Ecology and Management of *Scirtothrips dorsalis*

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POPULATION ATTRIBUTES OF THRIPS

- Vagile (excellent invaders, mobile)
- Broad host range
- Short generation time
- Predisposition to parthenogenesis
- A competitive breeding structure promoting aggregation and exploitation of localized optimal conditions

Mound. 1997. Thrips As Crop Pests (Lewis, ed.) CAB International

Host Range for *Frankliniella occidentalis*

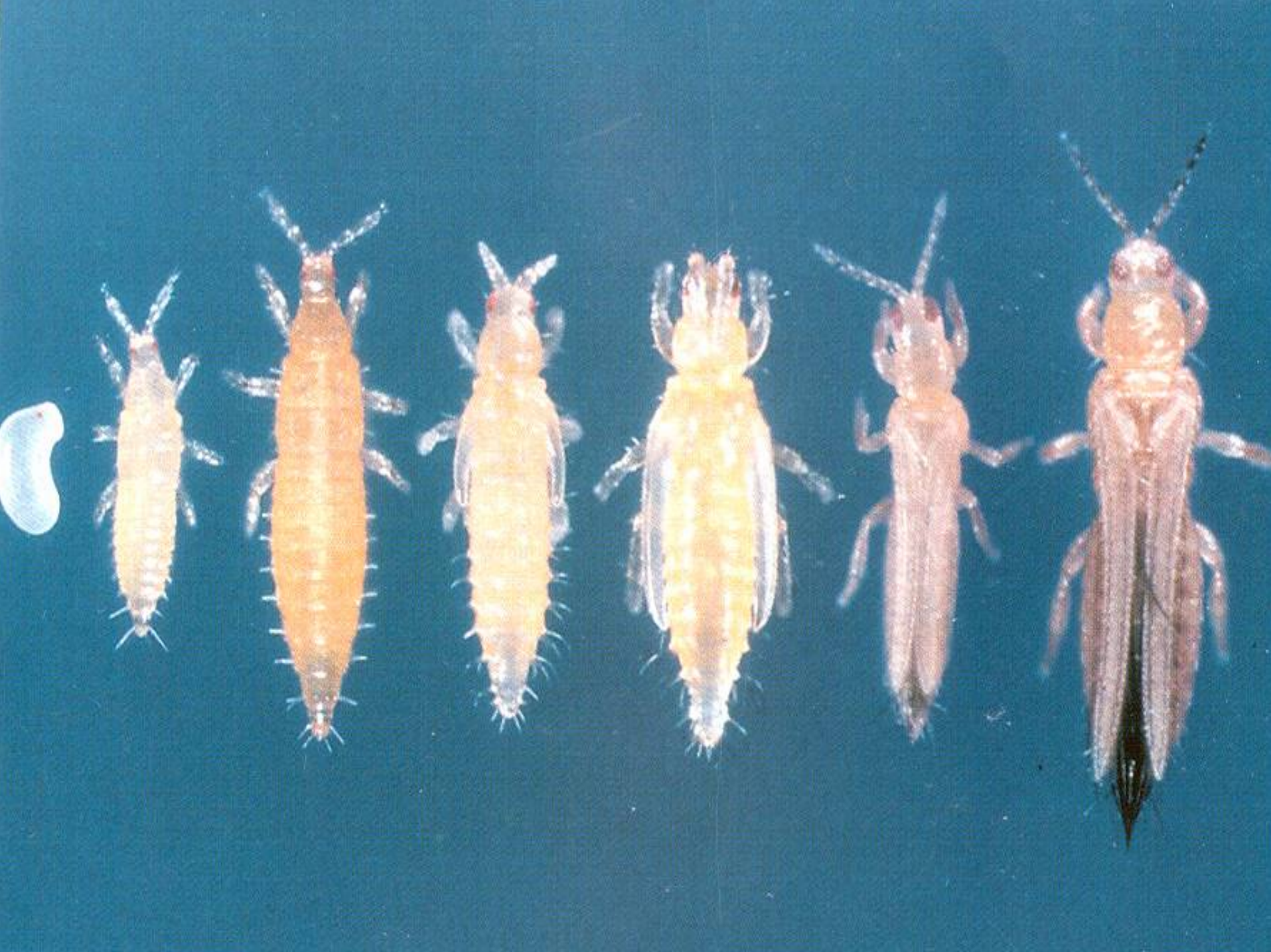
- 50 of 55 plant species in 22 families were food hosts for the adults in a survey in Central Chile
- 43 of 55 plant species were reproductive hosts

Plant Hosts for *Frankliniella occidentalis* in the Aconcogue Valley, Chile

Ripa, Rodriguez, Funderburk, & Espinoza, unpublished

Life History of Pest Thrips

- 30 to 40 days for a complete generation
- 6, 5, and 5 days for development of egg, larva, and pupa
- Pollen doubles or triples fecundity
- Strong aggregation tendencies for flowers of *Thrips* and *Frankliniella* species
- *Scirtothrips* aggregate on young foliage and flowers



Reproduction in Thrips

- In most Thysanoptera, reproduction requires copulation
- Parthenogenesis common
- In most species, fertilized eggs have the full diploid number and become female; unfertilized eggs are haploid and become males

Integrated Pest Management

Natural Enemies of Thrips

- PREDATORS Anthocorids, Chrysopids, Nabids, Aeolothrips, Phlaeothrips, predatory mites (*Euseius sojanensis*)
- PARASITES *Thripinema* (Tylechida: Allantonematidae)
- PARASITOIDS Chalcidoidea (*Megaphragma* sp.) *Ceranisus* (Eulophidae)
- PATHOGENS Fungal pathogens recently reported as important for *Scirtothrips dorsalis* in India

Important Worldwide Predators of Thrips

ORDER HEMIPTERA

FAMILY ANTHOCORIDAE
commonly, pirate bugs

GENUS *Orius*

SPECIES *insidiosus*

COMMON NAME
Insidious flower bug

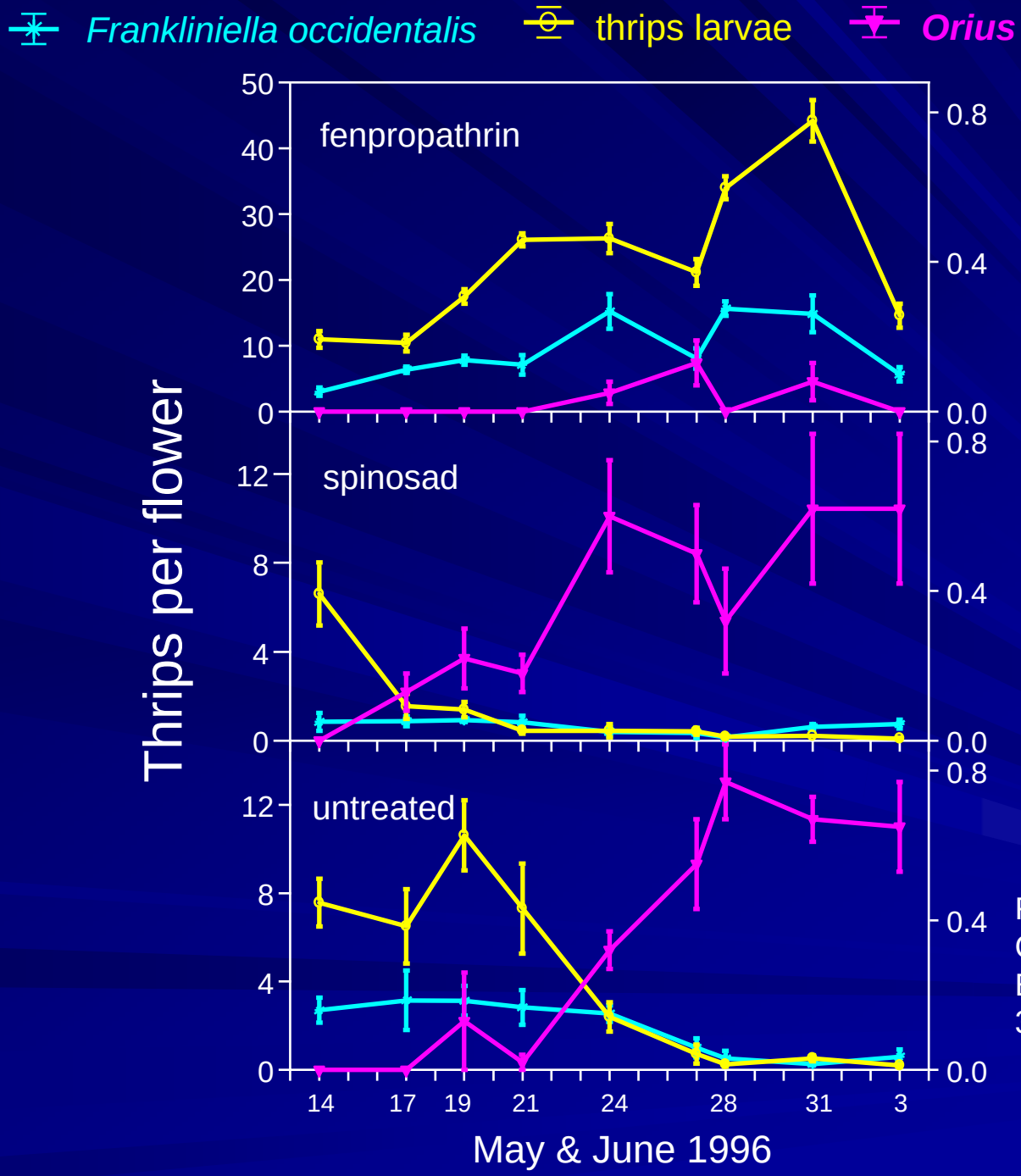
PEPPER

Intrinsic capacity of *Orius insidiosus* to reduce *Frankliniella occidentalis* populations

Photo Joe Funderburk

Predator-Prey Ratios
1 : 217 = population suppression
1 : 51 = rapid local extinction

Sabelis & Van Rijn (1997) Thrips as Crop Pests. (Lewis, ed.) CAB International, UK



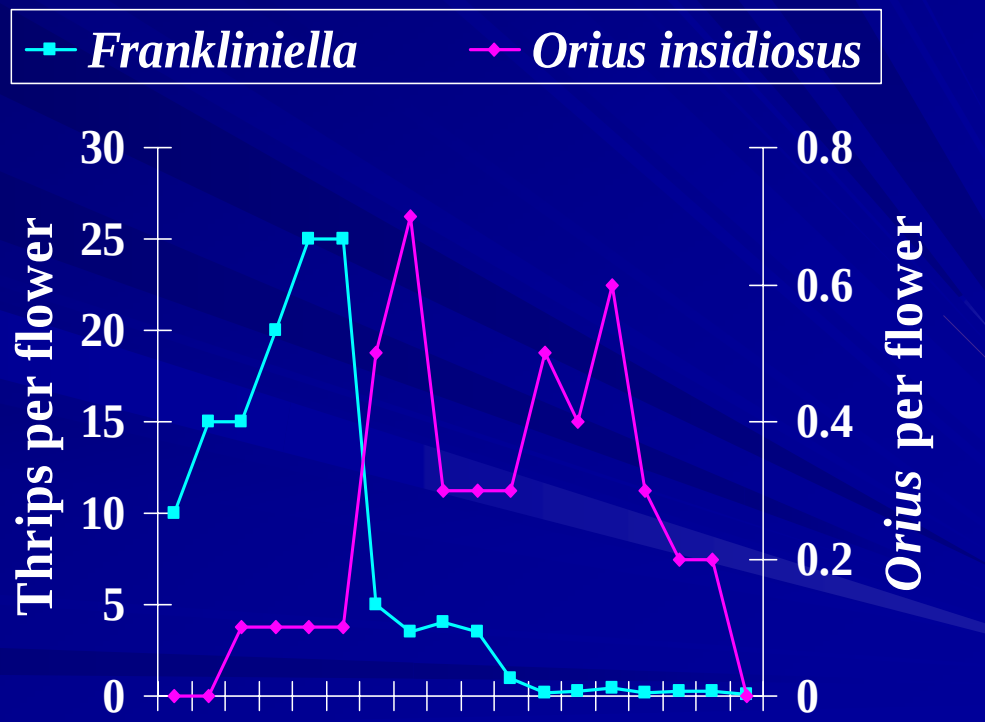
PEPPER

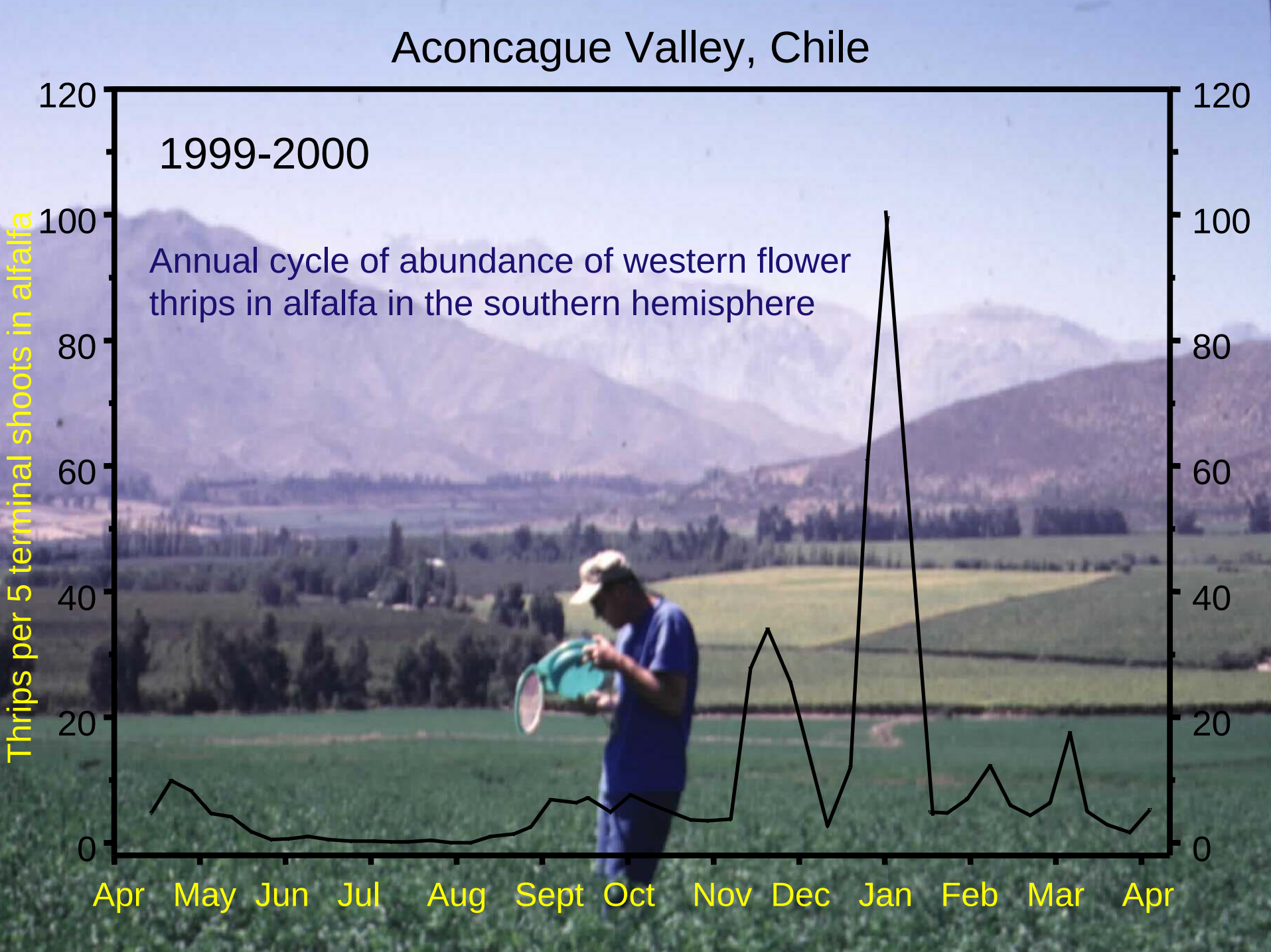
Funderburk, Stavisky & Olson 2000 Environ. Entomol. vol. 29 (2): 376-382

RECOMENDATION FOR PEPPER PRODUCERS

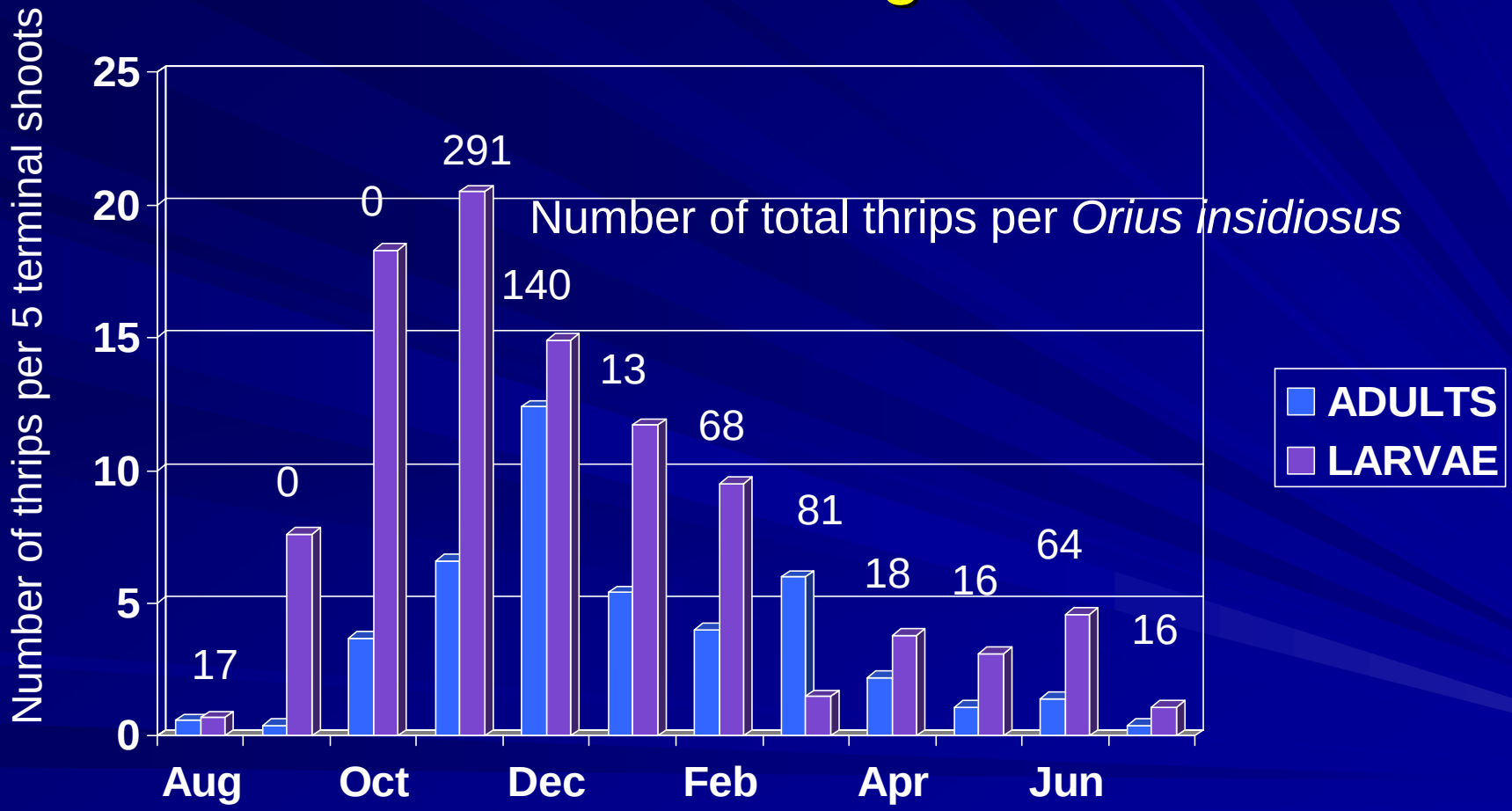
CONSERVE *ORIUS* POPULATIONS BY THE SELECTIVE USE OF TACTICS

Commercial Pepper Field
Thomas Smith Farms, Greensboro, FL




Aconcagua Valley, Chile
1999-2000
Annual cycle of abundance of western flower thrips in alfalfa in the southern hemisphere
Thrips per 5 terminal shoots in alfalfa
120
100
80
60
40
20
0
Apr
May
Jun
Jul
Aug
Sept
Oct
Nov
Dec
Jan
Feb
Mar
Apr

Dynamics of *Frankliniella occidentalis* in Alfalfa in Central Chile as Influenced by Pirate Bugs

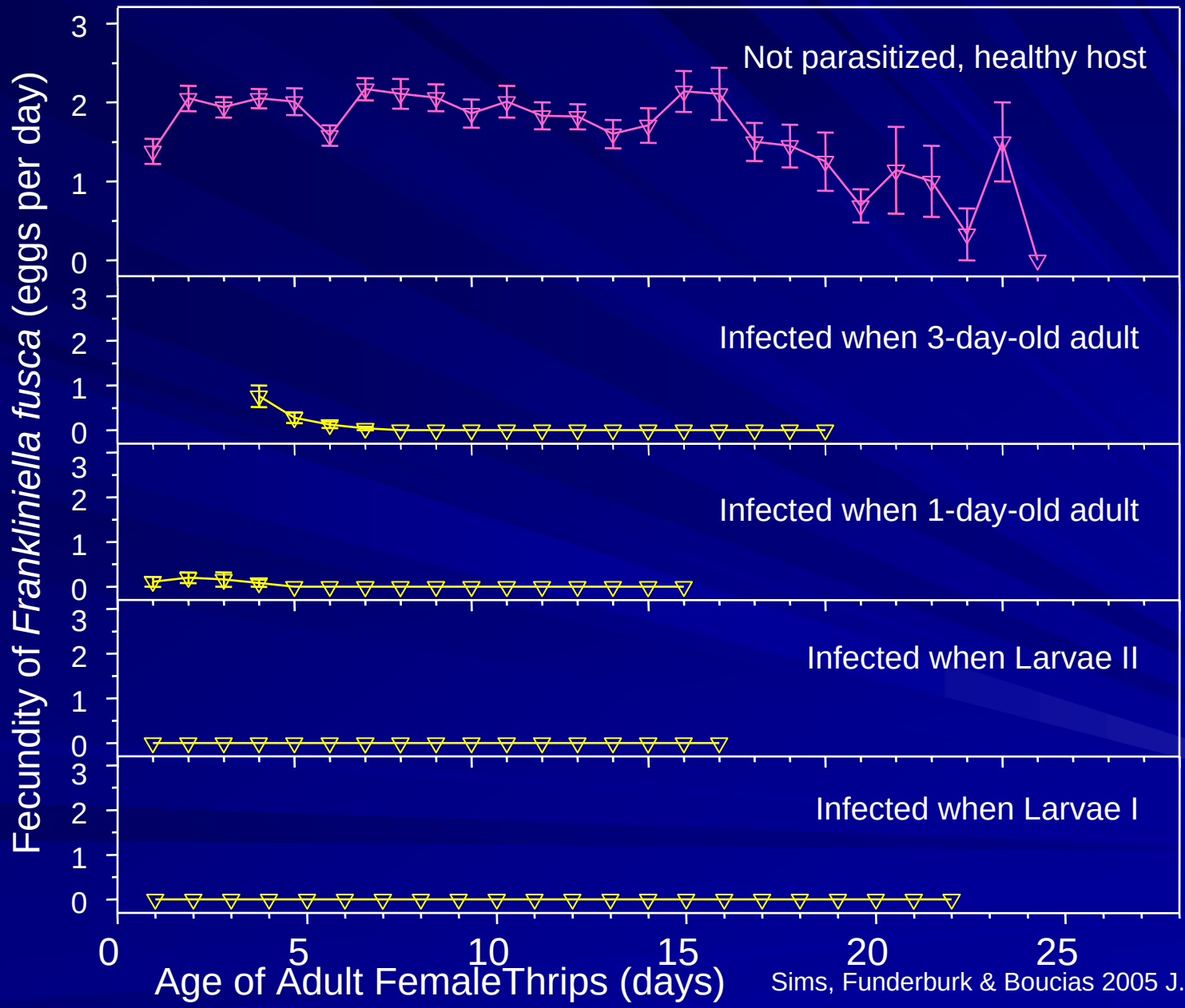


Species of *Thripinema*, Nematode Parasites of Thrips

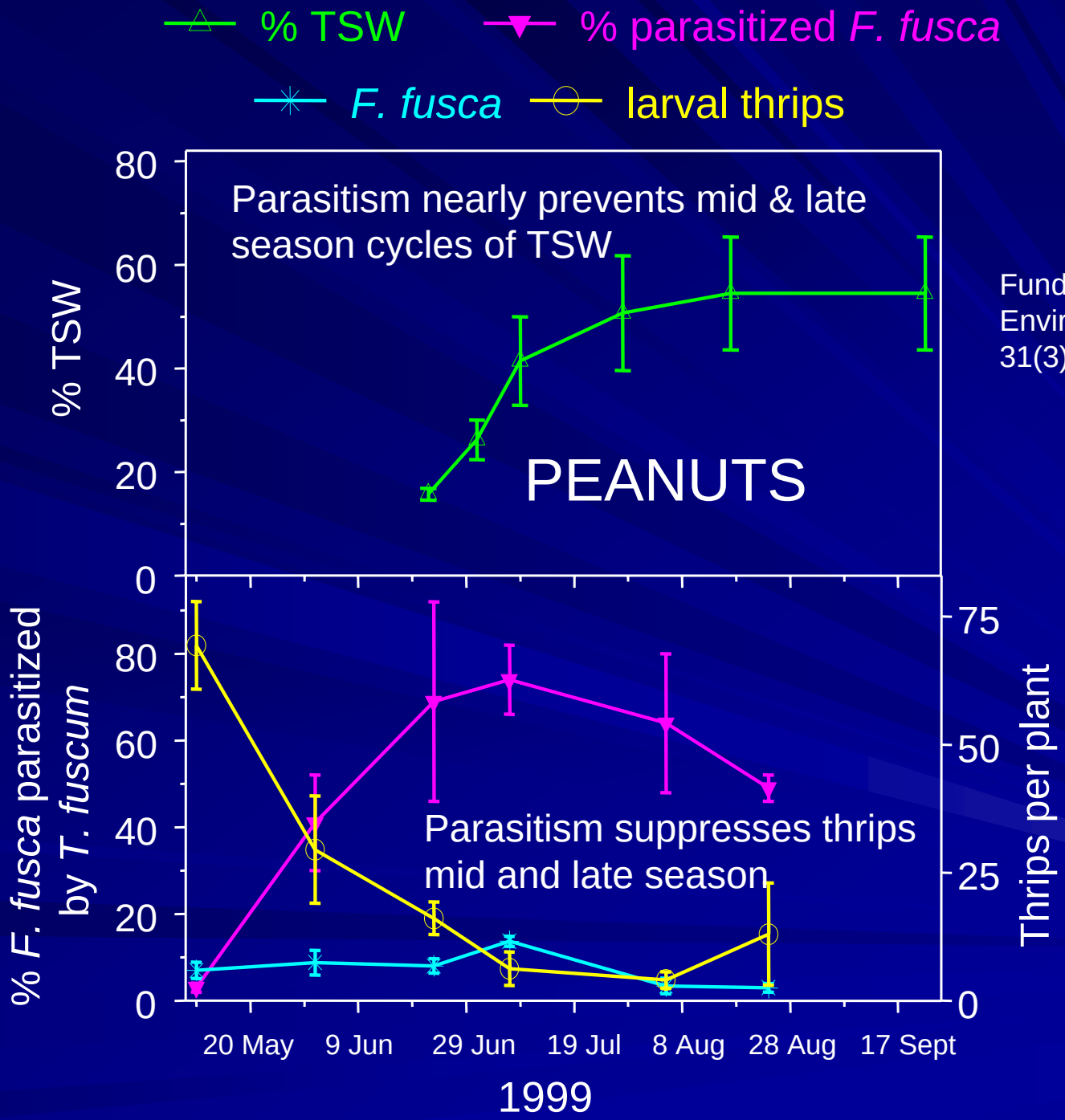
- *T. nicklewoodi* (North America)
- *T. khrustalevi* (Asia, South America)
- *T. fuscum* (North America)
- *T. aptini* (Europe)
- *T. reniroai* (Asia)
- Undescribed species (New Zealand)

Photo Chris Tipping

EFFECTS OF *Thripinema* PARASITISM ON EGG PRODUCTION OF THRIPS HOST



Sims, Funderburk & Boucias 2005 J. Nematol.



Funderburk et al. 2002. Environ. Entomol. 31(3): 558-563.

Recommendations for Peanut Producers

- Cultivars partially resistant to *Tomato spotted wilt virus*
- Biological control
- Planting date
- Insecticides that conserve key natural enemies

Funderburk & Latsha. 2005. Nematodes As Biocontrol Agents. (Grewal et al. eds.) CAB International, UK

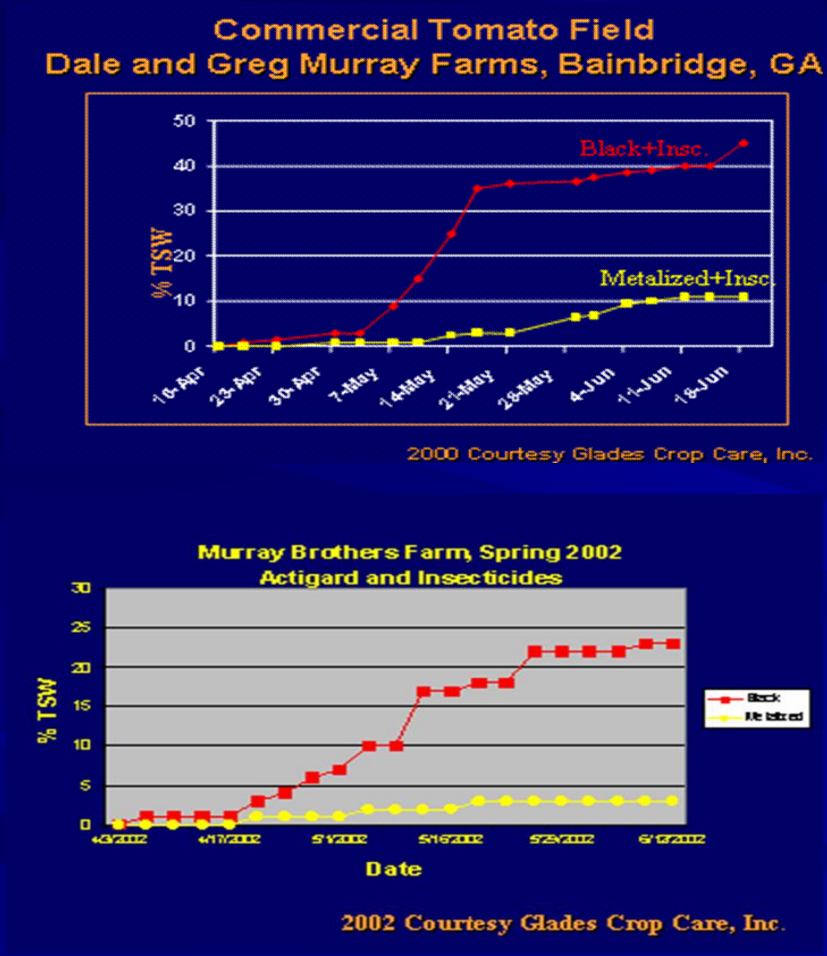
TOMATO

Photo Joe Funderburk

ACTIGARD (Syngenta)

- Acibenzolar-S-methyl
- Substitutes for the natural systemic-acquired-resistance molecule salicylic acid that is essential for activation of systemic acquired resistance
- Six applications on tomatoes at two-week intervals beginning at transplanting

Recommendations for tomato producers



- UV mulch effective in reducing thrips invasion and primary spread of TSWV
- Actigard recommended when using UV mulch to reduce sprays of copper and other pesticides that reduce the UV reflectance of the mulch
- Insecticides useful in suppressing thrips larvae and secondary spread of TSWV

Source Momol et al. 2004. Plant Disease 88(8): 882-890

Thrips and Tomato Spotted Wilt

- Regulation of vector populations with insecticides is not sustainable producing undesirable environmental and economic consequences
- Integrated pest management is effective, environmentally friendly, and sustainable
- Management programs developed from knowledge of vector population dynamics and disease epidemiology

Chilli Thrips Natural Enemies

- Egg Parisitoid
  - *Megaphragma* sp. (Chalcidoidea)
  - 53.2% parasitism on grapes in Japan
- Predatory Mite
  - *Euseius sojaensis*
  - 1.4 larvae/hr
  - 5.4 larvae/day

Ornamental Plant Hosts of Concern

Banana
Camellia
Castor Bean
Chrysanthemum
Dahlia
Euonymous
Firethron
Holly
Japanese Photina
Jasmine
Mexican Heather
Mimosa spp. (Sensitive plant)
Pittosporum
Podocarpus
Rhododendrum
Rose
Viburnum

For the latest information on chilli thrips and ornamental plants, visit http://mrec.ifas.ufl.edu/lso/thripslinks.htm

Ornamentals

- abamectin (Avid)
- acephate (such as Orthene or Orthonex)
- acetamiprid (TriStar)
- azadirachtin (such as Azatin, Neem oil) (not labeled for thrips)
- cyfluthrin (Decathlon, Discus, Bayer Advanced products such as Tree and Shrub Insect Control or Rose and Flower Insect Killer)
- disulfoton (such as Di-Syston Systemic Insecticide Granules)
- imidacloprid (Marathon, Merit, Discus and the Bayer products listed above)
- novaluron (Pedestal)
- spinosad (such as Conserve)

Materials in yellow would be suitable for use by homeowners if used according to the labeled instructions.

Overall Conclusions

- Management of *S. dorsalis* in the landscape requires an integrated approach that includes a detailed understanding of pest biology, natural enemy complexes, and host resistance.
- Chemical control options are also available and may be necessary in some cases.
- Chemical control options or destruction of plant material is the only option for retail nurseries as long as *S. dorsalis* remains a regulated pest.

Disclaimer

The use of trade names in this presentation is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication does not signify our approval to the exclusion of other products of suitable composition. All chemicals should be used in accordance with directions on the manufacturer's label. Use pesticides safely. Read and follow directions on the manufacturer's label.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