Table 2

Inheritance of pedicel length in an F_2 of string cob X Corn Belt dent.

Observed	Theoretical on a 9:7	Pedicel Length Mean (mm)	Standard Deviation
786	841	3.9	.6
710	654	2.0	.5

chi sq = 8.38

1 d.f. at 1% level = 6.64

Therefore the fit to a 9:7 ratio is highly significant.

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4. On the possible assemblage of a synthetic teosinte.

The following mutant genes and variants involving the maize cob are being recombined to produce a synthetic teosinte.

1. pd: single female spikelets, a mutant discovered by Hepperly (1949) and others.
2. tr: two ranked (distichous); although most mutants are unstable, rare stable forms were discovered by Tavcar (1935), Lindstrom (in Burdick, 1951) and myself (unpub.).
3. Sg: string cob (reduced pedicels), extracted from Confite Morocho (Galinat, 1969).
4. is: cupulate interspace, extracted from Coroico (Galinat, unpub.).
5. chr 4 complex: inclination of spikelets toward cupule, induration of the outer glume and development of an abscission layer. The extraction of this complex from Maiz Amargo or Enano, both of South America, may be critical. However, its components may be discovered and isolated individually. For example, the sweet corn inbred W400 out of the variety Buttercup has weak abscission layers in the rachis.

Other teosinte-like mutations, tsb (teosinte branched), nl (narrow leaf) and id (short-day response), are not considered as essential in

synthesizing the species and, therefore, they may be omitted as unnecessarily complicating the breeding work.

If this experiment is successful in synthesizing a teosinte-like spike, it would demonstrate three important things: (1) That the above few essential features are sufficient for the transformation; (2) That the teosinte-like races of South America contain a fourth chromosome complex comparable to that extracted from teosinte; (3) That the reverse transformation from teosinte to maize is possible, if not probable. It would also illustrate the well-known plastic nature of maize which makes it improbable that wild maize would have become extinct in the first place.

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5. Relative dominance of single female spikelets.

Single female spikelets, whether derived from teosinte or by mutation within maize, have dominance relative to the maize background. It was first noted by Mangelsdorf (1947) that in a cross of Durango teosinte by Guarani maize, the spikelets are predominantly single, whereas in crosses of the same teosinte by North American maize, they are predominantly paired. More recently similar results have been obtained independently by myself and Beadle. In my own material, single spikelets from northern teosinte were dominant in crosses with Confite Morocho, a primitive popcorn from Peru. Beadle (unpub.) has found dominance of single spikelets from Nobogame teosinte in a cross of Rhee Flint from North Dakota.

In my own crosses with the mutation to single spikelets, discovered by Hepperly (1949), dominance of expression occurred in combination with Wilbur's flint and a sugary string cob inbred, but not with inbred A158.

There is a good possibility that there was a reversal of dominance of the teosinte traits, at least for single versus paired spikelets, in Central America where repeated natural outcrossing to teosinte may have led to selection of a genetic background buffered against the heterozygous expression of the teosinte traits.

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