plants were produced by both classes of seeds. These results would place bm distal to 5S.10, the breakpoint of T1-5(8041) in chromosome 5.

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Genetic systems for the production of hybrid corn seed without detasseling

True genetic systems to eliminate detasseling (in contrast to cytogenetic systems that require translocations and deficiencies for gamete selection) are possible if man takes a physical part in selection for certain seed or plant characters associated with male sterility. Two such systems are described here.

A y ms system based on the close linkage of yellow-white endosperm and the male sterile gene on chromosome 6 was described by Singleton and Jones in 1930. The system was never put to use because the problem of contamination by the five percent of recombinant plants was not resolved. A modification in this system by applying the electronic eye seed sorters can make it practical. The y ms kernels that give male sterile plants are electronically sorted from a sib to heterozygous yellow endosperm, male fertile (Y y Ms ms) counterparts. When these white kernels are planted as the female in a crossing field with a normal yellow male, damage from selfing and sibbing by the five percent fertile recombinants appears as white kernels. Here again the electronic seed sorters are used but this second time to remove the white seed. Thus, the result is 100% hybrid bicolor seed. The farmer's crop will segregate ca. 25% white kernels on each ear.

A ts2 sk system is based on the female development of the tassel and its modifying genes. The ts2 gene raises the level of femaleness, resulting in tassel seed as well as ears with irregular rows from the development of both florets. But when the ts2 gene is combined with the silkless (sk) gene on chromosome 2, the tassels become at least partially male fertile, depending on the environment and other modifying genes. In contrast to the ts2 gene, the sk gene raises the level of maleness, resulting in stamens developing in both tassels and ears. Thus, when both the ts2 and sk genes are combined in the double recessive some sort of a male-female balance is once again established. A line cross between plants that are homozygous for ts2 and sk yields a progeny that is 100% tassel seed male sterile (ts2 ts2 Sk sk) because the recessive silkless gene is heterozygous. When this line cross is used as the female in crossing fields, detasseling is unnecessary. The ts2 ts2 Sk sk parent of this line cross must be maintained by the backcross-sib technique. In producing the line cross, the normal segregants may be cut out of the female rows long before pollen shedding. The tassel silks on the plants to remain in the field appear in the plant-whorl stage two weeks or more before the plant elongates and exposes ear silks.

Walton C. Galinat

Further notes on the use of Tr7 in the production of bisweet hybrids

In last year's MNL we mentioned that Tripsacum chromosome 7 (Tr7), which carries the Su locus also found on corn chromosome 4, may facilitate the practical production of bisweet hybrids. When the double recessive of sugary-shrunken-2 with an extra pair (20+2) of Tr7 chromosomes is line-crossed to su sh2 without the extra pair, the 20+2 condition is reduced to the 20+1 state. Then if the sh2 gene is also covered in the final crossing field involving a normal sugary seed parent, the hybrid seed crop is normal sugary with about 10% starchy kernels from Tr7. These starchy kernels may be eliminated from hybrid seed by the proper combination of

electronic eye sorting and/or gravity - shaker table sorting. The final consumer bite-off is a flavor blend of 25 percent sugary-shrunken on a sugary background. Credit for the suggestion of a physical separation of the ca 10% starchy kernels goes to my son David W. Galinat.

Walton C. Galinat

The practical production of trisweet hybrids

A type of sweet corn hybrid segregating two extra endosperm types on a sugary background is practical from a cross in which both pollen and seed parents carry a different endosperm recessive in combination with sugary. For example, if the pollen parent was su sh2 and the seed parent was su bt2 then the hybrid seed would be all standard su su with both sh2 and bt2 covered by their dominant alleles from the other parent. But the crop ear would be about 7/16 or 44% super-sweet on a sugary background rather than just 25% as in the case of the bisweet types.

Walton C. Galinat

Comparative cytology of certain Maydeae and Andropogoneae

The inclusion of several Oriental and American genera in a single tribe, the Maydeae, has been considered by some as an artificial assemblage of monoecious grasses from the tribe Andropogoneae (Weatherwax, 1954), while others have considered the Maydeae as a valid taxonomic offshoot from the Andropogoneae (Hitchcock and Chase, 1950; Anderson, 1945; Stebbins, 1956a - as reviewed by Chandravadana and Galinat, in press).

Since the floral morphology of the Maydeae is most similar to that of the subtribe Rottboelliinae of the Andropogoneae, it seems possible that studies of comparative chromosome morphology of the subtribe could help to identify the most probable connecting link between the American Maydeae and the Andropogoneae. If the closest possible hybrid between these tribes were produced experimentally, then subsequent studies of its chromosome homeology may serve to elucidate their evolutionary divergence.

In the present study, a comparative analysis is made of the chromosome morphology of the genera Elyonurus, Manisuris and Coelorachis of the tribe Andropogoneae. The individual chromosomes of these genera have been identified at pachytene and tabulated. The morphological details of the pachytene chromosomes have been reported earlier (MNL 44, 1970; MNL 45, 1971; and MNL 46, 1972).

An attempt to compare the morphological details of the chromosomes at pachytene of these genera with those of maize, Tripsacum and Coix, the first two of American Maydeae and the third of Oriental Maydeae, has revealed some interesting correspondences.

It appears that Manisuris and Coelorachis share many cytological features. Out of the 18 chromosomes of Coelorachis, 9 are comparable to the 9 chromosomes of Manisuris. Since no meiotic irregularities were noticed in Coelorachis at any stage, the similarities of nine of the Manisuris chromosomes with the nine of Coelorachis at pachytene, including the nucleolar chromosome, suggests a hybrid origin of Coelorachis. The two collections of Elyonurus tripsacoides from Veracruz and Mexico are distinct both morphologically and cytologically. The chromosomes of these three genera resemble maize chromosomes to a greater extent than they do those of Tripsacum. However, a comparison of maize chromosomes with the other Maydeae like Coix would reveal that they also share some features. They have the same lengths and both have internal and terminal knobs, the nucleolar chromosome of maize is more similar to that of the members of Andropogoneae studied than to that of either Tripsacum or Coix. In the light of the above cytological findings it seems that certain maize (Zea) chromosomes have more in common with certain members of Andropogoneae than with those of the other Maydeae (Coix and Tripsacum). This seems to support the earlier suggestions that Maydeae is an artificial assemblage and might be an offshoot of the Andropogoneae. The close relation of both maize