

1. Investigations on the storage of sugar in corn stalks.

In Maize Genetics Coöperation News Letter numbers 23, 24 and 25, W. Ralph Singleton, Robert Van Reen and Tsunetoshi Sibuya reported corn stalk sugar storage. From D. F. Jones we received the inbreds C103, P8, M14, W22, N6, T1, C106, and hybrids W22 x (T1 x C103), (T1 x 103) x C106, T1 x C103, M14 x C103, and W22 x C103.

Refractometer readings on more than 30,000 plants were made. All the plants observed were selfed for breeding purposes.

86 indigenous varieties
685 lines (from S_0 to S_{10})
130 inbreds, parents of standard American double crosses

Planting dates were not the same for all the material, (Table 2). The summer of 1951 was cloudy and cold (see meteorological data Table 1) and, because of this, the later material planted was handicapped for sugar production.

Lines C103 and M14 were planted at two different dates (Table 2).

Refractometer readings range from 1% to 21% at maturity.

Related families show similar variations in sugar content. Uniformity in lines is proportional to the number of generations of selfing.

There seem to be some differences between yellow and white yellow corn; yellow corn having higher readings than white corn. Inbreeding does not affect the mean reading (Table 3).

Some lines with very high readings were found, for example, inbred 47-L1- S_8 had an average of 14.06 and a maximum of 21 (table 2). This inbred had perfectly matured and well-filled ears.

Table 1.
Meteorological Data

Temperature C°			Precipitation		
			No.		
Ave.	Max.	Ave. Min.	Mean	Rainy Days	Mms.

May	18.3	8.7	13.5	14	104.1
June	23.0	12.8	17.9	5	58.9
July	26.8	14.4	23.0	4	23.8
August	24.5	12.6	18.6	2	102.5
Sept.	24.2	13.0	18.6	9	62.1
Oct.	19.7	9.3	14.5	13	123.8
Nov.	15.5	8.9	12.2	21	349.9

Table 2.
Refractometer readings in percentage of dissolved solids

Type of Corn	classes															Dates		
	2	3.5	5	6.5	8	9.5	11	12.5	14	15.5	17	18.5	20	21.5	Planting	Observation	Ear maturity	
C102				1		2	1								12/5	17/10	17/10	
C103, first planting			5	3	2	2	2								12/5	30/10	30/10	
C103, second planting		3		5	4	8	2	1	2	2	1				16/6	10/11	8/11	
C106	2	19	16	19	12	1	3	5							16/6	9/11		
T1				1	2										16/6	9/11	8/11	
Nb	2	17	7	2	2										16/6	30/10	8/11	
W22	2	5	8	19	6	4	1	1							16/6	30/10	8/11	
P8				4	7	7	7	7	3						16/6	9/11	8/11	
M14, first planting		7	10	2	8	4	1								16/6	30/10	8/11	
M14, second planting	1	6	24	32	36	62	38	40	9						16/6	24/10	8/11	
W22 x (T1 x C103)	2	10	2	8	3	4	9	10	10	4	1				16/6	10/11	12/11	
M14 x C103	2	6	7	10	7	1	9	5	2						16/6	10/11	12/11	
(T1 x C103) x C106	4	1	11	8	6	3		3	2	2	1				16/6	10/11	12/11	
T1 x C103	1		2	13	7	10	7	14	2	2	1				16/6	10/11	12/11	
W22 x C103	10	12	3	9	5	5	1	5	2						16/6	21/11-	22/11	
Yellow Flint*	4	18	26	56	34	54	14	8	3						1/5	16/9-10/9	8/9-29/9	
Yellow Dent*		4	18	68	53	71	20	18	4						1/5	11/9-14/9	17/9-18/1	
White Flint*	1	8	5	32	9	13	2	1	1						1/5	15/9-18/9	17/9-3/10	
White Dent*	1	8	26	27	13	11	1	2							1/5	19/9-20/9	20/9-18/1	
47-L1-1-2-1-1-1-2-1		3		1	1	2	3	3	4	9	6	5		1	1/5	3/10	5/10	
Indigenous varieties*		5	15	23	15	15	9	4							16/5	17/10	17/9-17/1	
American standard inb		14	29	43	20	9	11	4										

*Figures correspond to number of means of inbreds.

In all other cases the figures correspond to number of individual plants.

Table 3.
Means of varieties (S^0 and S_1) compared with the means of their inbreds.

	Variety number	Kernel type	Average Percent Sugar													Mean of means		
			2	3.5	5	6.5	8	9.5	11	12.5	14	15.5	17	18.5	20		21.5	
Inbreds	36	Flint yellow	2	1	3		5	2										6.28
Variety	36	Flint yellow			1	1	1											6.50
Inbreds	42	Flint yellow		1	3	1	7											6.75
Variety	42	"			1		1	1										7.50
Inbreds	47	"											1					15.50
Variety	47	"				1	1											8.50
Inbreds	39	"			1	1	1											6.50
Variety	39	"			1	3	3	3	3									8.46
Inbreds	40	"			1		1	2	1									8.60
Variety	40	"			1	1	1	5										8.37
Inbreds	33	Dent yellow			1	1	5	6	1	1								8.80
Variety	33	"		2		3	2	3				1						7.72
Inbreds	69	"			1	2		2	2									8.42
Variety	69	"			1	1		1										7.00
Inbreds	70	"			1		1	1										7.50
Variety	70	"			1	1	2											6.87
Inbreds	75	"				2	5											7.57
Variety	75	"				4	4	2										7.70
Inbreds	76	"				2		2		1	1							10.08
Variety	76	"			4	3	6	4										7.38
Inbreds	79	"					4	2	2	1								9.50
Variety	79	"			1	5	5	1	2									7.70
Inbreds	85	"			1	1	1	2	2									8.64
Variety	85	"					4	5	2	2								9.73
Inbreds	86	"				3	2		1									7.75
Variety	86	"			4	5	7	3	1									7.40
Inbreds	222	Flint white		2		1												4.50
Variety	222	"		1	1	3		1										6.25
Inbreds	38	"	1	1	2	4	3											5.95
Variety	38	"		2	2	2	1	1										5.87
Inbreds	65	Dent white		1	2	5	1	2										6.63
Variety	65	"			3	3	3			1								7.10
Inbreds	95	"		1	3													4.62
Variety	95	"			3		1											5.75
Inbreds	35	"			1	3												6.12
Variety	35	"			5	1	4					1						7.04

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