J. Indian Soc. Coastal Agric. Res. 35(1): 31-33 (2017)

Weed Management in Sesamum (*Sesamum indicum* L.) Grown under Coastal Region of Maharashtra

S. V. MANE, V. M. KANADE, G. B. SHENDAGE*, P. P. SARAWALE and V. N. SHETYE
College of Agriculture, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth
Dapoli - 415 712, Maharashtra

Received: 18.02.2017 Accepted: 20.05.2017

An experiment was conducted to study the effect of mechanical and chemical weed control measures on growth and yield of sesamum during *Rabi* 2014 at Agronomy Farm, College of Agriculture, Dapoli. The experiment was laid out in randomized block design with ten treatments and three replications. The treatments mainly comprised of Pre Emergence application of (PE) Pendimethalin @ 0.75 kg a.i. ha^{-1} (T_1), Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one hand weeding (HW) at 15 days after sowing (DAS) (T_2), Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 30 DAS (T_3), Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 45 DAS (T_4), Post Emergence application of (POE) Quizalfop-ethyl 0.05 kg a.i. ha^{-1} (T_5), Quizalfop-ethyl (POE) 0.05 kg a.i. ha^{-1} + one HW at 45 DAS (T_6), HW at 30 DAS (T_7), HW and hoeing at 45 DAS (T_8), Weed free check (T_9) and Weedy check (T_{10}). Results revealed that, treatment weed free check produced significantly higher growth and yield attributes followed by treatment Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 30 DAS as compared to rest of the treatments under study.

(***Keywords:*** *Sesamum, Mechanical control, Yield and Chemical control*)

Sesame (*Sesamum indicum L.*) is an important oilseed crop in India, which belongs to family *Pedaliaceae* and chromosome number is 2n=26. It is recognized by various names like gingely, til, simsim, gergelim, biniseed, etc. It has earned a poetic label "Queen of oilseeds" due to high quality of poly-unsaturated stable fatty acids in seeds (26g), Moreover, seeds are rich source of edible oil (48-55%) and protein (20-28%) consisting both methionine and tryptophan, vitamins (niacin) and minerals (Ca and P). Sesame is a good catch crop and performs well in pure and mixed stand in residual soil moisture. Sesame is widely cultivated in tropical and sub-tropical parts of the world. Sesame is grown in world on 6.3 million hectares. About 45 percent of the area lies in the India. Area under sesame crop in India is 17.03 lakh ha and total production is 7.5 lakh tonnes (Anonymous, 2013).

India is world's largest producer of the sesame accounting 35 percent of the total production, but its average productivity is extremely low (274 kg ha^{-1}) (Anonymous, 2012). Inadequate weed management appears to be one of the major constraints for such low productivity of sesame. Being slow growing during seedling phase, weeds affect the growth of sesame and reduced the yield. The period from 15 to 30 days after sowing is the most critical period of crop weed competition in the sesame (Duary and Hazra, 2013). Several annual grasses and broad leaf weeds invade this crop causing heavy losses. In oilseed crops, yield loss due to weed competition varied from 50-75% (Bhadauria *et al*., 2012). Hand weeding is commonly practiced by the farmer but weeding is not possible due to scarcity of the farm labour and cost of weeding operation. Chemical weed control is easier, time saving and economical compared to hand weeding.

MATERIAL AND METHODS

The field experiment was conducted during *Rabi* season of 2014 at the Agronomy Farm, College of Agriculture, Dapoli, Ratnagiri (Maharashtra). The soil of experimental plot was sandy clay loam in texture and slightly acidic in reaction (pH 7.8) with medium in organic carbon (9.7 g kg^{-1})). It was low in available nitrogen (242.24 kg ha^{-1}), phosphorus (11.26 kg ha^{-1}) and moderately high in available potassium (220.42 kg ha^{-1}). The experiment was laid in randomised block design with three replications.

The treatments mainly comprised of Pre-emergence (PE) application of Pendimethalin @ 0.75 kg a.i ha^{-1} (T_1), Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one hand weeding (HW) at 15 DAS (T_2), Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 30 DAS (T_3), Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 45 DAS (T_4), Post Emergence application of (POE) Quizalfop-ethyl 0.05 kg a.i. ha^{-1} (T_5),

**Corresponding Author :* E-mail: gshendage212@gmail.com

Quizalfop-ethyl (POE) 0.05 kg a.i. ha^{-1} + one HW at 45 DAS (T_6), HW at 30 DAS (T_7), HW and hoeing at 45 DAS (T_8), Weed free check (T_9) and Weedy check (T_{10}). The gross and net plot size were 4.20 m x 3.60 m and 3.90 m x 3.00 m respectively. The crop was sown in lines at the 30 cm x 15 cm and fertilized with 25 kg N and P 50 kg ha^{-1} at the time of sowing. The other common package of practices was followed time to time and periodical crop growth and weed observations recorded.

RESULT AND DISCUSSION

Effect of weed control measures on growth attributes of sesamum

The data presented in Table 1 showed that, the weed free check (T_9) recorded highest plant height, number of leaves, number of branches and dry matter accumulation per plant this might be due to the minimum weed growth, reducing crop-weed competition during the critical stages of crop growth helps to increase the growth attributes of crop similar finding was reported by Sootarkar *et al*. (1995). While treatment T_3 recorded higher growth attributes except treatment T_9, having shown effectiveness of pre-emergence application of herbicide to suppress the many grasses and broad leaf weeds along with later germinated weeds with the integration of one hand weeding at 30 DAS, this also helps to decrease crop-weed competition for sunlight, nutrients and space resulting in significant improvement in the growth attributes. Similar findings were also reported by Sheoran *et al*. (2012) and Sasikala *et al*. (2013).

Effect of weed control measures on yield of sesamum

Treatment weed free check (T_9) recorded maximum grain yield this is due to minimum competition of weeds with crop plants for different growth factors, similarly notable increase in plant height and branches increases, which was contributed to the increase in seed and stover yield. With regard to weed management practices it was observed that, the highest seed yield was recorded in pre-emergence application of herbicide with one hand weeding at 30 DAS. As the reduction in the total weed population rendered the crop with better availability of all the essential nutrients, which in turn helped to achieve higher source sink capacity which positively reflected on higher grain yield and weedy check recorded lower seed and stover yield. Similar result was observed by Savathi *et al*. (2005).

Effect of weed control measures on weed density and dry matter of weed

The data presented in Table 2 showed that, the weed free check recorded lower weed count with low dry weight of weed and higher weed control efficiency than the remaining treatments, while treatment T_3 and T_6 were found to be at par with each other at harvest, recorded minimum weed growth and maximum weed control

Table 1. *Effect of different weed control measures on growth and yield of sesamum*

Treatments	Plant height (cm)	No. of leaves $plant^{-1}$	No. of branches $plant^{-1}$	Dry matter production $plant^{-1}$	Grain yield (kg ha^{-1})	Stover yield (kg ha^{-1})
T_1: Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1}	59.54	41.13	1.60	8.14	328.0	658.2
T_2: Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 15 DAS	62.75	45.87	1.53	9.80	366.1	737.0
T_3: Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 30 DAS	70.93	55.13	2.33	14.80	532.2	1247.0
T_4:Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 45 DAS	69.07	36.33	1.53	12.79	353.0	716.2
T_5:Quizalfop-ethyl (POE) 0.05 kg a.i. ha^{-1}	65.99	34.93	1.27	12.43	322.0	646.1
T_6:Quizalfop-ethyl (POE) 0.05 kg a.i. ha^{-1} + one HW at 45 DAS	70.60	49.27	1.67	14.65	529.0	1239.0
T_7:HW at 30 DAS	70.40	48.93	1.60	13.21	457.1	1119.0
T_8:HW and Hoeing at 45 DAS	69.53	39.67	1.47	12.52	420.2	1002.1
T_9:Weed free check	75.77	57.53	2.67	17.26	733.1	1707.0
T_{10}:Weedy check	55.92	28.87	1.07	5.97	249.1	425.2
SEm $\pm$	0.55	0.45	0.11	0.15	0.10	0.12
CD at 5%	1.54	1.31	0.31	0.43	0.24	0.32

Table 2. *Effect of different weed control measures on weed count, dry matter of weed and weed control efficiency*

Treatments	Weed count of grasses m^{-2}	Weed count of BLWs m^{-2}	Dry weight of weeds (q ha^{-1})	WCE (%)
T_1: Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1}	6.33 (2.61)*	13.00 (2.14)	4.65	61.99
T_2: Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 15 DAS	7.33 (2.80)	11.6 (2.10)	4.38	64.21
T_3: Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 30 DAS	5.33 (2.41)	9.33 (2.01)	3.28	73.16
T_4: Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 45 DAS	7.00 (2.73)	12.33 (2.12)	5.02	58.99
T_5: Quizalfop-ethyl (POE) 0.05 kg a.i. ha^{-1}	7.33 (2.79)	18.67 (2.24)	6.39	47.79
T_6: Quizalfop-ethyl (POE) 0.05 kg a.i. ha^{-1} + one HW at 45 DAS	5.00 (2.34)	10.33 (2.04)	3.43	71.98
T_7: HW at 30 DAS	6.00 (2.54)	11.33 (2.09)	4.16	66.01
T_8: HW and Hoeing at 45 DAS	6.67 (2.68)	14.33 (2.18)	5.25	57.13
T_9: Weed free check	4.33 (2.20)	6.33 (1.86)	2.10	81.32
T_{10}: Weedy check	14.67 (3.89)	34.00 (2.61)	12.25	—
SEm $\pm$	0.10	0.04	0.40	—
CD at 5%	0.27	0.12	1.10	—

*Figures in parentheses are square root transformations $\sqrt{X + 0.5}$

efficiency. This is due to control of weeds by the herbicide and removal of grasses and broad leaf weeds by one hand weeding at 30 DAS. Similar results were reported by Ganavel *et al*. (2006) and Chauhan *et al.* (1998).

CONCLUSION

From the results of the present investigation, it can be concluded that, the treatment weed free check has proved better for obtaining higher growth and yield from sesame followed by Pendimethalin (PE) @ 0.75 kg a.i. ha^{-1} + one HW at 30 DAS than the application of chemical herbicides and mechanical methods alone.

REFERENCES

Anonymous, (2012). Sesame seed output may decline 25%. http://www.business-standard.com/article/markets/sesame.

Anonymous, (2013). State of Indian Agriculture 2012-13, Government of India, Ministry of Agriculture, pp.199-202.

Bhadauria, N., Asha Arora and Yadav, K.S. (2012). Effect of weed management practices on seed yield and nutrient uptake in sesame. *Indian Journal of Weed Science* **44**(2): 129-131.

Chauhan, D. V. S. and Gujar, B. S. (1998). Mechanical and Chemical weed control in S*esame (Sesamum indicum*). *Indian Journal of Agronomy* **43**(1&2): 480-483.

Duary, B. and Hazra, D. (2013). Determination of critical period of crop-weed competition in sesame. *Indian Journal of Weed Science* **45**(4): 253-256.

Ganavel, I., and Anbhazhagan, R. (2006). Integrated weed management in sesame (*Sesamum indicum* L.). *Agricultural Science Digest* **26**(1): 67-68.

Savathi, A., Rammohan, J., Nadanassababdy, T., and Chellamuthu, V. (2005). Influence of sowing methods and weed management on sesame (*Sesamum indicum* L) yield under irrigated condition. *Journal of Crop and Weed* **2**(1):4-7.

Sasikala K., Pashok and Boopathi, S.N.M.R. (2013). Evaluation of some post-emergence herbicide against weeds in summer irrigated gingelly (*Sesamam indicum* L) *International Journal of Farm Sciences* **3**(1): 47-50.

Sheoran, P., Sardana, V., Singh, S., Sharma, P. and Atwal, A. K. (2012). Evaluation of pre-emergence herbicides for weed management in sesame (*Sesamum indicum L.*) under semi-arid subtropical conditions. *Journal of Oilseeds Research* **29**(1): 53-57.

Sootarkar, B. P., Namdeo, K. N., and Khare, L. J. (1995). Effect of weed control on productivity of sesame. *Indian Journal of Agronomy* **40**(3): 454-458.