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WEED MANAGEMENT IN TRANSPLANTED FINGERMILLET IN SOUTHERN AGRO-CLIMATIC ZONE OF ANDHRA PRADESH

N.V. SARALA*, M. SUBBA RAO, L. MADHAVILATHA AND T.M. HEMALATHA

Agricultural Research Station, Acharya N.G. Ranga Agricultural University, Perumallapalle- 517 505

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ABSTRACT

Field experiment to study the efficiency of different herbicides to control the weeds in fingermillet was conducted during two seasons of *kharif* 2014 and 2015 in sandy loam soils at Agricultural Research Station Perumallapalle. Results from two consecutive seasons revealed that among different weed management practices,pre- emergence application of oxyfluorfen 0.2 kg a.i /ha + one hand weeding at 20 DAP (1.56) followed by pendimethalin 0.5 kg a.i/ha+ one hand weeding at 20 DAP realized higher benefit cost ratio (1.52) compared to hand weeding. Post emergence application of 2, 4-D Sodium salt @ 0.8 kg a.i /ha at 20 days after planting realized higher cost benefit ratio (1.91). Post-emergence application of bispyribac sodium @ 20 g a.i/ ha showed phototoxicity on crop growth.

KEYWORDS: Fingermillet, Weed management, Oxyflurofen, Pendimethalin and Hand weeding

Fingermillet is the most important small millet grown in Andhra Pradesh in an area of 0.29 lakh ha with a production of 0.03 lakh tonnes and a productivity of 951 kg/ha (Annual Report AICRIP on Small Millets 2016). The production and productivity of fingermillet is low because of insufficient irrigation, poor nutrient management, heavy weed infestation and incidence of blast disease. Among these, weed infestation is a serious threat to its production, particularly during the critical period of the crop. Reduction in yield due to weed competition to an extent of 55-61 per cent was reported earlier by Ramachandra Prasad *et al.* (1991) up to 43 per cent by Kumar, 2004 and Nanjappa (1980). Eventhough manual weeding is effective, it is time consuming and labour intensive and uneconomical. In view of the escalation of cost of labour, manual weeding is not worthy. Post-emergence herbicides for weed control in fingermillet become cheaper when compared to manual weeding. Hence, the present study was taken up with the objective to find out the best pre and post-emergence herbicides and best weed management practice in transplanted fingermillet during *kharif* 2014 and 2015 for two consecutive seasons in sandy loam soils of Southern Agro-climatic Zone of Andhra Pradesh.

MATERIALS AND METHODS

The field experiments were conducted at Agricultural Research Station, Perumallapalle, Andhra Pradesh, during *kharif* 2014 and 2015. The experiment was laid out in a Randomized block design with three replications. The variety used for the experiment was Vakula (PPR2700). The treatmental details are : T_1 : Control (no weeding), T_2: Hand weeding at 20, 40 days after planting, T_3: Pre-emergence application of oxyfluorfen 0.2 kg a.i /ha + one hand weeding at 20 DAP, T_4: Pre-emergence application o of pendimethalin 0.5 kg a.i/ha+ one hand weeding at 20 DAPT_5: Bispyribac sodium @ 20 g a.i/ha 20 days after planting, T_6: 2,4-D sodium salt @ 0.8 kg a.i /ha at 20 days after planting, T_7 : Oxyfluorfen 0.2 kg a.i /ha at 20 DAP. Seedlings were raised in nursery and 21 days old seedlings were transplanted with a spacing of 22.5 x 7.5 cm at one seedling per hill. The recommended dose of 60 kg N, 40 kg P_2O_5, 30 kg K_2O/ha was applied. P_2O_5 and K_2O were applied as basal dose in the form of single super phosphate and muriate of potash. Nitrogen was applied as urea in two equal splits half at the time of transplanting remaining half at 20-25 days after transplanting (after weeding). Need based irrigations were given when there were long dry spells. Major weed flora observed in the experimental field were *Cynodon dactylon, Cyperus rotundus, Dactyloctenium aegyptium , Panicum repens, Digitar*ia sps among grasses and *Trianthemma portulacastrum, Commelina benghalensis, phyllathus niruri, Parthenium hysterphorus* among broad leaved weeds. The data on weed density and weed dry matter were recorded at the time of harvest besides yield and yield components by adopting standard procedures.

*Corresponding author, E-mail: saralaangrau@gmail.com

RESULTS AND DISCUSSION

Effect on weeds

During both the seasons, weed management treatments significantly reduced the weed density and weed dry matter over un-weeded control plots at harvest (Table 1). Among the different weed management practices tried hand weeding at 20 and 40 days after planting recorded significantly lower weed density and weed dry matter. These results are in accordance with Basavaraj Patil *et al.,* 2013. Among herbicidal treatments, pre-emergence application of pendimethalin 0.5 kg a.i/ ha+ one hand weeding at 20 DAP gave lower weed density and weed dry matter followed by pre-emergence application of oxyfluorfen 0.2 kg a.i /ha + one hand weeding at 20 DAP. Post-emergence application of bispyribac sodium @ 20 g a.i/ at 20 days after planting was effective only against broad leaved weeds. Post-emergence application of 2,4-D Sodium salt @ 0.8 kg a.i /ha at 20 days after planting suppressed only broad leaved weeds and could not control grassy weeds and sedges and thereby weed infestation was severe which affected the grain yield of fingermillet during both seasons of study. Post-emergence application of oxyfluorfen 0.2 kg *a.i* /ha at 20 DAP effectively controlled both grassy and broad leaved weeds.

Effect on Crop Growth and yield:

Oxyfluorfen 0.2 kg a.i /ha at 20 DAP (T_7) and bispyribac sodium @ 20 g a.i/ha 20 days after planting (T_5) applied as post-emergence affect the crop growth, intensity of reduced tillering, phytotoxicity symptoms like leaf scorching and yellowing immediately after herbicide application crop was recovered subsequently within 10 days after treatment imposition. Severe crop damage was observed with application of bispyribac sodium @ 20 g a.i/ha. compared to oxyfluorfen 0.2 kg ai /ha. at 20 days after planting.

Yield and yield attributes were significantly influenced by different weed management practices. Among the different weed management practices hand weeding at 20,40 days after transplanting recorded the highest grain yield with pre-emergence application of oxyfluorfen 0.2 kg ai /ha + one hand weeding at 20 DAP which was on a par with pre emergence application of pendimethalin 0.5 kg a.i/ha+ one hand weeding at 20 DAP(33.6 q/ha). The increase in yield can be attributed due to better weed control in initial stages by pre-emergence application of herbicides and subsequently by manual weeding that resulted in better translocation of photosynthetates sufficient to the sink needs. The similar results were also reported by Basavaraj patil *et al.,* (2013), Ashok *et al.,* (2003), Kumar (2004), Rama moorthy *et al.*, (2009) and Channa Naik (2000). The lowest number of productive tillers and grain yield were recorded with post- emergence application of bispyribac sodium @ 20 g a.i/ha at 20 days after planting followed by post emergence application of oxyfluorfen 0.2 kg a.i /ha at 20 DAP which initial set back in crop growth was due to phytotoxic effect which affected initial plant growth.

Among weed management treatments, the highest net returns were realized with pre- emergence application of oxyfluorfen 0.2 kg a.i /ha + one hand weeding at 20 DAP followed by pre-emergence application of pendimethalin 0.5 kg a.i/ha. + one hand weeding at 20 DAP. Among the post-emergence herbicides application of 2,4-D Sodium salt @ 0.8 kg a.i /ha. at 20 days after planting realized higher benefit cost ratio. The results are in accordance with Krishna Prithvi *et al*.,(2015).

CONCLUSION

Among the different pre-emergence herbicides, oxyfluorfen 0.2 kg *a.i* /ha. or Pendimethalin 0.5 kg *a.i*/ha recorded significantly lesser weed density and dry weight, besides producing higher grain yield in fingermillet. Among the post-emergence herbicides, 2,4-D Sodium salt @ 0.8 kg/ha effectively controlled the weeds compared to bispyribac sodium and oxyfluorfen in Fingermillet as these post-emergence herbicides showed phytotoxicity to the crop.

REFERENCES

Ashok E.G., Chandrappa M., Kadalli G.G., Kumar Kiran, Mathad V., Gowda K.T and Krishne. 2003. Integrated weed control in drill-sown rainfed fingermillet (*Elesuine coracana*). Project Co-ordination cell, All India Co-ordinated Small Millets Improvement Project, University of Agricultural Sciences Banglore, Karnataka. *Indian Journal of Agronomy*. 48(4): 290-293.

Basavaraj Patil, Reddy, V.C., Ramachandra Prasad, T.V., Shankaralingappa, B.C., Devendra, R and Kalyanamarthy, K.N. 2013. Weed management in irrigated organic fingermillet. Indian Journal of Weed Science 45 (2) 143-145

Table 1: Weed parameters, yield components and yield of Fingermillet as influenced by different Weed management practices

Treatments	Weed density (No./m²)			Weed dry matter (g/m²)			Grain yield (q)			Productive tillers/m²	Fingers /ear	Grain yield (q/ha)	Gross returns (₹/ha.)	Net returns (₹/ha)	B:C
	2014 *kharif*	2015 *kharif*	Mean	2014 *kharif*	2015 *kharif*	Mean	2014 *kharif*	2015 *kharif*	Mean						
T_1 : Control (no weeding)	31.8	39.6	35.7	216	41.9	128.9	24.4	22.7	23.5	78.6	8.6	23.5	58750	19250	1.48
T_2 : Hand weeding at 20, 40 days after planting	8.3	9.2	8.75	152	25.8	88.9	34.8	36.6	35.7	124.0	9.0	35.7	89425	19925	1.28
T_3 : Pre emergence application of oxyfluorofen 0.2 kg *a.i* /ha + one hand weeding at 20 DAP	17.2	18.6	17.9	96.3	37.2	66.7	34.6	35.4	35.0	98.0	9.2	35.0	87500	31440	1.56
T_4 : Pre emergence application of Pendimethalin 0.5 kg *a.i* /ha + one hand weeding at 20 DAP	18.3	16.0	17.1	79.6	40.4	60.0	32.4	34.9	33.6	114.0	9.0	33.6	84000	28770	1.52
T_5 : Bispyribac sodium @ 20 g *a.i* /ha 20 days after planting	22.3	29.5	25.9	141.0	43.9	92.4	12.8	13.2	13.0	64.0	8.8	13.0	32500	-9030	0.78
T_6 : 2, 4 D Sodium salt @ 0.8 kg *a.i* /ha at 20 days after planting	24.3	19.7	22.0	121.0	53.2	87.1	27.7	33.3	30.5	106.6	8.6	30.5	76250	36452	1.91
T_7 : Oxyfluorofen 0.2 kg *a.i* /ha at 20 DAP	17.4	22.8	20.1	146.6	37.5	92.0	16.2	15.3	15.7	65.3	8.7	15.7	39250	-2310	0.94
S Em ±	3.63	0.59	-	30.2	0.61	-	4.38	1.72	-	2.86	0.36	0.35	-	-	-
CD (0.05)	11.3	1.84	-	NS	1.92	-	13.5	0.35	-	8.9	NS	1.72	-	-	-

Channa Naik, D., Muiyappa, T.V and Dinesh Kumar, M. 2000. Response of transplanted fingermillet (*Eleusine coracana*) on yield and economics as influenced by integrated weed management practices. *Indian Journal of Agronomy*. 45(1): 138-142.

Kumar O. 2004. Weed management transplanted fingermillet-groundnut cropping system. Ph.D thesis, University of Agricultural Sciences, Bangalore, p.80.

Krishna Prithi, B., Rao, A.S and Srinivasulu, K. 2015. Weed management in transplanted ragi. *Indian Journal of Weed Science*. 47(2): 214-215.

Nanjappa, H.V. 1980. Crop- weed competition and weed control studies in fingermillet (*Elesusine coracana*) Ph.D Thesis University of Agricultural Sciences Bangalore, India.

Ramachandra Prasad, T.V., Narasimha, N., Dwarakanath, N., Munegowda, M.K and Krishnamurthy, K. 1991. Integrated weed management in drilled fingermillet. *Mysore Journal of Agricultural Sciences*. 25:13-19.

Ramamoorthy, K., Radhamani, S and Subbaih, P. 2009. Integrated weed management for the control of *Trianthema portulacastrum* L. in rainfed fingermillet (*Eleusina coracana* (L.) *Gaertn*). *Green Farming*. 2(4): 221-223.