*Plant Archives* Volume 20 No. 1, 2020 pp. 3196-3198 **e-ISSN:2581-6063 (online), ISSN:0972-5210**

# EFFECT OF WEED MANAGEMENT PRACTICES ON WEED INDICES IN TRANSPLANTED KODO MILLET

**S. Jawahar*, S. Ramesh, S.R. Vinod Kumar, C. Kalaiyarasan, K. Arivukkarasu and K. Suseendran**

Department of Agronomy, Faculty of Agriculture, Annamalai University, Annamalainagar– 608 002, Tamilnadu, India

## Abstract

Field experiment was conducted to study the effect of weed management practices on weed indices in transplanted kodo millet at the Experimental Farm, Department of Agronomy, Annamalai University, Annamalainagar during Kharif season (June to October), 2014. The treatments consisted of unweeded control ($T_1$), twice hand weeding ($T_2$) (at 20 and 40 DAT), butachlor 50% EC @ 1.5 kg a.i $ha^{-1}$ ($T_3$), pretilachlor 50% EC @ 0.5 kg a.i $ha^{-1}$ ($T_4$), 2,4, d- Na salt 80% WP @ 0.75 kg a.i $ha^{-1}$ ($T_5$), bispyribac sodium10 % SC @ 20 g $ha^{-1}$ ($T_6$). The field experiment was laid out in randomized block design with four replications. Among the different weed management practices, hand weeding twice on 20 and 40 DAT ($T_2$) recorded the lesser weed intensity percentage on 30 and 60 DAT and recorded higher weed control efficiency and treatment efficiency index on 30 and 60 DAT. This was on par with the application of post emergence herbicide bispyribac sodium @ 20 g a.i $ha^{-1}$ on 20 DAT ($T_6$). Among the herbicides, lesser weed index was recorded under post emergence herbicide bispyribac sodium @ 20 g a.i $ha^{-1}$ on 20 DAT, which was followed by Pre-emergence application of Pretilachlor @ 0.5 kg a.i/ha on 3 DAT. Hence it can be concluded that application of post emergence herbicide bispyribac sodium @ 20 g a.i $ha^{-1}$ on 20 DAT ($T_6$) holds immense potentiality to control all types of weeds in transplanted kodo millet.

***Key words:*** weed management practices, weed indices, transplanted kodo millet.

## Introduction

Kodo millet is one of the major food crops in tribal areas of the country. It is widely distributed in damp habitats across the tropics and subtropics of the World. It is known to have been grown in southern Rajasthan and Maharashtra for at least 3,000 years. It is grown today from Uttar Pradesh to Bangladesh in the north, and kerala and Tamil Nadu in the south. It forms the main stay of the dietary nutritional requirements of farmers of marginal and dry lands in many parts of India. The fiber content of the whole grain is very high. Kodo millet has around 11% protein and the nutritional value of the protein has been found to be slightly better than that of foxtail millet but comparable to that of other small millets. As with other food grains, the nutritive value of kodo millet protein could be improved by supplementation with legume protein. Now a day's kodo grain is recommended as a substitute for rice next to finger millet to the patients suffering from diabetes diseases (Vanithasri *et al*., 2012). Further, the burgeoning population of our country may stabilize around 1.4 and 1.6 billion by 2025 and 2050, requiring annually 380 and 450 million tonnes of food grains respectively (Siddiq, 2000). Hence, there is an urgent need to increase the production and productivity of kodo millet to meet future food requirements.

Slow initial growth of kodo millet (*Paspalum scrobiculatum* L.) and favourable conditions for weed multiplication and a wide spectrum of heterogeneous weed flora, which gradually become a serious limitation for low production of kodo millet. Weed competition is one of the prime yield-limiting biotic constraints and weeds compete with crops for water, light, nutrients and space. Weeds are the most competitors in their early growth stages than at later stages and hence the growth of crops was suffered and finally reduced the grain yield (Jacob and Syriac, 2005). Weeds grow profusely in the field and reduce crop yields drastically normally the loss in yield range between 15 to 20 percent yet in severe cases the yield losses can be more than 50 per cent in rice depending upon the species and intensity of weeds (Mirza

***Author for correspondence :** E-mail : jawa_au@yahoo.com

Hasanuzzama *et al.*, 2009).Weed flora under transplanted condition is very much diverse and consists of grasses, sedges and broad-leaved weeds causing yield reduction upto 76 per cent (Govindra Singh *et al.*, 2004). Chemical method of weed control is effective to control the weeds economically. Now a day's use of herbicides is gaining popularity due to their rapid effects and less cost involvement compared to traditional methods (Kumar and Sharma, 2005). The use of herbicides offers selective control of weeds right from beginning, giving crop and advantage of good start and competitive superiority over weed (Saha 2006). Keeping these above said facts in consideration, the present investigation was carried out to study the effect of weed management practices on weed indices in transplanted kodo millet.

## Materials and Methods

The field experiment was conducted in the field No K8 of the Northern block of Experimental Farm, Department of Agronomy, Faculty of Agriculture, Annamalai University, Annamalai Nagar, Tamil Nadu (India) during Kharif (June to October), 2014 to study the effect of weed management practices on weed indices in transplanted kodo millet. The treatments consisted of unweeded control ($T_1$), twice hand weeding ($T_2$) (at 20 and 40 DAT), butachlor 50% EC @ 1.5 kg a.i $ha^{-1}$ ($T_3$), pretilachlor 50% EC @ 0.5 kg a.i $ha^{-1}$ ($T_4$), 2,4,d- Na salt 80% WP @ 0.75 kg a.i $ha^{-1}$ ($T_5$), bispyribac sodium10 % SC @ 20 g $ha^{-1}$ ($T_6$). The field experiment was laid out in randomized block design with four replications. The pre-emergence herbicides *viz.*, butachlor and pretilachlor were sprayed with knapsack sprayer fitted with a flood-jet nozzle. The pre-emergence herbicides were sprayed on the third day after transplanting. The post-emergence herbicide *viz.*, 2, 4, D - Na salt and bispyribac- sodium were sprayed on the twenty days after transplanting. Herbicides were mixed with a calibrated amount of water and sprayed plot wise. Weed indices viz., weed intensity percentage, weed control efficiency (WCE), treatment efficiency index and weed index were calculated by using the following formula.

$$\text{Weed Intensity (\%)} = \frac{\text{Weed population}}{\text{Weed} + \text{Crop population}} \times 100$$

$$\text{WCE (\%)} = \frac{\text{Weed DMP in control plots} - \text{Weed DMP in treated plots}}{\text{Weed DMP in control plots}} \times 100$$

$$\text{Treatment efficiency index} = \frac{\frac{\text{Yield of treatment} - \text{Yield of control}}{\text{Yield of control}} \times 100}{\frac{\text{Weed weight in treatmen}}{\text{Weed weight in control}} \times 100}$$

$$\text{Weed Index} = \frac{\text{Yield from hand weeded plot} - \text{Yield from treated plot}}{\text{Yield from hand weeded plot}}$$

## Results and Discussion

Experimental field was dominated by *Cyperus rotundus, Bergia capensis, Eclipta alba, Echinochloa colonum and Leptochloa chinensis*. However, only two weeds viz. *Cyperus rotundus and Bergia capensis* constituted greater proportions of weed flora in the experimental plots. The other weeds occurred only in negligible proportions and their occurrence was also rare. The weed management practices significantly influenced on weed indices *viz.*, weed intensity percentage, weed control efficiency, treatment efficacy index and weed index in transplanted kodo millet. Among the different weed management practices tried, hand weeding twice at 20 and 40 DAT ($T_2$) registered its superiority over others. The treatment $T_2$ recorded lesser weed intensity percentage on 30 and 60 DAT (Fig. 1). This might be due to the effective control of weed seed emergence and establishment initially and depleting the soil seed reserves and the late emerged weeds can be controlled through the hand weeding twice on 20 and 40 DAT. Similar results were reported by Chauhan *et al.*, (2013). This was on par with application of post emergence herbicide bispyribac sodium @ 20 g a.i $ha^{-1}$ on 20 DAT ($T_6$). Lower weed intensity percentage at $T_6$ could be due to absorption of chemical by roots, shoots and germinating weeds and


**Fig. 1:** Effect of weed management practices on weed intensity (%) and weed control efficiency (%) on 30 and 60 DAT in transplanted kodomillet.

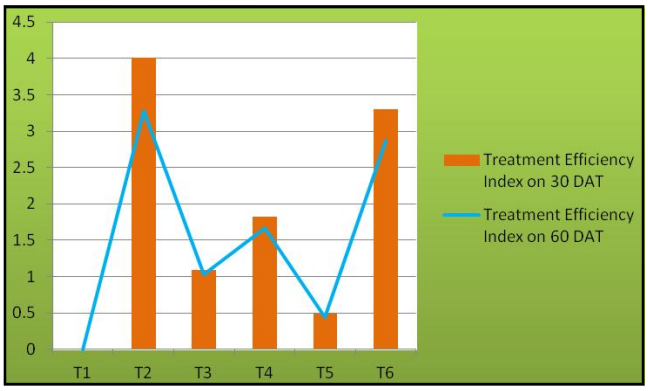


**Fig. 2:** Effect of weed management practices on Treatment efficiency index on 30 and 60 DAT in transplanted kodomillet.

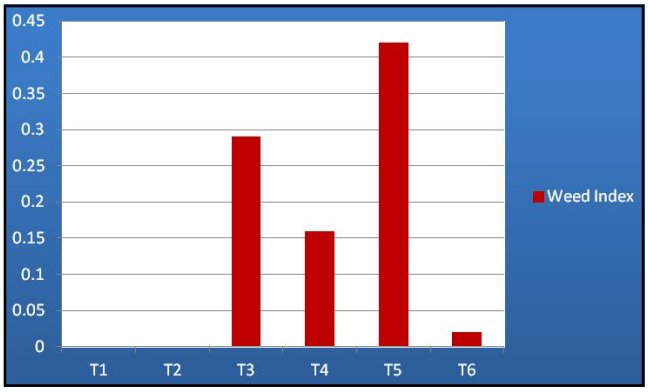


**Fig. 3:** Effect of weed management practices on Weed index in transplanted kodomillet.

inhibits the synthesis of essential branched chain amino acid, cell division and early development and thus effectively controlled the weeds and performed better than other herbicides resulted in significantly lower density than the unweeded control treatment. The finding of the present study is in accordance with those of Deepthi Kiran and Subramaniyan (2010).

The same treatment registered higher weed control efficiency (Fig. 1) and treatment efficiency index (Fig. 2) on 30 and 60 DAT, which was followed by herbicide bispyribac sodium @ 20 g a.i ha$^{-1}$ on 20 DAT ($T_6$). Lesser weed population and biomass at hand weeding twice on 20 and 40 DAT caused higher weed control efficiency and treatment efficiency index on 30 and 60 DAT resulted in higher yield of transplanted kodo millet. This was followed by application of post emergence herbicide bispyribac sodium @ 20 g ha$^{-1}$ on 20 DAT. Among the herbicidal treatment, the lesser weed index was recorded with application of post emergence herbicide bispyribac sodium @ 20 g ha$^{-1}$ on 20 DAT (Fig. 3). This was followed by Pre-emergence application of Pretilachlor @ 0.5 kg a.i/ha on 3 DAT. Based on the results of the study, it can be concluded that application of bispyribac sodium @ 20 g ha$^{-1}$ on 20 DAT holds immense potentiality to control the all types of weeds to boost the productivity of transplanted kodo millet.

## References

Ahamed, M.S. and H.S. Yadava (1996). Assessment of productivity and economics of small millets in Madhya Pradesh. *Crop Res.*, **12(3):** 12–15.

Chauhan, P.S., A.K. Jha and M. Soni (2013). Efficacy of chlorimuron-ethyl against weeds in transplanted rice. *Ind. J. Weed. Sci.*, **45(2):** 135-136.

Deepthi Kiran, Y. and D. Subramanyan (2010). Performance of pre and post-emergence herbicides on weed flora and yield of transplanted rice (*Oryza sativa*). *Ind. J. Weed sci.*, **42(3&4):** 229 -231.

Govindra Singh, V.P. Singh and Mahendra Singh (2004). Effect of almix and butachlor along and in combinations on transplanted rice and associated weeds. *Indian J. Weeds Sci.*, **36(1&2):** 64-67.

Jacob, D. and E.K. Syriac (2005). Performance of transplanted scanted rice (*Oryza satia* L.) under different spacing and weed management regimes in Southern Kerana. *J. Trop. Africa*, **43(1):** 71-73.

Kumar, M. and G. Sharma (2005). Effect of herbicides alone and in combination on direct seeds rice. *Indian J. Weed Sci.*, **37(3&4):** 197-201.

Mirza Hasanuzzama, M.H. Ali, M.M. Alam, M. Akther and K.F. Alam (2009). Evaluation of Pre emergence Herbicide and Hand Weeding on the Weed Control Efficiency and Performance of Transplanted Aus Rice. *American-Eurasian J. Agron.*, **2(3):** 138-143.

Misra, A. and G.C. Tosh (1979). Chemical weed control studies on dwarf wheat. *J. Res., Orissa Univ., of Agric and Tech.*, **10:** 1-6.

Saha, S. (2006). Comparative study on efficacy of sulfonyl urea herbicides and traditional recommended herbicides in transplanted rice. *Indian J. Agron.*, **51(4):** 304-306.

Saravanan, M. and S.K. Soam (2010). Exploitation of minor millets genetic resources for poverty alleviation in India. National Conference on Biodiversity, Development and Poverty Alleviation. Uttar Pradesh State Biodiversity Board, 22nd May , 2010, pp. 110-111.

Siddiq, E.A. (2000). Yawning productivity gaps. The Hindu Survey of Indian Agriculture. The Hindu Publication, Chennai, pp.39-44.

Vanithasri, J., S. Kanchana, G. Hemalatha, C. Vanniarajan and M. Sahulhameed (2012). Role of millets and its importance in new mellinium. *Inter. J. Food Sci. Technol. (IJFST)*, **2(1):** 35-47.