

possessed above average stability for this character. Co 23, IS3541, K6, KS7078, SPV544, TNS33 and CSH1 possessed above average stability for peduncle length (Table 3). The estimates of α and λ demonstrated that all the entries were unstable for number of rachis per panicle. The genotypic stability for grain yield showed that CS3541 and TNS 31 possessed average stability while CO 25 and TNS 33 had above average stability indicating their suitability to favourable environments.

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Madras Agric. J., 82(1): 24-26 January, 1995

<https://doi.org/10.29321/MAJ.10.A01113>

RESIDUAL EFFECTS OF INTERGRATED NUTRIENT MANAGEMENT IN RICE-RICE- PULSE CROPPING SEQUENCE

S. SELVI and P.P. RAMASWAMI

Department of Soil Science and Agricultural Chemistry,
Tamil Nadu Agricultural University, Coimbatore 641 003

ABSTRACT

A field experiment conducted with different N levels, ZnSO₄ sulphur, herbicide, organic manures, applied to the preceding rice crops revealed that the residual effect of NPK plus organic manure particularly FYM significantly increased the available N, P and K contents of soil. The highest grain and haulm yield of black gram was obtained in the 100 per cent NPK plus ZnSO₄ applied once in a cropping sequence. The N, P, K uptake was highest in the same treatment.

Rice - rice - pulse is the general cropping sequence under wetland conditions in Tamil Nadu. In this cropping sequence, the first two rice crops are being fertilised and the third pulse is grown as rice fallow pulse without any fertiliser application. Integrated nutrient management through chemical fertilisers and organic manures play a great role in maintaining the soil fertility as well as plant crop and residual crop yield. Information on the influence of continuous application of manures and fertilisers and ZnSO₄ to rice - rice and also the application of herbicides and their residual effects are not fully available for the alfisols of southern districts and hence the present investigation was undertaken.

MATERIALS AND METHODS

This experiment was conducted at the Agricultural College and Research Institute, Killikulum. This experiment has been in progress since 1989 with 16 treatments replicated twice in a randomized block design. Annual crop rotation of

rice - rice - pulse is being followed. The initial available nutrients status was low for N (175 kg/ha) medium for P₂O₅ and K₂O (19 kg/ha and 250 hg/ha respectively). The available NPK were estimated by following the standard procedure.

RESULTS AND DISCUSSION

Residual effect on soil available N content

The highest soil available N content in the past harvest stage of black gram was recorded in the NPK plus FYM treatment (Table 1). This might be due to continuous addition of 62.5 kg N through FYM every year and also by biological fixation of nitrogen in the FYM treatment. Similar results have also been reported by Mathan *et al.* (1978).

Residual effect on available P content of soil.

The highest available P content in the NPK plus herbicide treated plot might be due to stimulating effect of herbicide on the microorganisms which is responsible for

Table 1. Residual effect of organic and inorganic fertilisers on the soil available N, P and K status (in kg/ha) (0-15 cm depth).

Treatments	Nitrogen	Phosphorus	Potassium
50% NPK	121	44	162
100% NPK	116	45	178
150% NPK	144	52	242
100% NPK + Herbicide	118	67	174
100% NPK + Zn SO ₄ @ 25kg/ha once in a cropping sequence	106	24	166
100% NPK + ZnSO ₄ @ 25kg/ha each rice crop	125	13	135
100% NPK ('S' free source of fertiliser)	119	13	158
100% NPK + 'S' @ 20kg/ha for each rice crop in the form of CaSO ₄	134	42	202
100% NPK + FYM @ 12.5 t/ha	170	60	330
100% NPK + GLM @ 5t/ha	145	54	250
100% NP alone	134	49	105
100% NK alone	124	13	250
100% N alone	146	12	214
FYM alone	138	35	218
GLM alone	126	44	186
Control	102	7	102
CD at 5%	6	4	16

mineralization of organic phosphorus (Table 1). Application of FYM increased the soil available P in the post harvest stage of black gram. This result

could be justified on the ground that application of FYM helps to increase the availability of P after decomposition and hence the residual effect was

Table 2. Residual effect of organic and inorganic fertilisers on black gram yield (kg/ha) and N,P,K uptake (kg/ha).

Treatments	Yield (kg/ha)		Uptake (kg/ha)		
	Grain	Haulm	N	P	K
50% NPK	221	713	20.1	1.5	8.7
100% NPK	312	1117	33.5	2.9	14.8
150% NPK	381	1556	48.6	5.2	21.3
100% NPK + Herbicide	558	1888	56.3	7.1	28.6
100% NPK + Zn SO ₄ @ 25kg/ha once in a cropping sequence	638	2344	65.8	8.9	38.0
100% NPK + ZnSO ₄ @ 25kg/ha each rice crop	495	1703	40.7	6.6	22.5
100% NPK ('S' free source of fertiliser)	274	853	21.7	2.4	9.4
100% NPK + 'S' @ 20kg/ha for each rice crop in the form of CaSO ₄	507	1733	51.0	6.3	19.4
100% NPK + FYM @ 12.5 t/ha	477	1639	57.7	6.3	20.1
100% NPK + GLM @ 5t/ha	451	1628	45.7	5.8	23.6
100% NP alone	250	822	23.7	4.5	11.2
100% NK alone	234	742	21.4	2.5	12.8
100% N alone	158	749	20.2	2.2	9.8
FYM alone	333	1563	52.4	5.3	18.9
GLM alone	319	1233	36.0	3.9	16.8
Control	152	645	13.9	0.9	6.1
CD at 5%	38	291	6.0	0.8	3.6

observed. The organic matter undergoes decomposition and releases the ions readily available to the plants. Thus favourable effect from FYM on availability of P is always more consistent to the succeeding crop rather than plant crop. Similar findings have also been reported by Indulkar and Malewar (1990).

Residual effect on available K content of soil

The available K content was the highest in the NPK plus FYM treatment (Table 1). The K content has declined from the initial stages. This might be due to absorption of more of available K by the crops, and also to a certain extent to fixation in the soil as the time advanced due to drying. This is in accordance with the result of Mani and Ramanathan (1980).

Residual effect on yield and N, P, K uptake of black gram

Application of 100% NPK plus ZnSO₄ once in a cropping sequence has recorded the highest grain and haulm yield of black gram (Table 2) which might be due to increased availability of nutrients and in turn contributed to more responses by the crop because of zinc addition. Similar results have

also been reported by Indulkar and Malewar (1990).

The N, P, K uptake by black gram was the highest in the NPK plus ZnSO₄ applied once in a cropping sequence as in the case of black gram yield. Similar results of highest N, P, K uptake was reported by Sakal and Sinha (1983) and Rehman *et al.* (1988).

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Madras Agric. J., 82(1): 26-28 January, 1995

WEED MANAGEMENT IN OLITORIUS JUTE

N. ASOKARAJA and S. JEYARAMAN

Water Technology Centre, Tamil Nadu Agricultural University, Coimbatore 641 003

ABSTRACT

Experiments were conducted during 1987-88 in summer seasons at the Cotton Breeding Station, Tamil Nadu Agricultural University, Coimbatore; to evolve suitable weed management practice for olitorius jute cv. JRO 524. Herbicides *viz.*, fluchloralin, fluazipop-p butyl and pendimethalin were compared with conventional method of hand weeding twice at 21 and 35 days after sowing and unweeded check. The plots hand weeded twice recorded the lowest weed dry matter and higher plant height, basal stem diameter and green plant weight in both years. Among the herbicides, fluchloralin 1.0 kg/ha applied as pre-plant spray at three days before sowing combined with one hand weeding at 35 days after sowing and at three or seven days before sowing recorded comparable yield with hand weeding twice during 1987 and 1988 respectively. The herbicide pendimethalin was the least effective to jute in both years.

The growth of weeds with crops in the jute fields affects the crop adversely and causes heavy loss. If timely weeding is not done or if it is incomplete, fibre yield of jute may be reduced to half or even more and if it is neglected the crop as such may have to be abandoned (Saraswat and Mitra, 1977). The national average fibre yield is

1380 kg/ha while it is 4200 kg/ha at the research stations (Anonymous, 1976). The large variations in the fibre yield are mainly due to the input constraints of which competition due to weeds is one of the major constraints. The crop faces a very severe crop-weed competition in early growth phase, particularly upto 60 days after sowing