

4. Gene exchanges between corn and *Tripsacum*.

Genetic crossing over is observed at regular frequencies between certain common loci shared by the homeologous chromosomes of corn and *Tripsacum*. Both crossover products between the lg₁ and gl₂ loci on the short arm of corn chromosome 2 and the long arm of a *Tripsacum* chromosome have been obtained. All possible crossover classes have been recorded for the known common loci v₅, ra₁, gl₁, and ij on chromosome 7 of corn and 4 of *Tripsacum*. Exchanges between corn chromosome 9 and *Tripsacum* 7 or 8 are confined to yg₂ at the distal end of the short arm and bk₂, bm₄ on the long arm (of corn 9). The frequency of these observed gene exchanges is in the order of 1%. It has not been possible yet to use the rate of crossing over to ascertain the order of the different genes on the *Tripsacum* chromosomes.

Cytological studies have shown that the concerned chromosomes of corn and *Tripsacum* are different in their lengths and arm ratios. In the addition disomics, they show preferential pairing at pachytene to their respective homologs and because of the apparent lack of meiotic pairing between the corn and *Tripsacum* chromosomes, the regions involved in the exchanges could not be determined in the materials examined so far. The morphological differences in the pachytene chromosomes of corn and their *Tripsacum* homeologs, as well as the probable premeiotic exchanges involving regions of different lengths, indicate differences in the arrangement of the common loci on the chromosomes of the two genera.

W. C. Galinat
B. G. S. Rao

5. A possible elimination of corn chromosome 4 in the hybrid origin of *Tripsacum*.

Genetic comparisons of six linked loci on corn chromosome 4 to the genome of *Tripsacum* do not reveal a corresponding assemblage of these loci on any single *Tripsacum* chromosome. The position of the Su₁ locus in both corn and *Tripsacum* is close to the centromere but the similarities seem to stop there. The Su₁ chromosome of *Tripsacum* does not include La to which Su is linked by 11 crossover units on the short arm of corn chromosome 4 nor does it include 4 other loci tested on the long arm. A