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UNIVERSITY OF ILLINOIS.
Agricultural Experiment Station.

URBANA, FEBRUARY, 1895.

BULLETIN NO. 37.

CORN EXPERIMENTS, 1894.

SUMMARY.

Experiment No. 1, Corn, Testing Varieties. (See pages 4-16, also bulletins Nos. 4, 8, 13, 20, 25 and 31.) This experiment shows important differences in the varieties of dent corn, illustrating the need of careful selection of varieties by our farmers. Those classed as medium maturing varieties have usually given best results. In six out of seven years the medium maturing varieties have given larger yields than either the early or late varieties. For the seven years the medium maturing varieties averaged 65.2 bu. air-dry shelled corn per acre; the late, 58.8 bu.; and the early, 55.5 bu. The medium maturing varieties average about as follows: Stalks about nine feet tall, bearing ears at a height of rather more than four feet. The yield is about 9,500 ears to an acre, weighing one-half pound each. The height of stalks and weight of ears is less in the early maturing, and greater for the late, while the number of ears is less for the late, and about the same for the early. An average of about 83 per cent. of the kernels planted produces mature stalks. Barrenness does not seem to be a variety characteristic. It will vary much with the thickness of planting and nature of season, there being more barren stalks in an unfavorable year, or when planted thick, than in a favorable year, or when planted thin. White varieties have given larger yields than the yellow ones.

In general these tests indicate that the average farmer might largely increase his yields of corn with very little additional expense.

Experiment No. 3, Corn, Time of Planting. (See pages 16-18, also bulletins as above.) The largest average yield is from planting

from the 11th to 18th of May, with very little less from planting any time from April 27th to May 25th. Very early planting usually requires more cultivating and not unfrequently produces the poorest stand.

Experiment No. 4, Corn, Depth of Planting. (See page 18, also bulletins as above.) Planting one inch deep has given better results than planting at any greater depth. Plant at no more than sufficient depth to get moisture to germinate seed.

Experiment No. 5, Corn, Thickness of Planting. (See page 19, also bulletins as above.) When planting in rows 3 ft. 8 in. apart the largest yield of grain is obtained by planting one kernel every twelve inches; while the food value of total product has been greater when one kernel has been planted every six inches. When planting in checks 3 ft. 8 in. apart the largest yield of grain is from four kernels in a hill.

Experiments No. 6, Corn Planting in Hills or Drills; No. 8, Corn, Frequency of Cultivation; No. 9, Corn, Depth of Cultivation; and No. 10, Corn, Effect of Root Pruning. (See page 19, also bulletins as above.) There is no difference between planting in hills and drills, except that hills give a chance for best cultivation. Shallow cultivation has given better results than deep, the average yield for five years being 5.9 bu. greater for the shallow cultivation than for the deep. Root pruning has always reduced the yield. Very frequent cultivation has never shown sufficiently better results to justify its practice. Better crops can be produced without other cultivation than merely scraping the surface to destroy weeds than by deep cultivation.

Experiment No. 23, Rotation, University Experiments, Continued. (See page 19, also bulletins Nos. 8, 13 and 31.) The largest average yield of corn has been obtained by the liberal annual application of barnyard manure, while much larger yields have been secured by rotation than by continuous cropping, either without any manure or by the use of commercial fertilizers. Barnyard manure has given poorest results in very dry years.

Experiment No. 89, Corn, Cross-Fertilization. (See page 20, also bulletins Nos. 25 and 31.) Crossing varieties has usually increased the yield.

Experiment No. 134, Corn, Effect of Removing Tassels. (See pages 21-23, also bulletin No. 20.) Removing tassels in 1894 increased the yield 13 per cent., while in two former years there was no advantage found in detasseling. At other stations, the results have most frequently been detrimental. The good results occurred when there was little rainfall during the period of removing the tassels.

Characteristics of the Soil and Season.

The experiments were tried on the dark colored fertile prairie soil, common to central Illinois. The surface soil is about eighteen inches

deep, underlaid with yellow clay. The land used for the variety test was in oats in 1893, and was plowed in the spring, no fertilizers being applied. Most of the land used in other experiments was in corn in 1893, and was plowed in the fall, after the stalks were removed, no manure being applied except on plat 1 of experiment No. 23. In all cases the corn was planted by hand in checks 3 feet 3 inches apart, and covered with a hoe.

The season of 1894, while fairly favorable to the corn crop in central Illinois, was somewhat short in rainfall. The aggregate rainfall, 12.43 inches, for the five months, May, June, July, August, and September was well distributed through these months.

The mean temperature for each of the five months was slightly above the average of the same months for the past six years. Different parts of the tract used for the varieties showed marked variation in its capacity to withstand the drought, hence less importance should be attached to the yields of different varieties this year than to their average yields for a series of years.

The table gives the mean temperature and the rainfall in inches from May to September, inclusive, for each year from 1887 to 1894. The records for 1887 and 1888 are those of the Illinois Weather Service for central Illinois. For the remaining years the records are those of the observations made at the Station.

TEMPERATURE AND RAINFALL DURING THE CORN SEASON OF YEARS NAMED.

| Year. | Mean temperature, F. | | | | | |
|-------------------------|----------------------|-------|-------|---------|-------|-------|
| | May. | June. | July. | August. | Sept. | Ave. |
| 1887..... | 67.9° | 73.6° | 80.4° | 75.2° | 66.4° | 72.7° |
| 1888..... | 59.4° | 71.3° | 77° | 72.4° | 62.4° | 68.5° |
| 1889..... | 59.2° | 65.5° | 72.7° | 69.2° | 61.3° | 65.6° |
| 1890..... | 58.3° | 74.6° | 73° | 68.7° | 60.5° | 67° |
| 1891..... | 58.4° | 72° | 70° | 70.2° | 69.2° | 68° |
| 1892..... | 57.9° | 70.6° | 73.3° | 71.5° | 63.9° | 67.4° |
| 1893..... | 57.4° | 70.5° | 76.4° | 71.1° | 66.5° | 68.4° |
| 1894..... | 59° | 73.4° | 73.8° | 72.3° | 65° | 68.7° |
| Average, 1889-1894..... | 58.4° | 71.7° | 73.2° | 70.5° | 64.4° | 67.5° |

| | Rainfall, inches. | | | | | Aggregate. |
|-------------------------|-------------------|-------|-------|---------|-------|------------|
| | May. | June. | July. | August. | Sept. | |
| 1887..... | 3.84 | 1.62 | 1.65 | 2.56 | 3.68 | 13.35 |
| 1888..... | 6.84 | 5.75 | 5.34 | 3.14 | 1.95 | 23.02 |
| 1889..... | 5.52 | 6.81 | 5.84 | .6 | 2.74 | 21.51 |
| 1890..... | 3.56 | 3.8 | 2.83 | 1.93 | 1.19 | 13.31 |
| 1891..... | .89 | 2.08 | 1.41 | 2.86 | .41 | 7.65 |
| 1892..... | 7.86 | 5.36 | 2.5 | 2.43 | .93 | 19.08 |
| 1893..... | 4.83 | 1.55 | .59 | .06 | 3.62 | 10.65 |
| 1894..... | 3.3 | 1.78 | 1.08 | 2.06 | 4.21 | 12.43 |
| Average, 1889-1894..... | 4.33 | 3.56 | 2.37 | 1.66 | 2.18 | 14.1 |

Experiment No. 1. Corn, Testing Varieties.

DIAGRAM OF PLATS.

| | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|
| 81 | 77 | 73 | 69 | 65 | 61 | 57 | 53 | 49 | 45 | 41 | 37 | 33 | 29 | 25 | 21 | 17 | 13 | 9 | 5 | 1 |
| 82 | 78 | 74 | 70 | 66 | 62 | 58 | 54 | 50 | 46 | 42 | 38 | 34 | 30 | 26 | 22 | 18 | 14 | 10 | 6 | 2 |
| 83 | 79 | 75 | 71 | 67 | 63 | 59 | 55 | 51 | 47 | 43 | 39 | 35 | 31 | 27 | 23 | 19 | 15 | 11 | 7 | 3 |
| 84 | 80 | 76 | 72 | 68 | 64 | 60 | 56 | 52 | 48 | 44 | 40 | 36 | 32 | 28 | 24 | 20 | 16 | 12 | 8 | 4 |

Tests of varieties of dent corn have been made for eight consecutive years reports of which may be found in bulletins Nos. 4, 8, 13, 20, 25 and 31.

It has been the object from time to time to drop from the test such varieties as were clearly shown to be inferior to the average, and continue only those of high merit, with which to compare such new varieties as might come to notice.

The land used in 1894 was in oats in 1893 and in wheat in 1892. Excepting plats 1, 5, and the east third of 9, which were not plowed at all, it was plowed about five inches deep during April and harrowed and smoothed just before planting. Excepting plats 77, 78 and 79 the corn was planted May 9th and 10th. The three excepted plats were planted a few days later. It was planted by hand, four kernels a hill (excepting plats 81 and 83, which had only three kernels a hill, and which are left out of the following tables), in checks 3 ft. 8 in. apart and covered from one to two inches deep with a hoe.

There were 84 plats, as shown in the diagram, each one-fortieth of an acre, 2 rods or 9 hills square. They were so planted that corn grew on every side, there being extra rows on the border.

May 17th to July 2d, the corn was cultivated four times with surface cultivators, the first three times with the Superior, and the fourth time with the Tower. The diagonal line running across plats 57, 61, 62, 63 and 68 is the approximate location of a tile drain, and is the lowest part of the tract used. The land on both the east and west sloping toward it. The fact that the most of the large yields were made in the vicinity of this drain, and that the same varieties planted here yielded more than twice as much as when planted near the east end of the tract, indicates that this part withstood the drought very much the best.

The chinch bugs from an adjacent wheat field attacked the corn soon after the wheat was harvested, but by diligent work in constructing barricades of finely pulverized earth, over which they were usually unable to pass, and by the liberal use of coal tar, which is very obnoxious to them, their depredations were confined to the first row of plats on the north, where by the free use of kerosene emulsion they were destroyed by the million. The north row of plats was injured to the

extent of about 25 per cent. The results from these plats are published in the lower part of the tables, but are not to be compared with those of the uninjured plats.

The number of barren stalks, one-eared and two-eared stalks, was ascertained for the middle third of each plat, and the average height to butt of ear and tip of tassel for each plat. Observations were made on the time of ripening. October 15th to November 5th, the plats were husked by thirds, and the weight and number of ears ascertained for each third. The middle third was at once shelled and the number and weight of both good ears and nubbins, and the weight of both shelled corn and cobs ascertained. A pint jar of shelled corn from each plat was sent to the laboratory for determination of water. Eleven per cent. is taken as the average water content of air-dry corn.

DUPLICATE PLATS.

While the attempt has always been to have uniform soil and like treatment throughout, the differences in yield of plats planted with the same variety have always been considerable. This year there were four plats of Burr's white and five of Boone County white that were in the part not affected by the chinch bugs.

In case of each variety the smallest yield was less than one-half that of the largest. This is a greater variation than is usually found in the same variety, and it is believed to be chiefly due to the nature of the season and the variation in the capacity of the soil to retain moisture. Had the season been wet instead of dry, it is believed that the plats that gave the largest yields would have given the smallest. This is a striking illustration of how little may be the value of a single year's results.

When the variation of yield of different varieties does not exceed that of different plats of the same variety the results are inconclusive. A greater variation may properly be attributed, in part at least, to the variety. If single plats are used, it is only after varieties have been tested for a series of years that we can conclude which are the most prolific; but other things can be ascertained in a single year, such as time of maturity, size, ratio of ears to stalks, ratio of shelled corn to cobs, and the general characteristics of stalk and ear. If several plats, widely distributed over the tract, are used for each variety and the average yields ascertained, these form a better basis for a comparison of the varieties in respect to yield; for in this way the effect of differences in the conditions of the test is much diminished.

YIELD PER ACRE FROM DUPLICATE PLATS, BU.

| Variety. | a | b | c | d | e | Average. |
|----------------------|------|------|------|------|-------|----------|
| Boone Co. white..... | 43.9 | 78.7 | 98.4 | 86.6 | 64 | 74.3 |
| Burr's white..... | 38.5 | 78.2 | 90.2 | 71.8 | ..... | 69.7 |

MIXTURES.

Two plats were planted, each with equal parts of two varieties of corn, and two with equal parts of four varieties. One of the first two was among those injured by chinch bugs, so account is taken only of the other three. The accompanying table gives the per cent. of barren stalks, number of ears and bushels per acre for each variety planted separately, and their average as compared with the result of the mixture. In every case the mixtures gave very much the larger yields, but this is believed to be due chiefly to their more favorable location. In 1893, in four out of five cases, the yields were larger for the mixtures, while in 1892, in four out of five they were smaller.

RESULTS OF MIXTURES, 1894.

| Plat No. | Name of Variety. | Per cent barren stalks. | Yield per acre. | |
|-------------|---------------------------|-------------------------|-----------------|-------------------|
| | | | No. of ears. | Bu. air-dry corn. |
| 16 | Champion white pearl..... | 13 | 8440 | 51 |
| 14 | First premium..... | 15 | 7000 | 34 |
| | Average..... | 14 | 7700 | 42.5 |
| 54 | Mixture..... | 16 | 9400 | 77.8 |
| Av. 4 plats | Burr's white..... | 14 | 10100 | 69.7 |
| " 5 " | Boone county white..... | 7 | 9824 | 74.3 |
| 8 | Dunlap's white..... | 2 | 5800 | 41.8 |
| 2 | Dillon's white..... | 5 | 8940 | 57.7 |
| | Average..... | 7 | 8666 | 60.9 |
| 55 | Mixture..... | 15 | 10080 | 90.3 |
| 22 | Clark's Onarga..... | 19 | 9080 | 44.2 |
| 23 | Edmonds..... | 6 | 9920 | 54.3 |
| 30 | Champion yellow dent..... | 9 | 9200 | 60.2 |
| 32 | Reid's yellow dent..... | 5 | 10080 | 66.9 |
| | Average..... | 10 | 9570 | 56.4 |
| 70 | Mixture..... | 19 | 10840 | 74.3 |

CLASSIFICATION OF VARIETIES.

The table on page 7 gives a classification of the varieties tested this year, and the yield of air-dry corn for each variety, together with the average for its class. It is based upon the time of ripening, color, and smoothness or roughness of the outer end of the kernels. Varieties maturing before Sept. 12th are classed as early; those maturing Sept. 12th to 30th, as medium; and those maturing Oct. 1st, or later, as late.

The varieties that are very near the dividing lines, as to time of maturity and smoothness or roughness, are subject from year to year to change from one class to another.

RESULTS.

The number of plats in each of the three classes, early, medium, and late, and the results for each class for each of seven years, are shown in the table on page 8. In each of the years 1888 to 1892, inclusive, and

SYNOPSIS OF VARIETIES, 1894.

Yields.

| | | | | | | |
|------------------------------------|------------------------|-----------------------------------|---------------------------------|---------------------------|--------|--------|
| Corn.... | Early... | Yellow.. | Smooth.. | Cuban queen..... | 72.7 | } 60.3 |
| | | | | Waterloo extra early..... | 64.9 | |
| | | Rough.. | Minnesota king..... | 39.4 | | |
| | | | Huron..... | 64.3 | | |
| | | | Edmonds..... | 54.3 | } 61.2 | |
| | Leaming..... | 67.6 | | | | |
| | Pride of Columbia..... | 49.9 | | | | |
| | White.. | Smooth.. | Edmonds-Murdock cross..... | 73.0 | } 64.6 | |
| | | | Van's early..... | | | |
| | Rough.. | Smooth.. | White (no name)..... | 62.7 | } 66.1 | |
| | | | Davis improved..... | 69.6 | | |
| | Medium.. | Yellow.. | Smooth.. | Arleus..... | 43.6 | } 60.9 |
| | | | | Fisk's yellow..... | 45.2 | |
| | | | | Clark's Onarga..... | 44.2 | |
| | | | | Leaming..... | 62.1 | |
| Yellow (no name)..... | | | | 37.0 | | |
| Star..... | | | | 53.2 | | |
| Ried's yellow dent..... | | | | 66.9 | | |
| Legal tender..... | | | | 57.0 | | |
| John Cloud..... | | | | 75.2 | | |
| Yantis..... | | | | 85.4 | | |
| Rough.. | | Sterling..... | 72.6 | } 54.3 | | |
| | | Leaming-Edmonds cross..... | 60 | | | |
| | | Golden beauty-Leaming cross..... | 72.7 | | | |
| | | Leaming-golden beauty cross..... | 87.0 | | | |
| | | Early mastodon..... | 68.3 | | | |
| Mixed.. | Smooth.. | Queen of the prairie..... | 46.7 | } 76.1 | | |
| | | The Conqueror..... | 58.3 | | | |
| | | Steward's improved..... | 32.5 | | | |
| | | Riley's favorite..... | 62.8 | | | |
| | | Champion yellow dent..... | 60.2 | | | |
| White.. | Smooth.. | Mortgage lifter..... | 61.8 | } 49.5 | | |
| | | Calico..... | 91.5 | | | |
| | | Leaming-Burr's white cross..... | 60.7 | | | |
| | | Edmonds-Burr's white cross.. | | | | |
| | | White (no name)..... | 57.7 | | } 62.3 | |
| Boone Co. white (av. 5 plats)..... | 74.3 | | | | | |
| Burr's white (av. 4 plats)..... | 69.7 | | | | | |
| Forsyth's white..... | 51.2 | | | | | |
| First premium..... | 34.0 | | | | | |
| Rough.. | Smooth.. | Mills Co. white..... | 37.2 | } 56.5 | | |
| | | Champion white pearl..... | 51.0 | | | |
| | | Charles Cloud..... | 90.2 | | | |
| | | Waggoner..... | 88.9 | | | |
| | | White (no name)..... | 69.0 | | | |
| Late.... | White.. | Smooth.. | White beauty..... | 55.4 | } 56.8 | |
| | | | Dunlap's white..... | 41.8 | | |
| | | | J. J. Freeland..... | 77.0 | | |
| | | | Champ.w.p.-cranberry cross..... | 51.7 | | |
| | | | Helms improved..... | 44.3 | | } 56.8 |
| Hickory king-Helms imp.cross..... | 79.3 | | | | | |
| White (no name)..... | 46.8 | | | | | |
| Rough.. | Smooth.. | Burr's white-cranberry cross..... | | } 47.0 | | |

NUMBER OF EARS PER ACRE, AND WEIGHT OF 100 EARS, 1894.

| Plat No. | No. ears per acre. | | | Wt. 100 ears, lb. | | | Plat No. | No. ears per acre. | | | Wt. 100 ears, lb. | | |
|----------|--------------------|----------|--------|-------------------|----------|-----------|----------|--------------------|----------|--------|-------------------|----------|-----------|
| | Good ears. | Nubbins. | Total. | Good ears. | Nubbins. | Av. ears. | | Good ears. | Nubbins. | Total. | Good ears. | Nubbins. | Av. ears. |
| 2 | 7,106 | 1,834 | 8,940 | 53 | 27 | 51 | 40 | 8,881 | 3,039 | 11,920 | 64 | 23 | 55 |
| 3 | 4,932 | 3,148 | 8,080 | 65 | 18 | 51 | 42 | 7,650 | 2,550 | 10,200 | 57 | 31 | 51 |
| 4 | 5,694 | 2,946 | 8,640 | 56 | 36 | 46 | 43 | 5,888 | 3,312 | 9,200 | 49 | 23 | 40 |
| 6 | 5,804 | 3,480 | 9,240 | 49 | 20 | 38 | 44 | 8,389 | 2,331 | 10,720 | 51 | 26 | 45 |
| 7 | 7,004 | 3,276 | 10,280 | 59 | 33 | 51 | 46 | 8,157 | 1,523 | 9,680 | 71 | 34 | 59 |
| 8 | 3,974 | 1,826 | 5,800 | 68 | 23 | 57 | 47 | 9,065 | 1,295 | 10,360 | 61 | 20 | 56 |
| 10 | 4,562 | 3,158 | 7,720 | 49 | 23 | 39 | 48 | 7,791 | 2,209 | 10,000 | 68 | 28 | 60 |
| 11 | 6,369 | 2,571 | 8,940 | 56 | 25 | 44 | 50 | 8,386 | 2,254 | 10,640 | 76 | 31 | 67 |
| 12 | 7,920 | 2,280 | 10,200 | 40 | 24 | 44 | 51 | 7,962 | 2,078 | 10,040 | 84 | 25 | 74 |
| 14 | 4,454 | 2,546 | 7,000 | 55 | 25 | 42 | 52 | 8,371 | 2,349 | 11,720 | 70 | 30 | 58 |
| 15 | 5,202 | 2,838 | 8,040 | 42 | 23 | 35 | 54 | 7,546 | 1,854 | 9,400 | 68 | 25 | 62 |
| 16 | 6,330 | 2,110 | 8,440 | 54 | 25 | 46 | 55 | 8,608 | 1,472 | 10,080 | 75 | 27 | 68 |
| 18 | 4,373 | 3,547 | 7,920 | 53 | 22 | 44 | 56 | 6,114 | 2,446 | 8,560 | 52 | 16 | 41 |
| 19 | 4,136 | 2,344 | 6,480 | 51 | 19 | 38 | 58 | 8,950 | 2,210 | 11,160 | 48 | 26 | 42 |
| 20 | 6,235 | 1,765 | 8,000 | 57 | 23 | 45 | 59 | 10,853 | 1,727 | 12,580 | 53 | 27 | 49 |
| 22 | 6,400 | 2,680 | 9,080 | 50 | 15 | 30 | 60 | 5,531 | 2,589 | 8,120 | 53 | 19 | 44 |
| 23 | 7,316 | 2,604 | 9,920 | 52 | 27 | 43 | 62 | 8,887 | 2,193 | 11,080 | 71 | 25 | 66 |
| 24 | 7,865 | 1,015 | 8,880 | 60 | 31 | 51 | 63 | 9,222 | 2,298 | 11,520 | 75 | 22 | 66 |
| 26 | 5,587 | 2,853 | 8,440 | 62 | 35 | 58 | 64 | 5,376 | 3,584 | 8,960 | 59 | 15 | 41 |
| 27 | 6,022 | 2,258 | 8,280 | 54 | 18 | 41 | 66 | 8,253 | 3,827 | 12,080 | 62 | 22 | 47 |
| 28 | 6,709 | 1,851 | 8,560 | 53 | 19 | 52 | 67 | 6,284 | 5,076 | 11,360 | 60 | 14 | 38 |
| 30 | 6,754 | 2,446 | 9,200 | 65 | 33 | 53 | 68 | 7,955 | 2,045 | 10,000 | 83 | 32 | 69 |
| 31 | 7,172 | 3,188 | 10,360 | 48 | 23 | 44 | 70 | 8,193 | 2,647 | 10,840 | 70 | 15 | 54 |
| 32 | 8,087 | 1,993 | 10,080 | 58 | 22 | 50 | 71 | 9,019 | 3,741 | 12,760 | 55 | 21 | 44 |
| 34 | 7,617 | 2,623 | 10,240 | 62 | 30 | 53 | 72 | 8,998 | 3,082 | 12,080 | 64 | 26 | 54 |
| 35 | 7,821 | 2,499 | 10,320 | 55 | 20 | 50 | 74 | 6,741 | 3,840 | 8,540 | 72 | 21 | 58 |
| 36 | 5,442 | 1,518 | 6,960 | 72 | 21 | 60 | 75 | 7,080 | 2,640 | 9,720 | 40 | 16 | 30 |
| 38 | 6,700 | 2,820 | 9,520 | 60 | 17 | 52 | 76 | 8,440 | 2,400 | 11,840 | 45 | 20 | 38 |
| 39 | 8,009 | 2,631 | 10,640 | 59 | 23 | 56 | 78 | 7,045 | 3,235 | 10,280 | 63 | 26 | 52 |

| Plat No. | No. ears per acre. | | | Wt. 100 ears, lb. | | |
|----------|--------------------|----------|--------|-------------------|----------|-----------|
| | Good ears. | Nubbins. | Total. | Good ears. | Nubbins. | Av. ears. |
| 1 | 4,040 | 4,040 | 8,080 | 52 | 19 | 35 |
| 5 | 5,446 | 3,674 | 9,120 | 46 | 22 | 36 |
| 9 | 3,930 | 4,310 | 8,240 | 55 | 20 | 34 |
| 13 | 4,484 | 4,356 | 8,840 | 51 | 21 | 36 |
| 17 | 3,175 | 3,705 | 6,880 | 46 | 11 | 38 |
| 21 | 5,470 | 3,730 | 9,200 | 49 | 27 | 37 |
| 25 | 6,093 | 2,867 | 8,960 | 54 | 21 | 44 |
| 29 | 4,500 | 2,340 | 6,840 | 57 | 25 | 51 |
| 33 | 5,182 | 3,498 | 8,680 | 41 | 23 | 29 |
| 37 | 6,429 | 731 | 7,160 | 67 | 25 | 65 |
| 41 | 6,431 | 1,129 | 7,560 | 64 | 27 | 58 |
| 45 | 7,661 | 1,979 | 9,640 | 65 | 25 | 55 |
| 49 | 4,960 | 2,880 | 7,840 | 65 | 20 | 55 |
| 53 | 6,966 | 1,394 | 8,360 | 63 | 20 | 56 |
| 57 | 5,010 | 1,670 | 6,680 | 70 | 21 | 57 |
| 61 | 6,781 | 1,299 | 8,080 | 62 | 17 | 50 |
| 65 | 7,574 | 2,146 | 9,720 | 55 | 18 | 45 |
| 69 | 3,893 | 4,867 | 8,760 | 58 | 25 | 33 |
| 73 | 3,805 | 2,075 | 5,880 | 73 | 26 | 51 |
| 77 | 6,960 | 4,560 | 11,520 | 44 | 15 | 34 |
| 81 | 3,960 | 3,360 | 7,320 | 57 | 29 | 44 |

Plants injured by chinch bugs.

| Plat. | Name of Variety. | Seed received from. | Per cent. germinat'g in Geneva apparatus. | Per cent. of full stand of stalks. | Per cent. of bar- ren stalks. | Height, ft. | |
|-------|-----------------------|---------------------|--|---------------------------------------|----------------------------------|----------------|-------|
| | | | | | | Stalks. | Ears. |
| 2 | White corn (no name) | J. M. Dillon | 96 | 79 | 5 | 7.5 | 3.2 |
| 3 | Helms improved | Fred Helms | 62 | 75 | 16 | 8.1 | 3.8 |
| 4 | White beauty | R. H. Vanderhoof | 90 | 78 | 13 | 7.3 | 3.1 |
| 6 | Boone county white | James Riley | 88 | 92 | 7 | 7.2 | 3 |
| 7 | White corn (no name) | F. C. Sweet | 100 | 88 | 4 | 6.6 | 2.7 |
| 8 | Dunlap's white | H. M. Dunlap | 52 | 47 | 2 | 6.8 | 2.9 |
| 10 | Burr's white | University farm | 100 | 83 | 16 | 6 | 3 |
| 11 | Forsyth's white | J. A. Everitt | 98 | 84 | 10 | 7.1 | 3.2 |
| 12 | Van's early | R. H. Vanderhoof | 94 | 69 | 3 | 7.1 | 2.6 |
| 14 | First premium | J. A. Everitt | 88 | 78 | 15 | 7.2 | 3.2 |
| 15 | Mills county white | Nims Bros. | 98 | 86 | 8 | 5.8 | 2.5 |
| 16 | Champion white pearl | J. C. Suffern | 100 | 81 | 13 | 6.9 | 2.4 |
| 18 | Arleus | C. Freeman | 76 | 65 | 11 | 6.4 | 2.7 |
| 19 | Steward's improved | L. W. Steward | 92 | 60 | 22 | 6.9 | 2.7 |
| 20 | Fisk's yellow | E. C. Fisk | 96 | 76 | 20 | 7.9 | 3.7 |
| 22 | Clark's Onarga | H. H. Clark | 98 | 88 | 19 | 6.4 | 2.6 |
| 23 | Edmonds | Fruith & Edmonds | 100 | 78 | 6 | 6.7 | 2.7 |
| 24 | Leaming | T. P. Chester | 81 | 81 | 9 | 7.7 | 3.7 |
| 26 | Riley's favorite | James Riley | 88 | 83 | 10 | 7.8 | 3.2 |
| 27 | Yellow corn (no name) | Hiram Howard | 78 | 95 | 25 | 7.2 | 3.1 |
| 28 | Star | S. P. Campbell | 100 | 89 | 21 | 7.7 | 3.9 |
| 30 | Champion yellow dent | J. C. Suffern | 98 | 81 | 9 | 7.5 | 3.2 |
| 31 | Mortgage lifter | J. A. Everitt | 96 | 86 | 5 | 7.7 | 3.1 |
| 32 | Reid's yellow dent | J. L. Reid | 96 | 81 | 5 | 7 | 2.7 |
| 34 | Cuban queen | Nims Bros. | 96 | 81 | 8 | 7.4 | 3 |
| 35 | Waterloo extra early | Burpee & Co. | 90 | 85 | 14 | 7.2 | 3.1 |
| 36 | Legal tender | Nims Bros | 54 | 70 | 29 | 8.1 | 4 |

| | | | | | | | | |
|-----|--------------------------------------|------------------------------------|-------------------------|-------|-------|-------|-------|-------|
| 38 | Learning..... | W. T. Freeland..... | Windsor, Ill..... | 100 | 82 | 18 | 7 | 2.9 |
| 39 | John Cloud..... | " | " | 96 | 98 | 12 | 6.8 | 3.2 |
| 40 | Yantis..... | " | " | 100 | 86 | 6 | 7.6 | 3.7 |
| 42 | Sterling..... | T. J. Groves..... | Dana, Ind..... | 98 | 91 | 7 | 8.5 | 3.8 |
| 43 | Pride of Columbia..... | J. H. Beagley..... | Sibley, Ill..... | 96 | 81 | 17 | 7.1 | 2.7 |
| 44 | Davis improved..... | L. H. Davis..... | Earlville, Ill..... | 94 | 93 | 6 | 6.9 | 2.8 |
| 46 | J. J. Freeland..... | W. T. Freeland..... | Windsor, Ill..... | 100 | 80 | 14 | 8.4 | 3.5 |
| 47 | Burr's white..... | University farm..... | Champaign..... | 88 | 90 | 6 | 8.2 | 3.4 |
| 48 | Boone county white..... | James Riley..... | Thorntown, Ind..... | 88 | 85 | 3 | 8.2 | 3.6 |
| 50 | Charles Cloud..... | W. T. Freeland..... | Windsor, Ill..... | 98 | 86 | 3 | 9.1 | 3.4 |
| 51 | Waggoner..... | " | " | 92 | 86 | 7 | 8.2 | 4.1 |
| 52 | Calico..... | C. W. Bush..... | Putnam, Ill..... | 100 | 94 | 5 | 8 | 3.5 |
| 54 | Mixture (a)..... | " | " | 93 | 76 | 16 | 9.6 | 3.8 |
| 55 | Mixture (b)..... | " | " | 84 | 92 | 14 | 8.5 | 3.8 |
| 56 | Burr's white-cranberry cross..... | Exp't. No. 89-1893..... | Champaign..... | 100 | 92 | 15 | 8.3 | 4.3 |
| 58 | Learning-Burr's white cross..... | " | " | 100 | 97 | 4 | 7.4 | 3.1 |
| 59 | Hickory king-Helms imp. cross..... | " | " | 92 | 96 | 1 | 8.5 | 4.3 |
| 60 | Champ. w. pearl-cranberry cross..... | " | " | 100 | 88 | 22 | 7.8 | 3.2 |
| 62 | Boone county white..... | James Riley..... | Thorntown, Ind..... | 88 | 94 | 9 | 10 | 5 |
| 63 | Burr's white..... | University farm..... | Champaign..... | 100 | 94 | 12 | 8.7 | 3.9 |
| 64 | Edmonds-Burr's white cross..... | Exp't. No. 89-1893..... | " | 96 | 95 | 28 | 6.7 | 2.9 |
| 66 | Edmonds-Murdock cross..... | " | " | 100 | 99 | 12 | 8.2 | 3.4 |
| 67 | Learning-Edmonds cross..... | " | " | 98 | 111 | 34 | 7.6 | 3.2 |
| 68 | Boone county white..... | James Riley..... | Thorntown, Ind..... | 88 | 85 | 5 | 9.7 | 4 |
| 70 | Mixture (d)..... | " | " | 98 | 100 | 19 | 7.8 | 3.2 |
| 71 | Golden beauty-Leaming cross..... | Exp't. No. 89-1893..... | Champaign..... | 100 | 94 | 7 | 7.6 | 3.3 |
| 72 | Learning-golden beauty cross..... | " | " | 100 | 82 | 2 | 7.7 | 4.2 |
| 74 | Early Mastodon..... | Northrup, Braslan, Goodwin Co..... | Minneapolis..... | 90 | 81 | 9 | 7.7 | 2.8 |
| 75 | Minnesota king..... | " | " | 82 | 76 | 6 | 6.2 | 1.8 |
| 76 | Huron..... | " | " | 100 | 83 | 2 | 7.3 | 2.8 |
| 78 | White corn (no name)..... | E. O. Chester..... | Champaign..... | 100 | 81 | 5 | 8.2 | 3.8 |
| 79 | Queen of the prairie..... | J. W. Council..... | Fancy Prairie, Ill..... | 100 | 93 | 21 | 7.8 | 3.1 |
| 80 | White corn (no name)..... | J. H. Harrison..... | Salisbury, Ill..... | ..... | 85 | 7 | 7.1 | 2.4 |
| 80a | The conqueror..... | Northrup, Braslan, Goodwin Co..... | Minneapolis..... | ..... | ..... | ..... | ..... | ..... |
| 82 | Burr's white..... | University farm..... | Champaign..... | 100 | 97 | 20 | 8.3 | 3.1 |
| 84 | Boone county white..... | James Riley..... | Thorntown, Ind..... | 88 | 82 | 10 | 8.1 | 3 |

VARIETY OF CORN; SOURCE OF SEED; GERMINATION; STAND; BARREN STALKS; HEIGHT OF STALKS AND EARS, 1894.—Continued.

The following plats were injured by the chinch bugs:

| Plat. | Name of Variety. | Seed received from. | Per cent. germinat'g in Geneva apparatus. | Per cent. of full stand of stalks. | Per cent. of barren stalks. | Height. ft. | |
|-------|-----------------------------|---------------------|--|---------------------------------------|--------------------------------|----------------|-------|
| | | | | | | Stalks. | Ears. |
| 1 | Boone county white. | James Riley | 88 | 78 | 14 | 6.1 | 2.2 |
| 5 | Burr's white. | University farm. | 100 | 81 | 17 | 5.9 | 2.4 |
| 9 | Lowa king. | E. S. Teagarden | 96 | 71 | 26 | 5.7 | 2.2 |
| 13 | Short stalk. | J. B. Martin | 92 | 81 | 12 | 6.4 | 2.2 |
| 17 | Golden beauty. | W. W. Barnard & Co. | 54 | 44 | 8 | 6.3 | 2.4 |
| 21 | Clark's Iroquois. | H. H. Clark | 100 | 89 | 16 | 6.9 | 2.8 |
| 25 | California. | J. C. Vaughan | 100 | 86 | 20 | 7.8 | 3.2 |
| 29 | B. O. E. Ensilage. | J. H. Beagley | 76 | 38 | 2 | 6.2 | 2.2 |
| 33 | Yellow corn (no name). | E. C. Fisk | 98 | 70 | 16 | 6.7 | 2.1 |
| 37 | Crowden. | W. T. Freeland | 98 | 61 | 15 | 6.7 | 2.4 |
| 41 | Champion white pearl. | " | 100 | 67 | 4 | 7.5 | 2.9 |
| 45 | Champion | " | 100 | 80 | 4 | 7.7 | 3 |
| 49 | Storm. | " | 100 | 85 | 12 | 8 | 3.1 |
| 53 | White corn (no name). | E. E. Chester | 100 | 71 | 12 | 8 | 3.2 |
| 57 | Boone county white. | James Riley | 88 | 44 | ... | 8.3 | 3.6 |
| 61 | Burr's white. | University farm | 100 | 58 | 8 | 7.6 | 3.7 |
| 65 | Murdock-Burr's white cross. | Expt. No. 89—1893 | 98 | 80 | 7 | 7.3 | 2.8 |
| 69 | Mixture (c). | " | 87 | 65 | 14 | 6.5 | 2.2 |
| 73 | Mastodon | J. A. Everitt | 80 | 52 | 4 | 5.9 | 2.2 |
| 77 | Murdock. | Dr. H. C. Mills | ... | 88 | 7 | 6.7 | 2 |

VARIETY TESTS, YIELD, 1894.

| Plat. | Name of Variety. | Percent water in shelled corn as husked. | Lb. per acre ear corn as husked. | Lb. ear corn per bushel as shelled. | Lb. as husked to make bushel air-dry. | Bu. shelled corn per acre. | | |
|-------|--|--|----------------------------------|-------------------------------------|---------------------------------------|----------------------------|----------|-----------------|
| | | | | | | As shelled. | Air-dry. | Loss in drying. |
| 2 | White corn (no name)..... | 20.26 | 4590 | 71.3 | 79.5 | 64.4 | 57.7 | 6.7 |
| 3 | Helms improved..... | 26.93 | 4090 | 75.9 | 92.4 | 53.9 | 44.3 | 9.6 |
| 4 | White beauty..... | 16.57 | 3980 | 67.3 | 71.8 | 59.1 | 55.4 | 3.7 |
| 6 | Boone Co. white..... | 20.2 | 3500 | 71.5 | 79.7 | 49 | 43.9 | 5.1 |
| 7 | White corn (no name)..... | 23.18 | 5250 | 72.3 | 83.8 | 72.6 | 62.7 | 9.9 |
| 8 | Dunlap's white..... | 20.95 | 3330 | 70.9 | 79.8 | 47 | 41.8 | 5.2 |
| 10 | Burr's white..... | 18.71 | 3020 | 71.8 | 78.5 | 42.1 | 38.5 | 3.6 |
| 11 | Forsyth's white..... | 20.47 | 3980 | 69.4 | 77.7 | 57.3 | 51.2 | 6.1 |
| 12 | Van's early..... | 15.78 | 4510 | 66 | 69.8 | 68.3 | 54.6 | 3.7 |
| 14 | First premium..... | 22.12 | 2930 | 75.5 | 86.3 | 38.8 | 34 | 4.8 |
| 15 | Mills Co. white..... | 17.85 | 2810 | 69.8 | 75.5 | 40.3 | 37.2 | 3.1 |
| 16 | Champion white pearl..... | 18.77 | 3880 | 69.4 | 76 | 55.9 | 51 | 4.9 |
| 18 | Arleus..... | 21.25 | 3460 | 70.1 | 79.4 | 49.3 | 43.6 | 5.7 |
| 19 | Steward's improved..... | 18.67 | 2460 | 69.1 | 75.6 | 35.6 | 32.5 | 3.1 |
| 20 | Fisk's yellow..... | 22.82 | 3590 | 68.8 | 79.5 | 52.1 | 45.2 | 6.9 |
| 22 | Clark's Onarga..... | 19.07 | 3300 | 67.9 | 74.7 | 48.6 | 44.2 | 4.4 |
| 23 | Edmonds..... | 18.35 | 4220 | 71.2 | 77.7 | 59.2 | 54.3 | 4.9 |
| 24 | Leaming..... | 18.51 | 4580 | 67.5 | 73.8 | 67.8 | 62.1 | 5.7 |
| 26 | Riley's favorite..... | 20.53 | 4920 | 70 | 78.4 | 70.3 | 62.8 | 7.5 |
| 27 | Yellow corn (no name)..... | 26.59 | 3380 | 75.3 | 91.3 | 44.9 | 37 | 7.9 |
| 28 | Star..... | 24.9 | 4460 | 70.8 | 83.9 | 63 | 53.2 | 9.8 |
| 30 | Champion yellow dent..... | 22.18 | 4920 | 71.5 | 81.8 | 68.8 | 60.2 | 8.6 |
| 31 | Mortgage lifter..... | 18.7 | 4610 | 68.2 | 74.6 | 67.6 | 61.8 | 5.8 |
| 32 | Reid's yellow dent..... | 19.95 | 5060 | 68.1 | 75.6 | 74.4 | 66.9 | 7.5 |
| 34 | Cuban queen..... | 18.46 | 5460 | 68.8 | 75.1 | 79.3 | 72.7 | 6.6 |
| 35 | Waterloo extra early..... | 22.23 | 5200 | 70 | 80.1 | 74.3 | 64.9 | 9.4 |
| 36 | Legal tender..... | 17.86 | 4180 | 67.6 | 73.3 | 61.8 | 57 | 4.8 |
| 38 | Leaming..... | 18.1 | 4910 | 66.9 | 72.7 | 73.4 | 67.6 | 5.8 |
| 39 | John Cloud..... | 20.73 | 5930 | 70 | 78.8 | 84.6 | 75.2 | 9.4 |
| 40 | Yantis..... | 20.33 | 6540 | 68.1 | 76.6 | 96 | 85.4 | 10.6 |
| 42 | Sterling..... | 16.86 | 5210 | 67 | 71.8 | 77.7 | 72.6 | 5.1 |
| 43 | Pride of Columbia..... | 18.25 | 3690 | 68 | 74 | 54.3 | 49.9 | 4.4 |
| 44 | Davis improved..... | 15.36 | 4820 | 65.9 | 69.2 | 73.2 | 69.6 | 3.6 |
| 46 | J. J. Freeland..... | 18.62 | 5750 | 68.3 | 74.7 | 84.2 | 77 | 7.2 |
| 47 | Burr's white..... | 17.63 | 5840 | 69.1 | 74.7 | 84.5 | 78.2 | 6.3 |
| 48 | Boone Co. white..... | 18.46 | 6030 | 70.2 | 76.6 | 85.9 | 78.7 | 7.2 |
| 50 | Charles Cloud..... | 21.19 | 7160 | 70.3 | 79.4 | 101.8 | 90.2 | 11.6 |
| 51 | Waggoner..... | 22.27 | 7400 | 72.7 | 83.2 | 101.8 | 88.9 | 12.9 |
| 52 | Calico..... | 17.93 | 6830 | 68.9 | 74.7 | 99.2 | 91.5 | 7.7 |
| 54 | Mixture (a)..... | 18.33 | 5810 | 68.5 | 74.7 | 84.8 | 77.8 | 7 |
| 55 | Mixture (b)..... | 18.64 | 6850 | 69.3 | 75.8 | 98.8 | 90.3 | 8.5 |
| 56 | Burr's white-cranberry cross..... | 17.87 | 3510 | 68.9 | 74.7 | 50.9 | 47 | 3.9 |
| 58 | Leaming-Burr's white cross..... | 23.78 | 4740 | 66.9 | 78.1 | 70.9 | 60.7 | 10.2 |
| 59 | Hickory king-Helms improved cross..... | 22.15 | 6140 | 67.7 | 77.4 | 90.7 | 79.3 | 11.4 |
| 60 | Champion w. pearl-cranberry cross..... | 17.19 | 3610 | 65 | 69.8 | 55.6 | 51.7 | 3.9 |
| 62 | Boone Co. white..... | 18.19 | 7310 | 68.3 | 74.3 | 107 | 98.4 | 8.6 |
| 63 | Burr's white..... | 24.06 | 7570 | 71.6 | 83.9 | 105.7 | 90.2 | 15.5 |
| 64 | Edmonds-Burr's white cross..... | 18.52 | 3650 | 67.4 | 73.7 | 54.1 | 49.5 | 4.6 |
| 66 | Edmonds-Murdock cross..... | 20.18 | 5670 | 69.6 | 77.7 | 81.4 | 73 | 8.4 |
| 67 | Leaming-Edmonds cross..... | 16.81 | 4320 | 67.3 | 72 | 64.2 | 60 | 4.2 |
| 68 | Boone Co. white..... | 20.33 | 6940 | 71.8 | 80.2 | 96.7 | 86.6 | 10.1 |

VARIETY TESTS, YIELD, 1894.—Continued.

| Plat. | Name of Variety. | Per cent. water in shelled corn as husked. | Lb. per acre ear corn as husked. | Lb. ear corn per acre as husked. | Lb. as husked to make bushel air-dry. | Bu. shelled corn per acre. | | |
|-------|----------------------------------|--|----------------------------------|----------------------------------|---------------------------------------|----------------------------|----------|-----------|
| | | | | | | As shelled. | Air-dry. | Lo rying. |
| 70 | Mixture (d)..... | 21.83 | 5880 | 69.6 | 79.2 | 84.5 | 74.3 | 10.2 |
| 71 | Golden beauty—Leaming cross..... | 20.08 | 5820 | 69.4 | 77.3 | 80.9 | 72.7 | 8.2 |
| 72 | Leaming—golden beauty cross..... | 20.08 | 6500 | 67.1 | 74.7 | 96.9 | 87 | 9.9 |
| 74 | Early mastodon..... | 19.56 | 5140 | 68 | 75.2 | 75.6 | 68.3 | 7.3 |
| 75 | Minnesota king..... | 15.88 | 2930 | 70.3 | 74.4 | 41.7 | 39.4 | 2.3 |
| 76 | Huron..... | 15.79 | 4540 | 66.8 | 70.6 | 67.9 | 64.3 | 3.6 |
| 78 | White corn (no name)..... | 20.01 | 5500 | 71.7 | 79.7 | 76.7 | 69 | 7.7 |
| 79 | Queen of the prairie..... | 22.22 | 3910 | 73.3 | 83.8 | 53.4 | 46.7 | 6.7 |
| 80 | White corn (no name)..... | 20.69 | 3765 | 71.7 | 80.5 | 52.5 | 46.8 | 5.7 |
| 80a | The conqueror..... | 22.51 | 4770 | 71.4 | 81.9 | 66.8 | 58.3 | 8.5 |
| 82 | Burr's white..... | 17.29 | 5480 | 70.9 | 76.3 | 77.3 | 71.8 | 5.5 |
| 84 | Boone Co. white..... | 19.27 | 5020 | 71.2 | 78.5 | 70.5 | 64 | 6.5 |

Plats below injured by chinch bugs.

| | | | | | | | | |
|----|------------------------------------|-------|------|------|------|------|------|------|
| 1 | Boone Co. white..... | 20.31 | 2880 | 67.9 | 75.8 | 42.4 | 38 | 4.4 |
| 5 | Burr's white..... | 20.01 | 3300 | 70.7 | 78.6 | 46.7 | 42 | 4.7 |
| 9 | Iowa king..... | 20.85 | 2820 | 76 | 85.4 | 37.1 | 33 | 4.1 |
| 13 | Short stalk..... | 19.09 | 3160 | 70 | 77 | 45.1 | 41.1 | 4 |
| 17 | Golden beauty..... | 22.5 | 2620 | 72.1 | 82.9 | 36.3 | 31.6 | 4.7 |
| 21 | Clark's Iroquois..... | 22.08 | 3450 | 68.1 | 77.8 | 50.6 | 44.3 | 6.3 |
| 25 | California yellow..... | 18.18 | 3980 | 66.8 | 72.7 | 59.6 | 54.8 | 4.8 |
| 29 | B. O. E. Ensilage..... | 18.46 | 3470 | 70 | 76.4 | 49.6 | 45.4 | 4.2 |
| 33 | Yellow corn (no name)..... | 14.18 | 2500 | 63.7 | 66.1 | 39.3 | 37.9 | 1.4 |
| 37 | Crowder..... | 24.51 | 4660 | 68.2 | 80.4 | 68.4 | 58 | 10.4 |
| 41 | Champion white pearl..... | 18.39 | 4370 | 69.4 | 75.6 | 63 | 57.9 | 5.1 |
| 45 | Champion white pearl (smooth)..... | 17.62 | 5300 | 68.3 | 73.7 | 77.6 | 71.9 | 5.7 |
| 49 | Storm..... | 18.97 | 5410 | 70.1 | 77 | 77.2 | 70.3 | 6.9 |
| 53 | White corn (no name)..... | 19.04 | 4640 | 67.9 | 74.7 | 68.3 | 62.1 | 6.2 |
| 57 | Boone Co. white..... | 18.09 | 3830 | 68.3 | 74.2 | 56.1 | 51.6 | 4.5 |
| 61 | Burr's white..... | 18.9 | 4360 | 70.4 | 77.3 | 61.9 | 56.4 | 5.5 |
| 65 | Murdock—Burr's white cross..... | 20.19 | 4410 | 68.4 | 76.3 | 64.5 | 57.8 | 6.7 |
| 69 | Mixture (c)..... | 18.77 | 2870 | 71.8 | 78.7 | 40 | 36.5 | 3.5 |
| 73 | Mastodon..... | 18.66 | 3020 | 69.1 | 75.6 | 43.7 | 40 | 3.7 |
| 77 | Murdock..... | 20.79 | 3940 | 72.9 | 81.9 | 54 | 48.1 | 5.9 |

in 1894, there has been an average of from four-fifths to seven-eighths of a full stand, reckoning four stalks in each hill as a full stand. In 1893, however, the stand was more nearly perfect, it being over 93 per cent. The better stand was due to the fact that the corn was planted thicker than usual, and afterwards thinned to four plants a hill.

For 1888, 1890, 1891, 1892, and 1894 the per cent. of barren stalks was comparatively uniform, averaging about eleven; while in 1889 it dropped to about 1.5 per cent., and in 1893 went up to 22, 23, and 50 per cent. for the three classes, early, medium, and late, respectively. Only one variety was classed as late, and it has made some very good

yields in former years. The noticeable barrenness in 1893, was probably due, chiefly, to the severe drought and the fact that the corn was planted thicker than formerly.

Though varying much from year to year, owing to the nature of the season, in general the height of both stalks and ears increased with lateness of maturity, as did also the length and circumference of ears.

In four out of the seven years the weight of 100 average ears has been greatest for the late maturing, and for the other three greatest for the medium. In general, the number of ears per acre has decreased with the lateness of maturing. The pounds of ear corn, as weighed when husked, which must be taken to make a bushel of air-dry shelled corn, invariably increase with the lateness of maturity. This is due largely to the fact that the per cent. of water is greater in the late maturing varieties when husked.

YIELD OF AIR-DRY CORN OF VARIETIES TESTED FOR YEARS NAMED.

| Eight varieties tested in | 1887 | 1888 | 1889 | 1890 | 1891 | 1892 | 1893 | 1894 | Av. |
|--------------------------------|------|-------|------|------|------|------|------|------|------|
| Leaming | 29.6 | 86.6 | 80.6 | 69.4 | 67.3 | 70.1 | 34.6 | 62.1 | 62.5 |
| Burr's white | 30 | 85.9 | 75.7 | 67.7 | 67.7 | 64.2 | 38.6 | 69.7 | 62.4 |
| Champion white pearl | 20.2 | 70 | 94.8 | 74.9 | 76.5 | 65 | 37.3 | 51 | 61.2 |
| Riley's favorite | 30.8 | 81.8 | 66.1 | 53.3 | 56.1 | 74.1 | 38.1 | 62.8 | 57.9 |
| Legal tender | 25.8 | 84.2 | 68.9 | 60 | 56.8 | 60.3 | 33.8 | 57 | 55.8 |
| Steward's improved | 32.4 | 91.2 | 68.7 | 54.7 | 58.4 | 74.4 | 33 | 32.5 | 55.7 |
| Murdock | 33.3 | 80.3 | 65 | 61.6 | 59.8 | 57.6 | 35.7 | 48.1 | 55.2 |
| Edmonds | 27.7 | 83.7 | 66.3 | 55.9 | 58.6 | 58.4 | 28.3 | 54.3 | 54.1 |
| Eleven varieties tested in | 1888 | 1889 | 1890 | 1891 | 1892 | 1893 | 1894 | Av. | |
| Leaming | 86.6 | 80.6 | 69.4 | 67.3 | 70.1 | 34.6 | 62.1 | 67.2 | |
| Burr's white | 85.9 | 75.7 | 67.7 | 67.7 | 64.2 | 38.6 | 69.7 | 67.1 | |
| Champion white pearl | 70 | 94.8 | 74.9 | 76.5 | 65 | 37.3 | 51 | 67.1 | |
| Riley's favorite | 83.7 | 66.3 | 55.9 | 58.6 | 74.1 | 38.1 | 62.8 | 62.8 | |
| Clark's Iroquois | 68.5 | 81.9 | 59 | 65.4 | 72.9 | 30.7 | 44.3 | 60.4 | |
| Legal tender | 84.2 | 68.7 | 60 | 56.8 | 60.3 | 33.8 | 57 | 60.1 | |
| Helms improved | 84.8 | 102.6 | 51.1 | 39 | 79.2 | 16 | 44.3 | 59.6 | |
| Steward's improved | 91.2 | 68.7 | 54.7 | 58.4 | 74.4 | 33 | 32.5 | 59 | |
| Murdock | 80.3 | 65 | 61.6 | 59.8 | 57.6 | 35.7 | 48.1 | 58.3 | |
| Fisk's yellow | 76.6 | 79.5 | 61.7 | 57.4 | 61.1 | 19.5 | 45.2 | 57.3 | |
| Edmonds | 81.1 | 66.1 | 53.3 | 56.1 | 58.4 | 28.3 | 54.3 | 56.8 | |
| Thirteen varieties tested in | 1890 | 1891 | 1892 | 1893 | 1894 | Av. | | | |
| Boone county white | 74.6 | 89.3 | 85.5 | 33.8 | 74.3 | 71.5 | | | |
| Burr's white | 67.7 | 67.7 | 64.2 | 38.6 | 69.7 | 61.6 | | | |
| Champion white pearl | 74.9 | 76.5 | 65 | 37.3 | 51 | 60.9 | | | |
| Leaming | 69.4 | 67.3 | 70.1 | 34.6 | 62.1 | 60.7 | | | |
| Riley's favorite | 55.9 | 58.6 | 74.1 | 38.1 | 62.8 | 57.9 | | | |
| Clark's Iroquois | 59 | 65.4 | 72.9 | 30.7 | 44.3 | 54.5 | | | |
| Legal tender | 60 | 56.8 | 60.3 | 33.8 | 57 | 53.6 | | | |
| Murdock | 61.6 | 59.8 | 57.6 | 35.7 | 48.1 | 52.6 | | | |
| Golden beauty | 53 | 75.8 | 63.1 | 36.4 | 31.6 | 52 | | | |
| Steward's improved | 54.7 | 58.4 | 74.4 | 33 | 32.5 | 50.6 | | | |
| Edmonds | 53.3 | 56.1 | 58.4 | 28.3 | 54.3 | 50.1 | | | |
| Fisk's yellow | 61.7 | 57.4 | 60.1 | 19.5 | 45.2 | 48.8 | | | |
| Helms improved | 51.1 | 39 | 79.2 | 16 | 44.3 | 45.9 | | | |

Each year, excepting 1892, the medium maturing varieties have made the largest average yields, the average of air-dry shelled corn for the seven years being as follows: Medium, 65.2 bu.; late, 58.8 bu.; and early, 55.5 bu. per acre.

The following table gives the yield for each of eight varieties for eight years, of eleven for seven years, and of thirteen for five years, arranged in the order of the average yields. Of these varieties, Boone Co. white, champion white pearl, Burr's white, and Helms improved, are white; the others are yellow. Murdock and Edmonds are early maturing, Helms improved, late, and the others, medium. The average yield of the eleven varieties for seven years is 61.4 bu. per acre. Other varieties of considerable merit, that have been tested for four or more years, are Dunlap's white, Clark's Onarga, and California yellow.

It should be noticed that the average yield of Boone Co. white for five years is almost ten bushels more than for the next best variety tested during the same years.

A comparison of the white and yellow varieties for 1894 shows an average yield of 63.2 bu. an acre for the white and 60 bu. for the yellow. The average yield per acre for seven years is 61.8 bu. for the white, and 60.3 bu. for the yellow.

Experiment No 3, Corn, Time of Planting.

Experiments to test the effect of time of planting on yield and growth have been conducted for the past seven years. The land used in 1894 was in corn during 1893, in clover during 1892, and in oats during 1891. The stalks were removed and the land plowed during the fall of 1893. Each planting consisted of four plats, each 4 rods or 9 hills square, and each plat was planted with a different number of kernels in a hill, the numbers being 2, 3, 4, and 5 kernels per hill. The first four plats were planted April 26th, and four plats were planted each week thereafter till June 22d, there being 36 plats in all. The ground for each four plats was disked, smoothed and marked just before planting. The variety of corn used was Burr's white, and it was planted by hand in checks 3 feet 8 inches apart. Plantings 1, 2, and 6 were cultivated five times; 3, 4, 7, and 8, four times; and 5 and 9, three times. The cultivation was done with surface cultivators, and the remaining weeds removed with a hoe. Beginning June 15th, the height of each plant of two rows running across the nine plantings was measured each week during its growth. The average weekly height in inches to tip of tassel and upstretched leaf for each planting is given in the table.

The east third of each plat was used in a feeding experiment before it came to full maturity. The remaining two-thirds were husked in the usual way, the number of ears and weight being ascertained for each

third. The middle third of each plat was shelled and a sample of the shelled corn sent to the laboratory for determination of moisture.

The largest yield of air-dry corn is from planting May 11th, with nearly as good results from planting May 4th, 18th, and 25th. Taking the average of six years, the largest yield is from planting May 11th to 18th, with but little decrease in yield from planting any time from April 27th to May 25th. Corn planted May 25th matured in 118 days. This is less time than required by either earlier or later planting. This, together with the fact that the first three plantings reached their maximum height about the same time, shows the more rapid growth of corn planted later in the season, when the ground is warm, over that planted earlier, when the ground is cold.

By very early planting, if a good stand is secured and the corn kept equally free from weeds, we may expect as large yields as from later planting. But for this locality the extra labor required to remove the weeds and the risk of a poor stand will not justify planting earlier than about May 1st.

AVERAGE HEIGHTS TAKEN WEEKLY IN INCHES TO TIP OF TASSEL AND LEAF, 1894.

| Date of planting. | | June | | | July | | | | Aug. | | | | | Sept. | | | Oct. | |
|-------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|----|----|-------|-------|-------|-------|-------|
| | | 15 | 23 | 29 | 6 | 13 | 20 | 27 | 3 | 10 | 17 | 24 | 31 | 14 | 21 | 28 | 5 | 12 |
| Apr. 26 | Leaf..... | 26 | 42 | 60 | 75 | 86 | 92 | 94 | 94 | 94 | 94 | 94 | 94 | 90 | ..... | ..... | ..... | ..... |
| | Tassel..... | ..... | ..... | ..... | 72 | 88 | 91 | 92 | 92 | 92 | 92 | 92 | 92 | 91 | ..... | ..... | ..... | ..... |
| May 4 | Leaf..... | 15 | 28 | 43 | 56 | 69 | 83 | 89 | 91 | 92 | 90 | 90 | 90 | 88 | ..... | ..... | ..... | ..... |
| | Tassel..... | ..... | ..... | ..... | 52 | 70 | 87 | 89 | 90 | 90 | 90 | 90 | 87 | ..... | ..... | ..... | ..... | ..... |
| May 11 | Leaf..... | 13 | 29 | 43 | 57 | 70 | 82 | 91 | 95 | 97 | 95 | 95 | 96 | 93 | 92 | ..... | ..... | ..... |
| | Tassel..... | ..... | ..... | ..... | 64 | 85 | 93 | 95 | 93 | 93 | 93 | 93 | 93 | 92 | ..... | ..... | ..... | ..... |
| May 18 | Leaf..... | 11 | 23 | 38 | 53 | 67 | 80 | 90 | 96 | 98 | 99 | 99 | 99 | 97 | 96 | ..... | ..... | ..... |
| | Tassel..... | ..... | ..... | ..... | 68 | 80 | 92 | 98 | 98 | 97 | 97 | 97 | 97 | 97 | ..... | ..... | ..... | ..... |
| May 25 | Leaf..... | 10 | 21 | 34 | 48 | 61 | 75 | 85 | 94 | 97 | 98 | 98 | 98 | 97 | 95 | 95 | ..... | ..... |
| | Tassel..... | ..... | ..... | ..... | 60 | 74 | 92 | 95 | 96 | 96 | 96 | 96 | 95 | 95 | 96 | ..... | ..... | ..... |
| June 1 | Leaf..... | 6 | 9 | 16 | 25 | 35 | 47 | 56 | 71 | 81 | 87 | 89 | 90 | 91 | 91 | 89 | 87 | ..... |
| | Tassel..... | ..... | ..... | ..... | 55 | 64 | 76 | 87 | 91 | 93 | 92 | 92 | 92 | 93 | 93 | ..... | ..... | ..... |
| June 8 | Leaf..... | ..... | 7 | 13 | 23 | 31 | 42 | 51 | 66 | 76 | 87 | 92 | 93 | 93 | 92 | 93 | 93 | 89 |
| | Tassel..... | ..... | ..... | ..... | 61 | 68 | 84 | 93 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 | 95 |
| June 15 | Leaf..... | ..... | ..... | 5 | 11 | 17 | 24 | 31 | 44 | 54 | 72 | 86 | 95 | 97 | 96 | 96 | 94 | 89 |
| | Tassel..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 44 | 61 | 81 | 91 | 98 | 98 | 100 | 99 | 99 | 94 |
| June 22 | Leaf..... | ..... | ..... | 2 | 8 | 12 | 16 | 21 | 30 | 37 | 50 | 64 | 76 | 84 | 84 | 81 | 82 | 80 |
| | Tassel..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 45 | 72 | 85 | 86 | 86 | 86 | 86 | 85 |

RESULTS WITH CORN FROM PLANTING AT DIFFERENT DATES, 1888-1894.

| Dates. | Bu. air-dry corn per acre. | | | | | | | Av. |
|---------------------|----------------------------|-------|-------|-------|-------|-------|------|-----|
| | 1888 | 1889 | 1890 | 1891. | 1892. | 1893 | 1894 | |
| April 22-26 ..... | ..... | 52 | ..... | 51 | ..... | ..... | 58 | 54 |
| April 27-May 4..... | 80 | 44 | 67 | 50 | 72 | ..... | 60 | 62 |
| May 4-11..... | 87 | 51 | 71 | 48 | 70 | 47 | 61 | 62 |
| " 11-18..... | 86 | 56 | 75 | 50 | 63 | 48 | 60 | 63 |
| " 19-25..... | 87 | 50 | 71 | 52 | 66 | 40 | 61 | 61 |
| " 26-June 1..... | 83 | 55 | 74 | 34 | 59 | 37 | 40 | 55 |
| June 1-8..... | 81 | 50 | 61 | 37 | 68 | 34 | 42 | 53 |
| " 8-15..... | 50 | 50 | 60 | 19 | 49 | 38 | 21 | 41 |
| " 17-22..... | ..... | ..... | ..... | ..... | 30 | 22 | 12 | 21 |

RESULTS WITH CORN FROM PLANTING AT DIFFERENT RATES AND DATES.

| Plat No. | Date of planting. | Kernels planted per hill. | When ripe. | When husked. | Per cent. water in shelled corn when husked. | Lb. ear corn per acre as husked. | Lb. ears to make 56 lb. shelled. | Lb. ears to make 56 lb. air-dry shelled. | Bu. shelled corn per acre. | | |
|----------|-------------------|---------------------------|------------|--------------|--|----------------------------------|----------------------------------|--|----------------------------|----------|-----------------|
| | | | | | | | | | As shelled. | Air-dry. | Loss in drying. |
| 1 | Apr. 26 | 5 | Sept. 11 | Oct. 15 | 19.6 | 4980 | 70.4 | 77.9 | 70.7 | 63.9 | 6.8 |
| 2 | | 4 | | " 16 | 17.51 | 4335 | 68.7 | 74.1 | 63.1 | 58.5 | 4.6 |
| 3 | | 3 | | " 15 | 18.79 | 4560 | 70.5 | 77.2 | 64.7 | 59 | 5.7 |
| 4 | | 2 | | " 15 | 19.82 | 3945 | 70.8 | 78.6 | 55.7 | 50.2 | 5.5 |
| 5 | | 5 | | " 16 | 22.08 | 5760 | 71.4 | 81.6 | 80.6 | 70.6 | 10 |
| 6 | May 4 | 4 | Sept. 14 | " 16 | 21.5 | 4740 | 72.2 | 81.8 | 65.7 | 57.9 | 7.8 |
| 7 | | 3 | | " 16 | 21.22 | 4725 | 72 | 81.3 | 65.7 | 58.1 | 7.6 |
| 8 | | 2 | | " 16 | 21.29 | 4290 | 72.3 | 81.7 | 59.3 | 52.5 | 6.8 |
| 9 | May 11 | 5 | Sept. 17 | " 19 | 20.94 | 4995 | 71.4 | 80.3 | 70 | 62.2 | 7.8 |
| 10 | | 4 | | " 19 | 20.74 | 5235 | 71.4 | 80.2 | 73.3 | 65.3 | 8 |
| 11 | | 3 | | " 19 | 21.07 | 4995 | 71.9 | 81 | 69.5 | 61.6 | 7.9 |
| 12 | | 2 | | " 19 | 18.93 | 4305 | 71.5 | 78.5 | 60.2 | 54.9 | 5.3 |
| 13 | | 5 | | " 19 | 24.06 | 5130 | 73.7 | 86.3 | 69.6 | 59.4 | 10.2 |
| 14 | May 18 | 4 | Sept. 20 | " 19 | 23.26 | 5250 | 74.1 | 85.9 | 70.9 | 61.1 | 9.8 |
| 15 | | 3 | | " 19 | 22.97 | 5385 | 72.5 | 83.8 | 74.2 | 64.2 | 10 |
| 16 | | 2 | | " 19 | 22.97 | 4710 | 71.8 | 82.9 | 65.6 | 56.8 | 8.8 |
| 17 | May 25 | 5 | Sept. 20 | Nov. 12 | 21.71 | 4800 | 69.7 | 79.2 | 68.9 | 60.6 | 8.3 |
| 18 | | 4 | | " 12 | 19.16 | 4980 | 69.7 | 76.7 | 71.5 | 64.9 | 6.6 |
| 19 | | 3 | | " 12 | 19.91 | 4800 | 71.1 | 79.1 | 67.5 | 60.7 | 6.8 |
| 20 | | 2 | | " 12 | 19.04 | 4455 | 70.2 | 77.2 | 63.4 | 57.7 | 5.7 |
| 21 | | 5 | | " 12 | 25.98 | 4095 | 75.7 | 91 | 54.1 | 45 | 9.1 |
| 22 | June 1 | 4 | Oct. 2 | " 12 | 23.61 | 3825 | 74.1 | 86.4 | 51.6 | 44.3 | 7.3 |
| 23 | | 3 | | " 12 | 25.79 | 3435 | 74.8 | 89.8 | 45.9 | 38.3 | 7.6 |
| 24 | | 2 | | " 12 | 24.07 | 2670 | 73.4 | 86.1 | 36.4 | 31 | 5.4 |
| 25 | June 8 | 5 | Oct. 2 | Dec. 3 | 23.85 | 3315 | 75.2 | 87.8 | 44.1 | 37.7 | 6.4 |
| 26 | | 4 | | " 3 | 21.71 | 4230 | 71.2 | 81 | 59.4 | 52.2 | 7.2 |
| 27 | | 3 | | " 3 | 22.35 | 3585 | 73.6 | 84.4 | 48.7 | 42.5 | 6.2 |
| 28 | | 2 | | " 3 | 21.09 | 2850 | 73.1 | 82.5 | 39 | 34.5 | 4.5 |
| 29 | | 5 | | " 3 | 30.55 | 2115 | 82.6 | 105.9 | 25.6 | 20 | 5.6 |
| 30 | June 15 | 4 | not ripe | " 3 | 30.57 | 2775 | 79.4 | 101.8 | 34.9 | 27.3 | 7.6 |
| 31 | | 3 | | " 3 | 31.78 | 1935 | 84.6 | 110.4 | 22.9 | 17.5 | 5.4 |
| 32 | | 2 | | " 3 | 26.82 | 1770 | 80.6 | 98 | 22 | 18.1 | 3.9 |
| 33 | June 22 | 5 | not ripe | " 3 | 37.4 | 1635 | 87.3 | 124 | 18.7 | 13.2 | 5.5 |
| 34 | | 4 | | " 3 | 34.52 | 1185 | 89.2 | 121.1 | 13.3 | 9.8 | 3.5 |
| 35 | | 3 | | " 3 | 33.77 | 1530 | 93.9 | 126.2 | 16.3 | 12.1 | 4.2 |
| 36 | | 2 | | " 3 | 32.96 | 1335 | 86.1 | 114.3 | 15.5 | 11.7 | 3.8 |

Experiment No. 4, Corn, Depth of Planting.

This experiment was not conducted in 1894, the previous five years' work being thought sufficient to demonstrate that shallow planting gives best results, so long as the depth is sufficient to afford moisture to germinate the seed.

The table in bulletin No. 31, giving results for five years, shows that the average number of ears per acre uniformly decreases from the shallowest to the deepest planting, and that in general, the bushels per acre also decreases.

Experiment No. 5, Corn, Thickness of Planting.

In 1894 the same plats used for the time planting were made to serve also as a test for the thickness of planting. Each of the nine plantings had four plats planted with the varying amounts of 2, 3, 4, and 5 kernels a hill. Out of the nine cases four plats gave the largest yield for five kernels, four for four kernels, and one for three kernels.

The average yield per acre of air-dry shelled corn was as follows: 2 kernels, 40.8 bu.; 3 kernels, 46 bu.; 4 kernels, 49 bu.; 5 kernels, 48.1 bu.

In another field there were planted four plats of each of three varieties, twelve plats in all, six being planted with three kernels a hill, and six with four. The average yield was 44.6 bu. for three kernels and 50.5 bushels for four. In all cases the hills were in checks 3 ft. 8 inches apart. This shows, as in former years, that there is less danger of getting too many plants than of getting too few. Two reasons perhaps why farmers do not get so large yields from thicker planting are, first, because many of the nubbins are not husked at all, and second, because the yields are usually determined by measurement rather than by weight, and nubbins will largely occupy space that would otherwise be unoccupied between the large ears.

Experiment No. 6, Corn, Planting in Hills or Drills.

Experiment No. 8, Corn, Frequency of Cultivation.

Experiment No. 9, Corn, Depth of Cultivation.

Experiment No. 10, Corn, Effect of Root-Pruning.

These four experiments were dropped this year, in the belief that the work of the previous five years showed conclusively (1) that it makes little difference whether corn is planted in hills or drills so far as yields are concerned, but that it will usually be best to plant in hills for the sake of better cultivation; (2) that there seems to be no advantage in cultivating more frequently than is necessary to destroy weeds and keep the ground moderately porous; (3) that shallow cultivation has never failed to produce an increase in yield over that of deep cultivation, the average increase for five years being 5.9 bu. per acre; (4) that root-pruning has never failed to reduce the yield in a marked degree, this reduction frequently amounting to 25 per cent.

Experiment No. 23, Continuous Corn Cropping contrasted with a Rotation of Crops.

This experiment has been continued as usual, and while in general the yields of corn from the plat treated with barnyard manure have been somewhat greater than those from the plats in rotation, and considerably greater than from the plat continuously cropped without any manure, the yields of 1894 show an increase of 40 per cent. in favor of

CONTINUOUS CROPPING WITH CORN, AND ROTATION, 1888-1894.

In rotation since 1876. No manure or commercial fertilizers of any kind.

| In corn annually since 1876. | | Comerc'l fertilizers annually applied. | | No fertilizers annually. | | Corn and oats alternating. | | Corn, oats, and clover. | |
|-----------------------------------|------------|--|------------|--------------------------|------------|----------------------------|------------|-------------------------|------------|
| Barnyard manure applied annually. | | Plat No. 1. | | Plat No. 2. | | Plat No. 3. | | Plat No. 4. | |
| Stover, lb. | Grain, bu. | Stover, lb. | Grain, bu. | Stover, lb. | Grain, bu. | Stover, lb. | Grain, bu. | Stover, lb. | Grain, bu. |
| 1888 66.7 | 46.0 | 57.4 | 38.0 | 2575 | 54.3 | 2145 | 48 | 1665 | 3030 |
| 1889 77.4 | ... | 45.9 | ... | 8080 | 43.2 | 3010 | ... | 6665 | 3060 |
| 1890 55.1 | 33.92 | 41.5 | 2680 | 3010 | 48.7 | 3010 | ... | 2988 | 3068 |
| 1891 44.1 | 32.84 | 29.2 | 2400 | 2910 | 28.6 | 2910 | ... | 2988 | 3068 |
| 1892 60.5 | 26.10 | 32.7 | 1530 | 2910 | 33.1 | 2910 | ... | 2988 | 3068 |
| 1893 24. | 307.2 | 10.3 | 1792 | 216 | 21.6 | 216 | ... | 2988 | 3068 |
| 1894 32.5 | 368.2 | 39.8 | 2662 | 2308 | 34.8 | 2308 | ... | 2988 | 3068 |

| Plat No. 5. | | Plat No. 6. | | Plat No. 7. | | Plat No. 8. | | Plat No. 9. | | Plat No. 10. | |
|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|--------------|------------|
| Stover, lb. | Grain, bu. | Stover, lb. | Grain, bu. | Stover, lb. | Grain, bu. | Stover, lb. | Grain, bu. | Stover, lb. | Grain, bu. | Stover, lb. | Grain, bu. |
| 2145 | 48 | 1665 | 3030 | 3030 | ... | 3045 | ... | 61.2 | 31.90 | 3750 | 46.4 |
| 8080 | ... | 6665 | ... | 3060 | ... | ... | ... | 50.3 | ... | 3650 | 59 |
| 3010 | ... | 2900 | ... | 61.9 | ... | 56.4 | ... | ... | ... | 4680 | ... |
| 2910 | ... | 2554 | ... | 33.9 | ... | 55.3 | ... | ... | ... | 5180 | ... |
| 2910 | ... | 2636 | ... | 41. | ... | 2812 | ... | ... | ... | 4450 | ... |
| 2216 | ... | 2160 | ... | 2090 | ... | 1334 | ... | ... | ... | 2198 | ... |
| 2308 | ... | 1816 | ... | 1438 | ... | 52.3 | ... | ... | ... | 4354 | ... |

the rotation plats. The manured plat gave even less than the one without manure. This can only be explained by the drought, which seemed to affect the manured plat most.

Experiment No. 89, Corn, Cross fertilization.

The ten most promising crosses selected from 1892 and grown in 1893 were again grown in 1894 on plats of considerable size and at such distance from each other as to prevent much pollen being carried from one to another. The diversity in the character of the plats was such as to make a comparison of the yields unfair. By careful selection each is approaching more nearly a uniform type.

These same ten crosses were planted in the variety test for the sake of comparison of yields. The accompanying table gives the results of six of them, the other four being omitted, either because they fell in the row injured by bugs, or because one of the parent varieties was not grown with which to compare it. The first named variety is in each case the female parent. This table gives the per cent. of barren stalks, number of ears, and yield per acre in bushels of air-dry corn for each of the parent varieties, together with their averages as compared with the cross. In four out of the six cases the yield is greatest for the cross, the average increase being 12 bu. per acre. In 1893 three out of four cases gave largest yields for the cross, the average increase being 2.3 bu. per acre; and in 1892 five crosses gave in every case a larger yield than an average of the parent varieties, the average increase being 9.5 bu. per acre.

Farmers can produce cross-bred seed in considerable quantities in the following manner: Plant with one variety in one planter box and another variety in the other. Remove the tassels of one variety before they begin to shed pollen and the shoots of the same will be fertilized with pollen from the other variety, thus producing a direct cross. The seed should be selected from the rows from which the tassels have been removed.

RESULTS FROM CROSS-BRED CORN.

| Plat No. | | Per cent. of barren stalks. | Yield per acre. | |
|--------------------|---------------------|-----------------------------------|-----------------|--------------------------------|
| | | | No. of ears. | Per cent. air- dry corn. |
| 24 Av. 4 plats. | Leaming | 9 | 8880 | 62.1 |
| | Burr's white..... | 14 | 10100 | 69.7 |
| | Average..... | 12 | 9490 | 65.9 |
| 58 | Cross | 4 | 11190 | 60.7 |
| 23 Av. 4 plats. | Edwards | 6 | 9920 | 54.3 |
| | Burr's white..... | 14 | 10100 | 69.7 |
| | Average..... | 10 | 10010 | 62 |
| 64 | Cross | 28 | 8960 | 49.5 |
| 23 | Edwards | 6 | 9920 | 54.3 |
| 77 | Murdock..... | 7 | 11520 | 48.1 |
| 66 | Average... .. | 6 | 10720 | 51.2 |
| | Cross | 12 | 12080 | 73 |
| 24 | Leaming | 9 | 8880 | 62.1 |
| 23 | Edwards | 6 | 9920 | 54.3 |
| 67 | Average | 7 | 9400 | 58.2 |
| | Cross | 34 | 11360 | 60 |
| 17 | Golden beauty | 8 | 6880 | 31.6 |
| 24 | Leaming | 9 | 8880 | 62.1 |
| | Average..... | 8 | 7880 | 46.8 |
| 71 | Cross | 7 | 12760 | 72.7 |
| 24 | Leaming | 9 | 8880 | 62.1 |
| 17 | Golden beauty..... | 8 | 6880 | 31.6 |
| 27 | Average..... | 8 | 7880 | 46.8 |
| | Cross | 2 | 12080 | 87 |

Experiment No. 134, Corn, Effect of Removing Tassels.

The corn, variety Boone Co. white, used for this experiment, consisted of twenty-four rows, each five rods long. The tassels were removed from every alternate row. From six rows they were removed before they were expanded, and from six after, but before the pollen had been shed. From eight they were removed by cutting, and from four by pulling.

The following table gives the number of stalks, good ears, nubbins, weight of nubbins, weight of good ears, and total weight of ears for each row.

TABLE GIVING RESULTS FROM DETASSLING.

| Row. | Number of stalks. | Number of | | Weight of | | | |
|------|-------------------------|------------|-----------|------------|-----------|--------|------|
| | | Good ears. | Nub-bins. | Good ears. | Nub-bins. | Total. | |
| 1 | Tassels left on..... | 183 | 51 | 71 | 27.8 | 16.5 | 44.2 |
| 2 | " removed..... | 181 | 82 | 76 | 47.5 | 20.8 | 68.2 |
| 3 | " left on..... | 169 | 61 | 65 | 31.8 | 12.5 | 44.2 |
| 4 | " removed..... | 194 | 72 | 69 | 36.8 | 15.2 | 52 |
| 5 | " left on..... | 172 | 55 | 74 | 31.5 | 17 | 48.5 |
| 6 | " removed..... | 165 | 75 | 66 | 41.5 | 17.5 | 59 |
| 7 | " left on..... | 182 | 59 | 89 | 30 | 19 | 49 |
| 8 | " removed..... | 174 | 61 | 74 | 35.8 | 15.5 | 51.2 |
| 9 | " left on..... | 173 | 47 | 70 | 27.5 | 13.2 | 40.8 |
| 10 | " removed..... | 165 | 69 | 69 | 37.2 | 15.5 | 52.8 |
| 11 | " left on..... | 179 | 65 | 54 | 38.5 | 12.8 | 51.2 |
| 12 | " removed..... | 225 | 57 | 83 | 31.8 | 19 | 50.8 |
| 13 | " left on..... | 194 | 63 | 57 | 27.2 | 12.5 | 39.8 |
| 14 | " removed..... | 189 | 65 | 71 | 32 | 17.5 | 49.5 |
| 15 | " left on..... | 200 | 74 | 52 | 39.8 | 12.5 | 52.2 |
| 16 | " removed..... | 195 | 85 | 56 | 45.5 | 12.8 | 58.2 |
| 17 | " left on..... | 159 | 77 | 39 | 44 | 11.2 | 55.2 |
| 18 | " removed..... | 164 | 96 | 38 | 57 | 10.8 | 67.8 |
| 19 | " left on..... | 171 | 77 | 43 | 45 | 10.8 | 55.8 |
| 20 | " removed..... | 165 | 87 | 42 | 49.5 | 10.8 | 60.2 |
| 21 | " left on..... | 163 | 81 | 38 | 49.8 | 9.2 | 59 |
| 22 | " removed..... | 146 | 66 | 45 | 42.2 | 12 | 54.2 |
| 23 | " left on..... | 151 | 80 | 44 | 50.5 | 9.5 | 60 |
| 24 | " removed..... | 188 | 73 | 65 | 39.5 | 15 | 54.5 |
| Av. | " left on..... | 175 | 66 | 58 | 36.9 | 13.1 | 50 |
| " | " removed..... | 181 | 74 | 63 | 41.3 | 15.2 | 56.5 |
| " | " pulled..... | 169 | 85 | 55 | 48.8 | 15 | 63.8 |
| " | " cut off..... | 184 | 69 | 66 | 38 | 15 | 53 |
| " | " removed when expanded | 185 | 73 | 64 | 40.6 | 15.1 | 55.7 |
| " | " " before " | 173 | 75 | 61 | 42.1 | 15.3 | 57.4 |

In eighteen out of twenty-three comparisons, the yield of corn was greater for the rows having the tassels removed. For tassels pulled we have an increase of twenty-seven per cent., and for those cut only six per cent. Removed before expanded gives an increase of fifteen per cent., and removed after expanded, an increase of eleven per cent. The average increase is thirteen per cent.

In 1891, the tassels were removed from every alternate one of thirty rows, with the result of only one pound difference in the aggregate yield of ear corn. In 1892, the tassels were removed from every alternate one of twenty rows, and both the number of ears and yield were slightly reduced, the reduction being 2.2 per cent. In each of the last two years mentioned, the tassels were removed as soon as they appeared, by pulling at intervals of from two to four days. These results are conflicting, as are those of several other stations on this subject. The meteorological record shows us that during the period of removing tassels in 1894 the rainfall was very light, being less than

three-fourths of an inch, while for the periods of detasseling in 1891 and 1892 the rainfall was abundant.

The results of other stations are briefly as follows: At the Maryland Station, when the tassels of two out of every three rows were removed the detasseled rows gave a decrease in yield of 9.7 per cent.

At the Kansas Station, removing the tassels of alternate rows of six varieties gave in every case a reduced yield, the average reduction being 22 per cent.

The Delaware Station tried removing tassels on alternate rows, and secured an increase in yield of 6.6 per cent. Quoting Delaware: "A poor stand had necessitated numerous re-plants; upon such the tassels appeared later, and hence necessitated a daily revision of the work during, possibly, one week. Numerous tassels developed upon very late stalks after that time, and they were allowed to remain undisturbed. Upon cutting up the corn, a separation was made." This separation showed that only two-fifths of the stalks had tassels removed. The yield of both tasseled and detasseled was calculated by assuming 7,300 stalks to an acre. This comparison is unfair, from the fact that the detasseled stalks were the earlier ones, and consequently had the better chance for development; while all of the late stalks, which are usually inferior, were thrown into the part having tassels undisturbed.

The Kansas Station, by removing tassels on alternate rows as soon as they appeared, found an increase of fourteen per cent. This gain may be due to the fact that the plats were only five rows wide, and that two of the three rows having tassels removed were outside rows, thus having a better chance for development.

Early experiments at our Station, where a space of one row was left between plats, showed that the outside rows made larger yields than the interior ones. The average increase from outside rows, for twenty-five plats, was 12.3 per cent.

In 1890, Cornell Station reported an increase of fifty per cent. from removing tassels on alternate rows as soon as they appeared; while in 1891, when tried on two tracts, there was practically no difference in yield. The results may have been influenced by the rain, which in 1890 was very little during the period of removing the tassels, while in 1891 it was considerable.

Pollen and anthers collected show that there would be about 6.01 lb. of nitrogen in an acre, while the theory that, if the tassels are removed before pollen is produced, the material ordinarily used in producing anthers and pollen may be used in producing more grain, is all right; it does not seem to work out in that way under most circumstances. If an increase in grain is secured by detasseling, it is most likely to be on poor soil or in dry seasons. It seems that the injury done the plants may sometimes reduce the yield.

Experiment No. 163, Corn, Listing.

The land used for this experiment was in corn in 1893 and was fall plowed. The listing was done by furrowing about four inches deep and planting the corn in the bottom of the furrow. Ten plats listed gave an average yield of 51.1 bu., as compared with 55.9 bu. for ten adjacent plats that were planted in the ordinary way.

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NOTICE.

The Station has no seed corn for sale. The varieties here reported can usually be secured by addressing the person from whom the Station secured its seed, as reported on pages 10-12.





UNIVERSITY OF ILLINOIS-URBANA

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BULLETIN. URBANA
37-48 1895-97

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