

An experimental field study to evaluate a trap-barrier system and fumigation for controlling the rice field rat, *Rattus argentiventer*, in rice crops in West Java

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Abstract

The effectiveness of a trap-barrier system (TBS), which enclosed a crop planted 2–3 weeks early (trap-crop), and fumigation (sulfur dioxide) was assessed for managing pre-harvest damage by the rice field rat, *Rattus argentiventer*, to rice crops in West Java, Indonesia. The TBS was a 50 × 50 m plastic fence with live-multiple-capture traps inserted intermittently at its base. Damage to tillers and yield loss were assessed within the trap-crop and at 5, 50, 100, 150 and 200 m from the TBS. Two crops were monitored: dry season crop when rat densities were high and 20–55% of rice tillers were cut by rats; wet season crop when rat densities were low and 0–4% of rice tillers were cut. Over the two crops, rats caused a 20% annual loss in potential rice production. The benefit—cost ratios for using a TBS were in the range of 20:1 to 7:1 for the dry season and 7:1 to 2:1 for the wet season. Fumigation was not effective in reducing rat losses. Damage assessment provided a phenology of rat damage for the two crops but, unlike the yield data, differences were not significant between treatments. The benefits of the TBS need to be weighed against high labour input, initial cost, logistics of growing a trap-crop, and whether the technology can be transferred to growers. Research on how rats respond to a TBS-plus-trap-crop is required before it can be recommended to manage rats.

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