

# Strawberry Meeting – Savannah: Mites, Miticides, & Resistance Management

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# Fire Ants in Strawberry

- Two new baits labeled for use in bearing strawberry.
  - Esteem® (pyriproxyfen) – an insect growth regulator.
  - Extinguish® (methoprene) – an insect growth regulator.
- Baits must be applied broadcast when ants are actively foraging (warmer weather).
- Do not apply to wet ground nor in advance of rainy weather.
- Baits work slowly; four to six weeks for control of ants.

# Mites vs. Aphids

- **Two spotted spider mites at top.**
  - Mites have eight legs – two point forward and two backward.
- **Aphids in the lower picture.**
  - Aphids have six legs, two antennae, and two projections at their rear.
- **Mites are actually about 1/5<sup>th</sup> the size of the aphids.**
- **Both are found on the backs of the leaves.**



# Mites vs. Aphids

- Light colored swollen aphids are parasitized by a small wasp; they will die.
- The red mite at bottom is a predator mite; note the longer legs.
- You may see these when looking for spider mites.
- Don't worry.



UGA1327097



Roger Francis

# Control of Mites

- Manage before you see this.
- Bronzed, off-color foliage, stunting.
- Mites reproduce very rapidly especially during hot weather.
- Regular observation of plants is necessary.



# Spider Mite Monitoring

## ➤ Monitoring

- Sample 10 mid tier leaflets/acre for fields < 10 acres, 5 leaflets/acre for fields > 10 acres
- Observe with 10x hand lens or use mite brush/microscope

## ➤ Thresholds

- CA research
  - 5 mites/leaflet, early season
  - 10 mites/leaflet, fruiting
- FL research
  - 2 mites/leaflet

(Adapted from Hannah Burrack, NCSU)

# Newer Miticides

- Acramite® – all stages; 2 applications.
- Kanemite® – all stages; 2 applications.
- Oberon® – all stages; 3 applications.
- Savey® – eggs; little effect on other stages; 1 app.
  - Use with an adulticide such as Brigade for heavy infestations.
- Zeal® – mainly eggs; some effect on immatures.
  - 1 application with an adulticide (Danitol® or Brigade®).

# Effects on Arthropods and Other Information

Miticide	Eggs	Larvae	Adults	Predatory Mites*	Other Pests	Notes
<b>Kelthane</b>	<b>0</b>	+++	++	-	-	Resistance, phytotoxicity
<b>Vendex</b>	+	++	+	+++	-	resistance
<b>Agrimek</b>	<b>0</b>	++++	+++	-	-	Resistance, some translaminal leaf uptake
<b>Savey</b>	+++	+++	+++	++	-	Sterile eggs, apparent increase in egg numbers
<b>Acramite</b>	+	+++	+++	+++	-	New chemistry, single application, TLU
<b>Danitol</b>	<b>0</b>	+++	++	-	++	Pyrethroid, damaging to beneficial complex
<b>Brigade</b>	<b>0</b>	++++	+++	-	+++	Pyrethroid, damaging to beneficial complex
<b>Zeal</b>	+	++	+++	++	<b>0</b>	TLU, New chemistry
<b>Kanemite</b>	+	+++	+++	+++	<b>0</b>	TLU, New Chemistry

# Resistance Management

- Mites become resistant to miticides easily.
- If multiple applications are needed, follow label about total number of applications per season.
- Learn about ‘modes of action’ and rotate MoA if you must treat more than once.
- Newer materials have markings on the package indicating to which MoA class they belong.

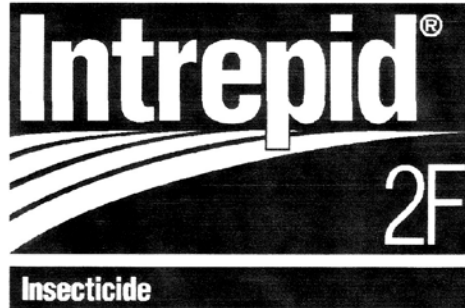
# IRAC Codes

- IRAC = Insecticide Resistance Action Committee; an industry group addressing the problem of insecticide/miticide resistance.
  - [www.irc-online.org](http://www.irc-online.org)
- They have placed materials into groups based on similarity of MoA.
- Lots of good information for free; has an extensive chart showing MoA's of most materials.

**Banner showing the IRAC MoA code and type of material.**

# Specimen Label

 **Dow AgroSciences**



®Trademark of Dow AgroSciences LLC

<b>Group</b>	<b>18</b>	<b>INSECTICIDE</b>
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**Active Ingredient:**

Methoxyfenozide: Benzoic acid, 3-methoxy-2-methyl-2-(3,5-dimethylbenzoyl)-2-(1,1-dimethylethyl) hydrazide .....	22.6% <sup>*</sup>
Inert Ingredients .....	77.4%
Total .....	100.0%

\*Contains 2 lb active ingredient per gallon

EPA Reg. No. 62719-442

**Keep Out of Reach of Children**

**CAUTION                      PRECAUCION**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

**Precautionary Statements**

**Hazards to Humans and Domestic Animals**

**Harmful If Absorbed Through Skin Or Inhaled**

**Avoid contact with eyes, skin or clothing. Avoid breathing spray mist.**

**Personal Protective Equipment (PPE)**

**Applicators and other handlers must wear:**

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks

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.

When handlers use closed systems, enclosed cabs or aircraft in a manner that meet the requirements listed in the Worker Protection Standards (WPS) for agricultural pesticides [40 CFR 170.240(d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

**User Safety Recommendations**

**Users should:**

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove contaminated clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

**First Aid**

**If 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.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

**Environmental Hazards**

Drift and runoff from applications of this product may be hazardous to sensitive aquatic invertebrates in water bodies adjacent to the treatment area. For terrestrial uses, do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination.

Methoxyfenozide can contaminate surface water through spray drift. Under some conditions, methoxyfenozide may also have a high potential for runoff into surface water (primarily via dissolution in runoff water) for several months post-application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas over-laying extremely shallow groundwater, areas with in-field canals or ditches that drain to overlaying tile drainage systems that drain to surface water.

Do not cultivate within 10 feet of aquatic areas to allow growth of a vegetative filter strip.

Do not apply by ground within 25 feet, or by air within 150 feet, of lakes, reservoirs, rivers, permanent streams, marshes, or natural ponds; estuaries and commercial fish farm ponds.

# IRAC Codes for New Miticides

- Acramite® – Group 25.
- Agri-mek® – Group 6.
- Kanemite® – Group 20B.
- Oberon® – Group 23.
- Savey® – Group 10B.
- Zeal® – Group 10C.
- Danitol® and Brigade® are both pyrethroids; Group 3.
- You could use only Savey® or Zeal®; not both on the same crop.