ISSN Print: 2664-844X
ISSN Online: 2664-8458
NAAS Rating (2026): 4.97
IJAFS 2026; 8(7): 275-278
www.agriculturaljournals.com
Received: 19-04-2026
Accepted: 23-05-2026

Satish Kumar
Associate Professor, Faculty of Agriculture Science, SAM Global University, Raisen Madhya Pradesh, India

Jitendra Patidar
National Associate Scientist - Agronomy, International Center for Agricultural Research in the Dry Areas (ICARDA), Bhopal, Madhya Pradesh, India

Bheru Lal Kumhar
Dr. B. R. Choudhary Agricultural Research Station, Mandor, Rajasthan, India

Vikash Singh Thakur
Assistant Professor, RNTU University, Bhopal, Madhya Pradesh, India

Corresponding Author:
Satish Kumar
Associate Professor, Faculty of Agriculture Science, SAM Global University, Raisen Madhya Pradesh, India

Evaluate the efficacy of basta (Glufosinate ammonium 150 SL) and glyphosate in non -cropped area

Satish Kumar, Jitendra Patidar, Bheru Lal Kumhar and Vikash Singh Thakur

DOI: https://www.doi.org/10.33545/2664844X.2026.v8.i7d.1679

Abstract
An experiment was conducted during *Rabi* season to evaluate the efficacy of basta (glufosinate ammonium 150 SL) and Glyphosate against weeds in non-cropped area. The experiment was laid-out in Randomized Block Design with three replications having seven treatments. The field was infested with 6 major weed species *Cynodon dectylon*, *Alternanthera sessilis*, *Parthenium hysterophorus*, *Phyllanthus niruri*, *Cichorium intybusand Euphorbia hirta*. Minimum total weed density per m^2, total weed dry weight gram per m^2 (2.52 m^2, 3.24 g m^2) and maximum weed control efficiency (57.4%) was found under the post emergence application of Glyphosate 41% SL (IPA Salt) 6000 ml ha^{-1} over weedy check.

Keywords: Weeds, non-cropped area, weed control efficiency

Introduction
Vegetation on non-crop areas such as rights of way, road sides, storage areas, public works yards, parking lots and transmission lines can create problems ranging from creating fire hazards, reducing drainage, reducing accessibility and visibility to snow blockage. Weed control in such areas can control these problems and give a well-kept appearance to the area. Weeds can be controlled by cultural methods like mowing or cultivation in combination with herbicide use. For total vegetation control, non-selective post-emergent herbicides can be used after weed emergence and, in some situations, soil sterilants can be used for long-term vegetation control. Weeds under non-cropped situation not only reduce the value of lands, but also deteriorate the aesthetic look and cause many problems for movement of human beings as well as animals. They provide shelter to the insect-Pest sand diseases in off-season and are also prolific seed producers. Manual and mechanical measures of their control are not only costly and labour intensive, but alsotake more time. Presently, paraquat and glyphosate are being used as total weed killer in non-cropped areas. Consequently, the weeds found in non – cropped area *viz.,* Brazil pusley (*Richardiabrasiliensis*), Spanish needles (*Bidenspilosa*), Florida beggarweed (*Desmodiumtortuosum*) and Pigweed (*Amaranthusretroflexus*) and grassy weeds–Guineagrass (*Panicum maximum*), Johnsongrass (*Sorghum halepense*) and Crowfoot grass (*Dactylocteniumaegyptium*) *etc.* Therefore, it is imperative to find out the right post emergent herbicides, particularly basta (glufosinate ammonium 150 SL) and glyphosate for maximizing herbicidal activity. Chemical weed control remains the most economic method of weed management. However, it provides a short duration control, and therefore, multiple applications are required to obtain effective year round control (Singh, 2000) [3].

Materials and Methods
An experiment was conducted on the Research Farm of Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur during *Rabi* season of 2017. The herbicides were applied with the help of knapsack sprayer fitted with flat fan nozzle using 600 liters of water per hectare. Data on weed population were recorded at before herbicide application, 14, 28, 42 and 60 days after application (DAA) of herbicides in each plot with the help of a quadrate of 0.25 m^2 size. The weeds were up rooted and allowed for sun drying and then oven dried at70 ^oC temperature

until constant weight was attained. Data on weed density and their dry weight were subjected to square root transformation before (√X+0.05) statistical analysis.

The climate of Jabalpur region is typically sub-humid, featured by hot dry summer and cool dry winter. Jabalpur is situated at 230 09' North latitude and 790 58' East longitudes with an altitude of 411.78 metres above the mean sea level. It is classified under "Kymore Plateau and Satpura Hills" agro- climatic zone as per norms of National Agricultural Research Project (NARP), New Delhi. The mean annual rainfall of Jabalpur is 1350 mm, mostly received between mid-June to end of September with a little and occasional rains in remaining parts of the year. The mean monthly temperature goes down to the extent of 4 0C during winter, while the maximum temperature reaches as high as 45 0C during the summer. Generally, relative humidity remains very low during summer (15 to 30%), moderate during winter (60 to 75%) and attains higher values (80 to 95%) during rainy season. The soils adjoining to Jabalpur are classified as "vertisol" as per US classification of soil. The soils of the region are medium to deep in depth, and black in colour, clay-loam texture and neutral in soil reaction.

Treatment details

Treatments: 7 weed control treatments

Treatments	Doses /ha (Formulation)	Mode of application
T_1- Basta (Glufosinate Ammonium 150 SL)	2000 ml	Post-emergence
T_2- Basta (Glufosinate Ammonium 150 SL)	2500 ml	Post-emergence
T_3- Basta (Glufosinate Ammonium 150 SL)	3000 ml	Post –emergence
T_4- Glyphosate 41% SL (IPA Salt)	3000 ml	Post –emergence
T_5- Glyphosate 41% SL (IPA Salt)	6000 ml	Post –emergence
T_6-Weed free	-	
T_7- Weedy check	-	

Result and discussion

Associated Weed Flora

It is evident from the data given in Table 1 that density of dicot weeds in weedy plots were higher (56.00 m^{-2}) as compared to monocot weeds (11.00 m^{-2}) during of experimentation, indicating predominance of dicoct weeds in the experimental field. Whereas, *Alternanthera sessilis* was dominant among the dicots (17.00 m^{-2}). Besides these, *Parthenium hysterophorus* (13.00 m^{-2}), *Phyllanthus niruri* (10.00 m^{-2}), *Cichorium intybus* (9.00 m^{-2}) and *Euphorbia hirta* (7.33 m^{-2}) also marked their presence in good numbers in the experimental field.

Table 1: Weed density and relative density of associated weeds

Weed flora	Common name	Family	Weed density (m^{-2})	Relative density (%)
			2017	2017
Monocot *Cynodon dectylon*	Bermuda grass	Poaceae	11.00	16.34
	Sub – total		11.00	16.34
Dicot *Alternanthera sessilis*	Creeping chaff weed	Amaranthaceae	17.00	25.25
Parthenium hysterophorus	Wild carrot weed	Astereceae	13.00	19.31
Phyllanthus niruri	Gulf leaf flower	Euphorbiaceae	10.00	14.85
Cichorium intybus	Blue daisy	Asteraceae	9.00	13.37
Euphorbia hirta	Corn Spurge	Euphorbiaceae	7.00	10.89
Sub – total			56.00	83.66
Grand total			67.00	100

*DAS means Days after sowing

Relative density

It is evident from the data given in Table 1 that relative density of dicot weeds in weedy plots were higher (83.66%) as compared to monocot weeds (16.34%) during of experimentation, indicating predominance of dicoct weeds in the experimental field. Whereas, *Alternanthera sessilis* was dominant among the dicots (25.25%). Besides these, *Parthenium hysterophorus* (19.31%), *Phyllanthus niruri* (14.85%), *Cichorium intybus* (13.37%) and *Euphorbia hirta* (10.89%), also marked their presence in good numbers.

Density and dry weight

Density and dry weight matter accumulation per unit area is an indication of weed growth under particular treatment. The observation on dry weight of associated weeds *viz., Cynodon dectylon, Alternanthera sessilis, Parthenium hysterophorus*, *Cichorium intybus*, *Phyllanthus niruri* and *Euphorbia hirta* were made at 14 DAA during the years 2016-17. The mean data of *Rabi* seasons (2016-17) pertaining to density and dry weight of weeds was influenced by different weed control treatments at 14 DAA are presented in Table 2 and Table 3.

Table 2: Effect of post emergence herbicide Basta (Glufosinate Ammonium 150 SL) on density of weeds (m^{-2}) in non-cropped area

Treatments	Doses /ha	*Cynodon dectylon*	*Alternanthera sessilis*	*Parthenium hysterophorus*	*Phyllanthus niruri*	*Cichorium intybus*	*Euphorbia hirta*	Total weed density
		14 DAA	14 DAA	14 DAA	14 DAA	14 DAA	14 DAA	14 DAA
T_1- Basta (Glufosinate Ammonium 150 SL)	2000 ml	2.77 (6.67)	3.91 (14.33)	3.05 (8.3)	2.38 (4.67)	3.00 (8.00)	2.37 (4.67)	2.91 (46.6)
T_2- Basta (Glufosinate Ammonium 150 SL)	2500 ml	2.64 (6.00)	3.79 (13.33)	2.83 (7.0)	2.31 (4.33)	2.94 (7.67)	2.31 (4.33)	2.80 (42.7)
T_3- Basta (Glufosinate	3000	2.58	3.56	2.77	2.23	2.89	2.23	2.71

Ammonium 150 SL)	ml	(5.67)	(11.67)	(6.7)	(4.00)	(7.33)	(4.00)	(39.4)
T_4- Glyphosate 41% SL (IPA Salt)	3000 ml	2.64 (6.00)	4.00 (15.00)	2.71 (6.3)	2.23 (4.00)	2.89 (7.33)	2.23 (4.00)	2.78 (42.6)
T_5- Glyphosate 41% SL (IPA Salt)	6000 ml	2.38 (4.67)	3.37 (10.33)	2.52 (5.3)	1.99 (3.00)	2.77 (6.67)	2.08 (3.33)	2.52 (33.3)
T_6- Weed free	-	1.28 (0.67)	1.00 (0.00)	1.00 (0.0)	1.14 (0.33)	1.14 (0.33)	1.14 (0.33)	1.12 (1.7)
T_7- Weedy check	-	3.74 (13.00)	4.32 (17.67)	3.87 (14.0)	3.31 (10.00)	3.21 (9.33)	3.00 (8.00)	3.38 (72.0)
SEm±		0.09	0.06	0.06	0.12	0.09	0.11	0.5
CD (P=0.05)		0.27	0.18	0.19	0.36	0.27	0.33	1.6

It is evident from the data that the different weed management practices significantly influenced the density and dry weight of weeds over weedy check during experimentation. The highest weed density and dry weight was observed in weedy check, whereas; under weed free treatment recorded lowest mean density and dry weight. Among the herbicidal treatments, post emergence application of basta (glufosinate ammonium 150 SL) and glyphosate reduction in the density and dry weight of weedsover weedy check. However, the efficacy basta (glufosinate ammonium 150 SL) and glyphosate was further improved with corresponding increase in the doses of application from 2000 ml -6000 ml ha^{-1}, being maximum when Glyphosate 41% SL (IPA Salt) applied at 6000 ml ha^{-1}followed byBasta (Glufosinate Ammonium 150 SL) 3000 ml ha^{-1}.

Table 3: Effect of post emergence herbicide Basta (Glufosinate Ammonium 150 SL) on dry weight of weeds (m^{-2}) in non-cropped area

Treatments	Doses /ha	*Cynodon dectylon*	*Alternanthera sessilis*	*Parthenium hysterophorus*	*Phyllanthus niruri*	*Cichorium intybus*	*Euphorbia hirta*	Total dry weight
		14 DAA	14 DAA	14 DAA	14 DAA	14 DAA	14 DAA	14 DAA
T_1- Basta (Glufosinate Ammonium 150 SL)	2000 ml	3.79 (13.40)	5.59 (30.28)	4.34 (17.83)	2.46 (5.08)	4.23 (15.76)	2.86 (7.23)	3.88 (89.6)
T_2- Basta (Glufosinate Ammonium 150 SL)	2500 ml	3.61 (12.06)	5.40 (28.17)	3.99 (14.98)	2.39 (4.73)	4.15 (15.10)	2.77 (6.70)	3.77 (81.7)
T_3- Basta (Glufosinate Ammonium 150 SL)	3000 ml	3.52 (11.39)	5.06 (24.65)	3.91 (14.27)	2.31 (4.36)	4.06 (14.45)	2.67 (6.22)	3.59 (75.3)
T_4- Glyphosate 41% SL (IPA Salt)	3000 ml	3.61 (12.06)	5.72 (31.69)	3.81 (13.55)	2.31 (4.35)	4.06 (14.45)	2.67 (6.18)	3.70 (82.3)
T_5- Glyphosate 41% SL (IPA Salt)	6000 ml	3.22 (09.38)	4.78 (21.84)	3.52 (11.41)	2.06 (3.28)	3.38 (13.13)	2.48 (5.18)	3.24 (63.0)
T_6- Weed free	-	1.49 (1.34)	1.00 (0.00)	1.00 (0.00)	1.15 (0.35)	1.26 (0.66)	1.19 (0.50)	1.18 (3.7)
T_7- Weedy check	-	5.21 (26.13)	6.19 (37.33)	5.56 (29.96)	3.45 (10.90)	4.55 (25.76)	3.66 (12.38)	4.77 (135.0)
SEm±		0.13	0.09	0.09	0.13	0.14	0.15	0.7
CD (P=0.05)		0.42	0.27	0.29	0.40	0.44	0.46	2.3

The post emergence application of Glyphosate 41% SL (IPA Salt) applied @ 6000 ml ha $^{-1}$ andBasta (Glufosinate Ammonium 150 SL) 3000 ml ha^{-1}proved equally good in reducing the density and dry weight of weeds as the differences among all the herbicidal treatments did not reach to the level of significance, but these herbicides proved significantly superior over weedy check which had the maximum density and dry weight of weeds during the year of experimentation. Similar findings have also been reported by Similar findings have also been reported by Buskien *et al.* (2006) [2], Ahuja *et al.* (1998) [1] and Sharma *et al.* (2008) [5].

Weed control efficiency of monocot and dicot weeds

The mean data on weed control efficiency in respect of monocot and dicot weed *viz., Cynodon dectylon, Alternanthera sessilis, Parthenium hysterophorus*, *Phyllanthus niruri*, *Cichorium intybus*and *Euphorbia hirta Rabi* seasons (2016-17) at 14 DAA under different weed control treatments are presented in Table 4.

Table 4: Effect of post emergence herbicide Basta (Glufosinate Ammonium 150 SL) on weed control efficiency of monocot and dicot weeds in non cropped area

Treatments	Doses /ha	*Cynodon dectylon*	*Alternanthera sessilis*	*Parthenium hysterophorus*	*Phyllanthus niruri*	*Cichorium intybus*	*Euphorbia hirta*	WCE%
		14 DAA	14 DAA	14 DAA	14 DAA	14 DAA	14 DAA	14 DAA
T_1- Basta (Glufosinate Ammonium 150 SL)	2000 ml	48.7	18.9	40.5	53.36	38.8	41.6	40.3
T_2- Basta (Glufosinate Ammonium 150 SL)	2500 ml	53.8	24.5	50	56.61	41.4	45.9	45.4
T_3- Basta (Glufosinate Ammonium 150 SL)	3000 ml	56.4	34	52.4	59.97	43.9	49.8	49.4
T_4- Glyphosate 41% SL	3000	53.8	15.1	54.8	60.12	43.9	50.1	46.3

(IPA Salt)	ml							
T_5- Glyphosate 41% SL (IPA Salt)	6000 ml	64.1	41.5	61.9	69.88	49.0	58.1	57.4
T_6- Weed free	-	94.9	100	100	96.76	97.5	96	97.5
T_7- Weedy check	-	0	0	0	0.03	0	0	0.0

Data pertaining to weed control efficiency revealed that the activity of Basta (Glufosinate Ammonium 150 SL) was lower (40.3%) against weeds when it was applied at lowest dose 3000 ml ha^{-1}hence it attained lowest weed control efficiency (40.3%). But, weed control efficiency against the *Cynodon dectylon, Alternanthera sessilis, Parthenium hysterophorus*, *Phyllanthus niruri*, *Cichorium intybus* and *Euphorbia hirta* was slightly inched up to 45.4%, 49.4%, and 46.3% respectively, with increase in the application doses 2500 ml, 3000 ml and 3000 ml ha^{-1} being the maximum (57.4%,) in the plots receiving Glyphosate 41% SL (IPA Salt)at highest dose 6000 ml ha^{-1}.However, none of the herbicidal treatments surpassed weed free treatment which curtailed the biomass production to the maximum extent (97.5%) and found superior to all the herbicidal treatments.

Conclusion

On the basis of the results, it was concluded that post-emergence application of Glyphosate 41% SL (IPA Salt) @ 6000 ml ha^{-1} significantly lowered the reduce weed density, total weed density, dry weight and total dry weight of weeds at 14 DAA. Also increased weed control efficiency at 14 DAA as compared to weedy check (control).

References

1. Ahuja KN, Yaduraju NT. Chemical control of Cynodon dactylon under non-crop situation. Indian Journal of Weed Science. 1998;30(1–2):96–98.
2. Buskien L, Uselis N, Lanauskas J. Possibilities of weed control with herbicide Basta 150 SL in young apple tree orchard. Agronomy Research. 2006;4(Special Issue):155–158.
3. Singh M. Weed management in citrus. In: Proceedings of the IX International Society of Citriculture Congress; Orlando, FL. 2000. p. 370–376.
4. Singh M, Sharma SD, Singh A. Effect of adjuvants and their concentration on rainfastness of glyphosate. Indian Journal of Weed Science. 2009;41(3–4):199–206.
5. Sharma A, Kewat ML, Shukla RP. Efficacy of Combi (ready mixture of 2,4-D + glyphosate) against weeds in non-cropped land. In: Proceedings of the Biennial Conference on Weed Management in Modern Agriculture; 2008 Feb 27–28; Patna, India. Indian Society of Weed Science; 2008. p. 155.