Material Available for Selection for Niacin in Maize

The following account describes the source and status of maize breeding stocks containing differential concentration of niacin which will be made available to anyone who may wish to continue selection or research with such material. Selection for high and for low niacin concentration in selfed lines of maize has been continued through several generations. (Richey and Dawson: Plant Physiology, 23:238-254. 1945). The choice of Huffman in starting niacin selection was fortunate and otherwise. The variety seemed particularly amenable to modification because of the variability among the S_1 ears assayed, and it is believed that this potentiality has been fulfilled. On the other hand, it is white (it should be for meal in the South), is very late and rank growing with consequent difficulty in maintaining the lines after a few generations of selfing. But considerable progress has been made in obtaining higher-niacin lines, and it seemed undesirable to lose this advance because of varietal limitations. Accordingly, high- and low-niacin selections of Huffman were crossed with single-crosses of Corn Belt inbreds and selections from these crosses then made. The concentration of niacin in the parent Corn Belt singles, as shown in table 1, is that for a selfed F_2 composite of several ears. This eliminates the differential influence of male and female parents. The niacin in the F_1 ears of Huffman x Corn Belt, as reported, are affected by this differential influence; the S_1 data are not. The number of S_2 ears assayed, their average concentration and range, suggest that possibilities for obtaining higher-niacin yellow corn are excellent. The genetic base from Huffman is restricted, of course, by the few lines available. An effort was made to compensate for this in using Corn Belt single-crosses mostly instead of inbreds as parents.

The number of selfed and/or crossed ears obtained from these progenies in 1953 is shown in table 2. It is from these that we will be glad to supply anyone interested.

Table 1. Niacin concentration (micrograms per gram) in parents and progeny of crosses between Corn Belt material and Huffman niacin selections.

	P			S_2 (1952 crop)			Planted 1953		
	*	F_1	S_1	No.	Av.	Range	Ear no.	Niacin	Index**
(893 x 751)	24.8								
	42.0	32.7	35.3	4	34.3	29.0–40.9	1415-2	40.9	A
(893 x M14)	27.9								
x H29-7	51.0	49.3	33.1	7	31.7	23.1–44.9	1416-2	44.9	B
x H38	38.0	43.4	33.1	7	30.6	22.6–41.3	1417-2	41.3	C
(893 x 38-11)	21.9								
x H29-3		28.0	41.4	7	39.5	28.6–54.6	1418-2	48.1	D
							-3	40.9	E
							-6	40.4	F
							-7	54.6	G
x H14	42.0	26.4	27.2	4	26.7	22.5–30.0	1419-2	30.0	H
(07 x Hy)	31.0								
x H29-7	51.0	29.7	42.4	6	37.1	29.5–44.3	1420-2	44.3	I
							-6	41.1	J

(RL x Ill.A)	17.4								
x H29-7	51.0	35.7	24.6	8	28.8	22.4–44.5	1422-2	44.5	K
x H8-7	14.0	21.1	16.9	5	16.1	11.9–18.2	2423-3	11.9	L
(M14 x 051A)	29.5								
x H29-7	51.0	41.1	32.1	6	30.4	25.3–36.1	1424-2	34.8	M
							-3	36.1	
x H6-5	16.0	24.2	19.1	8	20.1	17.4–22.1	1425-2	17.7	N
							-7	17.4	O
(Oh28 x W22)	25.2								
x H29-8		40.3	45.6	8	38.0	30.9–46.9	1426-4	43.8	P
							-6	46.9	Q
							-7	40.8	R
							-8	41.4	S
x H6-5	16.0	28.8	22.4	5	20.5	18.1–22.0	1427-1	20.2	T
							-3	18.1	U
893	24.0								
x H29-7	51.0	28.8	35.8	4	32.3	24.8–39.0	----	----	----
x H38	38.0	28.1	35.5	3	31.7	28.6–33.8	----	----	----
(205 x 289)	27.8								
x H29-3	?	32.3	27.2	10	29.6	24.8–36.8	----	----	----

*The values for the Corn Belt singles are based on assays of an F_2 composite. Those for the Huffman inbreds are estimates of the modes of the families in the 1952 crop, except for H29-3 which was not grown in 1952.

**See table 2 for seed obtained.

Table 2. Seed obtained in 1953 from the progeny of crosses between Corn Belt material and Huffman Niacin selections

Selfs Index*	Selfs No. Ears	Crosses Index	Crosses No. of Ears
A	1	B x J	2
B	2	C x G	3
C	5	G x C	3
D	5	G x Q	1
E	5	Q x G	3
F	9	H x A	3
G	3	K x B	3
H	6	K x J	3
I	4	L x O	3
J	4	O x L	1
K		N x L	1
L	4	N x T	1
M	1	T x N	2
N	6	U x O	4
O	5		
P	5		
Q	2		
R	4		

S	6
T	5
U	11

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