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# Management of Insect & Mite Pests in Vegetable Crops

OSU Oregon State University Extension Service


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**&**

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**11/17/2015**

**Pacific Northwest Vegetable Association's Pre-Conference Workshop on Vegetable Crop Management 101**

# Why Did It Have to be "Bugs"?

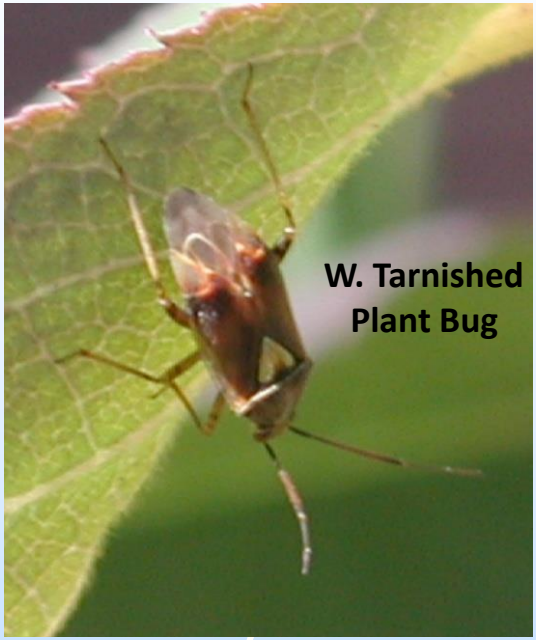
- Bugs = Hemiptera
- Half-winged
- Incomplete metamorphosis (nymph looks like adult)
- Sucking mouthparts



# Other Bugs of Veggies

- Bugs = Hemiptera & Homoptera

- Aphids, Psyllids, Whiteflies, & Leafhoppers
- Incomplete metamorphosis (nymph looks like adult)
- Sucking mouthparts!


Rose aphid- http://www.warrenphotographic.co.uk

# Bug Feeding & Crop Damage

- Piercing/sucking mouthparts
- Dimpling/Corking due to plant cell death
- Tissue stunting, crop loss of vigor
- Honeydew production
- Disease vector


Photo by C. Looney, WSDA

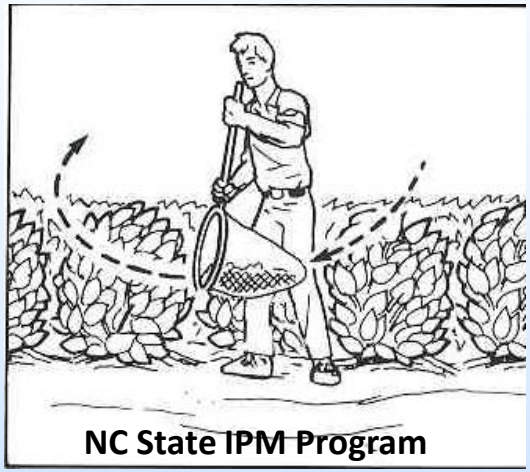

Photo by J. Glass- WSU


Photo by N. Wiman, OSU


Photo by B. Gunderson, WSU

# Sampling/Monitoring Bugs

- Sweep nets
- Yellow sticky traps
- Honeydew detection
- Area-wide detection

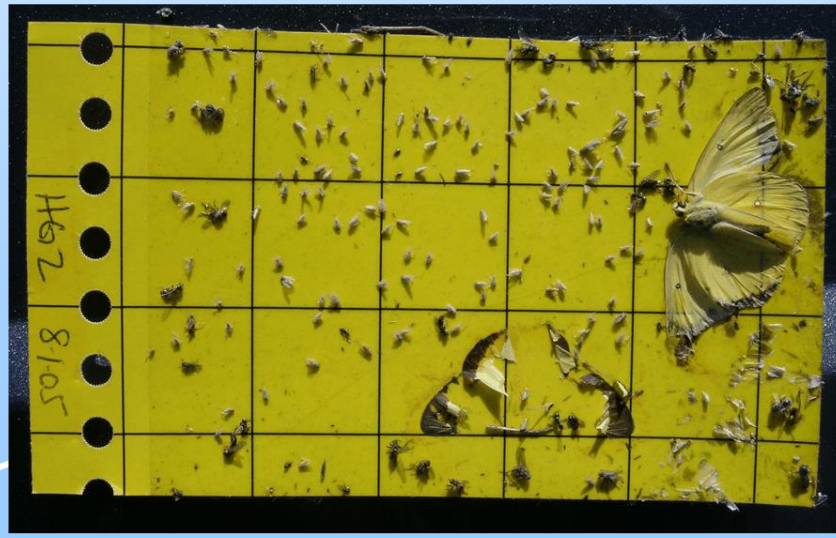



Photo by A. Jensen, WSPC

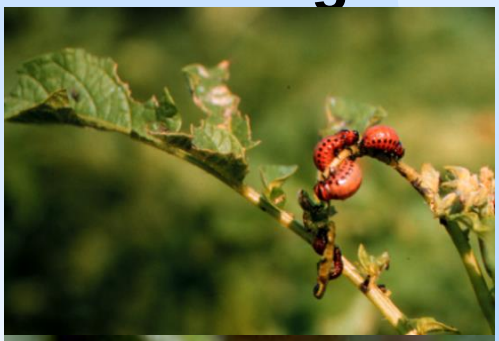
# Managing Bugs

- Biological control
- Cultural control
- Properly timed applications of contact pesticides
- Systemic pesticides


*Trissolcus japonicas*,
WSU Press 10/22/15

# Meet the Beetles

- **Beetles = Coleoptera**
- **Complete metamorphosis (Larvae not like adult)**
- **Sheathed-winged**
- **Chewing mouthparts**



L. Lacey, USDA-ARS

D. Horton, USDA-ARS


OR State University

# Beetle Feeding & Crop Damage

- Chewing mouthparts
- Defoliation, holes
- Frass
- Missing tissues (including roots)


# Sampling/Monitoring Beetles

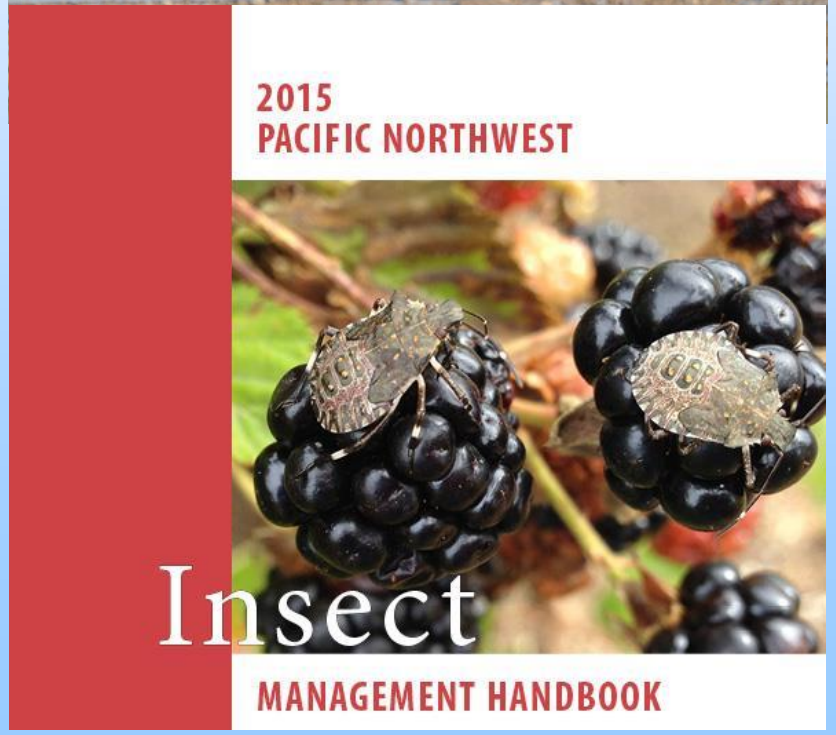
- Physical traps
- Visual evaluation for beetles or damage

D. Horton, USDA-ARS

Photo by Tom Brown

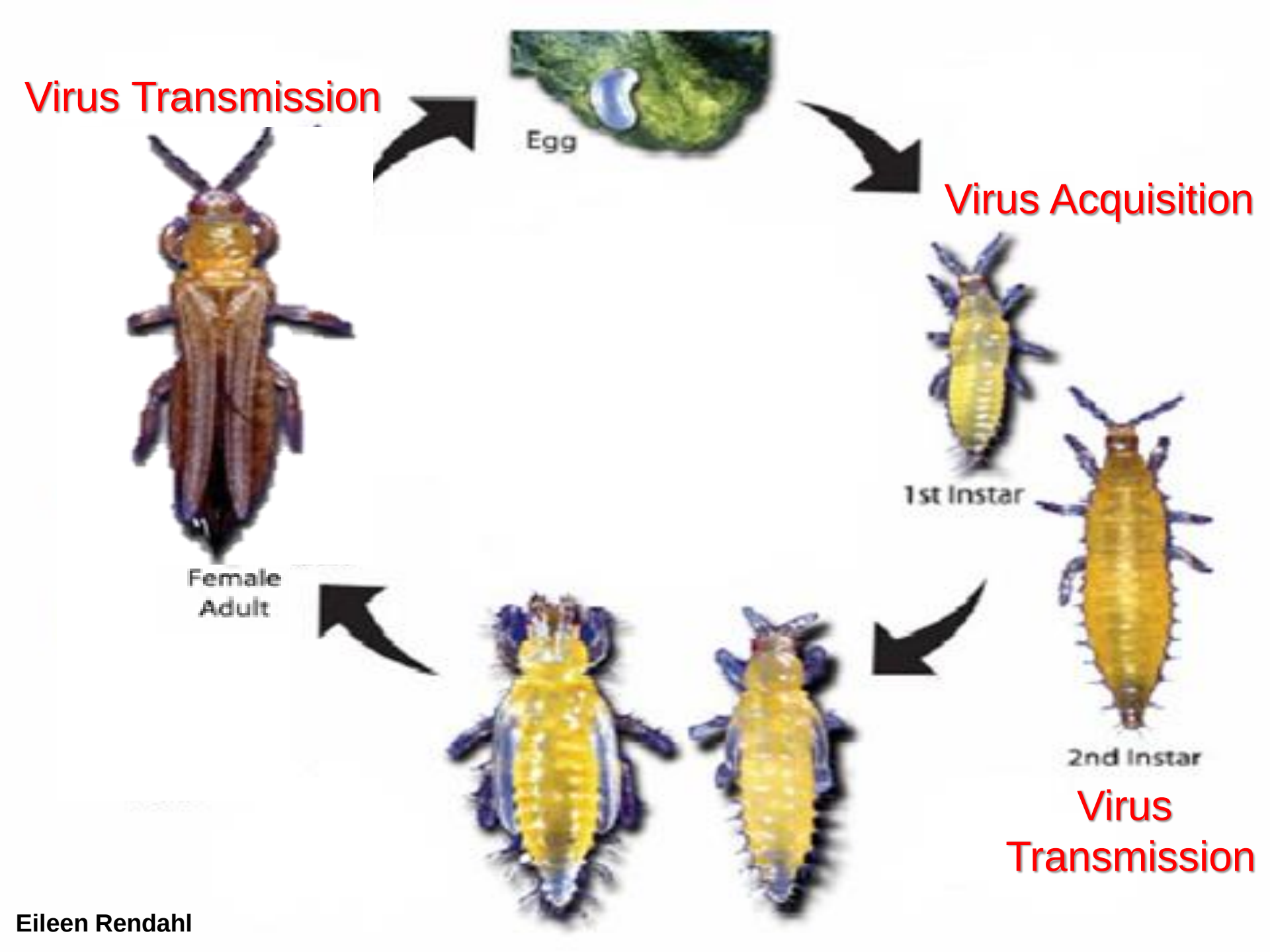
# Managing Beetles

- Crop rotation/ Fallow
- Soil cultivation
- Properly timed applications of contact pesticides
- Systemic pesticides

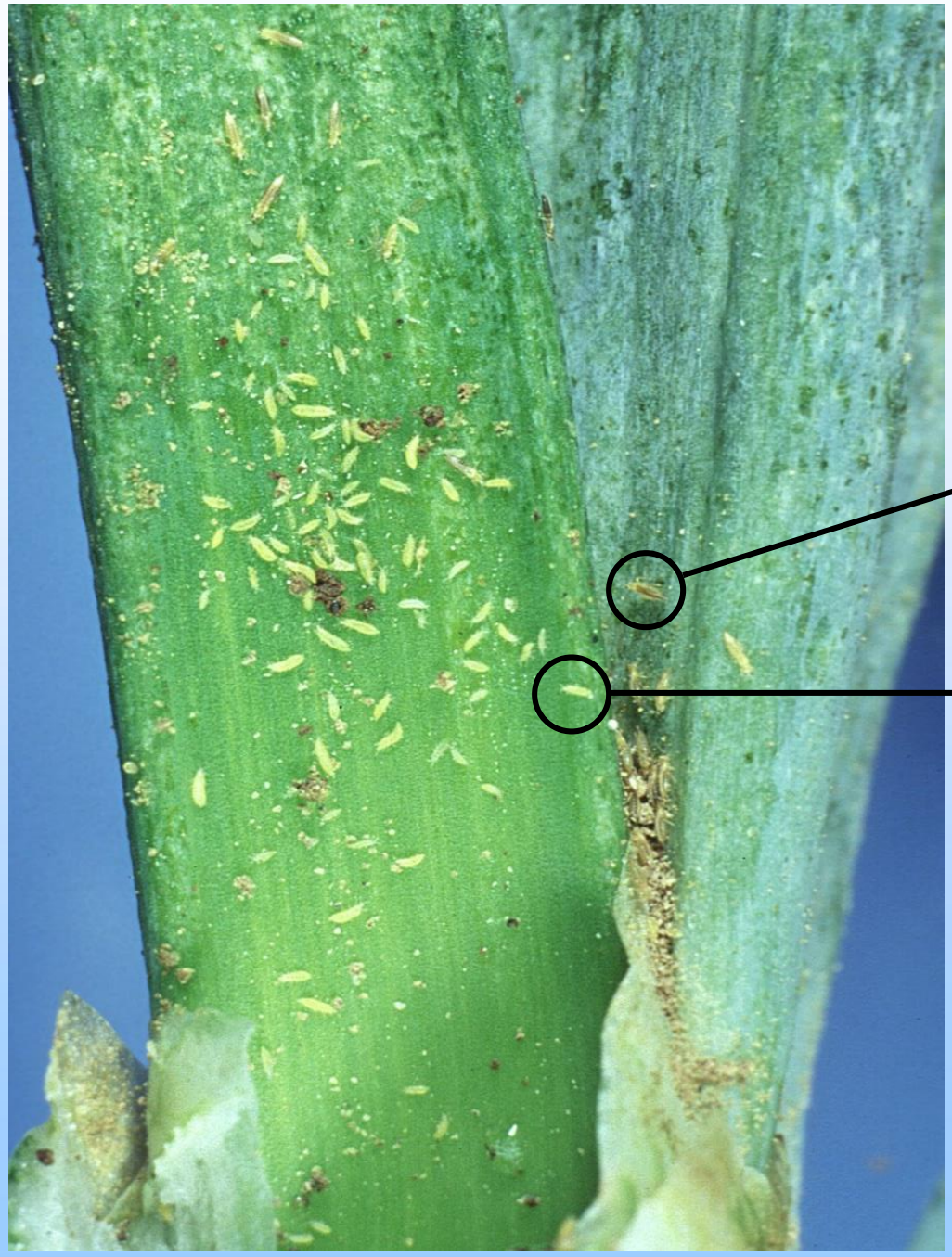


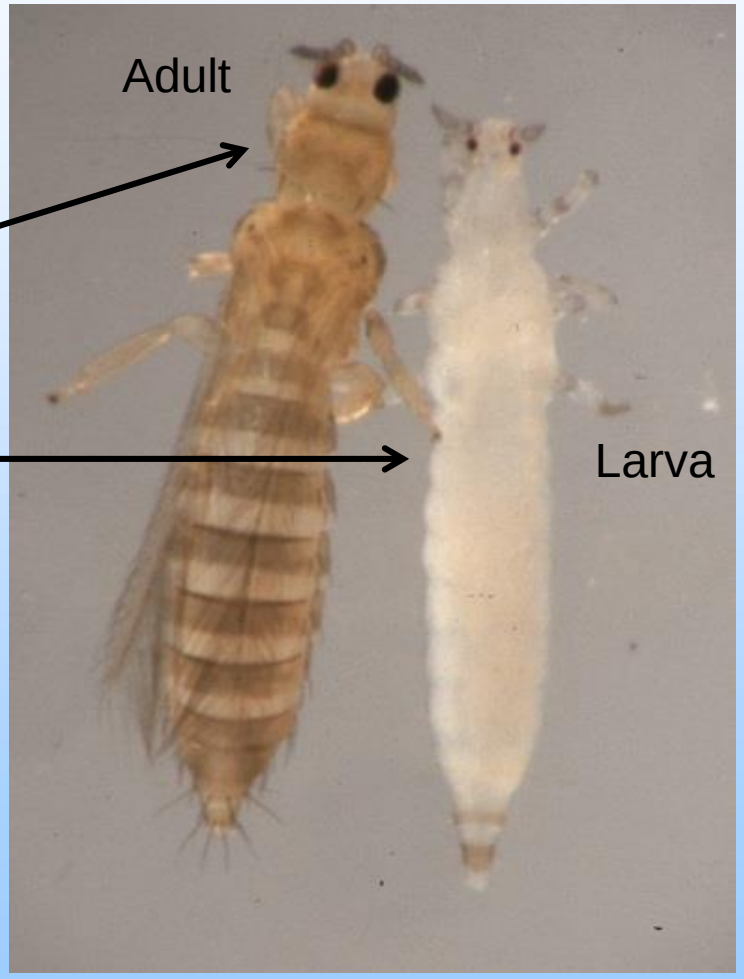
# Thrips

- Direct Feeding
  - Punch and suck feeding
  - “Silvering” scars on foliage
  - Reduce photosynthesis
- Virus Transmission
  - Iris Yellow Spot (IYSV)
    - Onions, Garlic
  - Tomato Spotted Wilt (TSWV)
    - Tomato, Pepper, Potato




Eileen Rendahl



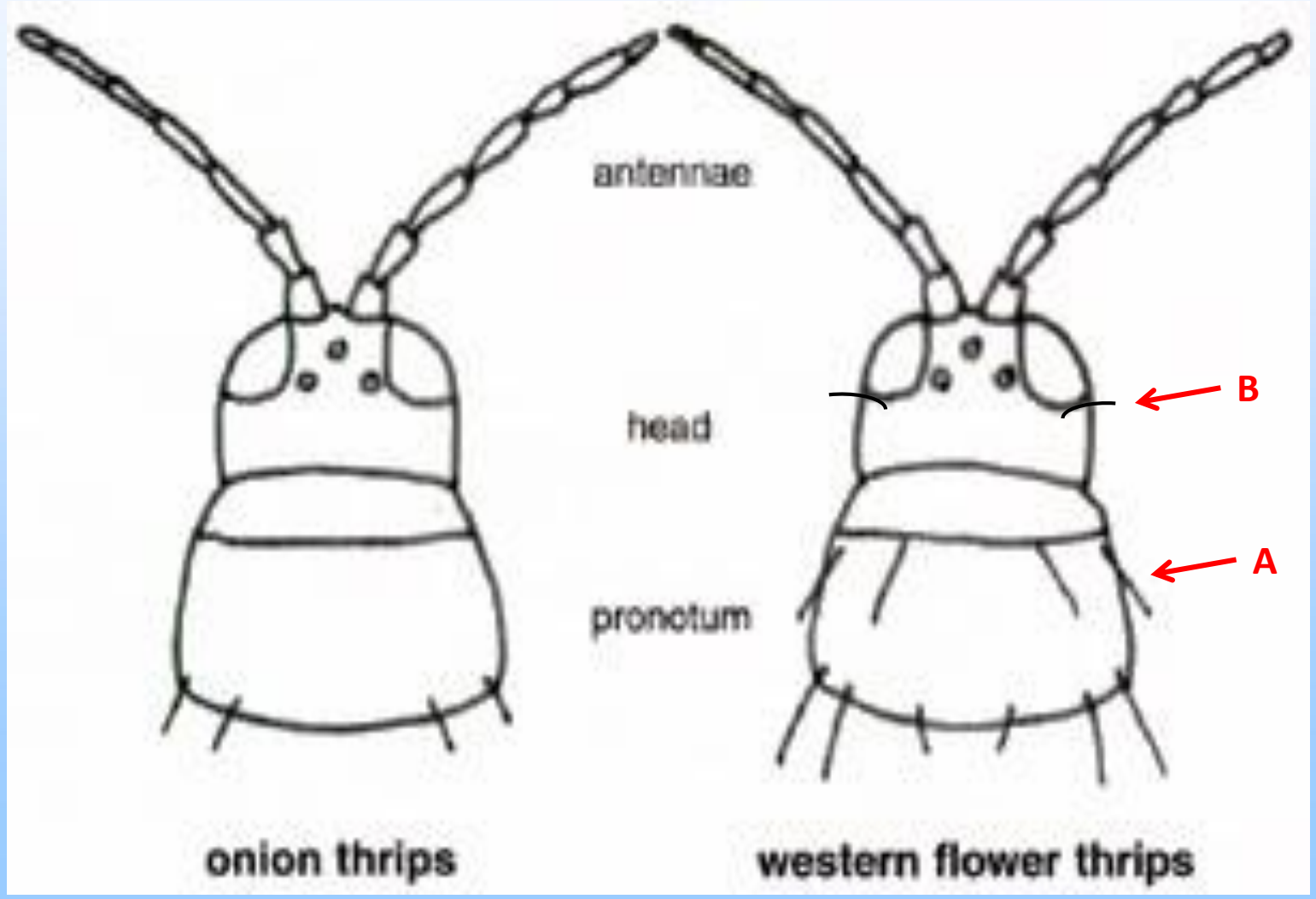



Stormy Sparks


Onion Thrips
Nigel Cattlin, HDC.ORG


Western Flower Thrips
© Alex Wild 2004


activeeye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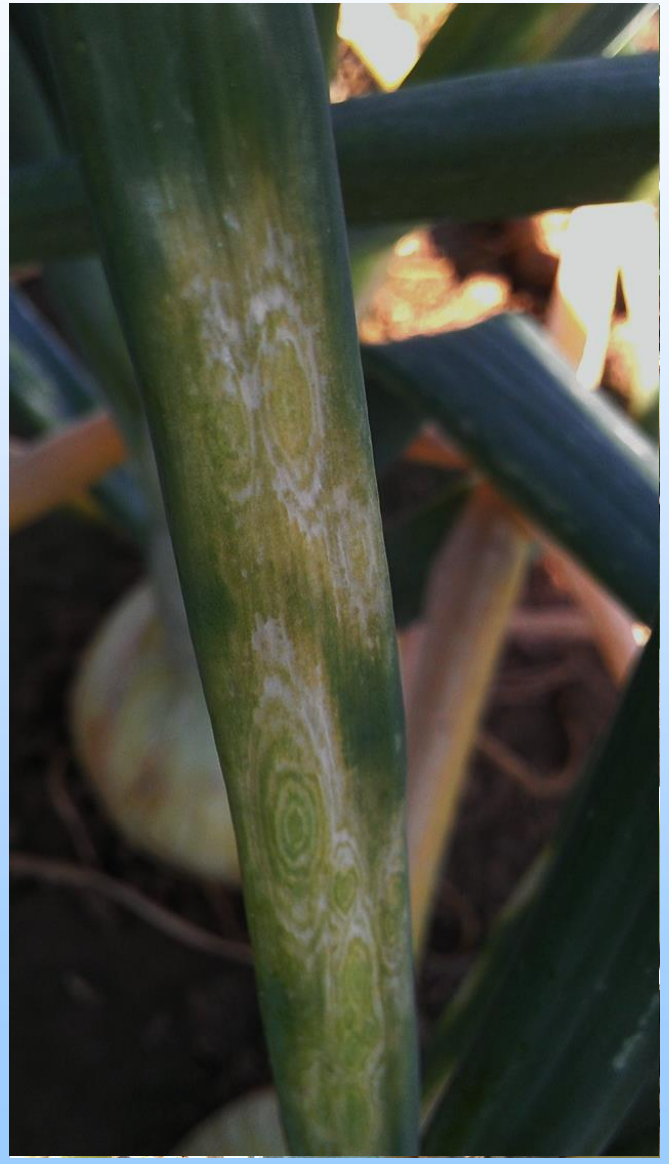
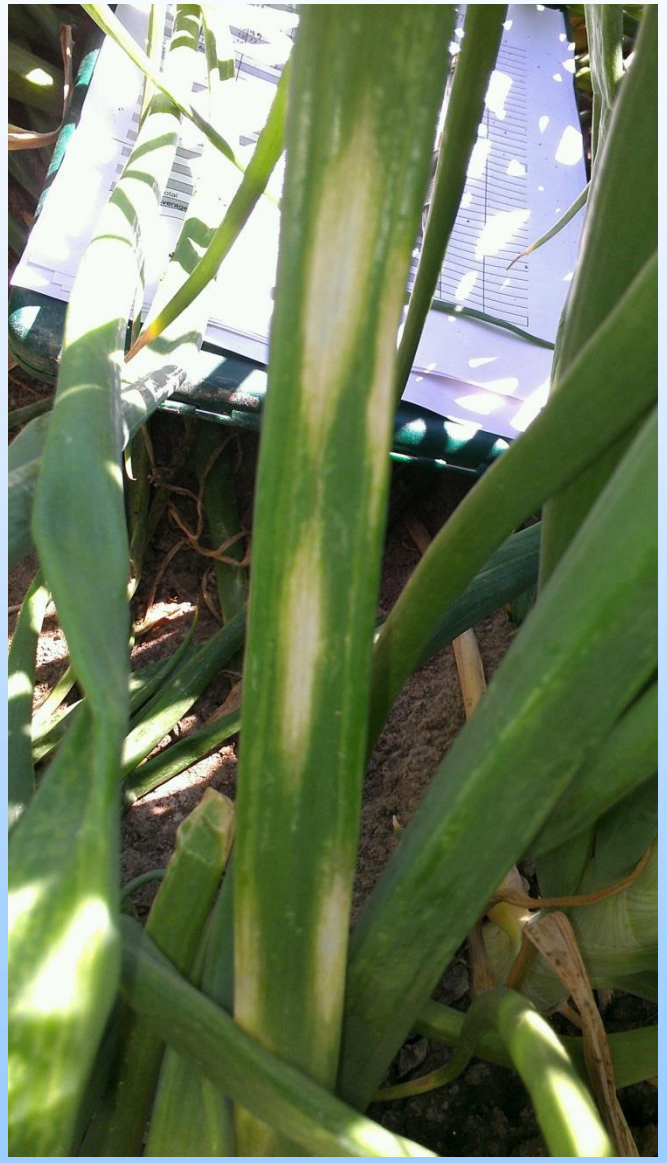
head
pronotum
B
A
onion thrips
western flower thrips


Howard Schwartz, CSU
5365856

# Iris Yellow Spot Virus on Onion



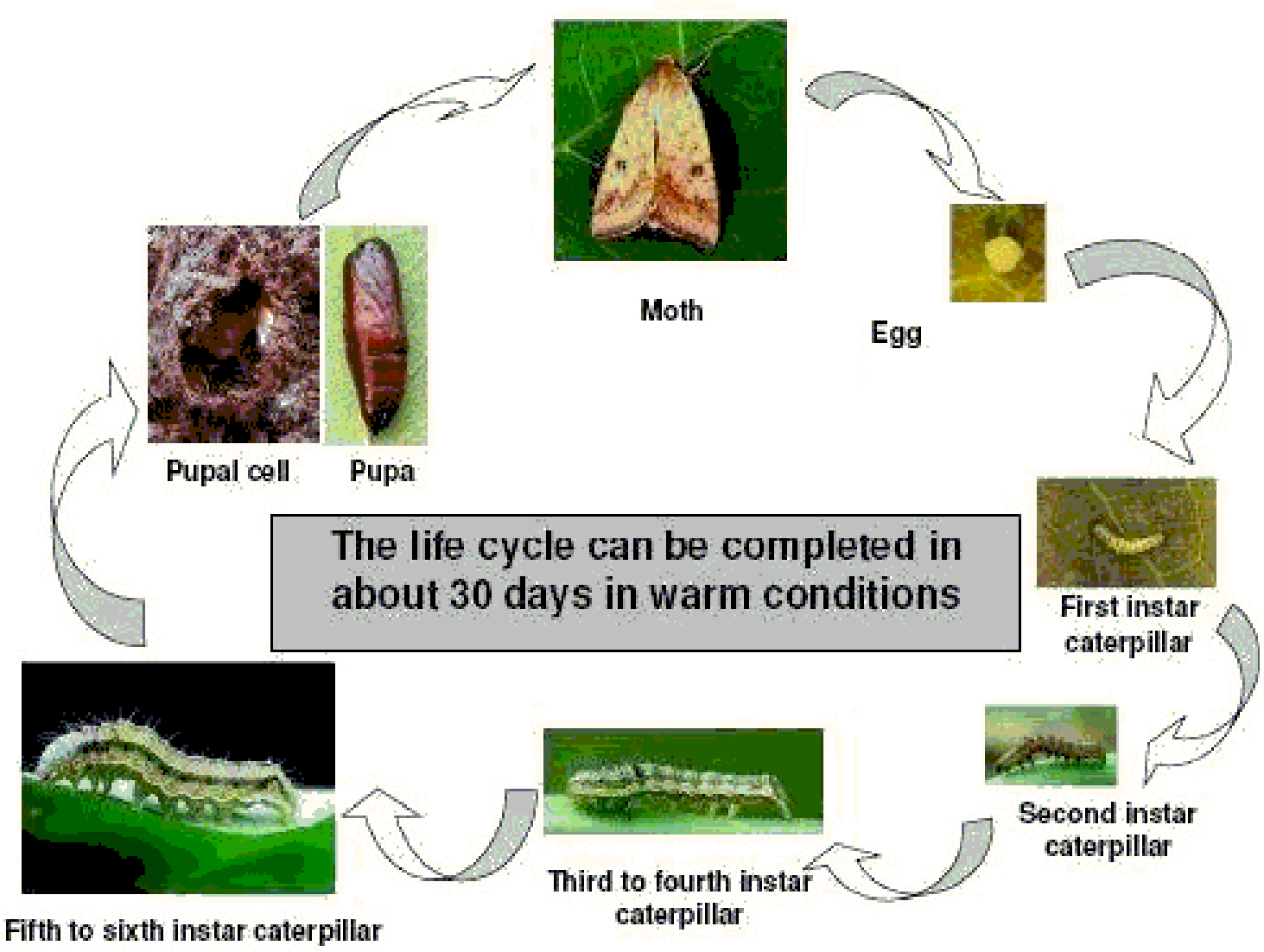


# Lepidoptera

- Adults
  - Moths, Butterflies
  - Feed on nectar


- Caterpillars
  - Feed on foliage, fruit, stems, roots
  - Chewing mouthparts

# Lepidoptera




A.M. Varela

Department of Entomology, University of Minnesota


Diamondback Moth
Ansel Oommen


A. M. Varela
Imported Cabbageworm


David Cappaert
Cabbage Looper


John Capinera
Beet Armyworm

# Monitoring for Lepidoptera

OSU – Ken Gray Collection

# Pheromone Traps


# Integrating IPM

"It is **short-sighted** to develop a chemical control program for the elimination of one insect pest and ignore the impact of that program on the other arthropods, both beneficial and harmful, in the ecosystem."

Vern Stern – One of the "Fathers" of IPM

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Pacific Northwest Vegetable Extension Group
Washington State University,
Oregon State University,
and University of Idaho

mtvernon.wsu.edu/path_team/vegpath_team.htm

**INSECT IDENTIFICATION SUBMISSION FORM**

OSU Oregon State University Extension Service

Insect Identification/IAEP
HAREC
2121 S First Street
Hermiston, OR 97838
Phone: (541) 567-8321
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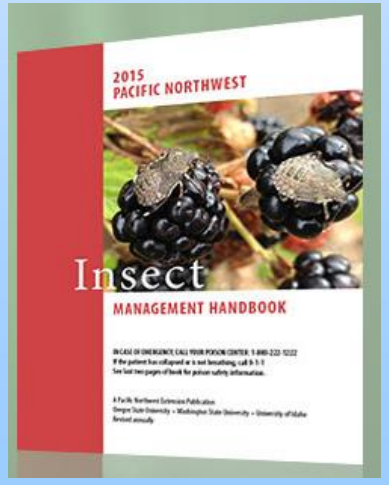
oregonstate.edu/dept/hermiston/entomology-laboratory

UNIVERSITY OF CALIFORNIA AGRICULTURE & NATURAL RESOURCES
UC IPM
Statewide Integrated Pest Management Program

www.ipm.ucdavis.edu




insect.pnwhandbooks.org/

FORESTRY IMAGES

www.forestryimages.org/

BugGuide

bugguide.net/