



## Post-emergence herbicides for weed control in sesame

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Sesame [*Sesamum indicum*(L.)] popularly known as til, tilli, gingelly *etc.* is important oilseed crop and belongs to the family *Pedaliaceae*. The area under the crop in India is about 1901 thousand hectares and total production is 810 thousand tonnes (Anonymous 2011-12). In Madhya Pradesh total cultivated area and production of sesame are 295 thousand hectares and 155 thousand tonnes; respectively. Average yield in India and Madhya Pradesh is 426 and 525 kg/ha, respectively (CLRS 2011-12). Severe weed competition is one of the major constraints in lower productivity of sesame. Though the conventional methods of weed control *viz.* hand weeding, hand hoeing *etc.* are very much effective but due to high wages and non-availability of labourers during the critical weeding season (15-30 DAS) and incessant protracted rains, use of herbicides and their combination with cultural practices could be more time saving, economical and efficient to check early crop-weed competition.

The present experiment was conducted at the Research Farm, College of Agriculture, Gwalior during *Kharif* season of 2013-14 under the edaphic and climatic conditions of Gwalior (M.P.). The topography of the field was uniform with proper drainage. The soil of the experimental field was sandy clay loam in texture. The experiment was conducted in randomized block design with and 7 treatments in three replication. The sesame crop variety 'TKG-22' was sown on 01-07-2013 and was grown with all recommended practices except weed control measures which were applied as per treatments undertaken for investigation. The nutrients were applied at the rate of 60 kg N, 40 kg P<sub>2</sub>O<sub>5</sub> and 20 kg K<sub>2</sub>O/ha.

### Effect on weeds

Weeds are most limiting factor responsible for low yield of sesame. The narrow-leaved weed flora

was dominated by species including *Cyperus rotundus* (L.), *Cynodon dactylon* (L.) pers., *Echinochloa crus-galli* (L.) Beauv., *Echinochloa colona* (L.), *Dinebra arabica* (L.), *Digitaria longiflora* (L.) and *Dactylactenium aegyptium* (L.) in the experimental site. Two hand weeding at 20 and 40 DAS gave complete total weed control. followed by propaquizafop 100 g/ha. The highest total weed dry weight was noted under control/weedy check. Reduced total weed dry weight obtained under different treatments might be due to effective control given by all treatments over control resulted in less population and reduced growth in weedy plants. The highest weed control efficiency (95.50%) was recorded in treatment two hand weeding at 20 and 40 DAS. Followed by treatment was propaquizafop 100 g/ha (73.03%). This may be attributed to better control of weeds under various treatments under investigation which might had provided comparatively stress free environment to crop.

### Effect on crop

The weed control practices significantly affected the yield and yield attributes in sesame crop. The highest plant height, number of branches/plant, number of leaves/plant, number of capsules/plant, grains/capsule, plant dry weight (g), 1,000-grain weight (g), grain yield/plant (g), grain yield (kg/ha), stalk yield (kg/ha) and harvest index (%) observed in treatment Two hand weeding at 20 and 40 DAS, followed by propaquizafop 50 g/ha. Whereas the application of propaquizafop 100 g/ha gave best weed control result but had phytotoxic effects, *viz.* chlorosis on growth of sesame resulting in decreased yield. The highest weed control efficiency and lowest total weed dry weight were recorded in treatment Two hand weeding at 20 and 40 DAS, followed by propaquizafop 100 g/ha. The results were conformed with (Nadeem *et al.* 2009, Bhadauria *et al.* 2012).

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**Table 1. Effect of weed control practices on yield attributing characteristics of sesame**

Treatment	Plant height (cm)	No. of branches/plant	No. of leaves/plant	No. of capsules/plant	Number of grains/capsule	Dry weight/plant (g)	1,000-grain weight (g)	Grain yield/plant (g)
Propaquizafop 50 g/ha as PoE	149.1	3.60	164.1	24.2	34.5	10.7	2.66	2.23
Propaquizafop 62.5 g/ha as PoE	143.2	2.93	148.6	22.1	33.0	9.9	2.54	1.85
Propaquizafop 100 g/ha as PoE	141.3	2.73	144.1	21.5	32.7	9.6	2.52	1.77
Quizalofop-p-ethyl 50 g/ha as PoE	148.5	3.40	160.9	23.5	34.1	10.5	2.64	2.12
Fenoxaprop-p-ethyl 100 g/ha as PoE	140.6	2.67	142.2	21.1	32.6	9.5	2.50	1.72
Two hand weeding at 20 and 40 DAS	154.3	4.27	175.3	26.9	38.1	12.1	2.75	2.82
Control/weedy check	129.5	1.87	129.4	16.9	24.9	7.9	2.19	0.93
LSD (P=0.05)	4.09	0.40	9.7	1.35	0.95	0.59	0.07	0.21

**Table 2. Effect of weed control practices on total weed control efficiency, yield and economics, grain yield, stalk yield, harvest of sesame**

Treatment	Total weed dry weight (g/m <sup>2</sup> )	Weed control efficiency (%)	Grain yield (kg/ha)	Stalk yield (t/ha)	Harvest index (%)	Net income (x103 `/ha)	B:C Ratio
Propaquizafop 50 g/ha as PoE	69.3	68.3	516	2.58	16.6	36.99	2.76
Propaquizafop 62.5 g/ha as PoE	63.6	70.6	437	2.36	15.6	28.03	2.32
Propaquizafop 100 g/ha as PoE	58.2	73.0	417	2.28	15.5	25.05	2.14
Quizalofop-p-ethyl 50 g/ha as PoE	72.4	64.0	501	2.53	16.6	34.76	2.61
Fenoxaprop-p-ethyl 100 g/ha as PoE	60.9	72.1	409	2.25	15.4	24.19	2.10
Two hand weeding at 20 and 40 DAS	-	95.5	674	2.94	18.6	48.70	2.81
Control/weedy check	180.0	-	208	1.86	10.0	4.06	1.21
LSD (P=0.05)	21.8	-	42	0.18	0.87	-	-

PoE=post-emergence

### Economics

All the weed control treatments gave higher income over control/weedy check. The highest net return and B:C ratio were obtained under treatment two hand weeding at 20 and 40 DAS, followed by Propaquizafop 50 g/ha, while lowest B:C ratio with control/weedy check. Under all weed control treatments B:C ratio were found low due to abnormal weather conditions in crop growth and maturity period.

### SUMMARY

On the basis of above findings, it may be concluded that treatment Two hand weeding at 20 and 40 DAS, followed by treatment Propaquizafop 10% EC (PoE) 50 g/ha are most effective and remunerative weed control practices for controlling

the weeds in sesame under sandy clay loam soils of Northern M.P.. The higher grain yield and net return were obtained from treatment two hand weeding at 20 and 40 DAS.

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