Pesticides Labeled for Low Volume Spray Application

Tim Hurner, Multi-County Citrus Extension Agent
UF/IFAS/Highlands County

&

Tim Gaver, Extension Agent-Citrus
UF/IFAS/St. Lucie County
Low Volume ACP Control Issues

- Equipment-
- New IPM Strategies-
- Labels-
- Worker Protection, PPE

2
What’s Unique about LV Labels?

The LABEL is the LAW!

• 2-5 GPA, except for ……. -
• Droplet Size Guidelines -
• Applications Prohibited Close to Aquatic Habitats
• PPE/Worker Safety Considerations
• Bee Cautions -
Current LV Labels

- Agri-Mek® 0.15EC
- Danitol® 2.4EC Spray
- Delegate® WG
- Dimethoate
- Sevin® XLR Plus
- Agrisolutions Malathion 5
- Micromite® 80WGS
- Mustang® Insecticide
Types of Label Registrations

- Federal EPA Registration
- Special Local Needs - SLN or 24(c) -
- Applicators must have a copy of the SLN label in their possession when applying the pesticide
Types of Label Registrations

• **Source for Labels**
  – CREC Web Site

http://www.crec.ifas.ufl.edu/extension/greening/
• Let’s look at the key items on these labels.
Agri-Mek 0.15EC
Agri-Mek 0.15EC

- Abamectin-
- Restricted Use Pesticide,
- Federal EPA label,
- Class - Avermectin
Agri-Mek 0.15EC

- Abamectin
- Restricted Use Pesticide, EPA label, Avermectin

- **Group 6 Mode of Action (MOA), chloride channel activator, affecting nerve & muscle action**
Agri-Mek 0.15EC

• Abamectin
• Restricted Use Pesticide, EPA label,
• Group 6 Mode of Action (MOA), chloride channel activator, affecting nerve & muscle action

• Apply in *Sufficient Water for Thorough Coverage*
• **10 – 20 ounces per acre**
Agri-Mek 0.15EC

- Abamectin
- Restricted Use Pesticide, EPA label,
- Group 6 Mode of Action (MOA), chloride channel activator, affecting nerve & muscle action
- Apply in *Sufficient Water for Thorough Coverage*
- 10 – 20 ounces per acre

- **Apply with not less than 1.0 gallon of horticultural spray oil/acre**
Agri-Mek 0.15EC

- Abamectin
- Apply in *Sufficient Water for Thorough Coverage*
- 10 – 20 ounces per acre
- Apply with not less than 1.0 gallon of horticultural spray oil/acre

- **Controls only ACP adults and nymphs present at the time of application**
Agri-Mek 0.15EC

- Abamectin
- Apply in *Sufficient Water for Thorough Coverage*
- 10 – 20 ounces per acre
- Apply with not less than 1.0 gallon of horticultural spray oil/Acre
- Controls only ACP adults and nymphs present at the time of application

- **12 Hr Re Entry Interval (REI)**
- **7 Day Post Harvest Interval (PHI)**
Danitol® 2.4 EC Spray

FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF FLORIDA

DANITOL® 2.4 EC Spray
(INSECTICIDE - MITICIDE)

For Control of Asian Citrus Psyllid in Citrus by Low Volume Ground Application Method

EPA Reg. No. 86593-3E
EPA SI No. 9L-090003

Active Ingredients

Crop, flume

Paraflum

Tolbo

V/W: 2.4% 2.4% 100% 100%

With paraflum-sodium (2,3,3,4-tetramethylpentane), or water

Combine 2.4 gallons per 1000 lbs per gallon.

Complete Product Literature

KEEP OUT OF REACH OF CHILDREN

WARNING - AVISO

For further information:

Florida Ag. 2.4E

Notice to Florida Ag. 2.4E

MAF 98-101

EPA 230-110

FD

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6887-15060
Danitol® 2.4EC Spray

- Fenpropathrin
- Restricted Use Pesticide
- 24(c) label
- Pyrethroid
Danitol® 2.4EC Spray

• Fenpropathrin
• Restricted Use Pesticide, 24(c) label, Pyrethroid

• **Group 3 MOA, Sodium Channel Modulator, Nervous System**
Danitol® 2.4EC Spray

• Fenpropathrin
• Restricted Use Pesticide, 24(c) label
• Group 3 MOA, Sodium Channel Modulator, Nervous System

• **Apply at a minimum of 2.0 GPA**
• **Droplet sizes with a volume medium diameter (VMD) of 90 microns or larger**
Danitol® 2.4EC Spray

- Fenpropathrin
- Restricted Use Pesticide, 24(c) label
- Group 3 MOA, Sodium Channel Modulator, Nervous System
- Apply at a minimum of 2.0 GPA
- Droplet sizes with a volume medium diameter (VMD) of 90 microns or larger

- **16 fluid ounces per acre**
- (max. - 42 2/3 oz. / season)
Danitol® 2.4EC Spray

• Fenpropathrin
• Apply at a minimum of 2.0 GPA
• Droplet sizes with a volume medium diameter (VMD) of 90 microns or larger
• 16 fluid ounces per acre

• **Good control of ACP and Root Weevil adults**
Danitol® 2.4EC Spray

- Fenpropathrin
- Apply at a minimum of 2.0 GPA
- Droplet sizes with a volume medium diameter (VMD) of 90 microns or larger
- 16 fluid ounces per acre
- Good control of ACP and Root Weevil adults

- **24 Hr REI**
- **1 Day PHI**
Delegate® WG

Supplemental Labeling

Delegate® WG

EPA Reg. No. 62719-541

Low Volume Application in Citrus
(For Distribution and Use Only in Florida)

ATTENTION
• It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
• This label must be in the possession of the user at the time of pesticide application.
• Read this SLN labeling and the label affixed to the container for Delegate® WG insecticide before applying. All applicable use directions, precautions and restrictions on this SLN labeling and the label affixed to the product container must be followed.

Active Ingredient:
spinetoram (a mixture of spinetoram-J and spinetoram-L) 25.0%
Other Ingredients 75.0%
Total 100.0%

Directions for Use
It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Citrus
Citrus Fruits (Crop Group 10), including: Grapefruit, Lemons, Limes, Oranges, Tangerines

Pests and Application Rates:
(numbers in parentheses refer to footnotes below)

<table>
<thead>
<tr>
<th>Pest</th>
<th>Delegate WG (gal/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian citrus psyllid(1)</td>
<td>3 - 6</td>
</tr>
</tbody>
</table>

(1) Control may be improved by the addition of an adjuvant to the spray mixture.

Delegate WG may be applied ground in a minimum finished spray carrier volume of 2 gallons per acre, at rates recommended on the product label. Spray applications must be made with spray nozzles that create a droplet size with a volume median diameter (VMD) of 90 microns or larger. An adjuvant may be used in the spray mixture at the recommended rate of the manufacturer. The effect of specific adjuvants or tank-mix partners on Delegate WG performance in low volume applications should be evaluated in a small-scale application before making large-scale applications. See the product label on the Delegate WG container for additional information on tank-mixing and adjuvants.
Delegate® WG

- **Spinetoram**
- **General Use Pesticide,**
- **24(c) label**
- **Class - Spinosin**
Delegate® WG

- Spinetoram
- General Use Pesticide, 24(c) label, Spinosin

- **Group 5 MOA, Acetylcholine Receptor Agonists, Nervous System**
Delegate® WG

- Spinetoram
- General Use Pesticide, 24(c) label
- Group 5 MOA, Acetylcholine Receptor Agonists Nervous System

- Apply in a minimum of 2.0 GPA
- Droplet sizes with a VMD of 90 microns or larger
Delegate® WG

- Spinetoram
- General Use Pesticide, 24(c) label
- Group 5 MOA, Acetylcholine Receptor Agonists Nervous System
- Apply in a minimum of 2.0 GPA
- Droplet sizes with a VMD of 90 microns or larger

- **3-6 fluid ounces per acre,**
- **max 3 applications/year**
Delegate® WG

- Spinetoram
- Apply in a minimum of 2.0 GPA
- Droplet sizes with a VMD of 90 microns or larger
- 3-6 fluid ounces per acre, max 3 applications/year

- **Good control of ACP**
- **Control of ACP may be improved by the addition of an adjuvant to the spray mixture**
Delegate® WG

- Spinetoram
- Apply in a minimum of 2.0 GPA
- Droplet sizes with a VMD of 90 microns or larger
- 3-6 fluid ounces per acre, max 3 applications/year
- Good control of ACP.
- Control of ACP may be improved by the addition of an adjuvant to the spray mixture

- **4 Hrs REI**
- **1 Day PHI**
Dimethoate 4E
Dimethoate 4E

- **Dimethoate**
- **General Use Pesticide,**
- **EPA label**
- **Class - Organophosphate**
- **Group 1b MOA, Acetylcholinesterase Inhibitor, Nervous System,**
Dimethoate 4E

• Dimethoate
• General use, EPA label, Organophosphate
• Group 1b MOA, Acetylcholinesterase Inhibitor, Nervous System,

• **At least 2 labels allow application at 5 gpa, with thorough distribution coverage**

• **2 pints per acre, 2 pints per year**
Dimethoate 4E

- Dimethoate
- Group 1b MOA, Acetylcholinesterase Inhibitor, Nervous System, Organophosphate
- At least 2 labels allow application at 5 gpa, thorough distribution coverage
- 2 pints per acre, 2 pints per year

- **Good control of ACP and scale insects**
- **48 hour REI**
- **15 - 45 day PHI**
Sevin® XLR Plus

Bayer CropScience LP
P.O. Box 12014, 2 T.W. Alexander Drive
Research Triangle Park, NC 27799
(919) 549-2000

FOR DISTRIBUTION AND USE ONLY IN THE STATE OF FLORIDA

FIFRA Section 2(o) Recommendation: This recommendation is made as permitted under FIFRA Section 2(o). It is a violation of federal law to use this product in a manner inconsistent with its label. This product bulletin must be in the possession of the user at the time of pesticide application. Follow all applicable directions, restrictions, Worker Protection Standard requirements, and precautions on the EPA registered label.

INSECT CONTROL
Use the lower rate on light to moderate infestations, young plants and early instars and use the higher rate on heavy infestations, mature plants, advanced instars and adults. Thorough and uniform spray coverage is essential for effective control.

DIRECTIONS FOR USE

<table>
<thead>
<tr>
<th>CROP</th>
<th>PEST</th>
<th>QUARTS OF SEVIN® XLR PLUS PER ACRE</th>
<th>SPECIFIC DIRECTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrus Fruits (such as grapefruit, lemons, limes, oranges, tangerines, tangelo, citrus citron, kumquat, and hybrids)</td>
<td>Asian Citrus psyllid (Diasphora citri)</td>
<td>1.5 – 3 qts/A</td>
<td>Repeat applications as necessary up to a total of 8 times but not more often than once every 14 days.</td>
</tr>
</tbody>
</table>

Restrictions and Precautions: Citrus Fruits
- Observe Bee Caution.
- For ground application: Apply in sufficient volume for adequate coverage.
- For aerial application: Use at least 10 gallons of spray mixture per acre for adequate distribution.
- Do not apply within 5 days of harvest.
- Do not apply more than a total of 20 quarts per acre per crop.
- For Medical and Transportation Emergencies: ONLY Call 24 Hours A Day 1-800-334-7577
- For PRODUCT USE Information: Call 1-866-99BAYER (1-866-992-8377) or Visit our worldwide web site at http://www.bayercropscience.us

As with any crop protection product, always read and follow label directions.
For additional information call toll-free 1-866-99BAYER (1-866-992-2037).

SEVIN is a registered trademark of Bayer.
Sevin® XLR Plus

- Carbaryl
- General Use Pesticide,
- EPA label, 2(ee)
- Class - Carbamate
Sevin® XLR Plus

• Carbaryl
• General Use pesticide, EPA label, 2(ee)

• **Group 1a MOA, Acetycholinesterase Inhibitor, Nervous System**
Sevin® XLR Plus

- Carbaryl
- General Use pesticide, EPA label, 2(ee)
- Group 1a MOA, Acetylcholinesterase Inhibitor, Nervous System

- **Apply in Sufficient Water for Adequate Coverage**
- **1.5 – 3 qts. per acre**
Sevin® XLR Plus

• Carbaryl
• General Use pesticide, EPA label, 2(ee)
• Group 1a MOA, Acetylcholinesterase Inhibitor, Nervous System
• *Apply in Sufficient Water for Adequate Coverage*
• 1.5 – 3 qts per acre

• **Low rate on light infestations,**
  **High rate on heavy infestations**
Sevin® XLR Plus

- Carbaryl
- General Use pesticide, EPA label, 2(ee)
- Group 1a MOA, Acetylcholinesterase Inhibitor, Nervous System
- Apply in Sufficient Water for Adequate Coverage
- 1.5 – 3 qts per acre
- Low rate on light infestations, high rate on heavy infestations

- **Good control of ACP, Root Weevil adults and Scale insects**
Sevin® XLR Plus

- Carbaryl
- General Use pesticide, EPA label, 2(ee) recommendation
- Group 1a MOA, Acetylcholinesterase Inhibitor, Nervous System
- *Apply in Sufficient Water for Adequate Coverage*
- 1.5 – 3 qts per acre
- Low rate on light infestations, high rate on heavy infestations
- Good control of ACP, Root Weevil adults and Scale insects
- **12 Hrs REI**
- **5 Days PHI**
Agrisolutions Malathion 5

Malathion 5
An Emulsifiable Concentrate Containing 5 Pounds Of Malathion Per Gallon.

ACTIVE INGREDIENT
Malathion (90.0-dimethyl phosphorothioate of
dimethyl phosphorothioate) 50.0%
INSERT INGREDIENTS* 43.0%
TOTAL 100.0%

Contains 5 pounds malathion per gallon.
*Contains 35.2% of Xylene range aromatic solvent.

KEEP OUT OF REACH OF CHILDREN
WARNING/AVISO

If you do not understand this label, find someone to explain it to you in detail.

FIRST AID FOR EXPOSURE

IF IN EYES
Hold eye open and rinse slowly and gently with water for 15-20 minutes.
Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.

INHALED
Move person to fresh air.
If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.
Call a Poison Control Center or doctor for further treatment advice.

IF ON SKIN OR CLOTHING
Take off contaminated clothing.
Rinse skin immediately with plenty of water for 15-20 minutes.
Call a Poison Control Center or doctor for treatment advice.

IF SWALLOWED
Call a Poison Control Center or doctor immediately for treatment advice.
Have person sip a glass of water if able to swallow.
Do not induce vomiting unless told to do so by the Poison Control Center or doctor.

Have the product container or label with you when calling a Poison Control Center or doctor, or going for treatment.

NOTES TO PHYSICIAN:
Malathion is an acetylcholinesterase inhibitor. Atropine is antidotal. Contains petroleum distillate which may cause aspiration pneumonitis.

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
WARNING
Causes substantial but temporary eye injury. Harmful if absorbed through skin. Do not get in eyes, on skin or on clothing.

Personal Protective Equipment:
Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category F on an EPA chemical resistance category selection chart.

Applicators and other handlers must wear long-sleeved shirt and long pants, chemical-resistant gloves, such as Butyl Laminated, Butyl Rubber, Nitrile Rubber or Viton, shoes plus socks and protective eyewear.

Disposal of clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

PRECAUTIONARY STATEMENTS
Read additional PRECAUTIONARY STATEMENTS

EPA Reg. No. 9779-5
FPA Est. Nos.
Distributed by:
Winfield Solutions, LLC
P.O. Box 64589, St. Paul, MN 55164-0589
0/09287
Agrisolutions Malathion 5

• Malathion
• General Use Pesticide,
• EPA label
• Organophosphate
Agrisolutions Malathion 5

- Malathion
- General Use Pesticide, EPA label Organophosphate

**Group 1b MOA,**
Acetylcholinesterase Inhibitor, Nervous System,
Agrisolutions Malathion 5

- Malathion
- General Use Pesticide, EPA label Organophosphate
- Group 1b MOA, Acetylcholinesterase Inhibitor, Nervous System

- **Not less than 3.0 GPA**
Agrisolutions Malathion 5

- Malathion
- General Use Pesticide, EPA label Organophosphate
- Group 1b MOA, Acetylcholinesterase Inhibitor, Nervous System

- **Not less that 3.0 GPA**
- **2.0 pints per acre?**
Agrisolutions Malathion 5

• Malathion
• General Use Pesticide, EPA label Organophosphate
• Group 1b MOA, Acetylcholinesterase Inhibitor, Nervous System,
• Not less that 3.0 GPA
• 2.0 pints per acre

• 12 Hr REI
• 7 Day PHI
Micromite® 80WGS

FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF FLORIDA

Chemtura Insect Growth Regulator
EPA REG. No. 468-467
EPA EWC No. FL-090019

Active Ingredients: 80% by weight

<table>
<thead>
<tr>
<th>Product Name (EPA)</th>
<th>Active Ingredient</th>
<th>Pounds per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micromite® 80WGS</td>
<td>80WGS</td>
<td>200 PPM</td>
</tr>
</tbody>
</table>

DIRECTIONS FOR USE

To ensure maximum efficiency of this product, follow the directions for use on the label at the time of pesticide application.

For application on non-tissue-cased application:

Crops: Fruit Trees, Vegetable Crops, Turf, and Other Uses

Product Rate (EPA): 200 PPM

Directions for Use:

Pour Micromite® 80WGS into a tank after the application of any surfactant and other ingredients, and apply as an immediate or delayed application. For best results, use Micromite® 80WGS in a dilution of 0.5% to 1% with water. The application rate should be at least 1 g per 1000 gallons of water. Do not mix with any other chemicals or fertilizers. Micromite® 80WGS is for use in Florida and should not be applied to crops other than those listed above.

Do not apply if the temperature is below 50°F or above 90°F. Apply in the early morning or late afternoon.

For additional information, refer to the Micromite® 80WGS label.
Micromite® 80WGS

• **Diflubenzuron**
• **Restricted Use Pesticide,**
• **24(c) label,**
• **Class - Benzolures**
Micromite® 80WGS

- Diflubenzuron
- Restricted Use Pesticide, 24(c) label,

- **Group 15 MOA,**
  Chitin Biosynthesis Inhibitor, Cuticle Synthesis
Micromite® 80WGS

- Diflubenzuron
- Restricted Use Pesticide, 24(c) label,
- Group 15 MOA, Chitin Biosynthesis Inhibitor, Cuticle Synthesis

- **2.0 to 5.0 GPA**
- **Droplet sizes with a VMD of 90 microns or larger**
Micromite® 80WGS

- Diflubenzuron
- Restricted Use Pesticide, 24(c) label,
- Group 15 MOA, Chitin Biosynthesis Inhibitor, Cuticle Synthesis
- 2.0 to 5.0 GPA
- Droplet sizes with a VMD of 90 microns or larger

- **6.25 oz per acre,**
  only 1 LV application per season
Micromite® 80WGS

- Diflubenzuron
- Restricted Use Pesticide, 24(c) label,
- Group 15 MOA, Chitin Biosynthesis Inhibitor, Cuticle Synthesis
- 2.0 to 5.0 GPA
- Droplet sizes with a VMD of 90 microns or larger
- 6.25 oz per acre, only 1 LV application per season

- Short-term control of ACP,
- The addition of a spray oil enhances coverage and may enhance control of ACP nymphs
Micromite® 80WGS

- Diflubenzuron
- 2.0 to 5.0 GPA
- Droplet sizes with a VMD of 90 microns or larger
- 6.25 oz per acre, only 1 LV application per season
- Short-term control of ACP,
- The addition of a spray oil enhances coverage and may enhance control of ACP nymphs

- **12 Hr REI**
- **21 Day PHI**
**Mustang® Insecticide**

**DIRECTIONS FOR USE**

**IT IS A VIOLATION OF FEDERAL LAW TO USE THIS PRODUCT IN A MANNER INCONSISTENT WITH ITS LABELING.**

Proper use of this product must comply with all applicable directions, restrictions, and precautions found on the labeling and of the federally registered product specified in the amendment or addendum.

<table>
<thead>
<tr>
<th>CROP</th>
<th>PEST</th>
<th>RATE OF APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrus Fruits (Orange, Grapefruit, Tangerine)</td>
<td>Asian Citrus Psyllid</td>
<td>4.0 gai (0.7 g/100 gal)</td>
</tr>
<tr>
<td>Citrus Trees (other citrus species)</td>
<td>Asian Citrus Psyllid</td>
<td>4.0 gai (0.7 g/100 gal)</td>
</tr>
<tr>
<td>Tropical Fruits (Melon, Papaya, Mango, Guava)</td>
<td>Asian Citrus Psyllid</td>
<td>4.0 gai (0.7 g/100 gal)</td>
</tr>
</tbody>
</table>

**Mustang Insecticide may be applied to structures 14 days before application to prevent contact with Asian Citrus Psyllid. Apy in 2.5 gallon or smaller sprayers is recommended. The use of certain crops is governed by local or state regulations. Do not apply to grapes or grape in rows. Mustang Insecticide may be applied with appropriate spray equipment at 1 to 10 cups per. Do not use on crops that are in contact with the treated crop. Do not apply to crops, grasses, weeds, or other vegetation that is in contact with the treated crop.**

**EMERGENCY CALLS: 800-321-0148**
Mustang® Insecticide

- Zeta-cypermethrin
- Restricted Use Pesticide,
- 24(c) Label,
- Pyrethroid
Mustang® Insecticide

- Zeta-cypermethrin
- Restricted Use Pesticide, 24(c) Label, Pyrethroid

- Group 3 MOA,
- Sodium Channel, Modulator, Nervous System
Mustang® Insecticide

• Zeta-cypermethrin
• Restricted Use Pesticide, 24(c) Label, Pyrethroid
• Group 3 MOA, Sodium Channel Modulator, Nervous System

• 2.0 GPA
• Droplet sizes with a VMD of 90 microns or larger
 Mustang® Insecticide

• Zeta-cypermethrin
• Restricted Use Pesticide, 24(c) Label, Pyrethroid
• Group 3 MOA, Sodium Channel Modulator, Nervous System
• 2.0 GPA
• Droplet sizes with a VMD of 90 microns or larger

• 4.3 oz/acre
Mustang® Insecticide

- Zeta-cypermethrin
- 2.0 GPA
- Droplet sizes with a VMD of 90 microns or larger
- 4.3 oz/acre

- **Good control of ACP and Root Weevil adults**
- **May be used with petroleum spray oil at 1-2 qts per acre**
Mustang® Insecticide

- Zeta-cypermethrin
- 2.0 GPA
- Droplet sizes with a VMD of 90 microns or larger
- 4.3 oz/acre
- Good control of ACP and Root Weevil adults
- May be used with petroleum spray oil at 1-2 qts per acre

- **12 Hr REI**
- **1 Day PHI**
Temperature vs. Efficacy

• A recent laboratory trial showed that the efficacy of an number of pesticides used for ACP control was affected by temperatures at application.

• ACP’s were subjected to pesticides at 63°F, 81°F, and 99°F.
Temperature vs. Efficacy

• **Dimethoate, Sevin, and Agri-Mek** performed better at **higher temperatures**.

• **Mustang and Danitol** performed better in **cooler temperatures**.

• Malathion, Delegate, and Micromite were not included in the experiment.
Summary

• The Label is the Law!!
• Carefully Read the Label Before Using the Pesticide
• Applicator must have a Copy in possession when using the product
• Thank You to:

• Dr. Michael Rogers, Entomologist, Integrated Pest Management, CREC, Lake Alfred for input in to this presentation.
That’s All Folks!
Thank You Sponsors!!