

1962 a further three progenies from dark variegated gave colored pericarp					colorless pericarp, red cob	Total
	<u>self red</u>	<u>dark var.</u>	<u>medium var.</u>	<u>light var.</u>		
number	262	559	59	10	54	946
per cent	27.91	59.09	6.24	1.06	5.71	

Several anomalies are obvious in these observations. First, the change to medium variegated from dark variegated involves a change of state according to my hypothesis rather than a transposition of Mp as in the change of medium variegated to light variegated. If so, this change is frequent. Transposition of the modified Mp should occur in dark variegated to give a lighter pericarp class analogous to light variegated. As yet this class has not been identified. In scoring progeny from dark variegated a class phenotypically like medium variegated is observed, but its true nature is unknown.

Second, the frequency of reds in the progeny of dark variegated is high, consistent with the heavy striping of the pericarp. A corresponding lighter level of pericarp variegation occurs with low frequency. This is not what one would predict from the twin spot hypothesis of the movement of Mp. Dark variegated ears with twin spots of red, and what looks like medium variegated, have been observed but remain to be grown out for progeny examination.

Finally in 1961, 4 ears out of 188 had colorless pericarp and in 1962, 54 ears out of 946 had colorless pericarp in the progeny of dark variegated. This is about 10 times more frequent than the occurrence of colorless pericarp progeny from medium variegated in the same inbred W9 background.

Robert I. Brawn

3. Indeterminate-growth in Gaspe Flint background.

An indeterminate growth segregate was found in 1958 which flowers only in short days. This new mutant has not been checked for allelism with Singleton's id. In an effort to develop a growth chamber sized corn with the id-like gene, the new mutant was crossed with the world's earliest and possibly smallest corn, Gaspe Flint. Following one back-cross to Gaspe Flint a few plants were selfed. Some of the progeny exhibited very peculiar flowering behavior. The main stalk came into flower just after Gaspe Flint in early July and resembled Gaspe except that it was a few inches taller. However, in September it was discovered that these same plants had indeterminate growth tillers from five to seven feet tall. By early October, just before frost, tassels were appearing on these tillers. Many plants in the row were ear bagged in July, but none of those which exhibited the abnormal behavior silked and so none were selfed.

Normal Gaspé Flint averages only 5 or 6 leaves on the main stalk. Tassels are visible in the leaf whorl two or three weeks after planting dry seed and pollen sheds in about one month. It has been suspected for some time that the growing point in the seed of Gaspé Flint has already been converted from the vegetative to the reproductive stage. Thus only the tassel would form after planting. Leaf number would be limited to those which have differentiated in the embryo of the seed while attached to the mother plant.

My working hypothesis to explain the early flowering main stalk and id-like tillers involves maternal genotype control of the growing point in the seed and autonomous genotype control in the tillers. That is, when id/id seed is produced on an +/id plant, the hormone pattern in the non-short day maternal plant may cause the embryo growing point to change from the vegetative to the reproductive stage as the seed matures. Growing points subsequently produced by the id/id plant in the form of tillers would be under the control of the plant's own genotype and would be indeterminate in growth.

Robert I. Brawn

MARQUETTE UNIVERSITY
Milwaukee 3, Wisconsin

1. Further observations on the etched phenotype.

A. Lack of gene expression in the root. In order to determine whether or not the starchless sectors found in et/et/et endosperm were present in et/et roots, the following procedure was followed: ten 10 mm. roots (chosen because of strong etched expression in the endosperm) were hand sectioned and stained with iodine. If staining of the starch grains was initially poor, the section was washed with a drop of concentrated HCl and restained. No starchless sectors were found in any areas of the root exhibiting detectable starch concentrations. In addition measurements of starch grain number, size, and location in the roots of these etched plants were not significantly different from comparative measurements made on two different non-etched inbred types.

Since the effect of the et allele is manifested only early in the embryology of the endosperm and shoot (virescence) it was thought that the 10 mm. roots observed may have been "too old" for et expression. However, roots just emerging through the seed coat also were without detectable starch sectoring.