in their characteristics. Accordingly we selected from the characters described in Emerson, Beadle, and Fraser a number of those described as "variable" or "difficult to classify." These were grown in 1962 and the ears were scored with respect to tripsacoid effects, especially the induration of the rachis and lower glumes of the cobs. The following characters proved to be associated with tripsacoid cobs: albescent, brevis, narrow leaf-1, pale green seedling-2, rootless, silky-1, zebra-1, zebra-2, zebra-3, and zebra-4. In several segregating populations the mutants were tripsacoid and normal plants not. Only one character of those studied in 1962, adherent-1, was not associated with tripsacoid effects.

P. C. Mangelsdorf
W. C. Galinat

7. Segregation of genetically marked chromosomes in maize-Tripsacum hybrids.

We have for some years been attempting to produce a hybrid of Tripsacum dactyloides with our WMT stock which has recessive marker genes on seven chromosomes (1, 2, 3, 4, 7, 8, 9). The principal purposes of making this cross were (1) to determine whether Tripsacum carries dominant alleles of the maize recessives; (2) to determine whether Tripsacum, having almost twice as many chromosomes as maize, carries the dominant alleles in duplicate in some cases; (3) to identify cytologically the Tripsacum chromosomes which carry the dominant alleles.

A hybrid plant obtained by employing embryo culture exhibited none of the recessive characters introduced from maize but proved to be completely sterile, probably because of the greater amount of chromosome pairing than had previously been reported in maize-Tripsacum hybrids. The chromosome number of this hybrid was doubled through colchicine treatment (MNL 35). Backcrosses to the multiple recessive maize stock produced 32 triploid hybrids having 20 maize and usually 18 Tripsacum chromosomes. These, like the F_1 hybrids, showed no maize recessive characters with three exceptions: one plant each was bm_2, a and j indicating that one or more Tripsacum chromosomes had in each case been lost. The cytological studies of the triploid which exhibited j showed that three Tripsacum chromosomes were absent.

The triploid hybrid proved to be highly sterile (1.7% fertile) when backcrossed by the multiple recessive stock. Ninety-two plants of the segregating backcross population were obtained. The frequencies of dominants in this population were as follows:

	Maize Chromosome						
	1	2	3	4	7	8	9
Dominant from Tripsacum	Bm_2	Lg_1	A_1	Su_1	Gl_1	J_1	Wx
Frequency of Dominants	34.5	23.9	31.6	28.2	38.0	60.5	37.0

If the Tripsacum chromosomes segregate at random at meiosis and if there is no selective gametic or zygotic elimination then there should be 50 percent of dominants for those loci for which Tripsacum carries one dominant allele and 75 percent dominants for loci for which Tripsacum carries two alleles. The data fit neither of these theoretical expectations, probably because the high degree of gametic elimination is selective against extra Tripsacum chromosomes. It may be significant, however, that six of the seven frequencies are similar to each other (average 32.2 percent dominants) while the seventh, J_1, has almost exactly twice this frequency. This may suggest that Tripsacum carries only one allele for the maize markers, bm_2, lg_1, a, su, gl_1, and wx, but carries two for j_1. The final answer will depend upon the cytological identification of the Tripsacum chromosomes carrying the dominant alleles in 2n+1 plants. If the presence of a particular dominant allele is always associated with a particular Tripsacum chromosome, it may be assumed that Tripsacum carries only one dominant locus for the character in question.

One Tripsacum chromosome has so far been identified both genetically and cytologically: the chromosome carrying the allele of wx. This is the satellite chromosome of Tripsacum which among the 18 Tripsacum chromosomes is the sixteenth longest in length. In one plant with better than average pachytene spreading this chromosome frequently associated with chromosome 9 of maize in a peculair configuration. This chromosome has a median centromere and two terminal knobs. Its two arms fold back on each other, their terminal knobs fusing. This large fused knob may then fuse with the terminal knob of chromosome 9 of maize. In this plant the satellite chromosome of Tripsacum never becomes attached to the nucleolus although it did so at times in the F_1 hybrid producing configurations in which two satellite chromosomes were attached to the nucleolus.

W. C. Galinat
P. C. Mangelsdorf
Raju S. K. Chaganti

8. Effects of Tripsacum floridanum chromosomes on the meiosis of maize.

During the summer of 1961-62 a large population (about 650 plants) was grown of the progeny of the triploid hybrid of corn and Tripsacum floridanum (produced by Dr. Galinat by backcrossing the F_1 corn-Tripsacum hybrid twice by corn, MNL 35, 36). Young tassel material was collected for the following types of cytological study: (1) frequencies of the numbers of extra Tripsacum chromosomes transmitted by the triploid hybrid; (2) identification of the Tripsacum chromosome carrying the dominant allele for gl_3 when this is covered; (3) affinities of maize and Tripsacum chromosomes within themselves when they are present as parts of the haploid complement and in different combinations;