## UNIVERSITY OF ILLINOIS

# Agricultural Experiment Station

### URBANA, ILLINOIS, JANUARY, 1918

CIRCULAR No. 211

# THE SEED-CORN SITUATION FOR 1918

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#### GERMINATION TESTS

The ear from which these kernels came should A-A poor germination. be thrown into the feed crib.

B-A test that indicates weakness. In a year of seed scarcity this ear may be as good as the average. A second set of kernels should be tested.

0-A good eight day test.

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The seed-corn situation in Illinois is the most serious in the history of the state. Seed corn is scarce. Many counties will be unable to supply their own seed. This means that large quantities must be brought in from other localities. Much has been published to discourage shipping seed in from distant sections, for in most cases marked differences in soil and climate result in poor yields from the imported seed. The general rule has been not to recommend the use of the imported seed corn, but the application of this rule can be carried too far even in normal times, and during the present critical condition which confronts the Illinois producer, a more liberal attitude must be assumed if seed corn is to be available for all who wish to plant this crop next May.

For the present season, seed must be shipped from central or more southern counties to areas in the northern part of the state. The University of Illinois has some specific data bearing on the movement of corn from Urbana, Champaign county, in central Illinois, to DeKalb, DeKalb county, in northern Illinois, a distance of 125 miles in latitude. These figures are submitted because they seem to have a value in throwing light upon the question whether imported seed may be expected to produce satisfactory results. The soils on which this corn was grown are very similar. Both would be considered very good corn land. The original seed was produced near Urbana and sent each year to DeKalb for planting.

COMPARATIVE YIELDS OF CORN GROWN AT URBANA AND AT DEKALB FROM SEED PRODUCED NEAR URBANA, ILLINOIS

(Bushels per acre)

| Reid's Valler D Variety | Years compared    | Urbana |
|-------------------------|-------------------|--------|
| Leaming.                | . 1908-1913, 1915 | 57.8   |
| Riley's Favorite.       | . 1908-1913       | 56.5   |
| Silvermine              | . 1912-1916       | 56.6   |
| Illinois High Ear.      | · 1907-1914       | 50.9   |
|                         | . 1907-1915       | 51.3   |

It will be observed from the above figures that the yields for Urbana and DeKalb vary but slightly, and in the present emergency these differences would appear negligible. At DeKalb, however, the corn is not always so well matured as at Urbana. 2

The score card, which has often been used as a guide in selecting seed corn, must be discarded for this season.

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Practical experience and the results of investigation have shown that fancy points are not necessarily associated with high yield. The University of Illinois has figures which seem to show that small ears selected from the crib may yield about as much as larger ears. It should be kept in mind that these figures are based on crib selection. and that this method is not to be recommended in normal years.

This year in order to get corn that will grow it will be necessary to disregard many of the points which have been considered important. If necessary, we must sacrifice everything for strong, vigorous germination.

From every section of the state reports have been received which indicate that most of the corn saved for seed is very low in germination. This means that in most cases every ear of seed must be tested, altho if a composite test shows a germination of 95 percent the individual ear test is not very important. This composite test may be made as follows:

Go thru the crib and pick out 100 ears which would ordinarily be considered fit for seed; select six kernels from the ears according to the method described later under the rag-doll test, and place them in some sort of a germinator. If, by the above method, a test of 95 percent is obtained (at least 570 kernels showing good germination), further examination of the corn in this respect will be unnecessary.

It is probable, however, that very little corn will be acceptable by the composite test. Therefore, the individual ear test will be found necessary. This means that every ear must be tried for germination. There are numerous methods of applying this individual ear test, and there are many kinds of commercial testers on the market, but homemade devices are as good as those which cost money. Two general types of homemade testers and general suggestions for their management are described below.

#### THE RAG-DOLL TESTER

The rag-doll tester is suggested for the following reasons:

- I. It will, if properly handled, give a reliable index of the vitality of seed corn.
- 2. It is cheap and easily made.
- 3. It is simple in operation, and takes no more time than other more expensive testers.
- 4. As a rule, there is little difficulty experienced with molds which develop in certain other testers.
- 5. It is easily disinfected.

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- 6. Counting the grains is less difficult, because the entire kernel with its roots can be observed.
- 7. The rag-doll tester is small, and "dolls" can be stored away in a limited space.





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Making the Tester.—Cut common muslin into strips 5 to 7 feet long and 10 inches wide. Hem the edge in order to prevent raveling. Then leaving at each end an unmarked area 8 to 10 inches deep, divide the strip of cloth down the center with a heavy line which cannot be easily erased and which will not blur upon wetting. Mark this area off into rectangles 3 inches wide and 5 inches long by crossing the center line perpendicularly with lines 3 inches apart. The tester is now ready for filling.

Arranging the Ears.-Place the ears in a convenient location where they will not be disturbed. The ears should be numbered to correspond with the squares in the tester. These may be placed in consecutive order on a table, but numbering them is better. (See Fig. 1) Preparing the "Doll" for the Test. --- First dip the tester in water, then wring gently, and spread it on a table of convenient height for comfortable work. The cloth when slightly moist will be more easily handled, and the grains will not slip about on the tester before it is rolled up. Removing and Placing the Kernels.—Six kernels from each ear should be used in each division of this tester. The grains should be placed germ-side up, and all the tips should point in the same direction in order to make possible the rapid reading of results at the end of the test. Remove one grain about two inches from the butt. Turn the ear one-fourth around and remove a kernel from the middle of the ear. Turn the ear again one-fourth around in the same direction as before and remove a grain two inches from the tip. Holding the ear in the same position, remove a kernel about two inches from the butt. Turn the ear and repeat the above operation, taking a kernel from the middle and one two inches from the tip. Thus, when the ear has been turned around once, six kernels will have been removed: two from the butt, two from the middle, and two from the tip; and each of the two grains from the butt, the middle, and the tip will have come from opposite sides of the ear.



# FIG. 2.—THE TESTER SHOULD BE ROLLED FIRMLY BUT NOT TIGHTLY AROUND A STICK OR SMALL CARDBOARD MAILING TUBE AS A CORE

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Rolling the "Doll" and Germinating the Corn.-Roll the cloth, with the grains, firmly but not tightly around a stick or a small piece of wire screening, bent in the form of a cylinder, for a core (Fig. 2). Place around each end, and the center if desired, a string or a rubber band (Fig. 3). Place the roll in a bucket of water with a temperature of about 80° F., and let it remain for about ten or fifteen hours. At the end of this period, pour off the water and store the tester in a warm room. A box, a bucket, or a moist sack may be placed



### FIG. 3.-THE RAG DOLL ROLLED AND READY FOR SOAKING

over the roll so that it will not dry out, but some allowance should be made for ventilation ( ) made for ventilation. A number of "dolls" may be used at the same time, making it possible to test a large quantity of corn quickly. It requires about two yards of 36-inch muslin to each 11/4 bushels of corn tested.

At the end of five to eight days the count may be made and the germination test recorded.



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are displaced. Note the germination of the kernels in each rectangle and count those good that show strong, vigorous shoots and roots from all six kernels (see illustration on front cover). Ears showing one or two kernels with weak shoots and roots should be discarded or laid out and retested. If the same results are obtained in the second test, the ear should be discarded. All ears in the test that show more than two kernels with weak shoots and roots should be thrown out at once. If only one kernel of the six from any one of the ears fails to grow, and the others are good, the ear should be retested; but if no better results are obtained in the second test, the ear should be thrown into the feed crib. All ears with more than one dead kernel among the six kernels in the test should be thrown out immediately.

After Each Test the cloth should be sterilized by boiling, in order to guard against trouble with molds when using it again.

#### THE SAWDUST AND THE SAND-BOX TESTER

The Sawdust Box is a favorite type of tester. Construct a box 24 by 30 inches, and 3 inches deep, inside measurements, and fill to within an inch of the top with sawdust which has been thoroly moistened. It is best to soak this material for 10 to 12 hours before placing it in the test box. When the sawdust is put into the container, pack it firmly and smooth it down even, to within about one inch of the top. Place stout muslin over the sawdust and tack it securely to the edges of the box; then rule it into 2-inch squares. Number the squares, and then take from each ear six grains as described for the rag-doll method, and place them on the squares, being careful that they are placed on numbers corresponding to the numbers of the ears from which they have been taken. Put these ears away where they will not be disturbed.



FIG. 4.---THE SAWDUST BOX IS A FAVORITE TYPE OF TESTER

When the box is filled, cover the grains with a clean cloth, and moisten cloth and grain. Place moistened sawdust over the top, and if this



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After six to eight days at room temperature, a count may be made and all poor ears discarded. The same rigid method of elimination must be followed here as indicated for the final count and rejection in the rag-doll test.

The Sand Box is very commonly used by corn growers. It is made in the same way as that indicated for the sawdust box, the only difference being that sand is employed instead of sawdust. The sand is moistened before the grains are put in place. The grains are usually pushed into the sand point downward, or they may be pressed into the sand with the germ side up. Glass may be put over the tester, in which case the germination and growth of the grains may be observed. More frequently, however, layers of moistened cloth are put over the sand. The grains from different ears are kept separate by means of wires. It is suggested that sand gives a more even moisture supply and more even temperature than sawdust.

### CHOICE OF VARIETY

For Northern Illinois.—Continued tests have shown that for northern Illinois the leading high-yielding varieties which have been grown for a minimum of four years are Western Plowman, Riley's Favorite, Griffith's Early Dent, Reid's Yellow Dent, Hecker's Red, and Funk's 90 Day.

For Central Illinois.—At Urbana, seventeen varieties of corn have been under test for five years or more. Reid's Yellow Dent, Boone County White, Leaming, Silvermine, Riley's Favorite, Champion White Pearl, Golden Eagle, Farmer's Interest, Johnson County White, and Beatty's Yellow are all high-yielding strains.

For Southern Illinois.—On well fertilized land in southern Illinois, the leading high yielding varieties tested for a minimum of four years are Funk's 90 Day, Reid's Yellow Dent, Perrine's White Pearl, Chinese Poor Land, Grave's Yellow Dent, Champion White Pearl, and Silvermine. On unfertilized land, Champion White Pearl, Perrine's White Pearl, and Esterly's White have been the highest yielders for three years.

For a further discussion of varieties, see Bulletin 191 of the Illinois Agricultural Experiment Station. Early varieties should be selected when the crop is to be grown for grain alone. Later maturing varieties may be seeded for silage. This will help to make the best use of early varieties, which must be used in the northern part of the state and the supply of which at best is very limited.

