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Rambuatsaiha
Krishi Vigyan Kendra, Champhai, Mizoram, India

R Vanlalduati
Krishi Vigyan Kendra, Champhai, Mizoram, India

Malsawmkimi
Krishi Vigyan Kendra, Champhai, Mizoram, India

Lalngaihawmi
Krishi Vigyan Kendra, Champhai, Mizoram, India

Malsawmkima Vanchhawng
Krishi Vigyan Kendra, Champhai, Mizoram, India

Corresponding Author:
Rambuatsaiha
Krishi Vigyan Kendra Champhai, Mizoram, India

Weed management in transplanted lowland rice of Champhai District, Mizoram: A review

Rambuatsaiha, R Vanlalduati, Malsawmkimi, Lalngaihawmi and Malsawmkima Vanchhawng

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Abstract
Weed pose a major significant challenge in lowland rice cultivation leading to considerable loss in production and productivity. Lowland rice is infested by diverse weed population and weed flora including aquatic and semi aquatic weeds. Infestation of weeds resulted to reduction in production and productivity as well as inability to produce maximum potential irrespective of rice varieties. Studies Weed Management have been undertaken but majority of research focused on herbicidal based Integrated Weed Management System. Effective weed management aimed not on eliminating weeds completely but at reducing infestation to a considerable and manageable level. Application of Triafamone 20% + Ethoxysulfuron 10%WG @ 90 g/ acre at 15 DAT with single manual weeding resulted to higher net return with a B:C ration of 2.20.

Keywords: Lowland rice, weed management, herbicide

Introduction
Rice (*Oryza sativa* L.) is an important staple food crop of India which is mainly grown by manual transplanting of seedlings in puddled soil. Lowland rice is generally grown under rainfed condition in the District. Depending upon rainfall intensity, rainfall pattern and topography of the land, lowland paddy experiences drought, flooding and submergence at different stages of the crop. Weed management is an important key factor in obtaining higher crop yield as the maximum potential could not be obtained due to weed infestation resulting to drastic reduction in yield. Successful weed management thus become a prerequisite importance to exploit its maximum production potential. There are several reasons for low production and productivity out of which loss due to weeds is one of the most important factor. The yield loss due to uncontrolled weed in lowland and upland rice ranges from 12-81% (Chopra and Chopra, 2003; Mukherjee and Singh, 2005) [3, 11].

Weed Flora: A diverse range of weeds including grasses, sedges and broad leaf weed are found colonizing lowland rice ecosystem which may either be of terrestrial, aquatic and semi aquatic weeds. Introduction of high yielding rice variety increased production and productivity of rice however could not possess their maximum potential owing to severe weed infestation. The pre dominant weed species found in lowland are of Champhai District are *Echinochloa colonum (L), Echinochloa crusgalli (L) Paspalum spp., Cyperus iria, Cyperus rotundus (L), Fimbrisystylis miliaceae*, *Monochoria vaginalis, Ludwigia octovalvis, Ludwigia hyssopifolia (L), Monochoria vaginalis*, *Ammania baccifera*, etc. The pre dominantweed flora associated with lowland Rice in eastern India were *Ammania bacifera, Fimbristylis miliacea, Cyperus microiria, Ludwigia parviflora, Monochoria vaginalis, Echinochloa crusgalli, Echinochloa colona, Lindernia ciliata, Marsilea quadrifolia, Spilanthes acmella, Cyperus diformis and C. iria* (Kundu *et al*. 2003, Mahapatra *et al*. 2012) [8, 9].

Existing Weed Management Practices of the District: Farmers of the district practiced manual weeding using traditional hand held weeding tools. It is found to be feasible in small areas with sufficient labour at relativiely cheap rates, but is not a case in the District due to high

labour cost and unavailable manpower and labour. However, weeds are controlled by application of 2,4-D prior transplanting the crop as well as application during vegetative growth stage in the District followed by manual weeding. Grasses and sedges are managed by manual weeding which is laborious as well as time consuming resulting to high cost of production. Under the limited manpower availability for manual weeding, herbicide Butachlor 5% granule @ 20 kg ai^{-ha} in 3-4 cm standing water within 2-4 DAT is useful to control grassy weeds (Saha *et al. 2022*) [15]. In general, 2-3 hand weeding is practiced throughout the cropped stage in the District.

Crop weed competition: Weeds are recognized as major biological constraints that hinder the attainment of optimal rice productivity and quality (Kumar and Ladha 2011, Rao and Nagamani 2013) [7, 14]. The intensity of loss due to weed infestation mainly depend on the type of weed flora and number of weed present during the crop stage and weed intensity. Direct yield loss has been estimated to the range of 16-86% depending on type of rice culture, cultivars, weed species and density, cropping season, plant spacing, fertilizer rate, duration and time of weed infestation and climatic and environmental conditions (Kolay 2007) [6]. In rainfed lowland rice, a period of 30-60 days after sowing was considered as a critical period for crop weed competition to avoid grain yield losses (Moorthy and Saha, 2005) [10].

Weed management advocated in the District: Several indirect and direct methods can be combined to control weeds effectively and reduce the total cost of weed control in a given situation (Ampong-Nyarko and Datta, 1991) [1]. Several research publications have proved that integration of herbicides with hand weeding is the most effective and economical method of weed management (Rao, 2011) [13]. Weed control cost is maximum for hand weeding (two hand weeding at 30 and 45 DAT) and the lowest for chemical weed management (Hasanuzzaman *et al*., 2007) [5]. Due to high labour cost, it is suggest to control weed through Integrated Weed Management approach. Cultural practices like suitable crop establishment method, efficient fertilizer use and timely weed control have to planned to attain the target food production (Nagaraju, 1994) [12]. It has been suggested that incorporation of manual weeding and chemical weed management control using Triafamone 20% + Ethoxysulfuron 10%WG @ 90 g/ acre for control of grasses, sedges and broad leaf weed which is applied 15 DAT in transplanted lowland rice cultivation of Champhai District. Incorporation of these chemicals resulted to higher net return because of less cost of cultivation due to reduction on labour cost for weeding and resulted in higher B:C ration of 2.20 as against the current existing practice of manual weeding alone (B:C Ration of 1.34). Sevral weed management methods *viz.* cultural, manual, mechanical and chemical methods used in controlling weeds under lowland rice ecosystem, each control method has advantages and disadvantages. Weeds have viable growth habit and life cycles so that no single method can effectively control weeds in all situation. Thus, integrated weed management approach is urgent requirement for sustainable rice production (Sridevi *et al*, 2013) [16].

Conclusion

Weed is one of the major constraints to successful cultivation and production of rice. Chemical weed management is gaining importance where labour cost is fairly high and labour scarce. From the above review, it can be concluded that weed management could be carried out effectively through Integrated Weed Management Practices. Adoption of single management practices whether cultural, mechanical or chemical method may not provide effective weed control in rice. The use of any single approach, however, would not provide season-long and sustainable weed control because of the variation in dormancy and growth habits of weeds (Chauhan, 2012) [2] Therefore, integrated strategy of weed management is to be carried out to reduce weed population below economic threshold level without deteriorating environmental quality and sustainability.

References

1. Ampong-Nyarko K, Datta SK. A handbook for weed control in rice. Phillipines: International Rice Research Institute; 1991.
2. Chauhan BS. Weed ecology and weed management strategies for dry-seeded rice in Asia. Weed Technol. 2012;26:1-13.
3. Chopra NK, Chopra N. Effect of doses and stages of application of pyrazosulfuron-ethyl on weed in transplanted rice. Indian J Weed Sci. 2003;35(1-2):27-9.
4. Duray B, Mondal DC, Hossain A. Integrated Weed Management in direct seeded dry sown rice in the lateritic belt of West Bengal. Indian J Weed Sci. 2004;37(1-2):101-2.
5. Hasanuzzaman M, Nahar K, Karim MR. Effectiveness of different weed control methods on the performance of transplanted rice. Pakistan J Weed Sci Res. 2007;13(1-2):17-25.
6. Kolay S. Weed management in transplanted Kharif rice and ecophysiological studies on completion between rice and *Ludwiga parviflora* (Roxb.) [Ph.D. thesis]. Visva-Bharati, Sriniketan; 2007.
7. Kumar V, Ladha JK. Direct- seeded rice: recent developments and future research needs. Adv Agron. 2011;111:297-413.
8. Kundu S, Mukhopadhyay SK, Duray B, Mondal DC. *Spilanthes acmella* – a new weed in West Bengal. In: Abstracts of Papers for National Seminar on Alien Invasive Weeds in India. Assam Agriculture University, Jorhat; 2003. p. 80.
9. Mahapatra IC, Rao KS, Oanda BB, Shivay. Agronomic Research on Rice (*Oryza sativa* L.) in India. Indian J Agron. 2012;57(3rd IAC Special Issue):9-31.
10. Moorthy BTS, Saha S. Studies on crop weed competition in rainfed direct seeded lowland rice (*Oryza sativa* L.). Indian J Weed Sci. 2005;40(3-4):112-6.
11. Mukherjee D, Singh RP. Effect of micro-herbicides on weed dynamics, yield and economics of transplanted rice. Indian J Agron. 2005;50(40):292-5.
12. Nagaraju AP. Efficacy of anilofos+ 2,4-D (ethyl ester) and other herbicide on transplanted rice (*Oryza sativa* L.) yield and economica. Indian J Weed Sci. 1994;26:87-8.
13. Rao AN. Integrated weed management in rice in India. In: Rice Knowledge Management Portal (RKMP). Directorate of Rice Research, Rajendranagar, Hyderabad; 2011. p. 1-35.
14. Rao AN, Nagamani A. Eco-efficient weed management approaches for rice in tropical Asia. In: Proceedings 4th Tropical Weed Science Conference 2013; 2013 Jan 23-25; Chiang Mai, Thailand; 2013. p. 78-87.
15. Saha S, Chowdhury S, Shakuntala I, Doley S, Ramakrishna Y, Singh SB, *et al*. Improving lowland rice productivity in Mizoram: Aligning field scale technology demonstration towards commercial seed production initiatives. PME Publication No. ICAR MZ BK-38; 2022. p. 43.
16. Sridevi V, Jeyaraman S, Chinnusamy C, Chellamuthu V. Weed Management in Lowland Rice (*Oryza sativa* L.) ecosystem a review. Int J Agric Sci Res. 2013;3(3):13-22.