2-1-1910

Corn

Clifford Willis

H.B. Potter

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AGRICULTURAL EXPERIMENT STATION

South Dakota State College
of Agriculture and Mechanic Arts

AGRONOMY DEPARTMENT

"Work and Knowledge are a stronger team than Work and Work."

CORN

Brookings, South Dakota

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Any resident of the state may have his name placed on the regular mailing list to receive the Bulletins of this Station free upon application to the Director.
The object of the present bulletin is to report the progress of work which has been done at this Station for the past five years in corn; also to consider the losses, their causes, and the means in use today to prevent such losses as the years go by.

During this period, the Bureau of Plant Industry, United States Department of Agriculture, carried on this work in cooperation with this Department.

The production of a large amount of good corn during any given season does not depend upon any one factor. It depends upon a great number of considerations, the absence of any one of which will cause a loss to the individual concerned. The most of the losses at the present time come because of carelessness and thoughtlessness on the part of the men responsible.

South Dakota is now one of the corn-producing states of the Union. The skeptic on this question is no longer heard, and the man who would disdain South Dakota soil because of its inability to produce corn has been shown his error. In fact, men who once scoffed are now buying South Dakota farms on which they expect to grow corn. During the year 1909 the state is shown to have produced sixty-five and a quarter million bushels of corn on two million fifty-nine thousand acres of land. This gives a yield per acre of 31.7 bushels.
as an average for the state. We know that there are farmers who produced eighty and a hundred bushels to the acre. Some one must have produced a very low yield to so lower the average.

Low yields may be due to one or more of the following facts:

1. Varieties of corn not suited to conditions where it is grown.
2. Poor seed bed.
3. Poor seed.
4. Faulty handling of good seed.
5. Seasonal influences.

Four of these five faults may be controlled by us if we use our good judgment at every move.

**SEED BED**

The field which will be selected for corn will be one where some legume has been growing the year before. In other words, the field will be a part of a regular rotation. While it is true every year that corn is produced successfully on sod land, the farmer must not take for granted the idea that that soil is specially adapted for corn. This assumption is too often the case, and when the next year a failure comes on the same piece of land where success was so plain the year before, there is much amazement. Corn cannot be recommended on other than well worked land, and the best crop to precede it is the legume. The legume (clover, alfalfa, etc.) leaves the soil in a loose, mellow condition, and if some of it is turned under, a splendid supply of available nitrogen is made ready.

This will be turned under early in the fall, which will allow the action of the winter weather on the soil, and afford time for the legume to decay. In the spring, as early as possible, the land will be worked, and this work will continue until the corn is ready to plant. The rules of a deep, firm seed bed
on which is kept a surface mulch, applies to corn land from
the time of planting to the time of harvest. Whatever is con-
ductive to the formation of such a seed bed should be prac-
ticed, and then the bad results will be due to other influences.

SEED CORN

Into the good seed bed should be placed good seed corn.
During the past few years a great deal of stress has been
placed on this one point, and the justice of this emphasis is
plain when the seed corn from the 1909 stock is examined.
Iowa is coming into South Dakota for her corn. Other states
are suffering, and even though South Dakota can supply corn
to some other states, there is in the state no great amount of
fine seed corn. There is a great deal of inferior corn. And the
peculiar thing about it all is that the most of this bad corn
is due to carelessness on the part of farmers. Often times it
is more thoughtlessness than it is carelessness. But the con-
dition exists.

Selection is the remedy. By selection is meant the practice
of securing from the available stock of corn the most ideal
ears possible, and using those for seed. Ideas may vary as to
what an ideal ear is, but when we say that we want for seed the
ear which, when placed in the field under average conditions,
will produce the greatest amount of good, marketable corn
the coming season, every one will agree. And our selection
should be based on this ideal.

The first and best place to make selection is in the field
before there is any likelihood of a killing frost. That can
be done by the farmer, and done well. The time will be well
spent. Let the farmer throw a bag over his shoulder and go
into his field, looking first at the stalks on which the ears are
borne. If they show strength, are large and lusty at the base,
have good leaves of healthy color, and so forth, examine the
ears which they bear. Do these ears have large shanks so
that they are held upright, ready to catch all the rain as it
comes, and later freeze at the slightest provocation? Do not
select such ears. Do the shanks allow the ears to drop off,
or do they allow the ears to maintain a nice angle on the stalk,
an angle which throws the husks in a position to protect the
ears? Select the last kind, the one with a medium sized
shank. This kind allows easy husking and affords the best
of protection for the kernels which we desire. And the ear
should not be too high from the ground, for that would
mean late maturity, a feature which must be avoided. The
field selection will note whether the ears are mature or not.
If they are not, they will be left on the stalks for the general
harvest, but if they are mature they may be selected, provid­
ing the general characteristics of an ear are present. These
characteristics will be mentioned later and in some detail.

BUYING CORN

It is not always possible for a farmer to get from his own
fields the seed he needs. In such a case the only resort he
will have is to buy it. Then he should exercise great care.
In the first place, home-grown seed corn is the most reliable, and
the farmer should see that his corn comes from his locality,
if possible; if not possible, the seed should be secured as near
home as convenient, from conditions as nearly like the con­
ditions under which it is to be grown as is feasible. Whether
the seed be secured from a neighbor or from a seed house,
insist on this fact, and as well insist that the corn be sent to
you on the cob. The thinking farmer will know what type
of ears he desires and can make a more rigid selection after
corn reaches him. The farmer will know, then, the sec­
tion from which the corn came, its general type, and he should
have from the man who sells the corn, a statement of its vi­
tality, i. e., what per cent of it will grow. This will give
the farmer a good working basis.

PRESERVATION OF SEED CORN

Whether the corn is bought or selected from the field, it
should be placed in dry, well ventilated quarters. You will
notice that nothing is said about heat or cold. This is for
the reason that it is moisture which is chiefly responsible for
damaged seed corn. It has been found by experiment that
dry seed corn will not be injured even by very low tempera-
tures. So as soon as the corn is secured, hang it up in a well
ventilated place.

In emphasizing this point, Indiana Bulletin No. 110 says
that as soon as corn is taken from the field,

"It should be stored at once in a dry, well ventilated place,
and in such a way that there may be a free circulation of air
around each ear. If this is not done its vitality is almost sure
to be injured, either by moulding, fermenting, growing or
freezing. There are many methods of storing seed corn, but
in all cases the place of storing must be dry and well venti-
lated. Seed corn should always be stored in the ear. It should
never be put into boxes, barrels or sacks. If the quantity of
seed to be stored is small, the ears may be set on end on the
points of nails driven through a board far enough apart so
that there will be a free circulation of air around each ear. In
some cases it is successfully kept in the cellar under the house,
but few cellars are dry enough for the purpose. The attic,
or an empty room upstairs in the house, is a good place for
storing, if it is not too warm and close while the corn is still
moist. * * * The amount of freezing seed corn will
stand depends entirely upon its dryness. If thoroughly dry
and surrounded by dry atmosphere, it will stand very cold
weather."
A HANDY WAY TO SAVE SEED EARS

1909 seed corn. There is plenty of space between ears. The corn is hung on binder twine, and the method used, which can easily be seen from the photograph, requires two men but a short time. Enough corn is hanging here for 150 acres. It was picked September 10th and 11th, 1909, Brookings, South Dakota.

TYPE

It is not always clear what type means, and after the definition is known there is very little likelihood of finding it existing throughout a state. Type may be defined by saying that it is present when a corn is recognized by experienced men the moment it is seen. A great number of South Dakota farmers come from old corn growing states, and the words Leaming, Reid's Yellow Dent, Johnson County White, Silver Mine, and so on, to them presents pictures of definite kinds
of corn. This is because those corns possessed qualities characteristic of the variety named. Good breeding and good selection were behind those types. South Dakota is somewhat unfortunate, and in other ways fortunate, for not having definite varieties established in the various sections of the state. Even seed houses are advertising in their catalogues corn which, although it goes under a name, deserves no recognition as a variety. It has no breeding behind it. The fortunate part is that the state has the chance to build up some good varieties. How many men will take hold of this opportunity remains to be seen. A glance at Figure III will show what breeding can do. These ears were the best ears that could be found in the two lots from which they were selected. It is easy to see which ear should be used in the breeding plot which every man may have. On some of the plots where the variety tests (of which statement is made later) were made, the plan of detasseling the rows from which seed was to be taken was used.

Briefly, a practicable method for the farmer is as follows: Take a corner, preferably the southwest, of the corn field, and plant the ears which are found to be the very best in that corner. When harvest time comes select seed from that corner. If one cares to go more into detail, and to insure cross fertilization on the seed ears, he may put an ear in each row, that is: row number one will be planted from ear number one, row two from ear two, and so on. Every other row will be detasseled by gently pulling out the tassels just as they appear. The seed, of course, comes from the detasseled, where cross pollination has been forced.
FIGURE III

DOES CARE IN SELECTION COUNT?

TYPE SELECTION

SHAPE OF EAR

Varieties, if established, will vary one with the other in shape, but there are general rules to be followed which apply
to all varieties. The objective point for most corn-breeding is a high yield of shelled corn per acre, and it is with this in mind that a standard, somewhat definite, has been set by men who have been studying needs and how to meet them for the past years.

In general it may be said that an ear should be nearly cylindrical in shape, have straight rows of regular shaped kernels. The ear will taper slightly toward the tip; one that tapers toward the butt is very objectionable. It should be full all the way from butt to tip, the dropping of rows being considered a serious fault.

**LENGTH AND CIRCUMFERENCE**

The length of ears will vary with variety, with the section where it is grown, and with ideas of breeders, but the exceedingly large corn should not be coveted. Do not sacrifice maturity for the sake of size. Just as long an ear should be grown as the conditions will permit, but the immature large ear should be avoided. The circumference will, in general, be three-fourths the length, and this allows from twelve to eighteen rows of kernels on each ear. This means a medium sized cob.

**UNIFORMITY**

Uniformity is one of the requirements of the corn which goes into the planter box, if a good stand is desired. On the show table uniformity of ears in the sample and uniformity of kernels on the ears are noticed among the very first points. That is because the farmer needs those items in his seed house. In Figure IV, ear I shows kernels that are not uniform, and if they are all shelled into the planter the drop cannot be uniform.
FAULTY POLLINATION

Ears of this sort are often found. They show poor pollination, and, of course, should not appear in the seed house.
FOUR GOOD SHAPES

There are objections to all of these ears, but they show good shape, the rows are straight and the kernels uniform. Four varieties are represented.
Number 1 is poor at the butt end; 2 has very irregular rows and tapers too much, as does 4; 3 has the rows twisted on the cob.

**SPACE BETWEEN KERNELS**

If the kernels are properly shaped there will be no waste space between kernels on the cob. When the ear is of the desired shape and size, the kernels will be wedge-shaped, not square or peg-shaped. Then they will fit closely one with another, but this should not exist to an extreme; there should be space enough to allow drying. Moisture escapes from the ear in all directions. If kernels so surround the cob that only the butt is exposed, and if there is no space between kernels, the moisture will damage the kernels. On the other hand, if the kernels are too far apart, a great deal of good space about
the cob is wasted. This space may be noticed at the crowns, as is shown in Figure VII, or it may be between the kernels at the cob, as is shown in Ear 4 of Figure IX.

DEPTH OF KERNEL

In Figure IX is shown several forms of kernels. The desired kernel for any locality is the deepest one that will mature under the conditions of that locality. Too many mistakes have been made in the past by breeders trying to get the kernels deeper than their conditions would allow. As a result, a great deal of immature corn has gone on the market, and some has even been planted in the fields. Ear 3 of Figure IX is a typical Minnesota No. 13 kernel which, no doubt, could be deepened a little in the course of good breeding.

BUTTS AND TIPS

Too much emphasis is often placed on the butts and tips, to the exclusion of other parts of the ear. The butts should be well rounded, with straight rows of full depth kernels. The tips should have full depth kernels in straight rows also, but it is not altogether objectionable to have the tip exposed a little. The shallow kernels are far more objectionable.

SHELLING PERCENTAGE

All of these points work to a high or low shelling percentage, depending upon whether or not they are favorable to the one or the other. Little space between kernels, deep kernels, well filled butts and tips point to a high shelling percentage.

In determining the actual proportion of shelled corn to ear, a number of representative ears should be weighed. These ears are shelled and the cobs weighed. From the weight of the ears subtract the weight of the cobs. This gives the weight of the shelled corn. Divide the weight of the corn by the total weight of ears, to get the per cent of corn. Corn should shell 86 to 88 per cent.
FIGURE VII

GOOD AND POOR SPACING OF KERNELS

Ears 1 and 2 are open at the crowns, there being large furrows from tip to butt of ears. Ear 3 shows kernels packed too closely. Figure XII shows the evil effects of such packing. Ear 4 shows good spacing, a little open, perhaps, on the top side, however.
Ear 1 is not proportioned well, has shallow kernels of doubtful shape. Ears 3 and 4 show deformed tips and butts. Ear 2 speaks well for itself in such company.
A STUDY IN ITSELF

Ear 1 shows exceptionally large cob and shallow kernels. Such ears will not have high shelling percentage. Ear 2 has deep, wafer kernels, showing space at crown, while Ear 4 shows space at cob. Ear 3 has some irregular kernels, and the cob is a little over size. Ears 2 and 3 have the good tips.
TYPES OF KERNELS

Kernels 1 and 2 offer the best shapes. Kernels 4 and 7 are too round. Kernel 8 is narrow; 5 is peg-shaped. Kernels 3 and 6 show blistered germs, which may indicate a weak vitality.

COLOR

If a corn has been well bred and well cared for, it will show in the color of the grain and the cob. In the varieties which were tested at Brookings during the past five years, one of the great differences between varieties was the color. For the farmer who takes one of these varieties to his farm, there should be but one thought; that of keeping that variety pure. During the past year questions have come to the Agronomy office asking whether or not the results will be beneficial if one variety is crossed on another. The answer is always “No” to the farmer, for he has not time to spend on detailed breeding of any kind. Keep the corn true to color, for that will show its purity, or its impurity, of breeding more quickly.
than anything else. A yellow corn should be yellow, and should have a red cob. A white corn should be white, and should have a white cob. In Ear 1 of Figure VII the photograph shows the cross kernels. Such are objectionable in seed corn. If they are present they should be picked out before planting is done. But it is better to use ears which show no crosses at all. The farmer who is doing his selection will do well to pay close attention to his corn field from the purity standpoint.

SEED AND MARKET CONDITIONS

Already the importance of a good maturing corn has been brought out, and the farmer in his selections will watch carefully for this point. The date of ripening of the varieties in the test which is described later on in this Bulletin varied greatly, and this is found to be true of corns everywhere. What should be desired, of course, are the varieties which mature well. Then a marketable corn can be expected.

Immature corn will be starchy, and consequently will have less feeding value than the mature product. When used for seed it grows rapidly, but lacks vigor with which to continue its growth. The immature corn can be told by its chaffiness at the crown, by the breaking off of kernel tip-caps when the kernels are removed, by the adherence of chaff to the tip-cap, by the whitish color of the kernel, and by the sappiness of the cob. The mature kernel will be hard, will have a well formed dent, will break off clearly at the cob, and will be borne firmly on a firm cob.

Immaturity offers a moist germ to the freezing weather, and as a result low vitality will be found. By vitality is meant the ability of the kernel to germinate and to do so strongly. The purpose of caring well for the seed corn is to preserve its germinating powers. But even when the best of care is taken and each ear is handled well, there may be faulty ears due to some cause that has been overlooked. For planting, only the ears which have a large store of vitality are wanted. While
various means of examination of kernels are good as far as they can go, it remains for the tester to decide. Strange as it may seem, it will take less time to test with a tester the seed corn than it will to examine carefully each ear by sight.

**FIGURE XI**
COLOR OF COB

Photographs do not show colors up well, but it can readily be seen that Ear 2 has a red cob, which is objectionable.
HOW TO TEST

No time can be spent more profitably than in testing seed corn. This should be done whether the seed is bought or raised at home. There are several commercial testers on the market, some of which are very good, but the farmer can prepare for himself a good box and in that do a great deal of testing with little time. The illustration, Figure XII, is furnished this Station by the Purdue Experiment Station, Lafayette, Ind., and we quote the description they give of its use:

"A convenient tester, and one which we would strongly recommend every farmer to use, is shown in the illustration below, and may be made as follows: Take ordinary inch lumber and make a shallow tray of convenient size, say about two by three feet, and two and a half inches deep. Then bore small holes through the sides and ends about two inches above the bottom and about an inch and three-quarters apart. Through these holes string light galvanized or copper wire in both directions. Then fill the tray up to the wires with sand, earth or fine sawdust. Sand is preferred, because it is clean and easily kept in good condition. Each square marked off on the surface by the cross wires is intended for the kernels from a single ear of corn. Instead of weaving in the cross wires as indicated, a piece of large meshed wire chicken fence may be fastened in. If this be preferred, the tray should be made two inches deep, then the piece of chicken fence fastened on top, and a half inch strip nailed on top of that so as to raise the edges of the tray half an inch above the wire netting, as in the other case. After the tray has been filled up to the wire with sand or other material as directed above and thoroughly moistened, the tester is ready for use. If much corn is to be tested, several of these testers should be provided. They are easily made, and with good care will last many years. For the average farmer one will be sufficient, as about three bushels of seed ears can be tested at one time."
"When making tests, some convenient system of arranging the ears on a floor, table, shelf or rack must be employed, so that the ear corresponding to a certain square in the tester may be readily located. Begin filling the tester by placing five kernels from the first ear, selected as directed above, in the first squares at the upper left hand corner, and fill each row of squares in regular order.

FIGURE XII

"After the kernels have been placed, the material in the tester must be kept thoroughly moist. Some kind of cover
must be used to keep the surface from drying, and if this is properly done the kernels need not be buried out of sight. Some kind of a glass plate or frame makes the most satisfactory cover. This should rest loosely on the edges of the tester, so as to admit some air. With such a cover, the soil need be moistened only once for each test, as the evaporated moisture will condense on the under surface of the glass and drop down again. When moistening is necessary after the kernels have been placed, a towel or other cloth should be spread on the surface and the water poured gently on top. If this is not done, the water poured on will move many of the kernels out of place.

"The tester should be placed in a room ranging around 70 degrees F. in temperature, as stated above. All kernels which do not send out vigorous root and stem sprouts within five days, under these conditions, should be considered too weak to germinate properly under ordinary field conditions. If the germination of any lot of kernels is unsatisfactory, the ear from which they came should be discarded. About 95 per cent of the kernels should germinate strongly within the five days.

"The seed corn tester should be as important a part of the corn grower's outfit as the planter or cultivator, and its use should never be neglected. A handy person can easily make an individual ear test of five or six bushels in a day, and the labor involved will be paid for many times over in the better stand of plants and the consequently larger crop secured."
FIGURE XIII

HOW TO REMOVE KERNELS

The less the ear is handled in removing kernels to place in the germination trays the less time is taken and the better the ear remains. By following the method shown in the above figure the ear remains on the table or floor, and the kernels are removed easily.

PREPARATION FOR PLANTING

After the selection made by the tester is complete, the ears to be used are shelled, the butts and tips are shelled and discarded. Then the rest of the ear is shelled and its kernels placed with those of similar size and shape. Perhaps three grades will be made, the large, the medium, and the small.
It may be necessary to make another grade or two, but that will depend on how uniform the corn is. After the corn is graded the planter should be regulated so that it will drop the desired number of kernels each time. It may be necessary to file the plates or to make some other alterations, but if, as a result, the planter drops regularly, the time is well spent.

CULTIVATION

The seed bed has been well prepared, the planter has put the seed in regularly, so that cultivation can take place both ways, and the corn soon appears above the ground. It may not be a bad idea to harrow the ground at this time. While the plants are small, no damage is done. But the cultivator should be started soon and kept in the field until late in the season. Do not let the ground crust on top. Use small shovels, at least five on a side, or some other arrangement which will keep down the ridges. Do not use large shovel plows. Keep the surface mellow and level, and then there will be no danger of lack of moisture in South Dakota drought conditions.

HARVEST

The harvest will come and it will be a joy, for that man who has spent hours upon hours at the work, to see it. The slovenly man may once in a while have a good crop, but it is the man who, every year, produces good corn, that deserves credit for his labors.
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<th>VARIETY</th>
<th>Source of Seed</th>
<th>Notes on Seed Planted</th>
<th>Ears in 100 Pounds</th>
<th>Percent of Grain</th>
<th>Pounds per Bushel</th>
<th>Per cent of Germination</th>
<th>Date of Planting</th>
<th>Date of Ripening</th>
<th>Number of Stalks Grown</th>
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<tr>
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<td>9-20</td>
<td>529</td>
<td>539</td>
<td>279</td>
<td>39.2</td>
</tr>
<tr>
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<td>Conn.</td>
<td></td>
<td>209</td>
<td>83.3</td>
<td>63.0</td>
<td>97.5</td>
<td>5-17</td>
<td>9-20</td>
<td>529</td>
<td>539</td>
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<td>39.2</td>
</tr>
<tr>
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<td>9-27</td>
<td>605</td>
<td>443</td>
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<td>59.4</td>
</tr>
</tbody>
</table>

Amount planted: Ten rows of each variety, each eight rods long, were planted in one locality in the field.
Method of planting, distances apart of rows and hills, etc.: Drilled in rows three feet eight inches apart. Same plates and method by which all corn on the Station is planted.
### VARIETIES OF FIELD CORN TESTED IN 1906

<table>
<thead>
<tr>
<th>VARIETY</th>
<th>Source of Seed</th>
<th>Notes on Seed Planted</th>
<th>Ears in 100 Pounds</th>
<th>Percent of Grain</th>
<th>Pounds per Bushel of Grain</th>
<th>Date of Planting</th>
<th>Date of Ripening</th>
<th>Number of Stalks Grown</th>
<th>Total Pounds of Ears Harvested</th>
<th>Bushels Dry Ears per Acre, 70 lbs. per Bushel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Tuscarora</td>
<td>S. D.</td>
<td></td>
<td>377</td>
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<td>9-1</td>
<td>553</td>
<td>78</td>
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<td>9-12</td>
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<td>5-12</td>
<td>9-12</td>
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<td>233</td>
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<td>9-17</td>
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<td>895</td>
<td>264</td>
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<td>9-20</td>
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<td>235</td>
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<tr>
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<td>250</td>
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<td>Mich.</td>
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<td>5-12</td>
<td>10-1</td>
<td>870</td>
<td>361</td>
<td>50.1</td>
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</tbody>
</table>

Amount planted: Ten rows of each variety, each eight rods long, were planted in one locality in the field.

Method of planting, distances apart of rows and hills, etc.: Three kernels in a hill. Hills three feet eight inches apart.
### Varieties of Field Corn Tested in 1907

<table>
<thead>
<tr>
<th>Variety</th>
<th>Source of Seed</th>
<th>Ears in 100 Pounds</th>
<th>Per cent of Grain</th>
<th>Per cent of Germination</th>
<th>Date of Planting</th>
<th>Number of Stalks Grown</th>
<th>Date of Tasseling</th>
<th>Number of Ears Harvested</th>
<th>Total Pounds of Ears Harvested</th>
<th>Bushels of Dry Ears per Bushel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwestern Dent</td>
<td>N. D.</td>
<td>260</td>
<td>82.6</td>
<td>58.0</td>
<td>5-18</td>
<td>269</td>
<td>8-5</td>
<td>8-9</td>
<td>326</td>
<td>98</td>
</tr>
<tr>
<td>Dakota Sunshine</td>
<td>N. D.</td>
<td>260</td>
<td>83.6</td>
<td>59.0</td>
<td>5-18</td>
<td>557</td>
<td>8-8</td>
<td>8-16</td>
<td>466</td>
<td>140</td>
</tr>
<tr>
<td>Triumph Yellow Flint</td>
<td>Minn.</td>
<td>272</td>
<td>82.6</td>
<td>62.0</td>
<td>5-18</td>
<td>579</td>
<td>8-7</td>
<td>8-16</td>
<td>500</td>
<td>148</td>
</tr>
<tr>
<td>Square Deal</td>
<td>N. D.</td>
<td>278</td>
<td>86.6</td>
<td>60.0</td>
<td>5-18</td>
<td>719</td>
<td>8-5</td>
<td>8-9</td>
<td>550</td>
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<td>56.0</td>
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<td>393</td>
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<td>479</td>
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<td>Striped Flint</td>
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<td>83.3</td>
<td>59.0</td>
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<td>295</td>
<td>8-5</td>
<td>8-10</td>
<td>436</td>
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<tr>
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<td>S. D.</td>
<td>233</td>
<td>83.3</td>
<td>59.0</td>
<td>5-18</td>
<td>645</td>
<td>8-10</td>
<td>8-16</td>
<td>530</td>
<td>156</td>
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</tbody>
</table>

Amount planted: Four rows of each variety, each eight rods long, were planted in one locality in the field. The season was very late and unfavorable. Date of last and first killing frost was May 25 and September 27. Probably forty per cent of the recorded weight of most varieties was water.
<table>
<thead>
<tr>
<th>VARIETY</th>
<th>Source of Seed</th>
<th>Notes on Seed Planted</th>
<th>Date of Planting</th>
<th>Total Pounds of Ears Harvested</th>
<th>Bushels Dry Ears per Acre, 70 lbs. per Bushel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Purs in 100 Pounds</td>
<td>Per cent. of Grain</td>
<td>Pounds per Bushel of Grain</td>
<td>Per cent. of Germination</td>
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<tr>
<td>Early Tuscarora</td>
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<td>55.5</td>
<td>87.5</td>
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<td>54.4</td>
<td>47.7</td>
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<td>55.4</td>
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<td>143</td>
<td>83.3</td>
<td>57.4</td>
<td>93.5</td>
</tr>
</tbody>
</table>

Amount planted: Ten rows of each variety, each eight rods long, were planted in one locality in the field.

Method of planting, distances apart of rows and hills, etc.: Rows three feet eight inches apart and hills twelve inches apart.
<table>
<thead>
<tr>
<th>VARIETY</th>
<th>Source of Seed</th>
<th>Notes on Seed Planted</th>
<th></th>
<th></th>
<th>Date of</th>
<th>Date of</th>
<th>Total Pounds of</th>
<th>Bushels Dry Ears per Acre, per Bushel</th>
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</thead>
<tbody>
<tr>
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<td>Exs per 100</td>
<td>Pounds</td>
<td>Germination</td>
<td>Harvested</td>
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<td>10-16</td>
</tr>
<tr>
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<td>82.7</td>
<td>57.5</td>
<td>99.5</td>
<td>5-14</td>
<td>10-16</td>
</tr>
</tbody>
</table>

Amount planted: Ten rows of each variety, each eight rods long, were planted in one locality in the field.
Method of planting, distances apart of rows and hills, etc.: Rows three feet eight inches apart and hills twelve inches apart.
### AVERAGE FOR NUMBER OF YEARS GROWN

<table>
<thead>
<tr>
<th>VARIETIES</th>
<th>1905</th>
<th>1906</th>
<th>1907</th>
<th>1908</th>
<th>1909</th>
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<th>3 yr.</th>
<th>4 yr.</th>
<th>5 yr.</th>
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<tbody>
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<td>20.4</td>
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<td>20.8</td>
<td>31.9</td>
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<td>20.9</td>
<td></td>
</tr>
<tr>
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<tr>
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