

QSLWF05-14.rpt
Protocol:

Ronald D. Oetting, Georgia

TEST: Efficacy of insecticides against the 'Q' strain of *Bemisia* whitefly

LOCATION: Greenhouse at Georgia Mountain Research and Education Center

APPLICATION DATE: Nov 1 and a second foliar spray on Nov 16, 2005

APPLICATION OBJECTIVE: Compare efficacy of insecticides against 'Q'

APPLICATION TEMPERATURE (RELATIVE HUMIDITY): 24°C, 23°C

APPLICATION: Applied twice as a foliar spray using a 8003 nozzle applied to full coverage or once as a drench in 120 or 250 ml of solution.

TREATMENTS:	Rate Form./100 gal	Rate/liter	Appl. Method
1. Check (water spray)	-		
2. Aria 50SG	120 g	0.32 gm	Drench (120 ml)
3. Celero 16WG	6.3 oz	0.47 gm	Drench (120 ml)
4. DPX-E2Y45	151 ml	0.40 ml	Drench (250 ml)
5. Safari 25WG	24 oz	1.80 gm	Drench (120 ml)
6. MilStop	2.5 lbs	0.2 gm	Foliar Spray
7. BW420	0.8 %	8 ml	Foliar Spray
8. Judo	4.0 fl oz	0.31 ml	Foliar Spray
9. Distance	8 fl oz	0.63 ml	Foliar Spray
10. Marathon II	5.4 fl oz	0.42 ml	Drench (120 ml)

PEST: tobacco whitefly *Bemisia tabaci* strain 'Q'

HOST: Poinsettia (cv. Dynasty Red)

PLOT SIZE: One 6 inch pot.

REPLICATIONS: Ten

EVALUATIONS: Plants were obtained from Olgevee greenhouses as rooted cuttings and potted on Sept 28, 2005. Plants were maintained on raised greenhouse benches. All plants were pinched on Oct 5, 2005. The plants were breaking on Oct 12, had short stems on Oct 19, and small leaves on Oct 26. The plants were kept under light from Sept 28 until Dec 14. The plants were exposed to a population of whiteflies on Oct 12 by bringing in five plants from a greenhouse that had 'Q' whitefly and scattering the adults over the plants. The infested plants were then placed in among the plants and moved at least every other day. The plants were not heavily infested and there was a slow movement of whiteflies to the test plants. The first application was made on Nov 1. Population counts were made at 7 day intervals after the initial application and continued for five weeks. To evaluate population levels three leaves from each

plant were carefully turned and the number of adult and immature whiteflies counted. The plants were observed for signs of phytotoxicity and any damage rated and recorded. Data analyzed using ANOVA and mean separation test.

RESULTS: This project was funded by IR-4 and is an initial trial to look at a selected group of insecticides to determine efficacy against the 'Q' strain of *Bemisia* whitefly. This whitefly was recently introduced to the United States and is reported to be more difficult to control than the 'B' strain of *Bemisia* that has been a nemesis for greenhouse growers since 1986. It is reported resistant to Distance and Marathon, which are two of the standbys for the 'B' strain. Most of the compounds tested are proven efficacious insecticides against the 'B' strain. Five of the compounds were applied as drench treatments and four were foliar sprays. In this trial we utilized a late planting of poinsettias so we could complete our 'B' strain trials before we started the 'Q'. In addition we wanted to wait until cooler weather and utilize an isolated greenhouse on the GA Mountain Research and Education Center in Blairsville for our trials. The 'Q' strain was obtained from a commercial greenhouse in Georgia and confirmed as the "Q" strain by Dr. Frank Byrne, University of California-Riverside. The sample of over 10 specimens was 100% 'Q'. A repeat sample was checked as the experiment started and the 5 specimens tested were all 'Q'.

At the start of the experiment we had a well established population of whiteflies and a very even distribution over the different treatments. Because of the infestation of these plants over a short period of time we had a weakly defined generation time. The first surge of egg hatch was on week one, the second on week four, and the last on week seven. Even with a low population of adults, we observed significant reduction of adults on week two with all treatments. Following the second week the adult population, in some of the treatments, increased to the level that was not significantly different from the check. The DPX-E2Y45 and BW420 treatments consistently had higher populations that were not significant. Safari controlled the adults very well with consistently the lowest population level of adults.

The immature population is the best guide of whitefly control. Safari again consistently resulted in the lowest population level, this time of immatures. It was not significantly less than a few of the other insecticides but was consistently the lowest actual count. Judo also had a consistently low population level throughout the seven weeks of the experiment. On week 5 all treatments were significantly lower than the check and there was no significant difference among treatments. However, there was a lot of variability in the population levels. In this experiment Safari and Judo appear to be the most efficacious compounds. Distance and Marathon were better than was expected since 'Q' was reported to be completely resistant to both of these compounds. Both of these compounds performed well but did not control the 'Q' whitefly with one application. Aria, Celero, and MilStop significantly reduced whitefly populations but the level was not adequate and more applications or rotation with other compounds would be needed. DPX-E2Y45 and BW420 were the least effective. Emergence of adults from the pupae appeared to correspond with the populations of immatures observed. If the immature survived to pupate they probably emerged as adults. There was evidence of increased growth on the Safari and Judo treatments which would indicate better health because of reduced whitefly population. The checks were definitely impacted by high population levels and had reduced growth.

Phytotoxicity was observed in some treatments. We sprayed the insecticides to wet to get good coverage on all plants. The result was that we probably applied more insecticide to each plant than a commercial grower. In the BW420 treatment we observed phytotoxicity expressed as marginal burn and distorted new growth with tip burn on two weeks after the first application. This damage was rated at 45 on a 1 to 100 scale. This damage was fairly uniform over all the plants in the treatment. On Nov 30 (2 weeks after the second application) the phytotoxicity was more intense. The Distance treatment had some chlorotic spots on the leaves two weeks after the second application (Nov. 30) at a slight to near moderate level (+25) on four of the ten replications. I am not sure this is a result of the treatment but should be noted.

In the following three tables the data for mean number of nymphs, pupal cases, or adults are presented. Each value on the table represents the population as a mean for three leaves from each pot, two pots per plot. Means were determined and the standard error calculated. Data were analyzed using ANOVA and mean separation by LSD. All letters following numbers within a column, that are different, are significantly different at the <0.05 level.

Table 1. Mean number of adult whitefly “Q” strain on three leaves.

Treatment	Precount	Week 1 Nov 1	Week 2 Nov 9	Week 3 Nov 16	Week 4 Nov 22	Week 5 Nov 30	Week 6 Dec 6	Week 7 Dec 14
Check	1.3a	1.0a	3.7a	5.7a	14.1ab	21.1a	17.2a	13.5a
Aria	1.6a	0.2a	0.5c	2.8bc	6.2bc	3.9bc	2.1c	6.9abc
Celero	2.6a	0.7a	0.7bc	1.6c	5.5bc	8.4bc	4.7bc	7.0abc
DPX-E2Y45	1.3a	0.6a	1.5bc	4.3ab	10.3abc	21.5a	12.1ab	9.8ab
Safari	1.9a	0.5a	0.4c	0.9c	1.6c	1.2c	1.0c	0.5c
MilStop	1.4a	0.8a	1.9b	2.8bc	7.5abc	7.7bc	10.9ab	8.7ab
BW420	1.2a	0.9a	1.6bc	1.3c	16.6a	12.6ab	12.3ab	10.3ab
Judo	1.2a	0.9a	1.6bc	2.0bc	4.6c	8.4bc	5.3bc	5.7bc
Distance	2.3a	0.9a	1.5bc	3.0bc	10.4abc	9.6bc	12.3ab	7.8abc
MarathonII	1.9a	1.0a	0.5c	1.9bc	6.2bc	4.0bc	5.7bc	4.8bc

Table 2. Mean number of immature whitefly “Q” strain on three leaves

Treatment	Precount	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Check	8.1c	22.4a	25.0a	34.4a	69.3a	65.3a	54.1a	73.0a
Aria	7.0c	9.7cd	11.1bcd	12.4bcd	28.0bc	27.0b	11.4de	21.2cde
Celero	10.2bc	11.5bcd	9.6cd	25.3ab	27.9bc	23.2b	18.0bcde	41.2bc
DPX-E2Y45	11.6abc	11.8bcd	10.4cd	12.4bcd	19.2cd	27.6b	33.4abc	38.9bc
Safari	13.2abc	7.5d	4.8d	2.4d	0.0d	0.0b	0.9e	0.0e
MilStop	9.8bc	14.5bcd	22.5a	23.3abc	29.4bc	28.4b	31.8bcd	54.9ab
BW420	10.7bc	18.5ab	23.4a	20.4abc	52.4ab	27.9b	36.4ab	28.4bcd
Judo	19.4a	12.1bcd	11.2bcd	6.9cd	1.9d	3.8b	6.3e	5.6de
Distance	14.7abc	15.3abc	20.9ab	15.6bcd	16.2cd	14.4b	14.8cde	15.3cde
MarathonII	17.8ab	17.3ab	15.4abc	18.6abcd	11.3cd	13.2b	18.7bcde	20.9cde

Table 3. Mean number of empty pupal cases of whitefly “Q” strain on three leaves

Treatment	Precount	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Check	0.0a	0.0a	0.9a	5.2a	0.0a	31.4a	32.1a	22.6a
Aria	0.0a	0.0a	0.1a	0.4a	0.0a	6.8cd	6.4bc	13.2abc
Celero	0.0a	0.0a	0.0a	2.4a	0.0a	9.5bcd	4.1bc	10.5abc
DPX-E2Y45	0.0a	0.0a	0.0a	3.9a	5.4a	21.7ab	7.3bc	17.9ab
Safari	0.0a	0.0a	0.0a	0.9a	0.0a	0.0d	0.0c	0.0c
MilStop	0.0a	0.0a	0.0a	2.3a	1.6a	16.6bc	18.9ab	11.8abc
BW420	0.0a	0.0a	0.0a	2.0a	1.5a	7.6bcd	10.0bc	14.4abc
Judo	0.0a	0.0a	0.0a	0.0a	0.0a	0.6d	0.0c	1.1bc
Distance	0.0a	0.0a	0.0a	0.7a	0.0a	11.7bcd	16.9abc	13.5abc
MarathonII	0.0a	0.0a	0.0a	0.6a	0.0a	12.0bcd	8.9bc	5.6bc

