

Evaluation of Insecticide Tank-Mixtures as Alternatives to Endosulfan For Control of Sweetpotato Whiteflies in Spring Melons, 2012



John Palumbo, Yuma Agricultural Center

With the impending loss of the endosulfan registration on melons, this trial was designed to evaluate the efficacy of several foliar insecticide alternatives as synergized pyrethroids (Brigade tank-mixtures) against adult whiteflies in spring melons. Cantaloupe plots planted with 'Gold Express' were established at the Yuma Agricultural Center on 25 Apr, 2012 and managed similarly to local growing practices. Plots consisted of a single 84-inch bed, 45 ft long with a 7 buffer between each plot. The study was designed as a RCB design with 4 replicates / treatment. The treatment combinations and rates are shown in the table below.

Treatment	Rate / acre
Dibrom 8EC + Brigade 2EC	1 pt + 6.4 oz
Dimethoate E267+Brigade	1.5 pt + 6.4 oz
Diazinon A500 + Brigade	1.5 pts + 6.4 oz
Malathion 8F +Brigade	1.75 pts + 6.4 oz
Lannate SP + Brigade	1 lb + 6.4 oz
Vydate L + Brigade	4 pts + 6.4 oz
Thionex 3EC + Brigade	32 oz +6.4 oz
Agri-Mek SC + Brigade	3.5 oz + 6.4 oz
Assail 30SG + Brigade	5.3 + 6.4 oz
Untreated control	-

Three foliar spray treatments were applied on 24, 31 May and 14 June with a CO₂ backpack sprayer that delivered 21 gpa at 40 psi, using 4 – TX18 ConeJet nozzles per bed as a broadcast spray. All spray treatments included an adjuvant, DyneAmic at 0.125% v/v. Populations of whitefly adults were evaluated at 1, 3 and 7 day intervals following each application (DAA). Adult populations were estimated using a modified vacuum method that employed a 2- gallon portable vacuum (DeWALT, Baltimore, MD) which was fitted with cloth-screened 40 Dram containers to capture and retain vacuumed adults. On each sample date, 5 separate plants from each replicate were sampled by vacuuming the terminal area of the plants for 3 s. Containers with adults were taken into the laboratory, placed in a freezer for 24 h after which the number of adults/ plant was recorded. Because of heterogeneity of mean variances, adult data were summed for each sample date, log transformed (mean+0.5) and subjected to ANOVA; means were separated using an *F*-protected LSD ($P \leq 0.05$). Actual non-transformed means are presented in the tables.

Summary: Adult pressure was light when the trial was initiated, but reached moderate levels at the completion of the trial. Table 1 and Figures 1-3 show the actual mean adult abundance, and percent reduction compared to the untreated control for treatments following each application. All the treatments provided significant knockdown control of adult whiteflies compared to the untreated control following most 1 DAA post-treatment evaluations. However, most of the OP/Carbamate mixtures were less consistent at 3 and 7 DAA evaluations. Among the OP / Carbamate + Brigade mixtures, only Diazinon (labeled for use on Honeydews only) provided consistent adult efficacy, often comparable to Thionex. A new formulation of Agri-Mek was also evaluated, but did not consistently provide efficacy comparable to Diazinon or Thionex. Finally, Assail (applied at the high label rate) provided consistent knockdown and residual control of adults comparable to Thionex following each application.

Table 1. Knockdown and Residual Efficacy of Alternative Insecticide Tank-mixtures Against Whitefly Adults as 1, 3 and 7 Days After Application (DAA) in Spring Melons, 2012

Spray # 1 (24 May)

Treatment	Rate	Adult Whiteflies / Sample			
		1 DAA	3 DAA	7 DAA	Avg.
		25-May	28-May	31-May	
Dibrom 8EC+ Brigade	1 pt + 6.4 oz	0.3 b	0.7 bc	2.8 a	1.3 b
Dimethoate E267+Brigade	1.5 pt + 6.4 oz	0.3 b	1.3 abc	2.6 a	1.4 b
Diazinon A500 + Brigade	1.5 pts + 6.4 oz	0.3 b	0.3 cd	0.9 b	0.5 cd
Malathion 8F +Brigade	1.75 pts + 6.4 oz	0.3 b	1.0 ab	2.0 ab	1.1 b
Lannate SP + Brigade	1 lb + 6.4 oz	0.1 b	0.6 bc	3.0 a	1.2 b
Vydate L + Brigade	4 pts + 6.4 oz	0.1 b	0.9 abc	2.1 ab	1.0 bc
Thionex 3EC+ Brigade	32 oz +6.4 oz	0.1 b	0.7 bc	1.8 ab	0.9 bcd
Agri-Mek SC + Brigade	3.5 oz + 6.4 oz	0.2 b	1.3 abc	3.1 a	1.5 b
Assail 30SG + Brigade	5.3 + 6.4 oz	0.2 b	0.2 d	1.1 b	0.5 d
Untreated control	-	1.1 a	1.7 a	2.9 a	1.9 a

Spray # 2 (31 May)

Treatment	Rate	Adult Whiteflies / Sample			
		1	3	7	Avg.
		1-Jun	4-Jun	7-Jun	
Dibrom 8EC+ Brigade	1 pt + 6.4 oz	0.7 bc	0.7 a	5.4 ab	2.3 b
Dimethoate E267+Brigade	1.5 pt + 6.4 oz	1.3 ab	0.6 ab	6.6 ab	2.8 ab
Diazinon A500 + Brigade	1.5 pts + 6.4 oz	0.6 bcd	0.6 ab	3.8 b	1.6 bc
Malathion 8F +Brigade	1.75 pts + 6.4 oz	1.2 b	0.6 ab	5.5 ab	2.4 b
Lannate SP + Brigade	1 lb + 6.4 oz	0.9 bc	0.5 abc	5.6 ab	2.3 b
Vydate L + Brigade	4 pts + 6.4 oz	1.0 bc	0.7 a	5.4 ab	2.3 b
Thionex 3EC+ Brigade	32 oz +6.4 oz	0.1 d	0.2 bc	3.8 b	1.4 cd
Agri-Mek SC + Brigade	3.5 oz + 6.4 oz	1.0 bc	0.6 ab	5.0 ab	2.2 b
Assail 30SG + Brigade	5.3 + 6.4 oz	0.3 cd	0.2 c	1.4 c	0.6 d
Untreated control	-	3.1 a	1.1 a	8.3 a	4.2 a

Spray # 3 (12 June)

Treatment	Rate	Adult Whiteflies / Sample			
		1	3	7	Avg.
		13-Jun	15-Jun	19-Jun	
Dibrom 8EC+ Brigade	1 pt + 6.4 oz	7.7 b	3.2 b	9.5 abc	6.8 bc
Dimethoate E267+Brigade	1.5 pt + 6.4 oz	8.5 b	2.8 b	7.1 bcd	6.1 bc
Diazinon A500 + Brigade	1.5 pts + 6.4 oz	6.0 b	2.3 b	5.6 d	4.6 c
Malathion 8F +Brigade	1.75 pts + 6.4 oz	9.1 b	2.5 b	8.1 bcd	6.6 bc
Lannate SP + Brigade	1 lb + 6.4 oz	7.4 b	2.2 b	7.4 bcd	5.6 bc
Vydate L + Brigade	4 pts + 6.4 oz	9.6 b	3.2 b	13.2 a	8.7 b
Thionex 3EC+ Brigade	32 oz +6.4 oz	0.6 c	0.5 c	2.3 e	1.1 d
Agri-Mek SC + Brigade	3.5 oz + 6.4 oz	7.2 b	2.3 b	6.5 cd	5.3 bc
Assail 30SG + Brigade	5.3 + 6.4 oz	1.0 c	0.4 c	2.2 e	1.2 d
Untreated control	-	18.8 a	8.7 a	10.4 ab	12.6 a

Means in a column followed by the same letter are not significantly different (P>0.05)

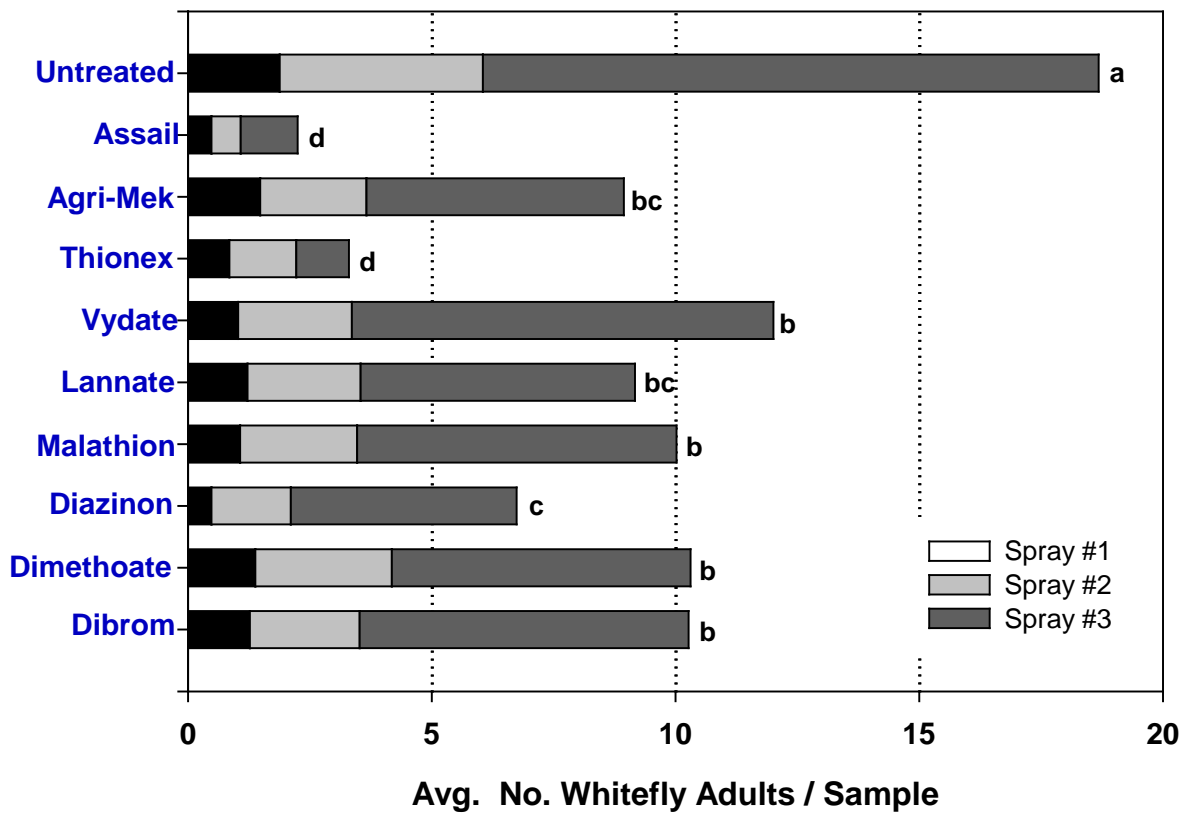


Figure 1. Whitefly Adults / Sample averaged for each spray application of Brigade tank mixtures.

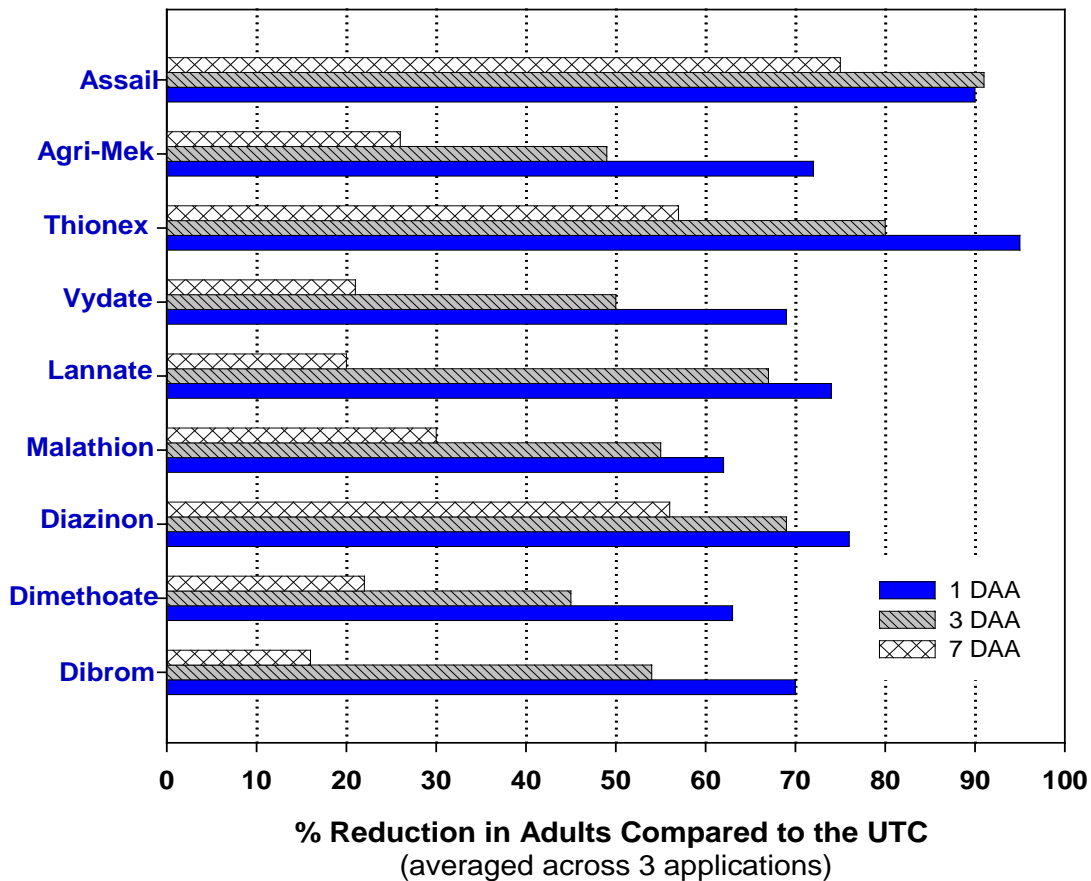


Figure 2. Average % Reduction of Adults at 1, 3, and 7 Days After Application of Brigade tank mixtures.

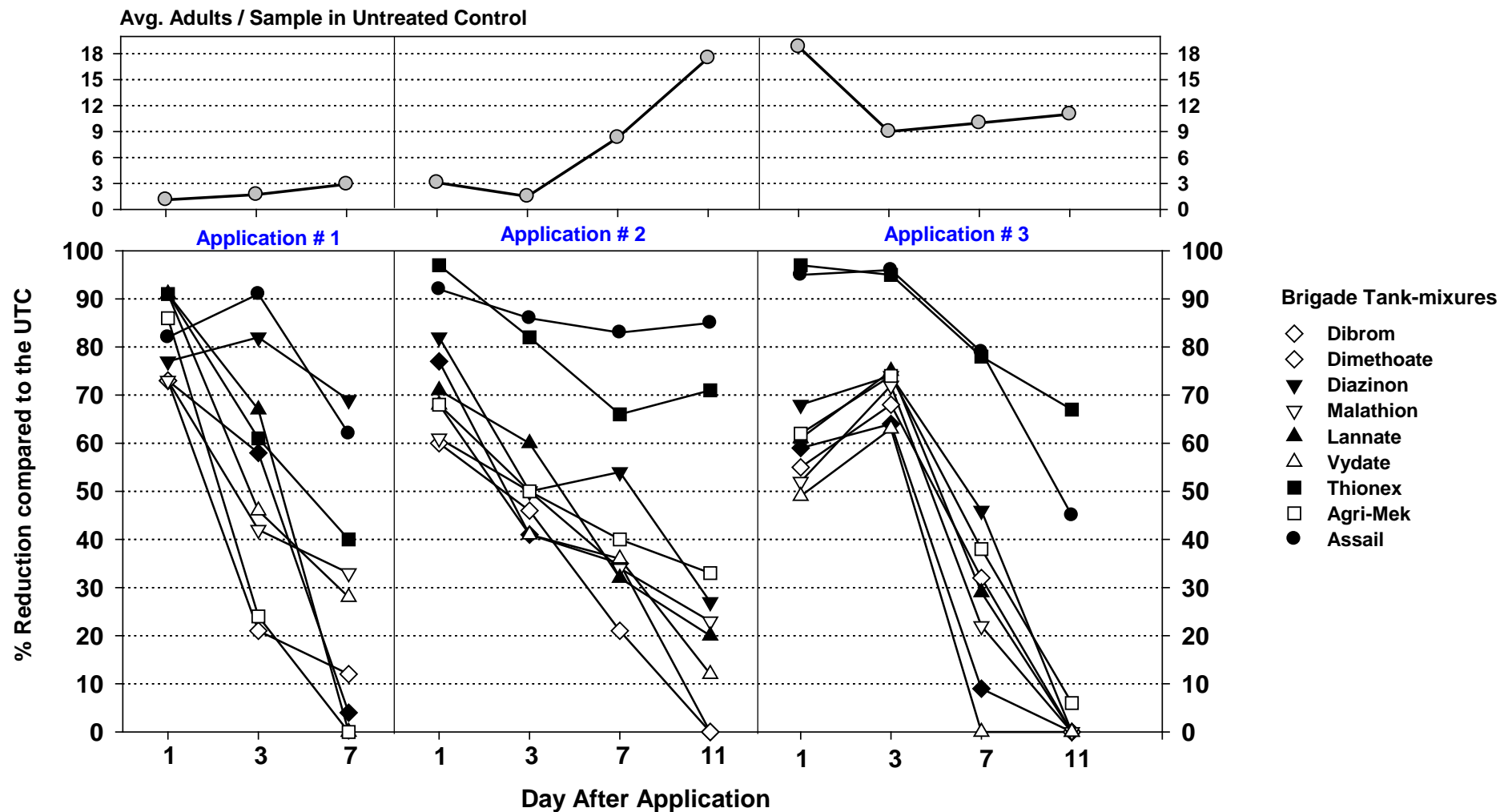


Figure 3. Average % Reduction of Adults following each of 3 spray applications (lower graph). Upper graph shows the whitefly abundance (mean/sample) in the Untreated control at each post-treatment evaluation