Identifying the Good, the Bad & the Ugly

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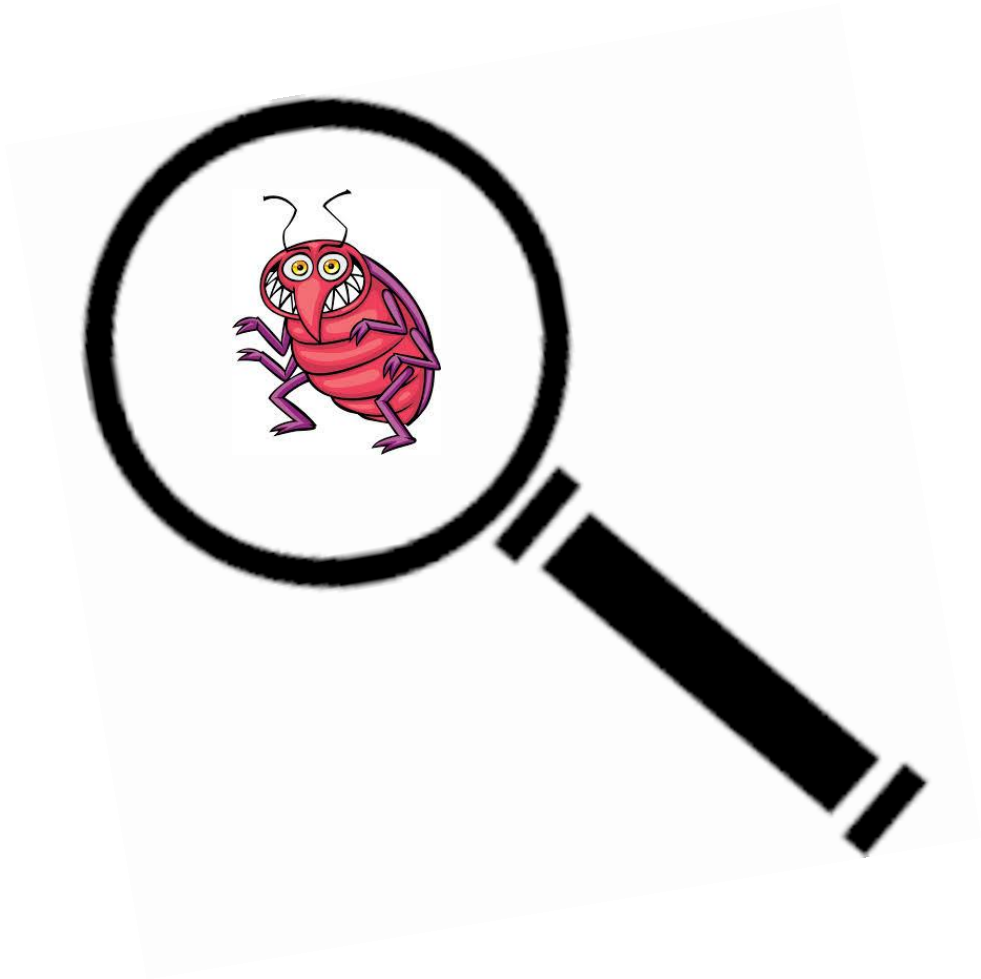
Expand Your Tunnel Vision: High Tunnel Production Conference ~ Manchester, NH ~ December 3-4, 2018

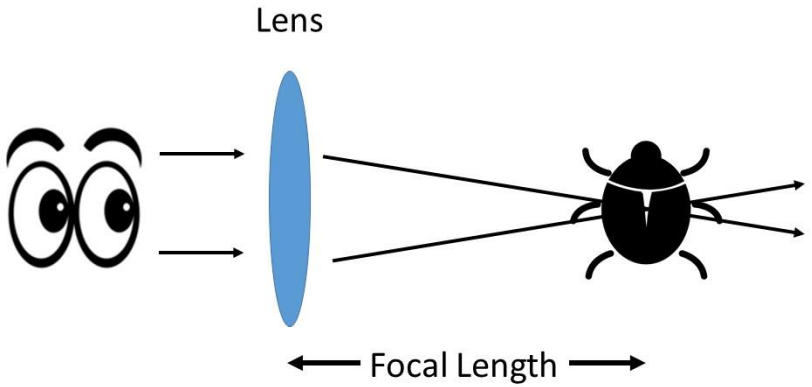
Session Format

- Break into 4 groups
- Cover 4 general pest-natural enemy associations (~10 min in each) focusing on some commercially available natural enemies.
- Brief review on screen then perform hands on activities



Why Id Anyways?

- If you use natural enemies, some are generalists (attack many) and some are specialists (attack few or one). Don't make an expensive mistake!
- Knowing, scouting & monitoring for pests & natural enemies critical for successful management program
  - Know their life cycles – at what stages do pests get attacked/natural enemies attack
  - How many plants are infested & at what magnitude
  - Keep track of when management occurred, rates used & effectiveness
- Where & how to look
  - Leaf undersides, growth tips, tap blossoms to dislodge arthropods
  - Use magnifying apparatus (hand lens) properly
- When in doubt, call a specialist (University Extension or Biocontrol Supplier)

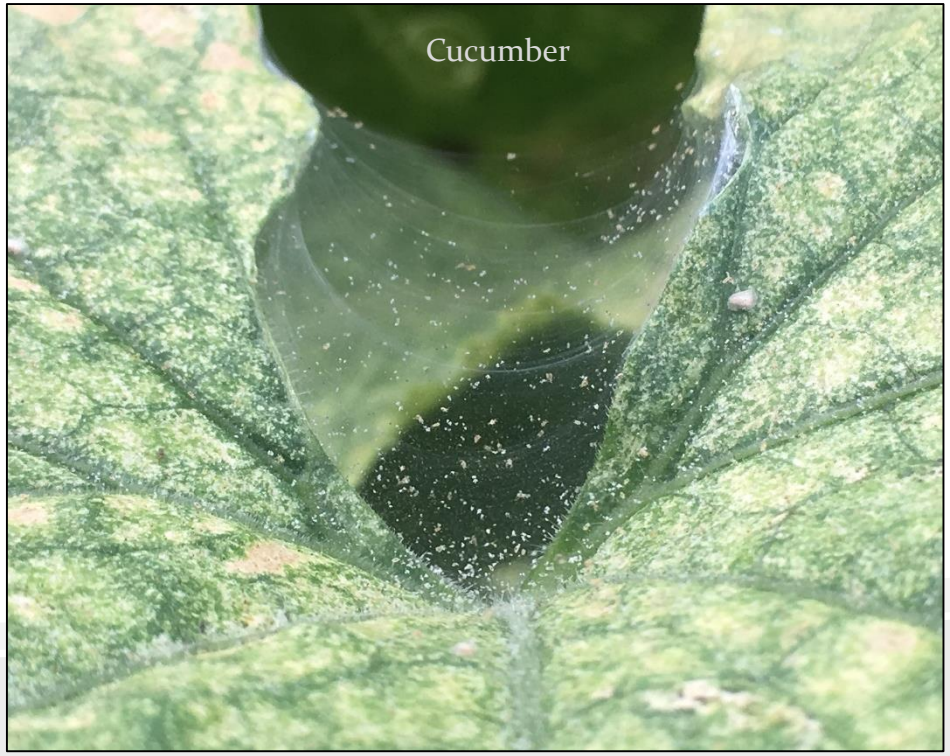


Adjust the distance between the specimen and the magnifier until the specimen is in focus

Spider Mites ~ Damage

Yellow stippling visible on leaf surfaces

Webbing



Yellow flecking on fruits

Spider Mites ~ Natural Enemies: Id

The Pest

2 dark spots

red overwintering phase

Predatory midge (fly)

Predatory as yellow-brown maggot/larva

Feltiella acarisuga

mosquito like adult

Predatory Mites

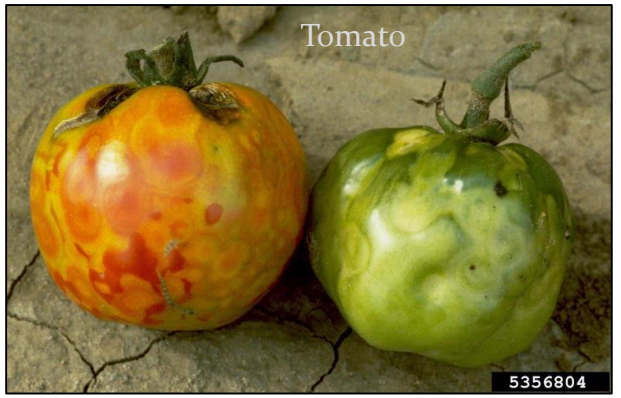
Phytoseiulis persimilis

(Specialist – eats only SM – bright red color – fast moving)

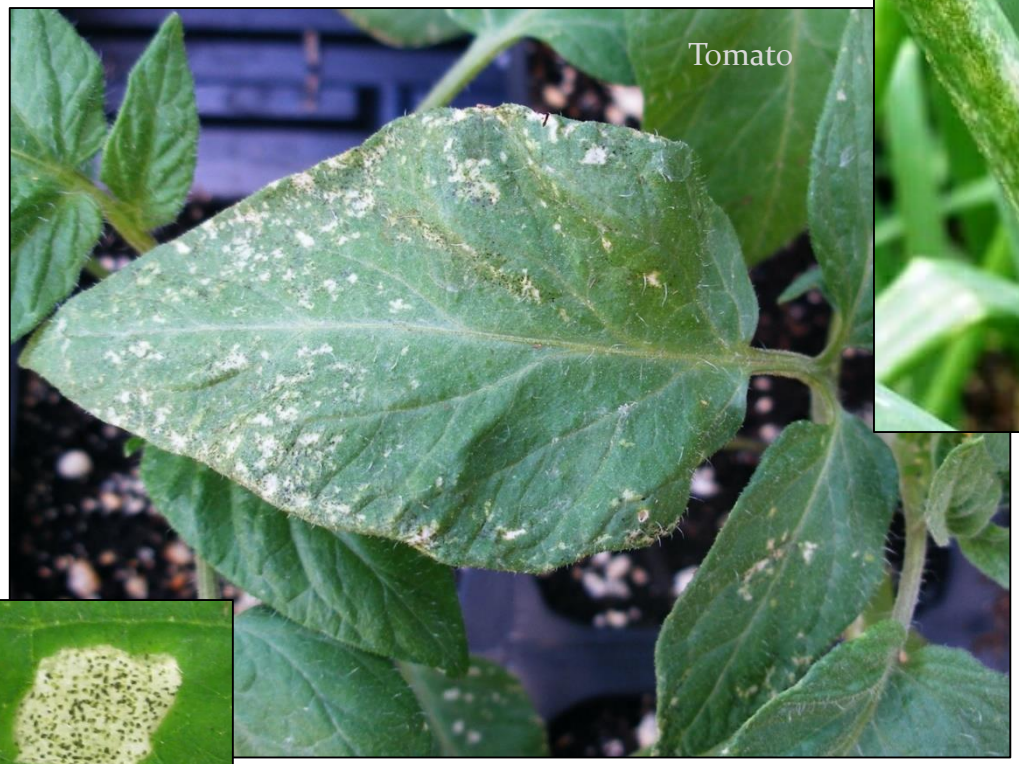
(Generalists – eats SM, other small arthropods & pollen – tan/yellow colors – fast moving)

Neoseiulus (Amblyseius) californicus & fallacis

Thrips ~ Damage

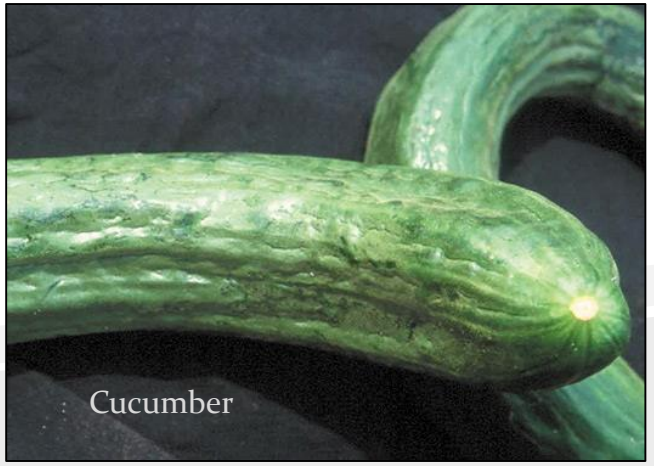


Virus symptoms (TSWV)



Silver patches with black dots (frass)

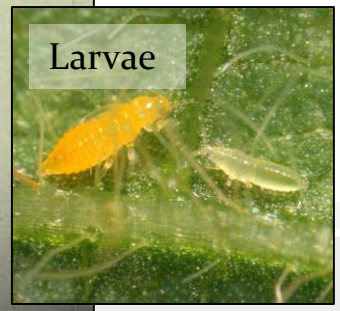
Distortion, yellowing & flecking of fruits



Thrips ~ Natural Enemies: Id

The Pests

Thrips tabaci (Onion) & *Frankliniella* spp. (Flower)



Predatory Beetle

Dalotia (Atheta) coriaria

Rove beetle

Soil dwelling, predatory as adults & larvae, consume soil dwelling arthropods like the thrips pupal stage.

Predatory Mite

Neoseiulus (Amblyseius) cucumeris

Generalists – eats other small arthropods & pollen

Predatory Bug

Predatory as adults & nymphs, naturally occurring

Orius insidiosus

(minute pirate bug/insidious flower bug)

Whiteflies ~ Damage

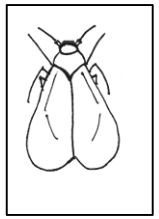
Irregular ripening of fruit

Leaf curling & yellowing/chlorosis (from feeding or viruses)

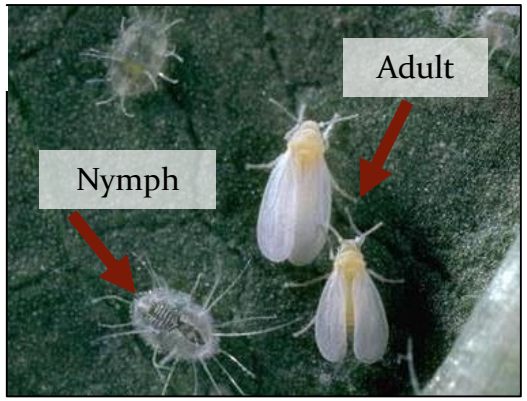
Sooty mold on leaves from honeydew excretion

Whiteflies ~ Natural Enemies: Id

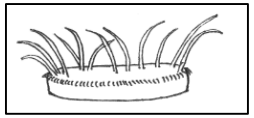
The Pests



Adults have flat wing shape



Trialeurodes vaporariorum (Greenhouse)



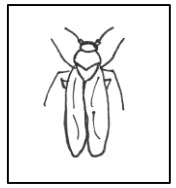
Nymphs cake shaped & hairy

Encarsia formosa

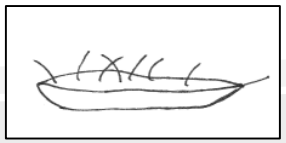
Prefers GWF - adults black & yellow
- parasitized nymphs turn black

Parasitic Wasps (specialists)

Bemisia spp. *(Silverleaf/Sweetpotato)*



Adults have tent wing shape



Nymphs pancake shaped

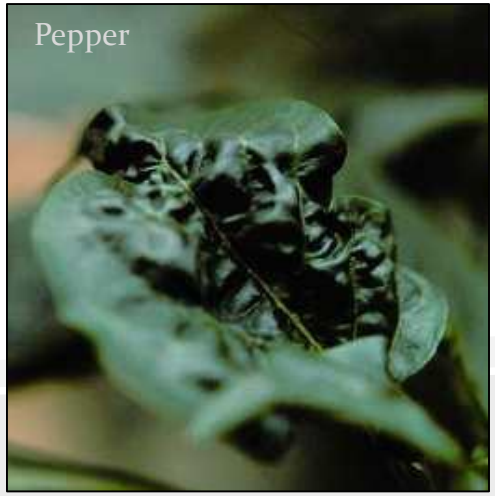
Prefers SWF - adults lemon yellow
- parasitized pupae turn gold

Eretmocerus eremicus

Aphids ~ Damage

Honeydew & Sooty mold

Distortion

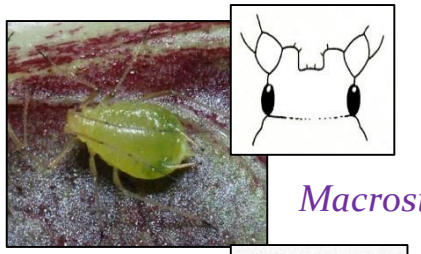


Cast skins

Aphids ~ Natural Enemies: Id

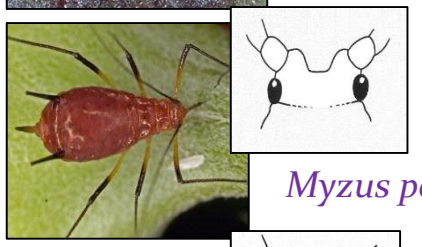
The Pests

Aulacorthum solani (Foxglove)



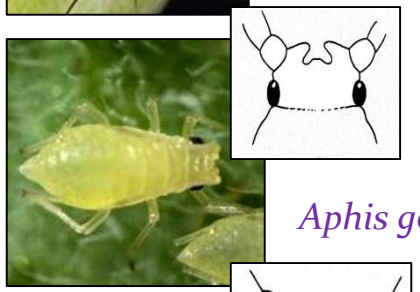
Pale green, yellow & shiny color, parallel-slightly divergent tubercles, dark spots at cornicle bases

Macrosiphum euphorbiae (Potato)



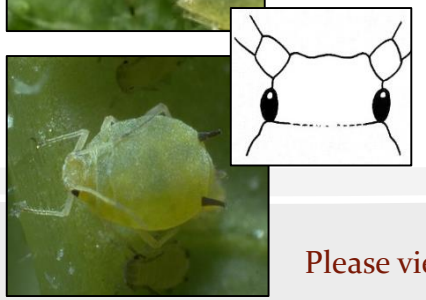
Pink, green color, parallel-slightly divergent tubercles, slender, pear shaped body, very long cornicles

Myzus persicae (Green peach)



Green, pink, orange color, converging inward (W) tubercles, long cornicles with black tips

Aphis gossypii (Melon)

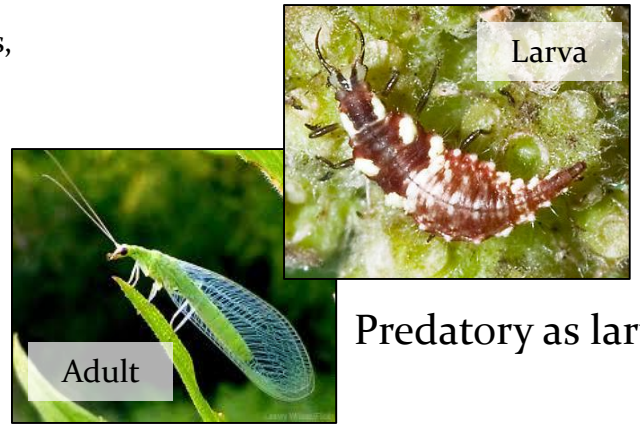


Green, yellow color, undeveloped, flat tubercles, short, dark cornicles

Please view anatomy handout on table

Predatory Green Lacewings

Chrysoperla rufilabris



Predatory as larva

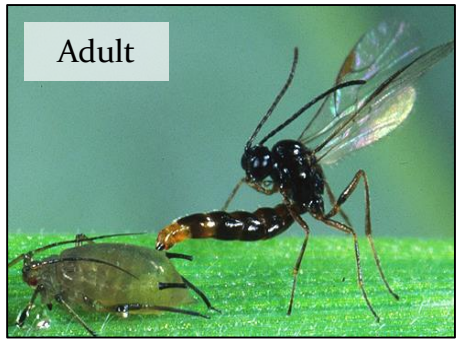
Predatory fly

Aphidoletes aphidimyza (many aphids)

Predatory as orange maggot/larva

Parasitic Wasps (specialists)

Aphidius colemani (green peach & melon)
Aphidius ervi (potato & foxglove)



Larvae-pupae develop within aphid 'mummy'

Aphelinus abdominalis (potato & foxglove)

Thank You! Please Contact Us Anytime!

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For more information please view High Tunnel Tomato Pests & Their Natural Enemies presented at the 2016 High Tunnel Conference:
https://www.uvm.edu/~entlab/High%20Tunnel%20IPM/Presentations/TomatoHighTunnelPests&NatEn-Dec2016Final.pdf

The Entomology Research Laboratory

NH Extension

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NORTHEAST SARE Sustainable Agriculture Research & Education

USDA United States Department of Agriculture National Institute of Food and Agriculture

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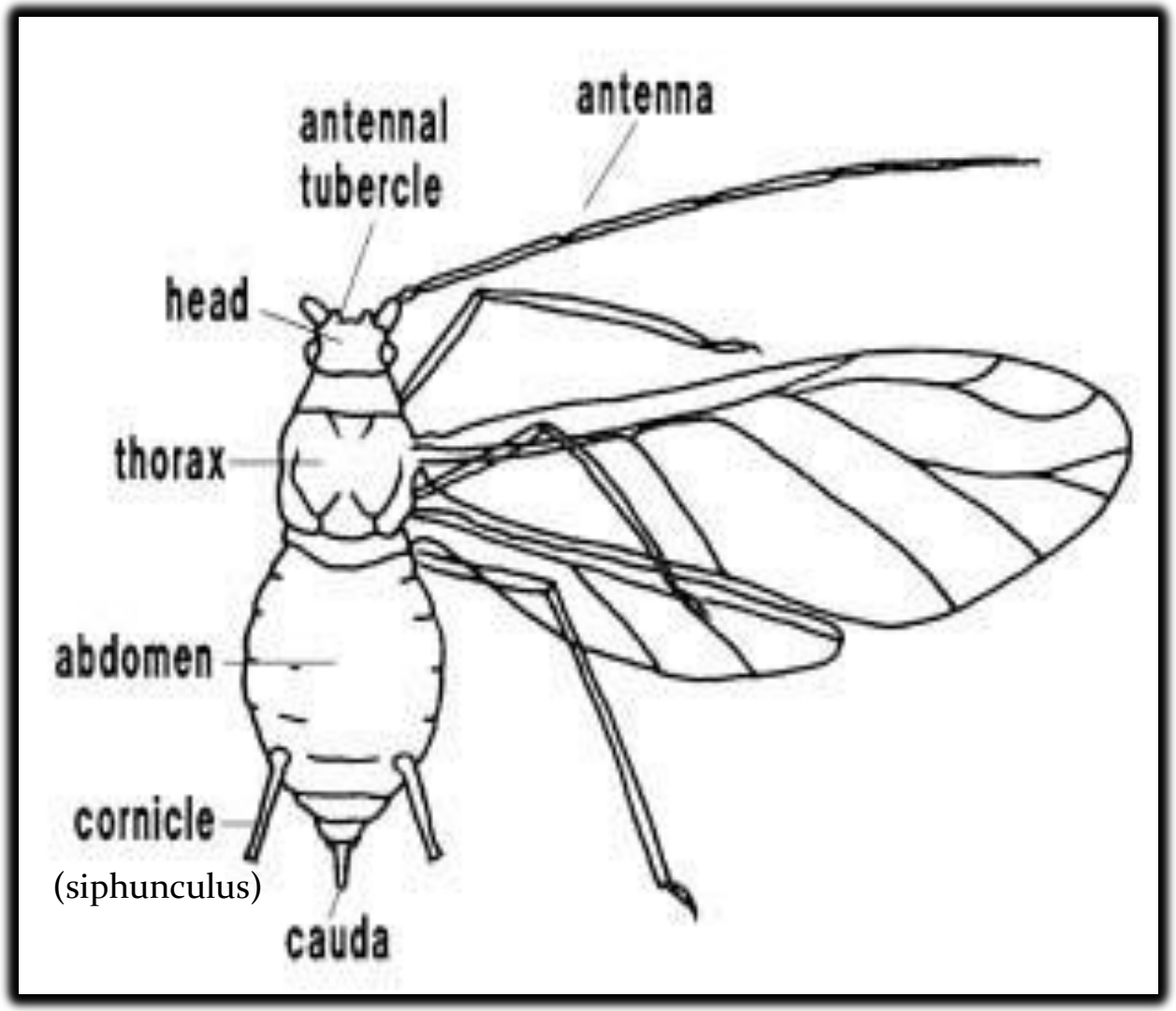
Aphid Anatomy

Winged adult (alata)

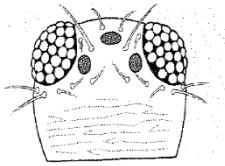
Wingless adult (aptera)

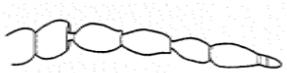


Thrips Anatomy

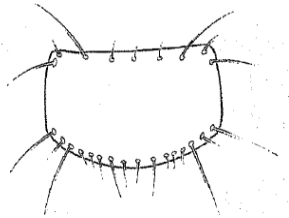
Western Flower Thrips (*Frankliniella occidentalis*)

Ocelli: red



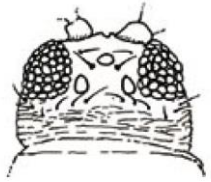


Antennae: 8 segments

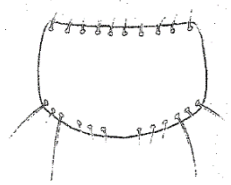


Pronotum: 5 pairs of distinct long hairs with smaller hairs between.

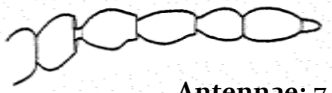
Onion Thrips (*Thrips tabaci*)



Ocelli: pale



Pronotum: 2 pairs distinct long hairs with smaller hairs between on rear corner.



Antennae: 7 segments