

STUDIES ON WEED MANAGEMENT IN GROUNDNUT CROPPING SYSTEM UNDER RAINFED CONDITION

P. KALAISELVAN, G.RAMADOSS, R. SETHUPATHI RAMALINGAM and M.R. SIVARAM

ABSTRACT

The experiment conducted at Regional Research Station during 1984 to 1986 under rainfed conditions on weed management in groundnut cropping systems revealed that weed populations was less under cropping systems and application of fluchloralin at 1.00 kg.a.i.ha⁻¹ as preplanting application with one hand weeding controlled the weeds and increased pod yields.

KEYWORDS: Groundnut, Cropping System, Weed Management, Rainfed.

Weeds compete actively at the germinating phase with the slowly germinating crops like groundnut. Kulkarni *et al.* (1963) recorded 52 and 18 per cent reduction in yield due to weed infestation in the bunch and spreading varieties of groundnut, respectively. The most common method of weed control practise is hoe-weeding at 20 days after sowing. Labour has become expensive and is scarce during the peak period of cultivation. The use of herbicides in groundnut crop has opened new dimensions in weed management. An experiment was laid out to evaluate the efficiency of different weed control methods individually and in combination with one hand-weeding to work out a system of weed control.

MATERIALS AND METHODS

The experiments were conducted in *Kharif* 1984-1986 in light loamy soils in a split plot design with three replications at the Regional Research Station, Virudhachalam under rainfed conditions. The organic carbon content of the soil was 0.17 per cent. The treatments comprised of pure crop of groundnut (M₁), groundnut + redgram (M₂) and groundnut + Cowpea (M₃) at 4:1 ratio in the main plot and weed control methods viz., pre-planting incorporation of fluchloralin @ 1.00 kg a.i. ha⁻¹ (S₁); fluchloralin @ 0.75 kg a.i. ha⁻¹ (S₂); S₁ + one hand weeding on 20th day (S₃); S₂ + one hand weeding on 20th day

(S₄); Farmer's method of weeding (S₅) and an unweeded control were included in the sub-plot. Groundnut cultivar Co 1 was sown by dibbling the seeds with a spacing of 30 x 10 cm under rainfed condition. The crop was sown on 22.7.1984, 2.7.1985 and 2.7.1986 during *Kharif* 1984, 1985 and 1986 respectively. Herbicide was applied as pre-planting incorporation on the same day of sowing when there was enough soil moisture and it was incorporated with hand hoe. The other recommended package of practices were followed in all the treatments. The rainfall during the experimental period of 1984, 1985 and 1986 were 559.8, 527.9 and 519.1 mm respectively.

Observations on weed population in each treatment were recorded from one m² area at 20 days after sowing. The data were transformed and statistically analysed. The weed control efficiency was worked out as per the method suggested by Rangiah *et al.* (1976).

RESULTS AND DISCUSSION

Weed Flora and Weed Population

The weed flora that occurred in the experimental field are *Dactyloctenium aegyptium* L., *Digitaria sanguinalis* L., *Echinochola Colonum* L., *Cyperus Rotundus* L., *Cynodon dactylon* L., *Chloris barbata* L., *Amaranthus Viridis* L.,

Boerhaavia diffusa L., *Digeria arvensis* L., *Gynandropsis pentaphylla* L., *Phyllanthus niruri* L., *Euphorbia hirta* L., and *Tridax procumbens* L. The most predominant weed species among the weed flora was *Dactyloctenium aegyptium* L. which accounted for 38.41 per cent of the weed infestation. *Gynandropsis pentaphylla* ranked second with an infestation of 17.68 per cent. The nutsedge *Cyperus rotundus* L. was observed in lesser number with 7.92 per cent infestation. Other weeds accounted for 35.99 per cent.

There was significant difference in weed population due to weed control methods in all the three seasons (Table 1). The pure crop of groundnut recorded the highest weed population (34.15 m⁻²) as compared to the intercropping systems like groundnut + redgram (23.48 m⁻²) and groundnut + cowpea (32.20 m⁻²) during 1984. Thus the weed control efficiency was high in intercropping system viz., groundnut+redgram (31.24%) followed by groundnut+cowpea (5.71%). Similar trend was observed during *Kharif* 1985 and 1986 (Table 1).

Among the different weed control methods, pre-planting incorporation of fluchloralin @ 1.00 kg a.i.ha⁻¹ recorded the lowest weed population (4.53 m⁻²) on 20th day after sowing when it was supplemented with one hand weeding during 1984. But it was found to be on a par with other chemical weed control methods. The control plot recorded the highest weed popula-

tion of 87.10 m⁻². The results of 1985 and 1986 exhibited similar trend (Table 1). Significant decrease in weed population in fluchloralin treated plots was also reported by Tosh and Anirudha Misra (1977).

Pod Yield

The results revealed that there was significant difference in groundnut pod yield due to different cropping systems. The pure crop of groundnut recorded significantly higher pod yield (1303 kg.ha⁻¹) than that registered in groundnut+redgram (1053 kg.ha⁻¹) and groundnut + cowpea (1067 kg.ha⁻¹) intercropping systems during 1984. Similar trend in pod yield was observed in 1985 and 1986 (Table 1)

The results of *Kharif* 1984 showed that the different weed control methods, pre-planting incorporation of fluchloralin 1.00 kg a.i.ha⁻¹ + one hand weeding recorded significantly higher pod yield (1369 kg.ha⁻¹) which was 21.40 per cent increased pod yield over farmer's method of weeding (Table 1). But in 1985, the application of fluchloralin 1.00 kg a.i. ha⁻¹ alone recorded significantly higher pod yield (1644 kg.ha⁻¹) and it was on a par with application of fluchloralin 1.00 kg a.i ha⁻¹+one hand weeding and 0.75 kg a.i. ha⁻¹ + one hand weeding. Increased pod yield due to herbicide application was reported by Soundara Rajan *et al.*, (1976) and Tosh and Anirudha Misra, (1977). The pod yield recorded in the trial laidout during 1986 showed that there was no difference among the different weed control methods (Table 1).

REFERENCES

- KULKARNI, L.G.P. VERMA, S.S. AND ACHUTHARAO L. 1963. Studies on weeding and interculturalures in relation to weed control in the yield of groundnut. Indian Oilseed J. 7: 126-129.
- RANGIAH, P.K. PAULCHAMY, A AND RAJAGOPAL, K. 1976. Pre-emergence herbicides for weed control in irrigated groundnut. Madras agric J. 63: 458-460.
- SOUNDARARAJAN, M.S., MURTHY, B.T.S. AND SANKARA REDDI, G.H., 1976. Chemical weed control in rainfed groundnut. Symp. On Pl. Prot. Res. and Dev. held at the TNAU. Feb. 1976.
- TOSH, G.G. AND ANIRUDHA MISRA. 1977. Effect of some pre-sowing herbicides on weed control and yield of groundnut. Pesticides, 6: 51-52.

Table 1. Effect of weed control treatments on total weed population and pod yield

Treatments	Weed Population m ⁻²					Pod Yield kg.ha ⁻¹		
	1984	1985	1986	1984	1985	1984	1985	1986
Cropping system								
Pure Groundnut	34.15 (11.44)	36.20 (5.94)	175.42 (10.19)	1303	1679	2140		
Groundnut + Redgram	23.48 (7.91)	35.68 (5.86)	175.81 (12.23)	1054	1346	1822		
Groundnut + Cowpea	32.20 (4.74)	33.09 (5.52)	172.92 (10.87)	1067	1500	1841		
SED	0.17	0.19	0.49	2	9	17		
CD (5%)	0.68	0.64	1.66	65	27	44		
Weed control methods:								
Fluchloralin P.P. 1.0 kg/ha	6.33 (2.58)	18.53 9.16	12.56 (3.60)	1251.00	1644.00	2265		
Fluchloralin P.P. 0.75 kg/ha	6.20 (2.26)	24.27 (44.89)	13.49 (4.17)	1140	1628.51	2194		
Fluchloralin P.P. 1.0 kg/ha + one Hand weeding	4.53 (1.76)	28.13 (5.32)	11.77 (4.74)	1369	1570	226		
Fluchloralin P.P. 0.75 kg/ha + one Hand weeding	4.76 (1.76)	27.37 (5.26)	13.13 (4.49)	1353	1628	2187		
Farmers method	70.73 (17.11)	51.46 (7.19)	488.15 (21.78)	1128	1559	2192		
unweeded control	87.10 22.76	61.1333 (7.84)	509.17 (27.83)	606	988	1048		
SED	0.12	0.19	0.57	3	20	215		
CD (5%)	0.35	0.54	1.93	7	42	439		

P.P = pre planting $\sqrt{X + 0.5}$ Transformed values.