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PEPPER (Jalapeño): *Capsicum annuum* L. 'Milta'

CONTROL OF SILVERLEAF WHITEFLY IN PEPPER WITH HORTICULTURAL MINERAL OIL AND OTHER INSECTICIDES, 2004

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Silverleaf whitefly: *Bemisia argentifolii* Bellows & Perring

The whitefly *B. argentifolii* = *B. tabaci* biotype "B" has become an increasing problem on pepper in south Florida in recent years. The present trial tested the whitefly-suppressive activity of horticultural mineral oil (HMO) and various pesticide regimes directed primarily at pepper weevil. Greenhouse-raised pepper plants were transplanted on 31 Mar at 10 inch spacing in single rows on 4 sets of 3 beds 240 ft in length and covered with polyethylene film mulch. Water and fertilizer were provided through Netafim® drip tape with 12-inch emitter spacing. The center bed in each set of 3 was left untreated to serve as the untreated control and a source of weevils. Each treated bed was divided into plots 30 ft long to which treatments were assigned in an RCB design with 4 replications. Eight weekly applications of the HMO, PureSpray Green Oil®, were made starting 14 April using a high clearance sprayer operating at 200 psi. Spray was delivered through two vertical booms, each fitted with 2 ceramic yellow Albuz® hollow cone nozzles for a total of 44 gpa until 25 May when 1 nozzle was added to each boom for an output of 66 gpa. Applications of Novaluron and Dimilin were made on 28 Apr, 12 and 25 May. Applications of TD-2472-01, and 3 different Assail treatments were made on 12 and 25 May. Seven weekly evaluations of whitefly adults were made beginning 19 Apr by beating 1 side of 4

plants at 3 locations per plot with a 9 x 13 inch pie pan painted black and coated with a 9:1 mixture of vegetable oil and liquid detergent. Immature stages were monitored 11 and 24 May, and 1 Jun using 1 mature leaf removed from 8 centrally located plants in each plot. All whitefly stages were counted that appeared in a 2 cm<sup>2</sup> ring placed twice on each side of the midrib (total 4 cm<sup>2</sup>) from each leaf collected. All marketable fruit was harvested 8 Jun. Weight of marketable fruit was determined by dissecting a random sample of 50 harvested fruit per plot, (200 per treatment), to obtain a percentage infested with weevils and adjusting the total weight accordingly.

Significantly fewer adults were seen 17 May on plants treated with 2% PureSpray Green Oil compared to the untreated check with the other oil treatments intermediate. Only plants treated with Assail 70 WP @ 1.2 oz/acre had fewer adults than the control on 24 May. However, on 1 June all treatments resulted in fewer adults than the control, with fewest seen on plants treated with 2% PureSpray Green Oil. Fewer large nymphs were seen on plants treated with all but the lowest rate of PureSpray Green Oil and with Novaluron on 11 May. A similar pattern was seen with pupae. Fewer eggs were seen with all treatments compared to the control on 24 May except Sunspray Ultrafine and Assail, and all treatments exerted control over small nymphs. Fewest large nymphs were seen with 2% PureSpray Green Oil, although not less than the lower rates, Sunspray Ultrafine and Novaluron. A similar pattern was seen with pupae. Fewest eggs were seen 1 June on plants sprayed with the mixture of Assail and 1% PureSpray Green Oil, although not significantly different from the other rates except the lowest (0.25%) or Sunspray. Fewest large nymphs and pupae were seen with the two highest rates of PureSpray Green Oil, and the Assail + 1% PureSpray Green Oil tank mix, although not significantly fewer than the lower rates, Sunspray or Novaluron. No phytotoxicity was observed with any treatment. Thus,

the horticultural mineral oils added to each spray provided an extra measure of protection against silverleaf whitefly in pepper.

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Spray dates and products applied<sup>1</sup>

Treatment/ formulation	Rate amt form/acre	Spray dates and products applied <sup>1</sup>							
		14 Apr	21 Apr	28 Apr	4 May	11 May	18 May	25 May	1 Jun
Untreated check									
Novaluron 0.83 EC	14 oz			Novaluron	Vydate	Novaluron	Vydate	Novaluron	Vydate
Dimilin 25 WP	6 oz			Dimilin	Vydate	Dimilin	Vydate	Dimilin	Vydate
PureSpray Green Oil	0.25 % v/v	Oil	Oil	Oil	Oil +	Oil +	Oil +	Oil +	Oil +
					Vydate <sup>1</sup>	Actara <sup>1</sup>	Vydate <sup>1</sup>	Actara <sup>1</sup>	Vydate
PureSpray Green Oil	0.5 % v/v	Oil	Oil	Oil	Oil +	Oil +	Oil +	Oil +	Oil +
					Vydate <sup>1</sup>	Actara <sup>1</sup>	Vydate <sup>1</sup>	Actara <sup>1</sup>	Vydate
PureSpray Green Oil	1.0 % v/v	Oil	Oil	Oil	Oil +	Oil +	Oil +	Oil +	Oil +
					Vydate <sup>1</sup>	Actara <sup>1</sup>	Vydate <sup>1</sup>	Actara <sup>1</sup>	Vydate
PureSpray Green Oil	2.0 % v/v	Oil	Oil	Oil	Oil +	Oil +	Oil +	Oil +	Oil +
					Vydate <sup>1</sup>	Actara <sup>1</sup>	Vydate <sup>1</sup>	Actara <sup>1</sup>	Vydate
Sunspray Ultrafine Oil	2.0 % v/v	Oil	Oil	Oil	Oil +	Oil +	Oil +	Oil +	Oil +
					Vydate <sup>1</sup>	Actara <sup>1</sup>	Vydate <sup>1</sup>	Actara <sup>1</sup>	Vydate
TD-2472-01	4 oz				Vydate <sup>1</sup>	TD-2472-01	Vydate <sup>1</sup>	TD-2472-01	Vydate
Assail 70 WP	1.2 oz				Vydate <sup>1</sup>	Assail	Vydate <sup>1</sup>	Assail	Vydate
Assail 70 WP	1.7 oz				Vydate <sup>1</sup>	Assail	Vydate <sup>1</sup>	Assail	Vydate

Assail 70 WP +	1.2 oz +	Vydate <sup>1</sup>	Assail +	Vydate <sup>1</sup>	Assail +	Vydate
PureSpray Green Oil	1.0 % v/v		Oil		Oil	

<sup>1</sup>Actara applied at 4 oz /acre and Vydate at 3 pt/acre

Treatment/ formulation		Mean adults per beat sample <sup>1</sup>		
		17 May	24 May	1 Jun
Untreated Check		61.9a	50.3abc	316.3a
PureSpray Green Oil	0.25 % v/v	28.3ab	41.1abcd	149.4cd
PureSpray Green Oil	0.5 % v/v	33.6ab	54.3ab	117.5d
PureSpray Green Oil	1.0 % v/v	26.2ab	39.2bcd	128.3cd
PureSpray Green Oil	2.0% v/v	14.3b	34.0cd	53.4e
SunSpray Ultrafine Oil	2.0% v/v	34.6ab	53.1abc	185.6bc
TD-2472-01	4.0 oz		60.0a	229.4b
Assail 70 WP	1.2 oz		24.3d	145.6cd
Assail 70 WP	1.7 oz		49.6abc	136.6cd
Assail 70 WP +	1.2 oz +		37.6bcd	184.3bc
PureSpray Green Oil	1.0 %			

Means in columns followed by the same letter are not significantly different (LSD, P<0.05)

<sup>1</sup>Total from beating 1 side of 4 plants

Mean number in 4 cm<sup>2</sup> per leaf

Treatment/ formulation	Rate amt form/acre	11 May		24 May				1 Jun			
		Large	Pupa	Egg	Small	Large	Pupa	Egg	Small	Large	Pupa
Untreated Check		1.5ab	1.0a	1.6a	5.3a	2.9a	4.9a	6.2ab	5.3abc	8.6a	4.4a
Novaluron 0.83 EC	14 oz	0.4c	0.2bcd	0.6b	2.9bc	0.7bcd	0.2e	3.3cde	8.0a	1.8cde	1.1cde
Dimilin 25 WP	6 oz	0.7bc	0.7abc	0.4b	2.8bc	1.7abc	2.8bc	6.4a	4.9abc	5.0b	2.9b
PureSpray Green Oil	0.25 % v/v	1.9a	0.8ab	0.3b	1.9bc	0.7bcd	0.9de	3.8bcd	6.8ab	2.0cde	1.4cde
PureSpray Green Oil	0.5 % v/v	0.4c	0.2bcd	0.7b	1.9bc	0.5cd	1.1de	2.1cde	7.2ab	2.6cde	1.6bcde
PureSpray Green Oil	1.0 % v/v	0.4c	0.1d	0.3b	1.8bc	0.4d	0.3e	1.6cde	5.1abc	1.2e	0.3e
PureSpray Green Oil	2.0% v/v	0.3c	0.2cd	0.5b	1.8bc	0.1d	0.1e	1.7cde	5.6ab	1.0e	0.3e
SunSpray Ultrafine Oil	2.0% v/v	1.4ab	1.2a	1.2ab	3.3bc	0.5cd	0.6de	1.2de	4.2abc	1.4de	0.8de
TD-2472-01	4.0 oz			0.6b	2.3bc	1.9ab	2.0bcd	4.0abc	6.0ab	4.0bc	1.9bcd
Assail 70 WP	1.2 oz			1.1ab	1.6bc	1.7abc	3.3b	2.8cde	4.8abc	2.4cde	2.4bc
Assail 70 WP	1.7 oz			0.7ab	3.4b	2.3a	2.1bcd	3.4cde	3.6bc	3.5bcd	1.7bcde
Assail 70 WP + PureSpray Green Oil	1.2 oz + 1.0 %			0.9ab	1.3c	0.5cd	1.7cde	0.7e	1.7c	1.2e	0.6de

Means in columns followed by the same letter are not significantly different (LSD, P<0.05)