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

and teosinte to Tripsacum cannot be denied, however, as is well known from their crossability and cross-mapping studies. Chromosome differentiation in this case seems to be more important in the tactics of immediate divergence than in the ultimate strategy of wider speciation.

P. Chandravadana and W. C. Galinat

UNIVERSITY OF MILAN
Institute of Genetics, Milan, Italy

A second case of transposed duplication in chromosome 10

We have presented evidence that a nonparental strand isolated from heterozygous R-sk/r-r K10 plants carries a chromosome segment in duplicate, one segment in normal position and one transposed to a new position on the same chromosome (G. Gavazzi and G. Galli, MNL 48:106-112; Gavazzi, Heredity in press). The data to be presented refer to another strand, referred to as case 1 strand, isolated from R-st K10/r-r parents as a presumed intralocus recombinant carrying the P component of r-r linked to R-st. The parental genotype expressed in terms of the P and S components of the R locus is symbolized p S-st/P s, where the lower case letters p and s do not distinguish between presence of a recessive allele and absence of the gene component.

The transmission of case 1 strand as determined in heterozygotes with a normal strand is significantly lower than the expected 50%, amounting to about 17% and 43% in the male and female germ line respectively (Table 1). Furthermore, stippled kernels with BFB cycles are frequently observed in testcrosses of

Table 1. Observed segregation on ears obtained by reciprocal crosses of heterozygous P S-st/p s plants to a p s line.

Entering parent	Colorless	Stippled	Light stip.	BFB	Total seeds	Case 1 strand transmission
female	7583	5537	26	95	13241	42.73%
male	3074	622	-	16	3712	17.19%

P S-st/p s plants, while they are not observed when S-st is on a normal strand. The frequent occurrence of the cycles is suggestive of chromosome instability.

The P to S-st recombination value as determined in testcrosses of P S-st/p s females is much higher than expected, suggesting that P of case 1 strand is dislocated to a new position either distal or proximal to the R locus:

Gametes tested	Presumed strand constitution				% nonparental strands	
	P S-st	p s	p S-st	P s	S-st	s
7240	3623	3445	116	56	3.10 (2.33)*	1.60 (1.86)*

*Recombination values corrected for differential transmission of strands with the duplication.

Case 1 strand carries Mst distal to S-st. Its loss through crossing over leads to a light stippled phenotype. Accordingly if this strand carries P distal to R then the light stippled recombinants yielded by testcrosses of P S-st/p s females (see Table 1) should not carry P but they would still carry it if the latter is proximal to R.

Out of 18 presumed light stippled progeny tested, nine bred true. Eight of them lost P, while one retained it. This is the result expected if the gene