

## INTEGRATED NUTRIENT MANAGEMENT IN IRRIGATED GRAM

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### ABSTRACT

The influence of integrated nutrient management in irrigated red gram Co.5 was studied over a period of three years during 1990- 1992. Integrated nutrient management such as recommended fertilizer viz., 25 Kg N + 50 Kg P<sub>2</sub>O<sub>5</sub>/ha + 750 kg/ha of enriched farm yard manure + foliar application of 2% DAP twice (one at flowering and the second 15 days thereafter) + foliar spraying of NAA at 40 ppm at 55 days after sowing recorded increased yield in redgram under irrigated condition.

**KEY WORDS :** Nutrient Management, Red Gram

Red gram (*Cajanus cajan* (L.) Millsp) occupies about 2.8 million ha with an annual production of about 1.5 million tonnes. It contains about 20-28 per cent of protein, an important source in the vegetation diet. Through atmospheric nitrogen fixation, it improves the soil fertility. Red gram, though a leguminous crop, requires a starter dose of nitrogen for proper establishment of root and plant growth before the formation of nodules (Goudalia *et al.*, 1988). Foliar application of N and P and seed treatment with rhizobium culture are also essential to increase the productivity of pulse crops (Bhattacharya *et al.*, 1984). But due importance has not been given to this crop in terms of management practices, and hence the present study.

### MATERIALS AND METHODS

Three field trials were laid out with red gram (Co.5) as the test crop with eight treatments during 1990-92 in the Central Farm, Agricultural College and Research Institute, Tamil Nadu Agricultural University Coimbatore. The treatment details are as follows:

- T1 : absolute control (no fertilizer application),
- T2 : standard check (recommended fertilizer viz., 25 kg N + 50 kg P<sub>2</sub>O<sub>5</sub>/ha + 6 t FYM/ha
- T3 : T2 + 720 kg/ha powdered farm yard manure incubated with rock phosphate for 30 days;
- T4 : T3 + Rhizobium culture c.c.1;
- T5 : T4 + foliar application of 2% DAP twice (one at flowering and the second at 15 days thereafter;

T6 : T5 + foliar spraying of NAA at 40 ppm at 55 days after sowing;

T7 : T6 + foliar application of KCl at 55 and 70 days after sowing (1.75 kg KCl in 250 l of water/ha);

T8 : fungicide + Rhizobium c.c.1. The design adopted was randomised block design with four replications. The soil contained available nitrogen 196 kg/ha, available phosphorus 34.5 kg/ha and available K<sub>2</sub>O 321 kg/ha. Fertilizer nitrogen in the form of urea, phosphorus as single superphosphate and potassium in the form of muriate of potash were applied basally to the respective plots. Interculture operations such as manual weeding, irrigation and plant protection measures were given at the appropriate time. Five plants in each treatment were selected at random and bio-metric observations were recorded. Finally the crop was harvested and the produce were thrashed, cleaned, dried and weighed. The yield data was subjected to the statistical analysis.

### RESULTS AND DISCUSSION

Recommended fertilizer (25 kg N + 50 kg P<sub>2</sub>O<sub>5</sub>/ha) + 750 kg/ha powdered farm yard manure incubated with rock phosphate for 30 days + rhizobium culture c.c.1., + foliar application of 2% DAP twice one at flowering and the second at 15 days thereafter (T5) and the treatment T5 + foliar spraying of NAA at 40 ppm at 55 days thereafter (T6) had recorded significantly higher mean yield of 517 and 510 kg/ha respectively. The treatment T5, had consistently recorded higher grain yield in

**Table 1.** Influence of integrated nutrient management on the yield of irrigated red gram Co.5

Treatments	Yield (kg/ha)			
	1990	1991	1992	Mean
T1	392	458	116	322
T2	477	594	137	403
T3	480	583	139	401
T4	537	541	133	404
T5	744	625	181	517
T6	733	624	173	510
T7	690	541	174	468
T8	415	531	144	364
CD (P=0.05)	65.6	NS	13.6	

NS : Not Significant.

all the three years, followed by T6 (Table 1) This was in close agreement with the findings of Solaiappan and Ramiah (1990), Tomar *et al.* (1987), Yellamananda Reddy *et al.* (1987) and Srivastava and Stivastava (1987).

The standard check, (T2) where the recommended fertilizer application of 25 kg N+50 kg P<sub>2</sub>O<sub>5</sub>/ha + farm yard manure at 6 t/ha had given higher mean seed yield of 403 kg/ha. Bhandari *et al.* (1989) based on the 43 trials conducted in the rainy seasons stated that the grain yield of redgram increased with the combined application of N and P at 20 and 17.5 kg/ha respectively. It was noticed that the treatment T8 (fungicide+ rhizobium culture c.c. 1) recorded the mean grain yield of 364 kg/ha showing that there was not appreciable effect on the yield of redgram. Similar results were obtained in greengram during the *kharif* season by Patel *et al.* (1988)

Based on the results obtained it could be concluded that application of N and P at 25 and 50 kg ha<sup>-1</sup> respectively yielded higher grain in irrigated red gram was compared to absolute control, the increase being 25.6 per cent. The integrated nutrient management practices *viz.*,

recommended fertilizer application, 25 kg N +50 kg P<sub>2</sub>O<sub>5</sub>/ha + 750 kg/ha of powdered farm yard manure undoubted with rock phosphate for 30 days +rhizobium culture c.c.1 + foliar application of 2% DAP twice (one at flowering and the second at 15 days thereafter) was found to give an increased yield of 28.5 per cent over standard check T2 in irrigated red gram.

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