August 25, 2005

IMPORTANT UPDATE:
CONTROL OF Q AND B BIOTYPE WHITEFLIES!

As we are all aware, growers in the U.S. have been battling the "B" biotype of the silverleaf whitefly (*Bemisia tabaci*) since its introduction in the late 1980's. This biotype caused significant losses for several years, but has been more manageable since the mid 1990's when several new insecticide classes were introduced. However, earlier this year, discovery of the "Q" biotype silverleaf whitefly was reported from Arizona and, subsequently, from other states as well. The Q biotype could pose a significant threat to the ornamentals industry, as well as the U.S. cotton and vegetable industries, because it is less susceptible to many of the insecticides that growers currently rely on to manage the B biotype.

Although the Q biotype has been established in the Mediterranean basin and central Europe for many years, this biotype had not been previously reported in the U.S. A national, USDA-coordinated survey is currently underway to estimate how widely this pest is distributed. **However, it is very important at this time for growers to be especially observant of whiteflies in their greenhouse crops, and ask for expert advice if you are having trouble controlling them.**

It is uncertain whether the level of resistance observed in the laboratory studies to date is great enough to cause an obvious reduction in field performance when insecticides are applied according to the label. Greenhouse trials are currently underway at the University of California to help answer this question, and to determine which insecticides are most effective against the Q-biotype. Results from these trials will be posted at: http://www.mrec.ifas.ufl.edu/LSO/bemisia/bemisia.htm. Other information on whitefly management is also available at that website.

As you know, whiteflies have a very wide host range, and can potentially impact many ornamentals crops – as well as, of course, cotton and vegetable crops. However, because poinsettia is one of the host species, and the industry is entering the poinsettia season, NOW is an important time for growers to pay particular attention to whiteflies on their poinsettia crops.

Greenhouse trials will not be complete until after many growers have initiated whitefly management programs. **Therefore, at the request of SAF and ANLA, university and industry experts have developed a "Best Guess" pesticide program for the Q whitefly on poinsettia. This program is attached.** Please be aware that this program may change based on the outcome of greenhouse efficacy trials, and may not apply to all populations of Q biotype whiteflies.

In closing, it is important for growers to place currently available information about the Q biotype into context. On the one hand, there is no reason to panic. Decreased susceptibility does not mean an insecticide will completely fail to

control the Q biotype. Producers of floral and nursery crops have been managing the Q biotype in Europe for many years – and are still in business! In addition, a couple of newer insecticides have recently been registered that have been quite effective against the Q biotype in Europe.

Finally, a whitefly control problem does not necessarily mean a grower even has the Q biotype! A lack of control is most often due to factors other than insecticide resistance (ex. poor spray coverage), or you may have a population of the B-biotype that is developing resistance. And go back to the basics... Scouting is essential to the success of any pest management program (see below for additional comments on scouting). Good sanitation is key. Get rid of weeds, old "pet plants," and anything else that might serve as a refuge for the insects you're trying to get rid of. And remember the importance of rotating chemicals for different classes of action (see chart below).

On the other hand, growers should also not be complacent about the Q biotype and assume that their current management program will be effective, especially if they are relying on just one or two products. It is likely that ongoing greenhouse trials will demonstrate that certain insecticides are less effective against the Q biotype than they are against at least some populations of the B biotype, especially with respect to the length of residual control. For example, a neonicotinoid drench that has historically given 8 weeks of control of the B biotype, may only give 6 weeks of control of the Q biotype. Therefore, a grower who relies on only this treatment may be confronted with a serious whitefly infestation after plants begin to show color - a time when adequate underleaf spray coverage is difficult to achieve and few pesticides are labeled for application.

Consequently, SAF and ANLA strongly recommend that growers who experience unexpected difficulty in controlling whiteflies should contact their local county advisor, extension agent, propagator's advice team, or submit a sample for biotyping. This step should be taken early in the crop cycle before whiteflies become established and spray coverage becomes an issue.

A list of laboratories which can biotype whiteflies is attached. Growers should contact one of these labs prior to shipment of samples, to make sure correct sampling and shipping procedures are followed. THE RESULTS WILL BE PROPRIETARY TO YOUR BUSINESS AND WILL REMAIN CONFIDENTIAL, IF YOU SO REQUEST.

If you have questions or concerns, visit the website above, established by Dr. Lance Osborne, of the University of Florida. Or contact your local pest advisor, or your propagator. We will continue to keep you updated as the season progresses, and wish you a safe and profitable growing season!

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"BEST GUESS" PESTICIDE PROGRAM FOR THE MANAGEMENT OF THE Q BIOTYPE OF *BEMISIA TABACI* ON POINSETTIA

Pesticide recommendations have been developed for each of the following four poinsettia growth phases:

I. Propagation phase (the cuttings are on the mist bench).
II. Recent transplant phase (Rooted cuttings have been transplanted, but not yet pinched. Roots do not yet extend well into potting media and plants will not be efficient at taking up soil applied systemic insecticides at this time).
III. Growth phase (transplants pinched and roots extend well into potting media and can efficiently take up soil applied insecticides. Bracts do not yet show color. Adequate whitefly control is critical during this time.)
IV. Color phase (bracts show color)

Pesticide options are most limited during Phases I and IV due to either frequent irrigation, phytotoxicity concerns, or both. .

Q-Biotype Pesticide Program

I. Propagation.
Pesticides may be washed off plants early in the mist cycle and phytotoxicity may be an issue with some products. Pesticides may be more effective after the mist frequency is reduced. Recommended products include:
a. Foggers
b. Beauveria bassiana
c. Avid (sometimes used in combination with acephate or a pyrethroid such as bifenthrin or cyfluthrin)
d. Neonicotinoid spray with translaminar and systemic activity.

II. Recent transplants
Foliar sprays are most effective during this phase. Recommended products include:
1. Abamectin
2. Azadiractin
3. Beauveria bassiana
4. Buprofezin
5. Endosulfan
6. Flonicamid
7. Kinoprene
8. Novaluron
9. Potassium bicarbonate
10. Pymetrozine
11. Pyridaben
12. Pyriproxyfen
13. Pyrethroid + Acephate
14. Pyrethroid + Azadiractin

III. Growth phase

A single soil drench or granular application with a neonicotinoid is STRONGLY recommended within 1-2 weeks after pinch. Soil treatments before or after this time may be less effective. Systemic activity may be greater with more water-soluble products. POTS SHOULD NOT BE DRENCHED DURING THE FIRST WEEK AFTER APPLICATION OR SOME INSECTICIDE MAY BE WASHED OUT OF MEDIA BEFORE BEING ABSORBED BY ROOTS. Recommended products include:

a. Neonicotinoid soil treatment
    1. Dinotefuran
    2. Thiamethoxam
    3. Clothianidin
    4. Imidacloprid

After drenching, apply foliar sprays as needed if whiteflies are present. Avoid repeated application with a single mode of action (products with the same number in the attached chart). **IF PLANTS HAVE RECEIVED A NEONICOTINOID DRENCH, DO NOT SPRAY WITH A NEONICOTINOID DURING THIS PHASE IF AT ALL POSSIBLE. IF NECESSARY, MAKE ONLY A SINGLE SPRAY JUST PRIOR TO BRACT COLOR**.
Recommended products include:

b. Foliar Spray Rotations as needed
    1. Insecticidal soap
    2. *Beauveria bassiana*
    3. Horticultural oil
    4. Potassium bicarbonate
    5. Spiromesifen
    6. Abamectin
    7. Azadiractin
    8. Endosulfan
    9. Acetamiprid
    10. Dinotefuran
    11. Clothianidin
    12. Thiamethoxam
    13. Imidacloprid
    14. Flonicamid
    15. Kinoprene
    16. Novaluron
    17. Potassium bicarbonate
    18. Pymetrozine
    19. Pyridaben
    20. Pyrethroid + Acephate
    21. Pyrethroid + Azadiractin

IV. Color phase

Control of whiteflies during this time is difficult due the difficulty of achieving effective under leaf spray coverage and the lack of labeled products.

Therefore, pest management efforts should be concentrated before bracts begin to show color. Recommended products include:

a. Foggers
b. Any other product whose use is not restricted by the label!

During the period from pinch to color formation use products with a non-specific mode of action (soap, oil, Potassium bicarbonate, *Beauveria*) as often as possible, but only if plant safety is first demonstrated. As with all pests and pesticides, proper application and coverage is essential to obtain the best results

If you have any comments or suggestions concerning the information contained within this document, please contact one of the contributors or Email Dr. Lance Osborne at: lso@ifas.ufl.edu.

Pesticides used in the management of whiteflies on ornamental crops.

COMMON NAME	TRADE NAME	MODE OF ACTION*
abamectin	Avid 0.15 EC	6
acephate	Acephate Pro 75 or WSP , Orthene Turf, Tree & Ornamental Spray or 97	1
acetamiprid	Tristar	4
azadirachtin	Azatin XL	26
bifenthrin	Talstar Flowable , Attain TR - A Pyrethroid	3
Beauveria bassiana	BotaniGard 22WP Mycoinsecticide BotaniGard ES Mycoinsecticide	-
buprofezin	Talus	16
clothianidin	Celero 16 WSG	4
cyfluthrin	Decathlon 20 WP/Tempo - A Pyrethroid	3
endosulfan	Endosulfan 3 EC , 50WP , Thiodan 3 EC Thiodan fumigator	2
dinotefuran	Safari 20SG	4
fenpropathrin	Tame 2.4 EC (+ acephate) - A Pyrethroid	3
flonicamid	Aria	9C
horticultural oil	Ultra-Fine Oil	--
imidacloprid	Marathon II , 1% G , 60 WP	4
imidacloprid + cyfluthrin	Discus	3 + 4
insecticidal soap	M-Pede , Insecticidal Soap 49.52 CF	--
kinoprene	Enstar II	7A

nicotine	Nicotine fumigator	4
novaluron	Pedestal	15
potassium bicarbonate	Milstop, Armicarb	--
pymetrozine	Endeavor	9B cross with 4
pyridaben	Sanmite	21
pyriproxyfen	Distance IGR	7C
spiromesifen	Judo (available soon)	23
thiamethoxam	Flagship	4

Legend	Unknown
	Known to be effective on B-biotype: >90%
	Known to suppress the B-biotype >70%
	Not very effective when used alone against the B-biotype <50%

***For an explanation of the what the various numbers mean under the "Mode of Action" heading please visit one of the following:**

Insecticide Resistance Action Committee Mode of Action Classification v 4.2 (2005) Revised and re-issued, May 2005 (www.irac-online.org/documents/moa/MoAv4 2 1.doc)

Chemical Class Chart Vol, VII at: www.ohp.com/Labels_MSDS/PDF/CCC_VII.pdf)

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WHITEFLY SCOUTING AND THE "BEST GUESS" PESTICIDE PROGRAM

A rigorous and regular scouting program is the foundation of any IPM or Resistance Management program for pests affecting floricultural crops. Scouting is especially critical for the management of the Q biotype of *Bemisia tabaci* on poinsettia, and its development of pesticide resistance.

While most poinsettia growers profess to follow an IPM program, many do not employ a scout. However, if growers do not scout, they will be unlikely to detect and identify pest problems early in the infestation cycle. The end result will be calendar spraying and/or the need for "curative" control of established pest populations. Calendar spraying can result in unnecessary (and costly) pesticide application, and it may also accelerate the development of pesticide resistance. The latter is especially undesirable for a pest like the Q biotype, which is already noted for its tolerance or outright resistance to a number of insecticide classes! Finally, once pest populations are established, they are much more difficult and costly to bring under control, and pesticide options can be more limited. An introduction to scouting can be found at: http://www.mrec.ifas.ufl.edu/LSO/SCOUT/INTRO.htm).

It is important for poinsettia growers to recognize that scouting is a critical component of whitefly management regardless of biotype, and that without a rigorous scouting program, they will be unable to take full advantage of the "Best Guess" pesticide program that is presented above. For example, several pesticides (ex. IGR insecticides that have strictly contact activity) listed in the program are much less effective once pest populations are established, and/or will take longer to work. In addition, once poinsettia begins showing color, pesticide options are very limited due to labeling restrictions. Therefore, it is vital for poinsettia growers to be proactive with respect to whitefly management, and to initiate control programs when pest populations are first detected. This requires scouting.

Poinsettia should be scouted at least weekly for adult and immature whiteflies. Scouts should tag or map the location of infested plants so these plants can be evaluated after the application of pesticides or other management tactics. This will allow growers to determine how effective their pest management program is against whiteflies. If control is less than desirable, this information will allow growers to investigate the root cause of the control failure. In many cases, control failures have nothing to do with resistance, but instead result from inadequate levels of pesticides reaching the pest. This is most often due to inadequate spray coverage or improper use of soil applied insecticides (ex. application before roots are established, or excessive leaching during the first week after application). Scouts can be instrumental in detecting poor application technique.

Scouts can also detect control failures that result from reduced tolerance of whiteflies to a given pesticide. The first sign of insecticide tolerance is a reduction in residual activity, and the consequent need for more frequent pesticide application. If whiteflies are developing a tolerance to an insecticide, early detection by scouts will allow growers to substitute or incorporate pesticides with different modes of action - before pest populations reach unmanageable levels.

We will develop a more detailed document on scouting poinsettias and post it to the Bemisia website (http://www.mrec.ifas.ufl.edu/LSO/bemisia/bemisia.htm).

LABORATORIES AUTHORIZED TO TEST TO DETERMINE Q-BIOTYPE FROM B-BIOTYPE

There are a number of specifics concerning how one collects a sample and preserves it for evaluation. For these specifics, scheduling and pricing information you MUST contact the individual laboratories.

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