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1. Instability at A_2 and C_1 .

In tests to uncover instability at the A_2 and C_1 loci twenty-two newly induced and independent changes have been confirmed in a population of over 10 million gametes. These unstable loci representing a wide spectrum of states (time and frequency of the mutation event) were found in a_1^m lines containing the En system and will be tested to: (1) identify the controlling-element system involved, (2) determine the state of each, and (3) compare the state induced with the state of the original a_1 mutable. Although there are differences in states between lines (resulting in identifiable patterns), the patterns of mutants isolated within lines are strikingly uniform. This suggests that the transposable element is the determinant for the pattern phenotype.

Peter A. Peterson

2. Phase variation of regulatory elements.

Two particular phenotypes represented by reciprocal patterns of mutability in the aleurone are due to the modification of activity of the regulatory elements (Enhancers, En) governing mutability at the a_1^m locus. The one, En (flow), is active at the base of the kernel but inactive at the crown, while the other, En (crown), is active at the crown of the kernel but inactive at the base. Mutability is found only where En is active. It is hypothesized that here the regulatory elements "switch on" and "switch off" (phase variation) during development of the endosperm.

Peter A. Peterson

3. Linkage and control of mutability of w_{13}^m - a white seedling mutable.

A white mutable seedling, w_{13}^m , was found among the progeny of some pg^m lines. The states of w_{13}^m mutability, like those of pg^m , vary from very early to very late. Stable forms have been isolated. w_{13}^m is located on chromosome 3, 28-30 units from a_1 and near lg_2 . Its exact location with reference to lg_2 is under investigation.

In order to determine whether the mutability of w_{13}^m is related to the En system, crosses were made with the En tester - $a_1^{m(r)}$. From the cross, $a_1^{m(r)}/a_1 \underline{sh}$ x w_{13}^m