NOTE ON THE EFFECT OF GREEN MANURE AND FERTILIZER APPLICATION ON THE GRAIN YIELD OF WHEAT IN JAWAI COMMANDED AREA OF WESTERN RAJASTHAN

G. S. SHEKHAWAT AND G. C. SHROTRIYA

Agronomy Section, Agriculture Department Rajasthan, Durgapura, Jaipur.

The traditional practice of keeping the fields fallow in *Kharif* and raising wheat crop in *Rabi* has resulted in the reduction of soil fertility and crop yield (Raheja (1964) and Singh (1967). Beneficial effect of green manure in improving soil fertility and yield of suceeding crops have been reported by Mirchandani and Khan (1962), Chandani and Oberai (1956), Singh (1961) and Singh (1967). The present study was aimed to investigate the effect of green manure and fertilizer requirement of the suceeding wheat crop.

A field trial was conducted at the Government Agricultural Research Farm, Sumerpur, during the year 1965–66. The factors of study included three treatments of green manure–G_0, G_1 and G_2 (No green manure, green manure without phosphate and green manure with 35 kg P_2O5/ha), three levels of nitrogen viz. N_0,N_1 and N_2 (0 17.5, and 35 kg N/ha) and three levels of phosphate i. e. P_0, P_1 and P_2 (0, 35 and 70 kg P_2O_5/ha). These nitrogen and phosphate treatments pertain to wheat crop only. Design of layout was 3^3 confounded with two replications. Gross and net plot size was 1/100th and 1/125th hectare respectively. Green manure crop-sunhemp *(Crotalaria juncea)* was sown on 19th July 1965 and turned down *in situ* on 5th September 1965. Wheat (variety R. S. 31–1) was drilled in rows 22.5 cms apart and one quintal seed per hectare was used. Nitrogen was applied in two equal splits at and one month after sowing. Full dose of phosphate was applied at the time of sowing. In all four irrigations were available from the Jawai Canal system and the crop was sown after pre-sowing irrigation. The wheat crop was harvested on 2.4. 1966.

Soil of the experimental field was sandy loam in texture with poor inherent fertility and slight alkaline reaction,

Grain yield obtained was statistically analysed and is presented in table 1. As evident from the data green manure without phoshate significantly increased the grain yield of wheat to 37.0% over no green manure. When green manure crop was raised with the application of phosphate, increase in yield over no green manure was 55.6 per cent, showing the beneficial effect of phosphate to green manure crop. These results are in close confirmation with the findings of Mirchandani and Khan (1952), Singh (1961) and Singh (1967).

Table 1. Effect of green manure levels of nitrogen and phosphate rates on the grain yield of wheat (q/ha)

Treatment	Yield	Treatment	Yield	Treatment	Yield
G_0	9.23	N_0	8.11	P_0	11.60
G_1	12.65	N_1	12.10	P_1	11 40
G_2	13.35	N_2	15.01	P_2	12.22
S.Em ±	0.403		0 403		0.403
'F' Value	Sig.		Sig.		N.S.
L.S.D. 5%	0.828		0.828		—
L.S.D. 1%	1.119		1.119		—

Increasing levels of nitrogen significantly increased the grain yield of wheat. Application of 35 kg N/ha resulted in significantly higher grain yield over 17.5 and 0 kg N/ha dose, the percent increase being 49.1 and 85.6% respectively. Nitrogen response was found linear up to 35 kg N/ha level. Similar results were also reported by Shrotriya *et al* (1966).

Direct application of fertilizer to wheat crop was not found effective, Probably soil of the experimental field was moderate in P_2O_5 content; available P_2O_5 being 40.46 kg/ha.

Table 2. Combined effect of green manure and nitrogen on the grain yield of wheat (q/ha)

Treatment	N_0	N_1	N_2	S.Em. ±	LSD 5%	LSD 1%
G_0	4.27	9.87	13.56	0.69	1.43	1.94
G_1	9.74	12.57	15.63			
G_2	16.34	13.87	15.83			

Maximum grain yield was obtained under G_2N_2 treatment—green manure with phosphate and 35 kg N/ha (Table-2). However, there was no significant difference between G_2N_2 and G_1N_2 treatments, but both these treatments resulted in significantly higher yields over rest of the treatments. Absence of nitrogen in either form, green manure and fertilizer, produced as low as 4.27 q/ha indicating very poor initial soil fertility. In green manure × nitrogen interaction also, effect of green manure and nitrogen was in line of their main effect.

SUMMARY

A field trial to study the effect of green manure, nitrogen and phosphate to wheat crop was laid out at Government Agriculture Farm, Sumerpur, during the year 1965–66. Combined application of green manure with 35 kg P_2O_5/ha and 35 kg N/ha gave maximum yield. Application of phosphate to wheat crop was not found effective.

ACKNOWLEDGEMENTS

The authors are greatful to Shri T.C. Kala, Ex—Director of Agriculture, Rajasthan and Shri M. P. Bhatnagar, Jt. Director of Agriculture (Research), Rajasthan, for providing necessary facilities.

REFERENCE

Chandani, J. J. and Oberai, S. R. 1956. Studies on relative value of various legumes as a source of green manure. *Ind. J. Agron. 1* : 95-104.

Mirchandani, T. J. and Khan, A. R. 1952. Green manuring. *I. C. A. R. Review Series No. 6.*

Raheja, P. C. 1954. Double croppinng. *I. C. A. R. Review Series No. 8.*

Singh, C. 1967. Effect of different legumes on the succeeding wheat crop *Ind. J. Agron. 12* : 108–115.

Singh, U. B. 1961. After effects of green manure crops on uptake of N and P by wheat. *Ind. J. Agron. 6* : 98–104.

Shrotriya G. C., Pareek. B. L. and Mathur, C. M. 1966. A note on nitrogenous fertilization on wheat in Pali, western Rajasthan. *Ann. Arid Zone 5* : 257-259.