corn.

An accurate and complete history of the corn used in the experiment is very necessary for a comprehension of the possible explanations offered of some of the results as shown by the data procured in the course of the investigation of the problem. This is especially true in the explanation of the very low germinability of the group of ears as a whole.

Six-hundred and sixty ears of pure bred Boone County White seed corn was bought from Mr. George Heckler at Dalton, Missouri. The corn was grown on very rich alluvial land, the yield per acre being about eighty bushels. As a whole, the ears were of a very heavy, large type, somewhat rough in indentation but of very good type for the variety.

No particular pains were taken in the selection and care of the corn. It was selected from the field at gathering time by the following method: A box was placed on the front of the wagon and whenever a well formed ear was found, it was thrown into this box and taken to the seed room. The husking of the corn was begun about November first and not completed until the latter part of December. During this time much of the corn had been exposed in the field to some damp and cold weather. The corn received no special treat-

ment to dry the ears well before freezing weather. It was scooped into a tightly boarded crib in a pile of over two-hundred bushels and allowed to remain until about March first.

If the corn had been gathered earlier in the season and more quickly and carefully dried, the germination would no doubt have been much stronger. The piling of corn in a large pile causes very slow drying out of excess moisture, and is generally admitted to cause an increase in the detrimental effect of the moisture upon the germination, as corn is greatly injured if it has a high moisture content and freezes. The expansion of the moisture in the cells when freezing causes a breaking down of the cell walls thereby killing the germ. There were probably many ears in this pile of seed ears which were very slow in drying and were subsequently injured in the above manner.

In looking over the descriptions of the ears, it will be noticed that they are as a whole rather heavy in weight, large in circumference and in every way large and of a late maturing type but in most cases they will be found to be of a type which according to the units of a score card could be called good ears for seed.

The above methods of selection, and care of the corn and its type which is of a kind likely to contain a very high moisture content, would tend to cause a low vitality of the corn.

The greatest of all factors in explaining the results obtained from data of investigation is the selection of the ears which were tested. There were no ears in the entire six-hundred and sixty which would not be called good seed corn ears from the standpoint of application of the score card. For example, all ears were of good shape, none were long and very slender, there were no nubbins, and there were no small wrinkled germs.

The grower of this corn had selected it in the manner characteristic of most growers. As a whole, they demand more of a small germ than of a large one, viz., a ear with a small germ will be thrown out unless it has a very bright, full, well shaped germ, but if a germ has size, it will be retained even though it is somewhat blistered, unshapely or discolored. The same is true of the shallow grained ear, unless the grains are uniform, well shaped and with bright germs it is discarded but the deep grained ear will be kept even if the germ and shape are poor.

The same exacting discrimmination is applied to the short ear versus the long ear, the ear with small circumference versus the ear of large circumference, the wide kernel versus t the shallow, the heavy weight ear versus the light weight ear, the tapering ear versus the cylindrical and so on through all characters set forth by the score card.

The above is more fully explained in the description of existing characters and is undoubtedly a valuable factor in explaining the results or effects of the physical characters upon the germination, and these characters are selected

for within the limits of good seed corn as they were in the corn used for this experiment.

Another factor which will aid in the explanation of the low percentage of germination and the resulting effects of various characteristics affecting the germination is the history of the storage and care of the corn from the time of being shipped to the experiment station up till the time germination tests were made. As previously stated, the corn was bought for the purpose of being used as seed in the carrying on of another experiment at Missouri station. It was shipped to the station about March first, 1910, in one bushel crates. Soon after being received at the Experiment Station the ears were described as to their physical characters and the corn shelled by hand and stored in eighty-three wide-mouth glass bottles. Each ear was stored in a separate bottle, labeled and carefully stoppered with cork stoppers. From this time until germination tests were made in October, November and December of 1911, the corn was kept in the bottles, upon shelves, in a dry room in the basement of the Agricultural building. Steam heat was in the room in winter time and the ventilation good at all times, the room being used as a seed store room. Corn weavil was very troublesome and at various times during the storage of the corn the stoppers were removed from the bottles and all uniformly fumigated with hydrocyanic acid gas.

The age of the corn (beginning on three years) should not have affected the germination seriously as the conditions of storing after being received at the Experiment

Station were good.

Sturtevant in American Naturalist of 1895, pp 806-904 gives the effect of age upon vitality of seeds. The following are his results upon corn:-

Age of Seed.	No. of Trials.	No. of seeds tested.	% Germination.
1/2 year	17	1075	100
2 years	37	3005	100
3 years	7	725	100
5 years	1	93	100

No doubt, from the high per cent of germination, secured by Sturtevant the corn used in his experiment was of very strong vitality and well selected, corn of less vitality having weak characteristics might be more greatly influenced in vitality by the age.

The deliterious effect of the hydrocyanic acid fumigation is also doubtful as several investigatiors have proven conclusively that this gas does not injure the germinating ability to any extent.

METHODS OF TAKING DESCRIPTIONS.

These descriptions of the physical characters of the ears and kernels were taken very carefully in tabulated form one ear at a time. In order to avoid all danger of variation due to various ideals held by different individuals the descriptive work was all done by one person. The characters were taken one at a time, disregarding the other characters possessed by the ear.

Length of The Ear. Long ears, ten inches and over:-

In general, the long ears were ears of large circumference, deep grains and rather coarse, rough type, of heavy weight and in every way very much above the average in size. Often there would be wide grains and an open space between the rows. The longest ears in the sample were, in most cases, well proportioned and less than twelve inches long; short ears were eight and one-fourth inches and less. In this class the ears were all over seven inches long and the majority of them were at least seven and three-fourths to eight and one-fourth inches, of medium small circumference and well proportioned. They included most of the shallow grained, small germed, narrow kerneled and close spaced ears. Average length ears were over eight and one-fourth and under ten inches and contained a variety of other characteristics but tending to fall in the average classes.

Circumference of Ears: Large circumference, eight inches and above; very few being over eight and one-half:-

These ears were of similar type to the long ears, deep grained, etc. Small circumference of ears, seven inches or less, very few being as small as six inches. Types were in general small shallow grains with very bright small kernels. The selector of the seed had thrown out all small, wrinkled germs and small poorly shaped kernels. Average circumference was above seven inches and under eight inches, majority of ears being of average types.

Weight of Ears: Ears of heavy weight weighed eighteen ounces or over, the highest being twenty-two ounces:-

These ears were large ears but not necessarily ears of a high shelling per cent of corn to cob, but very similar to ears of the large circumference and long ear type. Light weight ears were thirteen ounces or under, a few weighing as low as eleven ounces. These ears corresponded in general, to types of short and small circumference ears. Average weight ears were over thirteen ounces and less than eighteen ounces - the medium type of ear.

Number of rows per ear: Ears with twenty-two rows or over a very few having twenty-four or twenty-six rows:-

Mostly large circumference ears, or rather close spaced rows, narrow kernels, deep kernels in many instances were found. Ears with small number of rows, sixteen or less, mostly sixteen and fourteen rows. Ears tended to be smooth indentation. Medium horny composition, small circumference and shallow kernels. Average number of rows, eighteen and twenty. These ears varied in type but were in general medium types.

Shape of Ears:

Cylindrical, partly cylindrical and tapering. There were few ears which tapered to an excess. These classes include ears of every type.

Space between rows:-

Close spaced ears were in general ears of shallow, small grains. Open spaced ears were either extremely rough, deep, or extremely smooth indented with round caps and tending to be of horny endosperm type. Medium types were of

no special characteristic.

Indentation of Kernel:-

Ears of rough indentation were usually ears with deep grains and a large percent of white starchy endosperm. Smooth indentation seemed to be correlated with medium shallow grains with a large per cent of horny endosperm. The medium types varied as to other characters.

Width of Kernels:-

Wide kernels were often deep kernels and poor germs. Narrow kernels seemed to be associated with small, and poorly shaped germs. Average width kernels were kernels having the better shapes and better type of germs.

Depth of Kernels:-

Deep kernels were on ears of large circumference and often had discolored germs which were likely caused by the slow drying of the ears. Shallow kernels were in most cases grains with small but bright, well-shaped germs and well shaped kernels. Medium deep kernels included grains of good size and variation of shapes and types.

Composition of Kernel, in relation to the amount of horny or hard endosperm and starchy or soft, white, endosperm. These determinations were made by eye and by splitting the kernels with a pen knife. Kernels with all endosperm hard or horny were very few and of a vigorous looking type of medium depth and size. Medium horny kernels were kernels with over 50% of the endosperm of hard type. Medium starchy kernels had less then 50% of horny, hard endosperm. Starchy

kernels were those with a very large per cent of the endosperm white or starchy/ These kernels were of rough indented type and often poorly shaped and blistered or discolored germs.

Size of Germs:-

The size of germ was determined by eye, the grains being split with a knife to determine the thickness. The large germs were those of extra large size and often in deep wide kernels. The small germs were as a whole, brighter, better shaped germs than the extra large ones. The selector of the seed corn had thrown out all small germs except those of vigorous looking type. The germs coming in the average class, were of a good type and judging from the basis of the entire field, would have probably been classed as large germs.

Per cent of Corn to Cob:-

This was determined by shelling and weighing the corn and cob separately. The high shelling per cent ears were those shelling 87.50% or over, some running as high as 91%. These must necessarily be very deep, close rowed types and of a type slow to dry out. The low shelling per cent were those shelling 82% or less. The majority of them shelled over 80%. It will be noticed that these ears were of a sufficiently high shelling per cent to be classed as good seed corn. Medium shelling per cent ears shelled above 82% up to 87.50%.

Weight of Average Kernel on Ear:-

Heavy weight kernels were those averaging four grains each or over. This is associated with wide, deep grains.

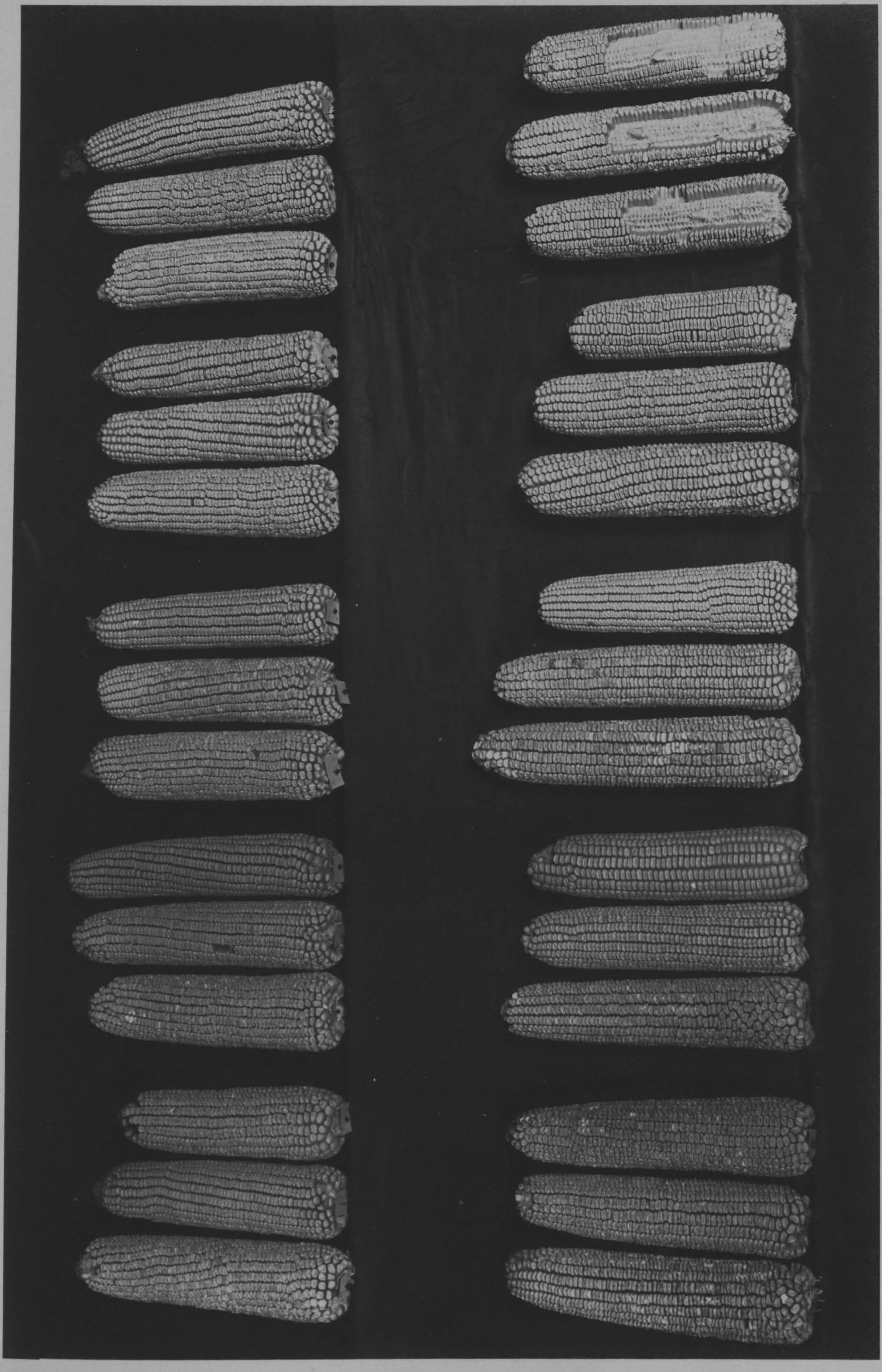
Light weight kernels were those weighing .312 grams or under. These grains were of starchy type and usually small in size. Average weight of kernels was from .312 grams to 4 grams and of the better type of kernel.

EAR CHARACTERS

Ear Number	Length of Ear	Circum. of Ear	Ear Wt. Ounces	Ear Wt. Grams	Number of Rows	Rows Twist or Straight	Ear Shape	Space Between Rows	Indentation	Kernel Width	Kernel Depth	Kernel Composition	Size of Germ	Size of Shank	Shape of Butt	Weight of Cob-Ozs	Shelling Per Cent	Wt. Average Kernel-Oz
8	8.50	6.75	12	340	16	S	C	M	R	W	M	MH	L	S	M	2.25	83.63	.342
18	9.62	7.00	13	368	22	T	PC	C	R	N	M	S	S	M	M	1.76	88.71	.273
26	9.50	7.00	12	340	18	S	T	M	R	N	S	S	S	S	M	2.38	81.01	.279
27	8.75	7.50	15	425	20	S	C	M	M	M	M	MS	M	S	D	2.50	83.33	.372
32	9.75	8.00	17	482	18	S	PC	M	R	W	M	MH	L	L	M	2.75	85.13	.317
33	9.50	7.75	17	482	20	S	C	C	M	M	D	MH	M	M	M	2.75	85.99	.397
34	10.50	7.25	16	454	18	T	T	M	M	M	M	MH	M	L	M	2.62	86.13	.366
35	9.00	7.37	17	482	18	T	PC	M	R	W	M	MH	M	L	M	3.25	82.89	.392
36	9.62	7.50	19	539	18	T	PC	M	M	M	M	MH	M	M	M	3.50	81.81	.395
37	9.00	7.37	14	397	18	T	PC	M	R	M	D	MS	L	L	M	2.12	87.28	.356
38	9.75	7.25	16	454	16	S	PC	M	M	M	M	MH	L	M	M	2.25	87.22	.437
39	9.50	7.25	16	454	16	S	PC	M	M	M	M	MS	M	L	M	2.88	83.45	.409
56	10.0	7.50	17	482	20	S	PC	M	M	N	M	MH	M	M	M	3.00	83.33	.346
57	9.12	7.00	12	340	18	S	T	M	R	N	M	MS	S	M	M	2.00	84.90	.307
58	8.38	7.75	15	425	18	T	C	C	R	M	M	MS	M	M	M	2.50	86.06	.396
59	8.00	7.87	16	454	18	T	C	M	R	M	M	MS	M	S	M	2.25	86.12	.329
60	8.88	7.63	16	454	16	S	C	M	R	W	D	MH	L	S	D	2.25	84.21	.456
61	9.50	7.25	15	425	18	T	T	C	M	M	M	MS	M	S	M	2.38	85.49	.386
62	9.25	7.00	12	340	18	T	C	M	S	N	M	MH	S	M	D	2.12	86.32	.351
63	8.13	7.38	14	397	18	T	T	M	R	M	M	MS	M	M	F	2.38	83.47	.391
64	9.00	7.88	16	425	18	T	C	M	R	N	M	MH	M	L	M	2.50	85.40	.365
65	9.50	7.00	14	397	16	S	T	M	M	M	M	MS	S	S	M	2.38	83.49	.401
66	9.25	7.50	16	454	20	T	C	M	M	N	M	MH	M	M	D	2.50	86.12	.310
67	10.00	7.75	17	482	18	T	T	M	R	M	M	MS	M	S	M	3.12	82.40	.390
68	8.50	7.88	15	425	20	S	PC	M	R	N	M	MS	M	S	M	3.00	00.00	.
69	9.38	7.63	15	425	16	S	PC	M	R	W	M	MH	M	M	M	3.00	82.35	.408
70	9.88	7.88	15	425	20	T	T	M	M	N	D	MH	M	S	F	1.88	88.47	.297
71	8.50	7.88	15	425	18	T	PC	M	M	M	M	MS	M	S	M	2.50	85.40	.333
72	9.50	7.75	16	454	20	S	PC	M	R	M	M	MS	M	M	D	2.50	87.01	.399
73	9.50	7.63	16	454	20	S	PC	M	M	N	M	MH	M	M	D	2.88	83.92	.325
74	9.50	7.75	17	482	22	T	T	C	M	M	S	MH	S	M	M	3.50	79.71	.299
75	9.13	7.75	16	454	18	T	T	M	R	M	M	MS	M	M	M	3.25	82.40	.369
76	10.0	6.88	16	454	20	S	T	C	S	M	S	MS	M	M	M	3.00	83.80	.331
77	8.88	8.00	14	397	22	T	PC	M	M	N	S	MS	S	L	M	2.38	84.61	.327
78	8.25	7.63	13	368	22	T	C	M	R	M	D	MS	M	S	M	2.00	86.72	.293
79	8.63	7.00	13	368	18	T	T	M	S	M	M	MM	M	L	M	2.12	86.74	.389
80	8.00	7.25	14	397	18	T	C	O	M	M	M	MS	M	M	M	2.75	83.58	.369
81	8.75	7.88	17	482	22	T	C	M	R	M	M	MS	S	M	F	3.38	82.67	.329
82	9.63	7.00	12	340	18	T	T	M	M	M	M	MS	S	L	M	2.50	83.86	.334
83	8.25	7.50	15	425	18	S	C	C	M	W	M	MH	S	L	F	2.88	83.05	.414
84	8.00	7.37	14	397	20	S	C	M	M	M	D	MH	S	S	D	2.00	87.30	.357
85	10.0	7.75	16	454	18	T	T	M	R	M	D	MS	S	L	M	3.25	82.40	.415
86	9.25	7.00	13	368	18	T	T	M	M	M	M	MH	S	M	M	2.50	83.40	.349
87	8.00	7.75	14	397	22	S	C	M	R	M	D	MH	L	S	D	2.25	87.76	.370
88	9.75	7.50	17	482	18	T	T	M	R	M	M	MS	M	L	M	3.38	81.48	.381
89	10.25	7.75	18	510	18	T	T	M	M	M	D	MS	L	M	M	2.50	87.92	.445
90	9.00	7.63	14	397	20	S	T	M	R	M	M	MS	M	M	M	2.38	85.62	.339
91	9.75	7.38	14	397	16	S	C	M	M	M	M	MS	M	M	D	2.75	83.68	.418
92	9.00	7.00	14	397	18	T	C	M	M	M	S	MS	M	S	D	2.25	86.12	.336
93	7.75	7.50	15	425	20	S	C	M	M	N	M	MS	S	S	D	2.12	86.30	.307
94	8.50	7.87	17	482	20	S	C	M	R	M	D	MS	M	M	M	3.00	81.68	.350
95	9.38	7.25	15	425	16	T	PC	O	M	M	M	MH	M	M	M	2.50	86.50	.415
96	8.50	7.63	15	425	20	S	C	M	R	M	D	S	L	S	M	2.12	88.43	.392
97	9.00	8.00	18	510	20	S	C	M	R	M	M	MM	M	M	M	3.25	80.50	.376
98	9.38	7.75	18	510	18	T	PC	C	R	W	M	MS	M	L	F	3.50	88.73	.392
99	9.63	7.75	16	454	16	S	C	M	R	W	M	MS	M	L	F	3.00	82.35	.418
100	8.50	7.13	14	397	16	S	C	M	S	M	S	MS	S	S	M	2.50	00.00	.379
101	8.63	7.00	14	397	20	S	PC	M	M	N	S	MS	S	S	M	2.00	85.47	.309
102	7.25	7.25	11	312	16	S	PC	M	M	M	M	MS	M	S	M	2.00	86.33	.392
104	9.50	6.75	14	397	20	S	PC	C	M	N	D	MS	L	M	M	2.50	87.10	.419
105	9.00	7.50	14	397	20	S	PC	M	M	M	M	MS	M	M	M	2.00	88.23	.376
106	9.38	7.75	14	397	18	T	PC	M	R	M	M	MS	M	L	M	2.75	83.58	.339
107	9.50	8.25	20	567	20	S	C	N	M	W	D	MH	L	M	M	3.62	83.80	.434
108	11.0	7.50	19	539	22	T	O	N	R	N	D	MS	M	L	M	2.88	86.16	.313
109	9.88	8.00	18	510	18	T	T	M	M	W	M	MS	M	S	M	3.25	84.91	.441
110	7.50	7.50	14	397	18	S	C	M	R	M	D	MH	M	M	M	2.00	86.92	.374
111	8.00	7.25	13	368	16	S	C	M	R	M	D	MS	L	L	M	2.00	87.09	.361
112	10.38	7.50	18	510	18	S	T	M	S	M	M	MH	M	L	M	2.75	85.59	.387
113	9.00	8.00	17	482	20	S	T	M	R	M	M	MH	M	M	M	3.00	84.78	.390
114	9.25	7.75	16	454	22	T	C	M	R	N	D	MH	M	M	M	3.00	84.61	.301
115	9.50	7.00	14	397	18	S	PC	M	M	M	S	MH	M	S	M	2.50	84.44	.389
116	8.75	7.75	14	397	20	S	T	M	R	M	M	MS	M	M	M	3.00	84.83	.313
117	10.0	7.00	14	397	18	T	C	M	S	M	M	MS	S	M	D	2.00	87.09	.358
118	9.00	7.50	16	454	20	S	C	M	S	M	M	MH	M	M	M	3.25	82.79	.378
119	8.75	8.00	16	454	22	T	C	M	M	M	M	MS	M	L	M	2.25	87.43	.378
120	9.25	7.75	16	454	18	T	T	M	R	M	D	MS	M	L	M	2.38	86.46	.397
121	9.50	8.00	18	425	20	S	T	M	M	M	M	MS	M	M	M	2.88	82.73	.374
122	9.75	8.00	17	482	22	S	T	M	M	M	M	MH	M	M	M	3.00	86.68	.332
123	9.00	7.50	16	425	18	T	T	M	M	M	M	MS	M	L	M	2.75	84.20	.343
124	9.00	7.00	14	397	16	S	PC	M	M	M	M	H	M	L	M	2.38	84.56	.349
125	9.50	7.50	16	454	20	S	PC	M	S	M	M	MM	M	L	M	2.50	83.33	.343
126	9.13	7.13	15	425	20	S	C	M	M	N	M	MH	S	M	M	2.38	85.21	.304
127	9.50	7.00	14	397	16	S	T	M	M	M	M	MS	S	L	M	2.88	82.99	.345
128	8.75	7.50	14	397	20	S	C	M	R	M	D	MS	L	S	D	2.12	86.61	.334
129	8.75	7.00	16	454	22	T	C	M	R	M	D	MH	L	L	M	2.75	84.62	.390
130	9.50	7.50	15	425	18	T	T	M	VR	M	M	MH	M	L	M	2.75	83.03	.349
131	9.75	7.00	14	397	16	S	PC	C	M	M	M	MH	L	S	D	1.75	89.52	.349
132	8.50	7.50	16	425	20	S	PC	M	R	N	M	MH	M	S	M	2.25	87.86	.372
133	8.60	7.37	12	340	20	S	C	C	R	M	M	MS	M	M	M	2.00	84.90	.303
134	9.25	7.75	15	425	20	T	PC	O	R	M	M	MS	S	M	M	2.75	85.04	.339
135	8.60	7.25	13	361	20	T	T	M	S	M	M	MS	M	L	M	2.75	81.98	.335
136	8.75	7.25	16	425	16	S	PC	M	VR	M	M	MS	S	L	M	2.63	82.05	.356
137	8.25	7.25	12	340	16	S	C	M	S	N	S	MM	M	M	M	2.12	85.95	.358
138	9.25	7.25	13	340	18	T	T	C	R	M	D	MS	M	M	M	1.88	87.31	.342
139	9.50	7.50	15	425	18	T	PC	M	M	M	M	MH	M	M	F	2.38	86.45	.369
140	10.0	7.00	16	454	18	T	PC	M	M	M	M	MS	S	S	D	2.63	83.72	.346
141	10.25	7.50	18	510	20	S	T	C	M	M	S	MS	S	M	F	4.25	78.88	.347
142	9.50	8.25	16	454	18	T	T	O	R	W	D	S	M	L	M	2.63	86.16	.391
143	10.38	7.50	18	510	18	T	T	M	S	M	M	MM	M	L	M	3.75	80.76	.363
144	9.50	7.00	14	397	18	T	T	M	M	M	M	MH	S	L	D	2.38	84.56	.371
145	9.00	7.50	14	397	18	T	C	M	R	M	M	MS	S	S	D	1.87	88.64	.338
146	9.38	7.75	17	482	20	S	C	M	M	M	M	MH	S	S	M	2.63	86.56	.422
147	9.00	7.25	15	425	20	T	C	M	R	N	M	MS	M	L	M	2.50	83.71	.345
148	9.00	7.50	14	397	16	S	T	O	R	M	M	S	M	S	M	2.25	85.91	.374
149	9.00	8.00	16	454	18	T	T	M	R	W	D	MS	L	L	D	2.75	84.71	.429
150	10.00	8.00	19	539	16	T	PC	O	M	W	D	MH	L	L	F	2.87	83.92	.471
151	10.50	7.00	15	425	18	T	T	M	M	N	S	MH	S	L	M	3.75	78.26	.349
152	9.50	7.25	14	397	20	S	T	M	M	N	M	MH	S	M	M	2.25	86.46	.347
153	9.38	7.75	16	454	20	S	C	M	M	M	M	MM	M	L	M	3.00	83.90	.353
154	9.00	7.25	16	454	22	T	C	M	R	N	O	MS	M	M	D	2.50	86.93	.379
155	8.75	7.50	15	425	20	S	C	M	M	N	O	MH	M	M	D	2.00	88.24	.335
156	8.50	7.25	15	425	18	T	C	M	VR	M	O	MS	M	S	M	2.63	84.78	.359
157	8.75	7.50	16	454	22	S	C	C	R	N	O	S	M	M	M	3.00	84.44	.291
158	10.25	7.25	19	539	18	T	T	M	M	M	M	MH	S	M	M	3.38	82.88	.403
159	9.50	7.50	16	454	20	T	T	M	R	M	M	MS	M	L	M	2.50	86.23	.341
160	9.25	8.00	16	428	18	T	PC	M	S	M	S	M	S	L	F	4.00	77.16	.350
161	9.75	7.75	16	454	16	S	PC	M	S	M	M	MS	L	L	M	3.25	83.20	.390

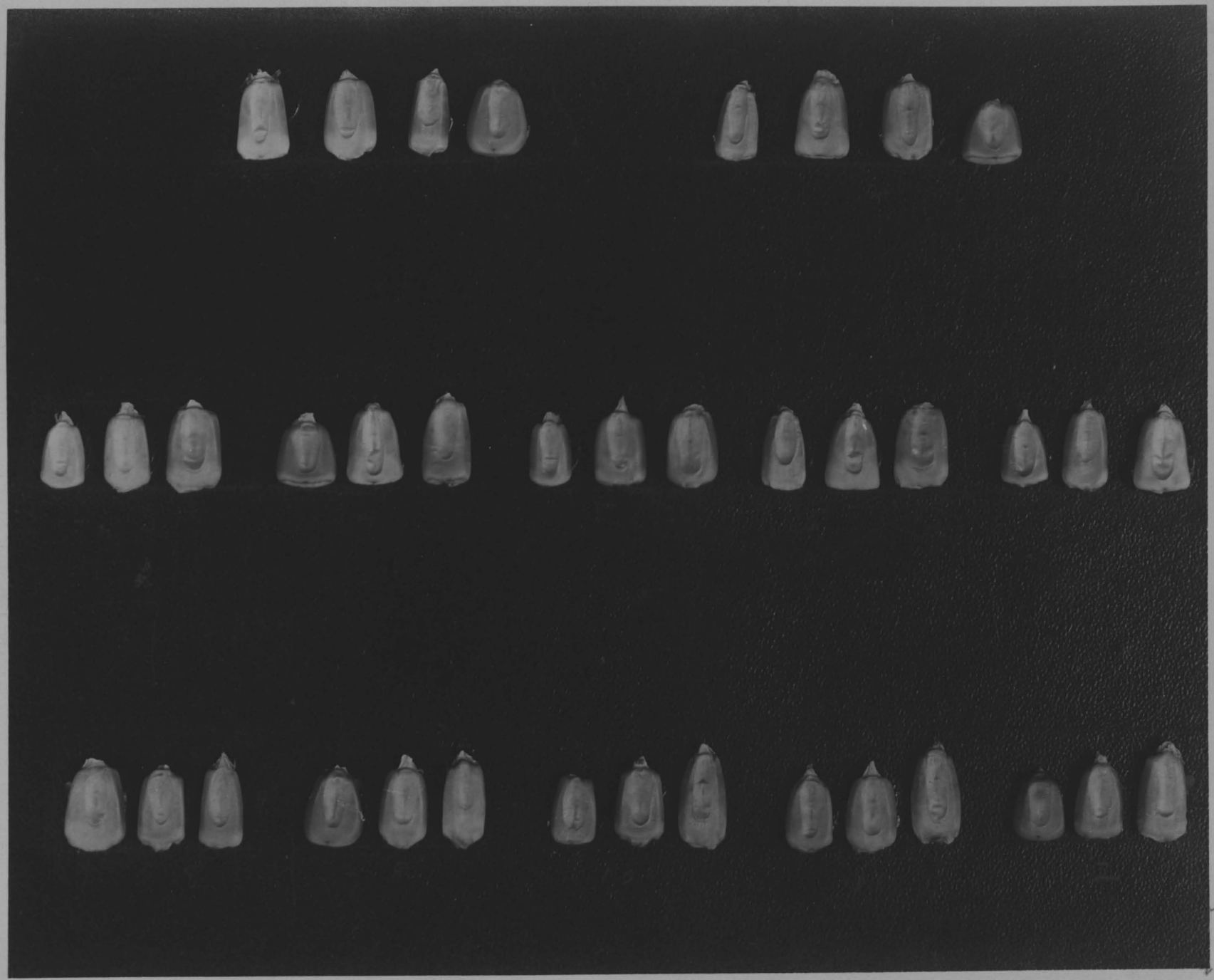
EAR CHARACTERS

Ear Number	Length of Ear	Circum. of Ear	Ear Wt. Ounces	Ear Wt. Grams	Number of Rows	Rows Twist or Straight	Ear Shape	Space Between R's	Indentation	Kernel Width	Kernel Depth	Kernel Composition	Size of Germ	Size of Shank	Shape of Butt	Weight of Cob-Ozs.	Shelling Per Cent	Wt. Average Kernel-Oz.
162	8.25	7.75	15	425	20	S	C	M	P	N	D	MS	M	S	M	2.50	8624	.372
163	9.50	6.75	13	368	16	S	C	M	M	M	S	MH	S	M	M	2.25	8597	.359
164	9.75	7.25	15	425	16	T	C	M	P	M	M	MS	M	L	M	2.88	8345	.355
165	8.75	7.50	14	397	22	T	C	C	P	N	S	S	S	S	M	2.50	8241	.282
166	9.00	7.25	12	340	18	S	C	M	P	M	M	MS	M	S	M	2.63	8421	.396
167	9.00	7.25	15	425	18	T	C	M	S	M	M	MS	M	M	M	2.87	8408	.394
168	9.00	7.50	15	425	20	S	C	M	P	M	D	S	M	S	D	1.75	8296	.351
169	9.00	7.50	15	425	20	S	C	M	S	M	M	MS	M	S	M	2.87	8534	.395
170	9.75	7.00	16	454	16	T	T	M	M	M	M	MS	S	S	M	2.00	8671	.319
171	9.75	7.25	16	454	18	T	T	M	S	M	S	MS	M	S	M	2.50	8518	.379
172	10.75	7.75	18	510	22	T	T	M	M	N	M	MS	M	M	M	2.75	8710	.363
173	8.75	8.00	14	397	22	T	Pc	C	P	N	M	S	S	M	M	2.63	8522	.308
174	10.75	8.00	20	567	22	S	C	M	P	N	D	MS	M	S	M	3.75	8420	.413
175	8.75	7.50	13	368	18	T	C	M	P	W	D	MS	M	S	M	1.75	9000	.418
176	8.75	7.50	13	368	18	T	C	M	P	W	D	MS	M	S	M	1.75	9000	.418
176	8.26	7.50	13	368	20	S	C	C	P	N	M	S	S	S	D	2.00	8730	.292
177	8.25	7.75	14	397	24	S	C	C	C	M	S	MS	L	L	M	2.63	8292	.291
178	8.75	7.75	16	454	18	T	T	M	P	W	M	MS	M	L	D	3.00	8400	.410
179	9.50	7.50	15	425	16	S	T	M	P	W	M	MS	L	M	M	3.00	8292	.371
180	11.00	8.00	20	567	18	T	T	M	M	M	S	MS	M	L	M	3.50	8070	.379
181	9.50	7.50	14	397	20	S	C	M	P	N	M	MS	L	M	M	2.38	8528	.323
182	9.25	8.00	17	482	20	S	C	M	P	M	D	MS	S	M	M	2.50	8572	.384
183	9.75	7.25	15	425	16	S	T	C	M	M	M	MH	L	M	M	2.50	8333	.343
184	10.00	7.25	16	454	16	S	T	C	M	P	M	M	MH	M	M	M	2.38	8516	.446
185	10.75	7.75	20	567	20	T	T	C	M	M	M	M	MH	M	L	M	3.25	8386	.405
186	9.75	7.50	15	425	18	T	Pc	M	M	P	M	M	MH	M	L	M	2.63	8314	.337
187	8.75	7.75	15	425	18	T	T	C	M	P	M	D	S	M	M	M	2.12	8687	.345
188	9.00	8.00	16	454	24	T	S	T	C	C	P	N	M	MH	M	L	M	2.50	8572	.351
189	9.00	7.50	15	425	18	T	S	C	C	C	S	W	M	MH	M	M	M	2.75	8366	.361
190	8.76	7.60	14	397	18	S	S	C	C	C	P	M	M	S	S	S	M	2.50	8320	.335
191	9.00	7.75	16	454	24	S	S	C	C	C	P	N	D	MS	M	L	D	2.25	8749	.309
192	9.75	7.75	16	454	18	S	T	Pc	O	P	M	D	MH	M	M	F	3.38	8180	.358
193	10.25	7.00	14	397	16	S	S	C	C	M	W	M	MS	L	S	M	2.26	8612	.358
194	8.50	7.50	14	397	20	S	S	Pc	M	P	N	D	S	S	M	D	1.75	8720	.349
195	9.00	7.50	15	425	20	S	S	Pc	C	M	M	M	MS	M	L	M	2.25	8544	.354
196	9.50	7.50	15	425	18	S	T	T	O	P	M	M	MH	L	M	M	2.00	8709	.335
197	8.75	7.13	12	340	16	S	S	Pc	M	S	M	M	MH	M	M	M	2.50	8444	.445
198	9.00	7.75	16	454	22	S	S	C	M	P	N	D	MH	M	M	M	2.75	8462	.348
199	8.75	7.50	14	397	20	S	S	Pc	M	P	N	M	MH	S	M	D	3.00	8065	.376
200	9.50	8.00	17	482	20	S	S	C	M	P	M	D	MH	M	S	D	2.50	8572	.379
201	9.50	7.75	16	454	20	S	S	Pc	M	P	M	M	MS	S	S	M	2.00	8730	.331
202	9.00	7.25	14	397	18	T	T	M	M	P	N	S	MH	S	L	D	2.25	8585	.295
203	10.25	9.50	17	482	18	S	T	M	M	M	M	M	MS	L	S	M	3.25	8240	.375
204	9.50	7.25	15	425	18	T	C	M	M	M	D	MS	M	S	M	2.63	8667	.394
205	8.25	8.00	15	425	22	S	Pc	M	M	N	M	MS	M	M	D	2.00	8673	.327
206	9.26	7.00	14	397	16	S	Pc	M	M	M	M	MH	L	M	F	2.12	8640	.374
207	10.00	7.60	17	482	18	T	Pc	M	S	M	M	MH	M	M	M	2.25	8700	.376
208	8.50	7.75	15	425	18	S	Pc	M	M	W	S	MH	L	S	M	3.00	8181	.410
209	9.25	7.50	16	454	18	T	Pc	M	P	M	M	MS	S	S	D	2.25	8571	.393
210	9.26	7.50	14	397	16	S	C	M	M	M	M	MS	M	S	D	1.87	8739	.405
212	9.50	7.50	16	454	16	S	C	M	M	W	M	MS	M	S	D	2.12	8760	.465
213	9.50	7.50	15	425	16	S	C	M	P	W	M	MH	M	S	M	3.00	8181	.386
214	9.75	7.60	16	454	16	S	C	M	S	M	M	MH	M	M	F	3.25	8276	
215	10.00	8.00	16	454	18	T	T	M	P	M	M	MH	M	M	M	2.75	8471	.379
216	9.50	7.75	16	454	18	T	C	C	M	M	M	MH	L	M	D	2.25	8571	.397
217	10.50	7.75	17	482	18	T	T	M	P	M	D	MS	S	M	M	3.25	0000	.384
218	9.50	7.75	16	454	24	S	C	C	P	N	D	MH	S	S	D	3.00	8290	.305
219	9.00	8.00	16	454	20	S	C	M	M	M	M	MS	M	M	M	2.25	8464	.359
220	9.00	8.26	18	510	20	S	C	M	M	M	M	MS	M	L	F	3.25	8594	.401
221	10.26	7.50	16	454	20	S	C	C	S	M	M	S	M	S	M	2.50	8278	.394
222	8.50	8.00	14	397	18	T	Pc	M	P	M	M	MS	M	M	M	2.25	8571	.361
223	10.50	7.00	16	454	18	T	C	C	M	N	M	MH	S	M	M	2.25	8511	.360
224	9.26	7.00	17	482	18	T	C	C	M	M	S	MS	S	M	M	3.00	8656	.379
225	8.25	7.25	14	397	18	S	C	M	M	M	M	MH	M	M	F	3.12	8181	.322
226	9.75	7.50	18	510	22	T	C	C	S	N	M	MH	S	L	F	4.00	7985	.339
227	11.00	7.25	17	482	20	S	Pc	M	P	M	M	MS	M	M	M	2.50	8110	.349
228	9.75	7.25	15	425	18	T	T	M	S	M	M	MS	M	M	M	2.25	8669	.333
230	9.75	7.75	18	510	22	S	T	M	S	N	M	MS	S	M	M	3.00	8668	.347
231	9.25	7.50	17	482	20	S	C	C	S	N	M	MS	M	M	M	3.87	8345	.364
232	8.50	7.75	15	425	20	S	C	M	P	M	M	MS	L	M	D	2.63	8413	.393
233	9.25	7.50	18	510	18	T	T	M	S	M	M	MH	L	M	M	3.00	8576	.311
234	8.50	7.50	16	454	20	S	Pc	M	S	N	M	MH	S	M	M	2.75	8296	.339
236	9.25	7.25	16	454	16	S	Pc	O	S	M	M	MS	M	L	F	2.87	8298	.412
237	8.75	7.50	15	425	22	S	T	M	S	N	M	MS	M	M	M	2.12	8535	.331
238	9.00	7.00	14	397	20	S	C	M	M	N	M	MH	M	M	M	2.25	8646	.389
239	9.50	7.50	15	425	18	T	Pc	M	P	M	M	S	S	M	M	2.87	8360	.339
240	9.75	7.50	15	425	18	T	T	M	P	M	S	S	S	M	M	2.00	8602	.359
241	8.75	7.00	13	368	16	S	C	M	M	M	M	.75	L	S	M	2.25	8278	.417
242	8.50	7.50	16	454	18	T	C	M	M	M	D	MS	L	S	M	2.50	8540	.373
243	8.25	7.50	14	397	20	S	C	M	M	M	M	S	M	L	M	2.38	8562	.398
245	9.25	7.00	14	397	18	S	Pc	M	M	M	M	MS	S	M	M	2.00	8661	.335
246	9.75	7.00	14	397	16	S	C	M	P	M	M	MH	M	L	F	2.38	8001	.338
248	9.75	7.75	16	454	20	S	T	M	P	M	M	MH	L	M	M	3.00	8333	
250	9.00	7.00	14	397	18	S	C	M	P	M	D	MS	L	S	D	2.12	8640	.358
251	9.50	7.75	18	510	18	T	T	M	M	M	S	S	S	S	M	2.50	8540	.405
252	9.50	7.25	16	454	16	S	C	M	M	W	M	S	S	S	F	1.63	8889	.406
253	9.00	8.00	16	454	18	S	Pc	M	P	W	M	MS	L	L	M	3.00	8181	.359
254	8.75	7.25	15	425	18	S	C	M	P	M	M	MS	M	S	D	2.12	8584	.407
255	9.00	6.75	12	340	18	T	T	M	P	N	M	MS	M	S	D	1.75	8660	.321
256	8.50	7.50	12	340	20	S	T	C	P	N	D	MS	M	M	M	2.00	8621	.316
257	9.50	7.00	14	397	18	T	C	C	P	N	M	MS	S	S	M	1.87	8688	.314
258	9.00	7.37	16	454	18	T	C	M	M	W	D	MS	L	L	M	2.50	8444	.374
259	8.25	7.50	14	397	22	S	T	M	M	N	D	MH	S	S	M	2.50	8462	.302
260	8.00	7.25	12	340	20	S	Pc	M	M	N	D	MH	L	M	M	2.00	8621	.325
261	9.00	7.00	14	397	18	T	T	M	M	N	D	MH	M	M	F	2.00	8709	.369
262	8.25	7.50	14	397	22	S	Pc	C	M	N	M	MS	S	M	M	2.12	8661	.273
263	10.38	7.60	16	454	18	S	C	M	M	M	S	S	M	M	M	2.87	8360	.364
264	8.25	7.50	15	425	22	S	T	M	M	M	D	MS	L	M	M	2.25	8749	.365
265	9.00	7.75	15	425	24	S	C	C	S	N	M	MS	M	M	M	2.50	8631	.323
266	9.25	7.50	15	425	20	T	T	M	8	N	8	MH	M	M	M	2.80	0000	.335
267	8.75	7.50	14	397	16	S	C	M	S	M	M	MS	S	M	M	2.25	8532	.394
268	8.75	7.00	13	368	18	S	C	C	M	M	M	MH	M	M	M	1.87	8780	.359
269	8.50	7.50	15	425	22	T	C	M	P	N	M	MS	S	M	M	2.00	8730	.297
270	9.75	7.50	16	454	20	S	T	C	M	M	M	MH	M	M	M	2.50	8671	.363
271	9.75	7.50	16	454	22	S	Pc	M	M	M	M	MS	M	S	M	1.38	9026	.309
272	9.75	7.50	16	454	18	T	T	M	P	M	M	MS	M	M	M	2.87	8360	.351
273	10.50	8.00	18	510	20	S	T	O	P	W	D	S	L	M	D	2.75	8488	.362
274	10.50	7.75	19	539	20	S	C	M	S	M	M	MS	M	M	M	3.25	8433	.399
275	11.25	7.25	18	510	16	S	C	O	P	W	M	MH	L	S	F	3.12	8276	.448
277	9.00	7.25	13	368	16	S	Pc	O	P	W	D	MS	L	S	M	1.75	8511	.291
278	8.75	7.50	16	454	22	S	Pc	C	M	M	M	MH	M	S	D	1.75	8771	.291
279	9.25	7.50	16	454	18	T	C	M	M	M	M	MH	M	M	F	2.50	8540	.436
280	8.25	8.25	17	482	20	S	C	O	P	W	D	S	L	S	D	2.50	8624	.408
281	8.50	7.50	15	425	18	S	C	O	M	M	M	MH	M	M	M	2.25	8511	.399
282	9.26	7.25	14	397	18	T	T	C	M	M	M	MS	S	M	M	2.12	8728	.358
283	10.50	7.50	16	454	16	S	C	M	M	M	M	MH	S	M	M	3.25	8312	.390
284	9.50	7.50	16	454	20	S	Pc	M	P	M	M	MS	M	M	M	2.00	8623	.390



EAR CHARACTERS

Ear Number	Length of Ear	Circum. of Ear	Ear Wt. Ounces	Ear Wt. Grams	Number of Rows	Rows Straight or Straight	Ear Shape	Space Between Rows	Indentation	Kernel Width	Kernel Depth	Kernel Composition	Size of Germ	Size of Shank	Shape of Butt	Weight of Cob - Ozs.	Shelling Per Cent	Wt. Average Kernel - Oz.
285	9.50	7.75	18	510	20	S	T	M	M	M	M	MS	L	L	M	2.25	86.96	.451
286	10.00	7.25	16	454	20	S	T	M	M	M	M	MM	L	L	M	3.00	73.33	.399
287	9.50	7.25	16	454	16	S	C	M	M	W	M	MW	L	L	M	2.75	73.08	.446
288	10.25	7.50	18	510	18	T	T	M	M	M	M	MS	L	L	F	3.00	84.44	.364
289	10.00	8.25	18	510	24	S	PC	M	P	N	D	MS	M	L	M	3.00	84.64	.363
290	10.75	8.00	18	510	20	S	PC	M	M	M	S	MS	S	L	M	4.30	78.64	.369
291	9.25	8.00	17	482	22	S	C	M	M	M	M	S	M	S	D	2.50	85.12	.364
292	9.25	7.50	14	397	18	S	C	M	P	M	D	S	M	M	M	3.00	88.40	.420
293	8.75	7.75	14	397	22	S	C	M	M	M	D	MS	S	M	M	2.00	85.60	.338
294	8.75	7.75	16	454	20	S	C	M	M	M	D	MS	L	L	M	2.25	84.96	.407
295	9.75	8.50	18	510	20	S	C	M	P	M	M	MS	M	L	M	3.00	76.80	.406
296	9.00	7.50	17	482	24	S	C	C	M	M	M	MM	S	M	M	3.00	81.81	.379
297	7.75	7.75	14	397	20	T	C	M	P	M	M	MS	S	S	M	2.50	83.33	.364
298	10.50	7.50	18	510	20	S	T	M	M	M	M	MS	M	M	D	2.38	87.36	.367
299	10.00	7.25	15	425	20	S	T	M	M	M	M	MS	M	M	M	2.50	86.34	.339
300	8.50	7.50	14	397	18	T	T	M	P	M	M	MS	M	S	D	2.00	87.09	.315
301	9.50	7.75	16	454	20	S	PC	M	P	W	D	MS	L	M	M	2.75	83.33	.399
302	8.50	7.75	16	454	20	S	C	M	P	M	M	MW	M	M	M	2.75	83.33	.396
303	9.00	7.50	16	454	22	T	C	C	P	M	M	MS	M	S	D	3.00	82.08	.369
304	9.50	7.00	15	425	18	T	C	M	M	M	M	MM	S	S	D	1.75	88.52	.322
305	10.00	7.75	17	482	18	T	T	M	M	M	M	MW	L	M	M	2.87	88.60	.429
306	9.25	7.00	13	368	18	T	PC	C	M	M	M	MS	M	M	M	2.75	82.21	.379
307	7.75	7.50	13	368	18	T	C	M	P	M	D	MS	S	S	M	1.75	87.43	.379
308	9.50	7.00	15	425	18	T	C	M	S	M	M	MS	M	S	M	2.00	87.09	.379
309	9.50	7.50	15	425	20	S	T	M	P	M	M	MS	S	L	F	2.50	81.84	.267
310	8.50	7.50	14	397	22	T	T	C	P	M	M	MS	S	S	D	2.00	86.72	.350
311	10.00	7.00	14	397	18	S	T	M	P	M	M	MS	M	M	M	2.00	87.09	.351
312	8.50	7.50	16	454	22	T	C	C	S	M	D	MS	M	M	D	2.25	87.00	.378
313	10.50	7.75	19	539	20	S	PC	M	M	M	M	MM	M	M	M	3.87	85.44	.399
314	9.50	8.25	19	539	20	S	C	M	M	M	D	MS	M	S	M	2.50	88.89	.434
315	8.75	7.25	14	398	18	S	C	M	P	M	M	MS	M	S	M	1.50	90.40	.403
316	10.00	7.50	17	482	20	S	T	C	S	M	M	MM	S	L	M	3.00	83.90	.347
317	10.75	8.50	21	595	22	T	T	M	P	M	D	MS	M	L	M	3.25	84.70	.373
318	9.00	7.50	16	454	18	T	T	M	M	W	M	MS	M	M	M	3.00	82.96	.377
319	10.25	7.50	16	454	18	S	T	M	M	W	M	MS	M	M	M	2.50	86.40	.423
320	9.50	7.00	14	397	18	T	C	M	S	M	M	MS	M	S	M	2.12	86.40	.373
321	9.50	7.00	13	368	18	T	T	M	M	M	M	MM	M	M	M	2.12	85.35	.330
322	10.00	7.00	15	425	18	S	C	M	M	M	M	MM	M	S	M	2.25	86.56	.379
323	9.75	6.75	14	397	16	S	C	M	M	M	S	MM	M	L	D	3.00	80.00	.365
324	9.25	7.75	16	454	18	T	T	O	M	M	M	MS	S	M	M	2.75	81.81	.334
325	9.50	7.25	16	454	20	T	T	M	S	M	M	MS	M	M	M	2.38	86.80	.353
326	9.25	7.25	17	482	20	S	C	M	M	M	M	MS	M	L	M	3.00	82.76	.367
327	8.75	7.50	12	340	18	T	T	O	P	N	D	MS	M	S	M	2.00	87.09	.399
328	9.75	7.50	16	454	20	S	C	M	P	M	M	MS	M	S	M	2.50	88.84	.351
329	9.00	7.25	14	397	20	S	C	M	M	M	M	MS	M	S	M	2.25	85.94	.316
330	9.75	7.50	16	454	20	S	C	M	P	M	M	MS	M	L	M	3.50	82.33	.390
331	9.75	7.50	16	454	18	S	T	M	P	M	M	MM	M	M	M	3.00	83.61	.377
332	10.25	7.25	16	454	18	T	T	M	M	M	M	MS	M	L	M	3.00	82.43	.391
333	9.50	8.00	15	425	18	T	T	O	P	M	M	MS	M	M	M	3.00	81.35	.406
334	9.00	7.25	14	397	16	S	PC	O	S	M	M	MH	M	S	D	2.00	87.09	.422
335	9.75	7.00	15	425	18	T	PC	M	M	M	M	MS	M	M	M	1.76	88.62	.376
336	9.25	8.00	18	510	20	S	C	M	M	M	N	MS	M	L	M	3.25	83.36	.369
337	8.75	7.25	14	397	18	T	T	O	P	M	M	MH	M	M	M	2.12	85.35	.395
338	8.25	7.50	14	397	20	S	PC	M	P	M	M	MS	M	S	M	1.75	87.72	.347
339	9.25	7.75	17	482	18	T	C	M	M	W	M	MH	M	L	F	4.00	80.86	.393
340	8.25	8.25	18	510	22	T	C	M	P	M	D	MS	M	S	M	2.75	87.74	.347
341	9.50	8.00	16	454	20	S	PC	M	M	W	M	S	M	L	M	3.25	72.80	
342	9.50	7.50	17	482	18	T	PC	M	S	W	M	MS	M	L	M	2.75	78.99	.357
343	9.75	7.50	17	482	20	S	PC	M	P	M	M	MS	S	M	F	2.30	79.67	.342
344	9.75	7.50	14	397	18	T	C	M	M	M	M	MM	M	S	F	2.50	85.40	.351
345	9.75	7.50	16	454	18	T	PC	O	P	M	D	S	S	L	M	2.88	74.66	.401
346	9.00	7.50	17	482	18	T	C	C	M	W	M	MS	M	L	M	2.87	79.40	
347	9.50	7.00	18	425	18	T	PC	M	S	M	M	MS	M	S	D	2.38	82.50	.379
348	10.25	7.50	16	454	18	T	PC	O	P	M	D	MS	M	L	F	3.75	82.90	.379
349	10.25	7.75	17	482	20	S	C	O	P	M	D	MS	M	M	F	3.25	82.70	.345
350	9.50	7.25	15	425	18	T	C	M	P	W	D	MS	L	M	M	2.12	87.30	.390
351	9.75	7.50	17	482	20	S	C	M	P	N	M	MS	S	M	M	2.75	81.99	.344
352	9.75	7.50	14	397	20	S	C	M	M	M	M	MS	S	S	M	2.50	82.60	.369
353	9.00	7.50	17	482	18	T	C	C	M	M	M	S	S	L	M	3.12	82.76	.396
354	9.50	7.00	18	425	18	T	PC	M	S	M	M	MM	L	L	M	4.00	80.19	.393
355	10.25	7.50	16	454	18	T	PC	O	P	M	D	MS	M	L	F	2.25	84.74	.334
356	10.25	7.75	17	482	20	S	C	O	P	M	D	MS	M	M	F	3.25	82.70	.345
357	9.50	7.25	15	425	18	T	C	M	P	W	D	MS	L	M	M	2.12	87.30	.390
358	10.00	7.50	15	425	20	S	C	M	P	N	M	MS	S	M	M	2.75	81.99	.344
359	9.75	8.00	16	454	22	S	C	C	P	M	M	MS	S	S	M	2.75	82.60	.369
360	8.00	7.75	14	397	20	S	PC	C	P	M	M	S	S	M	D	2.25	84.99	.301
361	9.50	8.00	17	482	24	S	C	C	M	M	M	S	S	L	M	3.12	82.76	.396
362	9.75	8.00	20	567	18	T	C	M	P	M	M	MH	L	L	M	4.00	80.19	.393
363	7.75	7.75	14	397	20	S	C	M	P	M	M	MS	M	M	M	2.25	84.74	.335
364	9.50	7.00	14	397	18	T	PC	M	M	M	M	MS	M	M	M	2.00	87.97	.364
365	9.25	7.00	15	425	18	S	T	M	M	M	D	MH	L	M	M	2.25	86.36	.379
366	9.25	7.50	17	482	18	S	T	M	M	M	M	MS	S	M	D	2.38	82.02	.393
367	10.50	7.75	19	539	18	S	T	M	M	W	M	S	M	L	M	1.50	0000	.406
368	8.50	8.25	16	454	20	S	T	M	P	M	M	MS	S	M	D	2.50	84.62	.319
369	9.50	7.50	15	425	18	S	T	O	P	M	M	MS	S	L	F	3.25	81.90	.391
370	9.25	7.25	16	454	18	S	T	M	P	M	M	MS	M	M	M	3.00	84.00	.350
371	8.50	7.50	14	397	16	S	C	O	P	W	D	M8	L	M	M	2.00	85.71	.409
372	8.75	7.50	14	397	20	S	T	C	M	M	M	S	M	M	M	2.63	83.99	.344
373	9.75	7.50	19	539	20	S	C	M	M	M	M	MH	M	M	M	2.50	87.20	.417
375	8.25	7.50	15	425	18	S	C	M	S	M	D	MS	L	S	D	2.25	85.71	.407
376	10.25	6.50	14	395	18	T	T	C	S	M	M	MM	M	M	M	2.38	85.76	.387
378	9.00	7.75	16	454	18	T	PC	M	M	M	M	MH	M	S	D	2.50	86.80	.396
379	9.75	7.50	17	482	19	S	PC	M	S	M	D	H	M	M	M	2.87	84.56	.395
380	9.50	7.00	14	397	16	T	T	O	M	M	M	MH	L	M	M	2.50	84.84	.405
381	8.75	6.75	12	340	16	S	C	O	R	M	M	MS	S	S	M	1.87	86.36	.347
383	10.00	7.50	17	482	16	S	PC	M	M	W	D	MH	L	S	M	2.50	86.94	.409
384	9.75	8.00	16	454	20	S	PC	O	R	M	M	MS	M	M	M	2.50	86.83	.355
386	9.75	7.50	18	510	20	S	C	M	M	M	M	MS	M	S	M	2.75	84.64	.396
387	10.75	7.75	20	567	16	S	PC	O	R	W	N	MS	M	M	M	3.26	83.06	.364
388	9.75	7.50	18	510	20	S	C	M	M	N	D	MS	M	S	M	3.25	84.34	.335
389	10.00	7.50	16	454	18	S	PC	M	R	M	M	MM	L	S	M	2.00	87.67	.409
390	9.50	7.25	16	454	20	T	T	M	R	N	D	MS	S	S	D	2.50	86.71	.373
391	9.75	7.25	15	425	16	S	T	M	R	M	M	MS	S	S	M	2.38	85.60	.405
392	9.50	7.50	16	454	18	S	C	M	M	M	D	MH	L	M	M	2.12	87.30	.389
393	9.75	7.75	19	482	22	S	T	M	M	N	D	MS	M	L	F	2.25	87.96	.347
394	9.00	8.00	17	482	20	S	C	M	M	M	M	MS	M	L	D	2.75	84.35	.397
396	8.50	7.50	16	454	20	S	C	M	R	M	M	MS	M	S	M	2.87	86.04	.335
397	10.00	7.50	17	482	20	S	T	M	M	M	M	MH	M	M	D	2.50	86.67	.396
398	9.50	7.50	16	454	20	S	PC	M	M	M	D	MS	L	S	M	1.87	88.89	.390
399	9.00	7.25	14	397	18	S	PC	M	R	M	D	MH	L	S	M	2.00	87.68	.397
400	9.25	7.25	16	454	20	T	PC	M	R	N	M	MS	M	S	D	2.00	88.66	.345
401	10.25	7.75	17	482	18	T	C	M	M	W	M	MH	L	S	M	3.25	82.90	.398
402	8.75	7.50	20	567	20	S	T	M	S	N	D	MH	M	S	M	2.25	87.00	.380
403	10.50	8.00	19	539	20	S	C	C	R	M	M	MS	M	S	M	3.50	83.33	.390
404	8.50	7.50	14	397	20	S	PC	O	M	N	M	MH	M	M	D	2.25	85.94	.396
405	8.50	7.50	14	397	16	S	PC	M	R	W	M	MS	M	S	F	2.00	86.61	.376
406	9.00	7.00	12	340	16	S	C	O	R	M	M	M9	M	S	M	2.00	84.00	.344
407	9.75	7.38	16	425	18	S	PC	M	M	M	M	MH	M	M	D	2.00	80.81	.396
408	9.25	8.00	17	482	18	S	C	M	S	W	D	MH	L	M	M	2.60	85.10	.423
409	8.75	7.25	12	340	18	T	PC	O	M	N	S	MS	S	S	M	2.12	84.11	.292
410	9.50	7.25	16	454	16	S	PC	O	M	M	D	MH	L	S	M	2.00	87.90	.386
411	7.50	7.50	16	454	18	S	C	M	M	M	D	MH	L	M	M	2.25	86.90	.414
412	9.25	7.12	13	368	18	S	T	M	R	M	M	MH	M	M	F	2.00	86.09	.346
413	8.75	7.00	14	397	18	S	C	C	M	M	M	MH	M	M	M	2.25	85.71	.336



EAR CHARACTERS

Ear Number	Length of Ear	Circum. of Ear	Ear Wt. Ounces	Ear Wt. Grams	Number of Rows	Rows Twist or Straight	Ear Shape	Space Between R's	Indentation	Kernel Width	Kernel Depth	Kernel Composition	Size of Germ	Size of Shank	Shape of Butt	Weight of Cob - Oz.	Shelling Per Cent.	Wt. Average Kernal - Oz.
414	10.00	7.50	19	539	18	T	T	M	S	M	D	MH	M	L	M	2.50	81.00	.407
415	9.00	7.50	15	425	18	S	Pc	M	R	W	D	MS	M	M	D	2.38	81.00	.402
417	9.75	7.50	16	454	20	S	Pc	O	M	N	D	MH	L	S	F	2.25	81.23	.317
418	10.25	8.00	18	510	18	T	T	M	R	W	M	MS	M	M	D	3.25	82.90	.416
419	9.50	7.50	16	454	18	T	T	M	M	M	M	MS	S	M	M	2.65	84.29	.375
420	9.25	7.25	14	397	18	T	T	M	M	M	M	MH	M	M	M	2.25	85.71	.431
421	9.75	7.50	16	454	20	S	T	M	S	M	M	MS	M	L	F	2.50	84.02	.369
422	10.00	7.50	16	454	18	T	T	M	R	M	M	MH	M	M	M	2.63	84.29	.396
423	9.75	7.50	16	454	20	S	C	C	R	M	M	MS	S	M	M	2.75	83.33	.316
424	10.25	8.00	19	539	22	T	T	M	R	N	D	MH	S	L	D	3.75	82.67	.327
425	10.50	7.50	18	510	18	S	T	M	M	M	M	MS	M	L	M	3.00	84.50	.391
427	8.50	7.25	13	368	18	S	Pc	M	M	M	M	MH	M	S	M	2.50	84.89	.337
428	9.75	7.75	17	482	18	T	T	M	M	M	M	MH	L	M	M	3.25	82.89	.367
429	8.50	7.00	13	368	16	S	T	M	R	M	M	MS	M	M	M	2.50	82.76	.338
430	10.50	7.50	20	567	18	T	T	M	S	M	M	MH	M	L	F	3.78	82.30	.417
431	10.50	7.25	18	510	16	S	T	M	M	M	M	MS	M	L	M	3.50	81.10	.484
432	9.75	7.25	16	454	18	T	T	C	M	M	M	MH	M	M	D	3.12	82.40	.378
433	10.25	7.75	16	454	18	T	T	M	R	M	M	MS	M	M	M	2.25	87.49	.404
434	9.75	7.75	17	482	20	S	T	M	R	M	M	MH	M	S	M	2.12	82.76	.353
435	10.25	7.50	16	454	16	S	T	O	R	M	D	MS	L	M	M	2.50	85.71	.446
439	10.25	8.00	20	567	22	T	C	C	M	M	D	MS	S	S	M	2.75	87.50	.348
440	9.00	7.75	16	454	18	T	Pc	M	R	M	M	MS	M	L	M	3.00	82.44	.364
441	8.75	7.50	14	397	20	S	C	C	R	M	M	MS	M	S	D	2.12	81.60	.361
442	8.75	7.50	15	425	20	T	C	C	R	M	M	MH	M	M	M	2.00	81.63	.340
443	10.00	7.00	12	340	16	S	Pc	M	M	M	M	MS	S	S	M	2.38	81.03	.366
444	9.00	7.50	15	425	18	S	T	M	M	M	M	MS	M	M	M	2.50	0000	.322
445	9.75	7.25	16	454	20	S	C	C	M	M	S	MS	S	M	M	2.87	85.34	.379
449	9.50	7.50	16	454	18	T	T	M	R	M	M	MS	M	M	M	2.12	86.17	.398
450	10.75	7.25	16	454	22	S	Pc	C	M	M	M	MS	M	M	M	2.50	86.13	.313
451	8.75	7.50	14	397	20	S	C	C	R	M	N	MS	M	M	F	2.50	84.00	.386
452	10.25	7.75	17	482	20	S	Pc	O	M	M	D	MH	L	M	M	3.12	0000	.367
453	9.00	7.75	16	454	20	S	C	M	M	M	M	MH	M	L	M	2.63	84.40	.398
456	9.50	7.00	14	397	16	S	C	M	M	W	S	MS	S	L	D	2.00	86.61	.375
457	9.00	7.50	15	425	18	S	Pc	C	S	M	M	MS	M	M	M	2.50	84.44	.338
458	9.00	7.75	16	454	20	S	C	O	M	M	D	MS	M	L	M	2.25	87.90	.329
459	10.25	7.25	19	539	16	S	C	M	S	M	M	MH	M	M	F	3.25	83.12	.488
460	9.50	8.00	18	510	18	T	C	M	R	M	M	MS	M	M	M	3.87	83.74	.419
461	8.75	7.25	14	397	18	T	T	M	M	M	M	MS	M	M	M	2.25	83.71	.341
462	9.50	6.75	12	340	16	S	Pc	M	S	M	M	MH	M	M	M	2.25	82.94	.388
463	9.25	7.25	12	340	18	S	C	C	M	M	S	MS	M	S	D	1.50	81.24	.367
464	10.00	7.00	14	397	18	T	T	M	M	M	M	MS	M	S	M	2.12	81.13	.388
465	8.75	7.25	14	397	18	S	C	C	M	M	M	MS	M	M	M	2.12	86.84	.418
466	10.00	7.00	14	397	16	S	Pc	O	R	M	M	MH	M	M	F	2.25	84.21	.390
467	10.00	8.00	19	539	22	S	Pc	M	M	M	D	MH	M	M	M	3.00	85.19	.401
468	9.75	7.00	14	397	16	S	T	C	M	W	M	MS	M	S	D	2.50	88.33	.388
469	10.25	7.75	18	510	20	S	T	M	M	N	M	MH	M	L	M	2.75	85.13	.377
470	9.50	7.00	14	397	14	T	C	O	R	W	M	MH	L	S	M	2.12	86.01	.454
471	11.00	8.00	20	567	20	T	T	M	M	M	D	S	M	L	F	3.75	83.34	.488
472	10.00	7.75	17	482	20	S	C	M	R	M	D	MH	M	M	M	2.75	82.26	.378
473	10.00	7.75	17	482	20	S	C	M	M	M	M	MS	M	M	M	3.00	85.67	.360
474	9.00	7.50	16	454	20	S	C	C	R	M	M	MS	M	S	M	3.12	82.76	.304
475	10.00	7.75	17	482	20	S	Pc	M	R	M	M	MS	M	M	M	1.87	90.00	.398
476	9.50	7.75	15	425	20	S	Pc	M	R	N	M	MS	M	M	M	2.63	86.06	.365
477	9.00	7.50	16	454	20	S	C	C	M	M	M	MS	M	M	M	3.00	83.33	.269
478	9.75	7.75	17	482	20	S	T	M	R	M	M	MH	M	L	M	2.87	84.49	.398
479	9.50	8.00	16	454	18	T	T	M	S	W	D	MH	L	S	D	2.25	88.30	.437
482	10.00	8.25	20	567	22	S	C	M	M	M	D	MH	M	M	D	3.12	85.60	.389
483	10.75	8.25	20	567	20	S	T	M	R	M	D	MH	M	M	M	3.87	78.13	.396
484	10.25	7.50	17	482	18	T	C	C	M	M	M	MS	M	M	M	2.25	87.50	.429
486	10.25	8.00	17	482	18	T	C	M	R	W	M	MS	M	S	M	3.25	84.56	.420
487	9.50	7.50	14	397	16	S	C	M	R	W	M	MH	M	M	M	2.90	84.30	.417
488	10.25	6.75	16	454	16	S	Pc	M	R	M	M	MH	L	M	M	2.75	84.44	.393
489	9.00	7.50	14	397	22	S	T	O	R	N	D	MS	S	S	M	1.75	89.60	.342
490	8.75	8.25	16	454	22	S	Pc	C	R	M	D	MS	S	M	M	3.25	82.60	.339
491	9.00	8.00	15	425	18	S	C	O	R	M	D	MS	S	M	M	2.12	81.08	.369
492	9.50	7.00	15	425	20	S	C	C	M	M	M	MS	M	S	D	2.00	81.28	.314
493	9.00	7.25	13	367	18	T	Pc	M	M	M	M	MS	S	S	M	2.12	81.30	.387
494	10.00	8.00	17	482	22	S	T	O	R	M	M	MS	M	L	D	3.00	83.49	.370
495	10.00	7.50	16	454	18	T	Pc	M	S	M	M	MH	M	M	M	2.75	83.60	.396
496	10.00	7.00	13	367	16	S	C	C	M	M	M	MH	M	S	F	2.00	83.50	.418
497	10.00	7.50	15	425	18	S	T	M	R	W	M	MS	L	S	F	2.88	83.69	.375
498	10.00	7.25	14	397	16	S	C	M	M	W	M	MS	M	S	D	2.80	84.49	.398
499	9.25	7.50	12	340	16	S	T	O	R	M	M	M	M	S	D	2.00	87.09	.398
500	9.25	7.00	14	397	16	S	C	M	R	M	M	MS	S	M	M	2.25	84.21	.355
501	8.75	8.00	15	425	22	S	C	C	R	M	M	MS	M	M	D	2.38	87.11	.360
502	8.50	7.50	13	367	20	T	Pc	C	S	M	D	MS	L	S	M	2.26	86.96	.395
503	8.75	7.25	14	397	18	S	C	M	M	M	M	MH	M	M	M	2.87	90.45	.421
504	8.50	7.50	17	482	18	S	T	C	M	W	M	MS	S	M	D	2.25	84.70	.401
505	10.50	7.25	16	454	18	S	C	M	R	M	M	MH	M	M	M	3.00	84.00	.395
506	10.50	7.50	16	454	18	T	Pc	C	M	M	M	MH	M	S	M	2.75	84.20	.381
507	9.75	7.75	16	454	20	S	T	M	R	N	D	MH	M	S	M	2.26	88.90	.329
508	10.00	7.75	18	510	18	T	C	M	M	M	M	MH	M	M	M	2.00	84.34	.382
509	10.00	7.50	16	454	20	S	Pc	M	M	M	M	MH	M	M	F	2.63	82.91	.390
510	9.00	7.00	14	397	16	S	C	M	M	M	M	MS	M	S	F	2.00	86.67	.403
511	9.00	7.25	16	454	20	S	T	C	M	M	D	MH	M	M	M	2.50	84.62	.377
512	9.25	7.50	15	425	16	S	Pc	C	M	W	M	MH	M	M	M	2.87	81.93	.426
513	9.13	7.00	12	340	18	T	T	M	M	M	M	MH	M	S	D	2.26	85.71	.345
514	9.50	7.50	15	425	18	T	T	M	M	M	M	MS	M	S	M	2.26	86.69	.420
515	9.00	8.00	16	454	18	S	C	M	R	M	M	MS	M	S	D	2.25	87.00	.418
516	11.00	8.00	21	595	20	S	T	M	M	M	D	MH	L	L	M	3.50	83.33	
517	10.00	7.25	16	454	20	S	C	C	S	M	M	MH	M	M	M	2.50	84.62	.377
518	10.00	8.00	20	567	18	S	T	M	M	M	M	MS	M	L	D	3.25	83.16	.429
520	10.00	7.25	17	482	16	S	Pc	M	M	M	M	MH	M	M	M	2.75	84.98	.422
521	8.75	7.25	15	425	16	S	Pc	M	M	M	M	MH	M	M	M	2.80	82.14	.374
522	10.00	7.50	19	539	16	S	T	M	M	W	M	MH	M	S	F	3.23	83.12	.589
523	10.50	7.25	17	482	18	T	T	M	S	N	S	MH	M	S	M	3.00	82.96	.374
524	10.00	7.25	17	482	18	T	Pc	C	S	M	M	MS	M	M	M	3.00	82.96	.355
525	9.75	7.50	16	454	16	S	Pc	M	R	W	M	MS	L	S	F	0.00	0.000	.455
526	9.75	8.00	18	510	18	T	C	M	R	M	M	MS	M	S	D	2.75	85.13	.407
527	8.50	7.50	13	369	20	S	Pc	C	M	M	M	MS	M	M	M	3.00	78.96	.295
528	9.00	7.50	16	454	18	S	Pc	M	R	M	M	MS	M	M	M	0.00	0.000	.309
529	9.25	7.50	16	454	18	T	T	O	R	M	M	MS	M	M	M	2.75	81.81	.398
530	9.50	8.00	17	482	22	S	T	M	M	N	M	S	M	S	D	2.63	85.22	.339
531	9.50	7.00	15	425	18	S	Pc	M	S	W	M	MH	L	M	M	2.75	84.71	.444
532	9.75	7.75	16	454	16	S	Pc	M	R	W	M	MS	S	M	F	2.75	83.60	.435
533	9.50	9.50	16	454	18	T	C	M	R	M	M	MS	S	S	M	3.00	82.96	.332
534	8.75	7.25	16	454	18	T	Pc	M	M	M	M	MH	M	S	M	2.87	81.08	.355
537	9.75	8.00	18	510	20	S	T	M	R	M	M	MS	M	M	M	2.50	84.00	.375
539	11.50	8.25	21	595	20	S	T	M	R	M	M	S	M	L	F	3.50	83.33	.377
540	10.00	7.75	18	510	20	S	C	C	R	M	M	MS	M	S	M	2.75	84.08	.340
541	10.00	7.25	16	454	20	T	T	M	M	M	M	MS	S	M	M	2.25	87.00	.379
542	8.75	7.50	15	425	20	S	C	C	S	M	M	MS	M	M	D	2.00	86.21	.356
543	9.75	8.00	16	454	18	T	T	M	R	M	M	MS	M	S	F	3.00	82.44	.367
546	9.75	8.25	18	510	22	S	T	T	M	R	N	D	MS	S	S	M	3.00	83.67	.389
547	9.50	7.00	13	369	16	S	C	M	M	M	M	MH	M	M	M	1.75	88.89	.399
548	9.25	7.50	16	454	20	T	Pc	M	S	M	M	MS	M	M	M	3.00	83.33	.351
549	9.50	7.25	15	425	20	S	C	C	M	M	M	MH	M	S	M	2.00	87.30	.379

EAR CHARACTERS

Ear Number	Length of Ear.	Circum of Ear.	Ear Wt. Ounces.	Ear Wt. Grams	Number of Rows	Rows Twist or Straight	Ear Shape	Space Between Ke	Inden-tation	Kernel Width	Kernel Depth	Kernel Composition	Size of Germ	Size of Shank	Shape of Butt	Weight of Cob-Ozs.	Shelling Per Cent	Wt. Average Kernel-Oz.
550	7.75	7.75	15	425	20	S	C	O	P	N	D	MS	M	M	M	.250	8462	.352
551	8.00	7.00	14	397	18	T	T	M	M	M	M	MH	M	S	M	.200	8602	.333
552	9.00	7.50	16	454	22	T	Pc	M	M	M	M	MS	M	L	M	.250	8526	.358
553	8.50	7.50	15	425	22	T	T	C	R	M	M	MS	M	S	M	1.75	8871	
555	8.50	7.50	14	397	20	S	Pc	C	M	M	S	MS	S	S	D	2.00	8663	.311
556	8.50	7.50	15	425	18	T	T	M	M	M	M	MS	M	M	M	2.50	83.85	.356
557	8.50	8.00	15	425	24	S	C	M	R	M	M	MH	M	M	M	2.75	0000	.302
558	8.50	7.50	15	425	18	T	Pc	M	S	M	M	MH	M	M	D	2.63	8181	.329
559	8.50	7.50	15	425	22	T	C	C	S	M	D	S	S	M	M	1.87	8398	.293
560	8.00	7.25	13	368	18	T	C	O	R	M	M	MS	M	S	D	1.87	86.88	.321
561	8.26	7.50	14	395	18	S	Pc	C	M	M	S	MS	S	M	D	2.00	8602	.344
562	9.00	7.50	15	425	20	S	C	M	S	M	M	MS	M	S	M	2.38	8469	.375
563	9.25	7.25	14	397	16	S	T	M	R	M	M	MS	M	M	M	2.00	8667	.321
564	8.38	8.00	16	454	22	S	C	C	M	M	D	MS	M	M	M	2.75	8462	.333
565	9.50	7.50	16	454	20	T	Pc	C	M	M	M	MS	M	S	M	2.12	8760	.336
566	9.50	7.75	17	482	18	T	C	M	M	W	M	MS	M	S	F	3.38	80.00	.379
567	10.50	8.50	17	482	18	T	T	M	M	M	M	MS	M	M	F	2.75	8513	.363
568	9.50	7.75	16	454	20	S	T	O	R	M	D	MS	M	M	M	2.63	8446	.345
569	9.75	7.00	17	482	18	S	Pc	C	S	M	M	MH	M	M	M	2.50	8444	.378
570	9.75	7.75	17	482	16	S	Pc	O	M	M	S	MS	M	S	M	3.50	79.41	.357
571	9.00	8.50	16	454	20	S	C	C	M	N	M	MS	S	S	D	2.75	8594	.367
572	9.75	7.50	16	454	20	S	C	C	M	M	M	MH	M	M	M	2.50	8571	.344
573	9.25	8.25	16	454	18	T	Pc	C	M	M	M	S	M	S	M	2.00	8709	.365
574	10.25	7.25	16	454	18	S	T	O	M	W	D	MH	M	M	M	3.00	8351	.396
575	9.50	7.00	15	426	18	T	Pc	M	M	N	M	MS	M	S	D	3.00	8046	.378
576	9.25	7.25	15	425	20	S	Pc	C	M	M	M	MH	M	M	M	2.76	8449	.335
577	9.50	7.25	16	454	16	S	T	M	R	M	M	MH	L	L	F	2.50	8536	.443
578	9.25	7.25	14	397	18	T	T	M	R	M	M	MH	M	M	D	2.00	8709	.337
579	9.25	8.00	17	482	22	T	Pc	C	R	M	M	MS	M	S	F	3.00	83.49	.316
580	8.75	7.50	16	454	18	T	Pc	M	R	M	M	MS	M	M	D	1.87	8780	.301
581	9.75	7.50	17	482	18	S	C	M	M	M	M	MH	M	M	M	3.25	8942	.447
583	9.75	8.50	21	595	24	S	Pc	C	R	N	D	MS	S	M	M	1.87	8480	.367
584	10.00	7.50	16	454	16	S	T	M	M	W	M	MH	M	S	D	3.38	8920	.471
585	10.26	8.25	19	539	22	T	C	M	R	N	D	MS	L	M	M	3.25	81.99	.338
586	9.00	8.00	17	482	20	S	T	M	R	M	M	MS	M	M	M	2.38	8156	.359
587	9.25	7.50	18	510	20	S	C	C	S	M	M	MH	M	M	M	3.00	83.33	.436
588	8.50	7.25	17	482	18	T	T	M	R	M	M	MS	M	M	M	000	000	
589	9.50	7.50	15	425	16	S	Pc	M	R	M	S	MS	M	M	M	3.00	80.00	.370
690	10.50	7.26	17	482	18	S	C	M	M	M	M	MH	M	M	D	2.12	8806	.395
591	8.50	7.00	14	397	18	S	C	C	M	M	M	MS	M	S	D	1.50	8824	.322
592	8.75	7.50	14	397	20	S	C	C	R	N	D	MS	M	S	D	2.12	8539	.309
593	8.25	6.38	15	425	18	S	C	C	M	N	M	MH	M	M	M	2.75	8181	.337
594	10.50	7.63	20	567	20	S	Pc	M	M	M	M	MH	M	M	M	3.25	8336	.357
595	9.75	8.00	18	510	18	T	Pc	M	R	W	M	MS	M	M	M	2.75	8513	.440
596	8.25	7.75	14	397	18	T	Pc	M	R	M	D	MS	L	S	M	2.12	8640	.377
597	10.00	7.00	15	426	18	S	Pc	M	M	M	M	MH	M	S	M	2.50	84.44	.358
598	10.00	6.75	15	425	16	S	T	M	S	M	M	MS	M	S	M	2.50	8280	.369
599	9.50	8.50	18	510	22	S	T	M	R	M	M	MS	M	M	M	3.50	8205	.344
600	10.00	8.00	19	539	20	S	T	M	M	M	M	MH	M	M	F	3.50	8170	.432
601	10.00	7.75	18	510	20	S	T	C	M	W	D	MS	L	L	M	3.38	8238	.371
602	10.26	7.75	18	510	20	S	T	M	M	M	M	MS	M	M	M	3.00	8333	.342
603	9.50	7.75	16	454	18	S	T	M	R	W	M	MS	M	M	M	3.25	8240	.397
604	10.50	7.75	18	510	18	S	Pc	O	R	M	M	MS	M	M	M	2.50	8631	.357
605	9.75	7.00	15	425	18	S	Pc	M	M	M	M	MS	M	S	F	2.12	8584	.405
606	9.00	7.25	16	454	18	T	C	C	M	M	M	MS	M	L	F	2.50	8320	.379
607	8.50	7.50	14	397	20	S	Pc	M	M	M	M	MS	S	M	M	1.63	8796	.328
608	9.75	7.75	17	482	20	S	Pc	M	M	M	M	MH	M	M	F	2.50	86.67	.369
609	9.25	7.75	15	425	20	S	T	M	R	M	M	MS	M	M	M	2.25	86.50	.363
610	9.25	7.00	14	397	16	S	C	M	R	M	M	MH	M	S	M	2.00	8570	.352
611	10.00	7.50	17	482	18	T	C	M	M	M	M	MH	M	M	M	2.50	8540	.391
612	9.50	7.50	17	482	24	S	C	C	R	M	M	MH	M	M	D	3.00	8333	.332
613	8.25	6.50	12	340	18	S	C	C	M	M	M	MH	M	M	M	1.75	86.58	.336
614	9.25	7.50	15	425	20	S	T	C	M	M	M	MS	M	S	M	3.25	8594	.333
615	8.50	8.25	18	510	20	S	C	C	M	W	D	MS	M	M	M	3.25	8333	.380
617	9.25	7.75	18	510	22	T	C	M	R	N	D	MS	M	M	M	2.50	8640	.322
618	9.00	7.50	16	454	18	S	Pc	M	R	W	D	MH	L	M	M	2.12	8640	.408
619	9.50	7.50	18	510	18	T	T	M	M	M	M	MS	M	M	M	2.75	8077	.397
620	8.00	7.00	14	397	16	S	C	M	M	W	S	MH	M	M	M	2.25	8535	.438
623	8.75	7.50	15	425	20	S	C	M	M	M	M	MS	M	M	F	2.12	85.39	.375
624	9.50	7.75	19	539	20	S	C	C	R	M	M	MS	M	M	M	2.37	8432	.371
625	10.26	7.00	16	454	16	S	T	O	R	M	M	MH	M	S	F	3.00	8000	.388
626	9.50	7.75	19	539	22	S	C	C	M	M	M	MH	M	L	F	3.50	8049	.366
627	9.50	7.25	15	425	18	S	T	O	M	M	M	MH	M	M	M	2.25	8608	.375
628	9.75	7.50	16	454	18	S	Pc	M	M	M	M	MH	M	L	F	3.12	8148	.358
629	9.50	7.00	14	397	16	S	T	M	M	W	M	MS	M	L	M	1.50	8930	.404
630	9.25	7.75	18	510	20	S	C	M	R	M	M	MH	L	S	F	3.00	8333	.384
631	9.25	7.75	17	482	20	S	T	C	M	M	M	MH	M	L	M	2.75	8438	.329
632	9.50	7.25	17	482	20	S	C	M	S	M	M	MH	M	M	F	2.63	8601	.381
633	9.50	8.00	19	539	20	S	C	M	M	M	M	MH	M	S	F	3.38	8279	.420
634	8.00	7.25	15	425	18	S	C	C	M	M	M	MS	M	S	D	2.00	8602	.345
635	10.50	7.00	16	454	18	S	T	M	S	M	M	MH	M	M	M	2.38	8603	.403
636	9.00	8.00	17	482	20	S	Pc	M	R	M	D	MS	M	M	M	2.75	8408	.371
637	9.50	7.25	16	454	16	S	Pc	M	R	W	M	MH	M	M	F	2.50	8278	.394
638	10.25	7.75	16	454	20	S	T	M	M	M	M	MH	M	M	M	2.38	8028	.370
639	9.00	7.75	17	482	18	T	Pc	M	R	M	M	MH	M	M	F	2.75	8513	.398
640	9.25	7.75	17	482	18	T	T	M	M	M	M	MH	M	L	F	3.25	8241	.407
641	9.75	7.50	16	454	18	S	T	M	M	M	M	MH	L	L	M	2.63	84.80	.396
642	9.75	7.75	18	510	22	T	T	M	R	M	M	MS	M	M	D	2.63	8633	.364
643	10.00	7.50	18	510	16	S	Pc	M	R	W	M	MS	M	L	M	4.12	7724	.431
644	11.25	8.50	21	595	20	S	T	M	R	W	M	MS	M	M	D	4.00	8139	.398
645	10.00	8.25	20	567	20	S	Pc	M	R	W	D	MS	M	M	M	3.50	8333	.418
646	9.75	8.00	15	425	20	S	Pc	M	M	N	M	MS	M	M	M	2.25	8696	.413
647	10.00	7.00	14	397	16	S	C	M	R	M	S	MS	S	S	M	2.00	8661	.362
648	8.75	7.50	16	454	18	S	C	M	R	M	M	MS	M	S	M	2.50	8490	.405
649	9.00	7.00	15	425	16	S	C	M	M	M	M	MS	M	M	M	2.63	8205	.416
650	8.50	7.50	12	340	16	S	Pc	O	R	M	M	MS	M	M	M	2.25	8427	.378
651	9.75	8.25	17	482	20	S	C	O	R	M	D	S	M	M	M	2.75	8438	.395
652	9.75	7.25	16	454	18	S	T	M	R	M	M	MS	M	M	M	3.00	8235	.396
653	8.50	7.50	13	368	16	S	Pc	M	R	M	M	MS	M	M	M	1.75	8721	.405
654	8.50	7.75	15	425	16	S	Pc	M	R	W	D	MS	M	M	F	2.75	8254	.456
655	9.00	7.00	15	425	18	S	T	M	S	M	M	MH	M	M	M	2.75	8364	.333
656	9.50	7.00	14	397	18	T	Pc	O	R	N	M	MH	M	M	D	2.25	85.71	.377
657	8.75	7.75	16	454	20	S	T	C	M	M	M	MS	M	S	M	2.12	8696	.398
658	8.50	7.50	15	425	20	S	C	M	R	M	M	MS	S	M	D	1.87	8750	.347
659	9.00	8.50	17	482	18	S	Pc	M	R	W	D	MH	L	M	D	2.38	8765	.438
660	9.25	7.75	16	454	20	S	Pc	M	M	N	M	MS	M	S	D	2.25	8833	.359
661	10.00	7.50	18	510	20	S	C	M	M	M	M	MS	M	M	M	3.25	8220	
662	10.50	7.75	18	510	20	S	Pc	C	M	M	M	MS	M	L	F	3.25	8220	.376
663	9.75	7.50	16	454	18	T	T	O	S	M	M	H	M	M	F	3.00	8400	.356
664	9.00	7.75	15	425	20	S	C	C	R	M	M	MS	M	M	M	1.87	8800	.376
666	9.50	7.50	15	425	18	S	T	C	R	M	M	MS	MS	M	M	2.50	8490	.351
666	8.50	7.75	15	425	18	T	T	M	R	M	M	MS	M	M	D	000	0000	.362
667	9.50	7.26	14	397	18	T	T	M	S	M	M	MH	M	M	M	2.76	8809	.365
668	8.26	7.75	14	397	20	S	C	C	M	M	M	MS	M	M	M	2.50	8504	.401
669	8.50	7.75	16	454	20	S	C	M	M	M	M	MH	M	M	M	2.25	8789	.381
670	9.50	7.50	18	510	18	T	C	M	M	M	D	MS	M	M	F	2.50	8701	.428
671	10.00	7.25	16	454	20	T	C	C	M	M	S	S	S	M	M	2.75	8401	.327

EAR CHARACTERS

Ear Number	Length of Ear	Circum. of Ear	Ear Wt. Ounces	Ear Wt. Grams	Number of Rows	Rows Twist or Straight	Ear Shape	Space Between R	Indentation	Kernel Width	Kernel Depth	Kernel Composition	Size of Germ	Size of Shank	Shape of Butt	Weight of Cob-Ozs.	Shelling Per Cent	Wt. Average Kernel-Oz.
672	9.75	7.50	15	425	22	T	C	O	R	N	D	MS	M	M	M	2.25	7861	.308
673	10.00	8.50	18	510	22	S	T	M	R	M	M	MS	M	M	M	3.87	7860	.333
674	11.00	7.75	19	539	18	T	T	M	R	W	M	MS	M	S	F	3.25	8298	.401
675	8.75	8.00	17	482	20	S	C	C	R	M	M	MS	S	M	M	3.00	8440	.384
676	10.75	9.75	19	539	18	T	T	M	M	M	M	MH	M	M	M	3.38	8333	.406
677	9.75	7.75	17	482	18	S	C	M	M	W	M	MH	L	M	M	3.25	8239	.340
678	9.25	7.00	15	425	18	S	T	M	M	M	M	MH	M	S	M	2.75	8075	.322
679	9.25	7.75	16	454	20	S	T	N	M	M	M	MH	M	M	M	3.25	8220	.348
680	10.00	7.60	16	454	18	T	T	O	R	M	M	MS	M	S	F	2.25	8467	.363
681	9.50	7.25	16	454	16	S	PC	C	R	M	M	MS	M	M	M	2.38	8456	.373
682	9.25	7.60	16	454	18	T	PC	C	M	M	M	MS	M	M	M	2.50	8580	.367
683	9.00	7.25	13	368	16	T	T	O	R	M	M	MS	S	M	M	2.25	8535	.426
684	9.50	7.60	15	425	20	S	C	C	R	N	M	MS	M	S	D	1.75	8889	.336
685	9.75	7.25	17	482	16	S	PC	O	R	M	M	MH	M	M	M	2.75	8540	.390
686	10.00	7.50	17	482	20	S	C	M	R	M	M	MS	M	M	M	2.69	8399	.341
687	9.50	7.25	15	425	20	S	T	M	M	M	M	MH	M	M	F	2.25	8646	.350
688	10.00	7.25	16	454	18	T	T	M	M	M	M	MH	M	M	D	2.50	8631	.356
689	9.75	7.75	17	482	18	S	T	O	R	M	D	MH	M	M	M	3.12	8360	.397
690	9.00	8.00	17	482	20	S	T	M	R	M	M	MS	S	M	D	3.00	8208	.375
691	9.00	7.25	15	426	16	S	C	M	M	W	M	MH	M	S	M	2.37	8192	.427
692	8.50	7.75	16	454	20	S	C	C	R	M	D	MS	M	S	M	2.37	8689	.371
693	9.00	7.50	14	397	18	S	T	M	M	M	D	MS	S	S	M	2.00	8661	.372
694	9.00	8.00	17	482	20	S	PC	M	M	M	D	MS	M	S	M	2.12	8590	.375
695	10.25	7.25	17	482	18	T	T	M	M	M	M	MH	M	M	M	2.25	8636	.375
697	9.50	7.50	15	425	18	S	PC	C	M	M	M	MS	S	S	D	2.75	8247	.285
698	8.50	7.00	13	368	16	S	C	M	M	W	M	MS	M	S	M	2.75	7912	.348
699	9.00	7.25	14	397	18	T	T	M	M	M	M	MH	M	M	M	2.00	8666	.412
700	9.50	7.25	14	397	16	S	PC	M	M	W	M	MH	M	S	M	2.38	8516	.392
701	9.25	7.75	16	454	18	T	C	M	R	W	D	MS	M	S	F	2.00	8709	.345
702	9.50	7.25	14	397	16	S	T	M	R	W	M	MH	L	S	M	2.26	8535	.340
703	8.50	7.00	13	368	18	T	T	C	M	M	M	MH	M	M	M	2.25	8333	.298
704	9.50	7.50	15	425	20	S	C	C	M	M	M	MH	M	M	M	2.76	8439	.344
705	9.00	7.50	14	397	16	S	T	M	R	W	M	MS	M	M	M	2.50	8387	.386
706	8.25	7.50	15	425	18	S	C	M	M	M	D	MH	M	M	M	2.50	8385	.379
707	8.50	7.50	13	368	16	S	T	M	R	W	M	MH	L	M	M	0.00	0000	.440
708	9.50	7.50	16	454	18	T	C	M	M	M	M	MH	L	M	M	2.50	8444	.367
709	9.50	7.75	16	454	20	S	C	R	R	M	M	MS	M	M	D	2.38	8562	.342
711	9.00	7.00	14	397	16	S	T	M	M	M	M	MH	M	M	F	2.12	8595	.396
712	9.00	7.00	16	454	18	T	PC	M	M	M	M	MH	M	M	M	2.38	8645	.417
713	9.00	7.00	14	397	16	S	T	C	C	M	M	MS	M	S	M	2.00	8797	.354
715	8.50	7.25	12	340	20	S	C	C	M	M	M	MH	M	S	M	0.00	0000	.331
716	8.75	7.25	14	397	18	S	PC	M	M	M	M	MH	M	M	M	0.00	0000	.384
717	9.50	7.50	16	454	18	T	PC	M	R	M	D	S	M	S	F	2.12	8730	.326
718	10.25	7.50	16	454	18	T	PC	M	R	M	M	MH	M	M	M	2.69	8529	.356
720	10.50	7.50	18	510	20	S	C	C	M	M	M	MS	M	S	M	2.50	8671	.344
721	9.50	8.00	20	567	18	T	C	M	M	W	M	MH	M	M	M	3.25	8385	.399
722	8.50	7.50	14	397	18	T	T	M	M	M	M	MH	M	M	M	1.75	8852	.354
723	10.00	7.50	15	426	20	S	T	C	M	M	M	MH	M	S	M	2.75	8408	.353
724	9.25	7.75	14	397	18	T	T	C	R	W	M	MS	M	S	D	2.25	8668	.353
725	9.75	7.25	14	397	20	S	C	C	M	M	M	MS	M	M	M	2.75	8333	.334
726	10.00	7.50	18	610	20	S	T	M	M	M	M	MS	S	L	M	3.25	8220	.330
727	9.00	7.75	16	454	16	S	T	O	R	W	M	MH	M	M	M	2.63	8461	.445
728	10.50	7.50	18	510	18	S	T	C	M	M	M	MH	M	M	F	3.63	8239	.381
729	9.00	7.75	15	425	18	T	T	M	R	M	M	MH	M	S	F	2.75	8365	.349
730	9.50	7.00	15	425	14	T	T	M	M	W	M	MS	M	M	M	2.50	8305	.406
731	9.50	7.00	13	368	16	S	T	M	M	M	M	MH	M	S	F	1.63	8962	.399
732	9.75	7.50	17	454	18	S	C	M	M	M	M	MS	M	M	M	2.25	8290	.379
733	11.26	7.75	18	510	18	S	C	M	R	M	M	MH	M	L	F	3.75	8078	.427
734	9.75	6.75	14	397	18	T	C	M	S	M	M	MH	M	M	F	2.75	8310	.383
736	10.25	6.75	14	397	14	T	T	M	M	M	M	MS	M	M	M	2.50	8484	.448
736	9.75	7.25	15	425	18	T	T	M	M	M	M	MS	M	M	M	2.76	8420	.378
737	9.00	7.50	16	454	18	S	C	M	M	M	M	MS	M	M	M	3.00	8181	.349
738	9.00	7.00	12	340	18	S	C	M	M	M	S	MH	M	S	M	2.60	8333	.328
739	9.00	7.25	13	368	20	S	PC	M	R	M	M	MH	M	M	D	1.87	8850	.368
741	10.00	7.50	17	482	18	T	T	M	S	M	M	MH	M	M	M	3.25	8240	.389
742	9.75	7.25	16	454	20	T	PC	M	M	M	M	MH	M	S	F	3.38	8030	.444
743	9.50	8.25	19	539	24	S	C	C	R	M	D	MS	M	M	M	3.50	8371	.337
744	9.75	8.00	18	510	22	T	T	C	M	M	D	MS	M	M	F	2.75	8136	.398
745	10.00	8.00	18	510	22	S	C	M	R	M	D	MS	M	M	M	3.00	8518	.389
746	9.50	7.25	16	454	20	T	T	M	R	M	M	MS	M	M	M	3.25	8220	.395
748	8.50	7.00	12	340	18	T	PC	M	M	M	M	MH	L	L	F	2.50	8320	.369
749	10.00	7.50	16	454	18	S	T	M	M	M	M	MH	M	M	M	2.50	8631	.400
750	9.25	7.75	16	454	18	S	PC	M	R	W	M	MS	L	M	M	2.50	8490	.388
751	9.25	7.50	16	454	18	T	C	M	M	M	M	MH	M	M	M	2.50	8418	.395
752	9.00	7.25	13	368	20	S	PC	M	R	M	M	MS	M	M	M	2.50	8462	.342
753	9.50	7.25	14	397	16	S	C	M	R	M	M	MS	M	M	M	2.00	8709	.402
754	9.00	7.75	17	482	16	S	T	M	S	W	M	MH	S	M	M	3.50	7844	.480
755	9.25	7.00	15	425	18	S	C	M	R	M	M	MS	M	M	M	2.00	8709	.379

PLAN OF GERMINATING KERNELS.

The corn was germinated in two series of fifty grains from each ear in each series. One series was run, then the other run as a check. This made a total of one-hundred average kernels from each ear or a total of 66000 grains tested. Some variation was noticed in the number of kernels germinating in the first series and in the check but the variation in the totals, being but 533 plants, it is considered well within the limits of experimental error. If the exact variation of each ear should be counted, the variation would be greater but as a whole the ears seemed to be constant in strength of germinative power.

The germination of the corn was begun in October and finished in December of 1911, The work being done in the germinating room in the basement of the Agricultural Building. This room was kept at a temperature of about 80° Fahrenheit during the day and at night the heat was turned off and the temperature would drop. At no time did the temperature drop below 60° F.

The kernels were carefully planted in a sand-box germinator. The germinator box was a wooden box eighteen feet long, three feet wide and twelve inches deep, provided with a cover of glass frames to conserve moisture and heat and at the same time admitting sufficient light. Heat was equally supplied to all parts of the sand bed by means of

steam pipes enclosed in a box frame running just under the floor of the sand bed. Well sifted creek bottom sand was evenly spread to a depth of about three inches in the bottom of the sand box.

The kernels were planted in rows running the narrow way of the box and two inches apart. In each row fifty kernels were planted. Each fifty kernels represented an average sample of fifty kernels from an individual ear. These rows were numbered by means of a scale drawn on the side of the box. Care was taken to spread the sand at an even depth and plant the kernels even distances apart and at an even depth. The depth of planting was one inch. Moisture was supplied at all times evenly and as needed by the plants.

After planting the kernels were given ten days in which to germinate. On the tenth day notes were taken of the vigor of the plants. In describing vigor, the size, color and the number of plants was considered. After taking notes upon the vigor a sharp, long bladed knife was run between the rows to cut off all long roots which would be likely to disturb grains in the adjacent row when the plant was pulled out of the bed. The total number of plants appearing above the surface of the sand was counted and divided into two classes: 1. Strong plants; 2. Weak plants. All the kernels were then dug out of the sand and a count made of those plants sprouted but not appearing above the surface of the sand.

As soon as all plants were removed from the bed, the sand was removed and fresh sand placed in germinator and a new set of ears tested.

GERMINATION STRENGTH.

	First Series.			Second Series.			Total.		
Ear No:	Strong	Weak	Not up:	Strong	Weak	Not up:	Strong	Weak	Not up.
8	30	1	0	29	5	1	59	6	1
18	34	10	0	30	1	5	64	11	5
26	26	8	0	20	4	8	46	12	8
27	40	2	0	40	3	0	80	5	0
30	38	7	0	38	4	3	76	11	3
32	18	3	0	17	3	2	35	10	2
33	36	7	0	43	3	1	79	10	1
35	29	4	0	25	5	5	54	9	5
36	40	1	0	42	6	0	82	7	0
37	25	15	0	20	10	8	45	25	8
38	39	8	0	38	7	0	77	15	0
39	22	14	0	19	8	5	41	22	5
56	30	11	0	31	4	7	61	15	7
57	15	13	0	16	7	0	31	20	0
58	38	2	0	40	5	1	78	7	1
59	1	9	0	3	2	2	4	11	2
60	1	2	0	2	3	1	3	5	1
61	36	10	0	39	4	5	75	14	5
62	42	6	0	42	5	3	84	11	3
63	18	3	0	20	8	9	38	11	9
64	1	2	0	0	0	0	1	2	0
65	40	3	0	36	7	2	76	10	2
66	26	5	4	28	8	5	54	13	9
67	0	4	0	5	2	0	5	6	0
68	3	7	0	2	1	1	5	8	1
69	19	10	1	16	13	3	35	23	4
70	7	10	0	7	5	1	14	15	1
71	14	12	0	18	7	3	32	19	3
72	9	3	0	8	4	0	17	7	0
73	43	7	0	43	4	1	86	11	1
75	10	17	0	8	8	4	18	25	4
76	46	2	0	47	2	0	93	4	0
77	24	2	3	26	8	5	50	10	8
78	25	9	2	28	8	5	53	17	7
79	8	9	0	6	3	2	14	12	2
80	9	10	1	9	9	4	18	19	5
81	0	0	0	0	0	0	0	0	0
82	10	7	0	9	4	5	19	11	5
83	8	7	1	10	7	6	18	14	7
84	0	3	1	0	0	1	0	3	2
85	10	13	0	9	8	3	19	21	3
86	35	5	1	35	4	1	70	9	2
87	4	1	2	6	6	3	10	7	5
88	36	10	0	34	5	2	70	15	2
89	0	1	0	0	0	0	0	1	0
90	8	5	0	6	4	1	14	9	1
91	10	5	2	12	8	1	22	13	3
92	20	16	0	21	6	2	41	22	2
93	20	3	0	21	7	3	41	10	3
94	4	2	4	9	9	0	13	11	4
95	32	8	0	30	5	1	62	13	1

	First Series			Second Series			Total.		
Bar No:	Strong:	Weak:	Not up:	Strong:	Weak:	Not up:	Strong:	Weak:	Not up.
96	0	0	0	1	0	0	1	0	0
97	0	4	0	2	4	0	2	8	0
98	10	7	2	12	8	3	22	15	5
99	35	6	1	38	6	3	73	12	4
100	24	10	1	22	8	2	46	18	3
101	26	4	2	26	8	3	52	12	5
102	30	10	1	28	10	0	58	20	1
104	32	10	1	35	6	4	67	16	5
105	47	2	0	50	0	0	97	2	0
106	32	10	3	32	7	8	64	17	11
107	0	0	0	0	0	0	0	0	0
108	26	5	2	28	8	1	54	13	3
109	3	4	0	2	3	1	5	7	1
110	10	4	3	10	8	9	20	12	12
111	4	2	0	3	0	2	7	2	2
112	32	8	0	34	7	2	66	15	2
113	24	7	0	21	10	1	45	17	1
114	28	6	2	27	6	4	55	12	6
115	16	5	2	16	6	4	32	11	6
116	35	10	0	35	7	5	70	17	5
117	43	5	0	46	3	0	89	8	0
118	30	10	0	30	6	4	60	16	4
119	12	5	0	11	8	2	23	13	2
120	34	5	1	32	10	4	66	15	5
121	19	10	0	19	11	2	38	21	2
122	35	6	3	36	7	7	71	13	10
123	36	11	1	35	7	3	71	18	4
124	43	4	0	48	1	1	91	5	1
125	0	0	0	1	4	1	1	4	1
126	39	4	0	39	6	0	78	10	D
127	30	11	0	32	4	4	62	15	4
128	35	11	0	35	6	2	70	17	2
129	1	2	0	0	1	1	1	3	1
130	10	3	0	12	1	2	22	4	2
131	45	5	0	45	3	1	90	8	1
132	2	5	0	2	0	2	4	5	2
133	5	10	0	4	4	2	9	14	2
134	41	9	0	40	8	1	81	17	1
135	40	10	0	39	9	0	79	19	0
136	26	10	0	28	12	0	54	22	0
137	18	12	4	20	16	7	38	28	11
138	27	7	4	28	7	3	51	14	7
139	25	6	2	25	9	4	50	15	6
140	35	10	3	36	9	4	71	19	7
141	46	4	0	45	5	0	91	9	0
142	34	5	4	29	5	3	63	10	7
143	22	9	0	26	8	2	48	17	2
144	24	3	0	25	5	3	49	8	3
145	36	10	0	35	6	2	71	16	2
146	21	11	3	23	12	3	44	23	6
147	5	2	1	4	5	4	9	7	5
148	38	6	3	40	5	5	78	11	8

	First Series			Second Series			Total.		
Ear No:	Strong:	Weak:	Not up:	Strong:	Weak:	Not up:	Strong:	Weak:	Not up:
149	6	4	0	5	6	2	11	10	2
150	17	13	0	19	11	1	36	24	1
151	11	3	0	7	8	2	18	11	2
152	37	2	1	43	4	2	80	6	3
153	35	2	4	39	6	2	74	8	6
154	3	16	2	3	14	5	6	30	7
155	7	7	0	10	1	1	17	8	1
156	2	5	2	5	10	0	7	15	2
157	4	9	5	14	6	7	18	15	12
158	33	5	4	34	6	7	67	11	11
159	19	5	3	20	11	3	39	16	6
160	17	2	1	11	5	7	28	7	8
161	29	4	0	33	6	1	62	10	1
162	46	2	2	39	8	3	85	10	5
163	44	1	1	45	4	0	89	5	1
164	23	8	2	23	7	7	46	15	9
165	40	8	0	33	14	3	67	22	3
166	20	6	1	19	11	3	39	17	4
167	21	17	1	25	15	4	46	32	5
168	5	8	1	8	8	6	13	16	7
169	44	0	0	45	4	1	89	4	1
170	30	5	0	30	14	4	60	19	4
171	37	6	3	37	8	5	74	14	8
172	44	4	0	37	6	4	81	10	4
173	36	6	0	38	4	3	74	10	3
174	9	12	6	7	8	15	16	20	21
175	31	8	1	25	11	5	56	19	6
176	21	11	2	20	11	5	41	22	7
177	28	16	0	29	9	3	57	25	3
178	31	11	2	30	10	7	61	21	9
179	27	7	0	27	7	4	54	14	4
180	44	4	0	37	8	0	81	12	0
181	12	9	1	4	10	7	16	19	8
182	32	7	5	33	8	1	65	15	6
183	35	7	2	27	8	6	62	15	8
184	34	7	1	32	7	6	66	14	7
185	15	23	1	15	10	7	30	33	8
186	18	17	1	21	9	8	39	26	9
187	12	22	2	12	10	6	24	34	8
188	32	8	0	33	6	1	65	14	1
189	33	5	2	43	3	3	76	8	5
190	17	13	1	23	12	4	40	25	5
191	9	13	7	4	7	4	13	20	11
192	13	10	5	11	9	5	24	19	10
193	25	11	2	24	12	6	49	23	8
194	45	3	0	36	5	4	79	9	4
195	39	9	2	43	6	1	82	15	3
196	34	6	6	41	3	2	75	9	8
197	38	3	9	45	3	2	83	6	11
198	30	10	0	22	13	4	52	23	4
199	13	13	5	12	12	7	25	25	12
200	30	7	7	33	9	6	63	16	13

Ear No	First Series: Strong	Weak	Not up	Second Series: Strong	Weak	Not up	Total: Strong	Weak	Not up
201	33	5	2	35	5	5	68	10	7
202	40	7	0	40	5	3	80	12	3
203	18	15	2	22	10	10	40	25	12
204	37	11	2	30	7	10	67	18	12
205	20	13	3	20	6	9	40	19	12
206	42	2	0	41	4	3	83	6	3
207	20	10	2	20	6	4	40	16	6
208	32	11	0	32	6	10	64	17	10
209	31	8	4	40	7	1	71	15	5
210	37	8	2	37	7	5	74	15	7
212	6	10	13	9	17	10	15	27	23
213	8	9	0	7	7	9	15	16	9
214	40	5	0	40	5	3	80	10	3
215	31	7	0	30	7	7	61	14	7
216	26	17	7	26	12	9	52	29	16
217	18	7	6	20	7	4	38	14	10
218	36	8	6	36	5	5	72	13	11
219	39	7	0	38	4	5	77	11	5
220	37	7	2	30	6	10	67	13	12
221	35	11	2	30	11	7	65	22	9
222	24	3	12	27	5	5	51	8	17
223	35	8	3	33	6	3	68	14	6
224	6	14	4	4	3	6	10	17	10
225	42	5	0	47	2	0	89	7	0
226	38	7	2	36	6	7	74	13	9
227	34	12	1	38	4	7	72	16	8
228	43	3	2	46	2	1	89	5	3
230	0	2	1	1	1	0	1	3	1
231	44	6	0	41	5	2	85	11	2
232	9	11	7	5	8	5	14	19	12
233	3	5	2	3	2	1	6	8	3
234	43	6	0	37	4	1	80	10	1
236	42	6	0	43	3	2	85	9	2
237	0	0	0	0	0	0	0	0	0
238	6	7	3	3	5	1	9	12	4
239	20	9	2	22	2	7	42	11	9
240	23	14	3	20	8	4	43	22	7
241	20	12	2	24	13	6	44	25	8
242	8	5	2	11	2	2	19	7	4
243	34	7	0	34	7	5	68	14	5
245	28	14	0	21	7	3	49	21	3
246	28	12	0	19	6	5	47	18	5
248	22	9	1	19	8	2	41	17	3
250	13	7	1	6	10	7	19	17	8
251	25	6	2	16	10	4	43	16	6
252	2	6	2				4	12	4
253	2	6	2	3	2	3	5	8	5
254	47	3	0	47	3	0	94	6	0
255	5	8	0	0	4	3	5	12	3
256	12	5	0	13	7	6	25	12	6
257	5	8	0	6	3	0	11	11	0

Ear no	First Series			Second Series			Total		
	Strong	Weak	Not up	Strong	Weak	Not up	Strong	Weak	Not up
258	40	4	0	44	4	2	84	8	2
259	2	14	7	1	5	5	3	19	12
260	35	10	1	40	5	5	75	15	6
261	0	2	1	1	2	2	1	4	3
262	12	8	0	10	5	2	22	13	2
263	12	13	1	13	6	4	25	19	5
264	18	4	7	20	6	3	38	10	10
265	17	13	2	11	9	8	28	22	10
266	17	9	0	18	8	2.	35	17	2
267	37	9	0	41	4	0	78	13	0
268	6	13	9	4	8	1	10	21	10
269	6	8	3	8	4	2	14	12	5
270	30	12	4	31	14	3	61	26	7
271	8	7	3	5	6	0	13	13	3
272	4	11	3	4	5	2	8	16	15
273	6	8	14	7	6	11	13	14	25
274	36	10	2	33	12	2	69	22	4
275	6	8	0	4	3	2	10	11	2
277	7	8	0	5	4	4	12	12	4
278	4	7	0	2	3	2	6	10	2
279	39	8	2	47	2	0	86	10	2
280	0	2	0	0	0	0	0	2	0
281	0	6	4	1	1	0	1	7	4
282	34	7	2	35	8	2	69	15	4
283	2	0	1	4	6	1	6	6	2
284	24	6	1	21	4	0	45	10	1
285	5	10	4	7	3	6	12	13	10
286	35	4	4	37	4	5	72	8	9
287	16	14	5	18	4	9	34	18	14
288	4	15	2	5	5	1	9	20	3
289	25	14	2	20	8	10	45	22	12
290	7	10	1	9	3	4	16	13	5
291	5	5	0	0	0	1	5	5	1
292	7	3	1	1	1	2	8	4	3
293	12	7	0	11	2	3	23	9	3
294	1	1	0	0	1	0	1	2	0
295	1	2	0	2	0	0	3	2	0
296	35	10	2	34	1	4	69	11	6
297	30	10	1	26	7	9	56	17	10
298	5	7	0	6	4	6	11	11	6
299	40	6	1	44	4	2	84	10	3
300	37	8	1	35	4	6	72	12	7
301	19	9	6	25	7	9	44	16	15
302	28	6	2	30	6	6	58	12	8
303	30	7	2	31	5	0	61	12	2
304	26	4	1	26	5	2	52	9	3
305	3	4	2	8	4	6	11	8	8
306	2	3	4	2	1	2	4	4	6
307	7	1	1	7	1	1	14	2	2
308	6	2	5	5	2	1	11	7	6
309	22	9	1	25	3	4	47	12	5
310	2	6	1	7	4	3	9	10	4
311	30	7	4	34	3	6	64	10	10

	First Series			Second Series			Total		
Ear No:	Strong:	Weak:	Not up:	Strong:	Weak:	Not up:	Strong:	Weak:	Not up:
312	17	4	5	25	1	4	42	5	9
313	24	8	4	27	5	8	51	13	12
314	12	7	6	16	11	8	28	18	14
315	1	4	3	3	0	3	4	4	6
316	6	4	2	8	3	6	14	7	8
317	1	5	2	3	0	6	4	5	8
318	6	2	6	10	4	2	16	6	8
319	14	10	5	16	6	6	30	16	11
320	4	6	3	8	5	2	12	11	5
321	26	9	3	33	4	6	59	13	9
322	25	6	2	38	2	0	63	8	2
323	38	7	2	46	1	1	74	8	3
324	22	5	2	38	4	2	70	9	4
325	12	6	3	12	6	4	24	12	7
326	0	2	4	5	3	4	5	5	8
328	0	0	0	0	1	2	0	1	2
330	22	7	5	28	4	9	50	11	14
332	18	7	2	18	5	3	36	12	5
333	17	6	1	21	8	7	38	14	8
334	0	4	4	2	0	6	2	4	10
335	0	1	0	2	1	0	2	2	0
336	8	6	0	10	6	4	18	12	4
339	27	6	5	35	5	7	62	11	12
340	12	9	1	15	5	5	27	14	6
341	0	0	0	0	0	0	0	0	0
342	13	7	7	22	6	12	35	13	19
343	8	4	3	12	6	4	20	10	7
344	9	7	3	6	2	11	15	9	14
345	7	6	7	6	5	12	12	11	19
347	18	7	5	20	4	3	38	11	8
348	5	8	11	2	3	6	7	11	17
350	15	7	6	12	4	13	27	11	19
351	22	9	0	21	6	4	43	15	4
352	0	6	9	3	5	7	3	11	16
353	23	9	4	21	7	2	44	16	6
354	13	6	2	16	5	12	29	11	14
355	5	5	0	6	2	9	11	11	9
356	0	1	3	3	1	0	3	2	3
357	11	10	6				22	20	12
358	5	6	2	11	6	11	16	12	13
359	36	9	5	35	4	6	71	13	11
360	5	7	2	8	6	4	13	13	6
361	19	7	4	25	7	1	44	14	5
362	26	9	3	38	2	6	64	11	9
363	8	8	5	10	4	7	18	12	12
364	5	5	4	5	1	1	10	6	5
365	14	10	3	22	10	1	36	20	4
366	0	2	2	4	4	0	4	6	2
367	13	5	2	14	2	3	27	7	5
368	21	9	3	32	5	7	53	14	10
369	4	10	2	15	8	8	19	18	10
370	27	16	6	35	11	0	62	27	6

Ear No	First Series			Second Series			Total		
	Strong	Weak	Not up	Strong	Weak	Not up	Strong	Weak	Not up
371	29	8	2	26	6	5	55	14	7
372	7	10	7	15	4	9	22	14	16
373	8	10	8	15	3	1	23	13	9
375	11	10	7	18	7	11	29	17	18
376	7	7	3	8	3	4	15	10	11
378	7	9	5	20	6	0	27	15	20
379	0	2	1	0	1	2	0	3	3
380	16	7	3	20	14	5	36	21	8
381	24	7	9	31	6	8	55	13	17
383	2	8	5	0	2	0	2	10	5
384	26	10	7	28	6	6	54	16	13
386	2	4	1	5	4	8	7	8	9
387	17	9	0	18	6	11	35	15	11
388	17	8	7	16	8	4	33	16	11
389	3	2	0	0	1	1	3	3	1
390	0	0	0	1	1	0	1	1	0
391	32	12	1	35	5	5	67	17	6
392	0	0	0	0	0	0	0	0	0
393	0	2	0	1	1	2	1	3	2
394	1	0	1	1	2	0	2	2	1
396	0	8	0	4	1	2	4	9	2
397	6	9	12	10	5	6	16	14	18
398	5	8	3	0	1	0	5	9	3
399	10	15	2	20	9	6	30	24	8
400	12	11	8	20	12	6	32	23	14
401	25	11	6	26	5	3	51	16	9
402	10	3	1	11	2	0	21	5	1
403	0	7	2	0	3	6	0	10	8
404	2	6	7	5	2	12	7	8	19
405	25	9	5	25	5	6	50	14	11
406	10	10	14	8	10	14	18	20	28
407	37	8	2	43	4	2	80	12	4
408	2	1	1	1	3	6	3	4	7
409	2	8	10	4	3	3	6	11	13
410	23	15	8	26	4	5	49	19	8
411	25	14	9	31	6	5	56	20	14
412	37	13	0	28	5	3	65	18	3
413	9	10	2	10	5	2	19	15	4
414	36	3	4	36	2	7	72	5	11
415	19	6	6	14	6	2	33	12	8
417	11	7	1	8	5	3	19	12	4
418	24	12	1	26	6	2	50	18	3
419	21	7	5	15	6	7	37	13	12
420	10	4	3	7	4	2	17	8	5
421	2	1	1	1	0	2	3	3	4
422	23	9	5	27	5	3	50	14	8
423	11	15	5	20	7	12	31	22	17
424	2	5	0	0	0	1	2	5	1
425	14	6	5	18	2	1	32	8	7
427	5	2	0	1	0	2	6	2	2
429	3	2	10	5	2	4	8	6	14
430	15	13	4	25	11	1	40	24	5
431	23	12	3	25	6	2	48	18	5

Ear No	First Series			Second Series			Total		
	Strong	Weak	Not up	Strong	Weak	Not up	Strong	Weak	Not up
432	8	10	0	9	4	2	17	14	2
433	2	3	1	3	2	0	5	5	1
434	23	7	5	28	2	1	51	9	6
435	6	6	7	2	0	3	8	6	10
436				42	4	1	84	8	2
439	51	15	1	32	10	2	63	25	3
440	0	0	0	0	0	0	0	0	0
441	12	10	5	12	5	9	24	15	14
442	17	12	3	30	5	4	47	17	7
443	32	5	2	40	2	5	72	7	7
444	23	15	6	30	9	5	53	24	11
445	24	9	1	30	9	5	54	18	6
449	27	9	4	35	8	6	62	17	10
450	0	2	5	7	9	1	7	11	6
451	12	8	5	12	7	12	24	15	17
452	25	7	5	20	1	2	55	8	7
453	0	2	2	2	0	1	2	2	3
456	18	9	1	20	4	2	38	13	3
457	5	0	1	9	0	2	14	0	3
458	20	8	4	29	5	2	49	13	7
459	5	6	4	4	5	0	9	11	4
460	2	7	4	3	2	2	5	9	9
461	0	0	0	0	1	2	0	1	2
462	1	2	1	0	3	2	1	5	3
463	0	4	0	1	3	1	1	7	1
464	7	7	4	7	3	1	14	10	5
465	20	6	2	12	4	3	32	10	5
466	15	13	1	15	2	6	30	15	7
467	4	5	3	4	3	0	8	8	3
468	15	13	4	25	13	4	40	26	8
469	7	8	4	10	7	5	17	14	9
470	2	4	1	1	2	2	3	6	3
471	4	6	5	8	1	8	12	7	13
472	17	6	2	20	4	6	37	10	8
473	9	6	2	10	1	3	19	7	5
474	40	3	6	36	2	5	76	5	11
475	2	7	8	2	2	14	4	9	22
476	16	11	3	20	4	2	36	15	5
477	48	2	0	49	1	0	97	3	0
478	0	5	10	5	5	3	5	10	13
479	33	7	0	47	2	1	80	9	1
482	0	0	0	0	0	1	0	0	1
483	20	5	3	16	5	5	36	10	8
484	0	2	0	0	2	3	0	4	3
486	13	5	5	18	3	7	31	8	12
487	4	3	3	3	1	2	7	4	5
488	27	7	4	30	2	6	57	9	10
489	0	0	0	0	0	0	0	0	0
490	7	7	4	6	6	3	13	13	7
491	5	1	1	4	2	4	9	3	5
492	14	10	4	13	9	12	27	19	16
493	3	7	3	6	4	1	9	11	4

Ear No	First Series			Second Series			Total		
	Strong	Weak	Not up	Strong	Weak	Not up	Strong	Weak	Not up
494	2	3	3	1	2	8	3	5	11
495	41	5	2	42	5	0	83	10	2
496	23	14	1	27	5	8	50	19	9
497	32	6	7	38	5	5	70	11	12
498	16	7	12	21	6	10	37	13	22
499	3	4	6	5	0	3	8	4	9
500	25	15	5	35	7	4	60	22	9
501	6	5	3	15	2	6	21	7	11
502	0	4	4	8	0	2	8	4	6
503	4	5	1	7	2	1	11	7	2
504	5	7	1	12	4	7	17	11	8
505	11	7	3	16	8	3	27	15	6
506	8	7	5	5	1	4	13	8	9
507	0	0	0	0	0	1	0	0	1
508	0	0	0	0	1	0	0	1	0
509	15	10	6	25	5	5	40	15	11
510	8	7	4	15	9	4	23	16	8
511	11	7	4	18	6	1	29	13	5
512	23	13	3	30	5	10	53	18	13
513	14	10	6	21	8	7	35	18	13
514	0	1	5	3	4	3	3	5	8
515	20	7	4	26	7	6	46	14	10
516	0	0	0	0	0	0	0	0	0
517	25	12	2	30	9	2	55	21	4
518	0	0	0	3	0	0	3	0	0
520	11	3	1	20	5	4	31	8	5
521	0	1	0	2	0	4	2	1	4
522	10	7	3	20	7	5	30	18	4
523	4	1	0	7	3	0	11	4	0
524	25	16	1	25	16	2	50	32	3
525	0	0	0	0	0	0	0	0	0
526	15	4	2	19	8	4	34	12	6
527	37	8	2	30	7	7	67	15	9
528	14	5	0	16	5	4	30	10	4
529	24	13	6	26	6	7	50	19	13
530	16	12	6	10	5	12	26	17	18
531	26	8	9	18	6	11	44	14	20
532	15	8	3	12	3	9	27	11	12
533	14	14	0	13	3	6	27	17	6
534	10	9	2	6	2	0	16	11	2
537	8	9	4	6	2	2	14	11	6
539	24	10	5	26	8	8	50	18	13
540	0	2	5	0	4	4	0	6	9
541	24	11	1	16	5	10	40	16	11
542	26	10	1	22	6	4	48	16	5
543	41	3	6	38	4	8	79	7	14
546	0	3	3	1	0	0	1	3	3
547	8	4	3	9	1	0	17	5	3
548	7	6	7	1	6	2	8	12	9
549	5	3	11	6	6	3	12	9	14

Ear No	First Series			Second Series			Total		
	Strong	Weak	Not up	Strong	Weak	Not up	Strong	Weak	Not up
550	18	9	3	17	6	4	35	15	7
551.	34	7	2	22	8	6	56	15	8
552	13	7	8	7	6	5	20	13	13
554	8m	11	0	10	3	1	18	14	1
555	11	5	4	5	4	3	16	9	7
556	35	6	4	25	6	5	60	12	9
557	32	11	0	29	5	3	61	16	3
558	8	10	1	9	3	0	17	13	1
559	31	4	2	24	6	0	55	10	2
560	32	7	3	35	4	2	67	11	5
561	30	8	0	28	5	8	58	13	8
562	38	6	5	44	4	0	82	10	5
563	25	6	5	20	10	8	45	16	13
564	6	9	4	4	3	4	10	12	8
565	7	8	4	10	5	2	17	13	6
566	30	4	5	35	4	6	65	8	11
567	7	2	2	6	1	1	13	3	3
568	35	5	6	34	5	6	69	10	12
569	20	5	4	28	3	6	48	8	10
570	30	6	5	20	4	5	60	10	10
571	0	4	1	4	1	1	4	5	2
572	15	14	2	18	5	3	33	19	5
573	3	7	2	35	2	3	65	9	5
574	10	0	1	0	2	1	1	2	2
575	37	8	4	31	8	8	68	16	12
576	7	5	3	7	3	6	14	8	9
577	8	9	3	10	4	3	18	13	6
578	6	13	4	7	3	2	13	16	6
579	22	6	2	20	6	3	42	12	5
580	11	7	6	14	7	1	25	14	7
581	5	5	3	5	4	0	10	9	3
583	3	2	4	0	4	0	3	6	4
584	7	9	4	9	8	5	16	17	9
585	0	3	1	2	2	1	2	5	2
586	0	1	0	0	1	2	0	2	2
587	13	8	8	8	5	0	21	13	8
589	17	8	0	14	5	1	31	13	1
590	30	10	1	18	7	11	48	17	12
591	28	10	0	31	7	5	59	17	5
592	13	7	5	18	3	8	31	10	7
593	1	6	5	3	5	3	4	11	8
594	30	10	4	31	7	5	61	17	9
595	10	10	4	10	9	6	20	19	10
596	10	14	4	7	9	7	17	23	11
597	44	5	1	37	6	2	81	11	3
598	37	7	3	40	5	2	77	12	5
599	13	13	0	14	4	5	27	17	5
600	12	9	5	2	3	0	14	12	5
601	30	7	5	26	3	3	56	10	8
602	0	0	0	0	0	0	0	0	0
603	21	8	9	17	4	2	38	12	11
604	7	3	12	1	1	10	8	4	22
605	21	13	5	13	5	5	34	18	10

Ear No	First Series: Strong	Weak	Not up	Second Series: Strong	Weak	Not up	Total: Strong	Weak	Not up
606	34	5	0	20	5	6	54	10	6
607	27	14	6	26	4	3	53	18	9
608	20	9	10	23	4	5	43	13	15
609	15	5	6	15	3	3	30	8	9
610	23	11	5	20	3	4	43	14	9
611	25	3	5	19	1	3	44	4	8
612	3	7	1	0	7	0	3	14	1
613	37	10	2	40	2	3	77	12	5
614	20	9	5	14	3	12	34	12	17
615	13	10	4	15	4	11	28	14	15
617	28	9	3	25	5	6	53	14	9
618	18	12	7	14	6	8	32	18	15
619	2	7	0	0	6	4	2	13	4
620	13	5	6	9	4	4	22	9	10
623	32	7	2	28	5	4	60	12	6
624	7	5	7	8	3	1	15	13	8
625	43	4	2	36	5	4	79	9	6
626	30	12	5	26	6	8	56	18	13
627	19	8	1	11	5	3	30	13	4
628	40	2	3	35	4	5	75	6	8
629	19	10	5	18	7	4	37	17	9
630	19	7	4	14	4	7	33	11	11
631	8	5	7	5	5	6	13	10	13
632	17	2	2	13	3	3	30	5	5
633	13	6	1	11	1	2	24	7	3
634	33	4	5	35	5	7	68	9	12
635	10	4	4	6	4	5	16	8	9
636	18	7	10	25	5	10	45	12	20
637	2	0	0	0	0	0	2	0	0
638	1	1	0	2	2	1	3	3	1
639	0	0	1	0	0	2	0	0	3
640	41	5	4	43	4	3	84	9	7
641	30	9	2	28	5	8	58	14	10
642	7	11	15	9	6	2	16	17	17
643	9	7	3	5	6	7	14	13	9
644	0	1	1	0	0	1	0	1	2
645	1	1	3	0	4	1	1	5	4
646	27	10	2	23	5	5	50	15	7
647	6	8	4	7	3	5	13	11	9
648	8	8	2	4	6	7	12	14	9
649	29	10	6	25	10	8	54	20	14
650	35	4	6	35	3	1	70	7	7
651	3	0	0	0	2	0	3	2	0
652	35	7	4	30	5	9	65	12	13
653	36	7	4	30	5	6	66	12	10
654	1	7	3	0	4	1	1	11	4
655	16	7	2	10	5	2	26	12	4
656	30	6	4	28	7	7	58	13	11
657	40	7	2	39	4	2	89	11	4
658	23	10	7	15	12	8	38	22	15
659	26	11	8	17	11	7	43	22	15
660	14	10	6	15	7	12	29	17	18
662	17	10	6	15	10	14	32	20	20

Ear NO	First Series			Second Series			Total		
	Strong	Weak	Not up	Strong	Weak	Not up	Strong	Weak	Not up
663	37	10	3	40	4	5	77	14	7
664	37	4	6	40	5	4	77	9	10
665	6	7	8	10	8	8	16	15	16
666	38	8	1	34	6	8	72	14	9
667	38	8	3	45	5	0	83	13	3
668	10	7n	4	16	4	3	26	11	7
669	35	7	6	40	5	5	75	12	11
670	4	0	4	7	0	3	11	0	7
671	24	6	9	28	7	8	52	15	17
672	28	8	0	30	5	6	58	14	6
673	16	8	5	26	7	5	42	15	10
674	1	2	1	0	3	3	1	5	4
675	34	7	6	34	7	3	68	14	9
676	10	4	4	5	7	3	15	11	7
677	3	2	2	2	4	1	5	6	3
678	38	6	4	40	3	1	78	9	5
679	32	6	9	44	6	0	76	12	9
680	35	12	1	40	4	2	75	16	3
681	28	11	5	34	9	4	62	20	9
682	36	7	3	38	6	5	74	13	8
683	11	11	8	14	16	11	25	27	19
684	44	4	2	45	4	1	89	8	3
685	24	10	6	25	7	10	49	17	16
686	32	8	8	38	6	4	70	14	12
687	39	10	1	34	12	4	73	22	5
688	24	11	3	26	6	9	50	17	12
689	35	11	2	38	7	4	73	18	6
690	27	8	12	24	6	11	51	14	23
691	19	13	2	24	10	6	43	23	8
692	19	9	11	26	10	11	45	19	22
693	35	6	8	40	4	1	75	10	9
694	27	14	6	20	13	4	47	27	10
696	17	9	1	12	11	6	29	20	7
697	25	6	6	25	9	7	50	15	13
698	45	4	1	40	6	3	85	10	4
699	45	4	1	42	6	1	87	10	2
700	26	9	2	30	8	4	56	17	6
701	30	7	0	25	9	6	55	16	6
702	38	6	4	35	7	6	73	13	10
703	43	6	D	40	8	2	83	14	2
704	0	0	0	0	2	0	0	2	0
705	32	13	3	40	9	1	72	22	4
706	11	16	2	12	8	6	23	24	8
707	13	10	2	10	10	10	23	20	12
708	40	10	0	43	5	1	83	15	1
709	20	5	2	17	10	5	37	15	7
711	35	10	3	40	6	4	75	16	7
712	30	14	2	36	10	2	66	24	4
713	26	10	9	34	8	7	60	18	16
715	37	8	4	40	5	4	77	13	8
716	25	10	5	21	5	6	46	15	11
717	25	11	12	28	10	6	53	21	18
718	25	13	4	36	7	4	61	20	8

Ear No	First Series			Second Series			Total		
	Strong	Weak	Not up	Strong	Weak	Not up	Strong	Weak	Not up
720	8	14	5	16	10	7	24	24	12
721	20	18	8	28	12	7	48	30	15
722	30	11	4	26	10	10	56	21	14
723	29	12	10	28	10	8	57	22	18
724	34	11	5	28	7	11	62	18	16
725	32	8	1	31	5	8	63	13	9
726	8	11	5	10	12	5	18	23	10
727	34	6	10	42	5	2	76	11	12
728	33	11	4	33	9	5	66	20	9
729	32	9	7	40	6	3	72	15	10
730	18	8	10	16	6	5	34	14	15
731	6	6	2	4	3	8	10	9	10
732	1	3	0	0	0	0	1	3	0
733	27	8	9	20	10	6	47	17	15
734	20	6	4	15	10	4	35	16	8
735	44	2	3	40	8	0	84	10	3
736	9	4	4	5	1	5	14	5	9
737	39	7	0	41	6	0	80	13	0
738	24	6	4	30	8	4	54	14	8
739	25	6	0	22	8	2	47	14	2
741	19	7	6	14	10	1	33	17	7
742	34	3	6	30	6	8	64	9	14
743	28	3	6	20	12	10	48	15	16
744	3	5	2	6	1	6	9	6	8
745	17	6	6	24	7	6	41	13	12
746	10	7	3	5	2	9	15	9	12
748	39	3	3	34	6	7	73	9	10
749	29	8	1	25	10	8	54	18	9
750	30	3	5	25	6	14	55	9	19
751	31	8	0	31	8	6	62	16	6
752	36	5	6	40	7	2	76	12	8
753	17	4	5	18	9	7	35	13	12
754	40	4	0	35	6	3	75	10	3
755	20	8	2	20	8	4	40	16	6
756	17	5	4	12	9	9	29	14	13

THE EFFECT OF CERTAIN PHYSICAL CHARACTERS UPON THE GERMINATION OF MAIZE.

Long Ears Versus Short Ears:-

In this experiment forty ears of 10 to 11 1/2 inches long were tested with 139 ears of 7 to 8 1/4 inches in length and a check row of 481 ears of lengths from 8 1/2 to 9 3/4 inches long. The short ears gave a germination of 5.98 per cent better than the long ears, the medium ears germinated better than the long ears and less than the short ears. Total moisture content of the two types of ears, long and short, would undoubtedly have varied greatly if taken at gathering time. The long type of ears were usually large in circumference and deep grained or heavy cobs and were of a type of ear which would dry out slowly while the short ears were of a type which would dry out quickly. This seems to warrant the conclusion that we should not select ears which were too long and proportionately large, but select those of medium length or a little short. Similar results have been obtained by the Georgia and Ohio Experiment Stations. Although the short ears germinated slightly better than the medium ones, it is probable that other factors would cause the medium ears to be the best yielders.

Ears of Large Circumference Versus Ears of Small Circumference:

Ninety-three ears of eight to nine inches circumference were compared in germinative power with one-hundred ears of six to seven inches in circumference. A check was run of

467 ears of medium circumference or ears between seven and eight inches in circumference. The small circumference ears germinated 16.47% stronger than those in the large class while the medium class gave a germination somewhat less than that of the small class. These results seem to show a direct relation between moisture content at maturity and germinative power. The large ears were of a type which usually contain much moisture - ears of deep grains or heavy cobs. In fact, many of these ears had slightly discolored germs which was undoubtedly caused by slow drying out. The ears of small circumference were of a brighter, fuller type of germ. The results show that we should not select ears too large in circumference unless extreme care is given to properly drying and storing the ears.

Weight of Ear; Heavy Versus Light:

A sample of 102 ears weighing from 18 to 22 ounces were contrasted with 61 ears weighing from 11 to 13 ounces, a check being run of 497 ears weighing from 14 to 17 ounces. The heavy ears were weak in germinative power, germinating 14.41% less than those of light weight and 12.32% less than those of medium weight. The heavy ears were as a whole very large in size and of a type of ear which dries out very slowly. The light weight ears were ears which were small in size and were usually very compact and sound. The data points to the fact that we should not select ears which were exceedingly heavy for in most cases this excess

weight is due to high moisture content. From the slight variation in vitality of the light and medium samples we hold the opinion that there would be other factors come into consideration which would make it advisable to select ears of medium weight for best yielding seed ears. Heavy weight of ears is not necessarily a factor in determining the per cent of shelled grain and it is possible to carry the selection of ears by weight, beyond the point where best yields would be obtained from the seed.

Number of Rows of Kernels:-

In this test, 72 ears with 22 full rows each were correlated with 133 ears with 14 or 16 rows each, the check sample being made up of 495 ears with 18 or 20 rows. The best results were obtained from ears with but 16 rows of kernels, they producing 16.07% more plants than the ears with 22 rows, and 7.47% more than the average ears. The possible factors causing a low germination of ears with 22 rows would be: narrowness of kernels, tendency to large circumference or large sappy cobs, or closeness of rows. Ears with an extremely large number of rows should not be selected as they are not best in germinative power and not necessarily high in per cent of corn to cob.

Straightness of Rows:-

Ears with the rows of kernels running straight from butt to tip were contrasted with ears which had rows twisting to the right or left. In this, no appreciable difference in germinative power was found. There is not much cause to believe that this character would influence the germination. The reason for desiring ears with straight rows is the

difference in uniformity of kernels. The kernels on ears with straight rows will average more uniform in size and shape and give more even planting when planted with edge drop planters as are now in common use.

Shape of Ears:-

Three divisions were made of ears in classifying them as to shape of ear. 267 ears were classed as cylindrical, 230 as tapering, and 163 as partly cylindrical. In these classifications no great differences were found in the germinative powers, the partly cylindrical ears giving slightly the best germination. If the tapering ears had been very tapering greater differences would no doubt have been found, but the tapering ears were ears which were but slowly tapering and were of a good type for seed corn. The deduction that slightly tapering ears are as strong as cylindrical ears in vitality, can be made.

Space Between Rows:-

Classification of ears was made into ears of close or little space between rows, and rows with open or large space between rows, and those with average spacing. Closely spaced ears gave the best germination, and those with open space next best, while those of average space between rows fell lowest in total per cent of germination. The difference in moisture content at maturity would probably explain these slight differences in germination. The close spaced ears were usually ears small in circumference and somewhat shallow grains. Open space was associated with very rough, deep kernels or smooth, indented

round-cornered kernels with a large per cent of horny endosperm. These two types of corn (open and close spaced) would include ears which would dry out rather quickly. It is hardly probable that there is sufficient difference in the strength of germination to warrant the selection of ears either very open or very close in space between rows as these two types of ears will give a low per cent of corn to cob.

Indentation of Kernel:-

281 ears were classed as very rough indented, 71 as very smooth indented, and 308 as medium indented. The smooth indented germinated 8.2% stronger than the rough indented kernels, and 5.27% stronger than the medium indented kernels. Smooth indentation was correlated with kernels with a high per cent of horny endosperm, medium depth, and medium to small in size. Rough indentation was correlated with large, heavy ears, or chaffy ears with poorly shaped kernels. These results do not permit concluding in favor of smooth ears over medium indented ears. The rough ears are not to be desired for seed ears, but probably medium indented are best types to select.

Kernel Width:-

Wide kernels were compared with narrow kernels, and average width kernels. There were 91 ears with wide kernels, 86 ears with narrow kernels, and 483 ears of average width. Narrow and wide kernels each gave low germination and equaled each other in strength, the medium width kernels

germinating 6% stronger. The wide kernels were correlated with rather large heavy ears with poor germs, and narrow kernels associated with poorly shaped kernels and poor germs. These results in germinative power indicate that the kernel of medium width is much better than very wide or narrow kernels for strength in seed corn. It is possible to carry selection for wide kernels to an extreme.

Depth of Kernel:-

Contrasts were made between kernels very deep, medium deep, and medium shallow. There were no exceedingly shallow or poorly shaped kernels among those classed as shallow kernels for these types of kernels had been discarded by the person selecting the seed corn. The very deep kernels were sometimes somewhat discolored or had germs which did not show a great amount of strength and vitality. A difference of 16.50% in strength of germination was found in favor of the shallow kernel over the deep kernel and 14.24% in favor of the average depth over deep kernels. These results show that more care should be given in selecting ears with extra deep kernels and more attention given to the proper drying out of such ears. The shallow kernels and average depth kernels germinating about the same number of plants, it is safe to conclude that other characters besides germination which determine yield would make it advisable to select ears with kernels of medium depth of kernel for seed.

Composition of Kernel Endosperm:-

The following divisions were made in this classification

as to amount of hard or horny endosperm contained in the kernel: very horny, medium horny, medium starchy and very starchy. Horny kernels germinated 13.5% better than starchy kernels and the two medium classifications were about equal in germinative vitality. Other things being equal, it would seem advisable to select for kernels with a large amount of hard or horny endosperm.

Size of Germ:-

Germs were divided into three classes: large , small, and medium sizes. The large germs were exceedingly large but the small germs were not exceedingly small and as a whole, were bright, full and smooth while the exceedingly large germs were often blistered or discolored. These variations are caused by the method of selection used by the person selecting the corn, too often not discarding ears if the germs had the one quality - being large. The germination results were 8.72% in favor of small germs over extra large ones, and 6.90% in favor of medium germs over extra large ones. It would seem be advisable to select ears of medium sized germs for these ears have some other characteristics which would make them preferable to ears with small germs, as small germs are somewhat correlated with small kernels and small ears. If we are going to select ears with large germs, care should be taken in drying such ears, as large germs are associated with rather deep kernels. Selection for large germs should not be made upon size alone but some attention given to the size, shape and color of the germs. This is a mistake too often made by persons selecting seed corn.

Per cent of Corn to Cob:-

Three divisions were made of the ears according to per cent of corn to cob; 58 ears were found which shelled from 87.50% to 91%; 62 ears were found which shelled from 79 to 82% and 532 of the ears had a shelling per cent from 82 to 87.50%. Those with very high shelling per cent were 12.49% weaker in germination than those of low shelling per cent and 9.75% weaker than those of average shelling per cent. This seems to indicate that an exceedingly high shelling per cent is not desirable, and is undoubtedly true where little care is given to proper drying of seed. It is certain that a very low shelling per cent would also be undesirable but 79% can not be classed as a low shelling per cent; so the conclusion is that a shelling per cent from 79 to 87.50% is the best for high production of grain per acre.

Average Weight of Good Kernels:-

This classification was based upon the actual weight of good kernels of each ear. Heavy kernels were those weighing .400 grams or over, light weight was .312 grams or less, and average weight was from .312 to .4 grams. The average weight kernels germinated more than 5% better than either the light or heavy kernels. This suggests the selection of kernels of medium heavy weight for seed kernels.

Weight of Cob:-

Cobs were weighed after corn had dried during the winter and classified as follows: heavy cobs, those weighing 3 1/4 ounces or over; light cobs weighing 2 ounces

or less; medium weight cobs, weighing from 2 1/8 to 3 1/8 ounces. Ears with heavy cobs gave a low germination and light weight cobs average germination, while those ears having medium sized cobs germinated 7.27% better than heavy, and 1.73% better than ears with light cobs. With these results and the fact that small cobs are usually found in small ears, there is ~~no doubt~~ an indication that the ear with the medium size cob is the best seed ear.

SUMMARY OF DATA.

Type of Sample	No. of ears in samp.	No. of strong plants	No. of weak plants	No. of plants not up	% Strong plants	% Weak plants	% Plants not up	Total % germination.
1st. Ser. 33000 gr.	12393	4681	1873					
2nd. Ser. 33000"	13118	3380	2672					
Total 660 ears	25511	8060	4545		38.65	12.21	6.73	57.59
Length of ears.								
Long 10in.+	139	4833	1688	996	34.76	12.14	7.17	54.07
Short 8 1/4-	40	1490	530	382	37.25	13.25	9.55	60.05
Av. length, 8 1/2-10	481	19188	5843	3167	38.89	12.15	6.59	57.63+
Circumference of ears.								
Large 8in.+	93	2835	1019	681	30.48	10.96	7.30	48.74
Small 7in.-	100	4544	1293	648	45.44	12.93	6.84	65.21
Av. circ., 7-8 in.	467	18132	5749	3216	38.83	12.31	6.89	58.03
Weight of ears.								
Heavy, 18oz+	102	2864	1201	726	28.27	11.78	7.12	47.17
Light, 13oz-	61	2571	760	425	42.15	12.64	6.97	61.58
Av. wt., 13-18 oz.	497	20076	6100	3394	40.39	12.27	6.83	59.49
Number of rows.								
22 rows +	72	2226	826	463	30.92	11.47	6.43	48.82
Av. "18-20	475	18239	5739	3292	38.40	12.08	6.93	57.41
16 rows -	113	5046	1496	790	44.66	1324	6.99	64.89
Straightness of rows.								
Twisting	235	9295	2962	1723	39.55	12.60	6.77	58.92
Straight	425	16216	5099	2822	38.13	12.00	6.64	56.77
Shape of ears.								
Cylindrical	267	10193	3145	1667	38.18	11.79	6.24	56.21
Tapering	230	8971	2862	1655	39.00	12.44	7.20	58.64
Partly cyl.	163	6347	2054	1223	38.94	12.60	7.50	59.04
Space between rows:								
Close	130	5505	1778	975	42.35	13.68	7.50	63.53
Average	469	17736	5575	3063	37.82	11.89	6.53	56.24
Open	61	2270	708	507	37.21	11.61	8.31	57.13

Type of Sample	No.of ears in sample	No. of strong plants	No.of weak plants	NO.of plants not up	% Strg plants	% Weak plants	%Plnts not up	Total% germination.
Indentation of grain.								
Rough	281	9913	3542	2097	35.28	12.60	7.46	55.34
Smooth	71	3293	838	381	46.38	11.80	5.36	63.54
Medium	308	12205	3681	2067	39.60	11.95	6.72	58.27
Width of kernel.								
Wide	91	3038	1132	713	33.39	12.46	7.84	53.69
Narrow	86	3051	1040	502	35.48	12.09	5.84	53.41
Average	483	19422	5889	3328	40.21	12.17	6.89	59.27
Depth of kernel.								
Deep	131	3665	1497	871	27.98	11.43	6.65	46.06
Shallow	36	15.92	464	198	44.17	12.89	5.50	62.56+
Average	493	20254	6100	3476	40.88	12.35	7.05	60.28
Composition of kernel.								
Horny	5	272	40	22	54.40	8.	4.4	66.80
Med/Horny	260	10234	3060	1599	39.36	11.76	6.11	57.23
Med.Starchy	358	14672	4588	2738	40.97	12.79	7.65	61.41
Starchy	37	1333	373	286	36.03	10.08	7.19	53.30
Size of germs.								
Extra large	91	3168	997	579	34.13	10.89	6.36	51.38+
Small	115	4783	1430	699	41.59	12.43	6.08	60.10+
Average	454	17661	5534	3267	48.90	12.19	7.19	58.28
% Corn to cob.								
High,87.50+	58	1752	667	375	30.21	11.50	6.47	48.18
Low, 82-	62	2702	714	358	43.58	11.32	5.77	60.67
Average, 82-87.50	532	20721	6588	3760	3895	12.39	7.09	58.43
Weight of average grains.								
Heavy,4gr.+	116	3748	1461	863	32.31	12.59	7.44	52.34
Light,3.12-	40	1484	466	221	37.10	11.85	5.53	54.48
Average, 3.13-4 gr.	504	20279	5134	3461	40.24	12.02	6.86	59.12
Size of cob.								
Large cob, 3.25 + oz.	96	3205	1168	669	33.39	12.17	6.95	52.51
Small,2oz/-	105	4127	1312	658	39.30	12.49	6.26	58.05
Average, 2-3oz.	459	18179	5580	3218	39.61	12.16	7.01	58.78

CHEMICAL COMPOSITION OF THE KERNELS.

These chemical analyses were made upon composite samples of corn taken according to the physical characteristics of the ear or kernel and cannot be considered as valuable as if they had been made upon individual ears. They were made when the corn was about one year old and this will especially influence such compounds as moisture content.

Moisture Content:-

Those types having high moisture content were ears of heavy weight, shallow kernels, medium sized germs, medium starchy and starchy composition of kernel. Low moisture content was found in kernels from ears of rough indentation, small circumference and average length. Before these analyses were made, the grains had been exposed to a long period of drying. No conclusions are drawn as to the cause of the types falling within the different classes.

Protein Content:-

Ears of high protein content were horny endospermed kernels and large germed kernels. There are two causes of high protein content in corn, one is a large germ, the other a large percent of horny or hard endosperm. Low protein content was found in ears of large circumference, light weight, medium depth kernels and starchy composition of kernel.

Fat Content:-

Low fat content was found in medium starchy endosperms. Kernels from short ears and ears of average circumference. High fat content was found in grains of horny composition and kernels of small germs. The fact that high fat content is found in those of small germs is possibly explained by these grains being all bright and full and in kernels of small but hard endosperms.

Ash Content:-

High ash content was associated with open space between rows, heavy weight of ears, average weight of ears and large circumference. Low ash content was found in grains of small germs, smooth indentation and medium horny composition.

Percent of Fibre:-

High fibre content was correlated with ears of starchy composition. Low percent of fibre in grain was found in ears of average length

Nitrogen Free Extract:-

Low percentage composition of nitrogen free extract was found in shallow kernels and kernels with medium sized germs. High composition of nitrogen free extract was found in kernels from ears of average length, heavy weight and rough indentation.

These chemical analyses were made for the department of Agronomy by the department of Agricultural Chemistry of the University of Missouri.

THE EFFECT OF THE CHEMICAL CONTENT OF THE KERNEL UPON THE GERMINATION OF MAIZE.

High Versus Low Moisture Content:-

In this the low moisture content seemed to be in favor of a higher germination. The high moisture content was 12% and low 9.9% the latter giving the better total germination by 2.84%. No doubt, much greater differences would be found in the effect of moisture content if the analysis had been made at gathering time instead of in August of the following year. The selection of ears with low moisture content, would however seem advisable.

High Versus Low Protein Content:-

The variation in protein content was 9.93% for high content of protein and 9.1% protein for low. The high protein ears gave a germination of 3.97% better than the low protein ears. This indicates that the protein content would have considerable effect upon the strength of germination. A much greater difference in content could no doubt be selected for.

High Versus Low Fat Content:-

High fat content ears contained 5.5% fat and low ones 3.59%, 7.93% better total germination was gotten from the high fat content ears. The results warrant the conclusion that high fat content is desirable in seed ears.

High Versus Low Fibre Content:-

Ears of high fibre content contained 2.34% crude fibre and those of low fibre, 1.4%. The ears of low fibre

content germinated 3.33% better than those of high fibre content, but the low came above the average total germination only .04%, which does not seem to show much in favor of selecting for extra low fibre content and the medium content is no doubt as good.

High Versus Low Ash Content:-

1.44% or more was taken as the basis of selection for high ash and 1.3% or less as the basis for low ash content. A total germination of 7.35% was found in favor of the kernels of low ash content. It would seem that kernels of low ash content were the more desirable for seed, as far as germination is concerned.

High Versus Low Nitrogen Free Extract Content:-

Ears of high nitrogen free extract 73.5% or more, and those low in nitrogen free extract, 69.9% or less. The ears low in nitrogen free extract germinated 7.09% better than the high division. The difference is sufficient to decide in favor of ears low in nitrogen free extract as best seed ears.

Highest and Lowest of all Types Compared:-

The highest germination given was by ears of horny endosperm: Strong, 54.40%; weak, 8%; not up, 4.4%; total 66.80% .

The lowest germination was by ears with very deep kernels: Strong, 27.98%; weak, 11.43%; not up, 6.65%; total 46.06%.

SUMMARY OF DATA - CHEMICAL.

	Strong.%	Weak.%	Not up. %	Total germination. %
Moisture content of kernel -				
Low 9.9%-	39.87	12.56	6.96	59.39
High 12% +	37.67	11.95	6.93	56.55
Protein content of kernel -				
Low 9.1% -	37.39	11.51	7.13	56.03
High 9.93%+	44.27	9.45	5.38	60.00
Fat content of kernel -				
Low 3.59-	36.02	12.29	7.22	55.53
High 5.5% +	48.00	10.22	5.24	63.46
Fibre content of kernel -				
High 2.34%+	36.03	10.08	7.39	53.30
Low 1.4%-	38.89	12.15	6.59	57.63
Ash content of kernel -				
High 1.44%+	33.71	11.83	7.33	52.87
Low 1.3% -	42.38	12.00	5.85	60.23
Nitrogen Free Extract Content -				
High 73.5%+	34.15	12.18	7.06	53.39
Low 69.9%-	41.54	12.54	6.40	60.48

A Test of the Strength and Vigor of different Types of Corn Kernels under Conditions Unfavorable to their Best Development.

In this investigation the selection of kernels was made upon the type of endosperm. Kernels with a large percent of starchy endosperm were compared with kernels with very hard or horny endosperms. The test was made in view of determining which type of kernel was best adapted to planting in a cold damp soil. This type of kernel would be able to resist the adverse conditions for growing, such as it would be subjected to when planted immediately before a cold, rainy period such as we often have in spring. These cold, rainy periods cause many farmers to replant their corn on account of poor stand caused by rotting of many kernels.

Seven common varieties of corn were tested, by selecting the ears with hardest and those with most starch in endosperms, to be found within each variety. The ears were not tested for perfect germination but were selected by eye as being ears of fair vitality and germinability. Some varieties tend to have harder kernels than others. The Reids Yellow Dent, being more starchy than any of the others, and the St. Charles White, is a very horny endospermed variety. In all of the varieties the horny kernels gave a more vigorous germination than the starchy

kernels when the conditions were most favorable.

The above fact would seem to indicate that there was some factor correlated with starchy endosperm which caused a decreased vitality of the kernels. It is a known fact that starchy kernels contain a greater amount of moisture than horny kernels and this could possibly have the effect of causing decrease in vitality in favorable conditions. Some writers have stated that starchiness seemed to be correlated with immaturity which would cause low vitality but the ears selected in this test did not show signs of immaturity.

In testing the kernels in wet and dry soil exposed to the early spring temperatures, the horny kernels showed strongest germination in the wet box. The increased amount of moisture seemed only to intensify the weakness of the starchy kernels. In the dry soil where the temperature was low, 508 kernels germinated in the horny group of kernels and in a wet box under the same conditions, 457 horny kernels germinated; the starchy kernels under same conditions germinated 363 kernels in dry soil, and 281 in wet soil. In this, the horny kernels show a decrease of 10.1 percent as effect of excess moisture and the starchy kernels 28.1 percent effect of excess moisture, a difference of 18.0 percent. This shows the horny kernel to be most resistant to very wet soil conditions. The wet box of soil

was watered with a garden sprinkler each day and the dry box had only sifficient moisture applied to give good conditions for germination. As for the different varieties, the varieties with the greatest specific gravity seemed those as a whole best adapted to wet soils.

Some tests were made with Reids Yellow Dent and Commercial White with indoor experiments. These experiments were not very extensively carried out but seemed to indicate that the horny kernel was the less subject to rotting when exposed to excess amounts of moisture. When kept at a temperature of 60 degrees F. for several days, the starchy kernels upon germination showed 5.8 percent more effect of adverse conditions than did the hard kernels;kept at a temperature of 90 degrees during the period of germination, showed 3.4 percent more effect of excess moisture on the starchy kernels than upon the horny kernels.

Possible explanations for the cause of the greater vitality of the horny kernels may be drawn from the following differences noted in the specific gravity of the kernels and the rate of imbibition of water and the difference in temperatures of wet and dry soils.

GERMINATION UNDER VARIABLE CONDITIONS OF SOIL MOISTURE AND ADVERSE TEMPERATURE.

Outdoor tests.

Variety	Kernel-Type of:	Wet Soil				Dry Soil.			
		No.1	No.2	No.3	Total	No.1	No.2	No.3	Total
Reids Y.D.	Horny	15	14	32	51	15	17	40	72
	Starchy	8	10	19	37	11	16	30	57
Boone Co W.	Horny	12	13	16	41	14	17	15	46
	Starchy	8	6	14	28	10	11	17	38
Johnson Co White.	Horny	23	16	19	58	23	17	25	65
	Starchy	14	10	11	35	22	13	11	46
St.Chas.Yel.	Horny	21	17	24	62	23	17	24	64
	Starchy	18	8	17	43	21	12	31	64
St.Chas.Wh.	Horny	16	9	33	58	25	14	41	80
	Starchy	14	16	15	45	15	16	27	60
Com.White	Horny	23	16	16	55	19	15	19	53
	Starchy	18	14	15	47	16	14	14	44
Leaming	Horny	20	17	18	55	20	17	18	55
	Starchy	14	12	20	46	20	15	21	56
Boone Sp.	Horny	25	13	29	67	25	16	32	73
	No starchy selection.								
Total	Horny	155	115	187	457	164	130	214	508
	Starchy	94	76	111	281	115	97	151	363

Note:

No. 1 was planted March 25, 1911. Each type of each variety, 25 kernels.

No. 2 was planted April 12, 1911. Each type of each variety, 25 kernels.

No. 3 was planted October 20, 1911. Each type of each variety, 50 kernels.

GERMINATION OF HORNY & STARCHY KERNELS INDOORS

AT 90 DEGREES.

Variety	Type	Wet Soil.				Dry Soil.			
		No.1	No.2	No.3	Total	No.1	No.2	No.3	Total
Reids Yel. Dent.	Horny	70	63	69	212	74	69	77	230
	Starchy	30	34	36	110	45	45	42	132
Commercial White.	Horny	90	86	82	258	94	97	89	290
	Starchy	81	71	70	222	85	80	73	238
Total	Horny	160	149	151	470	168	166	166	520
	Starchy	111	105	106	322	130	125	115	370

GERMINATION OF HORNY & STARCHY KERNELS INDOORS
AT 60 DEGREES SIX DAYS THEN 90 DEGREES.

Variety	Type	Wet Soil.				Dry Soil.			
		No.1	No.2	No.3	Total	No.1	No.2	No.3	Total
Reids Yel. Dent.	Horny	30	37	36	103	32	39	36	107
	Starchy	26	24	31	81	30	27	35	92
Commercial White	Horny	66	64	75	205	69	72	83	224
	Starchy	50	42	45	137	58	49	54	161
Total	Horny	96	101	111	308	101	111	119	331
	Starchy	76	66	76	218	88	76	89	253

TEMPERATURE - VARIATION.

A record of the variation of temperature of two germinating boxes was kept daily. One box was watered freely and kept very wet, while the other was only moist enough for germination of the corn. These boxes were exposed to outdoor conditions and had sunlight and cold or warm air conditions same as would be had by two adjacent fields.

The difference of temperatures is very noticeable. The dry soil warmed up more rapidly when exposed to sunlight but on cloudy days the temperature of the two soils would be about the same. An average of the temperatures for the entire period is 1.1 degrees centigrade or 1.98Fahrenheit higher in the dry soil than in the wet soil or the air temperature. It is believed that two fields would show a greater variation; in that the field when once warmed would not cool out as quickly as a small box of soil. In this test the temperature variation would not be sufficient to account for the variation in germination of the kernels of corn.

TEMPERATURE OF DIFFERENT SOILS.

Date	Time of day.	Temp. C° of air.	Temp. C° of dry soil	Temp C° of wet soil	Note.
Oct. 2	4.00 P.M.	20	20	20	started.
3	12 Noon	32 1/2	28 1/2	26	
4	12 Noon	23	22 1/2	22	
5	12 Noon	20	21	20 1/2	
6	10.30 AM	29	28	26 1/2	
7	12.35 PM	12	12	12	
8	10.15 AM	15.2	14	14.6	
9	2.15 PM	22.5	26	25.5	
9	4.15 PM	20.2	22	20.2	
10	3.00 PM	24	26.6	26.1	
11	2.00 PM	23	24	23.5	
12	3.15 PM	20	25	24.1	
13	11.50 AM	15.5	20	15.5	
14	10.30 AM	15	19.5	15.4	
23	2. PM	19	20	17.5	
24	10. AM	18	18	17	
25	8. AM	10	10	10	
25	12 Noon	22	20.5	20	
26	5. PM	8	12	12	
	Average of all:	20.5	21.6	20.5	

VARIATION OF IMBIBITION.

The work upon the imbibition of water by horny and by starchy kernels of corn was done to see if it could be a probable explanation for the cause of variation of germinative strength of the two types of corn when subjected to various conditions of moisture and temperature. The horny type seeming strongest was also found to imbibe water much more slowly. The specific gravity of the two types of kernels varied about .07.

Twelve samples of corn were accurately weighed and placed in beakers and covered with distilled water. The following tables will show the variation for different lengths of time and for different treatments of the corn. The starchy corn began by imbibing water most rapidly and continued so during the entire period of the test, in all averaging 10.7% more imbibition than the horny kernels when the room temperature was above 23 degrees Centigrade and 7.6 when temperature was below 15 degrees centigrade. It is a well known phenomenon that heat aids seeds in the imbibition of water.

This more rapid absorption of water by the starchy kernels might be a factor which would cause them to decay or otherwise be destroyed when subjected to conditions rather wet and unfavorable to the growth of corn and probably explains in part the reason for the horny kernels showing greater vitality. An increased amount of moisture would cause considerable difference in the rotting of a kernel.

IMBIBITION OF WATER.

Variety	Type	Wt. Sample 12:30 PM 2-7-11	% water imbibed by 4:30 PM 2-7-11	% water imbibed by 4:30 PM 2-8-11	% water imbibed by 4:30 PM 2-9-11
Reids Y.D.	Horny	100 gm.	14.5%	23.5%	34.5%
" "	Starchy	100 gm.	18.5	32.8	40.0
Com. White	Horny	100 gm.	12.2	25.3	36.0
" "	Starchy	100	13.9	35.5	46.5
Reids Y.D.	Horny	100 gm.	17.5%	31.0%	39.5%
" "	"	100	15.7	29.5	37.5
" "	Starchy	100	20.6	37.0	43.5
" "	"	100	19.5	36.0	43.0
Com. White	Horny	100 gm.	14.5%	31.5%	42.0%
" "	"	100 ,	15.8	36.0	41.5
" "	Starchy	100	15.5	42.5	52.5
" "	"	100	16.5	43.5	55.5

% water imbibed by 4:30-PM 2-10-11	Differences	Temperature.
402%	5.2%	15° C.
45.4		"
44.1	9.1%	"
54.0		"
43.0%	9.35%	23° C.
41.5		"
51.7		"
51.5		"
48.5%	12.8	23°C.
48.5		"
61.4		"
63.2		"

SPECIFIC GRAVITY - VARIATION.

A specific gravity test was made of the kernels of corn used in testing the variability of germinative power of horny and starchy kernels. In this,100 kernels of corn were very accurately weighed and then immersed in distilled water and the volume ascertained. The kernels were immersed in a long graduated cylinder of small diameter on which it was possible to read volumes to one-hundredths of a cubic centimeter. The weighing was done on an accurate chemical balance.

The following table gives an average of a number of samples of each variety, testing five samples for each type of a variety and taking an average.

The average differences between the types of the different varieties is the same, but it will be noticed that some varieties run much higher in specific gravity than others, i.e. the Reids Yellow Dent being lowest with 1.1944 specific gravity for horny kernels and 1.1048 for starchy kernels, and St. Charles White highest with 1.2742 specific gravity for horny kernels and 1.1888 for starchy kernels.

The general type of the varieties explains the condition, Reids Yellow Dent being a rather soft, starchy corn and St. Charles White being our hardest and most pearly variety.

This variation in specific gravity explains in part the cause for the variation in amount of water imbibed by the two types of kernels - horny and starchy.

SPECIFIC GRAVITY OF HORNY & STARCHY KERNELS.

Variety	Wt. 100 grains	Volume 100gr	Specific Gravity	Variation	Type
Reids Yel. D:	29.144 gms	24.40 cc	1.1944	.096	Horny
" " "	32.556 "	29.47 "	1.1048	---	Starchy
Johnson Co.W:	40.439 "	32.13 "	1.2587	.0832	Horny
" " "	41.851 "	35.60 "	1.1755	---	Starchy
St.Chas.Yel.:	43.630 "	35.07 "	1.2440	.0605	Horny
" "	41.661 "	35.20 "	1.1835	---	Starchy
St.Chas.W. :	38.905 "	30.53 "	1.2742	.0654	Horny
" "	38.605 "	33.33 "	1.1888	---	Starchy
Commercial W:	42.861 "	34.00 "	1.2606	. 763	Horny
" "	35.848 "	30.27 "	1.1843	---	Starchy
Leaming :	34.153 "	27.20 "	1.2556	.0631	Horny
"	28.773 "	24.13 "	1.1925	---	Starchy
Boone Co.W. :	38.410 "	30.53 "	1.2581	.0701	Horny
" " "	38.882 "	31.87 "	1.1880	---	Starchy
Boone County Special.	41.621 "	33.07 "	1.2587	---	Horny
Average	38.645 "	30.87 "	1.2505	.0767	Horny
"	36.882 "	31.41 "	1.1738	---	Starchy

SUMMARY OF CHAPTER V.

The investigations so far seem to indicate that the horny kernels are best adapted to being planted in cold, damp soils. They have a higher specific gravity and do not imbibe as much water and imbibe it less rapidly than the starchy kernels. The fact remains that the starchy kernels chosen in this investigation proved to be weaker in germinative power than the hard kernels when planted under ideal conditions, but there seems to be an intensification of this weakness when germinated in wet, cold soils which seems to indicate that there is some character in such a kernel which causes it to be less adapted to germinating in cold damp soils.

The fact that horny kernels imbibe water less rapidly is a factor which possibly would explain their ability to remain in a cold, damp soil in a living state for the longer time.

CHAPTER VI.

Test of the Variability and Accuracy of the Present Methods of Testing Germinative Power of Seed Ears.

This investigation was carried on to obtain some data upon the accuracy and advisibility of testing seed ears by the taking of a small number of kernels from the ear and germinating them under very favorable conditions and accepting this as an indicator of the vitality of the ear.

The above method is the one commonly practiced at the present time by most corn growers. Some results have been published indicating that there was variability enough in the vitality of kernels on an individual ear to cause this method to be inaccurate to some extent, and not as practical as generally assumed to be.

In this test, 97 ears of Reids Yellow Dent corn were used. They were ears which did not give a perfect test in a germination test as used by the Missouri Experiment Station in selecting seed corn.

The method of making germination tests was as follows: Ten kernels were taken out of each ear at various places on the ear from near the tip to the butt and taking kernels from all sides of the ear;in this manner there was as much of the ear as possible represented by the ten kernels. These ten kernels were placed carefully in a germination box by pressing them into the sand tip downward. Here they were given an ade-

quate supply of moisture for germination and kept at a temperature of about 85 degrees Fahrenheit for about five or six days when the sprouts would be over an inch in height. The kernels sprouting would then be counted and all ears not germinating ten kernels were discarded. The above mentioned ears were discarded out of five bushels of corn tested.

The method of testing the accuracy of the above method of making germination tests was to shell the entire ear mixing the kernels well, then count out 100 kernels from the mixture. These 100 kernels were tested in as nearly as possible the same manner and under the same conditions as the ten kernel test was made.

In drawing conclusions from data obtained in the experiment, any ear varying less than 10% cannot be considered as showing any variation, for in the ten kernel test, one kernel represents 10% of the total germination.

Compiling data in the above manner shows 6 ears showing no variation in germinability between the two tests and 85 ears showing variation of from one to 43 percent averaging a variation of 13.0%. Of these ears, 61 showed a decrease in germinative power and 30 an increase.

The results seem to indicate that the present method of testing seed ears is only partially accurate but that it is a valuable indication of the vitality of the majority of ears and we can advise testing by the ten kernel system.

DATA ON ACCURACY & VARIABILITY OF EAR GERMINATING TESTS.

Ear No.	No. germinating in 10 kernel test.	No. germinating in 100 kernel test.	Percent of variation of 100 kernel test above or below that of the 10 kernel test: -%	+%
1	6	74		14
2	5	16	34	
3	7	72		2
4	1	9	1	
5	4	10	30	
6	6	30	30	
7	4	44		4
8	4	32	8	
9	6	50	10	
10	5	21	29	
11	5	45	5	
12	1	10		0
13	5	28	22	
14	7	60	10	
15	4	54		14
16	5	58		8
17	2	12	8	
18	5	49	1	
19	5	40	10	
20	4	26	14	
21	0	0		0
22	5	59		9
23	3	18	12	
24	6	47	13	
25	0	6		6
26	5	61		11
27	2	17	3	
28	6	58	2	
29	7	39	31	
30	7	68	2	
31	6	27	33	
32	2	9	11	
33	6	71		11
34	7	52	18	
35	7	32	38	
36	5	21	29	
37	6	70		10
38	2	19	1	
39	2	3		10
40	2	10	10	
41	7	59	11	
42	3	11	19	
43	6	21	39	
44	2	10	10	
45	5	37	13	
46	5	23	27	
47	3	12	18	
48	1	9	1	
49	1	4	6	
50	7	72		2

Ear No.	No. germinating in 10 kernel test	No. germinating in 100 kernel test	Percent of variation of 100 kernel test above or below that of the 10 kernel test -%	+%
51	0	0		0
52	2	8	12	
53	4	10	30	
54	7	38	32	
55	1	8	2	
56	6	76		16
57	1	13		3
58	7	68	2	
59	4	29	11	
60	2	21		1
61	4	31	9	
62	6	51	9	
63	5	28	22	
64	0	3		3
65	7	74		4
66	1	10		0
67	0	18		18
68	6	59	1	
69	5	24	26	
70	7	48	32	
71	0	2		2
72	6	39	21	
73	5	28	22	
74	6	68		8
75	4	53		13
76	2	2	18	
77	2	27		7
78	1	14		4
79	2	17	3	
80	4	19	21	
81	0	0		0
82	0	4		4
83	6	75		15
84	6	81		21
85	3	22	8	
86	1	12		2
87	4	16	24	
88	3	29	1	
89	5	26	24	
90	5	45	5	
91	5	55		5
92	6	57	3	
93	5	38	12	
94	1	12		2
95	1	10		0
96	7	65	5	
97	1	53		43

SUMMARY.

The following conclusions have been drawn from the results obtained by the investigation of this problem:

I. The best type of ear to select for seed would be an ear with the following physical characteristics: Medium length, circumference, and weight of ears with sixteen rows of straight kernels of medium space between the rows, cylindrical or slightly tapering in shape; kernels smooth or medium indented, medium in width and depth, and having medium large germs and a large per cent of horny endosperm; kernels weigh .312 to .400 grains and 79 to 87.50 per cent of corn to cob and medium size of cob.

II. That we can carry selection for certain characters to an excess; namely, length, circumference and weight of ear; depth, width and weight of kernels; and per cent of corn to cob. Where these types are selected for to an extreme, more than usual precautions must be taken in drying and care in storing the seed.

III. That the most desirable chemical composition of kernel is, low moisture, high protein, high fat, low ash, and low nitrogen free extract content, and medium fibre.

IV. That chemical composition of kernel has as much effect upon the germination of the kernel as physical characters.

V. Corn kernels with hard, horny endosperms have a higher specific gravity and imbibe water less rapidly than kernels with starchy endosperms.

VI. Corn kernels with horny endosperms seem better adapted to germination in cold damp soils than kernels with starchy endosperms.

VII. The results given in this investigation indicate that the testing of ears of corn by the ten kernel system is sometimes not an accurate test of the vitality of the ear but can be advised for use in commercial corn growing as the very poor ears can be weeded out by this process.
