

Evaluation of the Effectiveness of Barriers for the Control of Rats in Rice Plantation Field

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Abstract : The rice field rat (*Rattus argentiventer* Robinson and Kloss) is a pest causing the greatest yield loss of rice plants, especially in lowland agroecosystems with intensive cropping patterns (2-3 plantings per year). Field mice damage rice plants at all stages of growth, from seedling to harvest, even in storage warehouses. Severe damage with yield loss of up to 100% occurs if rats attack rice at the generative stage because the plants are no longer able to recover by forming new tillers. Farmers mainly use rodenticides in the form of poisoned baits or as fumigants, which are applied to rat burrow holes. This practice is generally less effective because mice are able to avoid the poison or become resistant after several exposures to it. In addition, excessive use of rodenticides can have negative impacts on the environment and non-target organisms. For this reason, this research was conducted to evaluate the effectiveness of fences as an environmentally friendly mechanical control method in reducing rice yield losses due to rat attacks. This study used a factorial randomized block design. The first factor was the fence material, namely galvanized zinc plate and plastic. The second factor was the height of the fence, namely 25, 50, 75, and 100 cm from the ground level. Each treatment combination was repeated five times. Data shows that zinc fences with a height of 75 and 100 cm are able to provide full protection to plants from rat infestations throughout the planting season. However, zinc fences with a height of 25 and 50 cm failed to prevent rat attacks. Plastic fences with a height of 25 and 50 cm failed to prevent rat attacks during the planting season, whereas 75 and 100 cm were able to prevent rat attacks until all the crops outside of the fence had been eaten by rats. The rat managed to get into the fence by biting the plastic fence close to the ground. Thus, the research results show that fences made of zinc plate with a height of at least 75 cm from the ground surface are effective in preventing plant damage caused by rats. To our knowledge, this research is the first to quantify the effectiveness of fences as a control of field rodents.

Keywords : rice field rat, *Rattus argentiventer*, fence, rice

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