II. REPORTS FROM COOPERATORS

AGRICULTURAL ALUMNI SEED IMPROVEMENT ASSOCIATION, INC.
West Lafayette, Indiana

1. Preliminary indications of an Rf suppressor.

Observations from two sources during the past season indicate an unusual reaction of CI.44 when used as the pollen parent on lines carrying Texas sterile cytoplasm and restorer genes. The single cross Oh45 T Rf Rf x CI.44 was completely sterile until its silks started to dry and then it shed a little pollen.

In a program of backcrossing CI.44 on T Rf, difficulty has been experienced in "loosing" the Rf gene. This summer two of four backcross progenies of CI.44 on plants known to be of the composition T Rf rf yielded all sterile plants.

This peculiar reaction of CI.44 seems to indicate it carries a gene, or genes, which suppress the Rf gene. To our knowledge no such gene has been reported but it is entirely within the realm of possibilit that such a gene does exist. Numerous additional crosses have been made to further investigate these unusual reactions. These crosses will be observed in Florida this winter and in Indiana next summer.

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1. Numerical non-disjunction of chromosome 6 in an autotetraploid maize.

Numerical non-disjunction of chromosome 6 in a colchicine induced autotetraploid maize was studied by observing the number of nucleoli contained in the nuclei of the four spores in the pollen quartets in which the spores have not yet become free from each other. In maize, they remain together for a time after the completion of meiosis and it is also possible to distinguish the two division planes, since a cell division follows the first meiotic division. Usually each of the four microspore cells of the pollen quartet contains two nucleoli in the early stages organized by the two chromosomes 6 contained in their nuclei. These become fused together in the later stages. In each of five out of 207 pollen quartets examined at the early stages with

unfused nucleoli in the spore nuclei, three nucleoli were seen in each of two of the spore nuclei and only one in each of the other two. This distribution implies that non-disjunction occurred at division I. The pollen quartets in which a 3 : 1 distribution of nucleoli was observed comprise 2.42 percent of the total examined and can be taken to represent the percentage numerical non-disjunction of quadrivalents formed by chromosome 6. This value derived from the cytological data is close to the value obtained by Welch (1942) for chromosome 2 from genetical evidence. (See Welch, G. 1942 Linkage in autotetraploid maize. Ph.D. thesis, Cornell University.)

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1. Two recessive genes necessary for white seedlings.

Several different genes for white seedlings in maize are known. These are caused by monogenic recessives. Ten different rows segregating white seedlings were grown in 1962. Nine of these showed a monogenic segregation. It is not certain which genetic white seedling this is. Counts for these nine rows were: Green 690, white 228, compared with an expected ratio of 688.5 to 229.5, almost a perfect ratio. The other row showed a definite dihybrid ratio of 299 green : 20 white, almost a perfect 15:1 ratio. Here apparently two genes must be homozygous recessive to produce white seedlings. Seed is limited because of a drought in 1962 that killed all plants before pollen shedding. Reserve seed will be planted and plants selfed. Approximately 1/4 should be segregating for the two genes for white seedling, while another 1/4 should give monogenic ratios of 3:1. Has anyone observed a similar occurrence?

W. Ralph Singleton

2. Mutation CI to c:

In 1959 a plant which was B A_1 A_2 Pr Y Pl CI Sh Bz Wx R Og was radiated at the rate of 94 r/day for the period 29 to 15 days before the pollen was collected for pollination onto a stock which was A_1 A_2 pr y C sh bz wx R og. Among the resulting 12,000 seeds was one with a purple flinty endosperm. This was grown in 1960 and produced a plant which was B A_1 Pl Og. Pollen examination indicated 97.5% good pollen. The resulting ear had a full seed set and segregated +/y +/pr C/c +/sh +/bz +/wx. The colorless seeds were linked to the