**Chemical Weed Management in Sesame:**

**A Review**

**ABSTRACT**

This review aims to consolidate and critically examine the studies conducted on different pre- and post-emergence herbicides evaluated for their effectiveness in weed management in sesame, with a focus on their impact on weed suppression, crop growth, and yield performance. Sesame (*Sesamum indicum* L.) holds significant importance as an edible oilseed crop next to groundnut, rapeseed and mustard in India. Sesame is the oldest oil seed crop known to human beings and has been used by humans since ancient past. In 2023–24, it was cultivated on 15.31 lakh hectares with a production of 8.47 lakh tonnes and a productivity of 553 kg ha⁻¹. Weed infestation, especially during the early growth stages due to sesame’s slow initial growth, can reduce yields by 64% to 95.9%. Effective weed management during the critical period of 15–30 days after sowing is vital. Chemical control offers efficiency and scalability. Pre-emergence herbicides like alachlor, pendimethalin, and pyroxasulfone suppress early weeds, while post-emergence herbicides such as quizalofop-p-ethyl, clethodim, and propaquizafop target grassy weeds. However, selective options for broadleaf weeds remain limited due to crop sensitivity. The review emphasises recent research on herbicide efficacy and crop safety, promoting integrated weed management for sustainable sesame production. Future research should focus on identifying selective post-emergence herbicides for broadleaf weeds and promoting integrated weed management approaches. Combining chemical, mechanical, and cultural methods can ensure sustainable and efficient weed control, ultimately improving sesame productivity and sustainability.

*Keywords: Sesame, Pre-emergence herbicides, Post-emergence herbicides, Crop toxicity*

**1. INTRODUCTION**

Weeds pose a significant biological threat to agricultural systems, capable of causing substantial damage to both cropped and non-cropped areas. Their presence not only reduces the quality of produce but also increases production costs, as they often require significant effort and resources to manage. Weeds frequently serve as alternative hosts for insect pests and diseases, further complicating crop management practices (Dhanush et al., 2025). Sesame (*Sesamum indicum* L.), a tropical annual herb of the family Pedaliaceae, is commonly known as til or gingelly. Sesame (*Sesamum indicum* L.) holds significant importance as an edible oilseed crop next to groundnut, rapeseed and mustard in India. Sesame is the oldest oilseed crop known to human beings and has been used by man since ancient past. Sesame is one of the most significant traditional oilseed crops grown in tropical, subtropical, Asian and African nations. India is the world’s largest producer, with 15.31 lakh ha area, 8.47 lakh tonnes production and 553 kg ha⁻¹ productivity in 2023-24 (Indiastat, 2023-24). Among various biotic stresses, weed infestation is the most serious constraint in sesame production. “Heavy weed infestation is one of the key factors limiting the output among the various production limitations for sesame” (Chavhan et al., 2023). During the initial stages, sesame seedlings are very small, tender and have very slow growth. Slow growth of sesame and simultaneous emergence and vigorous growth of weeds make crop a poor competitor with weeds for light, moisture, space, and nutrients and shows a negative impact on sesame yield (Bhadauria *et al*., 2012). According to Aadi *et al.* (2024) yield losses resulting from weed competition all over the growing season in sesame ranged from 66.4 to 95.9% during summer. Bhavani *et al*. (2023) reported that the seed yield of sesame due to uncontrolled weeds was reduced by 64-70%. According to Bhaumik *et al*. (2023) “41.6 kg ha-1 of N, 6.6 kg ha-1 of P and 33.3 kg ha-1 of K were removed by weeds in the sesame field”. “The heavy weed infestation in unweeded check plots resulted in increased weed nutrient uptake upto 44.6, 5.6 and 34.0 kg of N, P and K ha-1, respectively in the experimental field of sesame” (Babu and Subramanyam 2018). The critical period of crop-weed competition during which weed management is very important to increase the yield of sesame is 15-30 DAS (Bhavani *et al.,* 2023; Verma *et al.,* 2023; Das *et al.,* 2022; Venu *et al.,* 2022; and Chauhan *et al.,* 2019). Hence, weed control at critical stages is essential to reduce yield losses caused by weeds. Weed control makes moisture and nutrients available to the crop and results in higher yield.

**2. WEED FLORA**

Hota *et al*. (2024) observed that *Digitaria sanguinalis*, *Echinochloa colona, Poa annua* and *Dactyloctenium aegyptium* among the grasses, *Melochia corchorifolia*, *Cleome viscosa* and *Cassia tora* among the broadleaved weeds and *Cyperus iria* among sedges were predominantly found in the sesame field in clayey soils of Odisha during summer. The weed flora of the sesame field comprised five species of grasses - *Cynodon dactylon, Dactyloctenium aegyptium, Digitaria sanguinalis, Echinochloa colona* and *Eleusine indica*; two species of sedges - *Cyperus rotundus* and *Cyperus esculentus*; five species of broadleaved weeds - *Alternanthera sessilis, Cleome viscosa, Euphorbia hirta, Heliotropium indicum* and *Trianthema portulacastrum* in sandy loam soils of Visva-Bharati, West Bengal during summer (Debnath *et al*., 2022). Kamani *et al.* (2022) reported that “the sesame field was infested with *Echinochloa crusgalli*, *Digitaria sanguinalis*, *Sorghum halepense*, *Cynodon dactylon*, *Bracharia* spp. among grassy weeds, *Amaranthus viridis, Alternanthera sessillis*, *Digera arvensis*, *Convolvulus arvensis*, *Eclipta alba*, *Vernonia cinerea*, *Euphorbia hirta*, *Euphorbia maderaspatensis*, *Cassia tora*, *Physalis minima*, *Trianthema portulacastrum* among broad leaf weeds and *Cyperus rotundus* among sedges during summer in clayey soils of Navsari, Gujarat”. The grassy weed flora observed in summer sesame were *Cynodon dactylon*, *Chloris barbata, Elusine indica, Dactyloctenium aegyptium*, *Digitaria sanguinalis,* sedges- *Cyperus difformis*, *Cyperus iria, Cyperus rotundus,* and broadleaved weeds- *Chenopodium album*, *Cleosia argentea*, *Amaranthus viridis, Portulaca oleracea*, *Cardiospermum halicacabum* in sandy clay loam soils of Odisha (Patnaik *et al.,* 2021).

**3. WEED MANAGEMENT**

Weed management in sesame (*Sesamum indicum* L.) is a critical component of crop production, as the crop is highly sensitive to weed competition, particularly during its early growth stages. Weeds compete aggressively with sesame for essential resources such as light, nutrients, water, and space, leading to significant reductions in growth, yield attributes, and overall productivity. Effective weed control is therefore essential for achieving optimum yields. A variety of weed management strategies have been explored, including physical, mechanical, and chemical methods. Among these, manual weeding, particularly two-hand weedings at 20 and 40 days after sowing (DAS), has consistently shown to improve plant growth, enhance yield attributes, and ultimately boost seed yield in sesame (Hota *et al*., 2024; Saha *et al*., 2022 and Aktar *et al*., 2021). Despite its effectiveness, manual weeding is inherently labor-intensive, time-consuming, physically demanding, and costly, making it increasingly less feasible, especially in regions where agricultural labor is scarce or expensive. Mechanical weeding, although an alternative, is often not suitable in sesame cultivation due to the prevalent practice of broadcast sowing, which does not allow for easy maneuvering of weeding implements without causing crop damage. In contrast, chemical weed management offers a more efficient and practical approach. The application of herbicides provides rapid and selective weed control, is less labour-dependent and can be cost-effective over larger areas. As highlighted by Omezzine *et al.* (2011), chemical methods are advantageous due to their quick action, ability to target specific weed groups, and effectiveness from the very early stages of crop establishment, helping reduce initial crop-weed competition. Chemical weed control in sesame typically involves the application of pre-emergence and post-emergence herbicides, each serving a distinct role. Pre-emergence herbicides, applied shortly after sowing but before weed emergence, target early-germinating weed species and create a weed-free environment during the critical crop establishment phase. Post-emergence herbicides are used later in the season to control subsequent flushes of weeds that escape early control measures.

Given the increasing importance and adoption of chemical weed control in sesame, there is a growing need to synthesize existing research on the efficacy, spectrum, and crop safety of various herbicides. Therefore, this review aims to consolidate and critically examine the studies conducted on different pre- and post-emergence herbicides evaluated for their effectiveness in weed management in sesame, with a focus on their impact on weed suppression, crop growth, and yield performance. The insights from this review will help guide herbicide selection, application strategies, and integrated weed management programs tailored to sesame production systems.

**4. CHEMICAL WEED MANAGEMENT**

**4.1 Pre-Emergence Herbicides**

**4.1.1 Alachlor**

Pre-emergence application of alachlor 50 EC @ 0.75 kg ha-1 produced the higher dry matter production (26.8 g plant-1), no. of capsules per plant (29), no. of seeds per capsule (34.3) and seed yield (480 kg ha-1) of sesame and reduced weed dry weight (Mruthul *et al*., 2023). Application of alachlor @ 1.5 kg ha-1 as pre-emergence *fb* quizalofop ethyl @ 50 g ha-1 on 25 DAS as early post-emergence recorded significantly lesser weed density, dry weight, weed index (4.1%) and higher weed control efficiency (96.2%), seed yield (550 kg ha-1) and stalk yield (2432 kg ha-1) (Sujithra *et al*., 2019). Among chemical weed management practices, alachlor @ 0.375 kg ha-1 registered the maximum number of capsules per plant (38), seed per capsule (50.7) and test weight (3.46) of sesame according to Chauhan *et al.,* (2019).

**4.1.2 Butachlor**

Pre-emergence application of butachlor @ 1.0 kg ha-1 could be used as an alternative to hoe weeding for effective weed control in sesame with higher seed yield but higher dose of butachlor @ 1.5 kg ha-1 resulted in suppressed crop growth of sesame (Audu *et al*., 2021). According to Chaudhari and Ghosh (2020) sole application of butachlor @ 1.0 kg ha-1 at 3 DAS may be considered as a promising cost-effective herbicide for the improvement of seed yield. The experimental results of Jadhav (2015) showed among herbicidal treatments lower weed count and dry weight of weeds and higher weed control efficiency, seed yield (0.48 t ha-1), stalk yield (1.40 t ha-1) and monetary returns were recorded with pre-emergence application of butachlor at 1.5 kg ha-1.

**4.1.3 Diuron**

“The highest grain yield (669.9 kg ha-1) followed by weed free (837.5 kg ha-1) was obtained from the application of diuron @ 650 g ha-1 + hand weeding but the highest crop injury (10%) at 10 days after treatment was observed from the application of diuron @ 650 g ha-1sprayed two times” (Baraki *et al*., 2023). Imoloame and Abubakar (2023) reported that tank mixture of pendimethalin + diuron @ 0.5 + 0.5 kg ha-1 resulted in greater yield components and increased sesame yield by 58.1% over weedy check.

**4.1.4 Fluchloralin**

Higher seed yield (760 kg ha-1) was recorded with pre-emergence application of fluchloralin @ 0.75 kg ha-1 + hand weeding which was 29.6% over weedy check (Ghatak *et al*., 2006). Svathi *et al*. (2005) results revealed that fluchloralin @ 1.0 kg ha-1 + hand weeding at 30 DAS gave higher sesame seed yield.

**4.1.5 Imazethapyr**

Pre-emergence application of imazethapyr @ 0.015 kg ha-1 + one HW at 30 DAS gave the greatest weed suppression and also produced the maximum seed yield (855 kg ha-1) (Dadarwal and Yadav 2025). Manoj *et al*. (2017) reported that “application of imazethapyr @ 0.03 kg ha-1 as pre-emergence plus hand weeding in custard-sesame-based agri-horticulture system recorded higher sesame seed yield (292 kg ha-1) and stalk yield (825 kg ha-1)”.

**4.1.6 Metribuzin**

Elakkiyapriya *et al.* (2022) reported that the least weed density and weed dry matter production were recorded in pre-emergence application of metribuzin @ 100 g ha-1 + early post-emergence application of imazethapyr @ 30 g ha-1 at 10 DAS + hand weeding on 20 DAS in sesame. Metribuzin @ 300 g ha-1 produced the best reduction of total weeds without any significant difference in hand hoeing twice, but sesame seed yield was reduced due to phytotoxic effect of herbicide on the sesame crop (Elnenny *et al*., 2022).

**4.1.7 Metolachlor**

Application of metolachlor @ 1 kg ha-1 has scored lower weed density (<35 weeds m-2), lower fresh weed biomass and higher sesame seed yield 613.3 kg ha-1 (Zenawi *et al*., 2020). Imoloame *et al.* (2011) concluded that metolachlor at 1.5 kg ha-1 produced significantly higher seed yield (529.7 kg ha-1) and significantly low weed cover score and weed dry matter in sesame. Ndarubu *et al*. (2003) observed higher sesame yield with application of a herbicide mixture of metolachlor + metobromuron at 1.0 + 1.0 kg ha-1.

**4.1.8 Oxyfluorfen**

“Pre-emergence application of oxyfluorfen @ 0.15 kg ha-1 reduced weed density and dry weight of weeds with higher weed control efficiency and gave higher seed yield of sesame” (Patnaik *et al.,* 2020). Singh *et al*. (2018) reported that “higher stunting was observed with oxyfluorfen 0.l5 kg ha-1 in sesame on clay loam soils”. “The lowest density and dry weight of weeds with higher weed control efficiency (59.97 %), higher stature of yield components and seed yield (784 kg ha-1) of broadcasted sesame were registered with pre-emergence application of oxyfluorfen 75 g ha-1 + quizalofop 50 g ha-1 applied at 20 DAS” (Babu *et al.,* 2016).

**4.1.9 Oxadiargyl**

Pre-emergence application of oxadiargyl @ 75 g ha-1 significantly reduced the total weed density and dry matter, but crop yield was reduced due to phytotoxic effects on sesame plants (Yadav, 2024). Oxadiargyl 80 WP @ 40 g ha-1 as PE *fb* quizalofop-p- ethyl 40 g ha-1 at 20 DAS resulted in comparable yield attributes and seed yield (377 kg ha-1) of sesame as that of hand weeding at 20 and 40 DAS (Rajpurohit *et al*., 2017).

**4.1.10 Pendimethalin**

Dhanush and Geetha (2024) reported that “pre-emergence application of pendimethalin @ 0.75 kg ha-1 at 3 DAS recorded lesser total weed density (76 m-2), total weed dry matter (74.45 g m-2), weed index (24.00) and higher weed control efficiency (58.48%) at harvest without any phytotoxic effect on sesame”. The results of Kabirou *et al*. (2023) revealed that the pre-emergence application of pendimethalin followed by a hoe weeding at 6 weeks after seeding recorded higher sesamum seed yield (1160 kg ha-1). Venu *et al*. (2022) observed pre-emergence application of pendimethalin 30 % EC @ 0.75 kg ha-1 *fb* mechanical weeding at 30 DAS resulted in higher sesame seed yield (921 kg ha-1).

**4.1.11 Pyroxasulfone**

Experimental results of Giridhar (2024), showed that the lower density and dry weight of weeds in sesame was recorded with pre-emergence application of pyroxasulfone @ 100 g ha-1 at 20 DAS*.* Grichar *et al*. (2021) reported that pyroxasulfone @ 0.09 kg ha-1 produced yields that were over 260% greater than the untreated check.

**4.1.12 Trifluralin**

Amini *et al*. (2022) observed that “application of trifluralin @ 2 l ha-1 as pre-emergence in integration with hand weeding in sesame had the highest weed control efficacy, higher reduction in weed biomass (79.33%) and recorded higher grain yield (164 g m-2) in Iran”. The higher biological seed yield (1878.2 kg ha-1) was observed with pre-emergence application of trifluralin @ 1200 ml ha-1 (Akbia *et al*., 2020).

**4.2 Post-Emergence Herbicides**

**4.2.1 Clethodim**

Ramesh *et al*. (2025) reported that among the different post-emergence herbicide treatments, clethodim 25 % EC @ 120 g ha-1 recorded weed control efficiency of 71% with higher sesame yield and demonstrated its potential to use for weed management in sesame. Higher seed yield (724.8 kg) and stalk yield (2640 kg) were observed with post emergence application of clethodim 7.5% + haloxyfop-methyl 15% @ 450 g ha-1 (Ismail *et al*., 2024).

**4.2.2 Fenoxaprop-ethyl**

Pramanik *et al*., 2025 observed that seed yield (1275 kg ha-1) and stalk yield (1275 kg ha-1) were the highest with post-emergence application of fenoxaprop-ethyl 60 g ha-1. Sahu *et al*. (2019) reported that among the sequential application of herbicides, pre-emergence application of pendimethalin at 750 g ha-1 *fb* fenoxaprop at 100 g ha-1 gave higher weed control efficiency (76.6 %) and seed yield (468 kg ha-1).

**4.2.3 Haloxyfop-methyl**

Ismail *et al*., 2024 reported that post-emergence application of clethodim 7.5% + haloxyfop-methyl 15% @ 450 g ha-1 recorded higher plant height (143.8), number of branches plant-1 (6.3), no. of capsules plant-1 (48.6) and no. of grains capsules-1 (56.8). According to Vafaei *et al*. (2013), higher dry matter accumulation (6578.1 kg ha-1) and grain yield (1117.7 kg ha-1) were recorded with application of haloxyfop + trifluralin @ 250+720 g ha-1.

**4.2.4 Imazethapyr**

“Post-emergence application of imazethapyr @ 0.015 g ha-1 supplemented with hand weeding at 30 DAS recorded significantly higher plant height, dry matter production with higher number of capsules plant-1, which was on par with the hand weeding twice” (Dhaka *et al*., 2013). The findings of Geethanjali *et al.* (2022) indicated that “imazethapyr @ 75 g ha-1 applied as a post-emergence herbicide at the seedling stage was toxic to sesame and caused adverse effects on sesame growth and yield”.

**4.2.5 Imazamox**

Vinay *et al*. (2023) reported that post emergence application of imazethapyr 10% SL + imazamox 10% SC @ 35 +35 g ha-1 recorded the lowest weed density (10.6), dry weight (6.4), weed index (5.8) and the highest weed control efficiency (82 %), grain yield (810 kg ha-1) and stalk yield (2111 kg ha-1). EPoE imazethapyr 35 + imazamox 35% @ 30 g ha-1 *fb* hand weeding at 40 DAS recorded higher net return and benefit cost ratio from 743 kg ha-1 of seed yield (Sangeetha *et al.,* 2019).

**4.2.6 Propanil**

Propanil was applied post-emergence @ 0.72, 1.44 and 2.16 kg ha-1. At a lower dose (0.72 kg ha-1) higher grain yield of 858 kg ha-1 was recorded without toxicity to the sesame crop. But, higher doses (1.44 and 2.16 kg ha-1) controlled the weeds effectively but caused significant injuries to the sesame crop and crop recovered after one month of post-emergence application of propanil. (Magani *et al.,* 2012).

**4.2.7 Propaquizafop**

According to Verma *et al*. (2023), post-emergence application of propaquizafop 10 EC @ 50 g ha-1 at 20 DAS recorded lower density of total weeds and the highest seed yield (710 kg ha-1) and stover yield (1082 kg ha-1). Among herbicidal weed control treatments, the highest sesame seed yield (517 kg ha-1) and stalk yield (2691 kg ha-1) were recorded with propaquizafop application @ 50 g ha-1 but propaquizafop @ 125 g ha-1 and 100 g ha-1 had phytotoxic effects on the growth of sesame (Gupta *et al.* 2016).

**4.2.8 Quizalofop-p-ethyl**

The sequential application of pendimethalin 0.50 kg ha-1 as pre-emergence followed by quizalofop-p-ethyl 0.05 kg ha-1 as post-emergence at 30 DAS, recorded the highest dry matter accumulation (15.01 g plant-1) and growth of summer sesame (Ninama *et al*., 2025). Higher seed (1177 kg ha-1) and stalk (1610 kg ha-1) yield were obtained with the application of quizalofop ethyl @ 0.05 kg ha-1 on 25 DAS + one hand weeding at 42 DAS in sesame (Roy and Umesha, 2023). Ambika and Sundari (2019) observed that “pre-emergence application of alachlor @ 1.5 kg ha-1 at 3 DAS followed by post-emergence application of quizalofop ethyl @ 0.05 kg ha-1 at 21 DAS in sesame resulted in significantly higher plant height, number of branches plant-1, number of capsules plant-1 and number of seeds capsule-1”.

**5. CONCLUSION**

Effective weed management is crucial for maximising sesame yield, particularly during early growth stages when weed competition is most detrimental. Weeds compete for vital resources and serve as alternate hosts for pests and diseases, causing significant yield losses. Chemical weed control using herbicides has emerged as an effective strategy for managing weeds and improving crop performance. Pre-emergence herbicides like alachlor, pendimethalin, and pyroxasulfone effectively control early-emerging grasses and some broadleaf weeds by preventing seed germination. Post-emergence herbicides such as quizalofop-p-ethyl, clethodim, fenoxaprop-ethyl, and propaquizafop are effective against grassy weeds that emerge later, improving yield and economic returns. However, a major limitation is the lack of effective and crop-safe post-emergence herbicides for broadleaf weed control. Broad-spectrum herbicides may cause phytotoxicity in sesame, reducing seed yield. As sesame is a broadleaf crop, developing selective herbicides remains a challenge. Consequently, manual or integrated weed management practices are often needed, which can be labour-intensive and costly. Future research should focus on identifying selective post-emergence herbicides for broadleaf weeds and promoting integrated weed management approaches. Combining chemical, mechanical, and cultural methods can ensure sustainable and efficient weed control, ultimately improving sesame productivity and sustainability.

**Disclaimer (Artificial intelligence)**

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, manuscript.

**REFERENCES**

Aadi, O.N and Almarie, A.A. 2024. Critical period for weed competition in sesame under Iraqi irrigated areas. *IOP Conference Series: Earth and Environmental Science*. 1371(5): 052011.

Akbia, H., Elahifard, E., Siahpoosh, A and Zare, A. 2020. Evaluating sowing method and soil applied herbicides on weed control and yield of sesame. *Journal of Crops Improvement*. 22(4): 543-556.

Aktar, M.N., Karim, M.F., Chakma, S., Marma, A and Rahman, M.A. 2021. Effect of weed management on the improvement of growth and yield of sesame (*Sesamum indicum* L.). *Biochemical & Cellular Archives*. 21(1):1809.

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

Amini, R., Hosseingolizadeh, M and Nassab, A.D.M. 2022. Effect of reduced rates of trifluralin in integration with living and straw mulch on weeds and yield of sesame (*Sesamum indicum* L.). *Journal of Agricultural Science and Sustainable Production*. 32(2):181-196.

Audu, I., Wamduda, D.K and Lawrence, T. 2021. Growth, yield and yield components of sesame (*Sesamum indicum* L.) as influenced by crop variety and different rates of herbicides in Adamawa state, Nigeria. *International Journal of Environment, Agriculture and Biotechnology*. 6(2): 164-174.

Babu, K.S and Subramanyam, D. 2018. Weed management in broadcast sesame (*Sesamum indicum* L.) through sequential application of herbicides. *Journal of Oilseeds Research*. 35(1): 67-70.

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.

Baraki, F., Gebregergis, Z., Gebremedhin, Z and Azerefegn, F. 2023. Efficacy of diuron on the management of broad-leaf weeds in sesame (*Sesamum indicum* L.) fields in Tigray, Ethiopia. *Indian Journal of Weed Science*. 55(4): 410–419.

Bhadauria, N., Arora, A 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.

Bhaumik, G.S., Singh, R.S and Sen, D. 2023. Effect of weed management practices on growth and yield of sesame (*Sesamum indicum* L.). *International Journal of Agriculture, Environment and Biotechnology*. 16(2): 105-111.

Bhavani, R., Reddy, G.K., Reddy, P.M., Kumari, P.L and Sagar, G.K. 2023. Nutrient uptake as influenced by methods of sowing and weed management practices in summer sesame (*Sesamum indicum* L.). *Andhra Pradesh Journal of Agricultural Sciences.* 9(2): 100-103.

Chaudhari, 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.

Chauhan, G.V., Pyare, R., Kumar, A., Kumar, A., Tomar, J and Singh, R. 2019. Effect of weed-management practices on yield and economics of sesame (*Sesamum indicum*) based intercropping systems. *Indian Journal of Agronomy*. 64(2): 186-190.

Dadarwal, P and Yadav, G.L. 2025. Impact of integrated herbicide hand weeding practices and nitrogen rates enhance weed control and seed yield of sesame (*Sesamum indicum* L.) under semiarid, loamy sandy soils. *Archives of Current Research International*. 25(5): 528-535.

Das, S., Dolai, A.K., Ghosh, P., Mandi, A and Aktar, S. 2022. Productivity improvement of sesame by weed management through plastic mulch and herbicides. *International Journal of Advanced Chemistry Research*. 4(2): 83-86.

Debnath, S., Ghosh, P., Chaudhuri, A and Dolai, A.K. 2022. Growth and productivity of sesame as influenced by different weed management practices in red and laterite belt of West Bengal. *Environment and Ecology*. 40(1): 19-23.

Dhaka, M.S., Yadav, S.S., Shivran, A.C., Choudary, G.L and Prajapat, K. 2013. Effect of weed management on performance of sesame under varying levels of nitrogen. *Annuals of Agricultural Research*. 34(2): 179-184.

Dhanush, G and Geetha, K.N. 2024. Evaluation of pre and early post emergent herbicides in sesamum (*Sesamum indicum*). *The Mysore Journal of Agricultural Sciences*. 58(1): 462.

Elakkiyapriya, P., Meyyappan, M., Sudhakar, P and Angayarkanni, A. 2022. Yield enhancement in sesame (*Sesamum indicum* L.) var. TMV 7 through weed management practices. *Crop Research*. 57 (5&6): 335-340.

Elnenny, E.M., Elian, H and Shawky, A.M.2022. Effect of some weed control treatments on sesame and associated weeds. *Egyptian Journal of Agricultural Research*. 100(4): 608-615.

Geethanjali, S., Durge, B.D., Sasikala, R., Thavaprakaash, N and Dhandapani, M. 2022 Assessment of genetic variation for herbicide tolerance in sesame (*Sesamum indicum* L.) germplasm: Assessment of genetic variation for herbicide tolerance in sesame germplasm. *Journal of Oilseeds Research*. 39(3&4).

Ghatak, R., Ghosh, R.K and Ghosh, S. 2006. Impact of integrated weed management on soil micro-flora in sesame (*Sesamum indicum* L.). *Journal of Crop Weeds*. 2(1): 15-19.

Giridhar, M. 2024. Weed management in line sown and broadcasted gingelly (*Sesamum indicum* L*.*). *M.Sc. (Ag.) Thesis.* Acharya N.G. Ranga Agricultural University, Guntur, Andhra Pradesh.

Grichar, W.J., Rose, J.J., Dotray, P.A., Tredaway, J.A., Bagavathiannan, M., Shankle, M.W and Langham, D. 2021. Sesame (*Sesamum indicum* L.) response to delayed applications of pre-emergence herbicides applied 3 or 6 days after emergence. *Journal of Experimental Agriculture International*. 43(1): 34-50.

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

Hota, S., Dash, S and Joshi, B. 2024. Sole and sequential application of herbicides and botanicals for weed management in summer sesame. *Plant Science Today*. 11(4): 1022-1027.

Indiastat.com*,* 2023-24.

Imoloame, E.O and Abubakar, L.F. 2023. Evaluation of sowing methods and herbicide mixtures for weed management and productivity in sesame (*Sesamum indicum* L.). *Pertanika Journal of Tropical Agricultural Science*. 46(4): 1151-1172.

Imoloame, E.O., Joshua, S.D and Gworgwor, N.A. 2011. Effect of pre-emergence herbicides on weed infestation and productivity of sesame in the Sudan Savanna Zone of Nigeria. *Journal of Agricultural Biotechnology and Sustainable Development.* 3(2): 19-27.

Ismail, A.M., Hamada, S.H.E., Korrat, E.E.E and El Gananiy, S.M. 2024. Response of sesame (*Sesamum indicum* L.), associated weeds and subsequent crops to pre and postemergence herbicides. *Applied Ecology and Environmental Research*. 22(4):3521-3537.

Jadhav K.S. 2015. Weed control in sesamum with pre-emergence herbicides. *Indian Journal of Weed Science.* 47(4): 428–429.

Kabirou, Y.I., Abdulrahman, L and Halima, M.I. 2023. Quality and profitability of sesame (*Sesamum indicum*) as influenced by weed management treatments in Kano, Sudan Savanna agro-ecological zone of Nigeria. *Indian Journal of Weed Science.* 55(1): 67-71.

Kamani, H.A., Bavalgave, V.G and Lad, Y.P. 2022. Influence of nitrogen levels and weed management practices on yield attributes, yield and economics of sesame (*Sesamum indicum* L.) under South Gujarat condition. *The Pharma Innovation Journal.* 11(6): 870-873.

Magani, E.I., Shave, P.A and Avav, T. 2012. Evaluation of fluazifop-p-butyl and propanil for weed control in sesame (*Sesamum indicum* L.) in Southern Guinea Savanna, Nigeria. *American Journal of Experimental Agriculture*. 2(4):680-689*.*

Manoj, K., Deepak, M.K and Singh, R.K. 2017. Weed control in custard apple-sesame based agri-horticulture system. *Agricultural Research Journal.* 54(1): 139-140.

Mruthul, T., Halepyati, A.S., Chittapur, B.M and Anu, V. 2023. Impact of weed management strategies on dry matter production and yield in sesame (*Sesamum indicum* L.). *The Pharma Innovation Journal*. 12(12): 2780-2784.

Ndarubu, A.A., Adejonwo, K.O., Adigun, J.A and Chiezey, U.F. 2003. Effects of weed control treatments and inter row-spacing on the growth and yield of sesame (*Sesamum indicum* L.). *Nigerian Journal of Weed Science*. 16:15-23.

Ninama, A.R., Kumawat, P.D., Bhuriya, K.P., Solanki, B.Pand Muchhadiya, R.M. 2025 Effect of clipping, plant growth regulators and weed management on growth of summer sesame (*Sesamum indicum* L.). *International Journal of Research in Agronomy*. 8(6): 813-819.

Omezzine, F., Rinez, A., Ladhari, A., Farooq, M andHaouala, R. 2011. Allelopathic potential of Indulaviscosa against crops and weeds. International Journal of Agricultural Biology. 13(6):841-849.

Patnaik, L., Adhikary, R and Reddy, M.D. 2021. Effect of chemical to herb control on performance of sesame (*Sesamum indicum*) under irrigated conditions. *International Journal of Environment and Climate Change.* 11(4): 75-81.

Patnaik, L., Deepthi, C., Reddy, M.D and Adhikary, R. 2020. Effect of chemical weed control on weed intensity in summer sesamum (*Sesamum indicum* L.) under irrigated conditions. *Agro Economist - An International Journal.* 7(2): 53-60.

Pramanik, A., Duary, B and Sar, K. 2025. Weed management in sesame using herbicides with and without soil mulch in lateritic soil of West Bengal. *Indian Journal of Weed Science*. 57(2): 247-251.

Rajpurohit, D.S., Arvadia, L.K., Thumar, V. M., Mawalia, A.K and Dinesh, K. 2017. Yield attributes, yield, quality, weed index, nutrient content and uptake of plant as influenced by different row spacing and weed management practices in summer sesamum (*Sesamum indicum* L.). *Progressive Research – An International Journal.* 12(3): 2087-2092*.*

Ramesh, K., Padmaja, B., Dilip, T., Ratna, K.P., Qureshi, A.A., Ravi, K.M and Suresh, G.2025. Evaluation of the efficacy of preand post-emergence herbicides in *rabi* sesame. *Indian Journal of Weed Science*. 57(2): 252-255.

Roy, P and Umesha C. 2023. Productivity of sesame on growth and yield as influenced by plant spacing and weed management practices. *International Journal of Environment and Climate Change.* 13(10): 2268-2276.

Saha, S., Thakur, A.K., Kumar, M., Chandrakar, T and Singh, D.P. 2022. Effect of different herbicides on yield and yield attributing characters of summer sesame (*Sesamum indicum* L.). *International Journal of Current Microbiology and Applied Sciences.* 11(1): 400-404.

Sahu, M.P., Jain, N., Bermaiya, U., Jain, V and Kumar, A. 2019. Enhancing productivity and profitability through herbicidal weed control in sesame. *Indian Journal of Weed Science.* 51(2): 214-216.

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.

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.

Sujithra, P., Hemalatha, M., Joseph, M and Sobhana, E. 2019. Effect of different weed management practices on growth and yield of rainfed sesame (*Sesamum indicum* L.) under vertisol. *Madras Journal of Agricultural Sciences.* 106(1&3): 1-4.

Svathi, A., Rammohan, J., Nadanassababady, 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*. 1(2): 4-7.

Vafaei, S., Razmjoo, J and Karimmojeni, H. 2013. Weed control in sesame (*Sesamum indicum* L.) using integrated soil applied herbicides and seed hydro-priming pretreatment. *Journal of Agrobiology*. 30(1): 1-8.

Venu, M., Reddy, G.S., Mahesh, N and Devi, M.U. 2022. Effect of integrated weed management practices on growth and yield of sesame (*Sesamum indicum* L.). *Biological Forum-An International Journal.* 14(2): 271-275.

Verma, N., Nandeha, K.L and Swarnkar, V.K. 2023. Performance and economical evaluation of different weed management practices on yield of summer sesame (*Sesamum indicum* L.). *The Pharma Innovation Journal*. 12(2): 1818-1822.

Vinay, K.L., Satish, K and Pradeep, K.K. 2023. Effect of different pre and post emergence herbicides on yield, productivity and economics of sesame (*Sesamum indicum* L.). *The Pharma Innovation Journal*. 12(9): 2141-2144.

Yadav, M. 2024. Performance of sesame (*Sesamum indicum* L.) under different weed management practices in Southern Rajasthan. *M.Sc. (Ag.) Thesis*. Maharana Pratap University of Agriculture and Technology, Udaipur.

Zenawi, G., Fiseha, B., Zerabruk, G., Goitom, T., Asefa, A., Weres, N., Yirga, B., Muez, B., Goitom, A and Alem, A. 2020. Evaluation of the efficacy of pre-emergence herbicides to control grassy and broad leaf weeds of sesame in Western Tigray. In *Proceeding for Completed Research Activities on Adaptation and Generation of Agricultural Technologies,* Tigray Agricultural Research Institute, Tigray, Ethiopia. 29-33.

Chavhan, K. R., R. D. Chaudhari, A. K. Kolage, and H. S. Mahajan. 2023. “Response of Sesame to Different Weed Management Pratices in Maharashtra, India”. International Journal of Plant & Soil Science 35 (15):111-15. https://doi.org/10.9734/ijpss/2023/v35i153085.

Dhanush G, Geetha KN, Pruthviraj N, Murali K, Krishnamurthy R, Sinchana JK. Optimising weed control in sesame: insights into herbicide performance and crop productivity. Plant Science Today. 2025; 12(3): 1-14. https://doi.org/10.14719/pst.7083