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EFFICACY OF HERBICIDES IN DIRECT SEEDED POST-FLOODED *KHARIF* RICE (*ORYZA SATIVA* L.)

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ABSTRACT

A field experiment was carried out during the late *kharif* season of 2020 and 2021 to study the effect of herbicides on weed management in direct-seeded post-flooded *kharif* rice (Bina dhan 11) (*Oryza sativa* L.) at Instructional-cum-Research (ICR) Farm, Assam Agricultural University, Jorhat. The experiment was laid out in a randomized block design (RBD) with three replications. The experiment consisted of twelve weed management treatments having tank-mix, application of pre and post-emergence herbicides in sequence with integration of hand and mechanical weeding *viz*., weedy check (T_1), weed free (T_2), pretilachlor 30.7 EC with safener PE (pre-emergence) *fb* 1 manual weeding at 30 DAS (days after sowing) (T_3), pretilachlor 30.7 EC with safener PE *fb*1 mechanical weeding at 30 DAS (T_4), pretilachlor 30.7 EC with safener PE *fb* bispyribac-sodium 10 SL @ 25 g a.i./ha PoE (post-emergence) (T_5), pretilachlor 30.7 EC with safener PE *fb* penoxsulam 2.5 OD @ 1000 ml/ha (T_6), bispyribac-sodium 10 EC @ 25 g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE (20 DAS) (T_7), bispyribac-sodium 10 EC @ 25 g a.i./ha PoE+ pyrazosulfuron @ 20 g a.i./ha PoE + one spot hand weeding (T_8), penoxsulam 2.5 OD @ 1000 ml/ha + almix @ 20 g/ha (T_9), trifamone 20 WG + ethoxysulfuraon 10 EC(Pre-mix) @ 225 g/ha + one spot hand weeding (T_{10}), two mechanical weeding at 15 and 30 DAS (T_{11}) and almix (Metsulfuron+ Chlorimuron) @ 20 g/ha + need based one spot hand weeding (T_{12}). The experiment revealed that other than weed-free treatment (T_2), application of bispyribac-sodium 10 EC @ 25 g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE (20 DAS) (T_7) at 60, 90 DAS and at the time of harvest showed the lowest weed density, highest weed control index, recorded highest yield attributes, higher net return and B: C ratio. Thus, the findings of this investigation indicated that tank mix application of bispyribac-sodium and pyrazosulfuron as post-emergence in post-flooded direct-seeded *kharif* rice could be a better choice to suppress weed flora over the sole application of herbicide.
***Keywords*:** Post-flooded, Weeding, Safener, weed density, Weed control index.

Introduction

Rice (*Oryza sativa* L.) is the main crop of Assam and India. India produces 132.0 million tonnes of rice annually from an area of 47 million hectares with 4.21 t/ha productivity (Ministry of Agriculture & Farmers welfare, Government of India, 2023) making it the second-largest global rice producer. Rice is a water-loving crop and cultivation of rice is mostly depending on the southwest monsoon so in India, rice is primarily grown during the *kharif* season. In Assam, the main rice *i.e., kharif* rice is grown through transplanting. However, sometimes timely transplanting of rice is not possible due to flood. Flood is one of the most devastating adversities in low-lying areas of Assam which results in partial to total loss in rice production. Post-flooded or after-flooded cultivation of rice is not common in India. 30% (12-14 million hectares) of India's rice-growing region is vulnerable to flash flooding with an average productivity of about 0.5-0.8

t/ha (Dar *et al.*, 2017). In post-flood situation, farmer has no time to prepare a new seedbed for transplanting. In such situations switching from transplanting to direct-seeded rice of a short-duration variety is possibly a better proposition. In wet direct seeded rice (WDSR), pre-sprouted seeds are directly sown into the main field rather than transplanting the seedlings, so it saves laborers, saves water, due to shorter flooding period minimizes the methane (CH_4) gas emissions, prevents the plow-pan formation, causing less soil disturbance as well as minimizes soil degradation and mature 7-10 days earlier than transplanting method. However, weeds are the main biological barrier to the acceptance and development of DSR technology (Chauhan, 2012). Severe weed infestation in direct-seeded rice may cause yield reduction up to 90% (Saha *et al.,* 2021, Dass *et al*., 2017). Nutrient uptake by weed was nine times higher in unweeded plots as compared to weed free plots (Dhaliwal *et al.,* 2021, Pratap *et al*., 2023). Hence, effective methods for controlling weeds are extremely important so far success of DSR is concerned. Owing to the rise in cultivation costs and unavailability of labour at peak periods, chemical weed management emerged as a promising solution in direct-seeded rice (Saravanane *et al*., 2021). In contrast to conventional weed control methods, chemical weeding is a more practical and affordable choice (Sen *et al.,* 2021). Chemical weeding is the process of application of chemicals or herbicides as a pre-emergence or post-emergence to reduce the weed infestation in the crop fields. Application of tank-mix herbicides reduces the weed growth and population in post-flooded direct seeded rice (Hazarika *et al.,* 2025). Rice seedlings are very sensitive towards applications of herbicides, so herbicide selectivity, phytotoxicity, correct amount of doses and critical time of application are crucial. Therefore, the present investigation was taken up to study the effect of herbicides on weed management and economics in direct-seeded post-flooded *kharif* rice.

Materials and Methods

The field experiment was conducted during the late *kharif* season of 2020 and 2021 at Instructional-Cum Research Farm of Assam Agricultural University, Jorhat. There are twelve weed management treatments *viz*., weedy check (T_1), weed free (T_2), pretilachlor 30.7 EC with safener PE (pre-emergence) *fb* 1 manual weeding at 30 DAS (days after sowing) (T_3), pretilachlor 30.7 EC with safener PE *fb*1 mechanical weeding at 30 DAS (T_4), pretilachlor 30.7 EC with safener PE *fb* bispyribac-sodium 10 SL @ 25 g a.i./ha PoE (post-emergence) (T_5), pretilachlor 30.7 EC with safener PE *fb* penoxsulam 2.5 OD @ 1000 ml/ha (T_6), bispyribac-sodium 10 EC @ 25 g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE (20 DAS) (T_7), bispyribac-sodium 10 EC @ 25 g a.i./ha PoE+ pyrazosulfuron @ 20 g a.i./ha PoE + one spot hand weeding (T_8), penoxsulam 2.5 OD @ 1000 ml/ha + almix @ 20 g/ha (T_9), trifamone 20 WG + ethoxysulfuraon 10 EC(Pre-mix) @ 225 g/ha + one spot hand weeding (T_{10}), two mechanical weeding at 15 and 30 DAS (T_{11}) and almix (Metsulfuron+ Chlorimuron) @ 20 g/ha + need based one spot hand weeding (T_{12}).

The soil of the experimental site was sandy loam in texture, acidic (pH 5.48) in nature with medium in organic carbon (0.56%), medium in available N (282.71 kg/ha), low in available P (18.18 kg/ha) and low in available K (119.40 kg/ha). Total rainfall during the experimental period 2020 and 2021 was 425.7 mm 265.4 mm and respectively. The RBD layout for the experiment included three replications. Bina dhan 11 was served as a test crop, which is submergence tolerant, semi-dwarf in nature and short duration rice variety. The well-sprouted seeds of rice were manually line sown with 20 cm spacing in last week of August (28^{th} August) and harvested on 24^{th} December in both the years. For every plot, an area of 1 m × 1 m at five randomly chosen spots was taken and the total number of average effective tillers (panicle-bearing tillers) was counted for that particular area. For panicle length, total grain per panicle and number of filled grains per panicle, 10 distinct panicles were randomly chosen from each plot, and their panicle length, total number of grains per panicle and number of filled grains per panicle were measured/counted and the average length, number of grains per panicle and number filled grains per panicle of were computed. For test weight, 1000 healthy grains were counted and their weights were recorded in grams from each net plot that was harvested. The harvest index is calculated by dividing economic yield by the biological yield and expressed in percentage [Harvest index = {Grain yield (kg/ha) / Grain + straw yield (kg/ha)}*100]. The dry weight of weeds was noted by collecting weed samples randomly from three places in each plot by using a metallic quadrate of size 50 cm x 50 cm at 30, 60, 90 DAS and at harvest and weed samples were accurately weighed after being oven-dried for 48 hours at 60^0C. For the recorded data, square root modification was carried out {Square root transformed value = $\sqrt{}$ (x + 0.5), where x is the original value}. The formula provided by Mishra & Tosh (1979) was used to calculate the weed control index, WCI (%) = (Weed dry weight (g/m^2) of control plot - weed dry weight (g/m^2) of treated plot / Weed dry weight g/m^2 of control plot) *100. For each treatment, the net and gross returns were computed in rupees per hectare. Net return was computed on a per-hectare basis by deducting the cultivation cost from gross return (Net return = gross return – cost of cultivation). The benefit-cost ratio was calculated by net return/total cost of cultivation.

Results and Discussion

Effect on weeds

Weed free decreased the weed dry weight g/m^2 (Table 1) considerably in all the growth stages since it received hand weeding as well as mechanical weeding at regular intervals. However, because of labour shortage, this kind of weed management won't be either physically practical nor economically viable (Sengxua *et al.,* 2019). In addition to being costly, manual weeding has the additional disadvantage of not having enough labour during peak times (Vivitoli *et al.,* 2021). At 30 DAS two mechanical weeding at 15 and 30 DAS significantly lowered the total amount of weed dry weight. This might be due to the early destruction and early removal of weed (15 DAS) with the help of Japanese paddy weeder which ultimately reduces the overall weed dry matter accumulation. The process of mechanical weeding led to a considerable rise in the production of tillers by opening up more soil pores, which made it easier for microorganisms and roots to obtain oxygen (Randriamiharisoa, 2002). At 60,90 and at harvest bispyribac-sodium 10 EC @ 25 g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE at 20 DAS significantly reduced the total weed dry weight g/m^2. It is due to tank mix application of bispyribac-sodium + pyrazosulfuron which was found to be extremely successful in controlling weeds associated with rice (Singh *et al*., 2017 and Khippal *et al.,* 2019). In suppressing mixed vegetation of weeds in wet-seeded rice, bispyribac-sodium was quite successful (Dangol *et al*., 2020). Application of bispyribac Sodium @ 250 ml/ha) successfully decreased the dry weight and overall weed density up to 81.50% and 77.38% respectively (Kundu *et al.,* 2020) Weedy check recorded higher weed dry weight in all growth stages.

In all growth stages, weed free check recorded the highest weed control index (Table 2). During both years, at 30 DAS, two mechanical weeding at 15 and 30 DAS showed the highest weed control index due to mechanical weeding which suppresses the weed dry matter accumulation and growth to a great extent. At 60,90 and at harvest bispyribac-sodium 10 EC @ 25 g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE at 20 DAS resulted in highest weed control index. It was because the majority of the mix's weed flora was successfully managed by tank-mix application of bispyribac-sodium + pyrazosulfuron, which ultimately led to a decrease in weed dry weight (Rao *et al.,* 2019). Tank mix application of herbicide reduced the biomass of weeds and their growth to a greater extent as compared to the sole application of herbicide in wet direct seeded rice (Reddy *et al.,* 2021). All growth stages had the lowest weed control index for weedy check. Due to uncontrolled weed growth in the weedy check plots, both weed growth and dry weight are eventually increased (Yogananda *et al.,* 2019 and Malik *et al.,* 2021).

Effect on yield attributes

The number of effective tillers/m^2, panicle length, total grains/panicle, filled grains/panicle and test weights in the weed free treatment (Table 2) were noticeably higher. This is due to the effective suppression of quantity and growth of weeds throughout the critical period of crop weed competition that might have enabled the rice crop to bear promising architecture of yield- attributing characteristics in weed free plot as compared to other treatments (Raghavendra *et al.,* 2014 and Vigneshwaran 2020). Weed free treatment significantly increases the yield attributing characteristics and grain yield in direct seeded paddy (Abbas *et al.,* 2021). Among other weed management treatments, application of bispyribac-sodium 10 EC @ 25 g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE at 20 DAS being statistically at par with bispyribac-sodium 10 EC @ 25 g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE + one spot hand weeding and two mechanical weeding at 15 and 30 DAS registered the highest yield attributing characteristics. In these weed control treatments, the increase in yield attributing characteristics like the number of effective tillers/m^2 possibly because of proper control of weeds which ultimately suppressed the crop weed competition and helps the crop to achieve better growth as well as development. Less crop weed competition enables crop to harvest more sunlight and absorb more nutrients as well as water from the soil which directly influences the effective tillering ability and yield attributing characteristics of the crop (Singh *et al*., 2021 and Suseendran *et al.,* 2020).

Table 1: Effect of herbicides on weed dry weight at different growth stages of direct seeded post-flooded *kharif* rice

Treatment	Total weed dry weight (g/m^2)							
	30 DAS		60 DAS		90 DAS		At harvest	
	2020	2021	2020	2021	2020	2021	2020	2021
T_1: Weedy check	8.14 (65.77)	7.20 (51.35)	12.33 (151.53)	12.12 (146.40)	13.10 (171.12)	12.98 (167.99)	14.10 (198.32)	13.80 (189.95)
T_2: Weed free	0.71* (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)	0.71 (0.00)
T_3: Pret. 30.7 EC with safener PE fb 1 manual weeding at 30 DAS	3.80 (13.95)	3.69 (13.10)	5.14 (25.93)	3.99 (15.43)	6.36 (39.96)	6.10 (36.72)	8.96 (79.79)	9.07 (81.71)
T_4: Pret. 30.7 EC with safener PE fb 1 mechanical weeding at 30 DAS	3.97 (15.27)	3.21 (9.81)	5.29 (27.49)	4.95 (24.01)	7.90 (61.92)	7.05 (49.21)	10.37 (107.04)	9.75 (94.57)
T_5: Pret. 30.7 EC with safener PE fb B.S. 10 SL @ 25 g a.i./ha PoE	3.86 (14.41)	3.17 (9.55)	4.58 (20.48)	3.98 (15.35)	6.06 (36.23)	6.06 (36.23)	8.90 (78.72)	8.48 (71.42)
T_6: Pret. 30.7 EC with safener PE fb penoxsulam 2.5 OD @ 1000 ml/ha	3.99 (15.43)	3.25 (10.07)	5.10 (25.52)	4.29 (17.91)	7.39 (54.12)	6.55 (42.41)	10.33 (106.21)	9.70 (93.60)
T_7: B.S. 10 EC @ 25 g a.i./ha PoE + P.S. @ 20 g a.i./ha PoE (20 DAS)	4.37 (18.60)	3.92 (14.87)	3.72 (13.34)	3.02 (8.63)	5.50 (29.76)	4.50 (19.76)	7.62 (57.57)	7.39 (54.12)
T_8: B.S. 10 EC @ 25 g a.i./ha PoE + P.S. @ 20 g a.i./ha PoE + one spot hand weeding	5.30 (27.60)	4.35 (18.46)	3.96 (15.19)	3.14 (9.37)	5.82 (33.38)	4.55 (20.21)	7.89 (61.76)	7.41 (54.41)
T_9: Penoxsulam 2.5 OD @ 1000 ml/ha + almix @ 20 g/ha	7.18 (51.06)	4.84 (22.90)	4.77 (22.26)	3.91 (14.79)	6.69 (44.26)	6.78 (45.47)	9.49 (89.57)	8.13 (65.66)
T_{10}: Trifamone 20 WG + E.S 10 EC(Pre-mix) @ 225 g/ha + one spot hand weeding	4.60 (20.67)	4.43 (19.10)	5.07 (25.21)	3.98 (15.35)	7.12 (50.20)	5.72 (32.22)	10.20 103.55)	8.88 (78.42)
T_{11}: 2 mechanical weeding at 15 and 30 DAS	3.31 (10.46)	2.09 (3.87)	4.17 (16.89)	3.78 (13.79)	5.78 (32.91)	5.02 (24.71)	7.68 (58.49)	7.72 (59.10)
T_{12}: Almix @ 20 g/ha+need based 1 spot hand weeding	5.80 (33.15)	4.12 (16.48)	4.36 (18.52)	3.73 (13.42)	5.86 (33.85)	4.72 (21.78)	8.32 (68.73)	7.57 (56.81)
S.Em.(±)	0.48	0.36	0.44	0.24	0.15	0.17	0.21	0.22
CD (P=0.05)	1.43	1.06	1.29	0.71	0.44	0.49	0.62	0.65

*Data in the parentheses indicated original values, DAS-Days after sowing, Pret.- Pretilachlor, B.S.-Bispyribac-sodium, P.S.-Pyrazosulfuron, E.S.-Ethoxysulfuraon

Table 2: Effect of herbicides on weed control index and yield attributing characters of direct seeded post-flooded *kharif* rice

Treatment	Weed control index (WCI %)				Number of effective tillers/ m^2		Panicle length (cm)		Total grains /panicle		Filled grains /panicle		Test weight (g)	
	30 DAS	60 DAS	90 DAS	At harvest										
	2020-21	2020-21	2020-21	2020- 21	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
T_1: Weedy check	0.0	0.0	0.0	0.0	118.3	148.1	21.1	21.3	91.0	92.7	75.8	77.2	26.1	26.0
T_2: Weed free	100.0	100.0	100.0	100.0	212.3	211.8	24.6	24.9	118.3	116.2	106.5	100.6	26.6	26.6
T_3: Pret. 30.7 EC with safener PE fb 1 manual weeding at 30 DAS	76.7	86.2	77.4	58.4	192.3	195.0	22.7	23.1	106.7	107.7	95.7	98.0	26.5	26.5
T_4: Pret. 30.7 EC with safener PE fb 1 mechanical weeding at 30 DAS	78.9	82.7	67.3	48.1	185.0	187.3	22.6	23.1	105.0	104.0	92.0	94.3	26.1	26.1
T_5: Pret. 30.7 EC with safener PE fb B.S. 10 SL @ 25 g a.i./ha PoE	79.8	88.0	78.7	61.3	192.0	196.1	22.7	23.2	106.4	107.9	98.1	97.8	26.4	26.6
T_6: Pret. 30.7 EC with safener PE fb penoxsulam 2.5 OD @ 1000 ml/ha	78.5	85.5	71.6	48.6	182.3	187.9	23.2	22.6	106.0	104.6	98.3	96.9	26.4	26.5
T_7: B.S. 10 EC @ 25 g a.i./ha PoE + P.S. @ 20 g a.i./ha PoE (20 DAS)	71.4	92.7	85.4	71.2	207.7	209.7	24.5	24.8	110.7	112.3	100.7	104.5	26.5	26.6

T_8: B.S. 10 EC @ 25 g a.i./ha PoE + P.S. @ 20 g a.i./ha PoE + one spot hand weeding	61.1	91.8	84.2	70.1	199.0	206.2	23.8	24.5	109.2	110.7	100.3	102.6	26.4	26.5
T_9: Penoxsulam 2.5 OD @ 1000 ml/ha + almix @ 20 g/ha	38.9	87.6	73.5	60.1	190.3	292.0	22.8	23.0	107.0	107.1	94.7	95.7	26.4	26.4
T_{10}: Trifamone 20 WG + E.S 10 EC(Pre-mix) @ 225 g/ha + one spot hand weeding	65.7	86.4	75.8	53.3	183.3	189.0	22.5	22.6	97.4	104.3	85.3	92.8	26.4	26.4
T_{11}: 2 mechanical weeding at 15 and 30 DAS	88.3	89.7	83.0	69.7	199.7	202.4	23.9	24.1	109.8	110.5	100.5	101.3	26.5	26.5
T_{12}: Almix @ 20 g/ha+need based 1 spot hand weeding	58.8	89.3	83.6	67.7	196.3	197.3	23.1	23.7	107.4	108.8	98.6	98.3	26.4	26.5
S.Em.(±)	-	-	-	-	3.3	3.8	0.4	0.4	1.1	1.1	2.1	2.1	0.2	0.3
CD (P=0.05)	-	-	-	-	9.54	11.09	1.12	1.05	3.24	3.29	6.06	6.28	NS	NS

NS-Non-significant, DAS-Days after sowing, Pret.- Pretilachlor, B.S.- Bispyribac-sodium, P.S.- Pyrazosulfuron, E.S.- Ethoxysulfuraon,

Table 3: Effect of herbicides on cost of cultivation, gross return, net return and benefit-cost ratio of direct seeded post-flooded *kharif* rice

Treatment	Cost of cultivation (Rs. /ha)	Gross return (Rs. /ha)			Net return (Rs. /ha)			B: C Ratio		
		2020	2021	Mean	2020	2021	Mean	2020	2021	Mean
T_1: Weedy check	22884	35938	40208	38073	13054	17324	15189	0.57	0.76	0.67
T_2: Weed free	39324	74270	73833	74052	34946	34509	34728	0.89	0.88	0.89
T_3: Pretilachlor 30.7 EC with safener PE *fb* 1 manual weeding at 30 DAS	31282	63523	64558	64040	32241	33276	32758	1.03	1.06	1.05
T_4: Pretilachlor 30.7 EC with safener PE *fb*1 mechanical weeding at 30 DAS	27994	48275	61871	55073	20281	33877	27079	0.72	1.21	0.97
T_5: Pretilachlor 30.7 EC with safener PE *fb* bispyribac-sodium 10 SL @ 25 g a.i./ha PoE	25455	62333	64950	63642	36878	39495	38187	1.45	1.55	1.50
T_6: Pretilachlor 30.7 EC with safener PE fb penoxsulam 2.5 OD @ 1000 ml/ha	26580	51800	62403	57102	25220	35823	30522	0.95	1.35	1.15
T_7: Bispyribac-sodium 10 EC @ 25 g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE (20 DAS)	24967	68672	72050	70361	43705	47083	45394	1.75	1.89	1.82
T_8: Bispyribac-sodium 10 EC @ 25 g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE + one spot hand weeding	31317	66923	70608	68766	35606	39291	37449	1.14	1.25	1.20
T_9: Penoxsulam 2.5 OD @ 1000 ml/ha + almix @ 20 g/ha	25272	57882	63149	60515	32610	37877	35243	1.32	1.5	1.41
T_{10}: Trifamone 20 WG + ethoxysulfuraon 10 EC(Pre-mix) @ 225 g/ha + one spot hand weeding	33032	58118	63215	60667	25086	30183	27635	0.76	0.91	0.84
T_{11}: Two mechanical weeding at 15 and 30 DAS	30008	68344	70126	69235	38336	40118	39227	1.28	1.34	1.31
T_{12}: Almix (metsulfuron+ chlorimuron) @ 20 g/ha + need based one spot hand weeding	30522	63180	65468	64324	32658	34946	33802	1.07	1.14	1.11

- The selling price of rice grain = Rs. 1940 per quintal (As per the MSP for *kharif* crops, 2021-22)
- The selling price of paddy straw = Rs. 550 per quintal

Economics

Among different weed management practices, application of bispyribac-sodium 10 EC @ 25 g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE at 20 DAS recorded the highest net return and benefit-cost ratio (Table 3) as this treatment recorded higher yield attributes and grain yield due to effective control of weeds. Grain yield and yield attributes are directly proportional to net return and benefit-cost ratio (Mohanapriya *et al.,* 2019 and Kashid *et al.,* 2016). Despite having the highest gross return in weed free, the cultivation expenses for weed free treatment was much higher, as it needs regular weeding which was labour intensive and time-consuming operation. In comparison to other weed management strategies, the cultivation cost was higher in the weed-free treatment because weeding by hand is labour intensive and expensive process in direct seeded upland rice (Jeet *et al.,* 2020). On the other hand, weedy check obtained the lowest benefit cost ratio due to increase in crop weed competition for sunlight, nutrients and water at entire stages of crop growth, which ultimately reduces the crop yield.

Conclusion

Based on the results from a two-year field experiment, it was observed that in flood-prone areas, farmers don't have enough time to go for recultivation of rice through transplanting. In that situation shifting from traditional transplanting to direct seeding will give farmers the upper hand. Traditional weeding through manual labour is time and capital-intensive due to which application of bispyribac-sodium 10 EC at 25g a.i./ha PoE + pyrazosulfuron @ 20 g a.i./ha PoE at 20 DAS was found to be a suitable method for weed management in wet direct seeded post flooded *kharif* rice in terms of reduced weed growth and weed dry matter and higher weed control index, higher yield attributing characters and higher economic return.

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Conflict of interest

All authors declare that they have no conflict of interest.

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