

## RESEARCH NOTE

### Effect of bispyribac sodium on *Echinochloa* sp. in rice nursery (*Oryza sativa* L.)

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A field experiment was conducted during *Kharif* and summer seasons of 2011-12 at Agricultural Research Station, Malnoor, University of Agricultural Sciences, Raichur to study the effect of bispyribac sodium on the *Echinochloa* sp. in rice nursery. The soil of the experimental field was clayey in texture, with a pH of 8.0, medium in organic carbon (0.64%) and available N (210 kg ha<sup>-1</sup>), and high in available P<sub>2</sub>O<sub>5</sub> (31.4 kg ha<sup>-1</sup>) and high in available K<sub>2</sub>O (285 kg ha<sup>-1</sup>). Sprouted rice seeds of variety 'BPT 5402' was sown in puddle leveled field. There were seven treatments laid out in a randomized block design with three replications. Treatments consisted of bispyribac sodium 15, 20, 25 and 30 g ha<sup>-1</sup> and pretilachlor 750 g ha<sup>-1</sup> was compared with hand weeding (20 DAS) and unweeded check. The data revealed that application of sodium @ 20 to 25 g ha<sup>-1</sup> controlled *Echinochloa colona* and *Echinochloa crusgalli* in rice nurseries effectively and was non phytotoxic to rice seedlings.

**Key words :** Bispyribac sodium, Pretilachlor, Rice nursery

Rice (*Oryza sativa* L.) is one of the most important food crops of Karnataka. It is grown in an area of 1.54 m ha with an annual production of 3.9 million tones and with a productivity of 2974 kg ha<sup>-1</sup>. In Karnataka it is cultivated in the command area of Cauvery, Tungabhadra and Upper Krishna Project where transplanting is the major method of cultivation. In transplanted rice cultivation, sprouted rice seeds are broadcasted in nursery and at 25-30 days seedling are uprooted and transplanted in puddle field where, maintenance of weed free nursery is a pre requisite, in order to ensure good seedling vigour and to reduce early weed competition in main field. Weeds are self sown and appear simultaneously with rice seeds creating sever competition for nutrient, space and solar radiation resulting in poor and weak seedlings. Presently this has been tackled by manual hand weeding. However, this is tedious, time consuming, costly and ineffective method where some of the rice associated weeds like *Echinocloa crusgalli* and *Echinocloa colonum*, due to similarities between weeds and rice seedlings, it could not be separated. In such situations the chemical weed control becomes an alternative method for weed control.

Chemical weeding with the application of pre-emergent or post-emergent herbicides is vital tool for effective weed control in rice nursery. As rice seedlings are very sensitive, and hence, selectivity, dose and time of application are more important to avoid phytotoxic effect and increase weed control efficiency.

Keeping these points in view, the present investigation was under taken.

A field experiment was carried out during *Kharif* and summer seasons of 2011-12 at Agricultural Research Station, Malnoor, University of Agricultural Sciences, Raichur to study the effect of bispyribac sodium on the *Echinochloa* sp. in rice nursery. The soil of the experimental field was clayey in texture, with a pH of 8.0, medium in organic carbon (0.64%) and available N (210 kg ha<sup>-1</sup>), and high in available P<sub>2</sub>O<sub>5</sub> (31.4 kg ha<sup>-1</sup>) and high in available K<sub>2</sub>O (285 kg ha<sup>-1</sup>). Sprouted rice seeds of variety 'BPT 5402' was sown in puddle leveled field. There were seven treatments laid out in a randomized block design with three replications. Treatments consisted of bispyribac sodium 15, 20, 25 and 30 g ha<sup>-1</sup> and pretilachlor 750 g ha<sup>-1</sup> was compared with hand weeding (20 DAS) and unweeded check. The herbicides were applied at 10<sup>th</sup> day after sowing (2-5 leaf stage of weeds). Herbicide was sprayed using knapsack sprayer fitted with solid cone nozzle using 500 litres water ha<sup>-1</sup>. Irrigation water was allowed as per the requirement. However, water was removed one day before application of herbicide and allowed two days their after. Weed density of *Echinochloa colona* and *Echinochloa crusgalli* were recorded at 10 (before application of herbicide), 25 and 45 days after sowing by using quadrat 0.25 square meters (0.5 x 0.5 m) count method. The weeds of 45 days after sowing was used for dry weight estimation.

At 10<sup>th</sup> day after sowing the weed count was not significant indicating the uniformity of the selected field for experimentation. At 25 and 45 days after sowing, application of herbicides reduced weed population and weed dry weight significantly over weedy check. (Table 1) indicating the efficiency of herbicides in controlling *Echinochloa* sp. The hand weeding showed the lowest weed count both during *kharif* and summer. With respect to herbicides bispyribac sodium was superior over pretilachlor in controlling *Echinochloa* sp. Increase in bispyribac sodium from 15 g ha<sup>-1</sup> to 30 g ha<sup>-1</sup> reduced the weed count but significant reduction was noticed up to 20 g ha<sup>-1</sup>. Walia *et al.* (2008) reported higher weed control efficiency at 30 g ha<sup>-1</sup> of bispyribac-sodium. Pretilachlor being pre-emergent applied at 10<sup>th</sup> after sowing due to the fact that it is phytotoxic if used at sowing. Hence, by the time the herbicide was applied maximum weeds have been germinated and were not controlled by pretilachlor.

The data on weed dry weight followed the similar trend both during *kharif* and summer. Hand weeding showed the lowest weed dry weight of 4.0 and 3.0 kg ha<sup>-1</sup> and this was 212% and 365 % higher during *kharif* and summer, respectively over unweeded check. The hand weeding was on par with bispyribac sodium at 20 g ha<sup>-1</sup> to 30 g ha<sup>-1</sup>. The bispyribac sodium at 15 g ha<sup>-1</sup> reduced the weeds but not to the level of hand weeding or bispyribac sodium at 20 g ha<sup>-1</sup>. Christos *et al.* (2008) reported that bispyribac sodium @ 24 to 36 g ha<sup>-1</sup> at 3 to 4 leaf stage of weeds controlled weeds to an extent of 89 to 100 per cent.

Table 1. Weed count, weed dry weight and weed control efficiency as influenced by bispyribac sodium in rice nursery

Treatments	Dose g/ha	Kharif					Summer				
		Weed count (m <sup>2</sup> )			Weed dry wt. kg ha <sup>-1</sup>	WCE %	Weed count (m <sup>2</sup> )			Weed dry wt. kg ha <sup>-1</sup>	WCE %
		10 DAS	25 DAS	45 DAS			10 DAS	25 DAS	45 DAS		
Bispyribac sodium 10SC	15	7.20	6.30	7.80	7.00	44.0	5.13	4.13	6.20	8.34	46.2
Bispyribac sodium 10SC	20	6.95	2.12	3.55	4.23	66.1	5.00	2.12	2.50	5.26	66.1
Bispyribac sodium 10SC	25	7.76	2.00	3.15	4.00	68.0	5.70	1.95	2.19	5.04	67.5
Bispyribac sodium 10SC	30	7.37	2.11	3.00	4.01	67.9	5.12	1.90	2.40	4.95	68.1
Pretilachlor 50 EC	750	7.00	5.95	5.49	5.95	52.4	5.10	2.92	2.68	5.75	50.0
Hand weeding (20 DAS)	-	7.05	0.52	3.51	4.00	68.0	5.01	1.12	2.00	3.00	80.6
Weedy check	-	6.90	9.52	10.12	12.50	-	5.90	6.50	10.12	15.50	-
S.Em±	-	0.25	0.40	0.68	0.72	-	0.40	0.35	0.70	0.77	-
C.D. 0.05	-	NS	1.21	2.10	2.34	-	NS	1.05	2.16	2.30	-

Similarly the weed control efficiency was highest in hand weeding during *kharif* (68.0%) and summer (80.6%). Increase in bispyribac sodium from 15 g ha<sup>-1</sup> to 25 g ha<sup>-1</sup> increased the WCE. However, the optimum would be 25 g ha<sup>-1</sup>. Yadav *et al.* (2009) indicated that application of bispyribac-sodium 20 g/ha was more remunerative as compared to weed free treatment.

The visual rating on phytotoxicity of herbicides on rice seedlings was recorded at 10 and 15 days after application indicated that post emergence application of bispyribac-sodium at 15 g ha<sup>-1</sup> to 30 g ha<sup>-1</sup> did not show phytotoxic symptoms. The pretilachlor applied at 10<sup>th</sup> day was also had no phytotoxic

effect on rice seedlings. Rao and Ratnam (2010) also reported that post emergence application of bispyribac-sodium at 30 g ha<sup>-1</sup> applied 15 DAS was found to be the most effective due to its effective broad spectrum control of weeds in rice, with out any phytotoxic effect. Anay Rawat *et al.* (2012) opened that the application of bispyribac-sodium 20 g/ha was more remunerative.

It was concluded from the data that bispyribac sodium @ 20 to 25 g ha<sup>-1</sup> could effectively control the problematic weeds like *Echinochloa colona* and *Echinochloa crusgalli* in rice nurseries and non phytotoxic to rice seedlings.

## References

- Anay Rawat, Chaudhary, C. S., Upadhyaya, V. B. and Vikas Jain, 2012, Efficacy of bispyribac-sodium on weed flora and yield of drilled rice. *Indian J. Weed Sci.*, 44 (3): 183–185.
- Christos, A., Damalas, Kico, V. and Illias, G., 2008, Bispyribac sodium efficacy on early water grass and late water grass as affected by application of selected rice herbicides. *Weed Tech.*, 22: 622-627.
- Rao, A. S. and Ratnam, M., 2010, Evaluation of post emergence herbicides on weed control in rice nursery. *Pakistan J. Weed Sci. Res.*, 16(4): 387-392, 2010.
- Walia, U. S., Singh, O., Nayyar, S. and Sindhu, V., 2008, Performance of post-emergence application of bispyribac-sodium in dry seeded rice. *Indian J. Weed Sci.*, 40 (3 & 4) : 157-160
- Yadav, D. B., Yadav Ashok and Punia, S S.. 2009, Evaluation of bispyribac-sodium for weed control in transplanted rice. *Indian J. Weed Sci.*, 41 (1&2): 23–27.