

# Q-Biotype Whitefly: Strategies for Prevention & Management

OFA Short Course  
July 8 – 11, 2006

# Perspective follows background

- Entomologist
- General Manager Parrish Farm
- Management responsibilities for Yoder's farm in Colombia, Flores del Amanecer
  
- Tri-lingual
  - Understand Lance and Jim
  - Understand language of our customers
  - Generally understand APHIS, PPQ

# Topics

- Whitefly prevention.
  - What offshore propagators are doing about whitefly
- Best Practices and IPM implementation.
- What if....
  - you are trying to avoid Q?
  - you suspect you have Q?
  - you get Q?
- Perceptions
  - Pest management practices





# Prevention



# Integrated Pest Management

- IPM = Best Practices
- IPM components
  1. Scouting
  2. Inspection
  3. Sanitation
  4. Cultural
  5. Physical
  6. Chemical



# 1. Scouting

- Know what pests you have, where, and how many
- Requirement for responsible pesticide use
- Done on a schedule
- Systematically cover the production areas
- Brush plant canopy for adults
- Pull leave or cutting samples to check for adults, immatures or pupae
- Also check sticky cards or other indicators



- Well defined programs with trained scouts
- Modeled after the scouting programs in place in the U.S. side of the business
- Information used to set thresholds for whitefly and other pests
- Also used as a measure of how your overall whitefly control strategy is working.





- While labor may be cheaper offshore, pesticides in general are not
- No desire on offshore producers parts to use pesticides that are not needed
- Depend on scouting to trigger chemical intervention



# Process

- Scouts cover the entire farm at least once a week
- Every bed, several locations on each bed
- Number of whitefly adults, immatures and pupae noted
- Threshold exceeded for a pest, then pesticides applied to that area
- Area might be a hotspot, one house, or entire block



- Yellow sticky cards are used to assess adult whitefly pressure
- Yellow sticky panels are used to help reduce any adult numbers in the production area
- Thresholds are set by either sticky card counts, adults on plants, or some combination
- Lower than in the states





## 2. - Inspection





# Incoming Plant Material

- Start clean!
- Examine or isolate all incoming plant material
- Install insect screening only to carry in whitefly???



- Incoming plant generally is of two types
  1. Germplasm for stock buildup
  2. Test production
  
- Great care is taken with either to make sure it is clean



# Stock buildup



- Incoming as ELITE or TC plantlets
- This starter material represents the cleanest germplasm that the propagators have.
- Grown and held under strict phytosanitary protocols.
- Lab tested
- Risk of this material having whitefly is zero





# Inspection - outgoing



- All have “quality checks” of some type
- These may take place at different points
  - Pre-harvest
  - Post harvest
  - Order assembly
- Generally 7 to 8 inspection points for cuttings shipped from offshore

# Typical Inspection Points

1. Scouting
2. Pre-harvest
  - Grower
  - Harvest supervisor
3. During harvest
4. Arrival at cooler
5. Order assembly
6. Airport departure
7. Airport arrival

# 3. Sanitation





- Soil or media steamed before use

- Disease management
- Nematodes
- Some insects



- Footbaths at entrance to greenhouses and production fields





# Sanitation

- No weeds under beds, along side walls, or in center walks
- No “pet plants” in production areas
- Discarded plants are composted
- NO dump piles of plant debris
- Any plants found infested are bagged and removed



# 4. Cultural



- Annual range sanitizing
- Crop-free period to break cycles
- Stock renewal schedules
- Planting density



# 5. Physical





- Screened stock
- Susceptible varieties
- Double door entryways
- Footbaths
- Hand wash stations
- Boot changing area
- Tool disinfection



- IPM measures we have in place in our U.S. facilities.....are in place offshore.

	United States	Offshore
SCOUTING	✓	✓
INSPECTION	✓	✓
SANITATION	✓	✓
CULTURAL	✓	✓
PHYSICAL	✓	✓
CHEMICAL	✓	?????



# 6. Chemical



# Perception

- Irresponsible use of pesticides
- Overuse of certain pesticides without regard to MOA
- Spray, spray, spray
- Oblivious to biotypes
- More likely to ship Q
- Are shipping Q

# Reality

- Follow Best Practices developed in U.S.
- Rotate products based on class & MOA
- Sound IPM programs
- Lab ID of strains
- Lower thresholds
- .....unlikely

# Best Practices for Q

- Long list of pesticides have been tested
- Published program for poinsettias and ornamentals
- Well informed on strategies to avoid/delay resistance developing
- Propagators are using these recommendations...both at home and offshore
- If our name is on the box....doesn't matter where it ships from. Our name is on the box.



## Table D. Plants are Actively Growing

Suggested Products	IRAC Class	Data on Q	Notes
<b>Neonicotinoid Soil Drench:</b> Celero (clothianadin) Flagship (thiamethoxam) Marathon (imidacloprid) Safari (dinotefuran)	4	Yes	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).
<b>Foliar Applications:</b>			
Aria (flonicamid)	9C	Yes	
Avid (abamectin)	6	Yes	
Azadirachtin	23	No	
<i>Beauveria bassiana</i>	n/a	Yes	
Celero (clothianadin)	4	Yes	
Endeavor (pymetrozine)	9B *	Yes	
Endosulfan	2	No	
Enstar II (kinoprene)	7A	Yes	
Flagship (thiamethoxam)	4	Yes	If plants have received a neonicotinoid drench, DO NOT spray with a neonicotinoid during this phase, if at all possible. If absolutely necessary, make only a single spray prior to shipping.
Horticultural Oil	n/a	Yes	
Insecticidal Soap	n/a	Yes	
Judo (spiromesifen)	23	Yes	
Marathon (imidacloprid)	4	Yes	
MilStop (potassium bicarbonate)	n/a	Yes	
Safari (dinotefuran)	4	Yes	
Sanmite (pyridaben)	21	Yes	
Talus (buprofezin)	16		
TriStar (acetamiprid)	4	Yes	
Foggers and other products whose use is not restricted by the label	Many	No	Tank mixes of pyrethroids with abamectin, azadiractin, or acephate may provide a suitable way to manage Q whiteflies when other pests need to be managed at the same time.

\* IRAC Class 9B exhibits cross resistance with IRAC Class 4

## Table E. Plants are Ready for Shipping

**NOTE:** Control of whiteflies during this time is difficult due the difficulty of achieving effective under leaf spray coverage, lack of labeled products, concerns about phytotoxicity or residue on final product. Therefore, pest management efforts should be concentrated before this phase. The neonicotinoid drenches have not been evaluated against the Q-biotype when plants are at this stage of crop production. Drenches are slower acting and should probably not be within 7 days of shipping.

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<b>Neonicotinoid Soil Drench:</b> Celero (clothianadin) Flagship (thiamethoxam) Marathon (imidacloprid) Safari (dinotefuran)	4	Yes
<b>Foliar Applications:</b>		
Avid (abamectin)	6	Yes
Flagship (thiamethoxam)	4	Yes
Judo (spiromesifen)	23	Yes
Safari (dinotefuran)	4	Yes
Sanmite (pyridaben)	21	Yes
TriStar (acetamiprid)	4	Yes
Foggers and other products whose use is not restricted by the label	Man y	No

**Table G. Summary of whole plant efficacy trials conducted in Georgia by Ron Oetting against Q-Biotype whiteflies on poinsettia in 2005.**

Trade Name	Common Name	IRAC Code	Rate per 100 gal	Application Method	Adult Mortality	Immature Mortality
Safari 20SG	Dinotefuran	4	24 oz (4 oz solution per pot)	Drench	89%	100%
Avid 0.15EC + Talstar GH (0.67F)	Abamectin + Bifenthrin	6 + 3	8 fl oz + 20 fl oz	Foliar	98%	98%
TriStar 70WSP + Capsil	Acetamiprid	4	2.25 oz	Foliar	88%	98%
Botanigard ES	<i>Beauveria bassiana</i>	n/a	64 fl oz	Foliar	0%	97%
Judo 4F	Spiromesifen	23	4 fl oz	Foliar	71%	97%
Naturalis L	<i>Beauveria bassiana</i>	n/a	64 fl oz	Foliar	92%	87%
Marathon II 2F	Imidacloprid	4	5.4 oz	Drench	57%	84%
Flagship 25WG	Thiamethoxam	4	3 oz	Foliar	0%	81%
Sanmite 75WP	Pyridaben	21	6 oz	Foliar	88%	81%
Distance IGR	Pyriproxyfen	21	8 fl oz	Foliar	28%	77%
Orthene TT&O + Tame	Acephate + Fenpropathrin	1 + 3	5.33 oz + 16 fl oz	Foliar	24%	74%
Celero 16WSG	Clothianidin	4	6.3 oz	Drench	57%	60%
Aria 50SG	Flonicamid	9C	120 g	Drench	57%	59%
MilStop (85S)	Potassium bicarbonate	n/a	2.5 lb	Foliar	42%	58%

# Management





# How can I avoid it?

- Get informed! Know what the risk is.
- Have a sound Integrated Pest Management program in place.
- Review your whitefly control program
- Does it differ from the Best Practices recommended?
- Responsible pesticide selection.
- Check incoming plant material

# How do I know if I have Q?

- Whitefly harder to control?
- Hotspots developing?
- Review your program
  - Spray coverage?
  - Reliance on one product class?
  - New spray person?
- Biotype identification

A

B

Q

# You are losing control...now what?

- Have you changed anything in your process of applying your pesticides?
- Write down a list of what pesticides you have applied to that particular crop over the last 12 weeks.
- Check them against the list from Best Practices program, for efficacy and for product mode of action category.
- Pick products from “effective” list with different modes of action other than that which has not worked for you.
- Set up your rotation. Don’t apply any one material more than twice in succession.
- Confined to “hotspots”....then bag and discard
- Don’t panic.



# Summary

- No 'corner cutting'.
- Requires more vigilance. For all pests.
- Committed to using Best Practices program. Having our programs reviewed by the whitefly experts.
- Practice Integrated Pest Management...at home and offshore
- Processes modeled after our U.S. programs

- Using labs here in the states to ID our biotypes
- Educating our customers. Letters, flyers with shipments
- Providing technical support to our customers
- Working closely with the Task Force of scientists, pesticide manufacturers, regulatory agencies, and industry associations.

# Most importantly.....

- We know what needs to be done to minimize our risk of infestation by this particular biotype.
- We know what to do when we find it. Q biotype can be controlled....just a little differently than we would B biotype.
- We also realize that anyone who grows plants may sooner or later see this pest. It has been reported from 20 states so far. We are prepared and want our customers to also be prepared.



Thank you!