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Effect of Different Sowing Methods on the Performance of Sunflower

Gulzar Ahmad¹, Zar Quresh¹ and Hafeez Ullah²

¹Agricultural Research Institute, Tarnab Peshawar, Pakistan

²NWFP Agricultural University, Peshawar, Pakistan

Abstract: Sunflower hybrid SF-177 was planted on three sowing methods i.e. Ridge, Furrow and Flat land. The experiment was laid out in RCB design having four replications. Results indicated that sowing methods showed no significant effect on the emergence/m², days to maturity and plant height. Head diameter, thousand grains weight, grain yield and oil yield kg/ha were significantly affected by different sowing methods. Maximum of 18.67 cm head diameter, 68.43 g thousand grain weight, 2229.74 kg/ha grain yield and 931.34 kg/ha oil yield were obtained from ridge sown crop while furrow method had the lowest values for these variables.

Key words: Sunflower, *Helianthus annuus* L, sowing methods

Introduction

In Pakistan, sunflower can be grown throughout the country but cannot compete with cash crops like Tobacco, cotton and wheat etc. Therefore, it has not been able to establish itself as cash crop in the cropping system. In 1997-98 sunflower was grown on 98459 hectares in Pakistan, which produced 129693 tones of seeds. Its yield is 1300 kg/ha (MINFAL, 1997-98) which is very low as compared to other agriculturally advanced countries. Sunflower yields in France and USSR are 2595 and 1439 kg ha⁻¹ respectively (FAO, 1989). Pakistan imported edible oil worth Rs. 43.0 billion during the fiscal year 1998-99 (Pakistan Oilseed Dev. Board). If due attention is given to sunflower crop, the gap between production and consumption can be narrowed down considerably.

The large gap between yield obtained at research institutes and at the farmer field suggests that efforts must be intensified to raise yield potential on national level. Various factors are responsible for the low yield of sunflower at the farmers field such as unawareness of the farmers about the right date of sowing, sowing method, improper irrigation, weed control, pest management practices and the use of unbalanced fertilizers. Among these factors various sowing methods are of great importance. It is generally agreed that appropriate sowing methods are necessary for obtaining higher yield of this crop, by establishing a good crop stand. Esehie *et al.* (1996) reported that oil yields were higher in the ridge sown than flat and furrow sown sunflower. Sidhu *et al.* (1995) reported highest yield from ridge sown sunflower. Buttar and Uppal (1996) reported that the highest seed yield of sunflower was recorded with sowing at the bottom of the ridge and the lowest yield was recorded with sowing at the top of the ridge. Firake *et al.* (1994) reported that seed yield was increased with graded ridges.

Keeping in view the above facts, the present project was initiated to know the response of sunflower hybrid SF-177 to various sowing methods for higher yield in Peshawar valley.

Materials and Method

An experiment entitled "Effect of different sowing methods on the performance of sunflower" was conducted at the Agriculture Research Institute Tarnab Peshawar, during spring 1999. Sunflower hybrid SF-177 was sown on April

13, 1999. The following sowing methods were studied in the experiment:

Treatment No.	Sowing Methods
T1	Ridge
T2	Furrow
T3	Flat land sowing

The experiment was laid out in RCB design having four replications. The sub plots size was 3x5 m². Each treatment had four rows, five meter long and 75 cm apart. The plant to plant distance was about 20-25 cm.

Data were recorded on the following parameters.

1. Emergence/m²
2. Days to maturity
3. Plant Height (cm)
4. Head Diameter (cm)
5. 1000 grain weight (g)
6. Grain yield (kg/ha)
7. Oil yield (kg/ha)

The recorded data were analyzed statistically according to RCB Design and Least Significant Difference (LSD) test was applied to detect whether the effects of different treatments were significant or not.

Results and Discussions

Results presented in Table 1 revealed that there was no significant effect of different sowing methods on the emergence/m², plant height, and days to maturity of sunflower. The possible reason could be that the seed had its own reserved food that helped in emergence without any role by the sowing method. Head Diameter was significantly affected by sowing methods. The maximum head diameter (18.67 cm) was produced in the plots sown on ridges while minimum (16.37 cm) was observed in furrow sown plots. The possible reason could be that the plants met its requirements from loosened surface fertile soil which augmented head diameter. Results presented in Table 1, indicated that thousand grain weight was significantly affected by different sowing methods. Maximum grain weight (68.43 g) was produced by plots sown on ridges while minimum weight (64.24 g) was observed in plots sown in furrows. The possible reason could be that the ridge sowing provided aerated fertile

Table 1: Results of different sowing methods on the performance of sunflower

Treatment	Emergence/m ²	Days to Maturity	Plant height (cm)	Head Diameter (cm)	1000 grain weight	grain yield (kg/ha)	Oil yield (kg/ha)
Ridge	4.79	108.40	177.65	18.67A	68.43 ^A	2229.74 ^A	931.34 ^A
Furrow	4.62	110.45	156.75	16.37 ^B	64.24 ^B	1414.63 ^B	553.23 ^B
Flat	4.57	108.85	171.45	18.12 ^A	67.35 ^{AB}	2114.37 ^A	369.31 ^A
LSD	N.S	N.S	N.S	1.722	3.247	653.90	362.0

Mean values with different letters are significantly different at 5% level of probability.

soil to the plants and gave favourable environment to the plants which helped in the absorption of more nutrients and hence more grain weight was produced.

Oil yield per hectare was significantly affected by sowing methods. Maximum oil yield was obtained in ridge sown plots while minimum oil yield was observed in furrow sown plots. The possible reason may be that ridge sowing provided soft or loosened soil and gave favourable environment to the plants. Confirmatory results were given by the Esehie *et al.* (1996) who reported that oil yields were higher in the ridge sown plots than flat and furrow sown sunflower.

Grain yield was also significantly affected by different sowing methods. Maximum seed yield of 2229.74 kg ha⁻¹ was produced by the plots sown on ridges while minimum (1414.63 kg ha⁻¹) was recorded in the furrow sown plots. This increase in grain yield may be attributed to bigger head diameter and higher thousand grain weight. Similar results were also reported by Sidhu *et al.* (1995) and Esehie *et al.* (1996).

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