

Low Volume versus Fogging

- Low volume applications are often compared to mosquito foggers, but they are not the same
- Mosquito foggers distribute a cloud of drift that floats through the air, killing flying insects. When the droplets, if any, make contact with plants, buildings or humans, it is no longer effective because the active ingredient has been diluted in the air
- Low volume applications have a larger particle size than foggers and less drift
- Low volume applications will slowly settle downward into the tree canopy for increased coverage and canopy penetration
- Low volume applications are not considered fogging



Current Understanding

- A proper psyllid management program requires multiple seasonal sprays, resulting in higher production costs
- Low volume applicators have been found to be as effective as conventional sprayers for psyllid control
- Applications are most effective when targeting adult psyllids before new flush is produced
- It is imperative that applications be made throughout the entire grove
- Additional applications can be made to borders or hot spots



Ongoing Research

- Research is being conducted to determine the effectiveness of spraying every row versus every other row and to optimize rates of currently available insecticides
- UF-IFAS-CREC and FAWN (Florida Automated Weather Network) are creating an internet tool to optimize spray timing based on weather conditions



Advantages

- More cost effective
- Cover large areas more quickly than conventional sprays
- May potentially use less chemical per acre
- Applicators may be truck mounted, therefore, reducing the need to load and unload equipment, making transport between groves easier

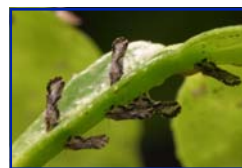
Disadvantages

- Applications need to be made during calm wind conditions, usually at night
- Limited time window may make it slightly more difficult to plan applications
- Requires work during unconventional hours



Asian Citrus Psyllid Movement

- During the spring and summer when psyllid populations are at a peak, foliar applications of insecticides against the psyllid are effective for only 2-3 weeks
- Psyllids quickly re-colonize groves from surrounding habitats but low volume technology can help slow psyllid recolonization because large areas can be treated rapidly and spot treatments are easier
- Movement is biased in the direction from abandoned or marginally managed groves into well managed groves
- Psyllids are capable of moving back and forth between 2 groves separated by 100 yards within 2 days
- Psyllids move even when there is flush (food/egg laying sites) available
- Most invading psyllids are found in the first 3-4 rows of trees from the grove borders, but are capable of invading grove interiors



Requirements

- At least 2 gallons per acre of carrier
- Average particle size must be above 90 microns
- Apply when wind is less than 10 MPH
- Low volume applicators create droplets with small particle size, therefore, calm conditions are required
- Best weather conditions are dusk to early morning hours

Types of Applicators

Efficacy is equivalent between applicator types for psyllid management.



LV-8 (A,B)



London Types (a,b)



Proptec



Air mist blower

Choosing an Applicator Method

- Advice: Ask applicators who have had experience with the various technologies
- Discuss durability, input into maintenance, how much post-manufacturer modification is needed, ease of operation, etc.
- Some machines require modification after purchase such as addition of appropriate tank and replacement pump

Approved Chemicals

- Before applying any chemical with low volume applicators, read the label carefully. Remember, the label is the law
- Legal products are Agri-Mek 0.15EC, Danitol 2.4EC, Delegate, Dimethoate (at least 5 gal/acre), Malathion 5 (at least 3 gal/acre), Micromite, Mustang and Sevin XLR Plus
- Imperative to remember the potential for insecticide resistance to develop with repeated chemical applications
- Carefully plan your spray program to reduce the possibility of resistance and do not use the same mode of action (MOA) two applications in a row

Worker Safety



- Use of respirator if operating a truck mounted applicator
- Standard label PPE precautions apply

Coordinated Grove Sprays

- Psyllids move frequently between groves resulting in reinfestation by psyllids shortly after treatment
- Duration of the reduction in psyllid populations following treatment will depend in part on psyllid management practices in surrounding groves
- Growers working together to control psyllids may reduce overall psyllid populations in an area thus slowing the rate of psyllid reinfestation following treatment

Application Method

- Fixed-wing aircraft and helicopters can treat large acreage in a short period of time
- Ground sprays can be used to treat areas where use of aircraft is not possible

Timing of Application

- Aerial applications are more effective for adult psyllid control than the egg and nymphal stages
- Efforts should be made to time aerial applications to periods when little new flush is present, preferably just prior to a major flush period

Product Choice

- Broad spectrum insecticides (e.g. OP's and pyrethroids) are the products of choice for aerial psyllid control applications
- Restricted Entry intervals (REIs) and Preharvest Intervals (PHIs) may affect product choice
- Label restrictions such as proximity to bodies of water and presence of bloom should be considered

Resources

Atwood, R. and L. Stelinski. November 2008. *Is there a future for Low Volume application for psyllid control?* Citrus Industry Magazine Volume 89 (Issue 11): 16

Atwood, R. and L. Stelinski. 2008. *Evaluation of Low Volume Application Technologies for Asian Citrus Psyllid (Diaphorina Citri Kuwayama) Control: Initial Results.* Proceeding of the Florida Horticultural Society

Rogers, M., et al. 2008. *Quick Reference Guide to Citrus Insecticides and Miticides* EDIS ENY-854

Citrus Research and Education Center Greening Extension website, <http://greening.ifas.ufl.edu>

Florida Automated Weather Network (FAWN) website, <http://fawn.ifas.ufl.edu>

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Understanding Low Volume Application Technology



The spread of citrus greening (Huanglongbing; HLB) and intense psyllid management programs have increased the cost of grove management, yet the price for oranges has decreased. When putting those factors together, new ideas emerged as growers began to think of innovative ways to manage psyllids and slow the spread of greening more efficiently. Increasing use of low volume application technology to assist in the management of the Asian citrus psyllid has raised many questions and concerns within the citrus industry.

An Emerging Technology in the Citrus Industry

