

Combining ability studies for seed yield and its contributing traits in sunflower (*Helianthus annuus* L.)

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SUMMARY

A Line × tester analysis of 45 hybrids in sunflower using three CMS lines and 15 testers was carried out to study the combining ability for seed yield and its contributing traits in sunflower (*Helianthus annuus* L.). The result revealed that, variance due to SCA was greater than GCA for all the traits except stem diameter and 100-seed weight, which indicated preponderance of non-additive gene action for all traits, while additive gene action for stem diameter and 100-seed weight. Line CMS 54A was a good general combiner for early flowering, early maturity, plant height, test weight, seed yield and oil yield, while CMS 56A was a good general combiner for hull content and oil content. The testers RHA 93 and RHA 115R transmitted allele with additive effects for seed and oil yield. RHA 6D-5-3-5 was good general combiner for early flowering and early maturity, while RHA 95C-1 was good general combiner for oil content. In lines CMS 54A and CMS 57A and in testers GKVK-1, GKVK-2, RHA 95C-1, RHA 6D-5-3-5, RHA-272-II, RHA 275, RHA-298, RHA-115R and RHA-115R possessed favorable alleles for most of the traits. Among hybrids CMS 57A × RHA 93 was identified as the best specific combiner for seed yield, oil yield, volume weight, head and stem diameter. CMS 56A × RHA 6D-5-3-5 was the best specific combination for early flowering and early maturity. While CMS 54A × RHA 6D-5-3-5 was the best specific combiner for economic trait oil content and oil yield.

Key Words : Sunflower, Line × tester, Combining ability

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In India, the farmers have accepted sunflower hybrid technology, thus making sunflower the second most important oilseed crop at present. The hybrids have proved to be more vigorous, uniform, self fertile and also relatively

resistant to diseases and insect pests. Further, the development of sunflower hybrids with high oil content opened new era in sunflower improvement, leading to rapid development of sunflower as an oilseed crop throughout the world. A landmark in sunflower breeding was the discovery of cytoplasmic male sterility by Leclercq (1969) and identification of the genes for fertility restoration by Kinman (1970), which shifted the interest from population breeding to heterosis breeding.

The information on the combining ability status of the parental lines will give an indication as to how well they combine with a given genotype to produce potential and productive hybrid. In this direction the concept of general combining ability (*gca*) and specific combining ability (*sca*) helps the breeders to decide upon the choice of parents for hybridization and to isolate promising genotype from the

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