

Common Pests in Greenhouses and Nurseries: The Role of Insects as Vectors for Plant Viruses

Daniel K. Hasegawa
Research Entomologist
USDA-ARS, Salinas CA

University of California Nursery and Floriculture Alliance
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Insect vectors of plant pathogens

100s of insect species worldwide



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Western flower thrips, *Frankliniella occidentalis*
'Thrips'



Insect vectors of plant pathogens

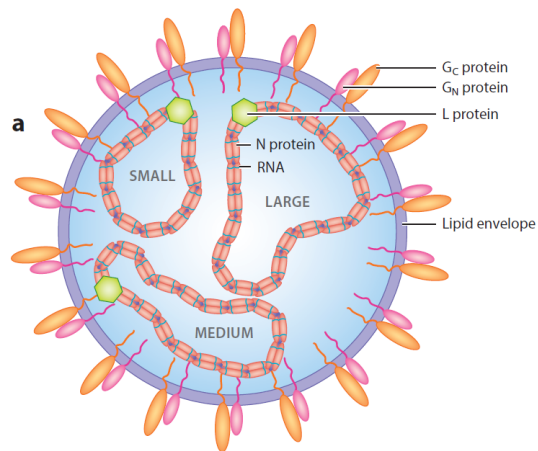
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Western flower thrips, *Frankliniella occidentalis*
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Tospoviruses:

Tomato spotted wilt virus (TSWV)
Impatiens necrotic spot virus (INSV)



Insect vectors of plant pathogens

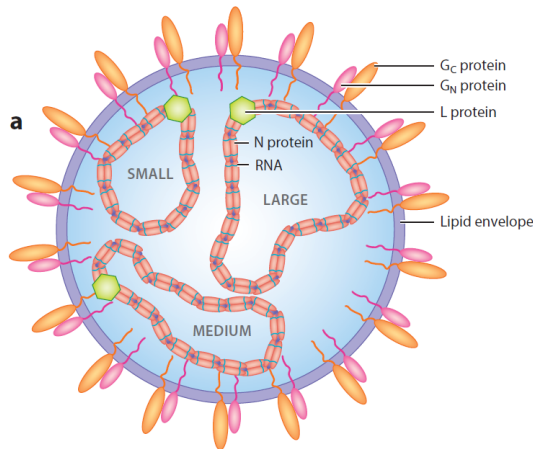
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Tospoviruses:

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Impatiens necrotic spot virus (INSV)



Tospovirus host range:
>800 described plant species

Ornamental hosts:
amaryllis, aster, ageratum, begonia, calendula, calla, chrysanthemum, coreopsis, cosmos, dahlia, forget-me-not, gerbera, gladiolus, gloxinia, impatiens, kalanchoe, gypsophila, lily, nasturtium, nemesia, papaver, petunia, phlox, primula, ranunculus, salvia, stock, sweet pea, tagetes, verbena, zinnia, and others



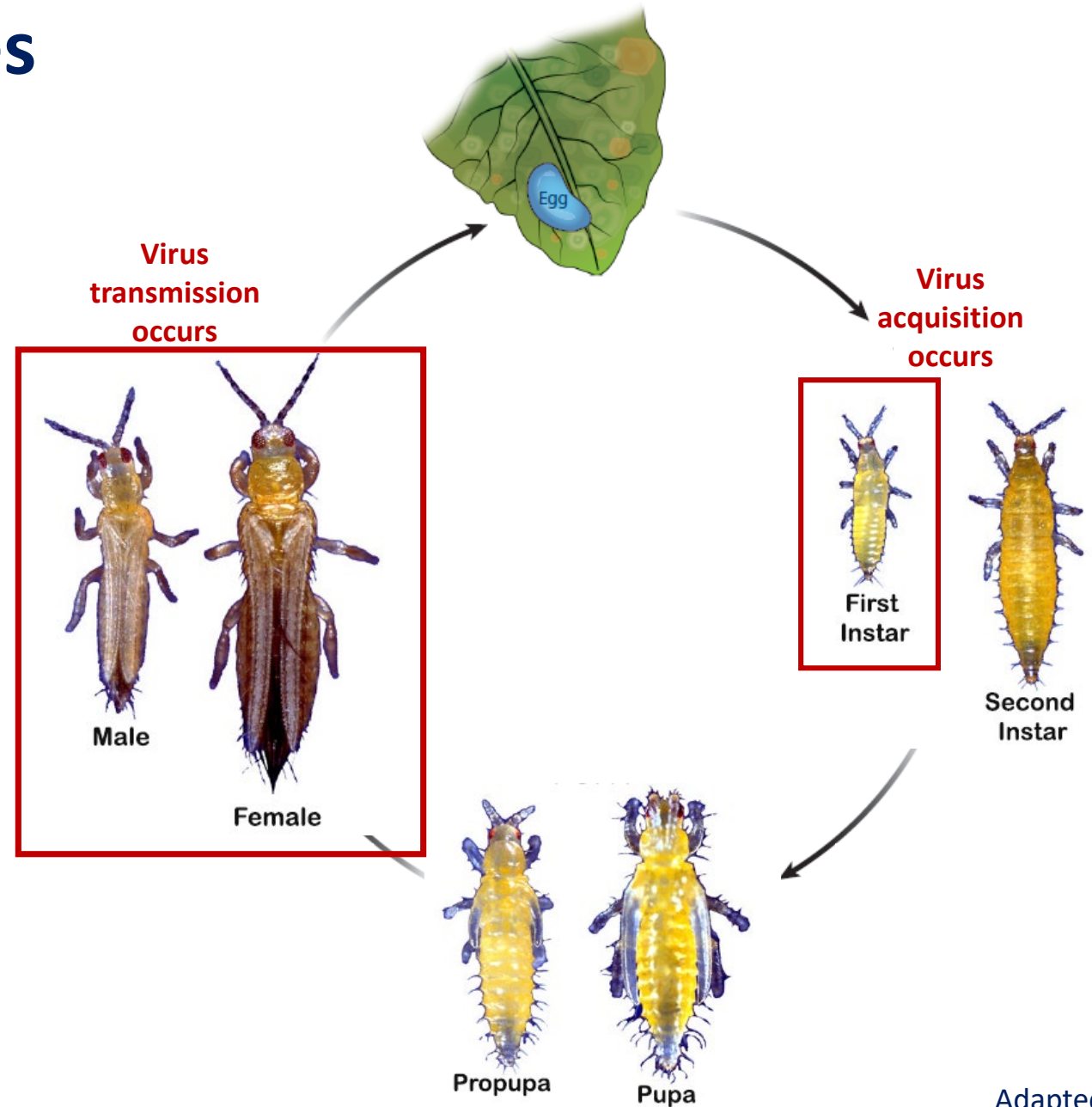
INSV in coleus



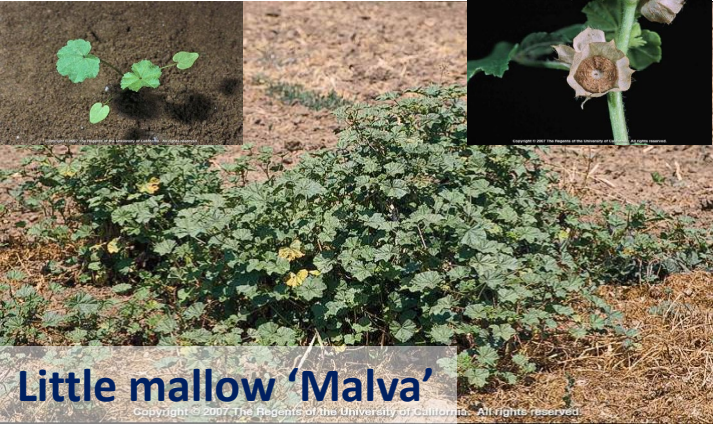
INSV in snapdragon

Transmission of tospoviruses (e.g., TSWV and INSV)

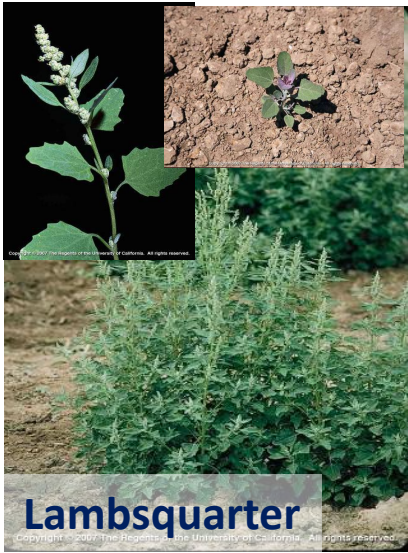
- Transmission occurs within minutes of thrips feeding.
- Virus acquisition occurs at the larval stage.
- Virus transmission occurs at the adult stage.
- Virus is not passed from adult to egg.
- Virus is not transmitted by farm equipment, boots, clothes, or handling.
- Virus is not transmitted by other insects (e.g., aphids, whiteflies, mealybugs).



Common weedy hosts for INSV in the Salinas Valley



Little mallow 'Malva'



Lambsquarter



Annual Sowthistle



Hairy Fleabane



Shepherd's purse



Nettleleaf Goosefoot



Burning Nettle



Marestail



Field Bindweed



Purslane

Considerations for monitoring and managing thrips-transmitted viruses

- Monitoring
 - Use of indicator plants and rapid serological tests
- Managing
 - Removal of infected plants
 - *Minimize thrips reproduction and secondary spread of viruses*
 - Removal of weeds and other plant hosts for viruses
- External considerations
 - Direction of wind
 - Weeds and secondary hosts for INSV and TSWV



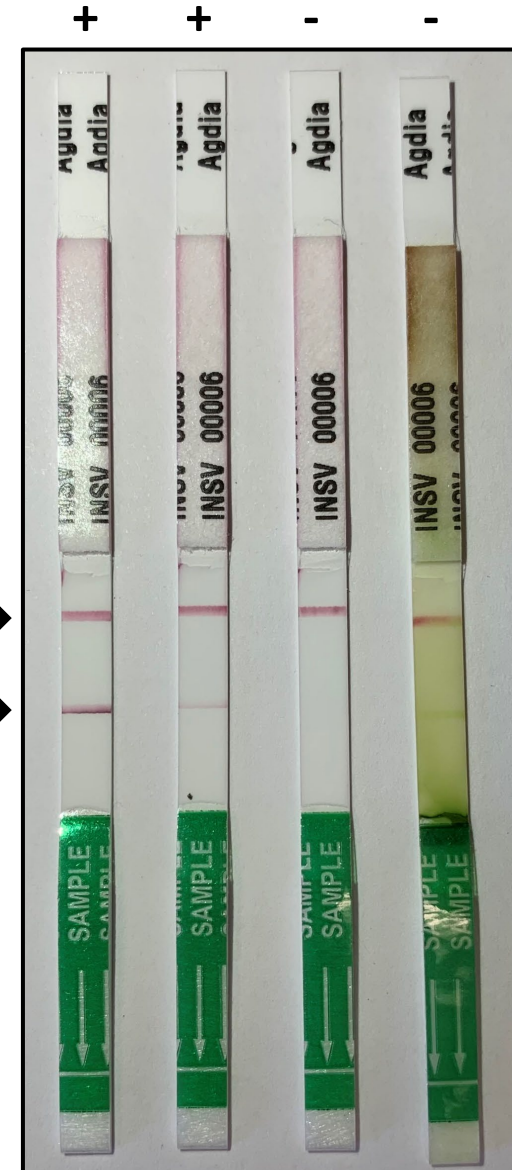
Petunia indicator plant
for monitoring
tospoviruses



Rapid serological
tests for INSV,
TSWV, others

Control line →

Test line →



Thank you!

Daniel K. Hasegawa
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Email: daniel.hasegawa@usda.gov
Mobile: 831-206-8177