

## Integrated weed management in *Rabi* groundnut

S.N. BHALERAO\*, A.R. SHAIKH, S.A. LANDGE<sup>1</sup> AND B.D. ROMADEV<sup>2</sup>

Department of Agronomy, Marathwada Agricultural University, PARBHANI (M.S.) INDIA

(Email : bhalerao\_santosh@rediffmail.com)

### ABSTRACT

The present investigation was undertaken during *Rabi* season of the year 2005-2006 at Water Management Centre, Marathwada Agricultural University, Parbhani. The result revealed that the treatments *viz.*, two hand weeding and hoeing at 15 to 30 DAS, and herbicides in combination with hand weeding were second in order. While only intercultural operations *viz.*, two hoeing at 15 to 30 DAS were third in rank and herbicides alone were next in order of merit. Weed intensity and dry matter of weeds was maximum (53.00/sq. m. and 77.70 g/sq. m., respectively) in weedy check (unweeded control). Weed control efficiency the basis of weed dry matter was maximum in weed free (96.43%) at harvest, which was followed by two hand weeding and hoeing at 15 DAS (95.49 %) and pre-emergence (PE) pendamethalin followed by hand weeding (95.08 %). Unchecked weeds recovered 63 % pod yield loss.

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**Key words :** Weed, Groundnut, *Arachis hypogaea*, IWM

### INTRODUCTION

Groundnut (*Arachis hypogaea*) is an important oilseed crop in India. The biological value of groundnut protein is among the highest of the vegetable protein. Groundnut kernels are rich in vitamins *viz.*, A<sub>1</sub>, B<sub>1</sub>, B<sub>2</sub>, and vitamins. It is a good rotation crop. It builds up the soil fertility and also an effective cover crop for lands exposed to soil erosion. In India, groundnut is grown on 5.7 million hectare with a production of 4.7 million metric tonnes (Anonymous, 2004). In spite of this crop so important, one of the most important reason of low yield is the competition of crop plant with the unwanted associated weeds flora during early growth stages due to late emergence and establishment. Considering the above fact in view, the present investigation were under taken.

### MATERIALS AND METHODS

A field experiment was carried out in plot No. A - 8 of Water Management Centre, Marathwada Agricultural University, Parbhani during *Rabi* season of the year 2005-2006 in Randomized Block Design (RBD) with three replication and nine treatments. Details of treatments and applications are given in (Table 1).

#### Weed count :

A quadrant (1 x 1 m<sup>2</sup>) was randomly fixed in two

places in each net plot and the monocot and dicot of weed count in the area of each quadrant was recorded. The total weeds per square meter was recorded before hand weeding and hoeing after harvest.

#### Dry weight of weeds :

Dry weight of weeds were taken separately of dicot and monocot weeds at 15, 30, 60 days after sowing and at the harvest.

**Weed control efficiency (WCE):** (Gautam *et al.*, 1975)

$$WCE (\%) = \frac{DMC - DMT}{DMC} \times 100$$

where,

DMC=Dry matter weight of weeds in control plot

DMT=Dry matter weight of weeds in treatment plot

**Weed index :** (Gill and Vijaykumar, 1969)

$$Weed\ index = \frac{X-Y}{Z} \times 100$$

where

X = Denotes the yield from yield free plot.

(Complete removal of weeds)

Y = Yield from treatment for with weed index is to

\* Author for correspondence.

<sup>1</sup>Department of Entomology, Mahatma Phule Krishi Vidyapeeth, Rahuri, AHMEDNAGAR (M.S.) INDIA

<sup>2</sup>Agricultural Technical School, Puntamba, AHMEDNAGAR (M.S.) INDIA

Table 1 : Treatment details			
Sr. No.	Symbol	Treatments	Abbreviation
1	T <sub>1</sub>	Imazethapyr (Pursuit 10%SL) 100g a.i./ha at 15 DAS (Days after sowing)	(POE) Imazethapyr @ 100g a.i./ha
2	T <sub>2</sub>	Imazethapyr (Pursuit 10%SL) 150g a.i./ha at 15 DAS.	(POE) Imazethapyr @ 150g a.i./ha
3	T <sub>3</sub>	Pre-plant incorporation fluchloralin @ 1000 g a.i./ha + hand weeding at 30 DAS	(PPI) Fluchloralin + HW
4	T <sub>4</sub>	Pre-emergence Pendimethalin @ 1000g a.i. + hand weeding at 30 DAS	(PE) Pendimethalin + HW
5	T <sub>5</sub>	Hand weeding at 15 and 30 DAS	2HW
6	T <sub>6</sub>	Two hand weeding and hoeing at 15 and 30 DAS	2HW + 2H
7	T <sub>7</sub>	Hoeing at 15 and 30 DAS	2H
8	T <sub>8</sub>	Weed free (4 weedings at 15, 30, 45 and 60 DAS)	Weed free
9	T <sub>9</sub>	Weedy check (unweeded control)	Weedy check

be work out.

Thus the generated data were subjected to statistical Analysis.

## RESULTS AND DISCUSSION

The generated data (Table 2, 3, 4) revealed that weed population per square meter was observed in the weed

Table 2 : Mean weed count (m <sup>-2</sup> ) at different stages of crop growth				
Treatments	Weed count (m <sup>-2</sup> )			
	15 DAS	30 DAS	60 DAS	At harvest
T <sub>1</sub> -Imazethapyr (POE) @ 100g a.i./ha at 15 DAS	18.50	14.08	13.50	16.46
T <sub>2</sub> -Imazethapyr(POE) @ 150g a.i./ha at 15 DAS	16.40	10.20	14.40	14.70
T <sub>3</sub> -Fluchloralin (PPI) @ 1000g a.i./ha+1HW at 30 DAS	2.45	3.00	4.76	5.40
T <sub>4</sub> -Pendimethalin (PE) @ 1000 g a.i./ha + 1 HW at 30 DAS	2.10	2.50	4.10	4.80
T <sub>5</sub> -Hand weeding (HW) at 15 and 30 DAS	18.20	7.33	11.30	14.80
T <sub>6</sub> -2 HW and hoeing at 15 and	20.33	1.23	2.00	3.46
T <sub>7</sub> -Hoeing at 15 and 30 DAS	20.10	10.50	13.40	14.51
T <sub>8</sub> -Weed free (4 weedings at 15, 30, 45 and 60 DAS)	--	--	--	2.24
T <sub>9</sub> -Weedy check (unweeded control)	22.21	39.21	49.66	53.00
S.E. (m) ±	1.08	1.45	0.88	0.62
C.D. (P=0.05)	3.23	4.34	2.66	1.98
G. mean	13.26	9.78	12.45	14.30

Table 3 : Dry matter of weeds g/m <sup>2</sup> at various stages of crop growth as influenced by different weed control treatments				
Treatments	Weed dry matter (g m <sup>-2</sup> )			
	15 DAS	30 DAS	60 DAS	At harvest
T <sub>1</sub> -Imazethapyr (POE) @ 100g a.i./ha at 15 DAS.	7.75	17.90	22.06	26.47
T <sub>2</sub> -Imazethapyr(POE) @ 150g a.i./ha at 15 DAS	7.40	17.39	21.80	25.20
T <sub>3</sub> -Fluchloralin (PPI) @ 1000g a.i./ha+1HW at 30 DAS	2.75	4.50	3.45	3.95
T <sub>4</sub> -Pendimethalin (PE) @ 1000 g a.i./ha + 1 HW at 30 DAS	2.66	4.09	3.34	3.82
T <sub>5</sub> -Hand weeding (HW) at 15 and 30 DAS	6.80	14.81	17.10	19.24
T <sub>6</sub> -2 HW and hoeing at 15 and	4.90	2.85	3.35	3.50
T <sub>7</sub> -Hoeing at 15 and 30 DAS	7.09	16.15	20.23	23.05
T <sub>8</sub> -Weed free (4 weedings at 15, 30, 45 and 60 DAS)	--	-	-	2.77
T <sub>9</sub> -Weedy check (unweeded control)	20.25	50.20	66.31	77.70
S.E. (m) ±	1.00	0.86	1.07	2.29
C.D. (P=0.05)	3.02	2.58	3.21	6.86
G. mean	6.61	14.21	17.50	20.83

**Table 4 : Weed control efficiency and weed index at various stages of crop growth as influenced by different weed control treatments**

Treatments	Weed control efficiency (%)				Weed index (%)
	15 DAS	30 DAS	60 DAS	At harvest	
T <sub>1</sub> -Imazethapyr (POE) @100g a.i./ha at 15 DAS	61.72	64.34	65.73	65.95	52.41
T <sub>2</sub> -Imazethapyr(POE) @ 150g a.i./ha at 15 DAS	63.45	65.35	67.12	67.56	49.19
T <sub>3</sub> -Fluchloralin (PPI) @ 1000g a.i./ha+1HW at 30 DAS	86.41	91.05	94.79	94.91	10.56
T <sub>4</sub> -Pendimethalin (PE) @ 1000 g a.i./ha + 1 HW at 30 DAS	87.00	91.85	95.00	95.08	7.91
T <sub>5</sub> -Hand weeding (HW) at 15 and 30 DAS	66.41	70.49	74.39	75.23	23.05
T <sub>6</sub> -2 HW and hoeing at 15 and	75.80	94.34	94.94	95.49	4.82
T <sub>7</sub> -Hoeing at 15 and 30 DAS	65.33	67.82	69.49	70.33	39.49
T <sub>8</sub> -Weed free (4 weeding at 15, 30, 45 and 60 DAS)	-	-	-	96.43	-
T <sub>9</sub> -Weedy check (unweeded control)	Control	Control	Control	Control	63.28
G. mean	72.30	77.89	80.20	82.62	31.33

free least (2.24/m<sup>2</sup>) at harvest followed by two hand weeding and hoeing at 15 and 30 DAS, (PE) pendimethalin followed by hand weeding, (PPI) Fluchloralin followed by hand weeding as compared to weed check (53.00 m<sup>2</sup>). Murthy *et al.* (1994) observed minimum weed population in cultural treatment and similar trend was observed in respect of dry weight of weed in various treatment. Devakumar and Gajendra Giri (1999) reported that weed dry weight decreased with the increasing weeding while groundnut pod yield was increased. The weed control efficiency at harvest on the basis of dry weed weight, weed free condition recorded highest WCE (94.43 %) than other treatments. The most equal WCE was noted in IWM *i.e.* two hand weeding and hoeing at 15 and 30 DAS (95.49 %) and next best was (PE) Pendimethalin followed by hand weeding (95.08 %). This result are in confirmative with those obtained by Hire math *et al.* (1997) and Ghosh (2000).

In case of additional return over control was maximum in the weed free Rs. 17,408/- ha<sup>-1</sup> followed by two hand weeding and hoeing at 15 and 30 DAS (Rs.16,082/-ha<sup>-1</sup>). The integrated methods *i.e.* (PE) pendimethalin followed by hand weeding at PPI fluchloralin followed by hand weeding were second in order of merit, respectively.

The weed Index was lowest (4.82 %) in two hand weeding hoeing at 15 and 30 DAS and it was maximum (63.28 %) in weedy check treatment. The Weed index in (PE) pendamithalin followed by hand weeding and fluchloralin followed by hand weeding were 7.91 and

10.56 %, respectively.

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