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## Weed Management Practices on Nutrient Uptake, Growth Parameters and Yield in Kharif Season Brinjal

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### ABSTRACT

An experiment was conducted on weed management practices on weed control efficiency, growth parameters and yield in kharif season brinjal at Vegetable Research Station, Agriculture Research Institute, Rajendranagar, Hyderabad, during *kharif*. The experiment was laid out in randomized block design with thirteen treatment combinations and replicated thrice. Among the treatments, significantly the highest nitrogen uptake ( $180.45 \text{ kg ha}^{-1}$ ), phosphorus uptake ( $142.22 \text{ kg ha}^{-1}$ ), potassium uptake ( $95.85 \text{ kg ha}^{-1}$ ) was observed with hand weeding three times at 20, 40 and 60 days after transplanting. With respect to growth parameters, treatment  $T_6$  recorded the highest plant height at 20 Days after transplanting (DAT) ( $17.38 \text{ cm}$ ) and Treatment  $T_{12}$  (hand weeding three times at 20, 40 and 60 DAT) had highest plant height ( $31.85 \text{ cm.}$ ) at 40 Days after transplanting. The highest plant height at 60days after transplanting was recorded in pendimethalin C.S as pre-emergence @  $0.70 \text{ kg a.i ha}^{-1}$  + one hand weeding at 45 DAT ( $T_1$ ) ( $56.52 \text{ cm.}$ ) whereas at 80 days after transplanting, the highest plant height was found with hand weeding three times at 20, 40 and 60 DAT ( $T_{12}$ ) ( $74.69 \text{ cm}$ ). Highest number of primary branches and plant spread were recorded in hand weeding three times at 20, 40 and 60 DAT ( $T_{12}$ ) ( $6.36$ ), ( $0.34 \text{ m}^2$ ). With respect to plant population, there was no significant difference between the treatments. The highest fruit yield ( $31.10 \text{ t ha}^{-1}$ ) was noticed with hand weeding three times at 20, 40 and 60 days after transplanting.

#### Keywords

Brinjal, Weed management, Growth parameters, Nutrient uptake, Yield

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### Introduction

Brinjal is native to India. It belongs to the family Solanaceae and it is also called as eggplant or aubergine. In India it is grown in an area of 589.5 thousand hectares, producing 10,163.1 thousand tonnes with a productivity of  $17,240 \text{ kg ha}^{-1}$ . In Andhra Pradesh it is grown in an area of 24.30 thousand hectares, producing 485.50 thousand tonnes with a productivity of  $19,959 \text{ kg ha}^{-1}$  (CMIE-2010).

Brinjal fruits are fairly good source of calcium, phosphorus, iron and vitamins particularly B group. Leaves contain more vitamin C ( $38.00\text{-}104.70 \text{ mg}/100 \text{ g}$ ) than that of fruits. It is supposed to contain certain medicinal properties and white brinjal is said to be good for diabetic patients (Choudhury, 1992). Brinjal is highly susceptible to weeds in the initial growth stage and weeds are the major hazard in successful cultivation of brinjal. Leela (1982) reported 45 per cent

annual loss in brinjal yield due to weed menace. Hand weeding, though effective is laborious, cumbersome and under many situations it becomes uneconomical. Herbicides have become an important tool for weed control, but are not effective in controlling all the weeds present in the crop. Indeed very little work was done on weed management in brinjal. Hence the present investigation was undertaken to study the effect of weed management practices on weed control efficiency, growth parameters and yield in kharif season brinjal.

### Materials and Methods

The field experiment was conducted at Vegetable Research Station, Agriculture Research Institute, Rajendranagar, Hyderabad, during *kharif*. The experimental site comes under sub-tropical zone and is situated at a latitude of 17° 19' N and longitude of 79° 23' E. The altitude of the place is 546.2 m above mean sea level. The mean annual precipitation on the basis of last ten years is 852 mm which received almost from South-West Monsoon during June to October. The mean annual minimum and maximum temperatures are 20.2°C and 32.6°C respectively. The humidity ranged from 44.5 per cent in summer and 79.4 per cent in rainy season. The experimental site thus has hot dry summer and moderate cold winter.

Thirty days old seedlings were transplanted in the main field at a spacing of 60 cm × 50 cm. Different herbicides with thirteen treatment combinations *viz.*, T<sub>1</sub>- Pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha<sup>-1</sup> + one hand weeding at 45 DAT, T<sub>2</sub>- Oxadiargyl as pre-emergence @ 90 g a.i ha<sup>-1</sup> + one hand weeding at 45 DAT, T<sub>3</sub>- Oxyfluorfen as pre-emergence @ 0.15 kg a.i ha<sup>-1</sup> + one hand weeding at 45 DAT, T<sub>4</sub>-Pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha<sup>-1</sup> followed by quizalofop ethyl @ 50 g a.i ha<sup>-1</sup> at 15 to 20 DAT, T<sub>5</sub>-

Oxadiargyl as pre-emergence @ 90 g a.i ha<sup>-1</sup> followed by quizalofop ethyl @ 50 g a.i ha<sup>-1</sup> at 15 to 20 DAT, T<sub>6</sub>-Oxyfluorfen as pre-emergence @ 0.15 kg a.i ha<sup>-1</sup> followed by quizalofop ethyl @ 50 g a.i ha<sup>-1</sup> at 15 to 20 DAT, T<sub>7</sub>- Pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha<sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha<sup>-1</sup> at 15 to 20 DAT, T<sub>8</sub>-Oxadiargyl as pre-emergence @ 90 g a.i ha<sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha<sup>-1</sup> at 15 to 20 DAT, T<sub>9</sub>- Oxyfluorfen as pre emergence @ 0.15 kg a.i ha<sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha<sup>-1</sup> at 15 to 20 DAT, T<sub>10</sub>- Glyphosate @ 1.5 kg a.i ha<sup>-1</sup> directed spray at 25 and 50 DAT, T<sub>11</sub>- Inter cultivation at 25 and 50 DAT, T<sub>12</sub>-Hand weeding three times at 20, 40 and 60 DAT and T<sub>13</sub>- Control were tried and replicated thrice.

The required quantity of herbicides for the experimentation was calculated by using the following formula.

$$\text{Commercial herbicide} = \frac{\text{RA}}{\text{C}} \times 100$$

Here,

R = Recommended dose of herbicide per hectare

A = Area (hectares)

C = Concentration of herbicide

Thus calculated quantity of herbicide was sprayed in each treatmental plot using knapsack sprayer with flat pan nozzle a with spray volume of 600 litres per hectare. The quantity of herbicide per plot (4.2 m x 4 m) was calculated by using above formula and dissolved in water and spread over an area of 16.8 m<sup>2</sup> according to different treatments.

For estimation of nitrogen, phosphorus and potassium content in brinjal, a sample of 0.1 g each was taken from previously ground

powder for estimation of nitrogen, 0.5 g for estimation of phosphorus and potassium was taken for chemical analysis. Nitrogen was estimated by Kjeldahl's method (Jackson, 1967) and expressed in percentage on dry weight basis.

Phosphorus was estimated by Vanedomolybdate method in triacid mixture as detailed by Jackson (1967). The intensity of colour developed was measured in a spectrophotometer, using blue filter. The amount of Phosphorus was calculated by referring to standard curve and expressed in percentage on dry weight basis.

Potassium content was estimated from triacid digest method using flame photometer as described by Jackson (1967).

Twenty days after transplanting, the surviving plant population in each treatment plot was counted and presented. The plant population at harvest was also counted and recorded as plants per ha. Plant height was measured in cm from ground level to the tip of the top most leaf at 20, 40, 60 and 80 DAT for all the observational plants and averaged per plant. Number of primary branches borne on the main axis of tagged plants was counted at final harvest stage and was taken as number of primary branches. The plant spread was recorded as the product of the N-S and E-W spread of plant canopy. The marketable yield per hectare of brinjal fruits was computed and recorded accordingly in tonnes per hectare. Fisher's method of analysis of variance was applied for the analysis and interpretation of data as given by Panse and Sukhatme (1967).

## Results and Discussion

Among the treatments, significantly the highest nitrogen ( $180.45 \text{ kg ha}^{-1}$ ), phosphorus ( $142.22 \text{ kg ha}^{-1}$ ) and potassium ( $95.85 \text{ kg ha}^{-1}$ ) uptake was observed in hand weeding three

times at 20, 40 and 60 DAT ( $T_{12}$ ) and the lowest nitrogen ( $81.49 \text{ kg ha}^{-1}$ ), phosphorus ( $73.51 \text{ kg ha}^{-1}$ ) and potassium ( $35.70 \text{ kg ha}^{-1}$ ) uptake was recorded in the treatment glyphosate @  $1.5 \text{ kg a.i ha}^{-1}$  directed spray at 25 and 50 DAT ( $T_{10}$ ) ( $78.66 \text{ kg ha}^{-1}$ ) which was on par with control ( $T_{13}$ ).

Among the different integrated management practices, hand weeding three times at 20, 40 and 60 DAT ( $T_{12}$ ) followed by intercultivation ( $T_{11}$ ) and pendimethalin C.S as pre-emergence @  $0.70 \text{ kg a.i ha}^{-1}$  + one hand weeding at 45 DAT ( $T_1$ ) recorded significantly more nutrient uptake (N, P and K) (Table 1) and it was on a par with application of oxadiargyl as pre-emergence @  $90 \text{ g a.i ha}^{-1}$  + one hand weeding at 45 DAT ( $T_2$ ) and oxyfluorfen pre-emergence @  $0.15 \text{ kg a.i ha}^{-1}$  + one hand weeding at 45 DAT ( $T_3$ ) which might be due to the better weed control efficiency, poor uptake of nutrients by weeds during grand growth period coupled with favourable conditions for growth and development of brinjal. Herbicides along with one hand weeding at 45 DAT reduced the nutrient loss from the soil by weeds when compared to herbicide alone. Similar results were recorded by Surinder Singh *et al.*, (2005) Rameshwar *et al.*, (2001) and Karle *et al.*, (2010).

Among all the treatments, significantly maximum plant height was recorded in oxyfluorfen as pre-emergence @  $0.15 \text{ kg a.i ha}^{-1}$  followed by quizalofop-ethyl @  $50 \text{ g a.i ha}^{-1}$  at 15 to 20 DAT ( $T_6$ ) (17.38 cm), whereas the minimum plant height was recorded in control ( $T_{13}$ ) (14.97 cm).

The highest plant height was recorded in hand weeding three times at 20, 40 and 60 DAT ( $T_{12}$ ) (31.85 cm.), whereas the lowest plant height was recorded in glyphosate @  $1.5 \text{ kg a.i ha}^{-1}$  directed spray at 25 and 50 DAT ( $T_{10}$ ) (22.55 cm.) followed by control ( $T_{13}$ ) (24.32 cm) at 40 days after transplanting (DAT).

**Table.1** Nutrient uptake ( $\text{g plant}^{-1}$ ) as influenced by different weed management Practices in brinjal

Treatments	N ( $\text{g plant}^{-1}$ )	P ( $\text{g plant}^{-1}$ )	K ( $\text{g plant}^{-1}$ )
T <sub>1</sub> . Pendimethalin C.S as pre- emergence @ 0.70 kg a.i ha <sup>-1</sup> + one hand weeding at 45 DAT	152.59	126.30	72.62
T <sub>2</sub> . Oxadiargyl as pre-emergence @ 90 g a.i ha <sup>-1</sup> + one hand weeding at 45 DAT	148.68	115.37	66.24
T <sub>3</sub> . Oxyflourfen pre-emergence @ 0.15 kg a.i ha <sup>-1</sup> + one hand weeding at 45 DAT	136.06	108.77	64.40
T <sub>4</sub> . Pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha <sup>-1</sup> followed by quizalofop- ethyl @ 50 g a.i ha <sup>-1</sup> at 15 to 20 DAT	125.92	98.28	60.00
T <sub>5</sub> . Oxadiargyl pre-emergence @ 90 g a.i ha <sup>-1</sup> followed by quizalofop-ethyl @ 50 g a.i ha <sup>-1</sup> at 15 to 20 DAT	119.15	93.59	58.23
T <sub>6</sub> . Oxyfluorfen pre-emergence @ 0.15 kg a.i ha <sup>-1</sup> followed by quizalofop-ethyl @ 50 g a.i ha <sup>-1</sup> at 15 to 20 DAT	110.54	88.69	55.22
T <sub>7</sub> . Pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha <sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha <sup>-1</sup> at 15 to 20 DAT	115.47	91.58	56.31
T <sub>8</sub> . Oxadiargyl pre-emergence @ 90 g a.i ha <sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha <sup>-1</sup> at 15 to 20 DAT	100.33	82.05	45.86
T <sub>9</sub> . Oxyfluorfen pre emergence @ 0.15 kg a.i ha <sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha <sup>-1</sup> at 15 to 20 DAT	112.60	86.45	48.50
T <sub>10</sub> . Glyphosate @ 1.5 kg a.i ha <sup>-1</sup> directed spray 25 and 50 DAT	78.66	72.28	35.70
T <sub>11</sub> . Intercultivation at 25 and 50 DAT	162.19	132.37	85.60
T <sub>12</sub> . Hand weeding three times at 20,40 and 60 DAT	180.45	142.22	95.85
T <sub>13</sub> . Control	81.49	73.51	37.31
S.Em ±	3.66	2.19	1.08
CD (5%)	10.75	6.44	3.18

**Table.2** Plant height (cm) at different growth stages as influenced by different weed management practices in brinjal

Treatments	Plant height at 20 DAT	Plant height at 40 DAT	Plant height at 60 DAT	Plant height at 80 DAT
T <sub>1</sub> . Pendimethalin C.S as pre- emergence @ 0.70 kg a.i ha <sup>-1</sup> + one hand weeding at 45 DAT	16.13	26.26	56.52	69.50
T <sub>2</sub> . Oxadiargyl as pre-emergence @ 90 g a.i ha <sup>-1</sup> + one hand weeding at 45 DAT	16.08	26.15	54.34	68.88
T <sub>3</sub> . Oxyflourfen pre-emergence @ 0.15 kg a.i ha <sup>-1</sup> + one hand weeding at 45 DAT	16.15	26.36	54.46	68.40
T <sub>4</sub> . Pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha <sup>-1</sup> followed by quizalofop-ethyl @ 50 g a.i ha <sup>-1</sup> at 15 to 20 DAT	17.16	29.24	51.3	65.63
T <sub>5</sub> . Oxadiargyl pre-emergence @ 90 g a.i ha <sup>-1</sup> followed by quizalofop-ethyl @ 50 g a.i ha <sup>-1</sup> at 15 to 20 DAT	17.05	28.55	50.24	64.96
T <sub>6</sub> . Oxyfluorfen pre-emergence @ 0.15 kg a.i ha <sup>-1</sup> followed by quizalofop-ethyl @ 50 g a.i ha <sup>-1</sup> at 15 to 20 DAT	17.38	29.71	50.20	64.49
T <sub>7</sub> . Pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha <sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha <sup>-1</sup> at 15 to 20 DAT	16.54	27.58	50.07	63.58
T <sub>8</sub> . Oxadiargyl pre-emergence @ 90 g a.i ha <sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha <sup>-1</sup> at 15 to 20 DAT	16.38	27.45	49.46	63.45
T <sub>9</sub> . Oxyfluorfen pre emergence @ 0.15 kg a.i ha <sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha <sup>-1</sup> at 15 to 20 DAT	16.40	27.25	49.32	63.35
T <sub>10</sub> . Glyphosate @ 1.5 kg a.i ha <sup>-1</sup> directed spray 25 and 50 DAT	15.5	22.55	41.42	57.35
T <sub>11</sub> . Intercultivation at 25 and 50 DAT	15.72	31.43	53.25	71.55
T <sub>12</sub> . Hand weeding three times at 20,40 and 60 DAT	15.75	31.85	54.20	74.69
T <sub>13</sub> . Control	14.97	24.32	44.23	55.46
S.Em ±	0.24	0.16	0.41	0.54
CD (5%)	0.98	0.47	1.22	1.59

DAT-days after transplanting

**Table.3** Primary branches per plant, plant population and plant spread as influenced by different weed management practices in brinjal

Treatments	Primary branches per plant	Initial plant population	Final plant population	Plant spread (m <sup>2</sup> )	Fruit yield (t ha <sup>-1</sup> )
T <sub>1</sub> . Pendimethalin C.S as pre- emergence @ 0.70 kg a.i ha <sup>-1</sup> + one hand weeding at 45 DAT	6.06	28.57	28.56	0.31	27.95
T <sub>2</sub> . Oxadiargyl as pre-emergence @ 90 g a.i ha <sup>-1</sup> + one hand weeding at 45 DAT	5.90	28.57	28.56	0.33	27.58
T <sub>3</sub> . Oxyflourfen pre-emergence @ 0.15 kg a.i ha <sup>-1</sup> + one hand weeding at 45 DAT	5.86	28.57	28.56	0.31	27.51
T <sub>4</sub> . Pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha <sup>-1</sup> followed by quizalofop- ethyl @ 50 g a.i ha <sup>-1</sup> at 15 to 20 DAT	5.83	28.57	28.56	0.28	24.42
T <sub>5</sub> . Oxadiargyl pre-emergence @ 90 g a.i ha <sup>-1</sup> followed by quizalofop-ethyl @ 50 g a.i ha <sup>-1</sup> at 15 to 20 DAT	5.73	28.57	28.55	0.26	24.28
T <sub>6</sub> . Oxyfluorfen pre-emergence @ 0.15 kg a.i ha <sup>-1</sup> followed by quizalofop-ethyl @ 50 g a.i ha <sup>-1</sup> at 15 to 20 DAT	5.73	28.57	28.56	0.26	24.12
T <sub>7</sub> . Pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha <sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha <sup>-1</sup> at 15 to 20 DAT	5.83	28.57	28.55	0.27	23.50
T <sub>8</sub> . Oxadiargyl pre-emergence @ 90 g a.i ha <sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha <sup>-1</sup> at 15 to 20 DAT	5.66	28.57	28.55	0.28	23.16
T <sub>9</sub> . Oxyfluorfen pre emergence @ 0.15 kg a.i ha <sup>-1</sup> followed by propaquiza fop @ 62.5 g a.i ha <sup>-1</sup> at 15 to 20 DAT	5.70	28.57	28.55	0.28	23.36
T <sub>10</sub> . Glyphosate @ 1.5 kg a.i ha <sup>-1</sup> directed spray 25 and 50 DAT	4.53	28.57	28.33	0.23	9.72
T <sub>11</sub> . Intercultivation at 25 and 50 DAT	6.23	28.57	28.56	0.32	28.92
T <sub>12</sub> . Hand weeding three times at 20,40 and 60 DAT	6.36	28.57	28.56	0.34	31.10
T <sub>13</sub> . Control	4.50	28.57	28	0.20	10.35
S.Em ±	0.06	-	-	0.01	0.17
CD (5%)	0.18	NS	NS	0.03	0.52

DAT-days after transplanting

Among all the treatments at 60 DAT, significantly the highest plant height was recorded in pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>1</sub>) (56.52 cm.), whereas

the lowest plant height was recorded in glyphosate @ 1.5 kg a.i ha<sup>-1</sup> directed spray at 25 and 50 DAT (T<sub>10</sub>) (41.41 cm.) followed by control (T<sub>13</sub>) (44.32 cm).

At 80 days after transplanting, significantly the highest plant height was recorded in hand weeding three times at 20, 40 and 60 DAT (T<sub>12</sub>) (74.69 cm.) followed by inter cultivation at 25 and 50 DAT (T<sub>11</sub>) (71.55 cm.) whereas the lowest plant height was recorded in control (T<sub>13</sub>) (55.46 cm.) followed by glyphosate @ 1.5 kg a.i ha<sup>-1</sup> directed spray at 25 and 50 DAT (T<sub>10</sub>) (57.35 cm.).

Significantly highest number of primary branches was recorded in hand weeding three times at 20, 40 and 60 DAT (T<sub>12</sub>) (6.36), whereas the lowest number of primary branches was recorded in glyphosate @ 1.5 kg a.i ha<sup>-1</sup> directed spray at 25 and 50 DAT (T<sub>10</sub>) (4.53). Other treatments were intermediate.

Different integrated weed management practices did not exhibit significant effect on Initial and final plant population. The highest plant spread was recorded in hand weeding three times at 20, 40 and 60 DAT (T<sub>12</sub>) (0.34 sq.m), whereas significantly the lowest plant spread was recorded in control (T<sub>13</sub>) (0.20 sq.m) which was on par with glyphosate @ 1.5 kg a.i ha<sup>-1</sup> directed spray at 25 and 50 DAT (T<sub>10</sub>) (0.23).

Among the different weed management practices, oxyfluorfen pre-emergence @ 0.15 kg a.i ha<sup>-1</sup> followed by quizalofop-ethyl @ 50 g a.i ha<sup>-1</sup> at 15 to 20 DAT (T<sub>6</sub>) recorded the highest plant height at 20 DAT (Table 2) but at 40 DAT hand weeding three times at 20, 40 and 60 DAT (T<sub>12</sub>) was the best whereas in 60 DAT Pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>1</sub>) gives the highest plant height on par with oxadiargyl as pre-emergence @ 90 g a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>2</sub>), oxyfluorfen pre-emergence @ 0.15 kg a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>3</sub>), hand weeding three times at 20, 40 and 60 DAT (T<sub>12</sub>), and intercultivation at 25 and 50 DAT

(T<sub>11</sub>). At 80 DAT, hand weeding three times at 20, 40 and 60 DAT was the best treatment (T<sub>12</sub>).

With regard to increase in plant height and number of primary branches per plant which could be attributed to higher availability of nutrients, particularly nitrogen and maximum utilization of sunlight by the plant due to minimum competition from weeds as a result of the actions of quizalofop (Davis, 1987) and pendimethalin (Jursik *et al.*, 2011). This was also supported by the results of nutrient uptake studies (Table 1). Similar results were reported by Qasem (2007) Nandal and Pandita (1988).

Number of primary branches per plant, final plant population, plant spread, were highest in hand weeding three times at 20, 40 and 60 DAT (T<sub>12</sub>) (Table 3), followed by inter cultivation at 25 and 50 DAT (T<sub>11</sub>). Next best treatment was pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>1</sub>) which was on par with oxadiargyl as pre-emergence @ 90 g a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>2</sub>) and oxyfluorfen pre-emergence @ 0.15 kg a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>3</sub>).

This might be due to the reason that faster vegetative growth due to reduction in weed population and the increased availability of moisture and nutrients which also enhances the early reproductive phase thereby recording minimum period for flower initiation and 50 per cent flowering and early fruit set. These results are in conformity with the findings of Sha and Karuppaiah (2005).

Among the different integrated weed management practices the treatment hand weeding three times at 20, 40 and 60 DAT (T<sub>12</sub>) recorded the highest marketable yield per hectare (Table 3), followed by intercultivation at 25 and 50 DAT (T<sub>11</sub>) and

pendimethalin C.S as pre-emergence @ 0.70 kg a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>1</sub>) which was on par with oxadiargyl as pre-emergence @ 90 g a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>2</sub>) and oxyfluorfen pre-emergence @ 0.15 kg a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>3</sub>), which are in concurrence with the findings of Reddy *et al.*, (2000).

On the basis of results obtained in this study, it was concluded that, hand weeding three times at 20, 40 and 60 DAT (T<sub>12</sub>) followed by pendimethalin C.S as pre-emergence @0.70 kg a.i ha<sup>-1</sup> + one hand weeding at 45 DAT (T<sub>1</sub>) recorded significantly more nutrient uptake (N, P and K) which has resulted in increased growth and yield in brinjal.

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