

# Laboratory Bioassay Evaluation of IKI-3106 (Cyclaniliprole) for Control of Mexican Bean Beetle and Japanese Beetle, 2014\*

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Mexican bean beetle | *Epilachna varivestis*

Japanese beetle | *Popillia japonica*

2', 3-dibromo-4'-chloro-1-(3-chloro-2-pyridyl)-6'-[[[(1RS)-1-cyclopropylethyl]carbonyl]pyrazole-5-carboxanilide; 3-Bromo-N-[4-chloro-2-methyl-6-[(methylamino)carbonyl]phenyl]-1-(3-chloro-2-pyridinyl)-1H-pyrazole-5-carboxamide

This experiment evaluated the efficacy of a new diamide insecticide, IKI-3106 50SL (cyclaniliprole), against MBB and JB. All insects were collected from wild populations at Kentland Research Farm in Blacksburg, VA, in the summer of 2014. MBB adults and larvae were collected from untreated snap bean plants, *Phaseolus vulgaris*, and JB adults were collected from untreated Pennsylvania smartweed, *Polygonum pensylvanicum*. All insects were brought back to the laboratory and maintained in cages for 24 h prior to use in bioassays. Three concentrations of IKI-3106 50SL were prepared at 0.127 (low), 0.190 (medium), and 0.254 (high) g AI/liter. In addition, we tested another anthranilic diamide, chlorantraniliprole (Coragen 1.67SC), mixed at 0.244 g AI/liter for comparison, as well as a water check. For MBB larvae and adults, fresh, untreated snap bean pods were dipped in treatment solutions for 4 s and allowed to dry under a fume hood. After drying, pods were placed in 9 cm Petri dishes, and five individual insects were placed in each dish. The

experiment was a completely randomized design with four replicates of each treatment and check. The same process was used for JB adults, but with fresh, untreated smartweed leaves. All treatments were placed in a temperature chamber held at  $25 \pm 3^\circ\text{C}$  and a photoperiod of 16:8 (L:D) h ratio. Mortality was assessed at 2 DAT for MBB adults and larvae and JB adults, by recording the number of live and dead insects. Data were subjected to ANOVA with means separated by Fisher's Protected LSD.

For MBB, there was a significant treatment effect on % mortality of larvae ( $P < 0.014$ ). The medium and high rates of IKI-3106 50SL killed 75 and 90% of larvae, respectively, which was significantly higher than the check and Coragen treatment. Check mortality was high in the adult MBB bioassay and the treatments were not significantly different (Table 1). For JB, there was a significant treatment effect on % mortality of adults ( $P < 0.0001$ ). All three rates of IKI-3106 50SL and Coragen caused significant (>90%) mortality of JB adults (Table 2).

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**Table 1**

Treatment/formulation	Rate-amt/acre	Concentration (g AI/liter)	% MBB Mortality	
			Larvae( <i>n</i> = 20)	Adults ( <i>n</i> = 20)
Untreated check	n/a	0	25.0b	35.0
IKI-3106 50SL	11.0 fl oz	0.127	70.0ab	100.0
IKI-3106 50SL	16.4 fl oz	0.190	75.0a	100.0
IKI-3106 50SL	22.0 fl oz	0.254	90a	100.0
Coragen 1.67 SC	5.0 fl oz	0.244	15.0b	90.0

Means within columns followed by same letter are not statistically different (Fisher's Protected LSD,  $P > 0.05$ ).

**Table 2**

Treatment/formulation	Rate-amt/acre	Concentration (g AI/liter)	% mortality of JB adults ( <i>n</i> = 20)
Untreated check	n/a	0	5.0b
IKI-3106 50SL	11.0 fl oz	0.127	90.0a
IKI-3106 50SL	16.4 fl oz	0.190	100.0a
IKI-3106 50SL	22.0 fl oz	0.254	100.0a
Coragen 1.67 SC	5.0 fl oz	0.244	95.0a

Means within columns followed by same letter are not statistically different (Fisher's protected LSD,  $P > 0.05$ ).