

Another interesting observation is the height of plants from the P/P and P/D grafts. The rate of growth of the two types was significantly different from early seedling stage until before maturity. However, the difference is not significant at maturity (See Table 2). The few P/D grafts that grew to maturity showed a much slower early growth rate than the P/P grafts, indicating possibly a lingering of the effect responsible for the low rate of germination. At seedling stage, the P/D grafts were about one-half of the height of P/P grafts and about the same height at maturity. Thus the factor responsible for the slow early growth of plants from the P/D grafts does not affect the later stages.

Table 2. Plant heights in cms. of P/P and P/D at various time intervals after plantings.

Number of Days After Planting	P/D	P/P	t-test
12	5.55	13.40	10.97**
19	16.10	34.19	8.87**
33	40.25	64.75	6.12**
47	50.75	75.25	6.45**
58	79.25	105.87	6.85**
67	109.87	116.25	1.91-
86	160.75	163.62	.52-

- not significant at 5% level.

** significant at 1% level.

Crosses were made using D/P (L317 on 149-5AA) and non-grafted L317 as pollen parents on grafted and ungrafted 149-5AA. Equal numbers of crosses of these pollen parents on 149-5AA were made at the same time to eliminate environmental influence in comparing the effect of the two pollen parents. The total average difference is not significant in any cross (See Table 3). Thus, the embryo transplantation didn't result in any increase in crossability between 149-5AA and L317.

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2. The effect of Pt on tassel development.

In reporting on Pt (A.J.B., 1954, Vol. 41), it was remarked that Pt surprisingly did not apparently affect tassel development in spite of its extreme effect on ear development. Since that time it has been found that in certain genetic backgrounds, the tassels of Pt plants may be drastically altered. The commonest effect within a spikelet is a proliferation of pistillate tissue produced by the meristem cutting off new rings of tissue successively at its periphery. Each ring may

produce a silk although not necessarily. This is analogous to the commonest effect produced in Pt ears.

When both tassel and ear are affected, there is general agreement between the severity of the effect on both. And when the phenotype of the ear is "inhibited" as is the case with many Pt/Pt plants, then the tassel also shows some degree of inhibition, i.e. restricted spikelet development.

The genetic background in which the effects of Pt are extended to the tassel has not been characterized although it is probably not complex. The best source was the linkage tester for Chr. 8 carrying i, v16, msg which was obtained from the Coop (50-55).

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3. Double mutants in the chromosomal vicinity of a mutable locus.

The mutable allele a^{Pm} produces a high rate of mutation at the A_1 locus (News Letter 30: 111). This allele mutates both somatically and germinally so that deep, pale, light pale and colorless levels of anthocyanin pigmentation are expressed in the aleurone tissue. The alleles produced by germinal mutation vary in stability from stable (a^{P5} , no mutants in 30,000 tested gametes) to moderate stability (a^{b1} , 1 mutant per 13,000 gametes) to moderate mutability (A^1 , 1 mutant per 4,000 gametes) to instability as marked as that in the parent allele.

Four of these new deep alleles, six new pale alleles, and four of the colorless alleles were examined for rates of mutation to stable alleles giving different levels of aleurone pigmentation. The results are given in Table 1. Two cases of coincident mutations at two loci occurred among the 158 mutants. In these cases the deep (A^4) and the pale (a^{a1}) alleles mutated to alleles expressing the colorless level while the adjacent dominant shrunken-2 allele assumed the recessive form. These mutants will be designated $\frac{1}{a\ sh_2}$ and $\frac{2}{a\ sh_2}$ respectively. One of these mutants, $\frac{1}{a\ sh_2}$, has been tested further and has been shown to behave in a manner similar to that of the a-X1 mutant of Stadler and Roman.

Although there is no visible indication of pollen abnormality in plants heterozygous for the double mutant ($\frac{1}{a\ sh_2/a\ sh_2}$), the transmission of the microgametophyte carrying $\frac{1}{a\ sh_2}$ is reduced. Table 2 shows a good deal of variation in the degree of transmission among the different cultures. The average per cent of normal transmission for these five cultures is 44.