Report of the Work in Corn Pollination, III.

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A brief resume may be helpful. In 1908 a series of studies in corn pollination was begun. Of these studies two were reported to this society at the 1908 meeting. One of these dealt with the vitality of pollen as affected by age. The other dealt with the results of cross-pollinating varieties of different colors also, the crossing of sweet and dent corn. Seed obtained from these crosses was used for planting in 1909. The results of this planting were reported at the 1910 meeting. In brief they showed an agreement with Mendelian principles.

In 1910 seed was selected from the various types developed in 1909. For example, from ears which showed white and yellow dent, and sweet kernels all on the same cob, the white kernels were picked out and planted separately; the same was done with the yellow dent and sweet kernels. In all sixteen different selections were made. These were planted in single rows side by side and given similar treatment in every way. Hand pollination was resorted to as in the two previous years. It may be said here that after three years of self-pollination there was not the marked deterioration which breeders have told us would happen from such in-breeding.

A full account of the results of this experiment may not be given in this place, but the following observations are presented:

1. The effect of using Reid's Yellow Dent as a male on Boone County White was to increase the height of the stalk noticeably, while the reciprocal cross showed a sturdier stalk than is usual with either variety.

2. Sweet corn as either parent induced an abundance of suckers. The average for six different rows in which the seed used had some sweet in it was 47.5 per cent. of the stalks being suckered, some stalks having as many as six to eight. Also, where Reid's Yellow Dent was the male, the per cent. of suckers was large, amounting to 42.6 per cent. of all the stalks, while the reciprocal gave only 9.6 per cent. It is well known that sweet corn normally produces many suckers, and under favorable conditions Reid's Yellow Dent produces more than most dent varieties.

3. The Sweet-Reid's Yelow Dent and the Reid's Yellow Dent-Boone County White crosses which had the largest per cent. of suckered stalks also showed the largest per cent. of twin ears and the smallest per cent. of barren stalks. It may not be accepted that suckers are an indication of prolificacy, but this series of experiments indicated as much.

4. This being the third year of the experiment the constancy of dominants and recessives would be expected to show itself. Sweet, red, speckled, and white are supposed to be recessive to dent and yellow. In 18 self-pollinated ears from sweet, 15 were pure sweet and 3 mixed white, sweet, and yellow. In 12 ears from speckled seed, 9 were pure speckled, 2 pure yellow, and 1 pure red. In 15 ears from red seed, 13 were pure red and 2 pure yellow. However, in none of the pollinations from white seed was the percentage of pure ears so high. The highest being from the white seed selected from the Sweet-Reid's Yellow Dent cross, in which 7 out of 12 ears were pure.

In the experiments of 1908 yellow showed itself dominant to all other colors, consequently it would contain not only the dominants but the hybrids and such a condition manifested itself in the various selection from yellow seed. A notable exception was from a row planted with yellow seed from a twin ear. Every self-pollinated ear from this row was pure yellow.

5. From the Sweet-Reid's Yellow Dent cross two types arose, one with whitish kernels and white cobs, like the original Stowell's Evergreen, and the other with yellowish kernels and red cobs. These two types were planted in 1911 on the grounds of the Horticultural Department, Purdue University. The season being backward the crop was not large, but enough was obtained to show that the types were fixed and would breed true.

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