

RESEARCH PAPER

Performance of branching and non-branching restorer lines in producing heterotic hybrids of sunflower (*Helianthus annuus* L.)

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To know the performance of branching and non branching restorer lines of sunflower in producing high yielding and high oil content hybrids, a study was undertaken at University of Agricultural Sciences, Dharwad to assess the magnitude of heterosis involving seventeen inbred lines of sunflower. The inbred comprised of five new male sterile lines and twelve diverse restorer lines (six branching and six non-branching) which were crossed in all possible combinations during *Kharif-2005*. The resulting 60 F₁ hybrids along with their parents were studied for the extent of Heterosis during Summer 2006 for nine characters by adopting line x tester analysis, considerable average heterosis was observed for all characters studied. Highest magnitude of average heterosis was observed for seed yield per plot (150.34) followed by seed yield per plant (118.86), head diameter (26.79), plant height (15.32), thousand seed weight (7.49) and oil content (2.13) for the characters days to 50 per cent flowering, the hybrids recorded negative average heterosis. Percentage contribution of component characters, viz., thousand seed weight, plant height and head diameter towards expression of heterotic effect for seed yield was to the extent of 15.06, 30.82 and 53.86 per cent, respectively

Key words : Heterosis, Sunflower, Branching, Non branching, Line x tester analysis

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INTRODUCTION

Sunflower is mainly grown for its oil and ranks third among oil seed crops in the world. The introduction of this crop to India in 1969 has helped a great deal in increasing oil seed production and the area under cultivation is increasing due to its day neutrality, wide adaptability, short duration, high yielding potential, remunerative market price and good quality oil.

Commercial cultivation of sunflower started in mid-seventies with open pollinated varieties like EC-68414, Sunrise, EC-68415 and Morden. However, favourable characters of the hybrids like production stability, suitability to high input agriculture, high self-fertility, uniform growth and maturity shifted the focus towards heterosis breeding leading to the release of the first ever sunflower hybrid in India, BSH-1 by Seetharam (1981). Since then, many hybrids have been released for cultivation by utilizing cytoplasmic genetic male sterility systems. The crop is gaining rapid popularity in India, but the productivity levels of sunflower still continue to be

low against the world productivity. Sunflower, being a highly cross-pollinated crop is ideally suited for exploitation of heterosis. The discovery of cytoplasmic male sterility by Leclercq (1969) and fertility restoration by Kinman (1970) provided the required breakthrough in the development of hybrids.

Branching type of restorer lines are characterized by small multi-heads and low test weight. However, in general these lines have high per se oil content and ensure pollen supply for longer duration in hybrid seed production plots. In contrast, the non-branching restorer lines with mono-head have comparatively large head size and high test weight. But in hybrid seed production pollen supply is restricted for shorter period. The utility of non-branching types in heterosis breeding programme should concentrate on nicking of parental lines in hybrid seed production plots.

Comprehensive studies involving non-branching restorer lines are limited in heterosis breeding programmes in sunflower. Hence, an attempt in the present study has been made to assess and compare the relative performance of branching and non-branching restorer lines and their hybrids