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1. Studies on the longevity of corn pollen.

This program was initiated as a portion of a study of the male gametophyte. Experiments were conducted in 1955 and 1956 to ascertain the effect of the environment upon the viability of the pollen grain, and, in addition, to determine the optimal conditions under which to store the pollen. The criterion of viability used was the ability to set seed.

Five ranges (15% - 60%) of relative humidity at each of 5 temperatures (-79°C to +16°C) represent the bulk of our treatments. A preliminary interpretation of data indicates that we were able to obtain seed from pollen approximately 150 hours old, at temperatures from -10°C to +5°C, with a reduction in the percentage of viability, however. Pollen that was 95-100% fertile at collection time showed a decrease in viability to approximately 15% after 150 hours. As mentioned, the test criterion was the ability to set seed.

If pollen could be stored for a week or longer and retain a small percentage of viability, it is probable that this would be advantageous to the corn breeder and geneticist, especially in the early stages of a program when the number of seed is not too important. It might also prove to be a profitable method by which to exchange pollen with co-operators separated by relatively great distances.

We plan to increase the precision of our experiment in 1957 and test some of these additional hypotheses.

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2. Mutagenic effect of diepoxybutane.

Experiments have been conducted for several seasons to determine the possible mutagenic effects of diepoxybutane,  $\text{CH}_2\text{---}\overset{\text{O}}{\text{C}}\text{---}\text{CH}_2\text{---}\overset{\text{O}}{\text{C}}\text{---}\text{CH}_2$ , on Zea mays. Treatments were made by placing the cut ends of newly shedding tassels taken from homozygous multiple dominant stocks in 0.2 per cent solutions of the chemical for 18 hours. Pollinations were made immediately and after a 24 hour period on homozygous multiple recessive stocks. Losses of dominant marker genes in the endosperm of the resulting kernels were used to evaluate the mutagenicity of the diepoxybutane.

Most of the experiments utilized a multiple recessive stock having the chromosome 9 markers c sh wx, all of which affect the endosperm. These linked genes were used to determine whether the appearance of the recessive characters involved chromosomal deficiency, gene mutation, or genic instability. The number of kernels showing single or multiple gene losses ranged from 8 to 12 per cent over a three year period. This compares with a control rate of less than 1 per cent. The extent of loss varied from a tiny spot to the entire kernel being affected, with all intermediate types occurring. Mosaic types also occurred in which there was an all over web-like appearance of the loss. Since the order of these loci with reference to the centromere is Wx, Sh, and C, coincident losses of all three loci or of Sh and C indicate chromosomal loss while a loss of Wx alone indicates a small intercalary deletion or mutation. Thus far the greatest percentage of observed deficiencies involved (1) all three loci, (2) Sh - C, or (3) C alone and can easily be explained as losses of terminal segments of chromosome 9. However, losses of Wx without losses of C and Sh did occur and must be explained in some other way. Mosaic patterns may be the result of either breakage - fusion - bridge cycles or genic instability induced by the chemical. No instance of the mosaic type of pattern was found in the controls.

Jean D. Kreizinger

### 3. Bird Repellants.

Results of a study on the sense of taste in birds by the New York State College of Veterinary Medicine prompted an investigation of the bird repelling properties on ripening corn of the most promising of the compounds. A single spray application on a small isolated block of inbred material gave complete control; the untreated half of the field showed only light damage, however. One application of spray to small areas in a large field of commercial corn reduced subsequent bird damage to approximately one-fourth of that in check areas. The compound used was easily handled, reasonable in price, and slightly objectionable in odor. Since it is primarily used as a food additive, it is presumably non-toxic.

Further investigations indicate that other more potent materials are available for tests of repellent effect during the coming season. Since many of the areas where Cornell grows breeding and testing material of corn are subject to extensive bird damage, we are hopeful that further investigations will produce an effective control.

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