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SELECTING AND PREPARING SEED FOR THE BREEDING PLOT

by

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It is very important in the starting of corn breeding work to begin with the very best of seed. Naturally the selecting of seed and the preparation of it for planting must receive careful attention.

A. The Kind of Ears We Want:

It is always best to select seed corn in the fall from the standing stalks just as the crop is maturing. However there are probably a large number of the ears that must be culled out because they did not retain all their good qualities after having been stored several months. The kind of ears to select are those that best conform to the standards of that particular variety. Generally speaking the ears to select for seed will not vary greatly from the ears to be selected for show purposes. An ear that conforms almost perfectly to the score card may not produce similar ears but the tendency will be in that direction. All ears that are immature, starchy, very rough, dull in appearance, or discolored, or affected by molds at any point of ear or cob should be discarded before the germination test is made.

B. How to Get the Right Kind of Ears:

A very practical and efficient method of securing the right kind of ears is described in the following steps:

1. Lay out the ears on a long board or table; put out as many as there is available working space --up to 100 ears-- at a time. Put butts all one way, on side one is working, and even with edge of table or board.
2. Pick up each ear, feel the weight of it, and twist it. Discard every ear which is not heavy and solid. Nothing else should be considered while going over the corn the first time, and every ear thrown out which is apparently light or the kernels of which are loose on the cob regardless of how nice looking the ear is in other ways. This is a very important measure of good seed corn.

3. While handling ears to learn whether they are heavy and solid, any ear which is particularly different from the rest in size or shape or in the size and shape of the kernels should be discarded. While uniformity is not absolutely essential to profitable seed, it is highly desirable. This matter of getting rid of irregularly shaped ears and kernels is not next in importance in getting rid of light and loose ears, but while the ears are being handled before the kernels are removed is the logical time to get rid of a lot of ears which would not possibly be selected for a seed plot.

4. Two grains should be removed from the same row side by side and laid in front of the ear, one with the back side up and one with the germ side up. This should be done only from those ears which have been selected as the specially heavy, solid, fairly uniform ears.

5. At this time select only those ears whose kernels are fully developed. This means those that are bright and clean from the crown to the tip without any indication of starchiness, except for a little way at the crown of the kernel, where the starchiness naturally appears on all dent corn. The backs of kernels should have the appearance which most farmers describe as oily. All those ears whose kernels are slightly shrunk at or near the tip and show the white, starchy appearance running down over the kernels should be discarded.

6. The ears for seed should be as nearly the same size and shape and the kernels should be as nearly of the same size and shape as it is possible to get them. It is far better to have a sample made up of ears whose kernels are of the same size and shape but with the ears somewhat irregular than to have a sample whose ears are of the same size and shape but with kernels of varying sizes and shapes. It is better to have the ears and kernels both somewhat uneven in size and shape and have all heavy solid ears with perfectly developed kernels than to have them of just the same size and shape with some light or poorly developed kernels among them.
7. Of course, one should pay some attention to having tips of ears fairly well covered, rows of kernels straight, and a uniform color running through the ears, but these things are of minor importance and should be looked at only after the above characteristics are carefully considered.

After the right ears have been selected so far as looks and appearance are concerned they should be tested in a germinator. The rag-doll method is about as good as any method. Seed corn, which has been carefully gathered and cured, should sprout all right but there is only one safe plan of proving its vitality and that is by testing its germination.

The following table shows the results of a test conducted by the Iowa Experiment Station:

<table>
<thead>
<tr>
<th>No. of Kernels tested from each ear.</th>
<th>No. of strong kernels</th>
<th>No. of dead kernels</th>
<th>Yield per acre (bushels)</th>
<th>Decrease in yield per acre (bushels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>6</td>
<td>0</td>
<td>75.1</td>
<td>--</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>1</td>
<td>65.4</td>
<td>9.7</td>
</tr>
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<td>6</td>
<td>4</td>
<td>2</td>
<td>58.6</td>
<td>16.5</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>3</td>
<td>50.1</td>
<td>25.0</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>4</td>
<td>42.1</td>
<td>33.0</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>5</td>
<td>39.4</td>
<td>35.7</td>
</tr>
</tbody>
</table>

From this experiment we can readily see that it pays to select only those ears that have a test of approximately 100 per cent.

C. Preparing the Ears for Planting:

After having carefully gone over the supply of seed ears, according to the method already described, the following points must be observed:

1. Select from 25 to 40 ears for the Ear-to-Row breeding plot. Start with the best obtainable.

2. Select ears on which germination test has been made.

3. Butt and tip each ear and discard these kernels.

4. Shell each ear separately and place kernels in paper or cloth sack, numbering each sack differently from 1 to as high a number as the ears selected.

References:
"Yields From Two Systems of Corn Breeding", S. D. Experiment Station Bulletin No. 184, Brookings, S. D.
"Corn Raising in Minnesota", Agricultural Extension Division, Special Bul. #58, University Farm, St. Paul, Minnesota,