Annals of Plant and Soil Research 16(2): 175-176 (2014)
Short Communication

INTEGRATED WEED MANAGEMENT IN CABBAGE

J. SURESH KUMAR, K. CHANDRASEKHAR REDDY, B.V. RAJKUMAR AND A. MANOHAR RAO

College of Horticulture, Rajendranagar, Hyderabad 500030, Andhra Pradesh
Revised: August, 2013; Revised accepted: December, 2013

Cabbage is an important vegetable crop, it is one of the favorite crop grown in kitchen garden because it is easy to raise, required little space grown in short duration and becomes ready for harvest in 3 months after sowing. It is a good source of vitamin A, C and minerals like I, Cu, K and S etc. It is used in salad, cooked vegetable, curries, pickles as well as dehydrated forms. Cabbage juice is said to be a remedy against poisonous mushrooms and is also used as a gargle against hoarseness. The leaves are used to cover wounds and ulcers and are also recommended against hangover (Chatterjee, 1990). The growth and yield of any cultivated crop is mainly influenced by genetical, cultural and management factors. The integrated method of weed control offer the possibilities of increasing crop production under weed free environment by keeping the crop healthier by suppressing the weeds competing for all imp resources which are needed to crop. Hence there is an imperative need to screen out suitable method of weed control.

An experiment was conducted as one season work at Model Orchard, College of Horticulture, Rajendranagar, Hyderabad. The experiment was laid in randomized block design with 3 replications and 13 treatments viz., Pendimethalin C.S @ 0.7 kg a.i.ha^{-1} (PE) + Propaquizafop @ 75 g a.i.ha^{-1} (POE), Pendimethalin C.S @ 0.7 kg a.i. ha^{-1} (PE) + hand weeding at 30 DAT, Pendimethalin C.S @ 0.7 kg a.i.ha^{-1} (PE) + black polythene mulch, Oxyfluorfen @ 0.25 kg a.i.ha^{-1} (PE) + Propaquizafop @ 75 g a.i.ha^{-1} POE), Oxyfluorfen @ 0.25 kg a.i. ha^{-1} (PE) + hand (weeding at 30 DAT, Oxyfluorfen @ 0.25 kg a.i.ha^{-1} (PE) + black polythene mulch, Alachlor @ 1.0 kg

Table 1: Effect of weed control treatments on weed density, dry matter of weeds, weed control efficiency and yield of cabbage

	Treatments	Weed density (number m^{-2})			Dry matter of weeds (g m^{-2})			WCE (%)	Yield (t ha^{-1})
		20 DAT	40 DAT	60 DAT	20 DAT	40 DAT	60 DAT		
$T_{1.}$	Pendimethalin C.S @ 0.7 kg a.i.ha^{-1} (PE) + Propaquizafop @ 75 g a.i.ha^{-1} (POE)	59.1 (7.7)	158.8 (12.6)	190.9 (13.8)	16.3 (4.1)	85.1 (9.3)	115.4 (10.8)	48.5	12.7
$T_{2.}$	Pendimethalin C.S @ 0.7 kg a.i.ha^{-1} (PE) + hand weeding at 30 DAT	79.2 (8.9)	82.9 (9.1)	134.3 (11.6)	21.9 (4.8)	44.7 (6.7)	81.4 (9.1)	30.6	19.2
$T_{3.}$	Pendimethalin C.S @ 0.7 kg a.i.ha^{-1} (PE) + black polythene mulch	33.6 (5.9)	94.5 (9.8)	117.8 (10.9)	9.2 (3.2)	50.8 (7.2)	71.2 (8.5)	70.9	30.7
$T_{4.}$	Oxyfluorfen @ 0.25 kg a.i.ha^{-1} (PE) + Propaquizafop @ 75 g a.i.ha^{-1} (POE)	57.2 (7.6)	155.8 (12.5)	188.8 (13.8)	15.7 (4.1)	83.4 (9.2)	112.6 (10.7)	50.2	13.4
$T_{5.}$	Oxyfluorfen @ 0.25 kg a.i.ha^{-1} (PE) + hand weeding at 30 DAT	76.4 (8.8)	80.9 (9.1)	130.0 (11.4)	21.1 (4.7)	43.7 (6.7)	78.7 (8.9)	33.1	20.3
$T_{6.}$	Oxyfluorfen @ 0.25 kg a.i.ha^{-1} (PE) + black polythene mulch	32.1 (5.8)	91.9 (9.6)	115.7 (10.8)	8.7 (3.1)	49.0 (7.1)	69.9 (8.4)	72.6	32.0
$T_{7.}$	Alachlor @ 1.0 kg a.i.ha^{-1} (PE) + Propaquizafop @ 75 g a.i.ha^{-1} (POE)	62.3 (7.9)	161.5 (12.7)	195.0 (13.9)	17.2 (4.2)	86.5 (9.3)	117.6 (10.9)	45.6	12.3
$T_{8.}$	Alachlor @ 1.0 kg a.i.ha^{-1} (PE) + hand weeding at 30 DAT	82.1 (9.1)	86.5 (9.3)	136.5 (11.7)	22.7 (4.8)	46.7 (6.9)	82.7 (9.1)	28.1	18.8
$T_{9.}$	Alachlor @ 1.0 kg a.i.ha^{-1} (PE) + black polythene mulch	36.1 (6.1)	97.3 (9.9)	120.2 (10.9)	9.8 (3.3)	52.0 (7.3)	72.6 (8.6)	69.1	24.6
$T_{10.}$	Propaquizafop @ 75 g a.i.ha^{-1} (POE)	72.7 (8.7)	164.2 (12.8)	196.5 (14.0)	20.0 (4.6)	88.0 (9.4)	118.8 (10.9)	36.7	13.8
$T_{11.}$	Black polythene mulch	38.2 (6.2)	99.3 (10.0)	122.3 (11.1)	10.4 (3.4)	53.1 (7.3)	74.2 (8.7)	67.1	23.9
T_{12}	Hand weeding twice at 25 and 50 DAT	106.3 (10.34)	88.8 (9.47)	75.0 (8.71)	30.0 (5.55)	47.9 (6.99)	45.3 (6.80)	5.3	22.4
$T_{13.}$	Unweeded control	113.3 (10.7)	209.2 (14.5)	254.8 (15.9)	31.6 (5.7)	112.0 (10.6)	154.1 (12.4)	--	17.8
CD (p=0.05)		0.5	0.3	0.3	0.2	0.3	0.2	--	2.7

**Figures in parentheses indicate transformed values.*
DAT- Days after transplanting PE- Pre emergence POE - Post emergence

a.i.ha^{-1} (PE) + Propaquizafop @ 75 g a.i.ha^{-1} (POE), Alachlor @ 1.0 kg a.i.ha^{-1} (PE) + hand weeding at 30 DAT, Alachlor @ 1.0 kg a.i.ha^{-1} (PE) + black polythene mulch, Propaquizafop @ 75 g a.i. ha^{-1} POE), black polythene mulch, hand weeding twice at 25 and 50 DAT, unweeded control. Twenty eight days old seedlings of cabbage variety Golden Acre was transplanted at 60 X 45 cm in the month of September 2010. The data collected were statistically analyzed for interpretation following the procedure outlined by Panse and Sukhatme (1978). Twenty eight days old seedlings of cabbage variety Golden Acre was transplanted at 60 X 45 cm in the month of September 2010. The data collected were statistically analyzed for interpretation following the procedure outlined by Panse and Sukhatme (1978). The prominent weed species in the experimental plots were *Cyperus rotundus, Cynodon dactylon, Dactyloctenum aegypticum, Parthenium hysterophorus, Digera arvensis,* and *Amaranthus viridis*. The data taken on weed parameters such as weed flora, weed count, dry weight of weed, weed index and weed control efficiency. All the weed control treatments caused significant reduction in total weed count, weed density and dry matter of weeds as compare to un-weeded control. Pre emergence application of Oxyfluorfen + black polythene mulch recorded significantly least weed density and dry weight at 20 DAT. At 40 DAT least weed density and dry weight were recorded with treatment Oxyfluorfen + hand weeding and at 60 DAT hand weeding twice at 25 and 50 DAT recorded least weed population and dry weight of weeds, followed by Oxyflorfen + black polythene mulch. Excellent control of weeds was observed due to the application of Oxyfluorfen + black polythene mulch during the initial stages of crop growth followed by the physical removal of weeds which emerged late. The reason for it is at the early stage herbicide controlled the weed growth efficiently but after some time residual effect of herbicide was lost, thereby, good control of weed was achieved in the hand weeding plots. These results are in conformity with the findings of Bhutia et *al*. (2005), Anuradha *et al*. (2006) and Sharma *et al*. (2009).

All the weed management treatments significantly increased the yield of cabbage over unweeded control. The Pre-emergence application of Oxyfluorfen @ 0.25 kg a.i.ha^{-1} + black polythene mulch was effective and significantly superior to rest of the treatments by recording the highest yield of cabbage (32 t ha^{-1}). This might be due to excellent control of weed infestation at early stage and less crop weed competition during the critical growth stage of the crop. Black polythene mulching improved better moisture utilization, by checking evaporation loss and fall of soil temperature during winter and lesser compaction of weed. Similar results were reported by Anuradha *et al*. (2006), Quasem (2007) and Basavaraj *et al*. (2009). The weed control efficiency was observed best in Oxyfluorfen @ 0.25 kg a.i.ha^{-1} (PE) + black polythene mulch which might be due to the suppression in weed density and slower dry matter buildup in weeds. The higher yields in this treatment can be attributed to lower weed competition in early stages of the crop that resulted in good use of nutrient factors available. Likewise, the other effective treatments were Pendimethalin C.S @ 0.7 kg a.i.ha^{-1} (PE) + black polythene mulch followed by Alachlor @ 1.0 kg a.i.ha^{-1} (PE) + black polythene mulch and black polythene mulch. The least wce was found in hand weeding where the weed density and dry matter of weeds were high during early stages of crop growth resulting in lower yields.

It can be concluded that the treatment consisted of pre-emergence application of Oxyfluorfen @ 0.25 kg a.i.ha^{-1} + black polythene mulch was effective in reducing the weed density, dry matter of weeds, weed control efficiency and thereby increasing the yield of cabbage.

REFERENCES

Anuradha, N, Gonge, V.S, Warade, A.D, Anjali, Mohariya. and Jagdale, Y.L. (2006) Influence of integrated weed management on growth and yield of cabbage. *International Journal of Agricultural Sciences* 2: 93-94.

Basavaraj, L, Dalavai Kandasamy and Hanumanthappa, M. (2009) Influence of herbicides and their application techniques on weed control efficiency, yield and economics of transplanted onion. Mysore *Journal of Agricultural Science* 43(1): 147-150.

Bhutia, D.T., Maity, T.K. and Ghosh, R.K. (2005) Integrated weed management in onion. *Journal of Crop and Weed* 1 (1): 61-64.

Chatterjee, S.K. (1990) Cole crops. In, Bose, T.K. and S.K. Mitra (Eds). ICAR New Delhi. Vegetable Crops 128-152.

Panse, V.G. and Sukhatme, P.V. (1978) Statistical methods for agricultural workers. *Indian Council of Agricultural Research*, New Delhi. pp: 359.

Qasem, J.R. (2007) Weed control in cauliflower with herbicides. *Crop Protection* 26: 1013-1020.

Sharma, S.P, Buttar, G.S., Sudeep, Singh and Khurana, D.S. (2009) Comparative efficacy of pendimethalin and oxyfluorfen for controlling weeds in onion nursery. *Indian Journal of Weed Science* 41 (1&2): 76-79.