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Behaviour of Some Genotypes of Sunflower

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Abstract

The performance of six sunflower hybrids i.e 6435, 6470, 6451, SF-177, SF-187 and Hysun-33 was observed during the autumn season 1997. The results revealed that Hysun-33 gave maximum plant height (131.1 cm) and number of leaves per plant (31.23). The maximum number of rows per head (60.62) were recorded in SF-177 while significantly more number of seeds per row (24.54), 1000-seeds weight (53.53) and grain yield (4403 kg ha⁻¹) was observed in SF-187. Hence SF-187 proved to be the best suited cultivar among all the cultivars included in this trial.

Introduction

Sunflower (*Helianthus annuus* L.) is the world's 2nd important edible oil crop. It is newly introduced in Pakistan which gives very good performance regarding yield and quality of edible oil as compared to our conventional oil seed crops. Edible oil is an important component of human diet. The domestic production of edible oil in the country is meeting only 35 percent of the total requirements (Aslam *et al.*, 1989). The per capita availability of edible oil in Pakistan is 9.78 kg/annum, that is much less than the recommended fat intake (Anonymous, 1990). At present our national requirement of edible oil is 1.297 million tones, out of which 24.44 percent (0.343 million tones) is produced with in the country, while the remaining deficit of 73.55 percent (0.954 million tones) is being met through import (Anonymous, 1990). As the import is increasing gradually, it is expected that it will reach to 1.7 million tones by the year 2000 (Beg, 1989). So there is an imperative need to enhance domestic production of edible oil. New and non-conventional sources of edible oils are sunflower, safflower and soybean. The seed of these crops are rich in oil contents and contribute 7.80 percent to the local production (Rana *et al.*, 1988). Sunflower is a drought tolerant and short duration (90-110 days) crop and has a wider range of adaptability. Its seed contain high oil contents ranging from 40-50 and 23 percent protein (Hatim and Abbasi, 1994). The sunflower hybrids are considered to play a remarkable role in boosting up production (Fick and Sweller, 1972). The present study was therefore, undertaken to select best suited cultivar of sunflower for the local ecological conditions of Dera Ismail Khan.

Materials and Methods

The study was undertaken at Agronomic Research Area, Gomal University, Dera Ismail Khan during autumn 1997. The experiment was laid out in Randomized Complete Block Design (RCBD) with six treatments using a net plot size of 5 m x 3.6 m. Sunflower hybrids 6435 (T6), 6470 (T5), 6451 (T4) SF-177 (T1), SF-187 (T2) and Hysun-33 (T3) were planted on a well prepared seedbed by dibbling method. The plant to plant and row to row distance was 20 cm and 60 cm, respectively. All cultural

practices were kept normal and uniform for all the treatments. The seed rate was 6.25 kg ha⁻¹. A fertilizer dose of 150-120-100 kg ha NPK was applied in the form of urea, triple super phosphate and potassium sulphate, respectively. The data collected were subjected to the analysis of variance techniques (Steel and Torrie, 1980) and Duncan's Multiple Range Test (Duncan, 1955) was used at 5 percent level of probability for comparing treatment means with the help of MSTATC package.

Results and Discussion

Plant height (cm): The height of a crop plant is mainly an expression of the interaction of inherent biological forces and environmental factors. It is revealed from the data given in Table 1 that maximum plant height was found in Hysun-33 followed by SF-177 as against minimum in cultivar 6451. The significant difference in plant height among different cultivars of sunflower might be due to varietal character and adoption to local conditions. Beg *et al.* (1984) evaluated 160 open pollinated cultivars as well as hybrids in yield trials on farmer fields and concluded that open pollinated cultivars matured later than hybrids (110 days) and plants were of unequal height.

Leaves per plant (No.): The data given in Table 1 showed that maximum number of leaves per plant was recorded in Hysun-33 followed by cultivar 6435. While minimum leaves were found in cultivar SF-177. Although visible differences were found among cultivars SF-187, 6470 and 6435 but statistically they were at par with each other. Cultivar 6451, 6470 and SF-177 were also statistically at par with each other. The variation in number of leaves might be attributed to environmental conditions and hereditary character.

Rows per Head (No.): It is indicated from the Table 1 that the maximum number of rows per head were recorded in SF-177, while the minimum in cultivar 6451. Although their were found visible differences among the cultivar 6435, 6470, SF-187 and Hysun-33 but statistically these were at par with each other. Also cultivar SF-187, H-33, 6470 and

Table 1: Yield and yield components of different hybrids of sunflower

Cultivars	Plant Height	Leaves per plant	Rows per head	Grains per row	Seed index	Grain yield
SF-177	119.9a	25.35d	60.62a	23.82bc	52.44a	4225b
SF-187	104.7b	27.83b	54.55ab	27.54a	53.53a	4403a
Hysun-33	131.1a	31.23a	55.50ab	26.06ab	53.22a	4349a
6451	98.25b	26.05cd	53.19b	23.92bc	44.83b	3152c
6470	102.50b	27.23bc	54.47ab	23.56bc	44.71b	3230c
6435	101.4b	28.65b	55.61ab	22.02c	45.30b	3146c
LSD value	12.05	01.373	06.151	02. 605	06.070	84.03

Means followed by similar letters are not significantly different at 5 percent level of probability

6435 produced higher yield but these are statistically at par with 6451. The probable reason might be the genetic make up of different cultivars and their best adaptation to local conditions.

Seeds per Row (No.): The potential of seeds per row is measured in terms of its number of grains which is an important yield component. The Table 1 clearly indicated that the maximum number of seeds per row was found in SF-187 followed by Hysun-33. Minimum number of seeds per row was recorded in cultivar 6435. The significant difference in number of seeds per row might be the genetic make up of the material.

1000-seeds Weight (g): It is clear from the Table 1 that cultivars SF-177, SF-187 and Hysun-33 yielded significantly higher 1000-seed weight than the rest of the cultivars. The minimum 1000-seed weight was recorded in 6470. Nadeem (1989) conducted a varietal trial for yield performance on 4 sunflower hybrids and found that all four cultivars were common in plant population per unit area, leaf area per plant and 1000-seed weight, but differed in plant height, seed yield, oil and protein content.

Seed yield (kg ha⁻¹): The seed yield per hectare is a function of the integrated effect of the different yield components. The data presented in Table 1 showed that among different hybrids, SF-187 produced the higher seed yield followed by Hysun-33. The lowest seed yield was produced by hybrid 6435. Fick and Sweller (1972) reported that hybrid sunflower cultivars gave significantly higher seed yield, more uniformity in flowering, plant height and oil content than open pollinated varieties. They further suggested that as a result of improved method of seed production, hybrid could be produced for commercial use.

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