

crosses of R/r-cu genotypes no R-mottled type allele or any other unusual R allele has been found.

Jaime Gonella and Peter A. Peterson

Comparison of the Fcu controlling element system to the spotted-dilute R system:
The relationship between Fcu and Spf

The spotted-dilute R system was originally described by Sastry and Kurmi (MGNL 44:101-105). They explained the aleurone spotting behavior of unstable R alleles designated as spotted-dilute (R-sd) based on two dominant factors, Dil (diluting factor) and Spf (spotting factor). In the presence of Dil alone the R allele of R-sd isolates conditions a dilute phenotype with no spots whereas Spf by itself results in spots on a colorless background. In further studies, Singh et al. (MGNL 49:45) showed that when both Dil and Spf are present spots appear on a dilute background, indicating that the two factors are autonomous and their effects superimposable.

The r-cu allele of the Fcu controlling element system has a variable expression in aleurone color ranging from completely colorless to dark dilutes and apparently fully colored phenotypes (MGNL 48:66-68 and the following section of this report).

The question was asked whether Fcu could substitute for Spf in inducing spots on ears that would be segregating dilute (R-r Dil) kernels from R-sd Dil Spf/r-r ⊗ and from R-r/r-r Dil/+ x r/r by crossing by plants of an Fcu line (stock segregating Fcu) whose Fcu content was determined with the Fcu tester r-cu/r. The results are shown in Table 1. The data indicate that when Fcu is present in the

Table 1. Results of tests of the relationship between Fcu and Spf.

Cross	Presence of spotted kernels	Presence of <u>Fcu</u> in male
'5 4607-1/4625-9	+	+
-2/4626-2	-	-
-7/4626-4	-	-
-8/4626-6	+	+
-9/4626-7	+	+
-11/4628-9	+	+
-13/4628-10	+	+
'5 4605-1/4626-7	+	+
-2/4628-5	+	+
-3/4628-9	+	+
-4/4628-10	+	+
-6/4625-10	-	-
-7/4625-6	-	-

male parent spotted kernels are produced in the crosses. Conversely, spotted kernels are absent if the male tester does not contain Fcu. It can be concluded that the factor at the R locus associated with the spotting behavior of R-sd isolates (i.e., responds to Spf) is also responsive to signals from Fcu. Based on this relationship one might also expect that r-cu should respond to signals from Spf. Tests of the type presented in Table 1 gave negative results, however.

When R alleles from R-sd isolates are separated by segregation from the factors Dil and Spf a full color phenotype appears and the associated R allele no longer responds to either factor. This differs from the Fcu system, from which no colored derivatives have been isolated, as will be shown in the following section.

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