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1. Correlation of earliness traits of hybrids produced from related and non related lines.

The earliness properties of 27 experimental and commercial single, three-way and double cross hybrids, produced from non related parents, were studied in four replicated trials during 1967 and 1968. Individual plants (160) from each hybrid were evaluated on the basis of the following traits:

- a) grain moisture content at harvest,
- b) days to 50% male flowering time,
- c) total leaf number per plant,
- d) number of leaves above the ear.

Highly significant positive correlations were obtained between different earliness properties. Table 1 contains the correlations of the possible pairs of traits.

Table 1
Correlation coefficients for different pairs of earliness traits
for 38 maize hybrids
Martonvásár, 1967-1968 and 1969-1970

Pair of earliness traits	Correlation coefficients	
	1967-1968 27 hybrids	1969-1970 11 hybrids
Total leaf number per plant Days to 50% male flowering time	$r = 0.8495^{***}$	$r = 0.8398^{***}$
Total leaf number per plant Grain moisture content at harvest time	$r = 0.7868^{***}$	$r = 0.8118^{***}$
Total leaf number per plant Number of leaves above the ear	$r = 0.8638^{***}$	$r = 0.8981^{***}$
Days to 50% male flowering time Grain moisture content at harvest time	$r = 0.7953^{***}$	$r = 0.8944^{***}$
Days to 50% male flowering time Number of leaves above the ear	$r = 0.6626^{**}$	$r = 0.7706^{**}$
Number of leaves above the ear Grain moisture content at harvest time	$r = 0.6291^{**}$	$r = 0.7103^{**}$

***Significant at 0.1 per cent level

**Significant at 1 per cent level

*Significant at 5 per cent level

Similarly, highly significant positive correlations were observed in those 11 maize hybrids which were evaluated (except for number of leaves above the ear) during 1967-1970 (Table 2).

Table 2
Correlation coefficients of the different pairs of earliness traits for 11 maize hybrids
Martonvásár, 1967-1970

Pair of earliness traits	Correlation coefficients
Total leaf number per plant Days to 50% male flowering time	$r = 0.8888^{***}$
Total leaf number per plant Grain moisture content at harvest time	$r = 0.8700^{***}$
Days to 50% male flowering time Grain moisture content at harvest time	$r = 0.8618^{***}$

***Significant at 0.1 per cent level.

We have also investigated the relationship of different earliness properties in hybrids which were close in type of vegetation period as well as in the building up of hybrids. The studied hybrids were special three-way cross hybrids. The maternal parent was WF 9 x N 6, the paternal parents being different selected sublimes of C 5 (also called W 23) an established inbred line. The three way crosses, designated by the general formula $(A \times B) \times C_1, 2, 3, C_n$, were produced by hand pollination.

These hybrids were studied in Martonvásár during 1966-1968 and at Madison in 1966 (University of Wisconsin Department of Agronomy, Madison, Wisconsin, USA) in collaboration with Prof. N. P. Neal, to whom special thanks is due. The mean values of different earliness properties are presented in Table 3.

Table 3

Mean values of earliness properties of the three way crosses produced from WF 9 x N 6 by C 5 sublimes Madison, 1966 and Martonvásár, 1966-1968

Hybrid	Grain moisture content at harvest	Days to 50% male flowering time	Total leaf number
(WF 9 x N 6) x C 5-1	27.5	82.5	19.2
(" ") x C 5-2	27.2	82.0	19.3
(" ") x C 5-5	27.4	82.0	19.0
(" ") x C 5-8	27.4	82.2	19.3
(" ") x C 5-10	27.6	82.2	19.7
(" ") x C 5-11	28.0	82.0	19.4
(" ") x C 5-12	28.1	82.2	19.1
(" ") x C 5-15	27.6	82.0	18.8
(" ") x C 5-16	27.4	82.2	19.2
(" ") x C 5-18-1	28.5	82.2	19.2
(WF 9 x N 6) x (W 23 x O14)	29.6	82.8	18.9
(WF 9 x N 6)	32.4	84.2	19.9
(WF 9 x N 6) x C 5-19	28.2	81.8	19.4
(" ") x C 5-20	27.5	81.0	19.0
(" ") x C 5-21	27.6	81.7	19.0
(" ") x C 5-22	27.2	81.7	18.9
(" ") x C 5-24	28.7	81.5	19.5
(" ") x C 5-25	27.9	81.5	19.3
(" ") x C 5-26	27.4	81.2	19.2
(" ") x C 5-28	28.0	81.2	18.9
Mean	28.1	82.0	19.2

From the data in Table 3 it can be seen that the different values of earliness are very stable and close to each other. Nevertheless, the relationships of earliness traits are also remarkable (Table 4).

Table 4

Correlation coefficients of different pairs of earliness traits
of the three way crosses produced from WF 9 x N 6 by C 5
sublines

Pair of earliness traits	Correlation coefficients
Total leaf number per plant Days to 50% male flowering time	$r = 0.4794^*$
Total leaf number per plant Grain moisture content at harvest time	$r = 0.5063^*$
Days to 50% male flowering time Grain moisture content at harvest time	$r = 0.7508^{**}$

**Significant at 1 per cent level

*Significant at 5 per cent level

The results may be summarized as follows:

1) Among the single, three way and double-cross maize hybrids produced from non selected inbred lines, the correlation between pairs of earliness traits were mostly significant at the 0.1 and 1 per cent level.

2) The correlation between earliness properties can also be observed in three way crosses produced from WF 9 x N 6 by C 5 related sublines. The correlations between pairs of earliness properties were significant at the 1 and 5 per cent levels.

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1. Influence of sex on crossing over in chromosome 5.

Rhoades (J. Amer. Soc. Agron. 33:603-615, 1941) found recombination in the proximal regions of chromosome 5 to be higher in male than in female meiocytes. Two explanations have been proposed to account for the lower female values, viz. (1) there is a basic difference in the rates of crossing over in mega- and microsporocytes (Rhoades 1941), or (2) selective orientation of the chromosome 5 bivalent on the meiotic spindle leads to the preferential segregation of noncrossover chromatids to the basal