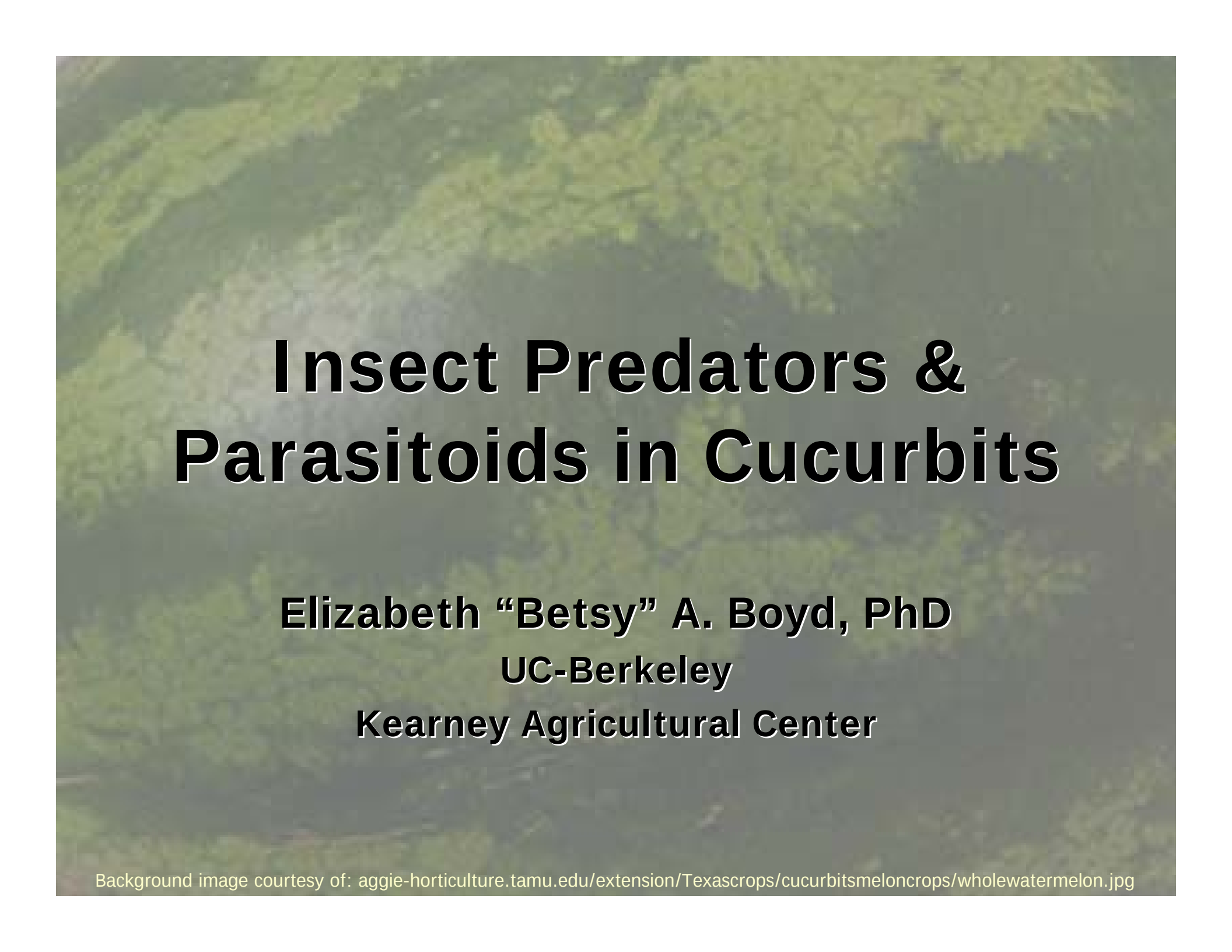




Insect Predators & Parasitoids in Cucurbits

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Kearney Agricultural Center

Roadmap

**Background Information: Types of
Insect Natural Enemies**

**Beneficial Predators and Parasitoids of
Common Cucurbit Insect Pests**

Where to get Natural Enemies



Three Classes of Insect Natural Enemies

Parasites

Parasitoids

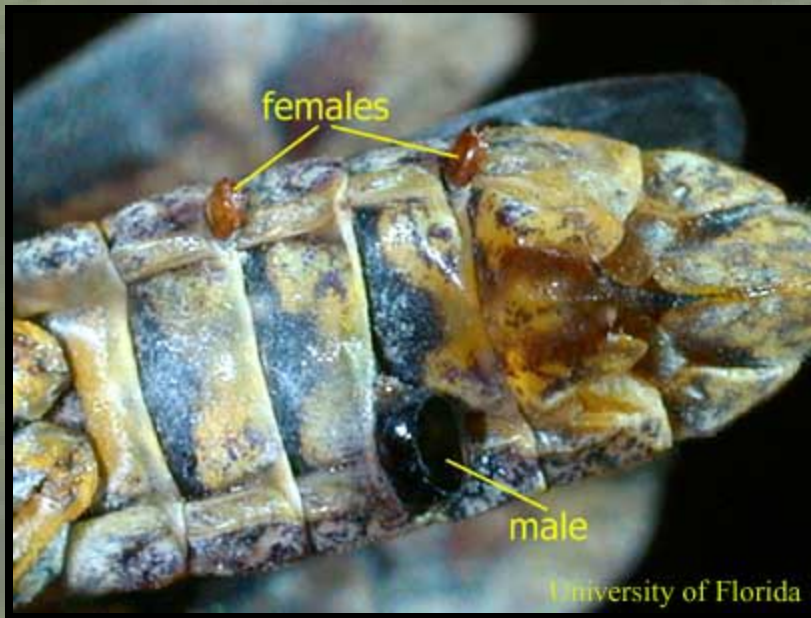
Predators

Parasites

Feed upon, but do not kill host

Internal or external development

Specific to a group of hosts



Parasitoids

Gradually consume & kill host

Develop internally or externally

Specific to one host or group of hosts

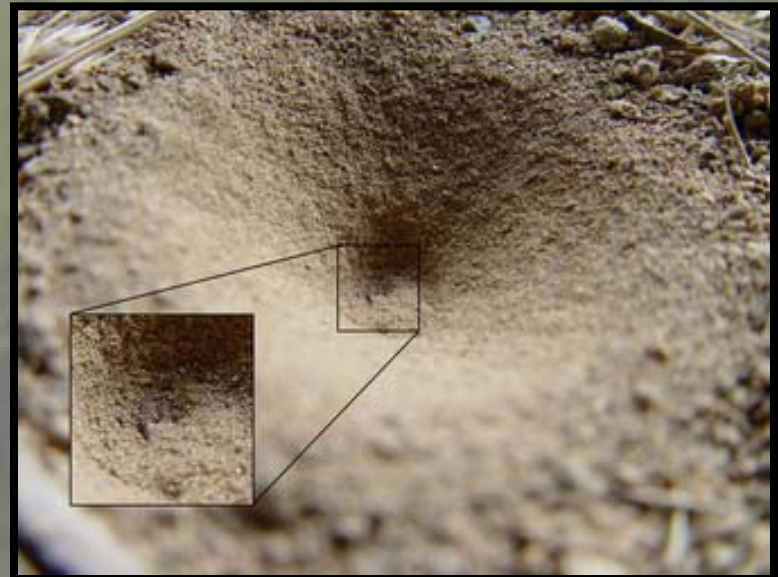


Predators

Immediately kill & consume prey

Not specific to a certain host

- Generalists: eat bad & sometimes good
- Active Searching, Sit-and-Wait, Ambush



Generalist Insect Predators

Ladybird Beetles



Lacewings



Syrphid Flies



True bugs



Flies



Wasps



Predatory mites & thrips



Spiders



Praying Mantids



Lizards





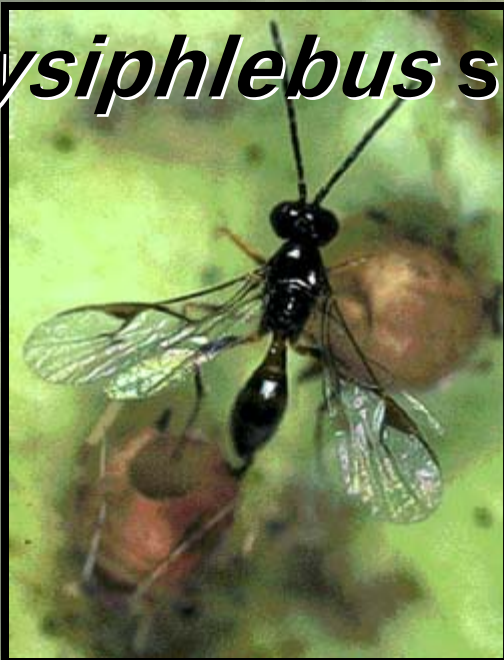
Biological Control of Common Pests in Cucurbits

Melon Aphids



Melon Aphid Parasitoids

Lysiphlebus spp



Aphidius spp



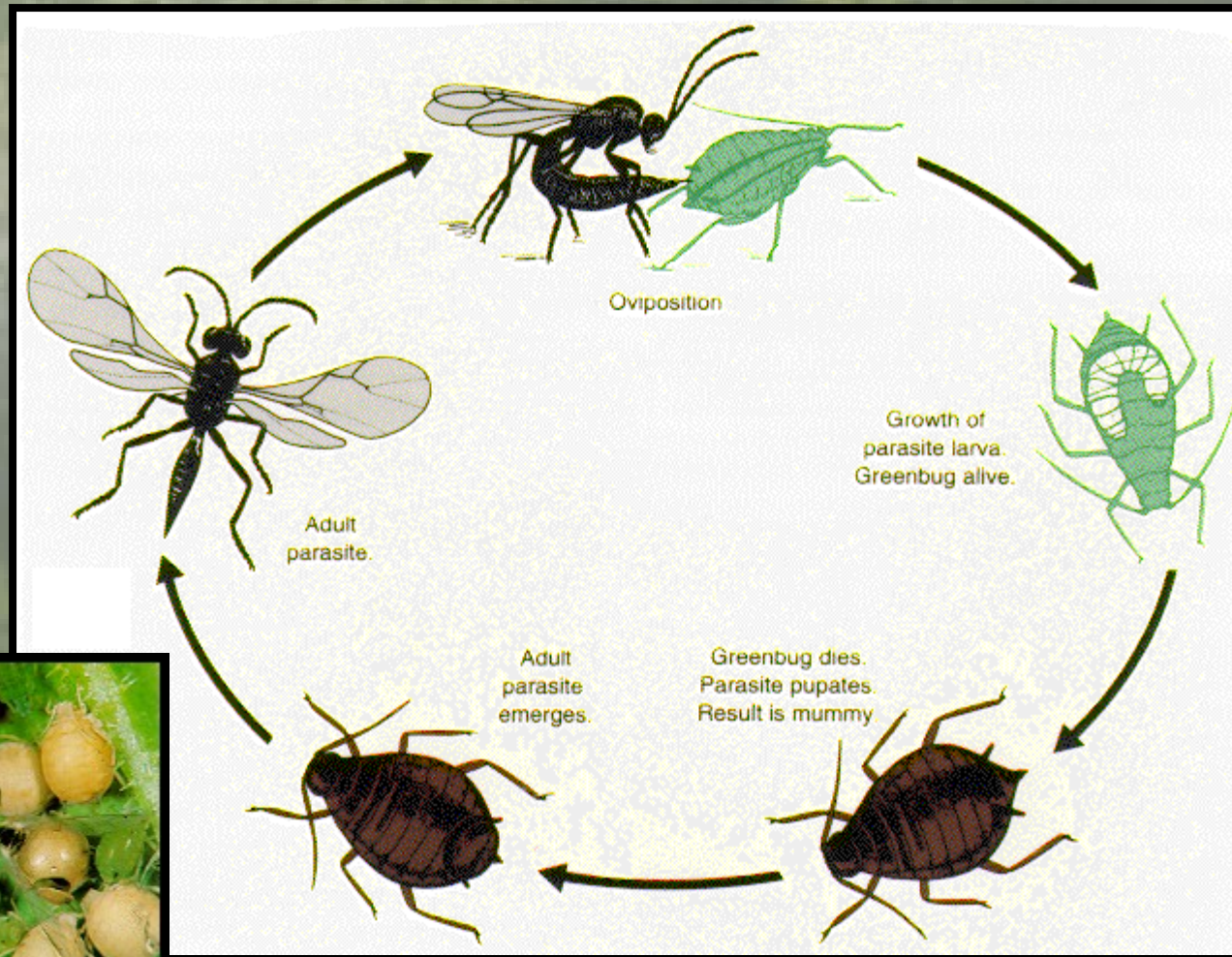
Diaeretiella spp



Aphelinus spp



Melon Aphid Parasitoid Life Cycle



Melon Aphid Predators: Ladybird Beetles

Adult



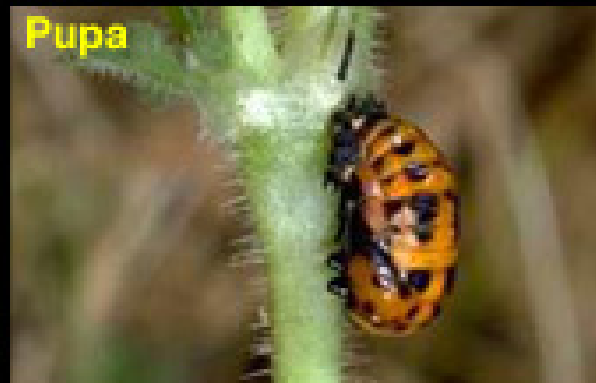
Larva



Eggs



Pupa



Melon Aphid Predators: Syrphid Flies (aka Hoverflies)

Adult



Egg



Larva,
unknown species



Large hoverfly larva



Pupa



Melon Aphid Predators: Green Lacewings

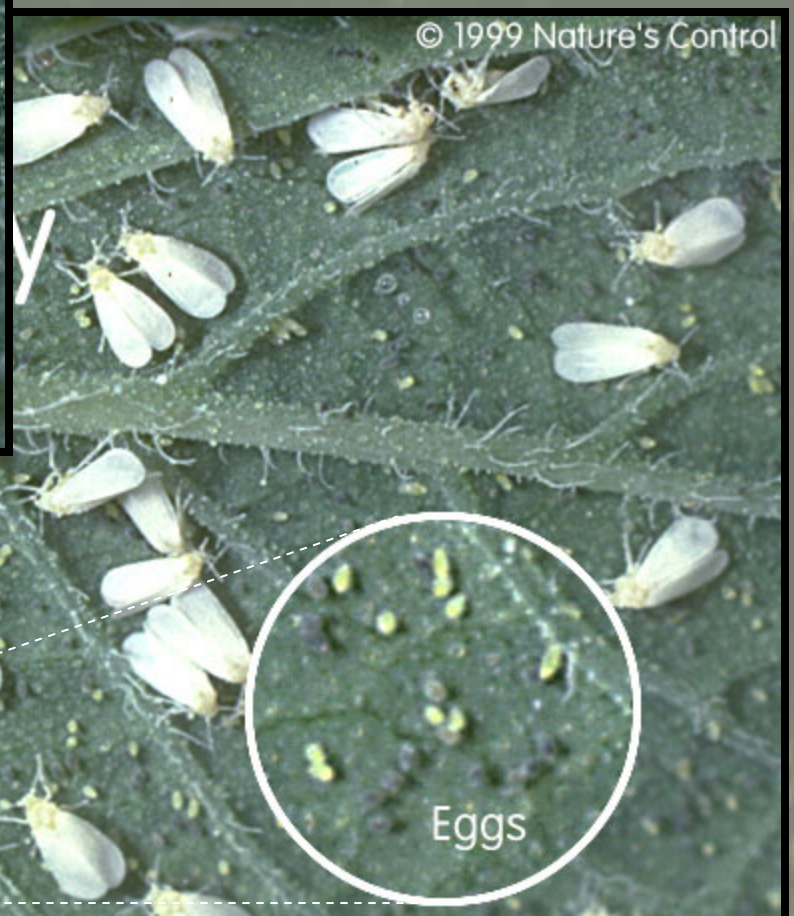




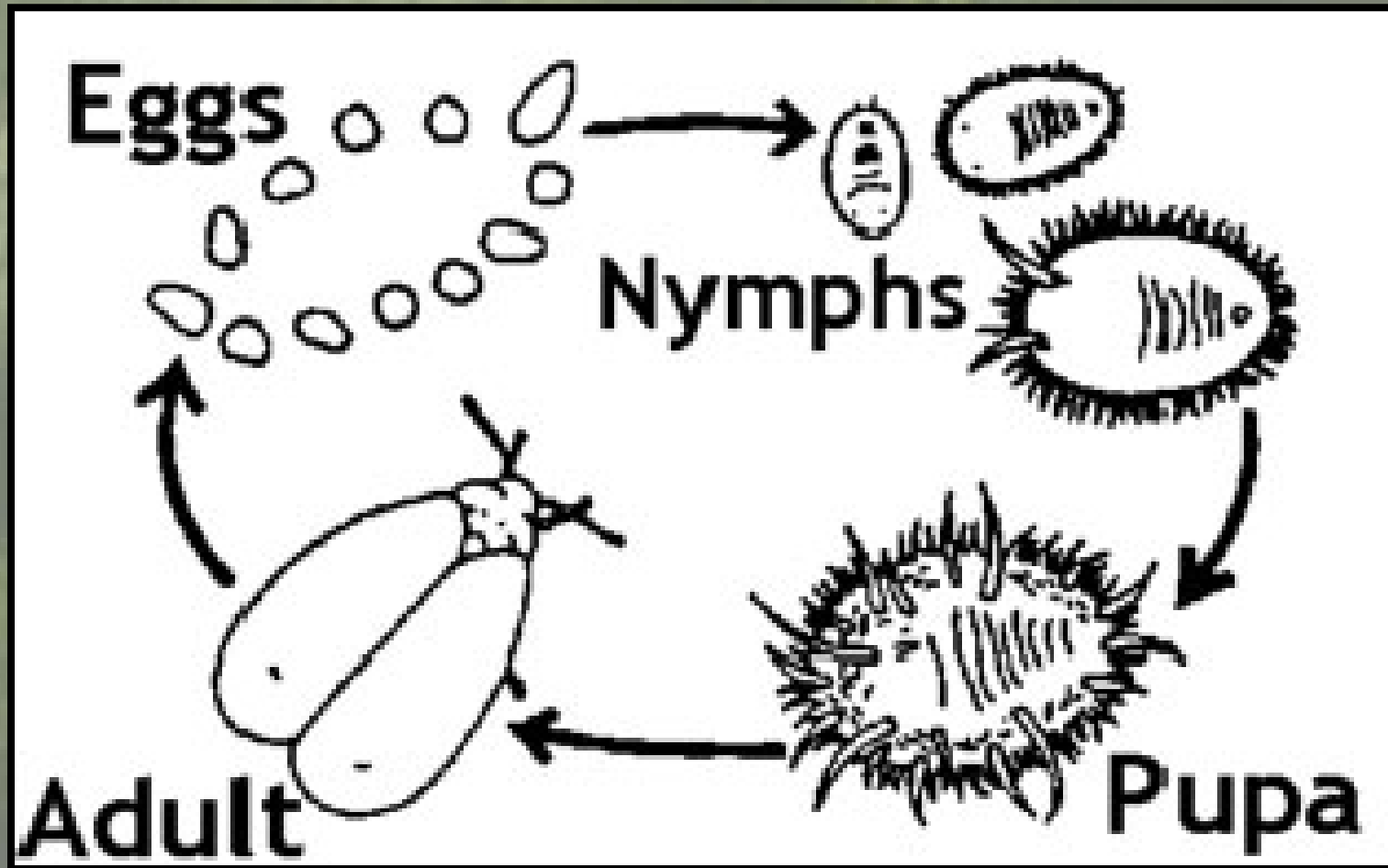
Melon Aphid Predators: Brown Lacewings



Whiteflies



Whitefly Lifecycle



Whitefly parasitoids

Encarsia formosa



Eretmocerus sp

Whitefly Predators

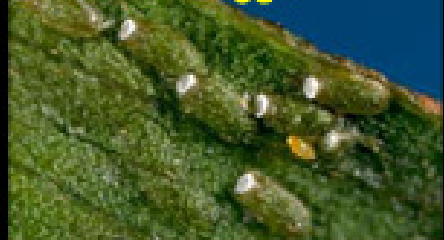
Big-eyed bugs,
Geocoris sp



Anthocoris adult



Anthocoris eggs



Orius adult



Orius nymph



Minute Pirate Bugs

Whitefly Predators

Lacewings



Ladybird beetles



Whitefly Predators

Delphastus pusillus



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Squash Bugs



Squash Bug Parasitoids

Trichopoda pennipes



* *Eumicrosoma beneficia* (Scelionid)

Leafminers



Leafminer Parasitoids



Diglyphus spp.



Cucumber Beetles



Cucumber Beetle Predators & Parasitoids

Soldier Beetles



Tachinid fly, *Celatoria diabroticae*

– Not effective controls in California

Armyworms, Cutworms, Loopers



Caterpillar Parasitoids

Hyposoter exiguae



Caterpillar Parasitoids

Microplitis brassicae



Trichogramma pretiosum



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Caterpillar Parasitoids



Tachinid flies



Caterpillar Predators

Lacewings



Ladybird beetles



Caterpillar Predators

True bugs



Robber flies



Minute Pirate Bugs



Wasps



Spider Mites



Spider Mite Predators

Western predatory mite,
Galendromus occidentalis



Phytoseiulus persimilis

Neoseiulus californicus

Neoseiulus cucumeris



Spider Mite Predators

Six-spotted thrips,
Scolothrips
sexmaculatus

Adult



Feeding on a mite



Nymph attacking spider mite



Spider Mite Predators

Spider Mite Destroyer, *Stethorus* spp.



Tiny size illustrated by



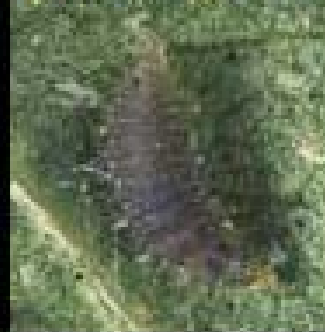
Adult



Egg



Larva



Pupa



An aerial photograph of a dense forest with a winding path. The text is overlaid on the image.

**Now you know the Natural
Enemies you want...**

But where can you get them?

Where to Purchase Natural Enemies?

University of Florida website:

**[www.hos.ufl.edu/ProtectedAg/
NorthAmericanBeneficialSuppliers.htm](http://www.hos.ufl.edu/ProtectedAg/NorthAmericanBeneficialSuppliers.htm)**

Local home and garden stores



Best Place to get Natural Enemies

A friend or neighbor's garden!
(with permission, of course)

Thank you!



eaboyd@uckac.edu



Squash Bug Parasitoids

see Metcalf&Metcalf 1993 Destructive
and Useful Insect...

Coleomegilla maculata (Coccinellidae)
perhaps not found in CA