

5. Individual Ear Tests

A LARGE NUMBER of ears of carefully selected seed were obtained from each of one to three men in each county and planted in ear-to-row tests on the County Farm. Usually two men each brought in forty ears. A total of 6,387 single ears were tested in 168 demonstrations in 35 counties during eight years.

The purposes of these tests were: (1) to demonstrate the difference in yielding power of different ears of one strain of seed that appeared equally good and (2) to determine if possible the causes for such difference.

Each ear was numbered and a germination test of each made. The usual procedure was to plant each ear in four rows in different parts of the demonstration field to overcome differences in soil and drainage. The same information was recorded regarding stand at harvest time and the yield and quality of corn produced as for the other demonstrations.

DIFFERENCES IN YIELD

The one-fourth best ears averaged 11.3 bushels per acre more than the average of all ears and 24.8 bushels more than the one-fourth poorest ears in the 168 tests. See Figure 5.3.

The value of making a careful germination test of a few kernels from each ear was again well demonstrated. Ears showing from none to 50 percent germination

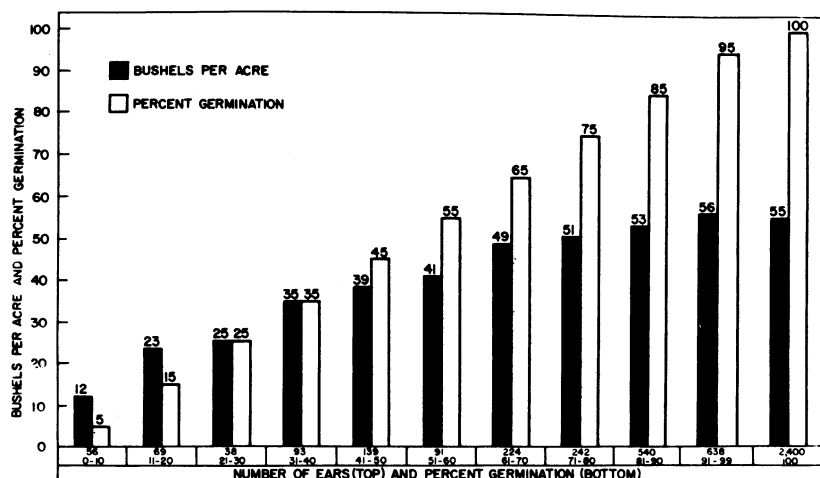


Fig. 5.1. Relation of yield to germination of single ears. Summary of 4,532 ears during five years of 1908 and 1910 to 1913.

averaged only 12 to 39 bushels per acre, with 4,532 ears from 100 men included in the comparisons. Ears showing 51 to 90 percent germination yielded 41 to 53 bushels and those testing better than 90 percent yielded an average of 55 or more bushels per acre (see Figure 5.1).

The individual ear tests, as did the farmers' variety tests, demonstrated the poor condition of the seed corn being planted by Iowa farmers. The seed used in the individual ear tests was obtained from the more progressive farmers of the counties in which the tests were made. Even so, only five of 80 lots of ears for which data were available had all ears with more than 90 percent germination. It is no wonder that the idea of testing a few kernels from each ear as a means of seed selection spread rapidly.

Average yields of individual ears increased at the rate of seven to 10 bushels per acre for each 10 percent increase in stand, up to 50 percent stand. The increase was from three to four bushels for each 10 percent increase above 50 percent (see Figure 5.2).

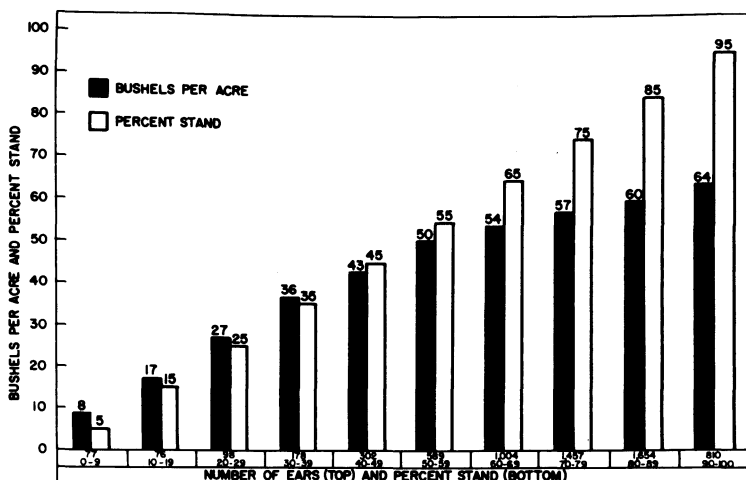


Fig. 5.2. Relation of yield to stand of single ears. Summary of tests of 6,245 ears during nine years of 1906 to 1914, except 1907.

BARREN STALKS AND POOR QUALITY OF GRAIN CAUSED LOW YIELDS

Yield and quality of corn from high- and low-yielding ears were compared with yield and quality of corn grown with the same stands in the thickness of planting tests conducted the same years in the same counties, as a means of determining the extent to which difference in yield was caused by factors other than differences in the stands.

As much as 9.8 bushels of the 11.3 bushels higher-than-average yields obtained from the one-fourth high-yielding ears was evidently due to other causes than better stands of stalks (see Figure 5.3).

This same condition was found in the study of the yields of corn from different farmers, as reported in Chapter 3. However, the effects of other factors than stand appear greater among the individual ears of one lot of seed than among samples of seed from different farmers.

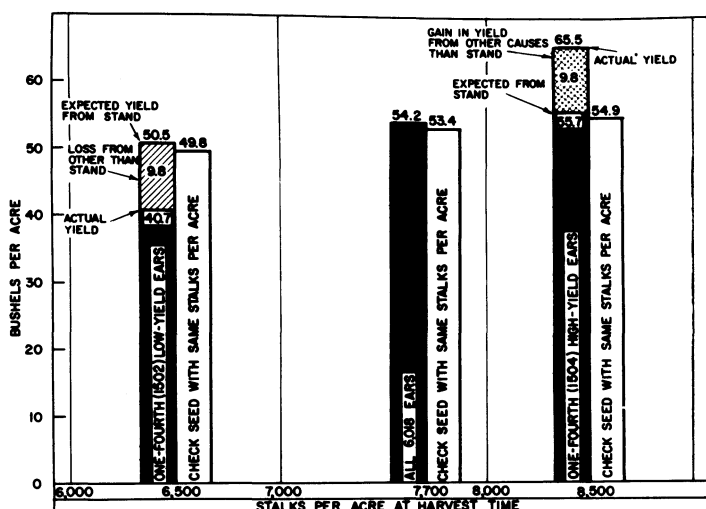


Fig. 5.3. Loss or gain in yield of single ears from causes other than thickness of stand. Summary of 6,018 ears in 151 tests in 33 counties during the seven years 1906 to 1913, except 1907.

All ears produced an average of 6.8 percent of barren stalks, as shown in Figure 5.4. The one-fourth highest yielding ears produced 5 percent barren stalks. They had considerably better stands than the average and would have been expected to have about 7.9 percent barren stalks when compared with corn with the same stands in the thickness of planting tests. This relation of barrenness to yield was shown in each of the many demonstrations.

The one-fourth low-yielding ears produced 8.9 percent barren stalks on relatively thin stands. They would have been expected to produce only 5.8 percent barren stalks when compared with corn with the same stands in the thickness of planting tests.

The thickness of planting tests showed that the thicker the stands, the smaller the proportion of marketable ears. However, in the single ear tests the high-yielding ears

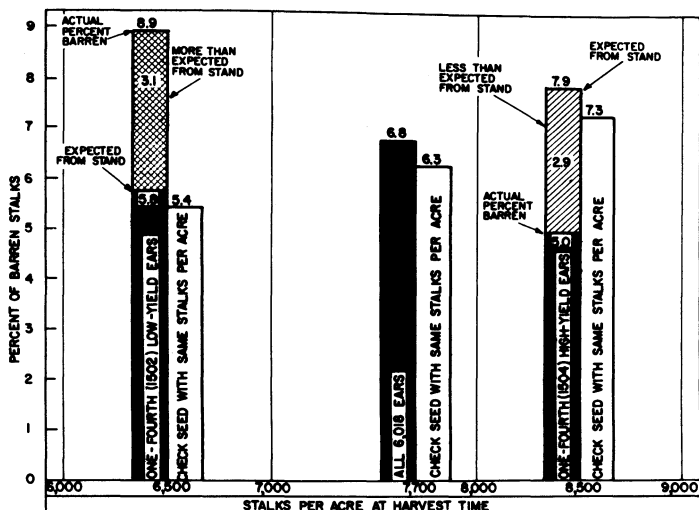


Fig. 5.4. Higher or lower percentage of barren stalks from causes other than the thickness of stand.

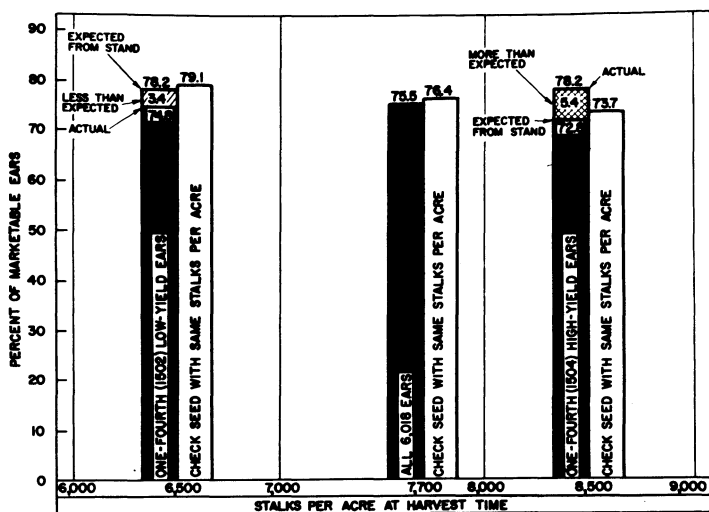


Fig. 5.5. Higher or lower percentage of marketable ears from causes other than thickness of stand.

with their thicker stands produced a larger percentage of marketable ears. Also, the low-yielding ears with their thin stands produced less marketable corn (see Figure 5.5).

Two facts were established by these Individual Ear Demonstrations: (1) many low-yielding ears could be eliminated by making careful germination tests of a few kernels from each ear. (2) low percentages of barren stalks and high percentages of marketable ears were closely associated with high yields.