

1. Additional Dt loci.

As a result of testing 97 races of corn of diverse origin for modifiers of mutation at the A_1 locus, two possible additional Dt loci have been discovered. (The gene Dt_1 discovered by Rhoades is located on the short arm of chromosome 9 and causes the gene a_1 on chromosome 3 to mutate to its dominant allele A.) The first of these two was found in the Brazilian variety "Cateto". Preliminary linkage evidence has shown it to be linked to the gene Y with about 22.5% recombination. Other crosses have clearly demonstrated that it is not an allele of Dt_1 , and is not linked to either sh_1 or wx . It has therefore been tentatively located on chromosome 6.

Except for location on different chromosomes Dt_1 and Dt_2 have not been found to be distinguishable. From a selfed ear of an $a^m a^m$, $Dt_1 dt_1$, $Dt_2 dt_2$ plant it was found that 1, 2, and 3 doses of Dt_2 give a near exponential increase in dot number as the Dt dosage is increased. This is similar to the behavior of Dt_1 under the same conditions.

In combination Dt_1 and Dt_2 supplement each other in dosage expression. Thus while two doses of Dt_1 give about the same dotting frequency as two doses of Dt_2 , the combination of two doses of each (giving a total of four doses) produces ten times as many dots.

It will be interesting to see what the seeds from a selfed ear of an a , $Dt_1 dt_1$, $Dt_2 dt_2$ plant will show. They will range in combined Dt dosage from 0 to 6 doses in the endosperm.

The second Dt gene was found in a Peruvian race. It has not yet been located and could be an allele of either Dt_1 or Dt_2 .

The three known occurrences of Dt genes reported to date are from widely separated unrelated races of corn. The first (Dt_1 , reported by Rhoades) was found in Black Mexican sweet corn, which is a North American variety of possible Central American origin. The second (Dt_2) is from a Brazilian yellow flint type, and the third is from a purple aleurone Peruvian race.