Research Update:
Worm control, herbicides, and TSWV
Resistant varieties

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Projects

- Powdery Mildew
- Tomato worm control
- Sandea + Matrix herbicide trial
- TSWV Variety Trial
- Tomato Spotted Wilt
Powdery Mildew, *Leveillula taurica*

- Optimal development when temp < 86 F and RH > 40%.
- Sporulation heavier on underside of leaves.
- Sulfur, Rally (myclobutanil), Cabrio/Flint/Quadris (strobilurins) provide some control.
Tomato Powdery Mildew Model Validation

- 2006-08, Brenna Aegerter, SJ Co.
- Compare model forecast to “calendar spray”.
  - Temp
  - RH
  - Leaf wetness
  - Rally/Cabrio rotation
FM Tomato Powdery Mildew Test Plot
Merced County 2007

% infection

UTC  Model  Calendar

Fungicide Treatment

Sep 6  Sep 14  Sep 28

3 apps

4 apps
Tomato Powdery Mildew Trial 2008
Merced 1

No significant differences.

Rating on 8/20
- M PM Score
- M # plants/10

Tomato Powdery Mildew Trial 2008
Merced 2

Rating on 9/25
- M PM Score
- M # plants/10

05/05/09
PM Model Trial
PM Model Trial
PM Model Trial
PM Model Trial
Main worm pests in California tomatoes

- Beet armyworm
- Tomato fruitworm
- Western yellowstripe armyworm
- Tomato pinworm
- Loopers
- Hornworms & cutworms
Beet Armyworm

Spodoptera exigua
Control

- **Fresh market tomatoes**
  - No fruit sampling thresholds established.
  - Leaf sample instead, after flowering.
  - 30 leaves, look for eggs, > 4 consider treating
Beet armyworm

- Avaunt (indoxacarb)
- Intrepid (methoxyfenozide)
- Success/Entrust (spinosad)
- Bt (Dipel, Xentari)
- Lannate (methomyl)
- Asana (esfenvalerate)
- Danitol (fenpropathrin)
- Coragen (chlorantraniliprole)
- Synapse (Flubendiamide)
- Radiant (spinetoram)

Proclaim, Rimon
Tomato Fruitworm

(*Heliothis zea*)
Tomato Pinworm

*Keiferia lycopersicella*
Research Trials
Worm trial in fresh market tomatoes 2003

1. Entrust 1.5 oz/A
2. Success 4.5 fl oz/A
3. Intrepid 4 fl oz/A
4. Intrepid 8 fl oz/A
5. Intrepid 12 fl oz/A
6. Pro Axis 3.8 fl oz/A
7. Warrior 3.8 fl oz/A
8. Avaunt 3.2 oz/A
9. Proclaim 2.4 oz/A
10. Dipel 1 lb/A
11. UTC
The graph shows the mean fruit damage for different treatments, measured as arcsin(v/X) where v is the number of damaged fruits and X is the total number of fruits. The treatments compared are UTC, Entrust 1.5 oz/A, Success 4.5 oz/A, Intrepid 4.0 oz/A, Intrepid 8.0 oz/A, Intrepid 12.0 oz/A, Pro Axis 3.8 oz/A, Warrior 3.8 oz/A, Avaunt 3.2 oz, Proclaim 2.4 oz, and Dipel 1 lb.
2006 Tomato Worm Trial
Gun Club North

worm counts per 4 plants

UTC
Proclaim 3.0 oz/A
Proclaim 3.5 oz/A
Intrepid 8 fl oz/A
Avaunt 3.5 oz/A
Success 4 fl oz
Assail 4 oz/A + COC

17-Aug
22-Aug
7-Sep
Yellow nutsedge *Cyperus esculentus*

Black nightshade *Solanum nigrum*

Hairy nightshade *Solanum sarrachoides*
UC IPM Guidelines

- Nightshade
  - Metam sodium
  - Matrix at 2 true leaves
  - Sencor at 5 - 6 true leaves
  - Crop rotation (RR cotton)
  - Deep plowing
  - Dual Magnum ?? IN TABLE PPI & Layby

- Nutsedge
  - Tillam PPI
  - Metam sodium
  - Dual Magnum at layby
  - Sandea post emergence
  - Rotate to corn or beans
  - Deep plowing
Herbicide Trials

- Pre & post application of Sandea and Matrix
- PPI Sprinkle incorporated
- Fresh Market and processing tomatoes
July 2, 2003

degree of weed pressure

- UTC
- Eptam 3.5 qts PPI
- Matrix 2 oz
- Matrix 2 oz + NIS
- Sencor 75.1 lb
- Sandea 1 oz
- Sandea 1 oz + NIS
- Matrix + Sandea + NIS
- Dual Magnum 1.5 pts PPI

Legend:
- nutfedge
- nightshade
Conclusions

- Matrix + Dual Magnum provided good control for both spp.

- Matrix + Sandea:
  - Excellent weed control
  - Significant yield increase
  - Better with NIS

- Sandea did not cause crop phytotoxicity in this variety
Herbicide Trials
Le Grand
2008
TSWV Variety Trial 2009
FM Tomato TSWV Resistant Variety Trial
Le Grand, CA 2009

Yield, boxes/A

- Rogers Quali T-47
- Takii AT98b
- Rogers Quali T-27
- BHN 934
- Takii AT98a
- Seminis PS 2942 (STD)
- Rogers Quali T-21 (STD)
- BHN 935
- BHN 933 (STD)
- Rogers Bobcat (STD)
- BHN 856
- Seminis PS 2935
- Harris Moran Trinity

XL boxes
L boxes
M boxes