Recent Innovations In Insect Control

Modern Chemical Era

- 1940-1990, 6 major classes of chemistry
- Since 1992:
  - CHLORNIOCTINYLS
    - Admire, Provado
  - SPINOSYNS
    - Success
  - PYRROLES
    - Alert
  - PYRIMIDINE IGR
    - Knack
  - THIADIAZINE IGR
    - Applaud, Courier
  - DIACYLHYDRAZINE- IGR
    - Confirm, Intrepid
  - MACROCYCLIC LACTONE
    - Proclain
  - OXADIAZINE
    - Avaunt, Steward

Selectivity of Reduced-Risk Products

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<tr>
<th>Product</th>
<th>Worms</th>
<th>WF</th>
<th>LM</th>
<th>Beetles</th>
<th>Aphids</th>
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The Two Most Important Chemistries in Vegetables

Spinosyns

Chloronicotyls

Bt, Cryolite

Pyrethroids

Orthene

Endosulfan

Larvin

Lannate

Pyrethroids

Stand Establishment

Post-thinning to Pre-heading

Pre-heading

Heading to Harvest

Coty 2-4" 4-8" 9-14" Pre-heading Head 2-4" Head >4"

Lannate

Larvin

Orthene

Endosulfan

Bt, Cryolite

Pyrethroids

<1995- BAW resistance to Lannate was documented in Yuma and La Paz counties.

Worm Management In Desert Head Lettuce

Pre-1997

1995- BAW resistance to Lannate was documented in Yuma and La Paz counties.

Worm Management In Desert Head Lettuce-2003

Stand Establishment

Post-thinning to Pre-heading

Pre-heading

Heading to Harvest

Coty 2-4" 4-8" 9-14" Pre-heading Head 2-4" Head >4"

Success

Proclaim

Avant

Intrepid

Confirm

Lannate

Larvin

Orthene

Endosulfan

Stand-alone application

Tank-mix application

10 Years of Admire in The Desert

Sustained Field Performance of Admire in Commercial Head Lettuce

Yuma, Gila, & Dome Valleys

Whitefly nymphs / cm

n = 5-8 fields

Fall Broccoli

Fall Cantaloupes

Nymphs / cm²

Field Standard (Admire - 16 oz)

Untreated Field Plots

n = 5

n = 4

93 94 95 96 97 98 99 00 01 02
What happened in 2003?

- **Mild Winter** – one of the warmest Januarys on record in Yuma.
- An increase winter / spring lettuce acreage not treated with Admire
- Emergence of the **Foxglove aphid** as a pest of lettuce
**Acyrthosiphon lactucae**

**Foxglove Aphid in Desert Lettuce**

- Native to Europe, has been recorded on crops in Western US since 1940's, including CA.
- Has a wide host range, but primarily a pest of potatoes and ornamentals in greenhouse production.
- Jan 1999 - Lettuce aphid found on lettuce in desert.
- Mar 2001 – Found an unidentified aphid in untreated lettuce plots at YAC.
- Feb 2002 – Identified Foxglove in Yuma on untreated lettuce plots at YAC.
- Nov 2002: First Foxglove aphids found colonizing untreated head lettuce in Yuma Valley.
- Jan 2003: Light infestations on numerous untreated fields in Yuma Valley.
- Feb 2003: Found on organic lettuce in Bard, CA and Algodones, Mexico.
- Feb 2003: Found colonizing mature head lettuce and Romaine treated with Admire in Yuma Valley.
- Winter 2004: ?
Will Foxglove Aphid Continue to be a Desert Pest?

- Ragweed
- Purslane
- Pigweed
- Ground cherry
- Shepards purse
- Silverleaf nightshade
- Lambsquarter
- Dandelion
- Celery
- Brassicas
- Citrus
- Melons
- Pecans
- Potato
- Peas
- Beans

Comparison of Soil-applied Insecticides
For Aphid Control in Head Lettuce

- Admire 16 oz
- Platinum 8 oz
- Platinum side-dress 8 oz
- Assail 1.7 oz
- Untreated

Foxglove Control in Head Lettuce With Nicotinoids

- Nov 14 wet date
- 106 DAP; 66 DAT SD; 14 DAT #3
- 80% 90% 92% 83% 100%
Interactions between Aphid and Thrips Control in Head Lettuce

Considerations for Foxglove Control in Desert Lettuce

- Begin scouting for aphids in October; be aware of fields adjacent to citrus/houses.
- Consider closing the Admire-free window earlier: late October in Yuma Valley.
- Apply a minimum of 16 oz of Admire in October/early November plantings.
- Increase rates of Admire to 20 oz or > in mid November – December plantings.
Considerations for Foxglove Control in Desert Lettuce

- Begin scouting for aphids in November; be aware of fields adjacent to citrus/houses.
- Consider closing the Admire-free window earlier: late October in Yuma Valley.
- Apply a minimum of 16 oz of Admire in October/early November plantings.
- Increase rates of Admire to 20 oz or > in late plantings: mid November – December.
- Incorporate foliar aphicides into your thrips program – Orthene, dimethoate, endosulfan

Foliar Efficacy Against Foxglove Aphid in Desert Lettuce

YAC, Spring 2003

Thrips Control in Head Lettuce

Sweetpotato whitefly
Bemisia tabaci
A – biotype
B – biotype
Silverleaf whitefly
B. argentifolii
Sweetpotato whitefly
Q – biotype

ag.arizona.edu/crops/