

# **Examination of Chemical Control Options For Roseau Cane Scale**

**Blake Wilson**  
**Field Crops Entomologist**

**State of the Coast Conference**

**May 30, 2018**



# Why Study Insecticides?

## Advantages

- **Rapidly protect plants from damage from herbivores**
- **Relatively easy to implement over large areas**

## Disadvantages

- **Risk of environmental impacts**
- **Control is temporary**
- **Requires continued input (\$\$\$)**

# Will Insecticides Work?

- Scales are common pests of crops and ornamental plants
- Numerous products effectively control scales in various systems



# **Pesticides in natural environments**

- **Wetland ecosystems much more complex than agricultural systems**
- **Non-target impacts can lead to cascading ecological consequences**
- **Pesticides can't be contained in aquatic systems**

# All Pesticides Have Risk!

control center or doctor, or going for treatment. You may also contact 1-800-992-5994 for emergency medical treatment information.

## Environmental Hazards

This product is highly toxic to bees exposed through contact during spraying and while spray droplets are still wet. This product may be toxic to bees exposed to treated foliage for up to 3 hours following application. Toxicity is reduced when spray droplets are dry.

Risk to managed bees and native pollinators from contact with pesticide spray or residues can be minimized when applications are made before 7:00 am or after 7:00 pm local time or when the temperature is below 55° F at the site of application.

Refer to the Directions for Use for crop specific restrictions and additional advisory statements to protect pollinators.

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

## Directions for Use

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

Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be



- Many modern insecticides have increased selectivity compared to broad spectrum products used in the past
- Target sites specific to insects

# Insecticidal Control Available Products

Table 16. Comparison of acute RQs for freshwater and estuarine/marine fish and invertebrates based on the crop/use scenario that resulted in the highest peak EECs of all modeled scenarios and the most sensitive acute toxicity values for each taxonomic group. <sup>a, b</sup>

Acute Aquatic Animal RQs <sup>d</sup>					
Residues <sup>c</sup>	Peak EEC (µg a.i./L)	Freshwater Invertebrates	Freshwater Fish	Estuarine/Marine Invertebrates	Estuarine/Marine Fish
Parent only	0.573	0.0009	0.0004	0.0007	0.0003
Total	11.4	0.0173	0.0081	0.0134	0.0058

<sup>a</sup> NC apple aerial application scenario, based on 3 applications at a rate of 0.4 lb a.i./A/season and a 7-day interval, generated the highest peak EECs.

<sup>b</sup> Toxicity values are based on studies with midges (*Chironomus riparius*) for freshwater invertebrates ( $EC_{50} = 660 \mu\text{g a.i./L}$ ), bluegill sunfish (*Lepomis macrochirus*) for freshwater fish ( $LC_{50} = 1410 \mu\text{g a.i./L}$ ), eastern oysters (*Crassostrea virginica*) for estuarine/marine invertebrates ( $EC_{50} = 850 \mu\text{g a.i./L}$ ), and sheepshead minnow (*Cyprinodon variegatus*) for estuarine/marine fish ( $LC_{50} = 1960 \mu\text{g a.i./L}$ ).

<sup>c</sup> 24-hour peak EEC values generated from PRZM/EXAMS are reported for the parent spirotetramat only as well as for total residues (i.e., residues for the parent plus degradates of concern).

<sup>d</sup> All RQs are below the acute risk (0.5), acute restricted use (0.1), and acute endangered species (0.05) LOCs.

**Acute and chronic toxicity data for model organisms is readily available.**

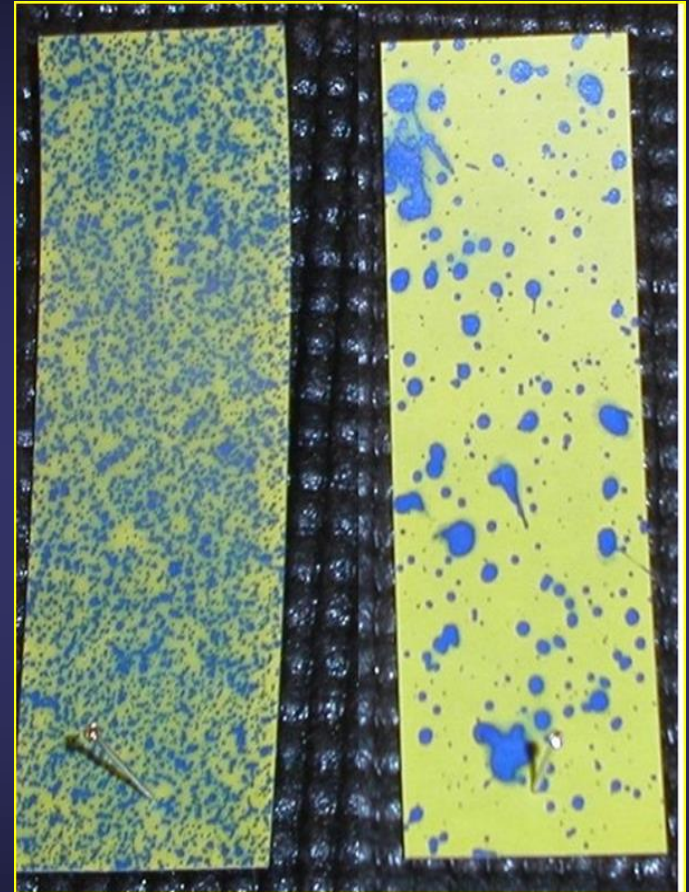
# Insecticidal Control Available Products

**Natural and synthetic insecticides to be evaluated for control of the Roseau scale**

<b>Active ingredient</b>	<b>Product Name</b>	<b>Scale activity</b>	<b>Systemic activity</b>
<b>Natural insecticides</b>			
<b>Azadirachtin (neem)</b>	<b>AzaMax</b>	<b>Suppression</b>	<b>Variable</b>
<b>Soaps</b>	<b>Multiple Products</b>	<b>Suppression</b>	<b>No</b>
<b>Diatomaceuos Earth</b>	<b>Multiple Products</b>	<b>Unknown</b>	<b>No</b>
<b>Neem Oil</b>	<b>Multiple Products</b>	<b>Suppression</b>	<b>Variable</b>
<b>Synthetic insecticides</b>			
<b>Spirotetramat</b>	<b>Movento</b>	<b>High</b>	<b>Variable</b>
<b>Imidacloprid</b>	<b>AdmirePro</b>	<b>Suppression</b>	<b>Yes</b>
<b>Acetamiprid</b>	<b>Intruder</b>	<b>Unknown</b>	<b>Yes</b>
<b>Clothiandin</b>	<b>Poncho</b>	<b>Unknown</b>	<b>Yes</b>
<b>Buprofezin</b>	<b>Talus</b>	<b>High</b>	<b>No</b>
<b>Pyriproxyfen</b>	<b>Knack</b>	<b>High</b>	<b>No</b>
<b>Flupryadifuron</b>	<b>Sivanto</b>	<b>High</b>	<b>Variable</b>
<b>Sulfoxaflor</b>	<b>Transform</b>	<b>High</b>	<b>Variable</b>

# Evaluating Risk

- **Risk to non-target organisms depends on *toxicity* and *exposure***
- **Application methods determine exposure risk**
- **Foliar vs systemic insecticides**





# **Insecticidal Control**

## **Three Step Evaluation Process**

### **What products work?**

**Greenhouse/laboratory toxicity assays**

### **How should they be applied?**

**Application method trials examining efficacy and risk**

### **What control methods work in the field?**

**Field validation trials**

**Products and application methods with *maximum efficacy* and *minimal risk* will be advanced at each step**

**Field studies conducted in terrestrial Roseau cane at Cut Off, LA.**

**Foliar application (spray)**

**Multiple active ingredients and rates tested**



**Poor control achieved with all products,  
limited exposure to foliar sprays.**



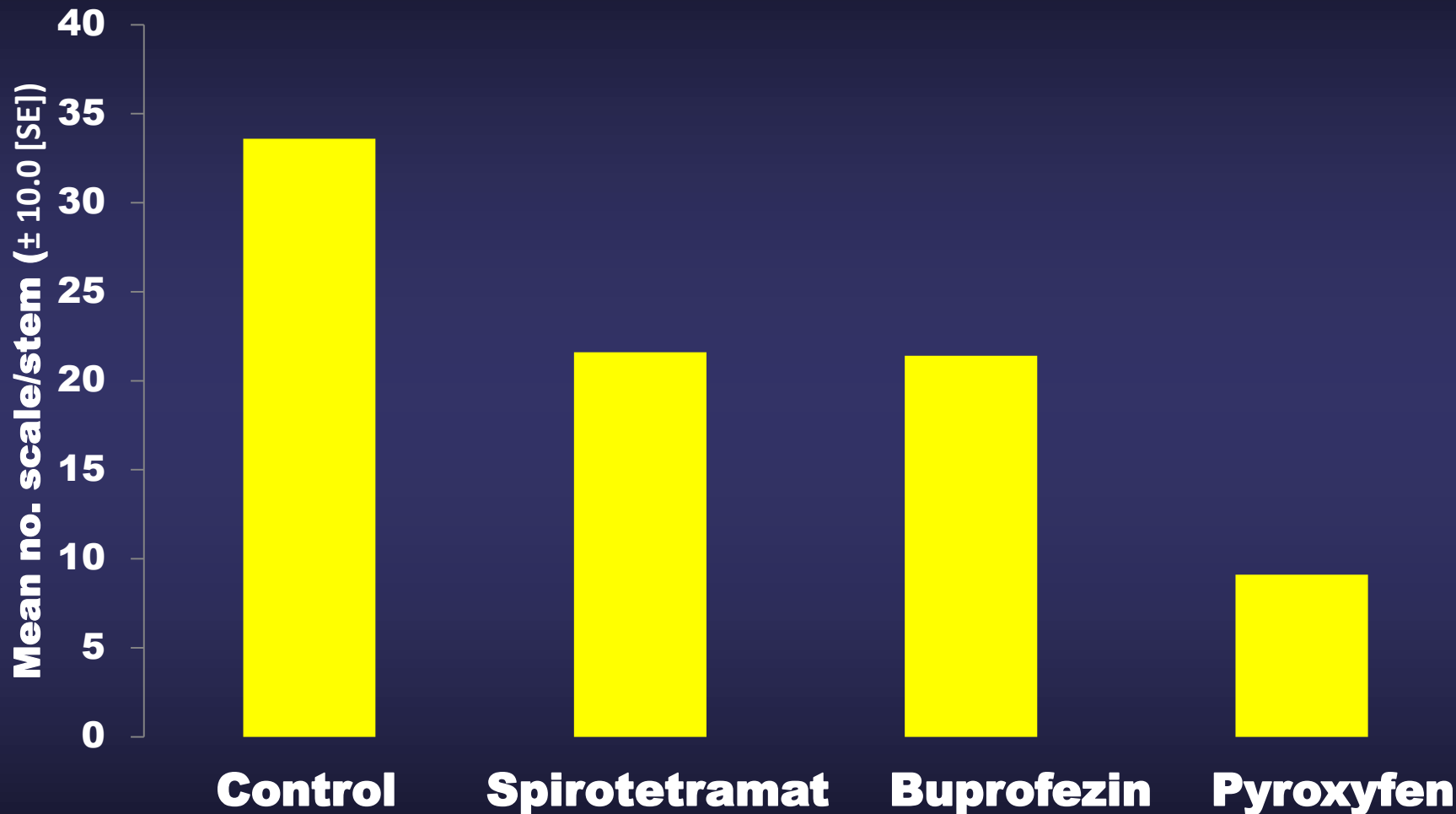
**Tightly wrapped leaf sheath  
protects scales.**

**Dry plant tissues don't  
readily absorb insecticides.**

**Test was repeated in April  
2018 with immature stems.**

# Results: Insecticide Field Trial 2018

## Product Efficacy 49 Days After Treatment



$F = 1.01, df = 3, 16; P = 0.41.$

# Pyriproxyfen

## **Insect Growth Regulator**

**Suppresses embryogenesis (eggs)  
and inhibits metamorphosis (nymphs)**

**No activity on adult insects**

**Translaminar activity (moves into  
plant tissues)**

# Ongoing trials with potted Roseau cane and laboratory assays



# **Long Path to Implementation**

**Can insecticides stop die-off?**

**Identify minimal risk strategies**

**EPA Registration**

**FIFRA Section 24C, Special Local Needs**

**Demonstrate need for new label, efficacy, and lack of available alternatives**

**Requires support from product manufacturer**

**Develop implementation plan**

**Who cover costs?**

**What areas are prioritized?**

# Questions?

**Blake Wilson**

**[bwilson@agcenter.lsu.edu](mailto:bwilson@agcenter.lsu.edu)**

**985-373-6193**

**Appreciation is expressed to CPRA and other agencies for funding and support.**

