

CORRELATIONS FOR IMPORTANT AGRONOMIC CHARACTERS BETWEEN PARENT LINES AND F₁ HYBRIDS OF SUNFLOWER

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ABSTRACT

When developing SC cms hybrids it is important to know the manifestation of heterosis as well as the correlations for important agronomic characters between parent lines and F₁ hybrids in order to be able to model correctly the inbreds and develop hybrids possessing desired characters. We examined correlations between a number of parent lines and their hybrids and drew the following conclusions:

- highly significant correlations were found for plant height and oil content in seed;
- significant correlations were found for seed yield per hectare, leaf number per plant, leaf area, and husk percentage;
- F₁ hybrids had higher correlation values for seed yield per hectare and oil content in seed with the mother than with the father lines;
- positive correlations were also found for other characters.

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INTRODUCTION

The development and testing of inbred lines of sunflower (*Helianthus annuus* L.) has been the primary breeding method for commercial and public programs since the hybrid industry expanded in 1975 — 1976. Efficient identification of superior lines has been an area of recent experimentation. During inbreeding, different pressures are applied for various traits, and final selections are made as the lines approach homozygosity. Several undesirable traits are easily identified, and lines may be discarded due to obvious morphological deformities, difficulty in maintenance because of poor self-fertility, susceptibility to specific diseases, or poor plant vigor. However, we know little about whether inbred expression regarding yield, oil percentage, and other seed characteristics are useful indicators of their potential in hybrids. Selection would be more effective during inbreeding if some knowledge about combining ability and line performance could be established.

Studies of correlations among sunflowers have shown that characters that contribute to good plant growth are associated with high seed yield (Gundaev, 1971; Kloczowski, 1972; Putt, 1966). Among inbred traits, the achene number, achene weight, height, capitulum diameter, and stem diameter have correlated well with inbred yield (Kovacik *et al.*, 1980; Putt, 1943). Russell (1953) correlated traits in inbred lines with yield of outcrossed hybrids. The fertile lines were open-pollinated with a cultivar, but hybrid percentage was not

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