

of four) are the two most frequent types observed in all the species. T. lanceolatum and T. pilosum had a low trivalent frequency.

On the basis of the meiotic behavior, distribution patterns and segregation of morphological characters, it is suggested that all the polyploid species of Tripsacum are segmental allopolyploids. T. laxum, T. latifolium and T. dactyloides are stabilized segmental allopolyploids; T. lanceolatum and T. pilosum are relatively young and are at an active stage of segregation.

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10. Heterosis: Kernel weight, ovules per ear row, and rows per ear.

The following data, gathered at DeKalb several seasons ago, may be of interest in regard to heterosis of 'yield components' of the maize ear, i.e., kernel weight, ovules per ear row and row number. The HD prefix indicates doubled haploid lines. L indicates a low value of the attribute in the parental line, M indicates a median value, and H a high value. Line averages are indicated in the columns to the right of each 2 x 2 table. Central values in these tables are those of the various single cross hybrids measured. Crosses were made one way only.

a. Kernel weight (grams per 100 kernels):

	L	L	L	H	H	H	Lines per se
	HD907	HD82	HD159	HD2380	HD1464	HD1344	
L HD907	----	25.8	21.9	27.6	28.5	29.9	17.1
L HD82	25.8	----	26.6	31.2	34.0	30.3	17.5
L HD159	21.9	26.6	----	30.3	31.7	29.2	18.5
H HD2380	27.6	31.2	30.3	----	37.9	35.2	30.0
H HD1464	28.5	34.0	31.7	37.9	----	36.7	34.5
H HD1344	29.9	30.3	29.2	35.2	36.7	----	37.0
Averages:	26.7	29.6	27.9	32.4	33.8	32.3	25.7

Summary:	L	H	Lines
L	24.8	30.3	17.7
H	30.3	36.6	33.8
Averages:	27.6	33.5	25.7

\* Heterosis:

L x L = 40.9%  
L x H = 17.9%  
H x H = 8.3%

\*Heterosis given as % increase of hybrids over average of parents.

## b. Ovules per ear row:

	L	L	L	H	H	H	Lines per se
	HD1344	HD73	HD1937	HD1801	HD82	HD1951	
L HD1344	--	50	50	49	59	58	25
L HD73	50	--	54	56	61	59	34
L HD1937	50	54	--	48	57	61	37
H HD1801	49	56	48	--	62	54	42
H HD82	59	61	57	62	--	65	45
H HD1951	58	59	61	59	65	--	49
Averages:	53.2	56.0	54.0	53.8	60.8	59.4	38.6

Summary:	L	H	Lines	Heterosis:
L	51.3	56.4	32.0	L x L = 60.3%
H	56.4	60.3	45.3	L x H = 45.7%
Averages:	53.8	58.4	38.6	H x H = 33.1%

## c. Rows per ear:

	L	L	LM	LM	M	M	MH	MH	H	H	Lines per se
	HD1092	HD1464	HD212	HD1432	HD73	HD1668	HD920	Hy	HD1689	HD910	
L HD1092	-----	12.8	13.5	13.6	15.1	15.4	15.2	16.4	14.5	14.5	11.2
L HD1464	12.8	-----	14.7	14.8	15.5	16.0	14.7	15.1	15.6	16.5	12.0
LM HD212	13.5	14.7	-----	15.3	15.8	17.9	16.2	15.8	18.7	16.4	13.3
LM HD1432	13.6	14.8	15.3	-----	16.0	17.3	15.7	15.6	17.1	17.3	14.4
M HD73	15.1	15.5	15.8	16.0	-----	18.7	17.2	16.5	19.2	19.0	16.1
M HD1668	15.4	16.0	17.8	17.3	18.7	-----	19.3	18.2	19.2	20.5	16.1
MH HD920	15.2	14.7	16.2	15.7	17.2	19.3	-----	17.5	20.2	19.4	17.1
MH Hy	16.4	15.1	15.8	15.6	16.5	18.2	17.5	-----	20.0	18.5	17.5
H HD1689	14.5	15.6	18.7	17.1	19.2	19.2	20.2	20.0	-----	20.7	20.6
H HD910	14.5	16.5	16.4	17.3	19.0	20.5	19.4	18.5	20.7	-----	21.3
Averages:	14.6	15.1	16.0	15.9	17.0	18.0	17.2	17.1	18.3	18.1	15.96

Summary:	L	IM	M	MH	H	Lines
L	12.8	14.1	15.5	15.3	15.4	11.60
IM	14.1	15.3	16.7	15.8	17.4	13.85
M	15.5	16.7	18.7	17.8	19.5	16.10
MH	15.3	15.8	17.8	17.5	19.5	17.30
H	15.4	17.4	19.5	19.5	20.7	20.95
Averages:	14.6	15.9	17.6	17.2	18.5	15.96

Heterosis:	L	LM	M	MH	H
L	10.3%	10.2%	11.5%	5.5%	-3.7%
LM	10.2%	10.1%	11.3%	1.3%	-0.6%
M	11.5%	11.3%	16.2%	6.6%	4.8%
MH	5.5%	1.3%	6.6%	1.2%	1.6%
H	-3.7%	-0.6%	4.8%	1.6%	-1.4%
Averages:	6.76%	6.46%	10.08%	3.24%	0.14%

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1. Winter breeding nurseries on the island of Molokai, Hawaii.

Commercial winter corn breeding nurseries were instituted in 1966 on the island of Molokai, Hawaii, in an area chosen for its uniquely dry temperate climate. Corn Belt and tropical maize varieties produced excellent seed yields in these nurseries and future development of the area by the seed industry appears certain. Some characteristics of this area and of corn grown there will be cited; detailed performance data can be obtained upon request.

The area chosen for nursery development is in the vicinity of Kaunakakai (sea level), on the southern, leeward coast of Molokai, 25 mi. by air from Honolulu (4 flights/day). The area is sunny, dry, and cooled by tradewinds that often blanket the island's mile-high hills with clouds. (Details on the 260 sq. mi. of Molokai may be found in "Molokai; Present and Potential Land Use" by Harold Baker, U. Hawaii Land Study Bur. Bull. 1, 1960).

Rainfall near Kaunakakai averaged 13.5"/yr. over a 25 yr. period (range, 2.8" to 29.2"), with monthly medians as follows:

Month:	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Rainfall:	0.2	0.6	1.1	2.2	0.8	1.0	0.1	0.2	0.0	0.0	0.0	0.0

Temperatures at Kaunakakai exceed by about 2° the following 10-yr. averages computed at the Molokai airport (elev. 443'):

Month:	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Mean Temp:	76°	74°	71°	70°	70°	71°	72°	74°	75°	76°	77°	76°

Max-Min temperatures in the winter of 1966-67 (Oct. to Feb.) were 86 and 65, resp., at the Molokai airport; it is doubtful whether temperatures below 55 or above 95 have ever occurred in this area.

Winter daylengths in Hawaii (19° N) minimize at 10 hr. 50 min., and the Kaunakakai area is rarely overcast. Winds are mild on the Kaunakakai