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Research Note

Correlation study for oil yield in sunflower (*Helianthus annuus* L.)

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Abstract:
Seventy nine inbred lines of sunflower were selected for the character association study to assess the relationship among oil yield and its components. Observations were recorded on eight traits *viz.*, days to 50% flowering, plant height (cm), head diameter (cm), 100-seed weight (g), volume weight per 100 ml (g), oil content (%), seed yield per plant (g) and oil yield per plant (g). Character association analysis revealed positive and significant association of oil yield per plant with seed yield per plant, plant height, head diameter, volume weight, 100-seed weight and oil content. Hence simultaneous selection of these characters would contribute for the improvement of oil yield per plant.

Keywords: Sunflower, correlation, selection indices.

India is facing a shortage of edible oil in recent years. During 2009-10 India imported almost 8 million tonnes of vegetable oil which is almost 45 per cent of country's needs spending almost 25000 crores. Sunflower has maximum potential for bridging the gap in the demand and production of edible oil in the country. Its seeds contain high oil content ranging from 35 to 40% with some types yielding upto 50% (Skoric and Marinkovic, 1986). Oil yield is influenced bymany plant traits like days to 50 % flowering, plant height, 100-seed weight, volume weight per 100 ml and oil content. Earlier Fick *et al*. (1974), Green (1980) and Joksimovic *et al*. (1999) used simple correlation analysis to study the relationships between oil yield on one side and the other sunflower plant traits on the other side. In the present investigation, simple correlation between oil yield and its component characters was studied to identify the selection indices.

In the present investigation, 78 hybrids derived from crossing between 78 inbred lines and one CMS line 234 A by top cross fashion in sunflower (*Helianthus annuus* L.) were studied. They were raised in a randomized block design with two replication in the Oil seeds Farm, Centre for Plant Breeding and Genetics, Tamil Nadu Agricultural University; Coimbatore during *kharif* 2010. In each replication, each entry was raised in 5.4 m2 plot adopting a spacing of 60 cm between the rows and 30 cm between the plants within each row. Normal agronomic practices were followed under irrigated condition. The data were recorded on five randomly selected plants for eighte yield and yield contributing traits *viz,* days to 50% flowering, plant height, head diameter, 100-seed weight, volume weight per 100 ml, oil content, seed yield per plant, oil yield per plant. The data collected were statistically analyzed for simple correlation.

Simple correlation coefficients among the oil yield and its component characters in sunflower are presented in Table 1. Oil yield was highly significant and positively correlated with seed yield per plant (0.97), plant height (0.49), head diameter (0.61), volume weight (0.29), 100-seed weight (0.49) and oil content (0.39). Similar results were reported by Chikkadeviah *et al.* (2002), and Ramasubrahmanyam *et al*. (2002). The character days to 50% flowering had non-significant and positive association with oil yield. Association among yield components days to 50 per cent flowering had positive and significant correlation with plant height. Similar results were reported by Teklewold *et al*. (2000) and Vidhyavathi *et al.* (2005). Plant height had positive and significant correlated with head diameter, seed yield per plant. Similar reports were also made by Lakshminarayana *et al.*, (2004) and Vidhyavathi *et al.* (2005). Head diameter had positive and significant correlation with 100-seed weight, oil content and seed yield per plant. Similar reports were also made by Moorthy (2004) and Manivannan *et al.* (2005). Volume weight had positive significant correlation with oil content and seed yield per plant. Similar results were reported by Vidhyavathi *et al*. (2005) and Manivannan *et al.* (2005). The character 100-seed weight had shown positively significant correlation with oil content and seed yield per plant.

The non significant association between days to 50% flowering and oil yield indicates that a breeder can develop high oil yielding hybrids/varieties in early or late maturity group.

Hence considering the correlation analysis, characters namely plant height, head diameter, volume weight/100 ml, 100-seed weight, oil content and seed yield per plant are considered as important selection indices for oil yield improvement.

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Table 1. Simple correlation among oil yield and component characters in parents

Characters	Plant height (cm)	Head diameter (cm)	Volume weight / 100 ml (g)	100-seed weight (g)	Oil content (%)	Seed yield/plant (g)	Oil yield / plant (g)
Days to 50% flowering	0.51**	0.12	0.19	-0.21	-0.04	0.11	0.09
Plant height (cm)		0.54**	0.39	0.12	0.15	0.49**	0.49**
Head diameter (cm)			0.21	0.50**	0.26*	0.59**	0.61**
Volume weight/100 ml (g)				0.20	0.35**	0.25*	0.29**
100-seed weight (g)					0.29**	0.46**	0.49**
Oil content (%)						0.21	0.39**
Seed yield/plant (g)							0.97**

*, ** are significant at 5 and 1 per cent respectively