

Comparison of the breeding performance of the barn owl *Tyto alba javanica* under chemical and bio-based rodenticide baiting in immature oil palms in Malaysia

ABSTRACT

The breeding performance of barn owl, *Tyto alba javanica*, in areas treated with rodenticides in immature oil palms in Malaysia was investigated. Four plots were established, each at least 100 ha in size and treated with warfarin, brodifacoum, a biorodenticide (*Sarcocystis singaporensis*) and a non-baited control plot. Three rat baiting campaigns, which coincided with the barn owl breeding season, were carried out in October 2008, February and March 2009, and in October 2009. The nest boxes were distributed at a mean density of one unit per 25 ± 3.83 ha. The clutch size, hatching and fledging rates of barn owls in each plot was monitored monthly from September 2008 to January 2010. There was no significant difference in mean clutch size for all four treatments. The lowest percentage of hatching success was recorded in the brodifacoum-treated plot in all three breeding seasons. Fledging success was highest in the control plot, followed by the *S. singaporensis*-, warfarin- and brodifacoum-treated plots. The mean clutch size and mean hatching success was not significantly correlated with mean rat damage (clutch size, $r = 0.754$, $p > 0.05$; mean hatching success, $r = 0.832$; $p > 0.05$). The mean fledging success was significantly correlated with mean rat damage ($r = 0.969$; $p < 0.05$). Brodifacoum achieved the lowest level of rat damage but not significantly lower than warfarin and *S. singaporensis*. This indicates that *S. singaporensis* is a better rodenticide than warfarin and brodifacoum in controlling rats and yet achieved the highest reproductive rates in the baited areas as reflected by the rate of fledging success.

Keyword: Brodifacoum; *Sarcocystis singaporensis*; Secondary poisoning; Warfarin; Rodent control.