



ISSN Print: 2618-060X
 ISSN Online: 2618-0618
 NAAS Rating (2026): 5.20
 IJRA 2026; 9(10): 503-508
www.agronomyjournals.com
 Received: 26-08-2026
 Accepted: 25-09-2026
 Published: 09-10-2026

The names and affiliations of all authors are provided below, following the references.

Efficacy of pre-emergence herbicides on weed dynamics, growth and yield of kharif groundnut (*Arachis Hypogaea* L.)

Tushar S Burale¹, BK Farkade², VV Goud³, AB Chorey⁴, SD Jadhao⁵, RV Mahajan⁶,
 Vaibhav G Badkhal⁷, Sukanya R Khadaskar⁸, Harsh M Dixit⁹

DOI: <https://www.doi.org/10.33545/2618060X.2026.v9.i10g.6832>

ABSTRACT

An investigation entitled “Efficacy of pre-emergence herbicide on weed dynamics, growth and yield of kharif groundnut (*Arachis hypogaea* L.)” was conducted during kharif 2025-26 at Oilseeds Research Centre, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola to study the effect of different pre-emergence herbicides on weed flora, growth and yield of kharif groundnut. The experiment was laid out with seven treatments viz., T_1 - Diclosulam 84% WDG 26 g/ha as PE fb Hoeing + HW at 40-45 DAS, T_2 - Diclosulam 0.9% WDG + Pendimethalin 35% (ready-mix) SE 897.5 g/ha as PE fb Hoeing + HW at 40-45 DAS, T_3 - Pyriithiobac sodium 3.1 % + Pendimethalin 34.0% (ready-mix) ZC 742 g/ha fb Hoeing + HW at 40-45 DAS, T_4 - Pendimethalin 30% + Imazethapyr 2% (RM) 800 g/ha as PE fb Hoeing + HW at 40-45 DAS, T_5 - Flumioxazin 50% SC 125 g/ha as PE fb Hoeing + HW at 40-45 DAS, T_6 - Farmers practice (Hoeing fb HW at 20-25 and 30-35 DAS) and T_7 - weedy check replicated thrice using randomized block design. The results revealed that, among the herbicides, application of flumioxazin 50% SC 125 g/ha as PE fb Hoeing + HW at 40-45 DAS (T_5) produced the lowest total weed density at 20 DAS which was closely followed by pendimethalin 30% + imazethapyr 2% (RM) 800 g/ha as PE fb Hoeing + HW at 40-45 DAS. Pod yield was highest under farmer's practice (3074 kg ha⁻¹) which was found statistically on par with flumioxazin 50% SC 125 g/ha as PE fb Hoeing + HW at 40-45 DAS (2999 kg ha⁻¹) and pendimethalin 30% + imazethapyr 2% (RM) 800 g/ha as PE fb Hoeing + HW at 40-45 DAS (2883 kg ha⁻¹). Flumioxazin 50% SC 125 g/ha as PE fb Hoeing + HW at 40-45 DAS recorded the lowest weed index (2.43%), highest net monetary returns (Rs. 161,903 ha⁻¹) and highest B:C ratio (3.44). On the basis of results, is concluded that, integration of suitable pre-emergence herbicide with one hoeing + weeding at 45 DAS induced better weed suppression and produced the higher yield and economic returns in kharif groundnut under the conditions of the study.

Keywords: Groundnut (*Arachis hypogaea* L.), Pre-emergence herbicides, Hand weeding, Weed control efficiency, B:C ratio

Introduction

Groundnut is an important oilseed crop cultivated in several parts of the world. It is the second most important edible oilseed crop of the India, which is the second largest producer of groundnut in the world. Globally, China leads in groundnut production with 19.27 million tonnes, followed by India with 10.30 million tonnes. Various factors of low productivity in groundnut crop viz. uncertain rainfall, unavailable irrigation facilities, and poor weed management, heavy weed infestation and unavailability of improved technologies. Out Of these, weed infestation is one of the prominent factors. Weeds should be removed from groundnut crop up to 45 DAS to minimize crop-weed competition (Prasad *et al.*, 2002). Otherwise, yield losses were observed up to 54-71 % in kharif groundnut due to weeds during early period of crop growth (Agasimani *et al.*, 2010) [1]. Weeds reduce yield by competing with the groundnut plants for resources such as sunlight, space, moisture and nutrients throughout the growing season. Besides competing for resources weeds surges difficulties in pegging, growing, pod developing and harvesting which ultimately result in yield losses. Conventional methods like manual weeding is labourious and practiced to control weeds in groundnut. But unavailability and scarcity of labours, higher labour wages and unfavorable environmental conditions during the critical period of crop-weed competition reduce the effectiveness and reliability of hand weeding. Therefore, herbicides alone or in combination with manual weeding provide an economically viable alternative for weed control. Thus, the present study was undertaken to assess the efficacy of pre-emergence herbicides on weed dynamics, growth and yield of kharif groundnut.

Corresponding Author: Tushar S Burale

Department of Agronomy,
 Post Graduate Institute, Dr.
 Panjabrao Deshmukh
 Krishi Vidyapeeth, Akola,
 Maharashtra, India

Materials and Methods

A field experiment was carried out at Oilseed Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during the *Kharif* season of 2025 with the objective of to study the effect of different pre-emergence herbicides on weed flora, growth and yield of *kharif* groundnut. The soil of experimental field characterized as clay loam in texture, having slightly alkaline pH (7.9), low nitrogen content (223 kg/ha), medium available phosphorus content (18.4 kg/ha), medium potassium status (297 kg/ha). Groundnut (PDKVG-335) was sown on 20th June 2025 at 30 cm x 10 cm spacing. The experiment was laid out in randomized block design with seven treatments replicated thrice. The treatment combinations with pre emergence T₁ - Diclosulam 84% WDG 26 g/ha as PE fb Hoeing + HW at 40-45 DAS, T₂ - Diclosulam 0.9% WDG + Pendimethalin 35% (ready-mix) SE 897.5 g/ha as PE fb Hoeing + HW at 40-45 DAS, T₃ - Pyriithiobac sodium 3.1 % + Pendimethalin 34.0% (ready-mix) ZC 742 g/ha fb Hoeing + HW at 40-45 DAS, T₄ - Pendimethalin 30% + Imazethapyr 2% (RM) 800 g/ha as PE fb Hoeing + HW at 40-45 DAS, T₅ - Flumioxazin 50% SC 125 g/ha as PE fb Hoeing + HW at 40-45 DAS, T₆ - Farmers practice (Hoeing fb HW at 20-25 and 30-35 DAS) and T₇ - weedy check was made. The pre-emergence herbicide was sprayed immediately after sowing on wet soil with the help of knapsack sprayer. Weed population and weed dry matter, taken at 20 days interval from sowing to harvest by using quadrat measuring 0.5 m² per plot. The weed control efficiency (WCE) and weed index (WI) was worked out and crop growth parameters i.e., no. of branches, leaf area index, no. of nodules, dry matter weight and yield and yield attributes were recorded.

Results and Discussion

The experiment was conducted at experimental site having medium black soil with low water holding capacity in *kharif* season at Akola location of Maharashtra, India. The results obtained in one year research trial are elaborated below with different sub titles as below.

Weed flora

The experimental field was invaded with mixed population of weed flora consisting of sedges, monocots and dicots major dicots weed flora during *kharif* season groundnut crop *Digera arvensis*, *Boerhavia diffusa*, *Trianthema portulacastrum*, *Parthenium hysterophorus* & *Portulaca oleracea* and among monocots *Cyperus rotundus*, *Commelina benghalensis*, *Dinebra arobica* and *Echinochloa colona* were observed in the experimental field. Similar observations on weed flora in *kharif* groundnut were also reported by Pawar *et al.* (2018) [2].

Effect on weed density and dry weight of weeds

The data on total weed density and weed dry matter revealed marked differences among the weed management treatments at all stages of crop growth. At 20 DAS, total weed density was lowest in T₅ (Flumioxazin 50% SC @ 125 g ha⁻¹ as PE fb Hoeing + HW at 40-45 DAS) with 4.0 weeds per 0.5 m², followed by T₄ (Pendimethalin 30% + Imazethapyr 2% (RM) 800 g/ha as PE fb Hoeing + HW at 40-45 DAS) (27.33), whereas, the weedy check (T₇) recorded the highest density of 162.33 weeds per 0.5 m². At 40 DAS, T₆ (Farmers practice (Hoeing fb HW at 20-25 and 30-35 DAS)) recorded the lowest weed density (8.67 weeds per 0.5 m²), due to hoeing fb hand weeding followed by T₅ (23.6), T₄ (49.0), while the maximum density was observed in T₇ (209 weeds per 0.5 m²). At 60, 80 DAS and at harvest the lowest weed density was recorded in T₅, closely followed by T₄, whereas T₇ recorded the highest density throughout the growth period. The cumulative weed density across observations was also lowest in T₅ (108.6 weeds 0.5 m⁻²), followed by T₄ (166.3), while the highest cumulative density was recorded in T₇ (1080.6 weeds per 0.5 m²). A similar trend was observed for weed dry matter accumulation. At 20 DAS, the lowest weed dry matter was recorded in T₅ (0.51 g 0.5 m⁻²), followed by T₄ (1.56), while the weedy check recorded the highest dry matter (13.8 g per 0.5 m²). At 40 DAS, T₆ recorded the

minimum weed dry matter (5.29 g 0.5 m⁻²), followed by T₅ (17.9), T₄ (45.5), whereas the weedy check recorded 229.3 g per 0.5 m². At 60, 80 DAS and at harvest the lowest weed dry matter was observed in T₄, followed by T₅, compared with T₇ which recorded highest weed dry matter throughout the crop growth stage. Overall, T₅ (Flumioxazin 50% SC @ 125 g ha⁻¹ as PE fb Hoeing + HW at 40-45 DAS) was the most effective treatment in suppressing both weed density and weed dry matter throughout the crop growth period, whereas T₇ (weedy check) recorded the highest weed infestation and dry matter accumulation. The lower weed density and dry matter under T₅ indicate its superior weed-suppressive effect, thereby reducing weed competition with groundnut for growth resources. Over the whole season T₅ had the lowest cumulative weed density, about 90% below the weedy check. Lower weed density and biomass under PE herbicides have likewise been reported by Dutta *et al.* (2005) [3] and Kumari *et al.* (2021) [4].

treatments in groundnut

* Figures in parenthesis are mean of original values and subjected to square root transformation ($x + 0.5$)

Effect on weed control efficiency and weed index

Weed control efficiency (WCE) varied considerably among the weed management treatments during the crop growth period (Table 2). At 20 DAS, WCE was highest with T₅ (Flumioxazin 50% SC @ 125 g ha⁻¹ as PE fb Hoeing + HW at 40-45 DAS) (96.3%), followed by T₄ (Pendimethalin 30% + Imazethapyr 2% (RM) 800 g/ha as PE fb Hoeing + HW at 40-45 DAS) (88.8%). At 40 DAS, WCE increased substantially following the intercultural operation in T₆ (Farmers practice (Hoeing fb HW at 20-25 and 30-35 DAS)) closely followed by T₅, with values of 97.7, 92.2, respectively. The relatively higher WCE recorded in T₆ at 40 DAS was primarily associated with the mechanical weed-control operation rather than herbicide application, as this treatment did not receive a pre-emergence herbicide.

At 60 DAS, WCE exceeded 95% in all weed-managed treatments, ranging from 95.8 to 97.8%, and remained high at harvest (92.6-94.6%). This indicates that the combination of a pre-emergence herbicide followed by hoeing and hand weeding at 40-45 DAS provided effective weed suppression throughout the crop season. The convergence of WCE values among treatments after 40-45 DAS suggests that the intercultural operation made a major contribution to late-season weed suppression, whereas the primary contribution of the pre-emergence herbicides was evident during the initial 40 days after sowing. Similar effectiveness of integrated herbicide and intercultural weed-management practices in maintaining higher weed control efficiency has been reported by Bhowmik *et al.* (2023) [5].

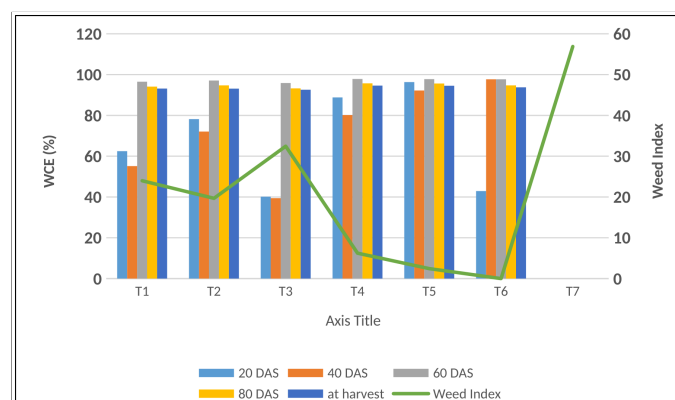


Figure. Weed Control Efficiency and Weed index as influenced by different treatments

No visible phytotoxic symptoms were observed in any of the herbicide-treated plots throughout the crop growth period. Thus, all the tested herbicide treatments were found to be safe to groundnut at the respective application rates, with phytotoxicity scores of 0 on the 0-10 scale.

Table 1. Density and Dry matter weight of total weeds (sedges + monocots + dicots) as influenced by different PE herbicide

Treatment	Weed density (0.5 m ⁻²)					Weed dry matter (g 0.5 m ⁻²)				
	20 DAS	40 DAS	60 DAS	80 DAS	At harvest	20 DAS	40 DAS	60 DAS	80 DAS	At harvest
T ₁ -Diclosulam <i>fb</i> Hoeing + HW at 45 DAS	8.99 (80.33)	10.30 (105.6)	5.78 (33.00)	7.03 (49.00)	7.47 (55.33)	2.39 (5.21)	10.15 (102.8)	3.33 (10.75)	4.55 (20.31)	4.94 (24.03)
T ₂ -Diclosulam + Pendimethalin (RM) <i>fb</i> Hoeing + HW at 45 DAS	6.84 (46.33)	8.27 (68.00)	5.11 (25.67)	6.52 (42.00)	7.20 (51.33)	1.88 (3.03)	8.03 (64.06)	3.07 (8.98)	4.31 (18.10)	4.96 (24.16)
T ₃ -Pyrithiobac sodium + Pendimethalin (RM) <i>fb</i> Hoeing + HW at 45 DAS	9.49 (89.67)	10.62 (112.0)	6.14 (37.33)	7.52 (56.00)	7.90 (62.00)	2.96 (8.30)	11.53 (132.4)	3.63 (12.78)	4.87 (23.28)	5.27 (27.33)
T ₄ -Pendimethalin + Imazethapyr (RM) <i>fb</i> Hoeing + HW at 45 DAS	5.27 (27.33)	7.06 (49.00)	4.22 (17.33)	5.61 (31.00)	6.47 (41.33)	1.43 (1.56)	6.79 (45.54)	2.67 (6.69)	3.86 (14.78)	4.40 (18.93)
T ₅ -Flumioxazin <i>fb</i> Hoeing + HW at 45 DAS	2.11 (4.00)	4.90 (23.67)	3.93 (15.00)	5.45 (29.33)	6.00 (35.67)	1.01 (0.51)	4.29 (17.96)	2.72 (6.91)	3.94 (15.01)	4.45 (19.30)
T ₆ -Farmer's practice (Hoeing <i>fb</i> HW at 20 and 35 DAS)	10.82 (117.00)	3.02 (8.67)	5.15 (26.00)	6.54 (42.33)	7.20 (51.33)	2.90 (7.93)	2.38 (5.29)	3.27 (10.22)	4.31 (18.13)	4.72 (21.83)
T ₇ - Weedy Check	12.76 (162.33)	14.47 (209.0)	15.17 (229.6)	15.56 (241.67)	15.41 (237.00)	3.79 (13.88)	15.16 (229.3)	17.52 (306.3)	18.53 (342.96)	18.72 (349.93)
SE (m) ±	0.23	0.18	0.19	0.16	0.17	0.05	0.24	0.19	0.20	0.17
CD at 5%	0.72	0.55	0.58	0.48	0.52	0.14	0.75	0.57	0.63	0.52

The lowest weed index was recorded with T₅ (Flumioxazin 50% SC @ 125 g ha⁻¹ as PE followed by hoeing + hand weeding at 40-45 DAS) (2.43%), followed by T₄ (Pendimethalin 30% + Imazethapyr 2% (RM) @ 800 g ha⁻¹ as PE followed by hoeing + hand weeding at 40-45 DAS) (6.22%). The lower weed index under these treatments indicates effective weed suppression and consequently lower yield reduction in comparison with the farmer's practice. In contrast, T₃ recorded the highest weed index (32.43%) among the herbicidal treatments, indicating comparatively greater yield reduction, which may be associated with inadequate weed suppression during the critical crop-weed competition period. The weedy check (T₇) exhibited the maximum weed index (56.88%), indicating a substantial reduction in groundnut yield due to unrestricted weed interference throughout the crop growth period.

groundnut

Effect on growth and yield

At 40 DAS, weed-management treatments significantly influenced the number of branches, leaf area index (LAI), root nodule number and dry matter accumulation. The number of branches and leaves fol-

lowed a similar trend, with higher values under effective weed-management treatments due to reduced weed competition for water, nutrients, light and space, which favoured better vegetative growth and canopy development. The number of branches ranged from 6.33 to 8.53 plant⁻¹. LAI was highest under farmers' practice (1.85), followed by T₅ (flumioxazin 50% SC 125 g/ha as PE *fb* Hoeing + HW at 40-45 DAS) (1.61) and T₄ (Pendimethalin 30% + Imazethapyr 2% (RM) 800 g/ha as PE *fb* Hoeing + HW at 40-45 DAS) (1.52), whereas the weedy check recorded the lowest value (0.91). Similarly, root nodule number was highest under farmers' practice (42.73 plant⁻¹) and lowest under the weedy check (26.30 plant⁻¹), indicating better nodulation under reduced weed competition. Dry matter accumulation was also highest with farmers' practice (5.16 g plant⁻¹) which is statistically at with T₅ and T₄ and lowest in the weedy check (2.40 g plant⁻¹), which may be attributed to improved resource availability and greater photosynthetic activity under effective weed control. Murthy *et al.* (1992) [6] and Kumar *et al.* (1996) [7] have reported significant reduction in the dry matter accumulation in groundnut under weedy check.

Table 2. Weed control efficiency (%) as influenced by different treatments in

Tr.no	Treatments	Weed control efficiency (%)			Weed index (%)
		20 DAS	40 DAS	60 DAS	
T ₁	Diclosulam 84% WDG 26 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	62.45	55.14	96.49	23.98
T ₂	Diclosulam 0.9% WDG + Pendimethalin 35% (RM) SE 897.5 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	78.14	72.07	97.07	19.67
T ₃	Pyrithiobac sodium 3.1 % + Pendimethalin 34.0% (RM) ZC 742 g/ha <i>fb</i> Hoeing + HW at 40-45 DAS	40.16	39.43	95.83	32.43

(continued on next page)

Tr.no	Treatments	Weed control efficiency (%)			Weed index (%)
		20 DAS	40 DAS	60 DAS	
T ₄	Pendimethalin 30% + Imazethapyr 2% (RM) 800 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	88.78	80.14	97.81	6.22
T ₅	Flumioxazin 50% SC 125 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	96.30	92.17	97.75	2.43
T ₆	Farmers practice (Hoeing <i>fb</i> HW at 20-25 and 30-35 DAS)	42.88	97.69	97.66	0.00
T ₇	Weedy Check	-	-	-	56.88
	S E (m)±	-	-	-	-
	C D at 5%	-	-	-	-

Different weed treatments had significant positive impacts on yield attributes and yield of groundnut, farmer's practice recorded the highest number of pods plant⁻¹ (31.40) and pod yield plant⁻¹ (9.56 g), followed by T₅ and T₄. Pod yield differed significantly farmer's practice produced 3074 kg ha⁻¹ and was statistically at par with T₅ (2999 kg ha⁻¹) and T₄ (2883 kg ha⁻¹). The weedy check produced only 1325 kg ha⁻¹. Haulm yield followed a similar pattern. The yield re-

sponse is consistent with the observed reduction in weed competition during the critical crop-growth period. (Lower weed infestation might help in accumulate more dry matter through greater nutrient uptake that might have provided more quantity of Photosynthesis to developing sink in crop plants produced more field.

(g) as influenced by different treatments in *kharif* groundnut

Table 3. No. of branches plant⁻¹, LAI, No. of nodules plant⁻¹ and dry matter weight plant⁻¹

Tr.no	Treatments	No. of branches plant ⁻¹	LAI	No. of Nodules plant ⁻¹	Dry matter weight plant ⁻¹ (g)
		40 DAS	40 DAS	40 DAS	40 DAS
T ₁	Diclosulam 84% WDG 26 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	7.37	1.18	36.30	3.58
T ₂	Diclosulam 0.9% WDG + Pendimethalin 35%(RM) SE 897.5 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	7.43	1.28	36.03	3.35
T ₃	Pyrithiobac sodium 3.1 % + Pendimethalin 34.0% (RM) ZC 742 g/ha <i>fb</i> Hoeing + HW at 40-45 DAS	6.83	1.02	33.03	2.95
T ₄	Pendimethalin 30% + Imazethapyr 2% (RM) 800 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	8.03	1.52	40.67	4.76
T ₅	Flumioxazin 50% SC 125 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	8.10	1.61	42.13	4.79
T ₆	Farmers practice (Hoeing <i>fb</i> HW at 20-25 and 30-35 DAS)	8.53	1.85	42.73	5.16
T ₇	Weedy Check	6.33	0.91	26.30	2.40
	S E (m)±	0.35	0.11	1.80	0.13
	C D at 5%	1.07	0.33	5.54	0.40

(Rs ha⁻¹), NMR (Rs ha⁻¹) and B:C ratio as influenced by different treatments in *kharif* groundnut

Economics of weed control

As indicated in Table 4, all the weed control treatments tended to significantly surpass weedy check in terms of gross returns, net returns and B:C ratio. Although, the maximum pod yield, maximum gross monetary returns and net monetary returns was registered in farmers practice (Hoeing *fb* HW at 20-25 and 30-35 DAS) (Rs. 233941 ha⁻¹ and Rs. 159114 ha⁻¹) followed by T₅- flumioxazin 50% SC 125 g/ha as PE *fb* Hoeing + HW at 40-45 DAS (Rs. 228390 ha⁻¹ and Rs. 161903 ha⁻¹) and T₄- pendimethalin 30% + imazethapyr 2% (RM) 800 g/ha as PE *fb* Hoeing + HW at 40-45 DAS (Rs. 219274 ha⁻¹ and

Rs. 153437 ha⁻¹), however highest pooled B:C ratio (3.44) was registered in application of T₅ followed by T₄ (3.33). The differences in B:C ratio is due to the cost of herbicides, labours required and productivity of the crop. Though the Twice hand weeding treatment resulted in highest pod yield owing to 97.19% weed control efficiency at 40 DAS but could not found as profitable as herbicidal treatment due to higher expenditure incurred on engaging labours. Annadurai *et al.* (2010) [8] also reported that weed management is the need of the day through the introduction of herbicides to meet labor shortage to effect early weed control and reduce the cost of weeding. Similar results were also obtained by Kumari *et al.* (2021) [4], Hinge *et al.* (2025) [9].

Table 4. No. of pod plant⁻¹ Pod yield plant⁻¹ (g), Pod and Haulm Yield (kg ha⁻¹), GMR

TN	Treatments	No. of pod plant ⁻¹	Pod yield plant ⁻¹ (g)	Yield (kg ha ⁻¹)		GMR (Rs ha ⁻¹)	NMR (Rs ha ⁻¹)	B:C
				Pod	Haulm			
T ₁	Diclosulam 84% WDG 26 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	24.87	7.38	2337	3876	177963	113091	2.74

(continued on next page)

TN	Treatments	No. of pod plant ⁻¹	Pod yield plant ⁻¹ (g)	Yield (kg ha ⁻¹)		GMR (Rs ha ⁻¹)	NMR (Rs ha ⁻¹)	B:C
				Pod	Haulm			
T ₂	Diclosulam 0.9% WDG + Pendimethalin 35%(RM) SE 897.5 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	25.04	7.78	2469	3924	187778	121566	2.84
T ₃	Pyrithiobac sodium 3.1 % + Pendimethalin 34.0% (RM) ZC 742 g/ha <i>fb</i> Hoeing + HW at 40-45 DAS	18.53	6.56	2077	3646	158948	90361	2.32
T ₄	Pendimethalin 30% + Imazethapyr 2% (RM) 800 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	28.23	9.30	2883	4382	219274	153437	3.33
T ₅	Flumioxazin 50% SC 125 g/ha as PE <i>fb</i> Hoeing + HW at 40-45 DAS	29.74	9.48	2999	4488	228390	161903	3.44
T ₆	Farmers practice (Hoeing <i>fb</i> HW at 20-25 and 30-35 DAS)	31.40	9.56	3074	4610	233941	159114	3.13
T ₇	Weedy Check	10.20	4.42	1325	2458	101178	50151	1.98
	S E (m)±	1.50	0.46	159.5	202.9	11945	11945	-
	C D at 5%	4.61	1.42	491.4	633.4	36805	36805	-

Conclusion

In kharif season on medium black soil at Akola location, integrated weed management substantially reduced the weed infestation and improved crop growth and productivity in comparison with the weedy check. Farmers' practice of two hoeing followed by two hand weeding at 20-25 and 30-35 DAS produced the highest pod at yield (3074 kg ha⁻¹), but flumioxazin 50% SC at 125 g ha⁻¹ as pre-emergence followed by hoeing + hand weeding at 40-45 DAS was statistically comparable for yield and growth attributes. Flumioxazin also recorded low weed index (2.43%), high net monetary returns (Rs. 161,903 ha⁻¹) and B:C ratio (3.44). Pendimethalin 30% + imazethapyr 2% RM at 800 g ha⁻¹ followed by hoeing + hand weeding also performed competitively, hence, it is advocate to use the Flumioxazin as pre-emergence weedicide followed by one hand weeding and hoeing at 45 DAS in *kharif* season of Vidarbha region of Maharashtra.

References

- Agasimani CA, Shanwad UK, Arvindkumar BN, Shivamurthy SD. Integrated weed management-A long term case study in groundnut-wheat cropping system in northern Karnataka. *Research Journal of Agricultural Sciences*. 2010;1(3):196-200.
- Pawar SB, Mahatale PV, Thakare SS, Sawarkar SD. Weed management in groundnut with tank-mix application of post emergence herbicides. *International Journal of Current Microbiology and Applied Sciences*. 2018;6:2169-2173.
- Dutta D, Bandyopadhyay P, Banerjee P. Integrated weed management in rainfed groundnut (*Arachis hypogaea* L.) in acid lateritic soils of West Bengal. *J Crop Weed*. 2005;2(1):47-51.
- Kumari S, Pandit A, Raj RK, Banerjee M, Malik GC. Efficacy of Flumioxazin 50% SL on weed dynamics, yield and economics of summer groundnut (*Arachis hypogaea* L.). *The Pharma Innovation Journal*. 2021;10(9):1835-1839.
- Bhowmik C, Paul SK, Banerjee M, Malik GC, Kumar DS, Bairagya MD, Sahoo U, Das S. Performance of pre-emergence herbicide in summer groundnut in laterite soil of West Bengal. *Environment and Ecology*. 2023;41(1):152-159.
- Murthy BG, Agasimani CA, Babalad HB. Studies on weed management in bunch groundnut. *Journal of Oil Seeds Research*. 1992;9(2):322-325.
- Kumar R, Sharma OL. Integrated weed Management in sunflower (*Heliantius annus* L). *Crop Research*. 1996;11(3):381-382.
- Annadurai K, Puppala N, Angadi S, Chinnusamy C. Integrated weed management in groundnut based intercropping system-A review. *Agricultural Reviews*. 2010;31(1):11-20.
- Hinge P, Karunakār AP, Goud VV. Effect of herbicidal weed management on growth attributes of groundnut. *Plant Archives*. 2025;25(1):719-724.
- Prasad TVR, Narasimha N, Dwarakanath N, Krishnamurthy K. Efficacy of oxyfluorfen for weed control in irrigated groundnut. *International Arachis Newsletter*. 1987;(2):9-11.

How to cite this article: Burale TS, Farkade B, Goud V, Chorey A, Jadhao S, Mahajan R, et al. Efficacy of pre-emergence herbicides on weed dynamics, growth and yield of kharif groundnut (*Arachis Hypogaea* L.). *International Journal of Research in Agronomy*. 2026;9(10):503-508. doi: <https://www.doi.org/10.33545/2618060X.2026.v9.i10g.6832>

Authors

Tushar S Burale

Department of Agronomy, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

BK Farkade

Assistant Professor of Agronomy, Oilseeds Research Unit, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

VV Goud

Assistant Professor, Department of Agronomy, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

AB Chorey

Head, Department of Agronomy, Post Graduate Institute, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

SD Jadhao

Assistant Professor, Department of Soil Science, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

RV Mahajan

Assistant Professor of Agronomy, ANCA, Warora, Chandrapur, Maharashtra, India

Vaibhav G Badkhal

Sukanya R. Khadaskar, PG Scholar, Department of Agronomy, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India, Harsh M. Dixit, PG Scholar, Department of Agronomy, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

Sukanya R Khadaskar

PG Scholar, Department of Agronomy, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India

Harsh M Dixit

PG Scholar, Department of Agronomy, Post Graduate Institute, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India