examined were derived from testcross progeny with the $\underline{a_2}^m$ allele in the female parent.

The lines were divided (for other reasons) into two groups and the distribution (in %) of sizes is given:

	A	B
1 cell	92.00	93.50
2 cells	5.40	3.85
3 "	1.25	.12
4 "	1.05	.10
5 and more	.30	2.43

It appears from the examination of the above abbreviated table that the mutation event takes place most of the time following the last cell division, since most are of the one cell type. This supports the allegation of the synchrony of the mutation event both within the kernel and between kernels on the same ear. The similarity in values even between different crosses (i.e., in a comparison of sib lines) shows a striking uniformity here also. At this time, it is hypothesized that the particular physiology associated with the terminal division of the aleurone triggers the event.

This particular $\underline{a_2}^m$ cannot at this time be ascribed to the En system since it is unable to give positive results in the standard test for En. This may be a consequence of the lateness of the event for which the standard test for En is not sensitive enough.

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1. Phenotypic and genetic analysis of a new endosperm mutant y_9.

In 1961 Dr. Kermicle gave me a new pale yellow endosperm mutant. The temporary symbol $\underline{w_{Kermicle\ \#3}}$ was given to it and this symbol has

been used in past News Letters. It is now proposed that the permanent symbol y_9 be substituted for the temporary one.

This mutant was first noticed in a culture of W23 grown at the University of Wisconsin. It is characterized by a pale yellow endosperm which can vary from an off-white to lemon yellow depending upon the genetic background. I have never observed the pure white seeds such as y_1 gives in certain backgrounds. The mutant has a tendency to be viviparous. However, unlike most other white endosperm viviparous mutants, the seedlings of y_9 are not albino. Seedlings are usually green. Occasional ones are found that will have pale green leaf tips and infrequently completely pale green seedlings are observed. Seedlings grown at higher temperatures (35°C) tend to have more pale green tissue but the temperature effect is not consistent. Mutant seedlings will grow into mature plants which in the original inbred background were later and weaker than normal siblings and tended to have a zebra phenotype. As the gene has been transferred into more vigorous stocks, mutant plants closely approximating normals have been observed. Last summer the mutant plants were very vigorous and could not readily be distinguished from normals. No zebra phenotype was observed. The performance of mutant plants is probably dependent upon genetic background and environmental factors.

Analysis of chlorophyll and carotene in seedlings of this mutant reveals that they occur in near normal concentrations. However, unlike normals, y_9 seedlings accumulate carotene precursors, phytoene, phytofluene and zeta-carotene. In this regard y_9 is similar to all known white endosperm, viviparous-albino mutants which accumulate one or more precursors of carotene.

Linkage tests with a series of chromosome nine translocations placed this gene on chromosome ten. With translocation T9-10b (9S.13, 10S.40), no crossovers were observed in 568 plants tested. The results of linkage tests with $\underline{r}$, $\underline{g}_1$ and $\underline{bf}_2$ are given in Table 1.

Table 1

Linkage test of $\underline{y}_9$ with $\underline{r}$, $\underline{g}_1$ and $\underline{bf}_2$.

Region tested	Testcross progeny				Total	#C.O.	%C.O.
$\underline{y}_9 - \underline{r}$	$+\ \underline{R}$	$\underline{y}_9\ \underline{r}$	$\underline{y}_9\ \underline{R}$	$+\ \underline{r}$			
	137	143	37	37	354	74	20.9
$\underline{y}_9 - \underline{g}_1$	$+\ \underline{g}_1$	$\underline{y}_9 +$	$\underline{y}_9\ \underline{g}_1$	$+\ +$			
	120	107	22	23	272	45	16.5
$\underline{y}_9 - \underline{bf}_2$	$+\ \underline{bf}_2$	$\underline{y}_9 +$	$\underline{y}_9\ \underline{bf}_2$	$+\ +$			
	133	130	4	2	269	6	2.2

The latest linkage map of chromosome 10 indicates 14 crossover units between $\underline{g}_1$ and $\underline{r}$. Thus, on the basis of the linkage data in Table 1, $\underline{y}_9$ is 16.5 units to the left of $\underline{g}_1$. This would place it in the short arm of chromosome 10, which is in agreement with very close linkage between T9-10b (breakpoint 10S.40) and $\underline{y}_9$. Because $\underline{bf}_2$ has not been mapped on chromosome 10, it cannot be placed with respect to $\underline{y}_9$. Since there are only 2.2 crossover units between $\underline{y}_9$ and $\underline{bf}_2$, the latter gene is also probably in the short arm of chromosome 10. Three point tests involving $\underline{y}_9$, $\underline{bf}_2$ and $\underline{g}_1$ have been initiated. Tests with TB-10a (10L.35) are in agreement with the above placement of $\underline{y}_9$. This translocation does not uncover $\underline{y}_9$. However, when deficient plants carrying $\underline{y}_9$ were crossed to homozygous $\underline{y}_9$ plants, 20.5% crossing over was observed between the TB breakpoint and $\underline{y}_9$ (see following report for details). The breakpoint of TB-10a is known to be proximal to $\underline{r}$. How far proximal is not known, but if it is close to $\underline{r}$ the value of 20.5% crossing over is in close agreement with the 20.9% crossing over observed between $\underline{r}$ and $\underline{y}_9$.

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