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RELATIVE CONTRIBUTION OF NON-MONETARY/LOW-COST INPUTS IN RED GRAM PRODUCTION

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ABSTRACT

Studies conducted at the Tamil Nadu Agricultural University Coimbatore, under the rainfed conditions during 1989-90 and 1990-91 revealed that adoption of the combined inclusion of non- monetary/low-cost inputs such as improved variety of red gram (Co.5), increased plant population (1,00,000 plants/ha), planting immediately after the onset of monsoon and weed removal on the third week after planting had resulted in the increased yield of red gram.

KEY WORDS : Red gram Production, Non-monetary, Low-cost Inputs

After the invention of fertiliser responsive, high yielding and short duration varieties of crops, attempts were made to exploit the production potential using new strategies of agricultural production. The cost of production went up due to heavy demand for fertiliser, intensive use of irrigation water and excessive use of plant protection measures. Further, increase in the cost of these resources was not much paying to the farming community. It was therefore, imperative to find out the ways and means to increase the production per unit of input used. Besides these, there were other associated agronomic practices *viz* choice of variety, date of planting, depth of seeding, seeding time, planting pattern, plant population, time and method of fertiliser application and time of weed removal which could be manipulated for higher crop production without affecting the cost of production. Keeping these factors in view, attempts were made to study the influence of non-monetary/low-cost inputs on the yield of red gram under rainfed condition, at the Tamil Nadu Agricultural University, Coimbatore over a period of two years *via*., 1989-90 and 1990-91.

MATERIALS AND METHODS

A combination of 16 treatments consisting of 4 factors in each of the 2 levels of cultivation, *viz* conventional method (local) and improved method involving the non-monetary/low-cost inputs, was tried in a randomised block design with two replications. The four factors were,(i) varieties:local variety SA1 (a1), and improved variety Co.5(a2), (ii) population levels: 50000 plants/ha (b1), increased plant population at 1,00,000 plants/ha (b2); (iii) time of planting: planting at the second fortnight of July (c1), planting immediately after the onset of monsoon (c2) and (iv) time of weed removal: weed removal on the sixth week after planting (d1) and weed removal on the third week after planting (d2). A common fertiliser dose of 50 kg. of diammonium phosphate was applied basally to all the treatments.

RESULTS AND DISCUSSION

The yield attributes and yield obtained from the various treatments are furnished in Table 1. It could be observed that the choice of improved variety Co.5(a2) had resulted in the increased yield (717 kg/ha) and also increased number of pods per plant (110 pods) as against the conventional variety (local) SA1 (a1) which had recorded 54 pods/plants and the mean seed yield of 625 kg/ha.

One of the major constraints for the low productivity in most of the pulses was low plant population per unit area. It had been reported that the crop yield increased with the corresponding increase in the plant density upto certain level. The data regarding the plant population revealed that increased plant population of 100000 plants/ha(b2) had recorded the highest mean seed yield as against the low plant population of 50000 plants/ha(b1). Singh and Rajendra Prasad (1987) reported that one lakh plant population per ha gave the highest seed yield in red gram. Further increase in the plant population to one and a half and two lakhs per ha reduced the grain yield in the varieties.

Ali (1987) had started that the second fortnight of October for the Northern plains and first fortnight of October for the Southern plains and first fortnight of October for the Southern Plains

Table 1. Influence of non-menetary / low-cost inputs on the growth and yield attributes of red gram.

	1989-90		1990-91	
	Number of pods per plant	Yield kg/ha	Number of pods per plant	Yield kg/ha
a1 b1 c1 d1	78.00	716.00	34.50	473.50
a1 b1 c1 d2	86.00	727.00	39.20	360.50
a1 b1 c2 d1	78.50	757.00	30.30	442.50
a1 b1 c2 d2	74.20	749.50	22.30	478.50
a1 b2 c1 d1	91.10	775.75	28.75	609.00
a1 b2 c1 d2	85.80	764.50	29.50	492.50
a1 b2 c2 d1	78.40	708.25	28.40	666.00
a1 b2 c2 d2	85.10	745.75	28.50	532.00
a2 b1 c1 d1	160.00	764.50	42.25	526.50
a2 b1 c1 d2	162.50	779.50	43.00	543.50
a2 b1 c2 d1	135.00	790.70	40.00	690.50
a2 b1 c2 d2	180.00	816.95	43.50	631.50
a2 b2 c1 d1	150.50	854.40	45.00	579.50
a2 b2 c1 d1	195.00	873.15	43.00	595.00
a2 b2 c2 d1	201.50	813.20	51.50	668.50
a2 b2 c2 d2	228.00	903.25	49.50	645.50
SED		23.847		86.494
CD (5%)		50.81		184.32

were the optimal time of planting for red gram respectively, for getting the increased yield. The results of the experiment also showed that planting immediately after the onset of monsoon (O2) had recorded the highest mean seed yield as compared to the planting on the second fortnight of July (c1). The reason for the increased yield in the planting immediately after the onset of monsoon was that the crop had the benefit of sufficient moisture throught the receipt of rainfall during the early stages of the crop growth.

Generally, the yield of pulses was severely affected due to the infestation of weeds. It had been reported that weed removal by 20- 25 days after sowing was the most effective and remunerative (Ali, 1987). The data revealed that weed removal at 3 weeks after planting (d2) had recorded the highest mean seed yield. as against the conventional method of weed removal on 6 weeds after planting (d1) (Table 2). Srivastava and Srivastava (1987) had reported that inputs such as fertiliser, weed control and pesticides had increased yield in red gram. They have concluded that weed

Table 2. Yield attributes and yield kg/ha (mean of two years).

Particulars	Number of pods per plant	Yield (kg/ha)
Variety		
Conventional variety (Local SAI) (a1)	54.53	625.00
Improved variety (Co.5) (a2)	110.64	717.00
Plant population		
Low plant population 50000 plants/ha (b1)	76.20	640.50
High plant population 100000 plants/ha (b2)	88.72	701.65
Time of planting		
Planting second fortnight of July (c1)	80.25	652.20
Planting immediately after on set of monsoon (c2)	84.66	689.97
Time of weed removal		
Weed removal on 6 weeks after planting (d1)	77.70	664.92
Weed removal on 3 weeks after planting (d2)	87.19	677.24

removal had resulted in the increased yield in red gram by 19.4 per cent over the control. Thus, adoption of non-monetary/low-cost inputs such as improved variety (Co.5), optimum time of planting, (planting immediately after the onset of monsoon) increased plant population (100000 plants/ha) and timely weed removal (removal of weeds at 3rd week after planting) were found to record increased yield in red gram. Raghumurthy and Yaragathihar (1987) had obtained the same results under the rainfed condition in Karnataka State.

Thus it could be concluded that combination of non-monetary/low- cost inputs was found to be suitable for getting the increased yield in red gram under rainfed condition.

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INFLUENCE OF RICE BASED CROPPING SYSTEMS ON SOIL HEALTH IN CAUVERY DELTA ZONE OF TAMIL NADU

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ABSTRACT

Field experiments were conducted in low lands at Tamil Nadu Rice Research Institute, Aduthurai, Tamil Nadu for two years (1985-87) to study the change in soil nutrient status due to the rice based cropping systems in Cauvery delta zone. The inclusion of legume in the cropping systems resulted in higher soil nitrogen (+95.2 kg ha^{-1}) and higher phosphorus uptake (13.4 per cent increase). As that of legume, cotton in the systems too resulted in higher soil available nitrogen (+117.1 kg ha^{-1}) which might be because of lesser uptake by cotton crop or higher addition of residues by cotton or both. The systems rice-rice-cotton andrice-cotton-cotton second flush possessing cotton as components crop found to leave more phosphorus into the soil because of mining/pumping of phosphorus from deeper soil zone with its deep root system. The systems involving pulses left higher potassium in the soil because of comparatively lesser uptake of potassium by these component crops.

KEY WORDS : Rice Cropping System, Cauvery Delta, Tamil Nadu.

In Intensive crop rotations, it is essential to determine the amount of nutrients removed by various crops, since it would indicate the extent to which the crop in the sequence enriches or exhausts the soil so that it will be helpful in formulating suitable manurial schedule. Under the circums tances. it is a long felt need to assess the change in nutrients status in Cauvery delta zone with the existing and proposed double rice based cropping systems under the blanket fertilisation practices.

MATERIALS AND METHODS

Field experiments were conducted in lowlands at Tamil Nadu Rice Research Institute, Aduthurai, Tamil Nadu for two years(1985-87) to study the change in soil nutrients' status due to the rice based cropping systems in Cauvery delta zone. The experiment was laid out in a randomised block design with the plot size of three cents with seven cropping systems replicated four times. Blanket recommendation of fertiliser was adopted for each component crop in the system. Soil samples were taken prior to start of the experiment and after harvest of each component crop and analysed for available nitrogen, phosphorus and potassium. Plant samples were estimated for chemical constituents such as nitrogen, phosphorus and potassium. The NPK balance in the cropping systems was computed. (Sandanandan and Mahapatra, 1973 a, 1973 b, 1974).