2. A new lutescent trait in maize.

Among recently-collected, chlorophyll-deficient traits, an expression similar to the tomato lutescent (Rick and Butler, Advances in Genetics 8:267-382, 1956) has been observed. This maize lutescent appears as a pale green leaf color in the seedling stage followed by a yellowing but persistence of the older leaves, hence the tentative designation lutescent. It is apparently not equivalent to Bianchi's lutescent term in MNL 37.

Expression of the new maize lutescent suggests nitrogen-deficiency symptoms. Preliminary experiments conducted by Mr. David Shortess of this laboratory indicate that changes in nitrogen nutrition strongly influence expression.

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3. Mutant nomenclature.

The growing assemblage of cataloged mutants in maize, tomato, barley, soybean, tobacco, potato, Arabidopsis and other vascular plants points out the need of a standard taxonomy of genetic traits. I have found little correlation in comparing the names given to traits from one genus to another. Moreover, inconsistencies exist within naming systems.

Investigations of gene action are obviously complicated by the differentiated cells and tissues of higher organisms. However, few of the names given to mutants in higher plants give any indication of gene action although differences in metabolism have been elucidated in a number of cases. I hesitate to suggest a renaming program for cataloged mutants, but a standardization of nomenclature seems to be an inevitability in the near future.

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1. Introgression in Corn Belt maize.

It has previously been shown (News Letters 35, 37) that introgression in maize, from its relatives teosinte and "Tripsacum", can be recognized on the basis of the morphological effects produced by the introgressed germ plasm on the component parts of the pistillate spikelet and its associated rachis internode. Since Corn Belt maize possesses numerous tripsacoid characters, a morphological study of a sample of the Corn Belt material was undertaken so as to recognize the introgressed components responsible for the tripsacoid characteristics. About 30 inbreds and a few typical flints and dents were employed in the present studies. The northern flints, it seems, are comparable to teosinte introgressed

A158 maize derivatives in most of the tripsacoid features of the pistillate spikelet, such as up-curved lower glume and inclined rachilla (teosinte component 4 modification), elongated rachis internodes (teosinte component 9 modification), whereas, the southern dents do not show many of the obvious effects of the teosinte introgressed components mentioned above. However, they do possess highly indurated and extremely thick rachis segments--the tripsacoid characters which are probably imparted to a certain extent by teosinte components 3 and probably 4+. Most of the inbreds fall within the two extremes of flints and dents giving further evidence that Corn Belt maize originated by the hybridization of northern flints and southern dents. It is interesting that some of the inbreds (C103, 099, 526, F14), although having different genetic background than the experimental teosinte introgressed A158 derivatives previously reported (News Letter, 37), still compare closely for spikelet characteristics with the A158-derivatives modified by individual teosinte components Florida 4+ and Nobogame 4B. Other inbreds, 695, 029, 291, and Oh 43, for example, showed the dilute effects similar to those expected from the introduction of more than one teosinte component. Still others, like 334, appeared to be even more tripsacoid than any of the teosinte introgressed derivatives of A158 or the flint and dent varieties.

S. M. Sehgal
W. L. Brown

2. Tripsacoid characters and combining ability.

If flints and dents have different types of introgressed components and if these components are heterotic (Sehgal, 1963), it would be logical to expect the inbreds with high combining ability to possess tripsacoid components from both blint and dent varieties and therefore to be probably more tripsacoid than either flints or dents. Examination of the internal cob morphology of a number of inbreds shows that this is true for many of them (C103, 705, 336, 385) and especially so for inbred 334. Inbred 334 possesses numerous tripsacoid features (strongly inclined, short and thick rachilla; extremely horny and highly indurated rachis segment) and appears to be more tripsacoid than the other inbreds studied or the experimental introgressed types. This is also one of the best general combiners in our cultures.

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3. Recovery of extreme segregates.

If Corn Belt maize possesses various degrees of teosinte germ plasm in its genetic constitution as most of the available evidence suggests, then it should be possible to recover segregates comparable to the experimentally introgressed teosinte derivatives by inbreeding the O.P. varieties. Such segregates, although not very frequent, do sometimes appear in F_2 and subsequent generations and have been observed in inbred progeny of the varieties Krug, Lancaster, and Midland. Some of the extreme segregates have many tripsacoid features of both plant and ear, and a few even exhibited a tendency toward single spikelets.

William L. Brown