

crossing the plants grown from these kernels to homozygous a Sh plants and detecting the presence of A sh gametes in the next generation. However, there is a third source of A Sh kernels which was recognized but not noted in the last report because it was thought of negligible importance. It is the result of the non-disjunction of either the A sh or the a Sh chromosome which produces trisomic sectors on the ears of the X_1 generation. These sectors yield trisomic kernels of the genotype A sh/a Sh/a sh which are phenotypically A Sh.

Much of the excess in the number of A Sh in the irradiated material over the controls is due to this. In the control there were three trisomic 3 plants out of 14 A Sh kernels tested. In the irradiated material 20 out of 44 A Sh plants were trisomics. Irradiation probably increases the frequency of non-disjunction. A great volume of material was obtained last summer in a repetition of the original experiment and the results of this experiment will be reported later in greater detail.

In 19 out of the 33 cases of trisomy there was non-correspondence between the phenotypes of the endosperm and the genotype of the embryo, which probably indicates some sort of tetrasporic development of the megagametophyte, as suggested by Neuffer.

It appears that tandem duplications are extremely hard to obtain. Oddly enough, this difficulty may be used in support of the hypothesis that homologous chromosomes tend to be in a semi-paired state in the interphase nucleus. If the hypothesis is true then most of the tandem duplications produced would tend to be very short and the probability that a duplication would include the loci followed would be very low.

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1. An observed alteration of the opaque-2 phenotype.

The opaque-2 recoveries of 2 inbred lines of corn (hereafter referred to as Line A and Line B) were crossed reciprocally to obtain F_1

seed. Seed of the cross A x B was all of the opaque phenotype. Seed of the reciprocal cross B x A, however, was of two distinct phenotypes, opaque and normal. Lysine analysis of the different phenotypes from this cross indicate that both types are similar in lysine content and within the range expected for the opaque-2 homozygote. The bioassay method was used for lysine analysis of whole kernel samples. Kjeldahl analysis indicates that both types are also similar in total nitrogen content.

The inbred lines involved were derived from yellow dent lines. They were included in our breeding program and converted to white endosperm before incorporation of the opaque-2 gene. It is suspected that the germ plasm used as the source of white endosperm contributed the factor or factors that apparently alter the opaque phenotype.

Since plant to plant crosses were not made and no phenotypic ratios obtained, no attempt can be made at this time to explain the observed results genetically. Further studies are being carried out and any new information will be included in subsequent reports.

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1. Mutants induced by thermal neutrons in B14 inbred.

The 1969 News Letter contained an item regarding the induction of seedling mutants by thermal neutrons. The mutants were observed in the M3 generation following open pollination of the M2 in an isolated field. Seeds of stocks segregating are now available. These are as follows: