

found to be controlled by two incompletely dominant genes, as indicated by F_2 ratios of 1:14:1. In some cases the phenotypic effects of these genes are measured best in terms of rachis diameters (cob minus glumes) and in other cases rachis internode length is the more important criterion. In the F_2 segregation from self pollinating a hybrid between a string cob inbred and the sweet corn inbred Ia 5125, the distribution of rachis diameters was trimodal with a good fit to the 1:14:1 ratio. The fit was less distinct for rachis diameters with G29 and not at all apparent with Wilburs Flint. The reverse was true regarding rachis internode length. Only Wilburs Flint yielded a trimodal distribution for rachis internode length fitting a 1:14:1 ratio. The segregation involving Wilburs Flint was homozygous for the eight-rowed condition.

Crosses with the collection of A-B translocation testers yielded a few extreme string-type specimens in hybrids with TB4S and TB9S which indicates that the two major genes involved may be located on the short arms of these two chromosomes. Other studies indicate that teosinte also has loci affecting rachis internode length on these chromosomes.

W. C. Galinat

3. Non-cupulate pistillate rachises in maize.

The F_2 segregation of Iowa 5125 x string cob yielded a few pistillate rachises which were like the staminate rachises in being barren of cupules. This condition, apparently not previously observed in maize, may result from a recombination of parental factors for small cupules.

The small cupules of the string cob inbred stem from their vestigial nature in their "pure-maize" source. Confite Morocho.

The small cupules of 5125 may also be associated with pure maize germ-plasm or, at least, from a low-level of teosinte introgression. Because 5125 is fasciated and because teosinte introgression is known to reduce or eliminate fasciation (Galinat, MNL 37:35-36. 1963), this inbred is presumed to have a low-level of such introgression. While cupules appear to be rudimentary in maize, they do have a function in the formation of the cupulate fruit case of maize's close relatives, teosinte and *Tripsacum*. The well-developed cupules of modern "tripsacoid" maize appears to stem from the introgression by these relatives.

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4. Recessiveness of hairy sheath in *Tripsacum* species hybrids.

The gene for hairy sheath (Hs) on the short arm of corn chromosome 7 acts as a dominant (Tavcar, 1932). Yet when either of two species of *Tripsacum* with hairy sheaths, *T. maizar*, *T. pilosum*, are hybridized with species having glabrous sheaths, *T. dactyloides*, *T. floridanum*, *T. zopilotense*, and a glabrous form of *T. australe*, the F_1 hybrid is glabrous. The results of this study of the inheritance of hairy sheath in chiefly diploid species of *Tripsacum* may be useful in determining the parentage of various tetraploid species believed to have had an allopolyploid origin.

The F_1 hybrid of the diploid species, T. maizar (FTG65-1237) and T. floridanum, in addition to having glabrous sheaths is highly pollen sterile and at meiosis in the microsporocytes there are varying numbers of paired and unpaired chromosomes which are irregularly distributed to the microspores.

These Tripsacum species hybrids are being grown for additional genetic tests and cytological studies at the Fairchild Tropical Garden in Miami, Florida along with an extensive live plant collection of the perennial relatives of corn.

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L. F. Randolph

5. Irregular transmission of the Su^d marked chromosome from Tripsacum in an addition monosomic stock of corn.

The starchy-marked (Su^d) chromosome, derived from Tripsacum as an addition chromosome on corn, gave a wide range of transmission rates in reciprocal crosses made on 112 ears (rows 66-1029 to 1064) grown under somewhat adverse conditions in Florida in January 1966. Transmission through the female ranged from less than 1% to 77% with an average of 6%. Transmission through the male ranged from less than 1% to 85% with an average of 15%.

Whenever the male and female transmission of the Su^d chromosome differed by more than a few per cent, it was always the male transmission which was higher. Sudden large increases in the rate of male transmission of this extra chromosome do not appear to be inherited. The cross su gl, x 66-1038-3 Su^d gave 66% starchy kernels while the reciprocal cross with the same two plants gave only 11% starchy kernels. These wide differences between male and female transmission in reciprocal crosses disappeared in 16 selfed progeny ears (67-266, 267) with a range of 13.8% to 25.2% Su^d and an average of about 19% derived from both crosses. There is, however, a slightly higher rate of male transmission over female transmission which, under good pollinating conditions at least, does appear to be inherited (see next item).

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6. Consistent low female and high male transmission of the Su^d Tripsacum addition monosomic of corn.

Reserve seed of the 66-1038 stock which gave 11% Su^d female and 66% Su^d male transmission in Florida was grown in Massachusetts in 1967 and reciprocally crossed to the sugary background. In the cross with Su^d as the male parent, two sugary seed parents were used with one from the related su seed and the other from an unrelated su tester stock. The results follow: