

Influence of phosphorus levels with and without PSB on growth and yield of rainfed sunflower

N.M. THETE*, P.S. SOLUNKE AND A.B. THAKUR

Department of Agronomy, College of Agriculture, LATUR (M.S.) INDIA

ABSTRACT

An experiment was conducted during *Kharif* season of 2006-07 at Agronomy Farm, College of Agriculture, Latur (M.S.) to study the effect of phosphorus levels with and without PSB on growth attributes and yield of sunflower. Nine treatments were tested in randomized block design with three replications. The experimental results revealed that the treatments application of 80 kg P₂O₅ ha⁻¹ with and without PSB and application of 60 kg P₂O₅ ha⁻¹ with and without PSB recorded significantly maximum growth attributes *viz.*, plant height, number of functional leaves plant⁻¹, leaf area plant⁻¹ (cm²), total dry matter plant⁻¹ (g), stem girth (cm), head diameter and yield parameters *viz.*, yield plant⁻¹ (g), seed yield ha⁻¹, stalk yield ha⁻¹, dry weight of capitulum ha⁻¹ and harvest index over rest of the treatments, respectively. However, control treatment recorded lowest yield attributes, yield and quality parameters of sunflower.

Thete, N.M., Solunke, P.S. and Thakur, A.B. (2011). Influence of phosphorus levels with and without PSB on growth and yield of rainfed sunflower. *Internat. J. agric. Sci.*, 7(1): 58-59.

Key words : Rainfed sunflower, Phosphorus levels, PSB

INTRODUCTION

Sunflower is an important oilseed crop of Maharashtra under rainfed situation particularly in vertisols. The productivity of sunflower is very low 560 kg ha⁻¹ in Maharashtra (Anonymous, 2010). Of the many reason of low productivity, nutrient management especially phosphorous management is one of the key factors enhancing the oil content as well as productivity of sunflower (Patil *et al.*, 2004). In view of escalating prices and high demand supply gap of chemical fertilizers, there is strong need to adopt judicious combination of inorganic with organic ones, more particularly biofertilizers of microbial origin to improve the soil health and productivity. Hence, the present study was undertaken to know the response of PSB alone and the combination with various phosphorous levels on productivity and quality of sunflower.

MATERIALS AND METHODS

A field experiment was conducted to study the effect of phosphorus levels with and without PSB on growth attributes and yield of sunflower during *Kharif* season of 2006-07 at Agronomy Farm, College of Agriculture, Latur (M.S.), India in Randomized Block Design with nine treatments replicated thrice. The treatments were T₁-Control, T₂-20 kg P₂O₅ ha⁻¹, T₃-20 kg P₂O₅ ha⁻¹ with PSB,

T₄-40 kg P₂O₅ ha⁻¹, T₅-40 kg P₂O₅ ha⁻¹ with PSB, T₆-60 kg P₂O₅ ha⁻¹, T₇-60 kg P₂O₅ ha⁻¹ with PSB, T₈-80 kg P₂O₅ ha⁻¹ and T₉-80 kg P₂O₅ ha⁻¹ with PSB. The experimental soil was deep black in colour with good drainage, pH (8.0), low in available nitrogen (187 kg ha⁻¹), medium in phosphorus (20.12 kg ha⁻¹) and rich in available potassium (695 kg ha⁻¹). Variety LSF-8 was sown by dibbling with row spacing of 45x20 cm² on 2nd Aug., 2006. Fertilizer dose applied as per treatments. Crop was harvested on 12th Nov., 2006. The total rainfall received during crop season was 619mm in 27 rainy days.

RESULTS AND DISCUSSION

The data pertaining to growth attributes and yield of sunflower are given in Table 1 and 2. Treatment T₉ registered significantly maximum growth attributes *viz.*, plant height (141.84 cm), leaf area plant⁻¹ (29.00 cm²), total dry matter plant⁻¹ (59.31 g) and head diameter plant⁻¹ (15.28 cm) over rest of the treatments. Treatments T₈, T₇ and T₆ were at par with treatment T₉ in respect of plant height (140.20, 139.23 and 138.52 cm), leaf area plant⁻¹ (28.20, 27.82 and 27.18 cm²) and head diameter (15.13, 14.92 and 14.79 cm), respectively. However, treatment T₁ registered lowest all the growth attributes. Similar results were also reported by Sharma (1994) and Patil *et al.* (2004). As regards yield parameters, same treatment *i.e.* treatment T₉ recorded significantly

* Author for correspondence.

Mahatma Phule Krishi Vidyapeeth, Rahuri, AHMEDNAGAR (M.S.) INDIA

Table 1 : Growth attributes of rainfed sunflower as influenced by phosphorus levels and PSB at harvest

Treatments	Plant height (cm)	No. of functional leaves plant ⁻¹	Leaf area plant ⁻¹ (cm ²)	Total dry matter (g plant ⁻¹)	stem girth (cm)	Head diameter (cm)
T ₁ - Control	133.32	16.41	22.47	38.72	4.98	12.20
T ₂ -20 kg P ₂ O ₅ ha ⁻¹	134.48	16.92	22.63	43.60	5.85	13.22
T ₃ -20 kg P ₂ O ₅ ha ⁻¹ with PSB	135.86	17.15	23.05	45.16	6.05	13.45
T ₄ - 40 kg P ₂ O ₅ ha ⁻¹	136.02	19.53	23.95	50.13	6.95	14.47
T ₅ -40 kg P ₂ O ₅ ha ⁻¹ with PSB	137.86	20.61	24.43	51.34	7.15	14.61
T ₆ - 60 kg P ₂ O ₅ ha ⁻¹	138.52	23.00	27.18	53.97	8.20	14.79
T ₇ -60 kg P ₂ O ₅ ha ⁻¹ with PSB	139.23	23.48	27.82	54.58	8.47	14.92
T ₈ -80 kg P ₂ O ₅ ha ⁻¹	140.20	24.71	28.20	57.34	8.81	15.13
T ₉ -80 kg P ₂ O ₅ ha ⁻¹ with PSB	141.84	25.12	29.00	59.31	9.00	15.28
S. E. ±	1.14	1.37	0.68	1.66	0.28	0.32
C.D. (P=0.05)	3.41	3.82	1.99	4.87	0.80	0.96

Table 2: Yield parameters of rainfed sunflower as influenced by phosphorus levels and PSB

Treatments	Yield plant ⁻¹ (g)	Seed yield (kg ha ⁻¹)	Stalk yield (kg ha ⁻¹)	Dry wt. of capitulum (kg ha ⁻¹)	Harvest index
T ₁ - Control	38.71	860	2510	1535	17.53
T ₂ -20 kg P ₂ O ₅ ha ⁻¹	41.55	965	2802	1646	18.54
T ₃ -20 kg P ₂ O ₅ ha ⁻¹ with PSB	42.05	998	3010	1712	18.65
T ₄ - 40 kg P ₂ O ₅ ha ⁻¹	44.92	1100	3262	1847	19.68
T ₅ -40 kg P ₂ O ₅ ha ⁻¹ with PSB	45.14	1115	3314	1859	19.76
T ₆ - 60 kg P ₂ O ₅ ha ⁻¹	46.12	1128	3362	1885	19.97
T ₇ -60 kg P ₂ O ₅ ha ⁻¹ with PSB	46.72	1140	3402	1900	20.14
T ₈ -80 kg P ₂ O ₅ ha ⁻¹	47.02	1152	3465	1920	20.45
T ₉ -80 kg P ₂ O ₅ ha ⁻¹ with PSB	47.49	1160	3502	1935	20.54
S. E. ±	0.89	22	81	32	0.33
C.D. (P=0.05)	2.63	68	244	95	0.98

maximum yield plant⁻¹ (47.49), seed yield (1160 kg ha⁻¹), stalk yield (3502 kg ha⁻¹), dry weight of capitulum (1935 kg ha⁻¹) and harvest index (20.54%) over rest of the treatments. Treatments T₈, T₇, T₆, T₅ and T₄ were at par with treatment T₉. Control treatment recorded significantly lowest all the yield parameters. Similar results of phosphorus levels and PSB on productivity and quality parameters were recorded by Ujjanaiah *et al.* (1989) and Sharma (1994).

Hence, it was concluded that the application of 60 kg P₂O₅ ha⁻¹ with PSB was the best treatment from production aspects.

REFERENCES

- Anonymous (2010).** <http://www.maha.agri.nic.in.com>
- Patil, S.N., Ulemale, R.B., Lande, S.S. and Mahajan, A.M. (2004).** Phosphorus management in sunflower. *J. Oilseeds Res.*, **21** (1) : 62-64.
- Shrama, R.S. (1994).** Influence of irrigation schedule and fertility levels on yield of sunflower. *Indian J. Agron.*, **39** (3) : 496-497.
- Ujjanaiah, V.S., Shanthamallai, N.R. and Maroti, N.M., (1989).** Effect of different row spacing, N and P fertilizers level on growth, yield, yield components and quality of seeds in sunflower. *Mysore J. Agric. Sci.*, **23** (3) : 146-50.

Received : June, 2010; Accepted : August, 2010