

Integrated Weed Management in Groundnut (*Arachis hypogaea* L.) under Varying Plant Densities

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Of the India's total production of edible oils, 67 % comes from groundnut. The demand for edible oil in the country is rising at about 6% per year. Therefore, concerted efforts are now being made for increasing and stabilizing oilseed production. Groundnut, being a high-energy crop, receives low level of management practices, more important but often not recognized factor responsible for poor yield is inadequate plant population and weed control especially during the early period of crop

under irrigated condition. In this period, less crop canopy coverage favours heavy competition with weeds causing considerable reduction in yield of the crop (Singh *et al.*, 1985).

Field experiment was conducted for two seasons from July-November 1998 and January-April 1999 in sandy clay loam soil. The initial soil available N, P₂O₅ and K₂O were 150, 18 and 168 kg ha⁻¹, respectively, with EC 0.15 dSm⁻¹ and pH 6.10. The main plot treatments of various plant densities

Table 1. Effect of plant densities and weed management practices on weed population, weed biomass, pod yield and kernel yield of irrigated groundnut

Treatment	Weed population at 60 DAS (No. m ⁻²)		Weed biomass (kg ha ⁻¹)		Pod yield (t ha ⁻¹)		Kernel yield (t ha ⁻¹)	
	1998	1999	1998	1999	1998	1999	1998	1999
Plant density (lakh ha⁻¹)								
3.3	76	79	398.6	387.6	2.2	2.1	1.8	1.5
4.0	74	77	337.0	333.9	1.9	1.9	1.5	1.2
5.0	72	75	273.0	279.1	1.7	1.6	1.2	0.9
LSD (P=0.05)	01	01	37.7	38.1	0.1	0.06	0.11	0.1
Weed management practices								
Unweeded control	88	92	470.3	464.2	1.4	1.4	1.3	0.9
Hand weeding at 20 & 40 DAS	75	79	328.2	323.6	2.0	1.9	1.5	1.2
Pre-emergence oxadiazon at 1.0 kg ha ⁻¹	84	88	402.5	397.5	1.6	1.5	1.3	1.0
Pre-emergence oxadiazon at 0.75 kg ha ⁻¹ +one weeding at 40 DAS	87	70	276.9	264.3	2.2	2.1	1.6	1.4
Pre-emergence metolachlor at 1.0 kg ha ⁻¹	80	84	353.6	353.4	1.8	1.7	1.5	1.1
Pre-emergence metolachlor at 0.75 kg ha ⁻¹ +one weeding at 40 DAS	68	71	279.8	274.7	2.2	2.1	1.6	1.3
Pre-plant incorporation of fluchloralin at 1.5 kg ha ⁻¹	81	85	356.4	359.4	1.8	1.7	1.4	1.1
Pre-plant incorporation of fluchloralin at 1.0 kg ha ⁻¹ +one weeding at 40 DAS	46	48	221.7	231.2	2.5	2.3	1.7	1.5
LSD (P=0.05)	01	02	37.7	22.3	0.1	0.08	0.05	0.07

3.3 lakh plants ha⁻¹ (30 x 30 cm), 4.0 lakh plants ha⁻¹ (25 x 10 cm) and 5.0 lakh plants ha⁻¹ (20 x 10 cm) and sub-plot treatments of various weed management practices (unweeded control, hand weeding at 20 and 40 DAS, pre-emergence oxadiazon at 1.0 kg ha⁻¹, pre-emergence oxadiazon at 0.75 kg ha⁻¹ + one weeding at 40 DAS, pre-emergence metolachor at 1.0 kg ha⁻¹, pre-emergence metolachor at 0.75 kg ha⁻¹ + one weeding at 40 DAS, pre-plant incorporation of fluchloralin at 1.5 kg ha⁻¹ and pre-plant incorporation of fluchloralin at 1.0 kg ha⁻¹ + one weeding at 40 DAS) were laid out in split plot design and replicated thrice. Weed species noticed were : *Digitaria sanguinalis*, *Echinochloa colona*, *Cynodon dactylon*, *Cyperus rotundus*, *Cleome viscosa* and *Croton sparsiflorus*.

The plant density and weed control methods significantly influenced the weed population and weed biomass (Table 1). Five lakh plants ha⁻¹ recorded significantly less weed population. Fluchloralin at 1.0 kg ha⁻¹ fb one hand weeding at 40 DAS reduced the weed population to 46.1 m⁻² during 1998 and 48.40 m⁻² during 1999. Higher population of the crop per unit area resulted in less weed count compared to lower population levels.

The effect of treatments on weed biomass reflected a similar trend as that of weed population. Better control of weeds at the early stages by fluchloralin at 1.0 kg ha⁻¹ and removal of weeds by hand weeding at 40 DAS resulted in less weed count.

Higher pod yield (2.18 t ha⁻¹) and kernel yield (1.71 t ha⁻¹) were recorded by maintaining 3.3 lakh plants ha⁻¹. Fluchloralin at 1.0 kg ha⁻¹ followed by one hand weeding at 40 DAS recorded significantly higher pod yield (2.44 t ha⁻¹) and kernel yield (1.13 t ha⁻¹). Effective control of weeds right from germination of crop might have allowed the crop to utilize the resources effectively and this could be the reason for higher yield with fluchloralin at 1.0 kg ha⁻¹ followed by one hand weeding at 40 DAS. This corroborates the findings of Patel *et al.* (1997).

REFERENCES

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