

GROWTH AND YIELD PERFORMANCE OF SOME SUNFLOWER (*HELIANTHUS ANNULS* L.) HYBRIDS PLANTED IN SPRING SEASON

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The study was carried out to see the yield performance of some sunflower hybrids, viz. NK 259, SF 100, NK 268 NSH 70, NK 265, C 206, NK 256, Rodeo, Pinto and ATI 3. All the hybrids were planted on March 6, 1990 and were harvested on May 30, 1990. The highest 1000-seed weight (43.15 g) was found in NK 268 as against the lowest (26.05 g) for SF 100. The highest seed yield of 2.68 t ha⁻¹ was obtained for SF 100, while the lowest of 1.72 t ha⁻¹ was found in case of NK 256. Sunflower hybrid NK 265 showed significantly higher seed oil content (44.50%) whereas the minimum (35.20%) was found in Rodeo.

INTRODUCTION

Sunflower is a short duration crop and can be fitted well in our present cropping system without bearing any major change in agricultural setup. Fick and Sweller (1972) and Beg *et al.* (1984) reported that hybrid sunflower cultivars gave significantly higher seed yield, more uniformity in flowering, plant height and oil content than open pollinated varieties. Premseker (1973) compared four sunflower cultivars with local cv. Sunrise-selection. It was concluded that EC 68415 gave the highest seed yield and oil content of 2.02 t ha⁻¹ and 45.2%, respectively. Similarly, Amable (1980) planted seven sunflower cultivars and obtained seed yields between 750 and 1600 kg ha⁻¹ with oil content from 41 to 47%.

Islam and Khan (1984) planted eight sunflower varieties during the spring and autumn seasons under both irrigated and rainfed conditions. Cultivar Peredovik and VNIIMK 8931 produced the highest seed yield of 1.997 and 1.824 t ha⁻¹, respectively

during the spring in irrigated trials while cv. VNIIMK 8931 produced the highest yield of 1.142 t ha⁻¹ in the autumn followed by Pere-dovik. Nadeem (1989) planted four sunflower hybrids, viz. HS 33, NK 212, Pioneer 4514 and SF 100 and found that all the cultivars were similar in plant population but differed in plant height, seed yield, oil and protein contents. Maximum seed yield was found in Pioneer 4514 (31.138 q ha⁻¹) and oil content in NK 212 (48.36%). Timirgaziu *et al.* (1989) grew four sunflower cultivars and eight lines. Seed yields was 3.47 of cv. Record and of Select was 4.11 t ha⁻¹. The seed oil content was 46.6% in Record and was 51.7% in Fundulea 50. Fundulea 90 gave the highest yield of 3.94 t ha⁻¹ (8 lines). The present study was conducted to select a sunflower hybrid best suited under the irrigated conditions at Faisalabad.

MATERIALS AND METHODS

To study the growth and yield performance of ten sunflower hybrids under field

conditions, experiment was conducted at the University of Agriculture, Faisalabad during Spring, 1990. The experiment was laid out in a randomised complete block design with four replications, using a net plot size of 3.60 x 7.00 m. Sunflower hybrids were NK 259, SF 100, NK 268, NSH 70, NK 256, C 206, NK 256, Rodeo, Pinto and ATI 3. Crop was sown on a well prepared seed bed with a single row hand drill. All the sunflower hybrids were sown on March 6, 1990. A basal fertilizer dose @ 100 kg N + 100 kg P₂O₅ ha⁻¹ was applied. In all six varieties were applied to the crop. After the first irrigation one hoeing was done to keep the field free of weeds. Crop was thinned out at 2 to 4 leaf stage in order to maintain uniform plant density (55,555 plants ha⁻¹) in all the treatments. Earthing up was done after the second irrigation to avoid lodging. The observations like number of plants ha⁻¹, plant height, head diameter, number of seeds head⁻¹, 1000-seed weight, seed yield and seed oil content were recorded. The data collected were analysed statistically by using Fisher's analysis of variance technique and LSD test was applied to compare the differences among treatment means (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

A perusal of the data (Table 1) indicated that final crop stand of cultivars varied significantly. Sunflower hybrid SF 100 recorded significantly higher number of plants ha⁻¹ (69841.27) than NK 259, NSH 70, NK 265, C 206, NK 256 and Pinto while the others differed non-significantly. The significant differences among different treatments might be attributed to genetic resistance of cultivars against agroclimatic condition in respect of the mortality. These results differed with those reported by Nadeem

(1989) who recorded similar plant population plot⁻¹ among various sunflower hybrids.

The height of plants at maturity varied from 1.46 to 2.21 m (Table 1). Sunflower hybrid NK 256 being short statured showed lower plant height (1.46 m) while cultivar ATI 3 exhibited maximum plant height of 2.2 m. These results are in line with those reported by Akhtar (1985) and Nadeem (1989).

Maximum head diameter (20.75 cm) was found in SF 100 as against 15.85, 15.95, 15.96, 16.48 cm for NK 256, NSH 70, Rodeo and ATI 3, respectively. However, the later were at par with one another. The cv. C 206 showed a head diameter of 18.95 cm that was closely followed by NK 268 which was statistically significant than rest of the hybrids except SF 100. Higher head diameter in SF 100 was attributed to its semidwarfness character. These results are partially in line with those of Akhtar (1985) and Nadeem (1989). Maximum number of seeds head⁻¹ (1591) was observed in SF 100, while minimum (697) was found in NK 256. In Pinto, 1431 seeds head⁻¹ were recorded which were significantly higher than the other hybrids except SF 100. The cv. C 206 and Rodeo produced 1244 and 1180 seeds head⁻¹ and were at par with each other. Sunflower hybrids NK 259, NSH 70, NK 265 and ATI 3 produced similar number of seeds head⁻¹. The lower number of seeds head⁻¹ in NK 256 might be due to the varying genetic potential of the hybrids for number of seeds head⁻¹. These findings are in conformity with those of Laureti (1982). The cv. ATI 3, NK 256 and NK 268 ranked first by giving 41.86, 42.87 and 43.15 g 1000-seed weight and were at par with one another. The minimum seed weight (26.05 g) was observed in Rodeo that, in turn, was statistically at par with SF 100, C 206 and Pinto which exhibited seed weights of 27.08, 28.22

and 28.24 g, respectively. Other group of cultivars, i.e. NK 259, NSH 70 and NK 265 although recorded significantly higher test weight than SF 100, C 206, Rodeo and Pinto but were statistically lower than NK 268, NK 256 and ATI 3. The lower test weight in SF 100, C 206, Rodeo and Pinto were attributed to their higher number of seeds head⁻¹. These results are in agreement with those of Akhtar (1985).

and Khan (1984), Akhtar (1985) and Nacem (1989). The results suggested that sunflower hybrid SF 100 might be suitable in spring season compared to the other cultivars tested.

The cv. NK 265 showed maximum seed oil content (44.50%) as against the minimum (35.20%) for Rodeo. The hybrids Pinto, NK 268, NSH 70 and C 206 remained at par with each other, giving seed oil con-

Table 1. Comparative growth and yield performance of some sunflower (*Helianthus annuus* L.) hybrids planted in spring season

Sunflower hybrid	Number of plants ha ⁻¹	Plant height (m)	Head diameter (cm)	Number of seeds head ⁻¹	1000-seed weight (g)	Seed yield (t ha ⁻¹)	Seed oil content (%)
NK 259	68254 bc	2.12 ab	17.08 cd	1006 d	36.62 b	1.73 c	36.74 de
SF 100	69841 a	1.62 e	20.75 a	1591 a	27.08 c	2.68 a	38.12 cd
NK 268	68849 abc	2.04 bc	18.33 bc	888 e	43.15 a	2.17 b	41.67 b
NSH 70	68254 bc	1.92 cd	15.95 d	982 d	37.63 b	1.96 bc	41.66 b
NK 265	67460 c	1.89 d	17.05 cd	935 de	36.70 b	2.22 b	44.50 a
C 206	68254 bc	1.95 cd	18.95 b	1244 c	28.22 c	1.91 bc	41.55 b
NK 256	68254 bc	1.68 f	15.85 d	697 f	42.87 a	1.73 c	40.25 bc
Rodeo	69643 ab	2.18 a	15.96 d	1180 c	26.05 c	2.20 c	35.20 e
Pinto	67460 c	1.95 cd	17.20 cd	1431 b	28.24 c	1.80 c	42.11 b
ATI 3	69048 ab	2.21 a	16.48 d	975 d	41.66 a	1.76 c	38.51 cd

Any two means in a column not sharing a letter in common differ significantly at $P = 0.05$.

There were highly significant differences in the seed yields among the different sunflower hybrids under investigation. Sunflower hybrid SF 100 produced significantly the highest yield of 2.68 t ha⁻¹. The cv. NK 268, NK 265 and Rodeo produced more seed yields than NK 256, Pinto and ATI 3, but were at par with NSH 70 and C 206. The cv. C 206 and NSH 70 had statistically non-significant differences giving seed yields of 1.91 and 1.96 t ha⁻¹, whereas NK 268, Rodeo and NK 265 had 2.17, 2.20 and 2.22 t ha⁻¹, respectively. Similar findings were reported by Beg *et al.* (1984), Islam

tent of 42.11, 41.67, 41.66 and 41.55%, respectively. It is interesting to note that SF 100 sunflower hybrid gave higher seed yields but oil percentage in seed was decreased significantly than the other hybrids except Rodeo which produced the lowest percentage of oil in seed.

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