

# The Q-biotype Whitefly

by JAMES BETHKE, DAN GILREIN, SCOTT LUDWIG,  
RONALD OETTING AND LANCE OSBORNE

A new type of whitefly hits the U.S.—and it may require changing your pest management program

**B**ackground: In 2004, the Q-biotype of the sweet potato whitefly, *Bemisia tabaci*, was identified in the U.S. for the first time. The level of insecticide resistance to pyriproxyfen (Distance) and imidacloprid (Marathon) of the Q-biotype was higher than any U.S. population of B-biotype whiteflies (silverleaf whitefly, *Bemisia argentifolii*) previously tested. An Ad Hoc Whitefly Task Force was established in the spring of 2005 to respond to this new pest. This task force includes representatives from the cotton, vegetable and ornamentals industries as well as regulators and scientists. The work conducted by this task force has been important in helping to avoid “panic” reactions from any one industry segment or from regulators. The efforts of the task force will continue but will require strong ornamentals industry support.

The good news for the ornamental industry is that at present, the U.S. Department of Agriculture (USDA) Animal Plant Health Inspection Service

(APHIS) won’t regulate biotypes. However, that doesn’t mean the policy can’t change. Therefore, the ornamental industry must remain vigilant.

As of February 2006, the Q-biotype whitefly had been found in 21 states. Most of the finds were on poinsettias but some have been found on other ornamental crops as well. The first time there’s a Q-biotype find on cotton or vegetables, we must anticipate that the ornamental industry will bear most of the blame for the introduction of this biotype. The



Lance Osborne

The Q-biotype whitefly looks just like any normal B-biotype (or silverleaf) whitefly you’d find in your greenhouse. The difference is in its genetics and in how it responds to chemical controls.

ornamentals industry must be proactive. This includes developing good management practices and preventing the spread of the biotype.

*Does the biotype matter?* You’re

probably asking, what’s a biotype and why should I care? A biotype is a race of a species that has a genetic difference from the rest of the species. This is often caused by geographical isolation. An important point is that the Q-biotype is indistinguishable from the B-biotype by visual examination. The only way

the two can be distinguished is by genetic analysis in a laboratory. The Q-biotype is widespread in the Mediterranean region and in Europe but has recently spread to other parts of the world.

**Control in your greenhouse.** Since the B-biotype whitefly is still the dominant whitefly in ornamental production, you should manage your whiteflies as if they’re the B-biotype. Because B-biotype whiteflies are▶

## Where is it?

Since the Q-biotype of sweet potato whiteflies was first found in Arizona in 2004, it has been found in numerous regions—which means everyone needs to pay attention. As of January 2006, it had been confirmed in 21 states—20 of which are listed here. (The name of the 21st state has not yet been released.)

Alabama  
Arizona  
California  
Connecticut  
Florida  
Georgia  
Illinois  
Indiana  
Kentucky  
Louisiana  
Maine  
Maryland  
Massachusetts  
Michigan  
New Hampshire  
New Jersey  
New York  
Oregon  
Pennsylvania  
Vermont

**Table 1**

## Summary of clip cage efficacy trials conducted in California by James Bethke against Q-biotype whiteflies on poinsettias in 2005

Trade name	Common name	Rate/100 gal.	Application method	Relative efficacy
Avid 0.15EC + Talstar	abamectin + bifenthrin	8 fl. oz. + 18 fl. oz.	Foliar	100%
Flagship 25WG	thiamethoxam	4 oz. <sup>1</sup>	Drench	80–90%
Judo	spiromesifen	4 fl. oz.	Foliar	100%
Safari 20 SG	dinotefuran	24 oz. (4 oz. solution/pot)	Drench	100%
Avid 0.15EC	abamectin	8 fl. oz.	Foliar	>95%
Sanmite 75WP	pyridaben	6 oz.	Foliar	>95%
Safari 20 SG	dinotefuran	8 oz.	Foliar	95%
Celero 16WSG	clothianidin	4 oz. /2,000 6-in. pots	Drench	70–90%
Marathon II	imidacloprid	1.7 fl. oz. /1,000 6-in. pots	Drench	60–95%
TriStar 75WSP	acetamiprid	4 pkt	Foliar	>90%
Dursban ME	chlorpyrifos	50 fl oz	Foliar	80%
Flagship 25WG	thiamethoxam	4 oz.	Foliar	80%
Celero 16WSG	clothianidin	4 oz.	Foliar	70%
Marathon II	imidacloprid	1.7 fl. oz.	Foliar	70%
Talus	buprofizen	6 oz.	Foliar	60%
Talstar	bifenthrin	18 fl. oz.	Foliar	50%
Aria 50SG	flonicamid	4.3 oz.	Foliar	45%
Tame 2.4EC	fenpropathrin	16 fl. oz.	Foliar	42–70%
Enstar II	s-kinoprene	10 fl. oz.	Foliar	38%
Endeavor 50WG	pymetrozine	5 oz.	Foliar	35%
Distance IGR	pyriproxifen	8 fl oz.	Foliar	30–95%
MilStop	potassium bicarbonate	2.5 lb.	Foliar	26%
Discus 2.94%	imidacloprid + 0.7% cyfluthrin	25 fl. oz.	Foliar	22%
Orthene TT&O	acephate	4 oz.	Foliar	18–30%

<sup>1</sup>Drench using 1/3 pot volume as drench solution

**Table 2**

## Summary of whole plant efficacy trials conducted in Georgia by Ronald Oetting against Q-biotype whiteflies on poinsettias in 2005

Trade name	Common name	Rate/100 gal.	Application method	Adult mortality	Immature mortality
Safari 25WG	dinotefuran	24 oz.	Drench	89%	100%
Avid 0.15 EC + Talstar 0.67	bamectin + bifenthrin	8 fl. oz. + 20 oz.	Foliar	98%	98%
TriStar 70WSP + Capsil	acetamiprid	2.25 oz.	Foliar	88%	98%
BotaniGard ES	<i>Beauveria bassiana</i>	64 fl. oz.	Foliar	0%	97%
Judo 4EC	spiromesefin	4.0 fl. oz.	Foliar	71%	97%
Naturalis L	<i>Beauveria bassiana</i>	64 fl. oz.	Foliar	92%	87%
Marathon II	imidacloprid	5.4 oz.	Drench	57%	84%
Flagship 25WG	thiamethoxam	3.0 oz.	Foliar	0%	81%
Sanmite 75 WP	pyridaben	6 oz.	Foliar	88%	81%
Distance .86EC	pyriproxifen	8 fl. oz.	Foliar	28%	77%
Orthene 975 + Tame 2.4 EC	acephate + fenpropathrin	5.33 oz. + 12.0 fl oz	Foliar	24%	74%
Celero 16 WG	clothianidin	6.3 oz.	Drench	57%	60%
Aria 50 SG	flonicamid	120 g.	Drench	57%	59%
MilStop 85WP	potassium bicarbonate	2.5 lb.	Foliar	42%	58%
BW420		102 oz.	Foliar	0%	24%

capable of developing resistance to the products used today, it's important to pro-perly rotate pesticides. A common error growers make is thinking that by using different chemical names they're "rotating." Rotation means switch-

ing among modes of action. The best way to determine a product's mode of action is to follow the Insecticide Resistance Action Com-mittee's number system (see [www.ircac-online.org](http://www.ircac-online.org)). Remember to review the labels for

restrictions on how often a material can be applied and to develop your plan thinking about other pests that you need to manage.

It's also important to go back to the basics. Scouting is essential to▶

## Pest Management

the success of any pest management program. Good sanitation is key. By starting clean, you'll often times be able to stay clean. Remove weeds in and around your production areas, your "pet plants" and anything else that might serve as a refuge for the insects or diseases. The major propagators are working with the task force because they know they have a higher standard to contend with. Many of the propagators will also act as a source of the latest recommendations for whitefly management.

At present, the Q-biotype is a manageable pest on floricultural crops if best management practices are employed. Researchers in California, New York and Georgia were able to evaluate insecticides against Q-biotype whitefly in 2005.

In the California trials, several products worked very well against the Q-biotype (see Table 1 on page 46). In these trials, insecticides were evaluated against whiteflies on plants in small cages. The results showed that some insecticides prevented immatures from developing through to adults. Foliar applications of Avid, Avid plus Talstar, Sanmite and Judo provided greater than 90% control. Some of the neonicotinoids also provided excellent control. Flagship

(drench), Safari (drench and foliar spray), Celero (drench), Marathon II (drench) and TriStar all provided good to excellent control. Results from an additional trial showed that while Distance will provide 100% control of B-biotypes, only 60 to 70% control was achieved against the Q-biotype.

In Georgia, similar results were observed for immature control with some insecticides (see Table 2 on page 48). Avid, Judo, Safari (drench) and Tristar all provided excellent control of the Q-biotype. Botanigard and Naturalis, two formulations of the insect pathogen *Beauveria bassiana*, also provided excellent control of immature whiteflies.

Trials conducted in New York also found that Safari and Judo provided excellent control of the Q-biotype, while Flagship only provided suppression. Marathon II and Distance didn't provide adequate control.

It's important to note that many products provide greater than 70% control. These products need to be used in a rotation program to assist in the prevention of insecticide resistance

**Take-home message!** Be aware of whitefly populations within your facility. If you notice they aren't responding to your spray program, be

ready to modify your management program. Insects that don't respond may be B-biotype that are developing resistance or they may be Q-biotype. Adjust your spray programs wisely!

As always, we recommend reviewing all aspects of your IPM program. Use the proper monitoring techniques, yellow sticky cards, weeding, spot treating, etc., and rotate modes of action. If you're curious and wish to know if you have Q-biotype whitefly and how best to manage it, see this Web site for more information: [www.mrec.ifas.ufl.edu/LSO/bemisia/bemisia.htm](http://www.mrec.ifas.ufl.edu/LSO/bemisia/bemisia.htm). ■

*Scott Ludwig is extension program specialist-IPM, Department of Entomology, Texas Cooperative Extension, Overton, Texas. James Bethke is staff research associate, Department of Entomology, University of California, Riverside, California. Ronald Oetting is professor of entomology, Department of Entomology, University of Georgia, Griffin, Georgia. Dan Gilrein is extension entomologist, Cornell Cooperative Extension of Suffolk County, Riverhead, New York. Lance Osborne is professor of entomology, University of Florida, Apopka, Florida.*