



Weed management in rainy season onion

K.G. Shinde, M.N. Bhalekar and B.T. Patil*

Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra 413 722

Received: 9 September 2012; Revised: 11 November 2012

Key words: Chemical control, Herbicides, Weed management, Onion

Onion (*Allium cepa* L.) is an important bulbous vegetable crop grown in India from the ancient times. The crop is grown for green vegetable as well as mature bulbs. *Kharif* onion which is 20% of total onion production, plays crucial role in filling supply gap from October to February. The productivity of *Kharif* onion is very low as compared to other seasons, because it is affected by diseases, pests and weeds. The integrated methods of weed control offer the possibilities of increasing crop production. Keeping abreast with the above facts, the present investigation was undertaken to evaluate the different weedicides for controlling weeds in *Kharif* onion.

An experiment was conducted at All India Coordinated Research Project on Vegetable crops, MPKV, Rahuri during *Kharif* season of 2011. The six treatments were tested in randomized block design with four replications in a plot size of 2 x 2 m². The seeds of onion cultivar 'Phule Samarth' was sown for nursery raising on 25 June, 2011 and the transplanting was done on 23 August, 2011 on flat beds by adopting spacing of 15 x 10 cm. The six treatments consist of T₁-Oxyflourfen (425 ml/ha) application before planting and second application at 15 days after transplanting, T₂-Oxyflourfen 23.5% EC (638 ml/ha) application before planting and second application at 30 days after transplanting, T₃-Oxyflourfen (870 ml/ha) application 15 days after transplanting and second application at 30 days after transplanting, T₄-Oxyflourfen 23.5% EC (870 ml/ha) application before planting and second application at 15 days after transplanting and third application at 30 days after transplanting, T₅-Oxyflourfen (625 ml/ha) application at 15 days after transplanting and one hand weeding at 45 days after transplanting and T₆-Weedy check.

Eight week old healthy and uniform seedlings were used for transplanting. Upper one third portions of seedlings were removed at the time of transplanting to reduce the transpiration losses and better establishment of crop. All package of practices to raise good crop was done in the experiment and weed control treatments applied as per

the treatments. Weed population counts were taken from an area of 0.50 m². from the net plot of each treatment and in each replication at 60 days after transplanting. Species wise weed count was recorded by using 0.50 m² quadrant in centre place in each plot and number of weeds per quadrant was worked out and weed control efficiency (WCE) was calculated.

The weed dry matter production (WDMP) was recorded after counting of weeds and removing all weeds from quadrant and sun dried for few days and then weight of each dried sample was recorded. The data recorded on weed population, weed control efficiency, weed dry matter production, kinds of weeds and yield was depicted (Table 1). The yield was influenced by different treatments of weedicide application and its frequency. The maximum yield (29.62 t/ha) was recorded in the treatment T₆, *i.e.* oxyflourfen 23.5% EC (625 ml/ha) at 15 days after transplanting and one hand weeding at 45 days after transplanting while it was minimum in treatment weedy check (17.97 t/ha). The second best treatment was T₁, *i.e.* oxyflourfen (425 ml/ha) application before planting and second application at 15 days after transplanting. The above findings confirmed the results of Vashi *et al.* (2011).

The maximum weed population was recorded in weedy check treatment, *i.e.* T₅ (28.50) while it was minimum in T₁ (3.75) followed by T₂ (4.0) and T₆ - (4.50). Similar trend was observed for weed dry matter production (Table 1). All kinds of weeds were observed in weedy check treatment. Similar results were also reported by Vashi *et al.* (2011) in onion.

The maximum weed control efficiency (WCE) (87%) was noticed in treatment T₁, *i.e.* oxyflourfen (425 ml/ha) before planting and second application at 15 days after transplanting followed by treatment T₂ (86%) *i.e.* oxyflourfen (638 ml/ha) application before planting and second application at 30 days after transplanting and treatment T₆ *i.e.* oxyflourfen 23.5% EC (625 ml/ha) (84% WCE) at 15 days after transplanting and one hand weeding at 45 days after transplanting (Table 1). Similar results were also reported by Patel *et al.* (1983) and Kumar *et al.* (1992).

*Corresponding author: btpatilveg@rediffmail.com

Table 1. Effect of different herbicides on yield and weed growth in onion

Treatment	Yield (t/ha)	Weed population (no./0.5 m ²)	WCE (%)	WDMP (g/0.5 cm ²)
T ₁ -Oxyflourfen (425 ml/ha) application before planting and second application at 15 days after transplanting.	29.30	3.75	87.00	2.80
T ₂ -Oxyfluorfen (638 ml/ha) application before planting and second application at 30 days after transplanting.	27.17	4.00	86.00	3.00
T ₃ -Oxyflourfen (870 ml/ha) application 15 days after transplanting and second application at 30 days after transplanting.	26.10	4.75	83.00	3.70
T ₄ -Oxyflourfen (870 ml/ha) application before planting and second application at 15 days after transplanting and third application after 30 days after transplanting.	28.05	4.50	84.00	3.35
T ₅ -Oxyflourfen (625 ml/ha) at 15 days after transplanting and one hand weeding at 45 days after transplanting.	29.62	4.50	84.00	3.40
T ₆ -Weedy check	17.97	28.50	--	220.0
LSD (P=0.05)	28.25	-	-	-

Table 2. Effect of different treatments on growth characters of onion

Treatment	Polar diameter (cm)	Equatorial diameter (cm)	Average weight of bulb (g)	TSS %	A grade bulb (%)	B grade bulb (%)	C grade bulb (%)	Small bulb (%)	Double bulb (%)
T ₁	4.60	5.30	62.37	10.2	32.8	18.8	29.9	18.3	0.69
T ₂	4.65	5.90	64.87	10.7	25.2	23.3	25.8	24.9	0.93
T ₃	4.70	5.80	60.37	10.6	20.1	20.9	36.6	21.2	0.71
T ₄	4.50	5.65	60.31	10.5	10.4	35.2	38.3	16.8	0.27
T ₅	4.60	5.60	61.30	10.6	32.2	24.5	23.5	19.5	0.35
T ₆	3.80	4.10	48.20	10.0	25.2	18.3	20.8	34.9	0.93

Growth and yield attributing components, viz. plant height (55.6 to 65.9 cm), number of leaves (9.1 to 11.4), neck thickness (1.2 to 1.7 cm), polar diameter (3.80 to 4.70 cm), equatorial diameter (4.10 to 5.90 cm), average weight of bulb (48.20 to 64.87g), TSS% (10.2 to 10.7) were influenced by different treatments of weedicide application along with weedy check (Table 2). Similar trend of growth and yield attributing components was also reported by Vashi *et al.* (2011). The per cent of A grade bulb size was ranged between 10.4 to 32.8, B grade bulbs was between 18.28 to 35.18 and C grade bulb was between 20.76 to 38.15%. The small bulb per cent was maximum in weedy check (34.87%), while it was minimum in T₄ (16.82), T₁ (18.3) and T₆ (19.5). This indicated the

effectiveness of weedicides in controlling the weeds and subsequently increasing the production of onion in the treatments. Similar results were also reported by Kumar *et al.* (1992).

It can be concluded that for controlling the weed flora in *Kharif* onion, the application of oxyfluorfen 23.5% EC (625 ml/ha) at 15 days after transplanting and one hand weeding at 45 days after transplanting was found effective followed by oxyfluorfen (425 ml/ha) application before planting and second application at 15 days after transplanting. These herbicides were helpful in controlling the weeds and enhancing the productivity of *Kharif* onion provided its time of application and quantity of herbicides should have followed accurately.

SUMMARY

A study was undertaken at AICRP (VC), MPKV., Rahuri during *Kharif* season of 2011 using different herbicides and their time of application. It was found that the maximum weed control efficiency (87%) was recorded in oxyfluorfen (425 ml/ha) application before planting and second application at 15 days after transplanting. For controlling weed flora in *Kharif* onion, the oxyfluorfen (625 ml/ha) at 15 days after transplanting and one hand weeding at 45 days after transplanting was found effective followed by oxyfluorfen (425 ml/ha) application before planting and second application at 15 days after transplanting.

REFERENCES

- Kumar V, Thakral KK and Pandita ML. 1992. Effect of different weed control treatments in *Kharif* onion. *Haryana Journal of Horticultural Science* **21**(3&4): 269–273.
- Patel CL, Patel ZG and Patel RB. 1983. Integrated weed management in onion bulb crop. *Indian Journal of Weed Science* **15**(1): 7–11.
- Vashi JM, Patel NK and Desai DT. 2011. Evaluation of different herbicides for controlling weeds in onion (*Allium cepa* L.) *Vegetable Science* **38**(1): 119–120.