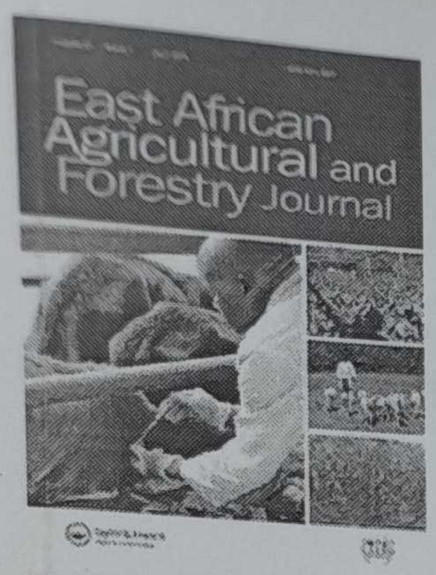

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Effects of Tillage System and Weed Control Method on Weed Infestation and Yield of Lowland Rice (*Oryza sativa* L.)

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ABSTRACT

A two–year experiment was carried out to determine the effects of tillage (heap and level, hoe plough and herbicide-based zero tillage) and weed control methods (no weeding, hoe weeding at 25 days after transplanting (DAT), hoe weeding at 25 and 45 DAT, application of post-emergence herbicide propanil plus 2,4-D (Orizo Plus, Proficol Calle, Baranquilla, Colombia) at 25 DAT followed by hoe weeding at 45 DAT, and Orizo Plus® at 25 and 45 DAT) on weed infestation and performance of lowland rice in Badeggi, Nigeria. Reduced weed density and biomass, taller rice plants, and higher panicle and paddy yield were recorded in most heap and level treatments. Two hoe weedings only and Orizo Plus® at 25 DAT followed by one hoe weeding resulted in significantly lower weed density and biomass, more panicles and significantly higher paddy yield. Hoe plough in combination with two hoe weedings had the lowest weed density. Zero tillage planting in combination with two hoe weedings produced weed biomass comparable to heap and level in combination with the application of Orizo Plus® at 25 DAT followed by one hoe weeding. These results suggest that hoe plough followed by hoe weeding at 25 and 45 DAT, or heap and level tillage followed by application of Orizo Plus® at 25 DAT and hoe weeding at 45 DAT effectively controlled weeds and increased plant height, panicle number and paddy yield of transplanted rice.

KEYWORDS

herbicide; lowland rice; tillage; weed control; weed infestation

Introduction

Rice (*Oryza sativa* L.) is cultivated in at least 144 developing countries and is a primary source of income and employment for several hundred million households in Asia and Africa (Matloob et al. 2014). It is consumed globally by nearly three billion people to provide 35 to 65% of their calories (Mubeen et al. 2014. Remarkably, more than half of the world population depends on rice for over 90% of its calorie intake (Ben-Chendo et al. 2017). Nigeria has a potential area for rice production of between 4.6 to 4.9 million hectares, however only 1.7 million hectares, representing 35%, is cropped to rice (Ismaila et al. 2013). Tillage, irrespective of the method adopted, constitutes a fundamental component in weed management practices in rice fields (Arif et al. 2007; Cherati

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