fertilized the egg, a kernel having colorless aleurone ($\underline{r}^g\underline{r}^g/-$) but the strongly colored embryo characteristic of $\underline{R}^{scm}$ should result.

Extensive matings to $\underline{r}^g\underline{r}^g$ (Inbred W22) females of forty plants treated with 500 R of X-irradiation yielded 102 colorless aleurone but colored embryo kernels. When grown and tested as staminate parents to $\underline{r}^g\underline{r}^g$ the following year, all but 38 segregated self-colored and colorless aleurone in a 1:1 ratio and possessed corresponding embryo phenotypes. Loss of $\underline{R}^{scm}$ from one sperm in these instances had not lead to detectable alteration in the second. The remaining 38 when similarly tested produced kernels of the selected parental phenotype in a high frequency, indicative of B-10 translocation. This experiment netted, therefore, nearly one translocation of the particular sort desired per irradiated plant, or, in terms of kernels screened, about 3×10^{-4}.

Bor-Yaw Lin

3. Effect of M^{st} on unstable plant color derivatives of $R^{st}R^r$ heterozygotes.

Among the progeny of $\underline{R}^{st}\underline{R}^r$ heterozygotes, near-colorless aleurone derivatives with unstable plant color occur with a frequency of approximately 5×10^{-5}. The phenotype and outside marker configuration of these new forms suggest that they arise by an intralocus recombination event which places the instability component associated with seed spotting of $\underline{R}^{st}$ into cis relation with the plant pigmenting determiner ($\underline{P}$) of $\underline{R}^r$. The net effect is that ($\underline{P}$) replaces the seed pigmenting component ($\underline{Sc}$) of the stippled complex ($\underline{ScI}^R\underline{Nc}$), yielding ($\underline{PI}^R\underline{Nc}$). The present report presents data showing that $\underline{M}^{st}$, an enhancing modifier of stippling, located 5.7 units distal to $\underline{R}$, also increases the plant color instability of ($\underline{PI}^R\underline{Nc}$) forms.

The plant color gene ($\underline{P}$) is expressed most conspicuously in the young seedling, where it conditions colored coleoptile and roots, and in the tassel, where it conditions pigmented anthers. The effect of $\underline{M}^{st}$ on unstable expression of ($\underline{P}$) was investigated at both stages of development, in separate studies. Three ($\underline{PI}^R\underline{Nc}$) selections of independent origin, isolated by K. V. Satyanarayana, were grown in each case as

heterozygotes with $\underline{r}^{g}\underline{M}^{st}$ (test) and $\underline{r}^{g}\underline{+}$ (control). Because the three selections gave similar results the data have been bulked.

(a) Instability in the seedling. Five hundred seedlings of genotype $(\underline{PI}^{R}\underline{Nc})\underline{+}/\underline{r}^{g}\underline{M}^{st}$ and 500 of genotype $(\underline{PI}^{R}\underline{Nc})\underline{+}/\underline{r}^{g}\underline{+}$ were scored for presence of pigmented sectors in coleoptile and roots:

Genotype	Seedlings with red sectors	
	Number	%
$(\underline{PI}^{R}\underline{Nc})\underline{+}/\underline{r}^{g}\underline{M}^{st}$	77	15.4
$(\underline{PI}^{R}\underline{Nc})\underline{+}/\underline{r}^{g}\underline{+}$	21	4.2

The effect of $\underline{M}^{st}$ was significant ($P < 0.01$).

(b) Instability in the tassel. Separate populations of plants with genotypes identical to those in Part (a) were grown to maturity and the anthers scored for presence or absence of pigmented sectors:

Genotype	Fraction of plants with anther sectors
$(\underline{PI}^{R}\underline{Nc})\underline{+}/\underline{r}^{g}\underline{M}^{st}$	46/48
$(\underline{PI}^{R}\underline{Nc})\underline{+}/\underline{r}^{g}\underline{+}$	0/93

Anther sectoring occurred exclusively in the $\underline{M}^{st}$ class. This supports the seedling observations in confirming that plant color instability of $(\underline{PI}^{R}\underline{Nc})$ is of the same fundamental nature as seed spotting of $\underline{R}^{st}$.

Although anther sectors were small, encompassing four anthers at most, a one-generation test for $\underline{M}^{st}$ in $\underline{R}^{g}$ stocks is now available.

W. M. Williams

4. Effect of hemizygosity on germinal mutation in the R-stippled and mutable R-Navajo systems.

In a limited test of plants hemizygous for $\underline{R}^{st}$ (i.e., those having an $\underline{R}^{st}$-bearing standard chromosome 10 but the 10^{B} chromosome of translocation B-10a in place of the normal homologue) Kermicle (1970*) obtained a self-colored ($\underline{R}^{sc}$) mutation frequency of 39×10^{-4}, while plants heterozygous $\underline{R}^{st}/\underline{r}^{r}$ (W22 source) gave a value of only 16.2×10^{-4}. In neither case was mutation to $\underline{R}^{sc}$ related to crossing over at meiosis.

*Genetics 64:247-258