

(V₅, Ra₁, Gl₁, I₁) in common with corn chromosome 7 and another Tripsacum chromosome has a series of at least 5 loci (Yg₂, C, Sh₁, Bz, Wx) found on corn chromosome 9. The data for constructing idiograms for these two isolated Tripsacum chromosomes have not yet been obtained.

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2. Selection for increased transmission of a Tripsacum chromosome and its resulting homozygosity.

The male and female transmission rates for the Su^d chromosome from T. dactyloides 4n of Florida on a background of a su gl₃ tester stock of corn were originally about 10% for either sex alone instead of 50% and self-pollinated ears had about 19% starchy kernels instead of 75%. By selecting for increased Su^d transmission among hundreds of ears over several generations, the transmission rate for either sex alone was raised to over 40%. Self-pollinated ears from these higher transmission lines yielded some ears (about 25% of the total) which showed 80 to 95% starchy kernels. At least some of these ears with around 90% starchy kernels are assumed to be addition disomics (20+2) with the extra Su^d chromosome from Tripsacum homozygous. The failure to obtain 100% starchy kernels on such ears would result from an occasional loss of both members of a pair of Su^d chromosomes which may not be coordinated in their meiotic behavior with the maize chromosomes. The cytological analysis of this material has not been completed.

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3. Homozygosity of a possible interchange chromosome from Tripsacum.

We did obtain one ear which had 100% Su^d Su^d kernels, but this plant has 20 rather than 22 chromosomes. This may have resulted from a homozygous substitution of a corn-Tripsacum interchange chromosome. Since the Su^d chromosome is known to lack some of the loci of corn chromosome 4 (La and Gl₃), it presumably would not provide a functional substitution in itself. This particular plant was partially male sterile and the ear had 26 per cent defective kernels (out of 133). Here again, the cytological analysis is incomplete.

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4. Additional evidence of somatic mosaicism in corn grass.

In last year's MNL, we reported that certain differences in morphology between two ears borne at different nodes on a corn grass plant were inherited rather than mere physiological variations. Since the action of the corn grass locus seems to involve the phase change process, it appeared that here was evidence for the involvement of a mutational (or paramutational) mechanism, as suggested by Brink on other grounds. However, Brink raised the question that my results could have come from a physiological difference carried through the cytoplasm of the egg.

We have tested this possibility by using pollen from two different forms of inflorescences borne on the same plant. The planting was widely spaced in the field (six sq. ft./plant) and extra fertilizer and water were applied. The plant chosen had a grade two lateral inflorescence that terminated a branch which originated above ground level and could not have been derived from a different embryo than that which produced the main stalk. The terminal inflorescence to the main stalk of this plant was normal (grade 5). The data were gathered from our winter crop planting in Goulds, Florida.

The results (Table 1) of a heritability test of variation through the male side confirm the previous one made on the female side. The hybrid progeny produced from crossing A158 with pollen from a 'vegetative' type tassel (grade 2) borne on a lateral branch was significantly more vegetative than that produced with pollen from the normal type tassel (grade 5) terminating the main stalk ($P = < .01$).

Table 1
Frequency distributions for hybrid progeny from A158 crossed by two grades of corn grass tassels borne on a single plant

Parental Tassel	Progeny Tassel Grades				Totals
	2	3	4	5	
Grade 2 (veg.)	9	18	35	16	78
Grade 5 (normal)	1	9	13	54	77

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1. Genetic instability of R^{st} and derivatives in somatic and germinal tissues.

In a previous report we showed that after introduction of Mp in a homozygous $R^{st} R^{st}$ stock, some kernels are produced exhibiting a new spotting pattern among the standard stippled kernels. These stippled derivatives, that breed true in successive generations, are here symbolized as R_{sk} , $R_{l.sk.}$, $R_{l.st.}$, and $R_{n.c.}$ to indicate respectively smoky, light smoky, light stippled and nearly colorless. Like R^{st} these new forms do not synthesize anthocyanin in the sporophytic tissues and they are strong inducers of paramutation. On the other hand, they differ from stippled in the number and size of dots that they form in the aleurone.

The mosaic phenotype of the aleurone is presumably caused by the frequent somatic reversion of R from an inactive to an active form. Each of the spots therefore registers one such event which occurred sometime