Short communication

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# Weed control in sesamum with pre-emergence herbicides

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Sesamum is regarded as "Queen of Oilseeds" by users because of quality (fatty acid composition) of its oil and its resistance to oxidation and acidity even when stored at ambient air temperature (Rathore 2005). The area under sesamum in India was 13.74 lakh ha with production of 5.22 lakh tonnes having productivity of 380 kg/ha during 2012-13, however, in Maharashtra state sesamum area is 0.31 lakh ha with production of 0.8 lakh tonnes and productivity of 260 kg/ha during 2012-13. The area under Marathawada region was 0.10 lakh ha with production of 0.02 lakh tonnes and productivity of 217 kg/ha during 2012-13 (Anonymus 2013).

In sesamum the weed competition is one of the most important causes of yield loss, which is estimated around 30-60 per cent. (Mukhtar and Elamin 2012). Application of herbicide is one of the best options and adequate information regarding the use of herbicide is available but in *Kharif* farmers have to synchronous the sowing time and pre-emergence herbicide application. Hence a field experiment was conducted at weed science Research Center, Parbhani during 2013 to find out the most effective pre emergence herbicide for Sesamum crop.

The experiment was conducted at Weed Science Research Center, VNMKV, Parbhani (M.S.) on black cotton soil with low nitrogen, medium phosphorus and high potassium content. The experiment was laid out in randomized block design with seven treatments [pendimethalin 0.75 kg/ha as pre-mergence, butachlor 1.50 kg/ha as pre-emergence, oxyfluorfen 0.10 kg/ha as pre-mergence, alachlor 1.00 kg/ha as pre-emergence, Weed free (four hand weeding at 15 days interval), weedy check, and two hand weeding (20 and 40 DAS) and one hoeing (30 DAS) and replicated thrice. The gross plot size was 5.4 x 4.5 m and net plot size 4.5 x 4.2 m. The sesamum cv. '*Phule Til- 1'* was sown by drilling on 16th June 2013 at 45 x 15 cm. Basal dose of fertilizer at 30:60 kg/ha N and P was applied. The total annual rainfall received was 658 mm in 40 rainy days. The weed count and dry weed weight was measured at 15 days interval. The weed count was measured with a quadrent.

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**Weed count**

Thirty three weed species associated with sesamum crop were recorded. Among which dicot contributed more than grassy species. Dominating dicots weeds were *Ipomoea* spp., *Phylanthus medrapatensis, Convolvulus arvensis, Euphorbia hitra, Parthenium hyseterophorus, Digera arvensis* and *Acalypha indica*. In grassy species *Cynodon dactylon* and *Bracheria eruciformis,* and in sedges *Cyperus rotundus* was recorded during the period of investigation.

As regards to herbicidal treatments, at all stages lower weed count of monocots was observed with (PE- butachlor at 1.5 kg/ha) followed by (PE- alachlor at 1.0 kg/ha). Whereas lowest weed count of dicots was observed in herbicidal treatment of (PE- butachlor 1.5 kg/ha) .

**Dry weed weight**

At all dates of observations, lowest dry weed weight of monocots and dicots was recorded in treatment (weed free) (Table 1). As regards to herbicidal treatments, at all crop growth stages lower dry weight of monocot weeds was observed with treatment (butachlor 1.5 kg/ha) followed by treatment (alachlor 1.0 kg/ha). Whereas lowest dry weed weight of dicots was observed in herbicidal treatment (PE- butachlor at 1.5 kg/ha) followed by treatment (PE- oxyfluorfen at 0.10 kg/ha.

**Weed control efficiency**

Highest weed control efficiency was recorded in weed free followed by two hand weedings + one hoeing. Among herbicidal treatments, PE - butachlor at 1.5 kg/ha recorded higher weed control efficiency because of restricted growth of weeds.

**Yield and net returns**

Highest sesamum seed yield (0.48 t/ha) and stalk yield (1.40 t/ha) were harvested from weed free, which was statistically similar with two hand weedings + one hoeing *i.e.* (seed yield 0.45 t/ha and

**Table 1. Mean weed count/m$^2$ as influenced by different treatments at various crop growth stages**

| Treatment | 30 DAS | | 45 DAS | | 60 DAS | |
|---|---|---|---|---|---|---|
| | Monocot | Dicot | Monocot | Dicot | Monocot | Dicot |
| $T_1$ – Pendimethalin 0.75 kg/ha | 4.50 (19.8) | 11.53 (132.5) | 4.74 (22.0) | 11.80 (138.9) | 4.88 (23.4) | 11.87 (140.4) |
| $T_2$ – Butachlor 1.50 kg/ha | 3.98 (15.4) | 10.98 (120.1) | 4.31 (18.1) | 11.40 (129.6) | 4.44 (19.3) | 11.59 (133.8) |
| $T_3$ – Oxyfluorfen 0.10 kg/ha | 6.60 (43.2) | 11.13 (123.6) | 7.02 (48.9) | 11.54 (132.8) | 7.32 (53.2) | 11.71 (136.8) |
| $T_4$ – Alachlor 1.00 kg/ha | 4.24 (17.5) | 11.26 (126.5) | 4.49 (19.7) | 11.63 (134.9) | 4.59 (20.6) | 11.73 (137.1) |
| $T_5$ – Weed free | 3.12 (9.3) | 4.98 (24.3) | 3.40 (11.1) | 5.31 (27.7) | 3.61 (12.6) | 5.58 (30.7) |
| $T_6$ – Weedy check | 11.14 (123.6) | 18.97 (359.9) | 11.94 (142.1) | 19.72 (388.7) | 12.70 (156.3) | 19.81 (392.0) |
| $T_7$ – 2 hand weedings + 1 hoeing | 3.31 (10.5) | 5.13 (25.9) | 3.52 (12.0) | 5.44 (29.1) | 3.67 (13.0) | 5.70 (32.1) |
| LSD (P=0.05) | 2.66 | 6.10 | 2.82 | 6.31 | 2.98 | 6.37 |

**Table 2. Mean dry weed weight (g/m$^2$) as influenced by different treatments at various crop growth stages**

| Treatment | 30 DAS | | 45 DAS | | 60 DAS | |
|---|---|---|---|---|---|---|
| | Monocot | Dicot | Monocot | Dicot | Monocot | Dicot |
| $T_1$ – Pendimethalin 0.75 kg/ha | 3.20 (10.2) | 9.17 (83.6) | 4.74 (22.0) | 9.41 (88.0) | 4.92 (23.7) | 9.86 (96.7) |
| $T_2$ – Butachlor 1.50 kg/ha | 2.60 (6.3) | 8.31 (68.5) | 2.96 (8.3) | 8.71 (75.4) | 3.05 (8.8) | 8.90 (78.7) |
| $T_3$ – Oxyfluorfen 0.10 kg/ha | 4.10 (16.3) | 9.14 (83.0) | 4.89 (23.4) | 9.36 (87.1) | 5.01 (24.6) | 9.74 (94.4) |
| $T_4$ – Alachlor 1.00 kg/ha | 2.86 (7.7) | 9.02 (80.9) | 3.11 (9.2) | 9.29 (85.8) | 3.43 (11.3) | 9.56 (90.9) |
| $T_5$ – Weed free | 1.54 (1.9) | 2.01 (3.5) | 1.80 (2.7) | 2.18 (4.2) | 1.96 (3.3) | 2.26 (4.6) |
| $T_6$ – Weedy check | 8.61 (73.6) | 19.70 (387.6) | 10.12 (101.9) | 20.54 (421.4) | 12.15 (147.1) | 21.79 (474.3) |
| $T_7$ – 2 hand weedings + 1 hoeing | 1.96 (3.3) | 2.05 (3.7) | 2.37 (5.1) | 2.27 (4.6) | 2.59 (6.2) | 2.56 (6.1) |
| LSD (P=0.05) | 1.86 | 4.88 | 2.49 | 5.04 | 2.69 | 5.28 |

The data were subjected to $\sqrt{x+0.5}$ transformation and values in parentheses are original.

**Table 3. Mean seed yield, stalk yield, gross / net monetary return and B:C ratio as influenced by different treatments at harvest**

| Treatment | Seed yield (t/ha) | Stalk yield (t/ha) | Gross monetary return (x10$^3$ `/ha) | Net monetary return (x10$^3$ `/ha) | B:C ratio | Mean WCE (%) |
|---|---|---|---|---|---|---|
| $T_1$ – Pendimethalin 0.75 kg/ha | 0.39 | 1.20 | 48.00 | 32.95 | 3.18 | 56.3 |
| $T_2$ – Butachlor 1.50 kg/ha | 0.42 | 1.25 | 51.62 | 37.21 | 3.58 | 65.0 |
| $T_3$ – Oxyfluorfen 0.10 kg/ha | 0.36 | 0.96 | 44.28 | 29.58 | 3.01 | 54.3 |
| $T_4$ – Alachlor 1.00 kg/ha | 0.40 | 1.20 | 49.20 | 34.63 | 3.37 | 62.1 |
| $T_5$ – Weed free | 0.48 | 1.40 | 58.95 | 39.10 | 2.96 | 86.2 |
| $T_6$ –Weedy check | 0.27 | 1.02 | 32.90 | 19.05 | 2.37 | - |
| $T_7$ – 2 hand weedings + 1 hoeing | 0.45 | 1.30 | 55.25 | 36.80 | 2.99 | 83.2 |
| LSD (P=0.05) | 0.09 | 0.15 | 4.93 | 4.00 | - | - |

straw yield 1.30 t/ha), PE - application of butachlor at 1.5 kg/ha and found significantly superior over rest of the treatments. Weedy check recorded lowest seed yield/ha (Table 2). Similar results were reported earlier by Mondal *et al.* (2008) and Sukhadia *et al.* (2004).

Highest net return was achieved with weed free. However, it was statistically at par PE - butachlor at 1.5 kg/ha and found significant over rest of all treatments. Similar results were also reported by Mondal *et al.* (2008). Similarly, highest benefit : cost ratio of 3.58 was observed in herbicidal treatment $T_2$ (PE- butachlor at 1.5 kg/ha) followed treatment $T_4$ (PE - alachlor at 1.0 kg/ha).

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