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1. Variation among inbreds for black spot maturity and filling period.

Recent interest in physiological maturity of maize grain determined by formation of a black layer at the base of the kernel prompted our investigation of the variation among inbreds for black spot maturity (planting to harvest) and filling period (pollination to harvest). Twenty maize inbred lines were examined over a three year period.

Appearance of the black spot always coincided with maximum dry weight accumulation. Moisture content at black spot maturity was significantly different among inbreds but the year means did not differ. There was a significant year x inbred interaction.

The growing degree days required to reach black spot maturity were significantly different among the inbreds and among years. However, interaction of inbreds with years was found to be minor. The variability among inbreds was always much greater than among years. Similar conclusions were made for the growing degree days required during the filling period.

The growing degree days required for the filling period had positive phenotypic and genotypic correlations with the growing degree days required for pollination, but the correlations were small enough to suggest possible selection for types with long filling periods and short time to pollination. The rate of kernel dry weight accumulation during the filling period was significantly different among inbreds and years but had a significant inbred X year interaction. The rate of kernel dry weight accumulation was not correlated with any character other than dry weight at black spot maturity.

A brief summarization of the three year averages is presented in Table 1.

Table 1
 Three year summary of black spot maturity (BSM) and filling
 period variation among 20 maize inbreds.

	High inbred	Low inbred	Average of twenty inbreds
GDD from planting to BSM	1808	1337	1648
% moisture at BSM	35.0	15.4	25.2
Dry wt. at BSM (mg/k)	322	192	237
GDD from planting to pollination	1060	818	940
GDD in the filling period	821	512	708
Rate of dry wt. accumulation (mg/k/day)	9.7	6.2	7.7

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1. Electrophoretic separation of peroxidases of lines carrying two different male-sterile cytoplasms.

The two male-sterile cytoplasms, D and K, both arose in Turkey (Beckett, 1971) and respond alike to restoration alleles (Beckett, 1971). Moreover, maize lines carrying either of the two cytoplasms are resistant to attack by the fungus Helminthosporium maydis (Gracen, et al., 1971). Hence, by three phenotypic criteria, i.e., male-sterility, response to restoration alleles, and fungal resistance, the D and K mutant cytoplasms appear to be identical. However, the three phenotypic manifestations