



in rice varieties with a relatively high K, P and Ca requirement increased reduction of Fe (III) oxides occurs at the root surface (Trollnier, 1973). This increased availability of Fe<sup>+2</sup> resulted in uncontrolled influx of Fe<sup>+2</sup> in sensitive varieties.

McHargue (1945) reported that if Mn is deficient there will be excess of active ferrous iron since Mn is associated with the oxidation of Fe<sup>2+</sup> iron to inactive iron. Hence the restricted uptake of iron associated with high uptake of other nutrients particularly K, Mn and maintenance of high nutrient ratios in plant enables them to tolerate the stress conditions in an ideal way.

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Madras Agric. J., 11-13 January, 1993

<https://doi.org/10.29321/MAJ.10.A01618>

## EFFECT OF INTERCROP ON THE INCIDENCE OF GROUNDNUT LEAFMINER

R.K.MURALI BASKARAN, J.CHANDRASEKARAN and S.THANGAVELU

### ABSTRACT

Influence of the intercropping system on the incidence of groundnut leaf miner. Significantly less number of leaf miner larvae per metre row, comparatively more percentage of parasitism by *Gonolozus* sp. and less percentage of leaflet damage (41.3%) in groundnut and cumbu intercropping system at 4:1 ratio. In addition, the groundnut cumbu intercropping system recorded 4.7 per cent increased net return when compared to the pure crop of groundnut.

(The groundnut leaf miner, *Aproaerema modicella* Deventer is one of the major pests causing considerable yield losses in groundnut even 40 to 70 per cent pod yield in Tamil Nadu. The attack of this pest is further aggravated under rainfed and prolonged drought condition.) The recent trend in the changing agriculture is the cultivation of more than one crop simultaneously to avoid crop losses and combat problem of pest and

disease susceptibility (Kavimani *et al.*, 1989). Associated crops provide more diversity of food source for predators and parasites (Risch, 1979).

### MATERIALS AND METHODS

In the present study, five intercrops were evaluated against the groundnut leafminer compared with pure groundnut crop as control. Four rows of groundnut variety Col

a spacing of 30 cm between rows and 15 cm between plants. The intercrops viz., Redgram (Co3), Blackgram (T9), Gingelly (TMV 3), cowpea (Co3) and cumbu (Co6) were tried in this trial. The plot size was 5.0 x 4.0 m and replicated five times. The trial received no plant protection measures. The leaf miner incidence was assessed on 35 and 55 DAS by recording number of leafminer larvae per metre row and per cent leaflet damage (number of affected leaflets to total number of leaflets in 5 randomly selected plants). The per cent parasitism by *Goniozus* sp. on larvae of leafminer was recorded by observing the presence of parasitic larvae. The dry pod yield was recorded. The economics of each system were also worked out.

## RESULTS AND DISCUSSION

The results (Table 1) revealed that the incidence of leaf miner was comparatively low in groundnut when cumbu was intercropped at 4:1 ratio with the base crop. The larval

population was 45.0 per metre row with 41.3 percent leaflet damage in groundnut + cumbu intercropping system while in the pure crop of groundnut, it was 82.9 larvae per metre row with 62.7 percent leaflet damage. The treatment which followed by groundnut + Cowpea and groundnut + gingelly intercropping systems, recording 68.9 and 69.1 larvae per metre row with 58.2 and 58.1 per cent leaflet damage respectively. Kennedy and Raveendran (1989) reported that groundnut + cumbu intercropping system registered low leaf hopper and trips population when groundnut was intercropped with Soyabean, Redgram, Greengram, Cowpea, Sunflower and Cholam. Evidently cumbu being a monocot might not have provided favourable physical and chemical factors for growth and reproduction of leafminer of groundnut. This cereal should have acted as a barrier for the dispersal of the leaf miner. Tahvanainen and Root (1972) suggested that the biological complexity

Table 1. Incidence of leafminer, parasite activity and economics under different intercropping system.

Treatment	No. of leaf miner larva/m.row			% leaflet damage			Goniozus Sp. parasitism (%)	Yield of base crop Kg/ha	Yield of inter crop Kg/ha	Net return Rs.	% over base crop
	35 DAS	55 DAS	Pooled	35 DAS	55 DAS	Pooled					
Groundnut Redgram + 4:1	64.2	108.0	86.1	47.2 (43.40)	74.8 (59.97)	61.6 (51.69)	6.0 (14.63)	822	150	2346	+ 1.6
Groundnut Cowpea + 4:1	58.2	79.6	68.9	43.6 (41.34)	71.9 (58.03)	58.2 (49.69)	2.4 (8.34)	758	41	2218	- 4.1
Groundnut Cumbu + 4:1	46.0	44.0	45.0	36.6 (37.22)	46.4 (42.80)	41.3 (40.01)	6.4 (15.21)	684	575	2423	+ 4.7
Groundnut Blackgram + 4:1	64.6	99.4	82.0	45.5 (43.59)	74.6 (59.74)	61.5 (51.66)	5.6 (14.20)	928	55	2281	- 1.2
Groundnut Gingelly + 4:1	64.2	74.0	69.1	50.0 (45.08)	65.8 (54.27)	58.1 (49.68)	4.8 (13.26)	914	20	2188	- 5.2
Groundnut alone + 4:1	69.2	96.6	82.9	50.2 (45.09)	74.1 (59.58)	62.7 (52.39)	4.8 (13.26)	1154	--	2308	--
SE (D)	4.1	4.3	3.3	1.6	2.1	1.4	1.2	16.3	--	--	--

would effect the factory stimuli and alter the insect behaviour in the crop. Here, the phytochemicals produced by cumbu would have altered the oviposition of gravid moths of *A. modicella* and led to minimum damage by the leaf miner in the intercropped system.

The mortality due to the bethylid parasite, *Goniozus* sp. was observed to be comparatively high (6.4%) in groundnut + cumbu combination, which was on par with other intercropping systems except groundnut + Cowpea combination (2.4%). The pure groundnut crop yielded 1154 kg/ha of pods. The yield in the groundnut + cumbu system was 684 kg/ha. Though the yield of the base crop in groundnut + Cumbu system was low, because of substantial increase in yield of the companion crop, cumbu, this system recorded the highest net return of Rs2423

comparative base crop (Rs. 2308). Thus, groundnut + Cumbu intercropping system recorded 4.7 per cent increased monetary benefit, followed by groundnut + Redgram system (1.6%) and others were not profitable.

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Madras Agric. J., 13-16 January, 1993

## A REVIEW OF THE EXISTING BLANKET RECOMMENDATION TO RICE IN CAUVERY BASIN OF TAMIL NADU

V. MURUGAPPAN<sup>1</sup>, R. NAGARANAJ<sup>2</sup>, K. NATARAJAN<sup>3</sup>, SP. PALANIAPPAN<sup>4</sup> and T.S. MANICKAM<sup>5</sup>

An attempt was made to find out whether or not the available rice response information indicates the possibility of increasing the productivity with a higher level of fertilizer application. The results clearly indicated the need for an upward revision of N dose from the present level of 100 kg to 150 kg N ha<sup>-1</sup> for realizing yields corresponding to maximum profit in rice in Cauvery basin of Tamil Nadu. In the absence of such clear cut indications with respect to P and K, the presently recommended levels of 20 kg P and 40 kg K ha<sup>-1</sup> seem to be sufficient until more detailed investigations are carried out relating rice response with application, fixation and availability of P and K.

To an Indian farmer agriculture is no more a way of life but a progressive and dynamic business. Hence, it becomes imperative that efforts are made to generate technologies aimed to increase crop production by exploiting the high level of managerial ability of our farmers.

Rice is the major food crop grown in Tamil Nadu in 27.5 lakh hectares with an annual production of 65 lakh tonnes of paddy. The average yield is well below 2.5 tonnes ha<sup>-1</sup>. In a review of the research work on nitrogen management for rice, Palaniappan and Balasubramanian (1983) have reported that the average rice yields in Cauvery basin of Tamil Nadu are 1426, 1018 and 1112 kg

1, 2, 3 and 5 Professors of Soil Science, TNAU, Coimbatore  
4 Director (SCMS), TNAU, Coimbatore