The assumption can be tested with the chi-square test:

Observed	39,713	36,523
Expected	75,696(2/3.9257) = 38,564.33	75,696/(1.9257/3.9257 = 37,131.67

Chi-square = 19.5728, df=1, P <.005

The result suggests, first of all, that waxy may have an effect on stylar tissues. If further studies support this suggestion, an interesting interaction between pollen tubes and stylar tissues will be indicated. These further studies must, of course, test for an alternative explanation: the possible influence of the ga8 locus, which is within 15 map-units of wx on chromosome 9. Perhaps some of the material summarized by Ericksson showed the influence of this locus. This too could have caused the deviations observed.

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The practical use of high quality but defective endosperm traits — Various recessive endosperm mutants (e.g., shrunken, brittle, opaque, waxy, etc.) which improve the quality (sweetness, flavor, nutritive value) of the endosperm are often impractical for large scale commercial use because they are associated with undesirable production traits such as reduced germination and disease susceptibility. However, if they enter a corn hybrid from just the pollen parent, which constitutes only every fifth row in a crossing field and which may come from nurtured means, the desired recessive traits will still segregate out in 25% of the F_2 kernels scattered at random on each ear of the farmer's crop. Thus, there will be normal seed quality for the seedsman, and the recessive mutants will still have a significant although reduced effect on the quality blend of the farmer's crop.

The popular bi-color (Y vs. y) sweet corn hybrids are an established example of the concept. In the case of shrunken-2 now used in combination with starchy (Su Su, sh2 sh2), the double recessive (su su, sh2 sh2) would be in the pollen

parent with any desired sugary inbred as seed parent. This permits high quality seed with good germination rates. The farmer gets a crop ear with a sprinkling (25%) of extra sweet kernels, usually just the correct amount for the many people who find 100% shrunken-2 kernels too sweet for their taste preference.

The propagation of the double recessive su sh2 in the pollen parent may be facilitated by the use of an extra Tripsacum chromosome carrying the dominant allele of one or the other of the recessive. When present as an extra pair of alien chromosomes, the transmission to daughter gametes is the normal 50-50. But when reduced to a single extra alien chromosome in the farmer's crop, its transmission drops down to about 8%, leaving the recessive trait largely uncovered to the benefit of the quality connoisseur. At present this system would have to be restricted to the use of Tr7 carrying the Su locus. The Tripsacum chromosome marked by Sh2 has not been isolated.

A side advantage of bisweet hybrids, as with bicolor hybrids, is that they are a source of "grow-it-yourself" ears exhibiting F_2 ratios. With the segregation of both bi-sweet and bi-color factors on a single ear, independent assortment may be demonstrated for students.

Walton C. Galinat

Three systems for two-ranked ears in corn — Depauperate type: The eight-rowed Northern Flints, when grown under stress, frequently produce two-ranked ears with paired spikelets giving a four-rowed ear. The tendency toward this type of two-ranking is stronger in eight-rowed strains having an inherited reduction in the vascular system of the cob. When such a reduction in vascular system is combined with the mutant for single female spikelets, the styles may fail to elongate, as in the "silkless" mutant.

Elongation type: When condensation is relaxed sufficiently, ranking continues to drop until the two-ranked state is achieved. The two-ranked level of condensation was selected from among the F_2 segregants of a cross between a string cob sweet corn inbred (MW401) and an "interlocked" derivative of Coroico corn by eight-rowed Northern Flint corn. The two-ranked cobs of this selection are sometimes four-ranked at the base or in the lower half of the rachis. The degree of condensation upon which this is based is polygenically controlled between extremes like that of kernel row number.

Tripsacum-teosinte type: A dominant factor for two-ranked spikes, first discovered as one of the effects of a Tripsacum chromosome (Tr9) when present