GAU Res. J. 1996. 22 (1) : 101-102

Heritability and Genetic Advance in Sunflower

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Improvement in sunflower yield depends on the nature and extent of genetic variability, heritability and genetic advance in the base population on which selection is exercised. Besides, the information on the nature of association between yield and its components helps in simultaneous selection for many characters associated with yield improvement. In the present study, such analysis has been carried out in F_1 population of sunflower hybrids.

Forty hybrids were obtained by crossing between four male sterile lines and ten restorers of *Helianthus annuus*. Forty hybrids and parents were raised in randomised block design with three replications, and observations were recorded for nine biometrical characters. The co-efficient of variability (GCV, PCV) were calculated using the formulae given by Burton (1952).

TABLE 1

Estimation of genetic variability and heritability.

Characters	*GCV*	*PCV*	*Heritability (per cent)*	*Genetic advance (percentage of mean)*
Days to first flowering	7.47	7.54	98.28	15.27
Days to maturity	3.44	3.48	97.72	7.01
Diameter of the capitulum	12.41	12.74	94.80	3.62
Plant height	11.05	11.21	97.14	22.43
Number of leaves per plant	7.97	8.39	90.10	15.57
Thickness of the stem	16.45	16.76	96.22	33.22
100 seed weight	17.63	18.12	94.60	35.31
Yield per plant	24.35	25.13	93.83	48.57
Oil content	4.12	4.21	95.65	8.30

Heritability was worked out by following the method given by Singh and Chaudhary (1985). Genetic advance was estimated by Johnson *et al.* (1955) method.

The co-efficient of variability, heritability and genetic advance are presented in Table 1.

The extent of genetic variability in a base population is essential for subjecting the population for selection for achieving improvement in a particular trait. In the present investigation moderate genotypic and phenotypic co-efficient of variability were observed for diameter of the capitulum plant height, number of leaves per plant, thickness of the stem and 100 seed weight. As compared to other characters high phenotypic and genotypic variability were observed yield per plant indicating the scope of selection of promising high yielding genotypes.

High heritability estimates were observed for all the characters studied. High heritability indicates the dependency of phenotypic expression which reflects the genotypes ability to transmit the genes to their off-springs. A combination of high heritability and genetic advance was noticed for plant height, thickness of the stem, 100 seed weight and yield per plant which shows that these characters are amenable for improvement by selection.

(Received on 28th Aug., 1995)

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