

# Bioassay Evaluation of Closer SC for Control of Harlequin Bug and Kudzu Bug, 2013\*

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harlequin bug | *Murgantia histrionica*

kudzu bug | *Megacopta cribraria*

[methyl(oxo){1-[6-(trifluoromethyl)-3-pyridyl]ethyl}-λ6-sulfanylidene]cyanamide

The new sulfoximine insecticide Closer SC (sulfoxaflor) has demonstrated a high level of activity against sucking insects such as aphids and whiteflies, but there is considerably less known about the activity of this insecticide on heteropteran pests. The objective of this experiment was to evaluate the toxicity of sulfoxaflor against two heteropteran pests of agricultural importance, harlequin bug (HB), and kudzu bug (KB). Leaf-dip bioassays were conducted at Virginia Tech in Blacksburg, VA during the summer and fall of 2013. Insecticide solutions were prepared with Closer SC as serial dilutions in water at concentrations of 0, 1, 10, 218, and 436 ppm AI. All insects were obtained from the field on various host plants; HB nymphs and adults were collected from untreated collards, and KB nymphs and adults were collected from wild kudzu. Fresh collards leaves (for HB) were obtained from insecticide-free plants grown at Kentland Research Farm near Blacksburg, VA and were dipped in the test solutions with gentle agitation for 4s and then placed on plastic drying racks under a fume hood for 1 h. Dry leaves were then placed into 500-ml plastic

containers with a ventilated top along with either 10 nymphs (third or fourth instars) or 10 adults per container. For KB, it was determined that the insects suffered mortality after they were dislodged from a kudzu plant; thus, infested leaves (with >10 bugs) were excised from the plant in the field, stuck into moistened floral foam, and sprayed until runoff with a hand-pump mister/sprayer. Four containers of each concentration were tested in each bioassay, for a total of ~40 insects tested for each dose per experiment. Each container was considered a replicate. Mortality was assessed at 2 and 3 DAT. All tests were conducted under ambient laboratory conditions at 25 ± 5°C with a photoperiod of 16:8 (L:D) h. Data were analyzed with an ANOVA, and means were compared using a Student's *t*-test.

Closer SC caused significant mortality of both HB and KB nymphs and adults at a concentration ≥ 218 ppm. A typical spray tank concentration of Closer SC at the labeled rate of 5 fl oz/acre would be roughly 10 ppm. For all three species, toxicity levels of sulfoxaflor were similar for nymphs and adults.

Table 1

Treatment/formulation	Concentration ppm AI	% Mortality (at 2 DAT)			
		HB		KB	
		Nymphs	Adults	Nymphs	Adults <sup>a</sup>
Closer SC	0	7.5 C	10.0 C	15.2 C	0.0 D
	1	0.0C	—	4.8C	—
	10	33.3B	25.0B	2.3B	11.1C
	218	94.7A	97.5A	26.2AB	66.0B
	436	89.8A	100.0A	41.9A	95.5A

Means within a column followed by letter are not statistically different (Student's *t*-test  $P > 0.05$ ).

<sup>a</sup>3 DAT mortality data were used.

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