

2. The blotching system affecting the r locus.

A similar system affecting the r locus causing blotches of color in the aleurone in the presence of recessive r was reported last year to involve at least two loci. It now appears that it involves at least seven loci, one of which has an allele which acts as a complete inhibitor to the system.

When stocks segregating 9:7 for blotching were crossed with Indiana P39, Mendelian ratios approaching 3:1, 9:7, 27:37, 81:175, 243:781 were obtained, indicating segregation for 1, 2, 3, 4, and 5 loci, respectively.

When similar stocks were crossed with a white P39, being developed by Pearson and still heterozygous, ratios approaching 243:781, 729:3367, and 2187:14,197, corresponding to segregation at 5, 6, and 7 loci, respectively, were obtained. These ratios are still to be verified by backcrosses and progeny tests; but, since evidence for at least four loci has already been obtained in the c blotching system, it is not unlikely that the wider ratios in the r system will prove to involve a greater number of loci.

When similar plants were crossed to Connecticut P39, the F_1 seeds were all non-colored, indicating the presence in this strain of P39 of a dominant inhibitor. The F_2 results verify this; however, the expected ratio of 3:13 was modified to 1:3, indicating that the inhibitor is an allele of one of the Bh genes. Percentage of blotched seeds varies from 25 to 7.5 percent. The ratios correspond to those obtained in the crosses with Indiana P39, except that, because of the presence of the inhibitor, only one-fourth as many seeds are blotched.

Tester stocks, recessive for one of the genes in this system and homozygous dominant for all the others, are being isolated. A cross of one of the testers for the c system with one of those for the r system has produced blotching. This suggests that the two systems may have loci in common but is not proof since individual Bh genes for both systems occur widely in various stocks of corn.

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