

Understanding of relationships between ground cover and rat abundances: An integrative approach for management of the oil palm agroecosystem.

ABSTRACT

Ground cover is an essential element in the selection of habitats by small mammals. It provides shelter, foraging opportunities and a hiding place from predators. In oil palm plantations rodents are abundant yet the relationships between ground cover structure and rats are not well understood. Plantation management emphasizes maximisation of oil palm yield by reducing rat damage and competition from weeds, typically through chemical control. This study examined the relationships between ground cover, including undergrowth and frond piles, and rat abundance. Rat trapping and vegetation assessment were conducted simultaneously in five study plots in the Labu Estate, Negeri Sembilan, Malaysia. Over 21,000 trap-nights 1190 individual rats were captured and these data were analysed using spatial analysis by distance indices (SADIE). No significant clustering of rats was observed within any plot over time. Redundancy analyses suggested that the overall occurrence of rats, especially *Rattus argentiventer*, was positively correlated with vegetation cover and height. This implies that habitat complexity is important to rats, even in a relatively simple agroecosystem. Results of the SADIE analyses were inconsistent, perhaps due to highly variable management practices in the plantations. The findings from this study suggest that using an integrated approach in the control of both weeds and rats in oil palm plantations may maximise the benefits from weeding while reducing the production loss due to rats and the need for chemical control of rats.

Keyword: Vegetation cover; *Rattus argentiventer*; Oil palms; Weeds; Spatial associations.