

DIRECT AND RESIDUAL EFFECT OF FYM AND NPK LEVELS ON SUNFLOWER

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ABSTRACT

Field experiments conducted in a red sandy loam soil to investigate the direct and residual effect of FYM and NPK fertilizers on sunflower revealed that application of FYM at 20 t/ha with 50% of recommended NPK fertilizer increased the seed yield of direct and residue crops. The yield reduction in residue crop under FYM and NPK treatments was only 18 to 19 per cent as against 21 to 28 per cent under no FYM and no NPK treatments. The reduction in oil yield in the residue crop was 21.8%.

Key words: Direct and residual effect, FYM, NPK, sunflower.

Continuous use of high analysis fertilizer to get maximum production leads to wide occurrence of deficiency of major and micronutrients in soil while combined application of organic manures and chemical fertilizer economizes the fertilizer nutrients by increasing the efficiency of

the added fertilizers (Srivastava and Khanna, 1974). Information available on combined use of FYM with different levels of NPK fertilizers on direct and residual crop yield and quality of sunflower are scanty. Hence, the present study was taken up.

Table 1. Effect of levels of FYM and NPK fertilizers on head diameter and seed test weight of sunflower

Crop	Direct crop (Kharif 1987)		Residue crop (Summer 1988)	
	Head diameter (cm)	100 seed weight (g)	Head diameter (cm)	100 seed weight (g)
Treatments				
FYM levels				
No FYM	13.7	4.4	13.8	4.3
FYM @ 5 t/ha	14.2	4.5	14.2	4.5
FYM @ 10 t/ha	14.2	4.7	14.3	4.5
FYM @ 15 t/ha	14.9	4.7	14.6	4.5
FYM @ 20 t/ha	14.9	4.7	15.5	4.6
SEd	0.2	0.03	0.3	0.06
CD (0.05)	0.5	0.8	0.8	0.12
Fertilizers levels				
No NPK fertilizer	13.9	4.5	14.2	4.3
50% of NPK	14.4	4.7	14.5	4.5
100% of NPK	14.5	4.7	14.8	4.6
SEd	0.3	0.04	0.2	0.04
CD (0.05)	NS	0.07	0.4	0.08

Table 2. Direct and residual effect of fertilizer on sunflower seed and oil yield (kg/ha)

Levels of fertilizer FYM	Direct crop (Kharif 1987)			Residue crop (Summer 1988)		
	No NPK	50% of NPK	100% of NPK	No NPK	50% of NPK	100% of NPK
Seed yield (kg/ha)						
No FYM	1075	1257	1237	807	881	921
FYM @ 5 t/ha	1135	1293	1260	858	908	917
FYM @ 10 t/ha	1119	1257	1225	924	954	1069
FYM @ 15 t/ha	1182	1264	1226	969	1101	1123
FYM @ 20 t/ha	1263	1404	1395	1005	1215	1246
Mean	1155	1295	1289	913	1012	1055
	SED	CD (0.05)		SED	CD (0.05)	
FYM	47	110		43	99	
Fertilizer	30	62		29	61	
FYMxFertilizer	66	NS		65	NS	
Oil yield (kg/ha)						
No FYM	413	484	477	294	329	354
FYM @ 5 t/ha	436	499	487	325	345	346
FYM @ 10 t/ha	432	487	477	353	366	417
FYM @ 15 t/ha	455	490	479	366	420	436
FYM @ 20 t/ha	490	547	550	382	469	498
Mean	445	501	494	344	386	410
	SED	CD (0.05)		SED	CD (0.05)	
FYM	19	43		19	44	
Fertilizer	12	25		11	24	
FYMxFertilizer	27	NS		26	NS	

MATERIALS AND METHODS

A field experiment was conducted in a red sandy loam soil (Alfisol) of Agricultural Research Station, Bhavanisagar with sunflower morden as test crop for both direct and residual study. The treatments were five levels of FYM (0, 5, 10, 15 and 20 t/ha) and three levels (0, 50 and 100 per cent) of soil test recommended NPK fertilizer at 60:39.6:49.8 kg/ha and their combinations contributing to 15 treatments, laid out in FRBD, replicated three times. The direct crop was raised during kharif 1987 and the residue crop was grown during summer 1988 in the same plots without disturbing the original layout of the direct crop. The crops were harvested and the seed samples obtained from the different treat-

ments were analysed for oil content in a Nuclear magnetic resonance meter.

The soil of the experimental field was free from salt hazards and neutral in reaction. The soil available NPK contents were 130, 6.4 and 320 kg/ha respectively.

RESULTS AND DISCUSSION

There was significant increase in seed yield in both direct and residue crops owing to FYM and NPK levels (Table 2). Application of FYM at 20 t/ha recorded maximum seed yield. The 50% NPK fertilizer level was on par with 100% NPK level in both direct and residual crops. Combined application of 20 t/ha of FYM and 50% of

recommended NPK fertilizer was found optimum for higher level of seed production in sunflower.

The increase in seed yield in FYM and NPK applied plots could be attributed to the corresponding increase in head diameter and seed test weight (Table 1) and also due to nutrient supplied by the FYM. The applied FYM at 20 t/ha supplied 80, 17.6 and 66.4 kg of NPK/ha. Besides, it might have improved the physical condition of the sandy loam soil (Gaur *et al.*, 1984). Favourable effect of 5 to 27 t/ha FYM was revealed by Jagtap and Shingte (1982) in wheat and Mohamed Ali *et al.* (1974), Loganathan and Krishnamoorthy (1980) and Kadam and Desai (1983) in groundnut.

The sunflower seed yield was reduced to 22 per cent in summer 1988 residue crop compared to kharif 1987 direct crop. This could be attributed to the fact that the residue crop did not receive FYM or NPK. The reduction in seed yield was more pronounced in control plots (21 to 28 per cent) as compared to FYM and NPK applied plot. The higher seed yield of residue crop under FYM and NPK fertilizer treatments as compared to control could be attributed to the favourable residual effect of FYM and NPK fertilizers applied to the kharif 1987 direct crop. Devarajan *et al.* (1987) reported 42 per cent increased grain yield in the residue crop of maize due to FYM application at 15 t/ha to the preceding maize crop.

The difference in oil content due to FYM and NPK levels was not significant in both direct and residue crops. This might be due to the fact that in sunflower, the oil content is generally influenced more by the environmental factors than by fertilizer treatments (Marton and Fekete, 1975).

Addition of FYM at 20 t/ha recorded an increased oil yield of 15 and 38 per cent in direct and residue crops respectively over no FYM (Table 2). Among the fertilizer levels, 50% NPK

recorded 12.6 and 12.2 per cent increased oil yield over no NPK and it was on par with 100% NPK level in both direct and residue crops. The oil yield was reduced to an extent of 21.8 per cent in residue crop compared to direct crop. The oil yield reduction could be attributed to the corresponding low seed yield in residue crop.

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