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Original Research Article

Effect of Mechanical and Chemical Weed Control Measures on Yield and Economics of Sesame

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Keywords

Sesame, Weed control, Economics

A B S T R A C T

An experiment was conducted to study the Effect of mechanical and chemical weed control measures on growth and yield of sesame during rabi 2014 at Agronomy Farm, College of Agriculture, Dapoli. The experiment was laid out in randomized block design with ten treatments and three replication. Yield, all yield attributes and economics of sesame noticed significantly higher in treatment T_9 followed by treatment T_3 (Pendimethalin pre-emergence with one hand weeding at 30 DAS) at the time of harvest. Seed yield and B:C ratio of sesame significantly affected with weed control treatments.

Introduction

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 (niacine) and minerals (Ca and P). sesame is a good catch crop and performs well in pure and mixed stand in residual soil moisture. Sesame widely cultivated in tropical and sub-tropical parts of the world.

Sesame is grown in world on 6.3 million hectares. About 45 per cent 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 tone (Anonymous, 2013). India is world's largest producer of the sesame accounting 35 per cent of the total production, productivity is extremely low (274kg/ha) (Anonymous, 2012). Inadequate 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 annul grasses and broad leaf weeds invade this crop causing heavy losses. In oilseed crops, yield loss due to weed competition varied from 50 to 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.

Materials and Methods

The field experiment on sesame (*Sesamum indicum* L.) was conducted during *rabi* season of 2014 at the Agronomy Farm, College of Agriculture, Dapoli, Dist Dapoli, Dist. Ratnagiri (M.S.). 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}) and low in available phosphorus (11.26 kg ha^{-1}) and moderately high in available potassium (220.42 kg ha^{-1}).

The experiment was laid out with ten treatments as detailed in Table 1 in randomised block design with three replication. The gross and net plot size were 4.20m×3.60m and 3.90m×3.00m respectively. The crop was sown in lines at the 30cm×15cm and fertilized with 25kg N/ha, 50kg P/ha at sowing.

The plot area was fixed for weed count and dry matter studies. On the basis of dry matter of weeds the weed control efficiency was worked out separately for each treatment.

Results and Discussion

Effect of weed control treatments on yield of sesame

Treatment T_9 recorded maximum grain yield this is due to minimum competition of weeds with crop plants for different growth factors, which was contributed to the increase in seed and stover yield. Similar result was observed by Savathi *et al.*, (2005). 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 yield. Similar result was observed by Savathi *et al.*, (2005).

Effect of weed control treatments on yield attributes of sesame

The treatment T_9 recorded significantly maximum number of capsules and number of seeds per capsule over rest of the treatments. T_3 was at par with T_6. And maximum weight of capsule was recorded in treatment T_9, which was significantly superior rest of the all treatments and treatment T_3 and T_6, T_7 and T_8, T_1 and T_5 was found to be at par with each other.

While, many weeds, especially broadleaf weeds initially controlled by pre-emergence application of herbicide but having re-growth at later stages of the crop growth period causing significant yield reduction. However, integration of hand weeding (4WAS) along with pre-emergence application of herbicide have provided better control of weeds for longer crop growth period resulting in better yield contributing characters and yield compared to sole application of herbicide.

The present findings were in conformity with the results of observed Sheoran *et al.*, (2012), Chauhan *et al.*, (1998), Bhadauria *et al.*, (2012) and Sasikala *et al*., (2013).

Table.1 Effect of mechanical and chemical weed control measures on yield and yield attributes sesame at harvest

Treatment	No of capsule per plant	No of seeds per capsule	Wt of capsule in (gm)	Grain yield Qtl/ha	Straw yield qtl/ha
T1: Pendimethalin (PE) @ 0.75 kg a.i/ha	39.07	42.40	7.15	3.28	6.58
T2: Pendimethalin (PE) @ 0.75 kg a.i/ha+ one HW at 15 DAS	43.47	45	10.56	3.66	7.37
T3: Pendimethalin (PE) @ 0.75 kg a.i/ha+ one HW at 30 DAS	45.60	48.50	13.11	5.32	12.47
T4: Pendimethalin (PE) @ 0.75 kg a.i/ha+ one HW at 45 DAS	42.27	43.73	10.20	3.53	7.16
T5: Quizalfop-ethyl (POE) 0.05 kg ai/ha	34	40.97	7.03	3.22	6.46
T6: Quizalfop-ethyl (POE) 0.05 kg ai/ha + one HW at 45 DAS	45.33	46.50	13.60	5.29	12.39
T7: HW at 30 DAS	44.20	46.23	11.55	4.57	11.19
T8: HW and Hoeing at 45 DAS	43.33	44.77	11.13	4.20	10.02
T9: Weed free check	47.20	49.83	16.37	7.33	17.07
T10: Weedy check	20.13	34.40	4.49	2.49	4.25
S.E.+	0.45	0.40	0.17	0.10	0.12
CD at 5%	1.24	1.11	0.48	0.24	0.32

Table.2 Effect of mechanical and chemical weed control measures on economics of sesame at harvest

Treatment	Total cost (₹ ha-1)	Gross income (₹ ha-1)	Net income (₹ha-1)	B:C Ratio
T1: Pendimethalin (PE) @ 0.75 kg a.i/ha	34671	35406	735	1.02
T2: Pendimethalin (PE) @ 0.75 kg a.i/ha+ one HW at 15 DAS	37371	39535	2164	1.06
T3: Pendimethalin (PE) @ 0.75 kg a.i/ha+ one HW at 30 DAS	37371	57730	20359	1.54
T4: Pendimethalin (PE) @ 0.75 kg a.i/ha+ one HW at 45 DAS	37371	38139	768	1.02
T5: Quizalfop-ethyl (POE) 0.05 kg ai/ha	34753	34779	26	1.00
T6: Quizalfop-ethyl (POE) 0.05 kg ai/ha + one HW at 45 DAS	37633	57403	19770	1.52
T7: HW at 30 DAS	36500	49663	13163	1.36
T8: HW and Hoeing at 45 DAS	37140	45603	8463	1.22
T9: Weed free check	42140	76965	34825	1.82
T10: Weedy check	32060	26782	-5277	0.83

Effect of weed control measures on economics different treatments of sesame

Data of the Economics of the treatments indicated that, net returns as well as B:C ratio were higher with treatment T9, found to be significantly superior than the all other treatments which was followed by treatments T3, T6 and T7. While negative net return and less than one B:C ratio recorded by weedy check (T10) treatment (Table 2). Bhadauria *et al.*, (2012) reported that, different weed management treatments increases the net profit, highest net profit recorded in weed free treatment followed by post emergence application of herbicide with one HW at 30 DAS and lowest net profit recorded in weedy check plot due to poor performance of the sesame crop because of excessive weed competition.

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 Nisha, Asha Arora and K.S. Yadav (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 Sesame (*Sesamum indicum*). *Indian Journal of Agronomy*. 43(1&2): 480-483.

Duary. B and D. Hazra (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.

Sasikala K., Pashok and Snm Ramachandra Boopathi (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.

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

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