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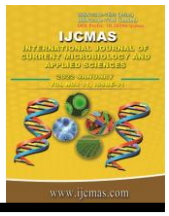

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Effect of Different Herbicides on Yield and Yield Attributing Characters of Summer Sesame (*Sesamum indicum* L.)

Sushant Saha, A. K. Thakur*, Manish Kumar, T. Chandrakar and D. P. Singh

S.G. College of Agriculture and Research Station, Jagdalpur-494001, IGKV, Raipur, Chhattisgarh, India
**Corresponding author*

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A B S T R A C T

The study was conducted at Instructional cum Research Farm, S.G. College of Agriculture and Research Station, Kumharawand, Jagdalpur, Bastar (C.G.) during summer season 2021. Result revealed that two hand weeding significantly highest plant height, plant dry weight, no. of seeds capsule^{-1}, no. of capsules plant^{-1}, gross return, grain yield, straw yield and net return but B:C ratio was highest in treatment Imazethapyr 10% SL @ 75g ha^{-1} at 20 DAS test weight was not affected by different weed control methods but it was numerically highest in treatment two hand weeding. It can be concluded that farmers can go for post emergence application of Imazethapyr 10% SL @75g ha^{-1} at 20 DAS for better weed management and higher seed yield.

Introduction

Sesame (*Sesamum indicum* L.) is also known as Gingelly, Til (derived from a sanskrit word Taila). It is also called poor man substitute of ghee as it provides large amount of oil. People used to say it is Rani of Tilhan (Babu *et al.*, 2016). Sesame is multipurpose crop use as raw materials in the production of confectionery and bakery products; while the oil is use in the industry to produce carbon paper, soap, perfume, pharmaceuticals and edible vegetable oils (Yol *et al.*, 2010). Sesame is economically very important crop, due to its high oil content about 40-64 % and 20-25 % protein. Its oil is mainly used for cooking purposes, cosmetics, perfumery, pharmaceuticals industries and for the manufacture of insecticides, soap and paints (Shin *et al.*, 2003) Globally sesame is grown on 6.57 million hectares with production of 2.94 million tonnes and productivity of 448 kg ha^{-1} (Anonymous, 2013). India is the world's largest producer of sesame and stand 1st in both area and production but productivity is very low. India is the 4th largest edible oil economy in the world (Tripathy and Bastia, 2012). Nearly one fourth of world's sesame production is from India which occupies 38 per cent with an area of 16.67 lakh hectares with a production of 7.47 lakh tonnes and productivity of 448 kg ha^{-1} in the year 2017 (Ambika and Sundari, 2019). Weeds are one of the major constraints for

the poor yield of sesamum crop as they compete with the crop plants for nutrient, moisture, space and light and 50-75% yield reduction cause by weeds in sesamum crop (Bhadauria *et al.*, 2012).

Materials and Methods

The study was conducted at Instructional cum Research Farm, S.G. College of Agriculture and Research Station, Kumharawand, Jagdalpur, Bastar (C.G.) during summer season 2021. The soil of experimental field was *Inceptisols* with neutral pH, organic carbon was medium, available N was low and, available P and K was medium in the soil.

The experiment was carried out in Randomized Complete Block Design (RBD) and replicated thrice with consists of eight treatments ie. T_1: Oxyfluorfen 49EC @ 75g ha $^{-1}$ at 3 DAS, T_2: Metribuzin 70%WP @ 200g ha^{-1} at 3 DAS,T_3: Fenoxaprop-p-ethyl 9.3% w/w EC @ 100g ha^{-1} at 20 DAS, T_4: Imazethapyr 10 % SL @ 75g ha^{-1} at 20 DAS, T_5: Quizalofop-p-ethyl 5 EC @ 50g ha^{-1} at 20 DAS, T_6: Propaquizafop 10EC @ 60g ha^{-1} at 20 DAS, T_7: Two hand weeding at 20 and 40 DAS and T_8: Absolute control. Variety GT-1 was taken as test crop with recommended dose of fertilizer 60:30:20 kg NPK ha^{-1} and planting geometry was 40 cm x 10 cm. The data obtained on various parameters were tabulated and subjected to statistical analysis. The difference of treatment was tested with F test, where F test shown their significance, the level of treatment were compared by critical difference at 5% level of probability. The skeleton of analysis of variance and formula used for various estimations are given by Gomez and Gomez (1984).

Results and Discussion

Plant Height (cm)

The plant height of sesame at different crop growth stages were recorded in Table 1. The data reveals that treatment Quizalofop-p-ethyl 5EC @ 50g ha^{-1} (T_5) recorded significantly taller plant at 20 and 40 DAS among all the treatment which was found significantly on par with treatment Absolute control (T_8), Metribuzin 70% WP @ 200g ha^{-1} (T_2) and Propaquizafop 10EC @ 60g ha^{-1} (T_6) at 20 DAS.

At 40 DAS, Two hand weeding (T_7) and Fenoxaprop-p-ethyl 9.3% w/w EC @ 100g ha^{-1} (T_3) was observed on par, it might be due to maintenance of weed free environment at critical growth stage. Ambika and Sundari (2019) also reported similar results. At 60, 80 DAS and at harvest treatment Two hand weeding (T_7) produced significantly taller plant which was recorded at par with Quizalop-p-ethyl 5EC @ 50g ha^{-1} (T_5), Fenoxaprop-p-ethyl 9.3% w/w EC @ 100g ha^{-1} (T_3) and Imazethapyr 10% SL @ 75g ha^{-1} (T_4) at 60 DAS and Fenoxaprop-p-ethyl 9.3% w/w EC @ 100g ha^{-1} (T_3) at 80 DAS and at harvest. It was due to periodical removal of weeds by hand weeding which provide better weed free environment to the crop during critical period for growth and development.

These results were in conformity with the findings of Singh *et al.*, (2018) and Mathukia *et al.*, (2015).

Yield and yield attributing characters

Table 2 reveals that treatment Two hand weeding (T_7) recorded significantly higher number of seed capsule^{-1} and number of capsule plant^{-1} among all treatment and lowest was recorded in treatment Absolute control (T_8).

Test weight was not produced significant effect due to different weed management practices but it was recorded numerically higher test weight in treatment Two hand weeding (T_7) and lowest test weight was recorded in treatment Absolute control (T_8). Grain yield and straw yield was recorded significantly highest in treatment Two hand weeding (T_7) and lowest was recorded in treatment Absolute control (T_8). The increase in yield attributes under two hand weeding was due to availability of nutrient, water, light and space to the crops as a result higher grain and straw yield. Gupta and Kushwah (2016 a) also reported similar results.

Table.1 Effect of different weed control methods on plant height of sesame

Treatment	Plant Height (cm)				
	At 20 DAS	At 40 DAS	At 60 DAS	At 80 DAS	At Harvest
T_1: Oxyfluorfen 49 EC @ 75g ha^{-1}	5.63	18.67	45.73	54.90	55.20
T_2: Metribuzin70% WP @ 200g ha^{-1}	6.27	17.60	38.40	43.30	46.33
T_3: Fenoxaprop-p-ethyl 9.3%w/w EC @ 100g ha^{-1}	6.00	22.53	49.87	60.10	60.47
T_4: Imazethapyr 10% SL @75g ha^{-1}	5.03	20.30	48.80	56.80	57.27
T_5: Quizalofop-p-ethyl 5EC @ 50g ha^{-1}	6.80	24.07	51.93	55.50	57.07
T_6: Propaquizafop 10EC @ 60g ha^{-1}	6.20	18.43	39.93	43.10	43.33
T_7: Two hand weeding	5.75	23.07	53.07	68.20	70.30
T_8: Absolute control	6.68	16.47	38.00	38.80	39.12
SEm ±	0.34	0.76	3.04	3.60	3.58
CD at 0.05	1.03	2.34	9.31	11.04	10.98
CV %	9.64	6.57	11.52	11.87	11.57

Table.2 Effect of different weed control methods on yield and yield attributing characters of sesame

Treatment	No. of Capsules Plant^{-1}	No. of Seeds Capsule^{-1}	Test Weight (g)	Grain Yield (kg ha^{-1})	Straw Yield (kg ha^{-1})
T_1: Oxyfluorfen 49 EC @ 75g ha^{-1}	13.4	44.78	3.17	601.37	1567.80
T_2: Metribuzin70% WP @ 200g ha^{-1}	9.13	41.37	3.20	423.61	1124.17
T_3: Fenoxaprop-p-ethyl 9.3%w/w EC @ 100g ha^{-1}	15.07	48.65	3.20	849.23	1750.50
T_4: Imazethapyr 10% SL @75g ha^{-1}	14.53	46.70	3.17	780.63	1623.63
T_5: Quizalofop-p-ethyl 5EC @ 50g ha^{-1}	16.33	48.57	3.11	843.77	1746.97
T_6: Propaquizafop 10EC @ 60g ha^{-1}	10.67	40.04	3.20	467.20	1253.47
T_7: Two hand weeding	23.53	54.94	3.38	1123.00	2297.20
T_8: Absolute control	5.07	29.76	2.73	225.23	1053.37
SEm ±	0.85	1.73	0.17	23.49	44.85
CD at 0.05	2.61	5.23	NS	71.95	137.36
CV %	10.96	6.76	9.19	6.13	5.01

Table.3 Effect of different weed control methods on economics of sesame

Treatment	Gross return (Rs ha^{-1})	Net return (Rs ha^{-1})	B:C ratio
T_1: Oxyfluorfen 49 EC @ 75g ha^{-1}	41224	26368	1.77
T_2: Metribuzin70% WP @ 200g ha^{-1}	29038	13935	0.92
T_3: Fenoxaprop-p-ethyl 9.3%w/w EC @ 100g ha^{-1}	58215	41828	2.55
T_4: Imazethapyr 10% SL @75g ha^{-1}	53512	38859	2.65
T_5: Quizalofop-p-ethyl 5EC @ 50g ha^{-1}	57840	41249	2.49
T_6: Propaquizafop 10EC @ 60g ha^{-1}	32027	16436	1.05
T_7: Two hand weeding	76982	55091	2.52
T_8: Absolute control	15440	1049	0.07
SEm ±	1611	1611	0.10
CD at 0.05	4933	4933	0.29
CV %	6.13	6.13	9.45

Economics

The data on economics are presented in Table 3. The data shows that gross return and net return was significantly higher in treatment Two hand weeding (T_7) and lowest was recorded in treatment Absolute control (T_8). Similar type of observation was earlier made by Chaudhuri and Ghosh (2020), Sangeetha *et al.*, (2019) and Gupta *et al.*, (2016b). B:C ratio was recorded significantly higher in treatment Imazethapyr 10% SL @ 75g ha^{-1} (T_4) which was comparable with treatment Fenoxaprop-p-ethyl 9.3%w/w EC @ 100g ha^{-1} (T_3), Two hand weeding (T_7) and Quizalofop-p-ethyl 5EC @ 50g ha^{-1} (T_5) and lowest B:C ratio was recorded in treatment Absolute control (T_8). It might be due to higher weed control efficiency that produced maximum B:C ratio.

Plant height, plant dry weight, number of seeds capsule^{-1}, number of capsules plant^{-1}, grain yield, straw yield, gross return and net return was significantly highest in treatment T_7 which was Two hand weeding but test weight was not affected due to different weed management practices. B:C ratio was found highest in treatment T_4 (Imazethapyr 10% SL @ 75g ha^{-1} at 20 DAS) over the rest of the treatments but it was produced similar result with Fenoxaprop-p-ethyl 9.3%w/w EC @ 100g ha^{-1} and Quizalofop-p-ethyl 5EC @ 50g ha^{-1}. It reflect the chemical weed control was cost effective, less labour require and easy method of control the weed.

References

Ambika, M. and Sundari, A. 2019. Weed management in irrigated sesame (*Sesamum indicum* L.). International scientific journal, 131: 272-278.

Anonymous, 2013. Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India, New Delhi.

Babu, K. S., Subramanyam, D., Sumathi, V. and Umamahesh, V. 2016. Weed management in sesame with sequential application of herbicides. Indian journal of weed science, 48(4): 455-457.

Bhadauria, N., Yadav, K. S., Rajput, R. L. and Singh, V. B. 2012. Integrated weed management in sesame (*Sesamum indicum* L.). Indian Journal of Weed Science, 44(4): 235-237.

Chaudhuri, A. and Ghosh, P. 2020. Effect of different weed management practices on growth and yield of summer sesame (*Sesamum indicum* L.). International journal

of chemical studies, 8(1): 2090-2093.

Gomez, K. A. and Gomez, A. A. 1984. Statistical procedures for agricultural research. A Willey- Inter Sci. Publication. John Willey & Sons, New York.

Gupta, S. and Kushwah, S. S. 2016 a. Post-emergence herbicides for weed control in sesame. Indian journal of weed science, 48(1): 97-98.

Gupta, S., Kushwah, S. S. Mandloi, R., Sahu, J., Sharma, R. N. and Yadav, S. 2016 b. Effect of post-emergence herbicides on yield and economics of sesame (*Sesamum indicum*). Indian journal of Agronomy, 61(3): 372-376.

Mathukia, R. K., Sagarka, B. K. and Jadav, C. N. 2015. Integrated weed management in summer sesame. Indian Journal of Weed Science, 47(2): 150–152.

Sangeetha, K., Selvakumar, T. and Chinnamuthu, C. R. 2019. Effect of chemical weed management practices on economics of irrigated sesame cultivation in western zone of Tamil Nadu. International Journal of Chemical Studies, 7(4): 144-147.

Shin, H. S., Park, H. and Park, D. 2003. Influence of different oligosaccharides and Inulin on Heterocyclic Aromatic Amine Formation and Overall Mutagenicity in Fried Ground Beef Patties. J. Agric. Food Chem., 51: 6726-6730.

Singh, R., Ghosh, D., Dubey, R. P. and Singh, V. P. 2018. Weed control in sesame with pre-emergence herbicides. Indian Journal of Weed Science, 50(1): 91–93.

Tripathy, S. and Bastia, D. K. 2012. Irrigation and nutrient management for yield augmentation of summer sesame (*Sesamum indicum* L.). Journal of Crop and Weed, 8(2): 53-57.

Yol, E., Karaman, E., Furat, S. and Uzun, B. 2010. Assessment of selection criteria in sesame by using correlation coefficients, path and factor analyses. Australian Journal of Crop Science, 4: 598-602.

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