



(F)
**EFFICACY OF SELECTED INSECTICIDES AGAINST FLEA
 BEETLE AND HARLEQUIN BUG IN CABBAGE IN VIRGINIA,
 2022**

Journal:	<i>Arthropod Management Tests</i>
Manuscript ID	Draft
Manuscript Type:	AMT Paper
Date Submitted by the Author:	n/a
Complete List of Authors:	Sydnor, Taylore; Virginia Polytechnic Institute and State University, Department of Entomology McIntyre, Kelly; Virginia Polytechnic Institute and State University, Entomology Bekelja, Kyle; Virginia Polytechnic Institute and State University, Department of Entomology Kuhar, Thomas; Virginia Polytechnic Institute and State University, Department of Entomology
Section:	Section F: Field & Cereal Crops
Active Ingredients:	cyclaniliprole, spinetoram, flupyradifurone, GS-omega/kappa-Hxtx-HV1a, isocycloseram
Hosts:	Cabbage (red, white, savoy) Brassica oleracea var. capitata
Pests:	crucifer flea beetle Phyllotreta cruciferae, striped flea beetle Phyllotreta striolata, harlequin bug Murgantia histrionica

SCHOLARONE™
 Manuscripts

(F)

Cabbage: *Brassica oleracea* (L.) var. 'Blue lagoon'

EFFICACY OF SELECTED INSECTICIDES AGAINST FLEA BEETLE AND HARLEQUIN BUG IN CABBAGE IN VIRGINIA, 2022

Taylor Sydney, Kelly McIntyre, Kyle Bekelja, Thomas P. Kuhar*

¹Department of Entomology, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061, USA

*Corresponding author. Email: tkuhar@vt.edu

Striped flea beetle: *Phyllotreta striolata* Fabr.

Crucifer flea beetle: *Phyllotreta cruciferae* (Goeze)

Harlequin bug (HB): *Murgantia histrionica* (Hahn)

Insecticides were evaluated for their efficacy against flea beetles (FB) and harlequin bug on cabbage at Homefield Farm in Whitethorne, VA. Cabbage (Blue lagoon) was transplanted on 3 Jun into raised beds (3 ft wide) on 6 ft centers covered with white plastic mulch and drip irrigation. Plots were one row wide by 15-ft long, and plant spacing was 12 in. Treatments were arranged in a RCB with four replicates. Foliar insecticide treatments were applied twice (17 June for FB and 15 Jul for both FB and HB) with a 3 nozzle drop down boom sprayer with D3 tips at 40 PSI delivering ~30 gpa. Drench treatments were also applied on the same dates using a ladle to apply 8 fl oz of treatment at the base of each plant. Treatment efficacy was determined by counting numbers of live insects per 5 plants per plot on 20 Jun (3 DAT), 24 Jun (7 DAT), 29 Jun (12 DAT), 19 Jul (4 DAT2), 21 Jul (6 DAT2), and 25 Jul (10 DAT2) 2022. Data on each sample date were analyzed using two-way ANOVA and means were compared using Tukey's Honestly Significant Difference test at the 0.05 level of significance.

FB species were comprised of ~75% *Phyllotreta striolata* and 25% *P. cruciferae* and counts of the two species were combined for data collection. There was a significant effect of treatment on FB densities on all post-spray sample dates (Table 1). On 20 Jun (3 DAT), all insecticide treatments had significantly fewer FB than the untreated check. On 24 June (7 DAT) and 29 June (9 DAT), only Sivanto Prime and Plinazolin had significantly fewer FB than the untreated check. Following the second insecticide application, on 19 Jul (4 DAT), all insecticide treatments except Spear T had significantly fewer FB than the untreated check. On 21 Jul (6 DAT) all treatments except Spear T had significantly fewer FB than the untreated check and Harvanta, Sivanto, and Plinazolin had fewer FB than Radiant. On 25 Jul (10 DAT), only Plinazolin had significantly fewer FB than the untreated check.

HB did not appear on the cabbage plots until the 2nd insecticide application (mid Jul), and there was a significant effect of treatment on HB densities on all post-spray sample dates (Table 2). On 19, 21, and 25 Jul (4, 6, and 10 DAT2), Sivanto, and Plinazolin had fewer HB than the untreated check. This research was supported in part by industry gifts of pesticides and/or research funding from Summit Agro and Syngenta Crop Protection.

Table 1.

	Rate / acre (fl oz form.)	Applic. Method	Total No. Flea Beetle Adults Per 5 Plants ^a					
			20 Jun	24 Jun	29 Jun	19 Jul	21 Jul	25 Jul
Untreated check	-	-	17.5 a	30.0 a	32.2 a	38.2 a	50.2 a	24.0 a
Harvanta 50SL	5.5	Foliar	1.0 b	10.8 abc	30.2 a	1.8 b	2.8 c	17.0 a
Radiant	5.0	Foliar	2.0 b	20.5 abc	30.0 a	3.5 b	24.5 b	38.5 a
Sivanto Prime 200SL	21.0	Soil drench	2.8 b	4.8 c	12.5 b	2.75 b	5.5 c	22.2 a

Spear T	36.0	Foliar	5.5 b	48.2 a	39.0 a	32.8 a	58.8 a	36.5 a
Plinazolin SC400	1.0	Foliar	1.8 b	8.5 c	11.2 b	1.8 b	3.0 c	2.3 b
P>F			0.001	0.001	0.001	0.001	0.001	0.001

Means within columns connected by the same letter are not significantly different (Tukey's HSD $P < 0.05$)

^aSquare-root transformed data used for analysis; untransformed values are reported.

Table 2.

	Rate / acre (fl oz form.)	Applic. Method	Total no. HB (nymphs + adults) per 5 plants		
			19 Jul	21 Jul	25 Jul
Untreated check	-	-	6.0 a	10.5 a	20.8 a
Harvanta 50SL	5.5	Foliar	6.3 a	15.8 a	14.8 a
Radiant	5.0	Foliar	6.3 a	8.8 ab	14.8 a
Sivanto Prime 200SL	21.0	Soil drench	0.3 b	0.5 c	1.0 c
Spear T	36.0	Foliar	9.8 a	8.5 ab	9.3 ab
Plinazolin SC400	1.0	Foliar	0.0 b	2.3 bc	4.0 bc
P>F			0.001	0.01	0.05

Means within columns connected by the same letter are not significantly different (Tukey's HSD $P < 0.05$)

^aSquare-root transformed data used for analysis; untransformed values are reported.