

1. The blotching system involving the c locus.

New data obtained during the past year require a revision of several statements made in the 1955 News Letter. Blotching is not the product of crossing maize and teosinte derivatives, since it is also produced when the original strain A158, involved in all of our teosinte derivatives, is crossed with a multiple gene linkage tester. There is also some doubt, as shown below, that it represents a mutagenic system.

Data presented last year showed that at least four loci, in addition to R, are involved in this blotching system which causes blotches of color to develop in the aleurone in the presence of recessive c. This has been verified by isolating tester stocks which are homozygous dominant for three of the four loci and homozygous recessive for the fourth. When two stocks differing in their recessive loci, both colorless, are crossed, blotching appears in the F₁ seeds. Three such stocks have now been isolated. It is hoped to pick up the fourth in the Florida winter crop.

The existence of several loci in this system has been further verified by linkage tests which show that one gene for blotching is associated with Y on chromosome 6, another is linked with Su on chromosome 4, and a third is independent of these two chromosomes.

The data on linkage of Y and one of the Bh loci are in close agreement with those reported by Rhoades (M.N.L. 1948) which showed 30.2 percent of crossing over between Y and Bh. Rhoades also showed that a Bh gene is closely linked to Pl with 0.8 percent of recombination.

The doubt that this is a mutagenic system arises from the fact that the blotches are highly irregular, not at all like the mutant spots in the Dt or Ac-Ds system. Furthermore, not all of the aleurone cells in the blotches become completely colored; some are only slightly colored. These several facts suggest that we are dealing, not with somatic mutations, but with threshold effects. The blotching system acts to produce a substance which causes part of the c genes to elaborate color when normally only their dominant allele is capable of doing this.

Rhoades' experiment (M.N.L. 1945), in which he found less blotching when c was partially absent because of a deficiency, does not necessarily show that c is mutating. His results are susceptible to the threshold interpretation given above.

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