endosperm mutants suggest that the majority of maize endosperm mutants considered to be dominant will exhibit dosage effects if observed when appropriately selected endosperm mutants are present as homozygous recessives.

D. L. Garwood, C. D. Boyer and J. C. Shannon

Sweet corn breeding questionnaire summary

Information has been compiled concerning (1) maintenance of publicly released su inbreds, (2) maintenance of publicly released du, sh2, and su2 inbreds in sweet corn backgrounds, (3) open pollinated sweet corn (su) variety maintenance, and (4) mutant genes being incorporated by backcrossing into sweet corn inbreds and varieties. Copies of the summary are available upon request. Information from individuals not previously contacted would be appreciated.

D. L. Garwood

PIONEER HI-BRED INTERNATIONAL, INC.
Mankato, Minnesota

Progress report on lethal leaf spot (lls)

Dr. A. J. Ullstrup and I reported (Phytopathology 57:1282, 1968) a recessive lethal leaf spot whose lesions resemble H. carbonum race 1. The target-shaped lesions (concentric rings) begin on older leaves at the 5 or 6 leaf stage then spread and enlarge to kill the plant just before or shortly after pollen shed. Our efforts at Mankato on the trait since that report are as follows:

1. We have made allelism tests with hm. Because of the similar phenotype, we made tests with the recessive gene for susceptibility to H. carbonum race 1 in the presence of the disease. F_1 plants were normal and the two genes segregated with normal in F_2, indicating they are non-allelic.
2. We have successfully selected for longer living plants. After ten years of selection, all lls plants shed pollen well; some even produce a few silks, but none have set seed. Our goal is to be able to maintain the stock by selfing.
3. We have tested two new sources of lls and found them to be allelic to the original. The first new source was also from Mankato (we do not think it was a contaminant) out of a background involving a cross of Oh43 by a Pioneer synthetic. The other new source (from Dr. D. N. Duvick of our organization) was in two or more stocks that had Confite Puneno (from Bolivia) in common. The Confite Puneno source dies before shedding, the original dies at about time of shed, and the Oh43 source usually sheds before dying. These differences in time of death are presumed to be due to modifiers that may also condition non-lls stocks.
4. We are trying to map lls. Dr. C. R. Burnham graciously provided 22 translocation stocks. Progenies of T1-3(5883) and T1-3(5982) deviated from expected backcross ratios (p=.05-.02), indicating that lls is probably located on the short arm of chromosome one. Dr. R. J. Lambert provided marker stocks for chromosome one. Backcross ratios with bm2 (at the far end of the long arm) did not deviate significantly (p=0.30) from 1:1:1:1. Two attempts to set up a three point test with br and sr have failed; we have not yet produced the double mutant (lls, sr) let alone the triple mutant. Perhaps lls is very close to sr or perhaps they are incompatible. We will keep trying.
5. We have observed other mutants from the Confite Puneno lls source, including: Pale green or yellowish seedlings that become normal colored when 2 or 3 feet tall, governed by a single recessive gene; double tassels due to a branched stem (usually above the ear), inheritance unknown; and a lethal leaf spot stripe occurring on three or four leaves (one stripe per leaf), usually including the ear leaf (the stripes are 1/8 to 1/2" wide, have straight edges, and contain lethal

leaf spots; if not classified early, the leaf splits and the stripe is not noticeable). The pale green seedlings and double tassels have shown up in progenies involving lethal leaf spot stripe, whose inheritance is not yet known.

6. We have sent seedstocks of *lls* to the Maize Coop.

A. Forrest Troyer

THE UNIVERSITY OF RHODE ISLAND
Department of Botany, Kingston, Rhode Island

Non-Mendelian inheritance of an aleurone pigment inhibitor

In the progeny of a cross between a *C Sh bz-x3m Wx/C Sh bz-x3m Wx* ear parent and a *C sh bz wx* tester stock, colorless kernels and kernels variegated for *bz-x3m* and colorless tissue were produced. The numbers on the main stalk ear were 221 *bz-x3m*, 84 variegated and 58 colorless, and on a tiller ear, 167 *bz-x3m*, 81 variegated and 21 colorless.

Among the progeny of the reciprocal cross in which the *bz-x3m* stock was used as the pollen donor, no variegated or colorless kernels were observed. It was suspected that the factor responsible for the mutant phenotype was cytoplasmic rather than nuclear since it appeared to be transmitted only through the female gametophyte.

Some of the colorless, variegated and *bz-x3m* sibs were planted this past summer and used in a number of different crosses. Table 1 lists the progeny obtained when these individuals were used as female parents. From the first two crosses it

Table 1. Progeny obtained in self pollinations or out crosses of colorless individuals and their variegated or full color sibs when used as female parents.

Cross	Parental phenotype	Progeny phenotypes		
		Full color	Variegated	Colorless
4322-2 self	colorless	186	*	235
4322-4 self	colorless	141	19	209
4317-3 self	variegated	273	*	120
4318 self	variegated	102	*	237
4316-2 x 4068a	variegated x bronze	312	115	29
4316-3 x 4068a	variegated x bronze	365	*	23
4319-6 x 4068a	*bz-x3m* x bronze	368	*	176
4320 x 4068a	*bz-x3m* x bronze	336	140	45
4316-1 x 3991s	variegated x red	299	98	4
4322 x 4068a	colorless x bronze	383	*	20

*On some ears where the full color pigment was bronze, the full color and variegated phenotypes were difficult, if not impossible, to distinguish; in these cases both types are listed under full color.

can be seen that the colorless trait is not true breeding, a pattern which would be expected if the factor responsible were cytoplasmic. Full color and mosaic kernels as well as colorless ones appear in the progeny of self pollinated colorless individuals but in no apparent ratio. Similar results were obtained in self pollinations of the variegated types. In crosses of either the colorless or variegated individuals with a bronze stock, the colorless and mosaic phenotypes segregated but at an apparently low frequency.

When full color *bz-x3m* sibs of the colorless types are used as female parents in outcrosses to a bronze stock, the colorless and variegated phenotypes appear