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Research Article

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

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Abstract
Fifty five hybrids of sunflower were selected for the character association study to assess the relationship among yield and its components. Observations were recorded on nine traits *viz.,* 50% flowering, days to maturity, plant height, head diameter, 100-seed weight, volume weight, oil content, oil yield per plant and seed yield per plant. Character association analysis revealed strong positive association of oil yield per plant with days to maturity, 100_seed weight, volume weight, oil content and seed yield per plant. Hence simultaneous selection of these characters would contribute for the improvement of the oil yield per plant.

Key words: Sunflower, oil yield, correlation

Introduction

Sunflower (*Helianthus annuus* L.) has become an important oil crop in the world with annual production of 20 to 25 million hectares worldwide in the present decade. Breeders focus their entire attention in developing sunflower genotypes with higher oil yield. Higher oil yield is an ultimate objective of sunflower researchers. Oil yield is affected by many other plant characteristics. Plant traits like days to 50 % flowering, days to maturity, plant height, 100-seed weight, voume weight per 100 ml and oil content are very important in connection with oil yield. Earlier Fick *et al.* (1974), Skoric *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. We studied simple correlation between yield and yield components.

Materials and methods

In this present investigation, 55 hybrids derived from crossing between 55 CMS lines and one restorer by top cross fashion in sunflower (*Helianthus annuus* L.) was 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* 2009. In each replication, each entry was raised in two rows of 4.5m length 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 of each entry of each replication for nine yield and yield contributing traits viz, days to 50% flowering, days to maturity, 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 for aforesaid plant traits were statistically analyzed for simple correlation utilizing the formula suggested by Aljibouri *et al.* (1958).

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Results and discussion

Simple correlation coefficients among the yield and yield component characters in sunflower are presented in Table 1.

Oil yield *vs* other characters

Oil yield was highly significant and positively correlated with seed yield per plant (0.964). Other researchers (Suzer, 1998; Teklewold et al., 1999) indicated a positive relationship of different intensity between grain and oil yield. Days to maturity (0.289), 100-seed weight (0.621), volume weight per

100 ml (0.401), oil content (0.442) were recorded significantly correlated with oil yield. Similar results were reported by Chikkadeviah *et al*. (2002), Ramasubrahmanyam *et al*. (2002), Anto Mijic *et al*. (2009). The characters plant height and head diameter had non-significant and positive association with oil yield.

Between other characters

Days to maturity had significantly positive correlation with seed yield per plant such results are in concurrence with the results of Lakshminarayana *et al.* (2004). Plant height showed significant and positive correlation with head diameter and volume weight per 100 ml. Similar results were reported by Chikkadeviah *et al*. (2002) Head diameter exerted significant positive correlation with 100-seed weight. These findings related to the results of Sasikala (2000) and Moorthy (2004). The correlation between 100-seed weight and seed yield per plant was found to be significant and positive. The similar results were reported in earlier findings of Lakshminarayana *et al*. (2004). Volume weight per 100 ml had significant and positive correlation with oil content and seed yield per plant.From the above discussion, it may be concluded that differential association was observed among these component characters. Due to the presence of non-significant association between days to 50 % flowering and plant height, it may be inferred that, the early and dwarf hybrids can be developed with high seed yield and oil yield. The character days to maturity, 100-seed weight and volume weight were considered as important selection indices for both oil and seed yield improvement.

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Table 1. Simple correlation between yield and component characters

Characters	Days to maturity	Plant height (cm)	Head diameter (cm)	100-seed weight (g)	Volume weight per 100 ml (g)	Oil content (%)	Oil yield/plant (g)	Seed yield/plant (g)
Days to 50% flowering	0.248	0.205	-0.048	0.021	0.044	0.014	-0.003	0.005
Days to maturity		0.250	0.253	0.214	0.145	0.123	0.289*	0.270*
Plant height (cm)			0.372**	0.060	0.348**	0.264	0.258	0.221
Head diameter (cm)				0.327*	0.091	-0.006	0.238	0.276*
100 seed weight (g)					0.173	-0.028	0.621**	0.704**
Volume weight per 100ml (g)						0.603**	0.401**	0.273*
Oil content (%)							0.442**	0.199
Oil yield/plant (g)								0.964**

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