

Plant-Insect interactions



What is a pest?



Arizona State Butterfly –
the two-tailed swallowtail *Papilio multicaudata*

What is a pest?



Symptoms of plant problems caused by insects

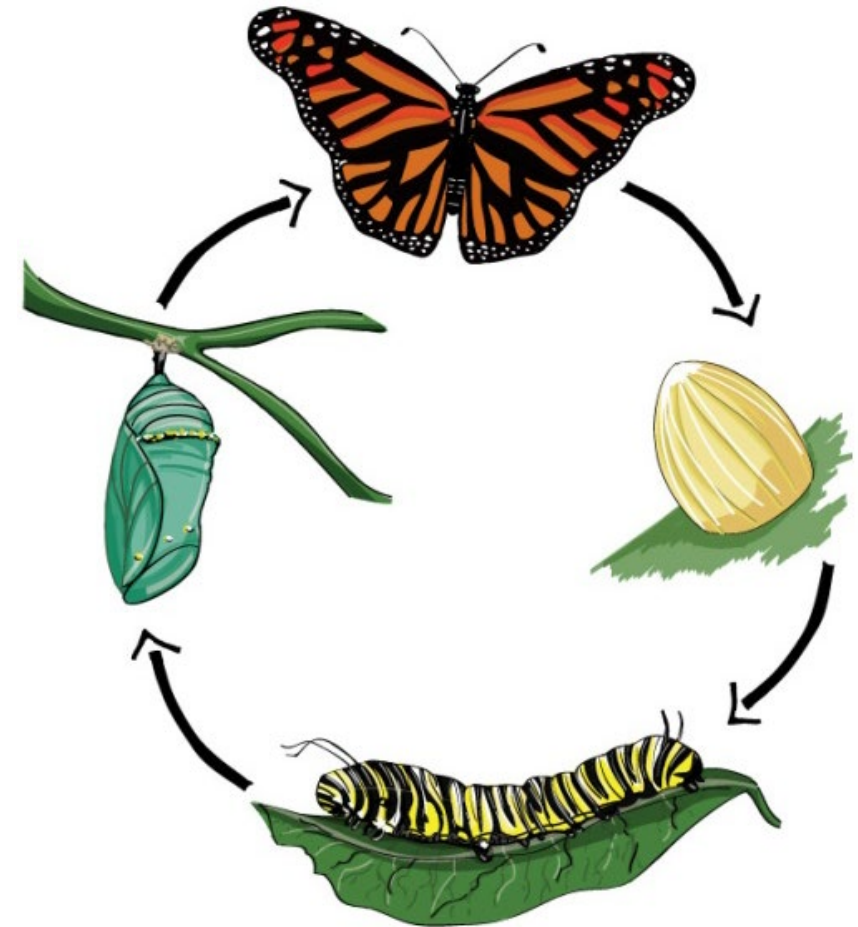
1. Chewed or tattered foliage or blossoms
2. Stippled (flecked), yellowed, bronzed or bleached foliage
3. Distortion of plant parts
4. Dieback of plant parts
5. Insect or insect-related products

Many other “pests”



'Pest' Identification is Critical!

- All stages of a pest may not look the same or cause the same damage.
- Knowing the host or where it was found helps!



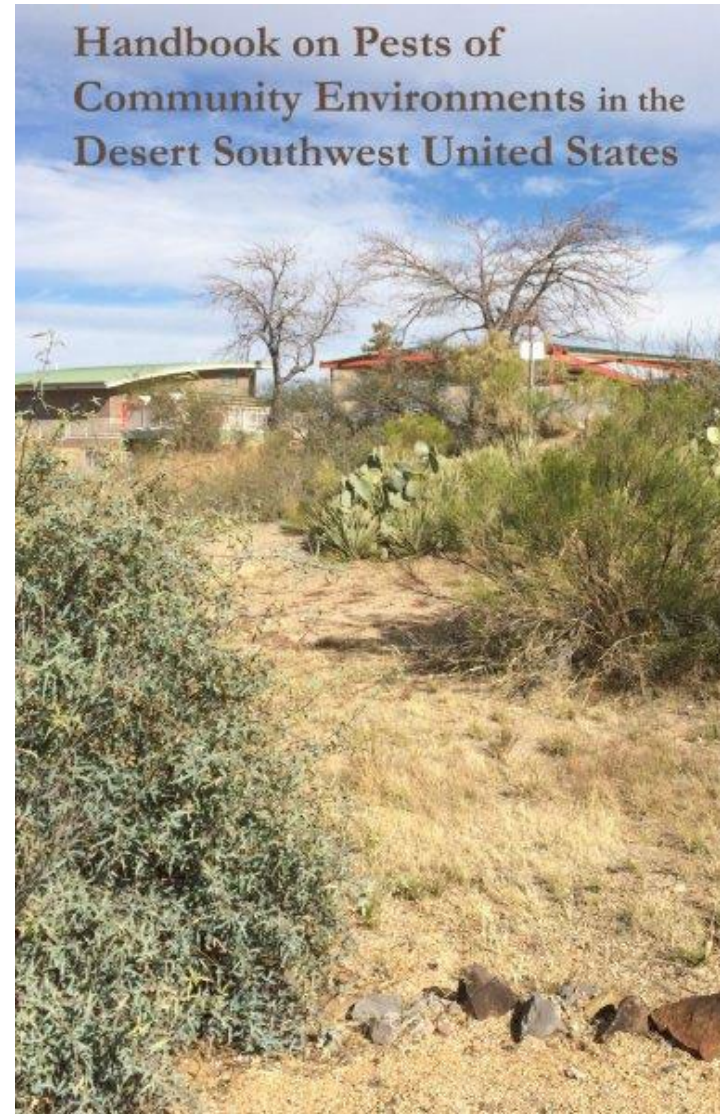
'Pest' Identification is Critical!



- Handle samples carefully.



Use good resources



Use good resources

<https://cals.arizona.edu/apmc/Handbook.html>



THE UNIVERSITY OF ARIZONA®

Western Region School And Home IPM Work Group

COOPERATIVE EXTENSION

Handbook on Pests of Community Environments in the Desert Southwest United States

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[1 Cover pages and contents](#) (PDF, 1.2MB).

[2 Introduction](#) (PDF, 230KB).

[3 IPM in community environments](#) (PDF, 209KB).

[4 Biting, stinging and venomous pests: insects](#) (PDF, 2.9MB). Non-insects can be found on page 23.

[5 General household pests](#) (PDF, 4.5MB).

[6 Pests of plants](#) (PDF, 2.3MB).

[7 Pests of public health importance](#) (PDF, 1.9MB).

[8 Pests of stored products](#) (PDF, 2MB).

[9 Structural pests/wood-damaging pests.pdf](#) (PDF, 2.2MB).

[10 Vertebrates](#) (PDF, 6MB).

Take good pictures

- Don't zoom too much on your phone.
- Hold your camera with both hands and as steady as possible.
- Get as many pictures as possible.
- Click, check, click again.
- Get pictures of damage, or other useful background.

Take good pictures

- Smartphone photo tip: **Zoom in with your hands or feet, not your**



Photo taken without zooming, keeping camera steady, from a good distance.



Can be enlarged by receiver without losing much of the details.



Photo taken with zooming on phone already lost some clarity.



Further zooming by receiver makes it very blurry.

Add something for scale



Its not always a pest!!!

Abiotic stress signs

- Leaves –changes in color, wilting, abnormal growth
- Stem or trunk – die back
- Flowers/fruit – changes in size/color, abnormal growth, drying up, wilting



What caused these?



Scale insect damage



Leaf scorch



Drought damage



Whitefly damage

Common insect pests in the desert landscape



Foliage feeders

BEETLES

Chewing and biting



Agave weevil



Cactus longhorn beetle

Common insect pests in the desert landscape

Foliage feeders

BUTTERFLIES AND MOTHS



Gulf fritillary



Bagworm



Palo verde webworm



Tent caterpillar

Common insect pests in the desert landscape

Foliage feeders



Grasshoppers
Chewing and biting



Leaf-cutter bees
Chewing and biting

Common insect pests in the desert landscape

Leaf miners
Chewing and biting



Foliage feeders



Common insect pests in the desert landscape

Thrips
Rasping and sucking



Foliage/fruit
feeders



Common insect pests in the desert landscape

Foliage feeders

Piercing and sucking



Aphids



Pay attention →

Common insect pests in the desert landscape

BUGS-HEMIPTERA
Piercing and sucking

Foliage feeders



Leafhoppers



Lace bugs



Whiteflies

Common insect pests in the desert landscape

BUGS-HEMIPTERA
Piercing and sucking



Mesquite scales

Foliage feeders



Cochineal scales



Common insect pests in the desert landscape

BUGS-HEMIPTERA

Foliage feeders



Piercing and sucking



Giant Mesquite Bugs – Scary but harmless

Common non-insect pests

Foliage feeders

Mites



Piercing/Scraping and sucking



Common insect pests in the desert landscape

Foliage, root
feeders

BEETLES



Palo verde beetle
Chewing and biting

Common insect pests in the desert landscape

Foliage, root
feeders

BEETLES



White grubs

Chewing and biting

Common insect pests in the desert landscape

Stem/trunk borers Chewing and biting



Flatheaded borer



Round-headed borer

Nuisance pests-Ants



- Nuisance, can give painful bites
- Watch out for fire ants – 2 noded waist

Nuisance pests-Ants



- Harvester ants also bite
- Beard, 2-noded waist

Nuisance pests-Rove beetles



- Nuisance, but no damage
- Mostly feed on organic matter or other insects

Nuisance pests-Earwigs



- Nuisance, but no damage
- Mostly feed on organic matter or other insects

Quiz time!

Identify the pest group that caused this damage



Leaf beetle or
young caterpillars

Identify the pest group that caused this damage



Caterpillars

Identify the pest group that caused this damage



Tent
caterpillars

Identify the pest group that caused this damage



Stem borers

Identify the pest group that caused this damage



Stem borers

Identify the pest that caused this damage



Agave weevil

Identify the pest group that caused this damage



Agave plant bug

Identify the pest group that left these signs



Caterpillars

Identify the pest group that left these signs



Bag worms

Identify the pest group that caused this damage



Leaf miners

Identify the pest group that caused this damage



Mites



Identify the pest group that caused this damage



Bacterium (*Pseudomonas syringae savastanoi*)

Causes Oleander galls

Identify the pest group that caused this damage



Cynipid wasp

(Desert gall)

Identify the pest group that caused this damage



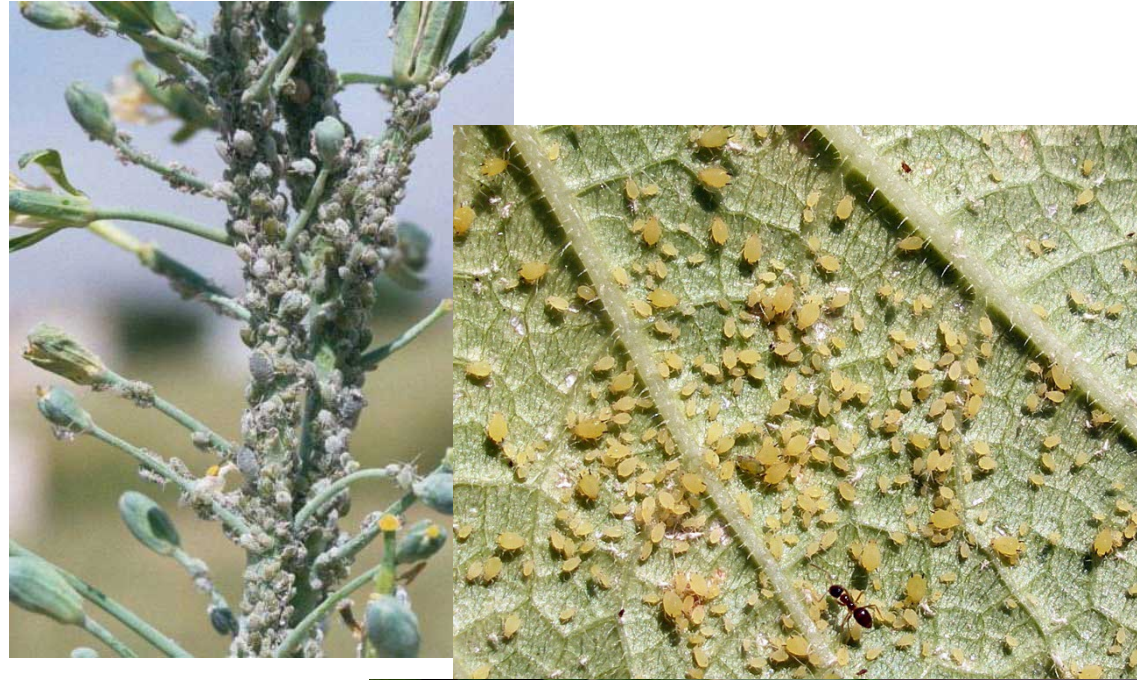
Leaf-cutter bees

Identify the pest group that caused this damage



Thrips

What are these?



Aphids

Pay attention →



What are these?



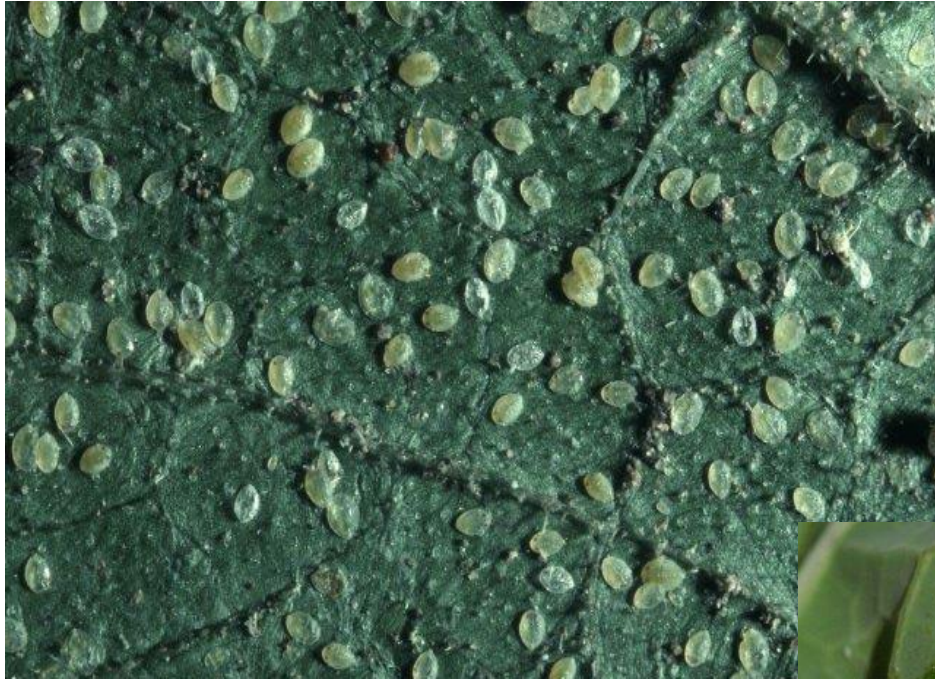
Mealy bugs

What are these?



Psyllid nymph
"lerps"

What are these?



Whitefly nymphs



What are these?



Cochineal scales

Scary looking!



Giant Mesquite Bugs – Scary but harmless

What are these?



Conenose bug/
kissing bug



Corsair

Assassin bugs

What are these?



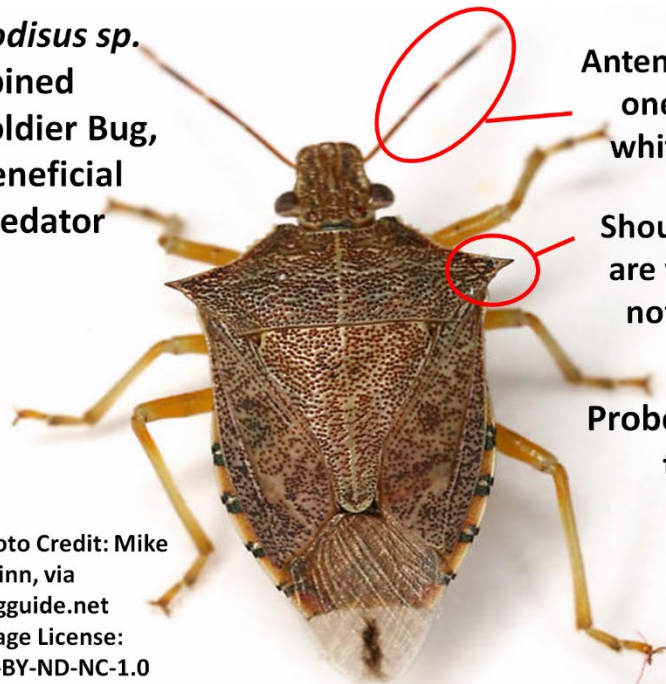
Assassin bugs

What are these?



Stink bugs

Podisus sp.
Spined
Soldier Bug,
Beneficial
Predator

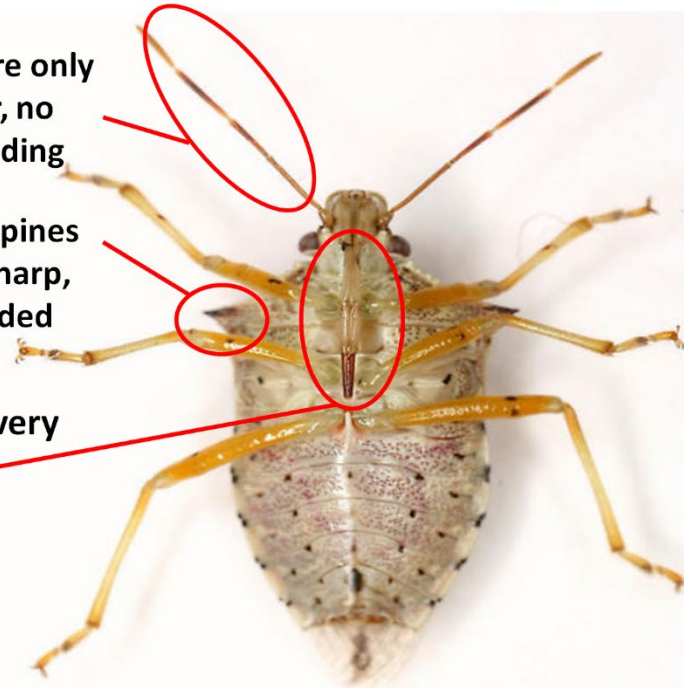


Antennae are only
one color, no
white banding

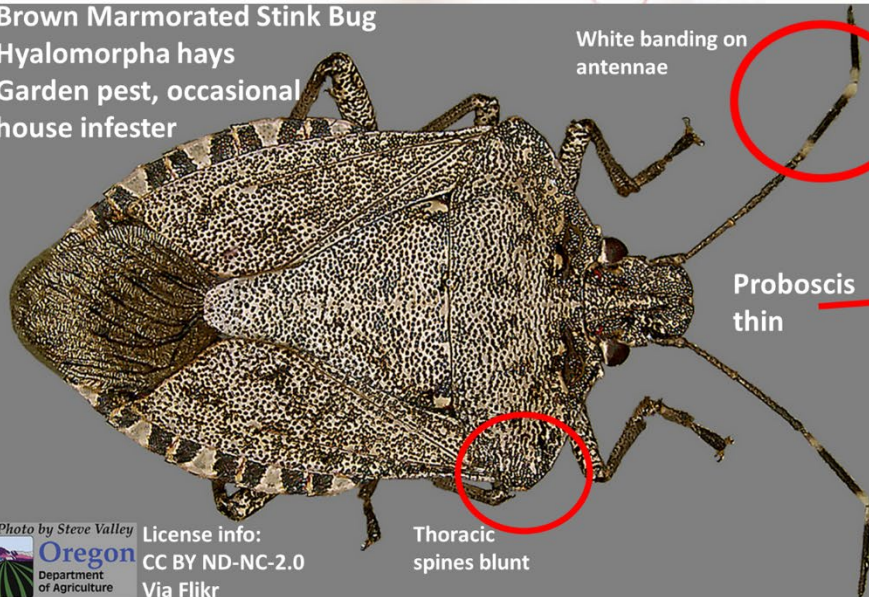
Shoulder Spines
are very sharp,
not rounded

Proboscis very
thick

Photo Credit: Mike
Quinn, via
Bugguide.net
Image License:
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Brown Marmorated Stink Bug
Hyalomorpha hays
Garden pest, occasional
house infester



White banding on
antennae

Proboscis
thin

Thoracic
spines blunt



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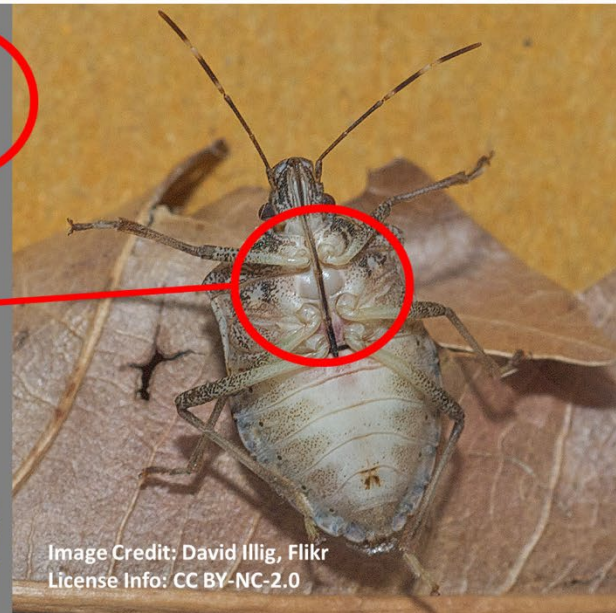
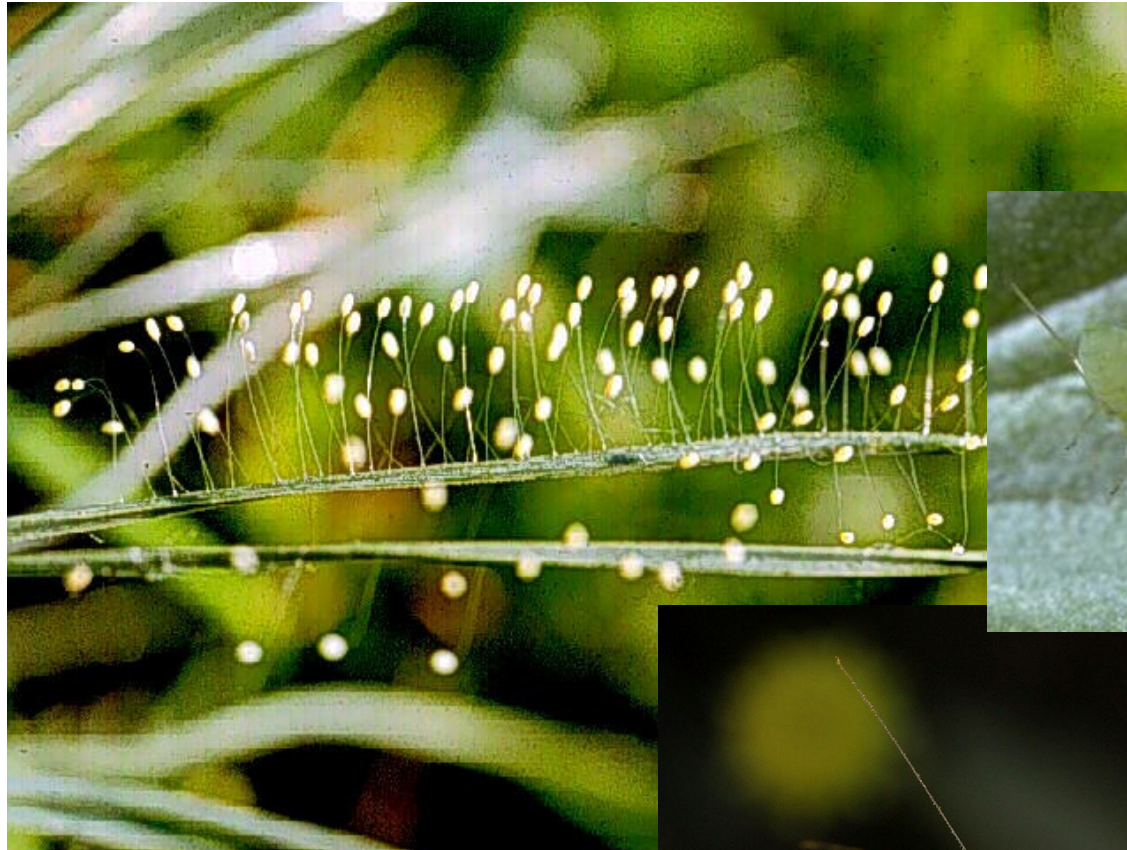


Image Credit: David Illig, Flickr
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What are these?



Green lacewing eggs



Bugs get bugs too!



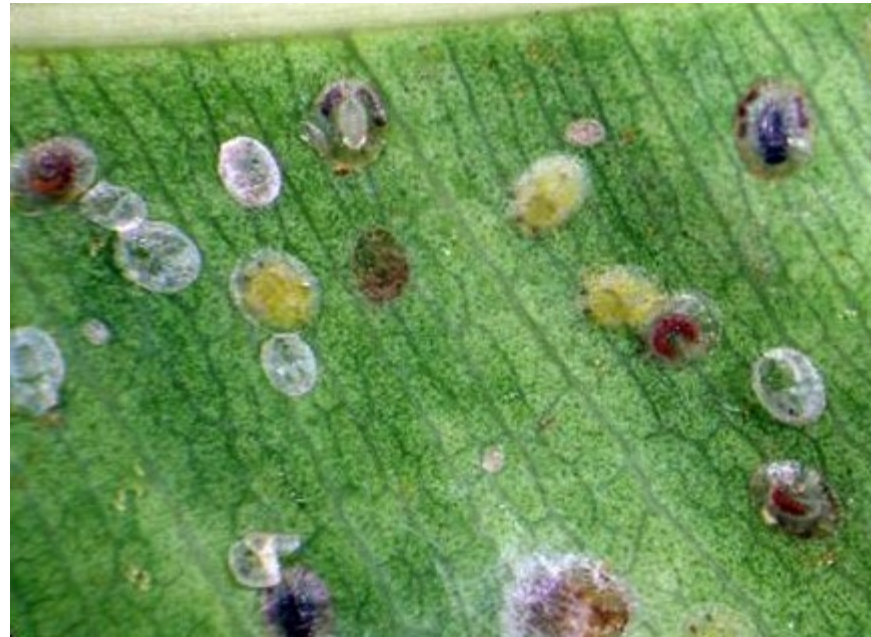


Parasitoid wasps





Parasitized beetle grub



Parasitized whitefly nymphs

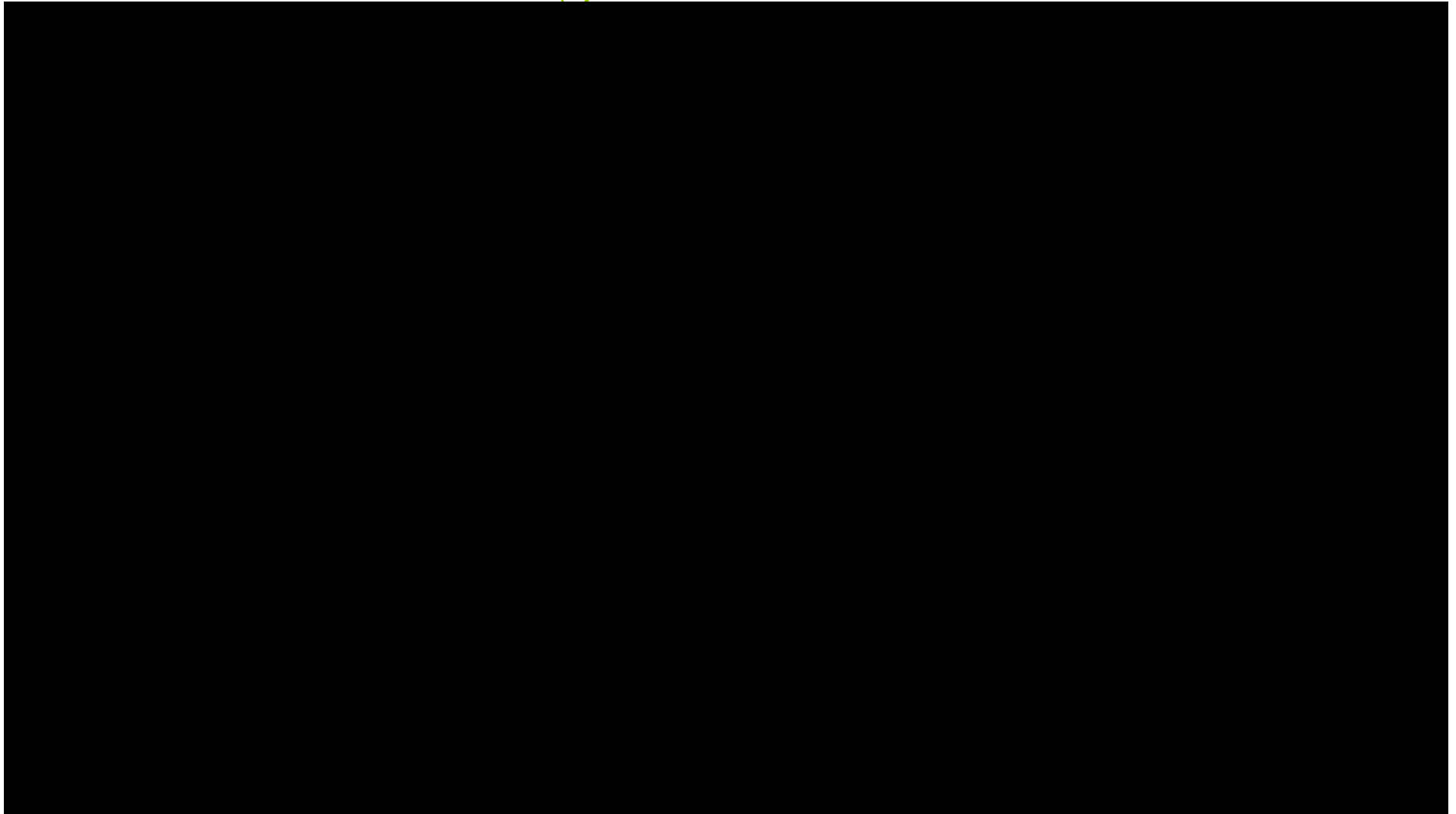


Mummified aphids



Mummy with exit hole

Body Invaders



Big-eyed bugs in turf



Not all bugs are bad!



Lady beetle



Hover fly



Not all bugs are bad!

Beneficials



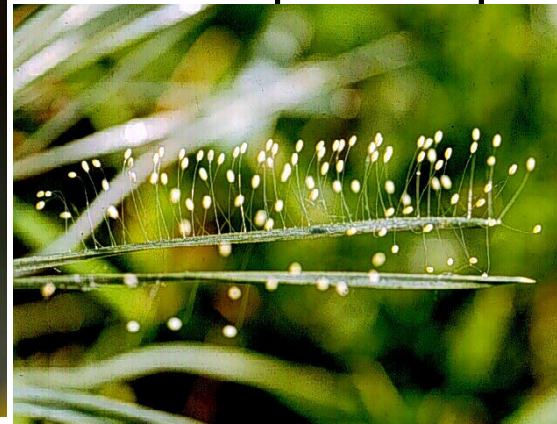
Lady beetle



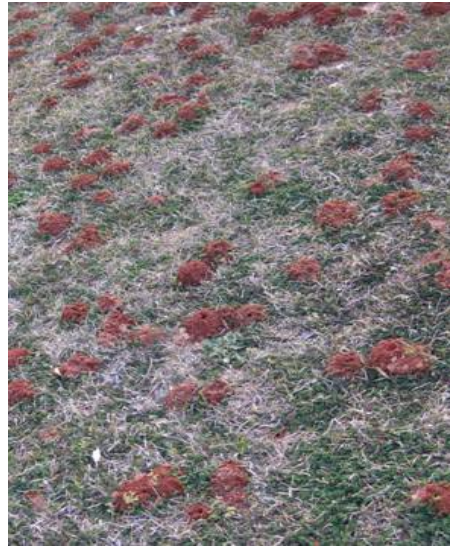
Paper wasp



Green lacewing



Pests or not?



Digger bees

Pests or not?



- Leaf cutter bees

Pests or not?



Turkestan



American



Oriental

Pests or not?



Africanized bees



Pests or not?



Scorpions

Mosquitoes



- Athletic and event disruption
- West Nile Virus, dengue fever, chikungunya, most recently - Zika

School Playing Field



- Thousands from 1 gallon of water
- $\frac{1}{4}$ inch of water is enough



Food for thought



Contact



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