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Chlorantraniliprole: A Novel Insecticide for Bagworm (*Metisa plana*) Control in Oil Palm Plantation

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Bagworm is generally kept at low population in the natural habitat by many natural enemies. However, in the mono-cropping cultivation of oil palm plantation and during the absence of effective natural control, bagworm can increase into large population rapidly and cause severe damage to the crop. The bio-efficacy and rain fastness of chlorantraniliprole were evaluated against *Metisa plana* in the greenhouse in comparison with the currently used insecticides. There was no significant difference in the bio-efficacy between 12.5 ppm to 50.0 ppm chlorantraniliprole, 25.0 ppm to 50.0 ppm indoxacarb, 75.0 ppm cypermethrin and 1900.0 ppm trichlorfon treatments, but all these treatments were better than 324.0 ppm *Bacillus thuringensis*. The rain fastness properties of chlorantraniliprole at 25.0 ppm to 50.0 ppm was able to maintain 100.00 per cent insect control when subjected to 25 mm of artificial rainfall after 3 hours of spraying, but with slight decrease in efficacy at 12.5 ppm (91.67% mortality). However, it was better than 75.0 ppm cypermethrin and 1900.0 ppm trichlorfon which recorded 83.34 per cent and 50.00 per cent insect control respectively. The Day 1 laboratory bioassay test against adult *Elaeidobius kamerunicus* showed that chlorantraniliprole at 12.5 ppm to 50.0 ppm caused very low mortality on *E. kamerunicus* adults ranging from 7.50 per cent to 35.00 per cent, compared to 97.50 per cent to 100.00 per cent mortality by cypermethrin and trichlorfon respectively. Field evaluation of chlorantraniliprole of 50 ppm and 100 ppm by foliar application with power sprayer resulted in 94.12 per cent and 96.64 per cent insect control respectively, compared to 82.35 per cent for 1900.0 ppm trichlorfon and 52.10 per cent for 75.0 ppm cypermethrin. The residue level of chlorantraniliprole was very minimal in crude palm oil (CPO) samples and not detectable in palm kernel oil (PKO) samples.

Keywords: Chlorantraniliprole, bagworm, *Metisa plana*, *Elaeidobius kamerunicus*, oil palm, foliar application, rain fastness.

