

(E29)

COLLARD: *Brassica oleraceae* L. 'Georgia'

Silverleaf whitefly (SLF); *Bemisia argentifolii* Bellows & Perring
Turnip aphid: *Hyadaphis erysimi* (Kaltenbach)
Twospotted spider mite; *Tetranychus urticae* Koch

P.A. Stansly, J.M. Conner, & M. A. Pomerinke

University of Florida/IFAS
Southwest Florida Res. and Ed. Center
2686 State Road 29 North
Immokalee, Florida 34142-9515
Phone: (941) 658-3427

CONTROL OF SILVERLEAF WHITEFLY AND TURNIP APHID ON COLLARDS WITH FOLIAR AND SOIL-APPLIED SYSTEMIC INSECTICIDES, 1998:

The grower may have the option to apply systemic insecticides to the foliage or the soil. The objective of this study was to compare the efficacy of these two application methods against the silverleaf whitefly. Two sets of 3 beds, 32-inch wide and 240 ft long, were fumigated with 67/33% methyl bromide/chloropicrin at a rate of 300 lb/acre, and covered with black polyethylene film. Dry fertilizer (800 lb/acre 5-16-8) was incorporated at bedding and an additional 1.5 lb/acre/day of N and K injected through the drip irrigation. The 2 sets of 3 rows were separated by a 15 ft drive and the middle row of each set was planted with collard seedlings on 12 Jan as a source of pest inoculum. Greenhouse-raised collard seedlings were planted in the remaining 4 beds at 18-inch spacing on 13 Feb. Each bed was divided into 7 plots, 34 ft long, to which 6 treatments and untreated check were assigned in a RCB design with four replications. Soil treatments were applied in 10 ml water to each plant hole on 6 Mar. Foliar treatments were initiated 28 Apr with a high clearance sprayer utilizing a hydraulic pump operating at 200 psi and delivering the spray at a rate of 33 gpa through one drop boom on each side of the row and one overhead, each equipped with 1 yellow hollow cone Albuz® nozzle. These applications included two of CGA-215 and CGA-293 on 28 Apr and 15 May and six of acetamiprid and Provado each week beginning 28 Apr. Silwet at 0.25% V/V was added to the tank with all sprays. Aphids and adult whiteflies were sampled in soil-treated and check plots on 2 whole leaves, one upper (18 x 25 cm) and one lower (29 x 34 cm) canopy leaf, on each of 10 plants/plot on 7 and 20 Apr, respectively. Most aphids were found on the upper leaf and whiteflies on the lower leaf. Sampling for adult whiteflies in all plots began 1 May using a 9 x 13 inch metal cake pan ("beat pan") painted black and covered with a 10% detergent/vegetable oil mixture. Total number of adults captured from three beats on one side of 3 separate plants was counted as a sub-sample with 4 sub-samples collected/plot. Immature whiteflies were counted under a stereoscopic microscope in the laboratory on 4 leaves (approximately 1,000cm²)/plot collected from the field on 5 May and 14 May. A spider mite infestation was noted and therefore evaluated on 14 May using the same leaves evaluated for immature whiteflies. A rating scale of 0 to 3 0 indicating no mites, 1 indicating 1-15, 2 indicating 16-45, and 3 indicating > 45 mites.

Turnip aphids were present on 7 Apr but disappeared later following the appearance of numerous coccinellids. Both aphid and whitefly numbers were significantly lower in soil-treated plots on 7 Apr compared with the check with no significant difference between treatments. The same pattern was seen with whiteflies on 20 Apr. On all subsequent dates, fewer whitefly adults were observed on treated plants in all plots compared with the check except on 4 Jun for plants treated with CGA-215. There were no significant differences between soil treatments in number of adults although the overall mean was slightly lower in Admire treatment. Also, there was no significant differences between foliar CGA-293 and acetamiprid although the overall mean for the latter was numerically lower. CGA-215 provided the least protection against adults, significantly less than acetamiprid on 5 sample dates and overall dates. Acetamiprid provided significantly better control of adults than Provado on two sample dates, and fewer adults were seen on plants sprayed with Provado compared with CGA-215 on one sample date. Fewer adults were seen on plants treated by soil application compared with foliar application through 14 May (68 DAT) and there were still significantly fewer adults on soil-treated plants through 17 Jun (103 DAT) than on the check plants. On 5 May, fewest eggs or small nymphs were seen on plants treated with CGA-293 and Admire, though not significantly less than all other treatments except Provado and the check (eggs) or the same two and acetamiprid (small nymphs). On that date, fewest large nymphs and pupae were seen on plants treated with Admire, though not significantly less than other treatments except the check and Provado (pupae) or Provado and acetamiprid (large nymphs). No eggs or small nymphs were found on Provado or CGA-293 soil-treated plants on 14 May and all treatments had fewer eggs than the check except for CGA-215. Fewer large nymphs as well were seen on all treated plants compared with the check except for CGA-215, and there were no pupae on Admire-treated plants although differences were not significant except for the untreated check. The proportion of large nymphs and pupae that were parasitized was not diminished by any treatment, and might have been enhanced although differences were not significant. Spider mites were not significantly affected by any treatment. In summary, imidacloprid provided excellent control of both adult and immature whiteflies when soil-applied but did not function well when applied to the plant. CGA-293 functioned well in both modes, comparable to Admire when soil-applied and to acetamiprid when applied as a foliar treatment.

Treatment/formulation	Rate lb (AI)/acre	Method of application	No. insects/3 leaves/10 plants			
			07 Apr		20 Apr	
			Aphid	Whitefly	Adult	Whitefly
CGA-293 2.0SC	0.044	Soil	0.50b	0.03b	0.00	0.03b
Admire 2.0F	0.126	Soil	0.25b	0.00b	0.00	0.08b
Untreated check			1.08a	0.73a	0.03	0.93a

Means in a column followed by the same letter are not significantly different (LSD, $P < 0.05$).

Treatment/ formulation	Rate lb (AI)/acre	Method of application	No. adult whiteflies from beat pan samples of 3 plants/plot							
			01 May	05 May	14 May	21 May	27 May	04 Jun	17 Jun	All dates ^a
CGA-215 50WG	0.085	Foliar	5.44b	3.56b	24.38b	31.31b	15.88bc	23.63b	13.94ab	16.88b
CGA-293 25WG	0.044	Foliar	2.19c	1.75cd	21.81b	27.06bc	8.69bcd	9.19c	4.63c	10.76bcd
Acetamiprid 70WG	0.07	Foliar	1.75c	2.56bc	19.06b	13.50cd	5.13d	6.94c	5.19c	7.73cb
Provado 1.6EC	0.047	Foliar	5.44b	3.94b	19.56b	23.88bc	17.13b	13.56c	6.94bc	12.92bc
CGA-293 2.0SC	0.044	Soil	0.75c	0.81d	4.88c	8.75d	7.44cd	9.75c	6.38c	5.54cd
Admire 2.0F	0.126	Soil	0.81c	0.44d	3.50c	8.13d	6.56d	6.19c	7.88bc	4.79d
Untreated check			8.19a	7.06a	47.31a	77.50a	38.25a	42.63a	20.44a	34.48a

Means in a column followed by the same letter are not significantly different (LSD, $P < 0.05$).

^aLeaf turn counts of adult whiteflies on 07 Apr and 20 Apr for soil treatments and untreated control not included in means for all dates.

Treatment/ formulation	Rate lb(AI)/acre	Method of application	No. immature whiteflies/4 leaves of approximately 1,000cm ² each over both days					Pupae parasitized	
			Eggs	Nymphs		Pupae	Total immatures ^a	No. Pupae	% parasitised
				Small	Large				
CGA-215 50WG	0.095	Foliar	6.91ab	4.97b	5.88b	2.63b	20.38ab	0.81ab	25.44
CGA-293 25WG	0.044	Foliar	0.09b	0.84b	2.53b	0.63b	4.09b	0.38b	32.14
Acetamiprid 70WG 0.07	Foliar	0.07	2.09b	4.94b	6.31ab	1.97b	15.31b	0.91ab	24.95
Provado 1.6EC	0.047	Foliar	5.00ab	5.44ab	9.03ab	5.78a	25.25ab	2.25a	24.09
CGA-293 2.0SC	0.044	Soil	0.19b	0.00b	0.59b	0.47b	1.25b	0.00b	0.00
Admire 2.0F	0.126	Soil	0.06b	0.13b	0.22b	0.00b	0.41b	0.00b	—
Untreated			14.22a	14.06a	12.16a	6.31a	49.75a	1.50ab	18.28

Means in a column followed by the same letter are not significantly different (LSD, $P < 0.05$).

^aTotal immatures include eggs.