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Biological Control Basics

Adapted from presentation by Bob
O'Neil, Rob Wiedenmann, Farah Heraux,
and Cliff Sadof

For more information see this website
<http://www.agriculture.purdue.edu/acorn>



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What is biological control?

The use of living organisms to control pest insects, weeds, or diseases. Typically involves some human activity.



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Why should we look at biological control?

- Homeowners spend over \$11 billion/year on pesticides.
- Gardeners spend 50% more on pesticides than they spend on new plant material.
- Per acre pesticide use in home gardens exceeds that of many major agricultural commodities.
- Application, storage and disposal issues challenge many home gardeners.



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Biological control

How is it Implemented?

- Use what you have.
- Add what you need.

By Whom?

- Predators
- Parasites
- Pathogens



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Predators

- Adults and immatures are often generalists rather than specialists.
- Kill and consume many prey.
- Generally larger and faster than prey.
- 200,000 species!
- Remove the evidence.



Photo courtesy of Michael Jeffords





Photo: James Sternburg





Who Am I?





Photo courtesy of Michael Jeffords

Ground Beetle Larva





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Rule of thumb

Bigger, badder, fewer, faster =
Predator





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Parasites

- Specialized in choice of host.
- Develop from eggs laid in or on a host (the original “Alien”).
- Certain kinds of wasps and flies.
- Could be up to 1 million species!
- Smaller than host (stealth pays).
- Leave a trail.

A stinger or ovipositor???



291-27



Parasitized insect was cut open to show the parasites.

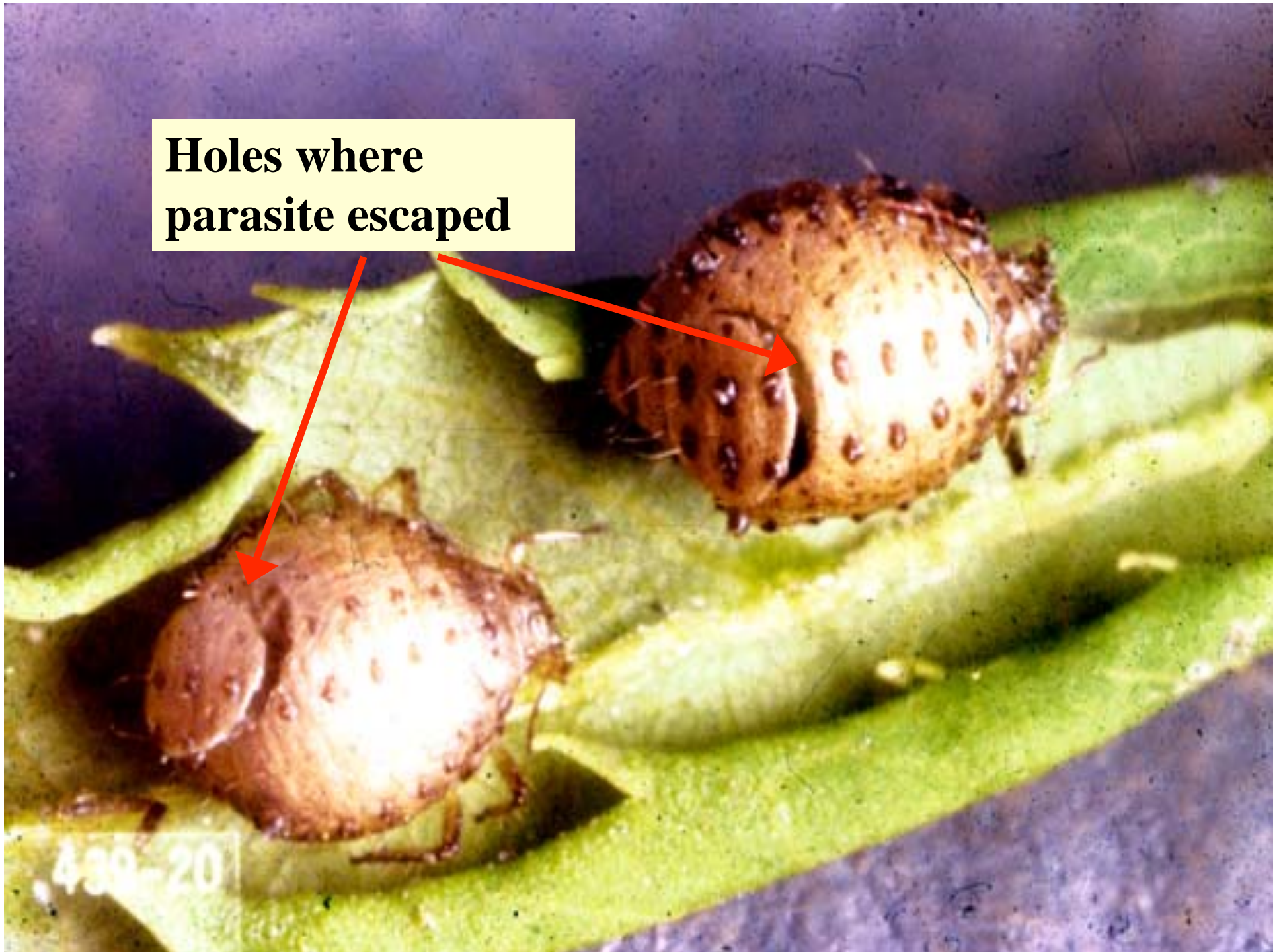


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Eggs or Pupae???



**Holes where
parasite escaped**





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Pathogens

- Kill, reduce reproduction, slow growth, shorten life of pest.
- May take several days to provide control.
- Usually very specific.
- Leave a trail.

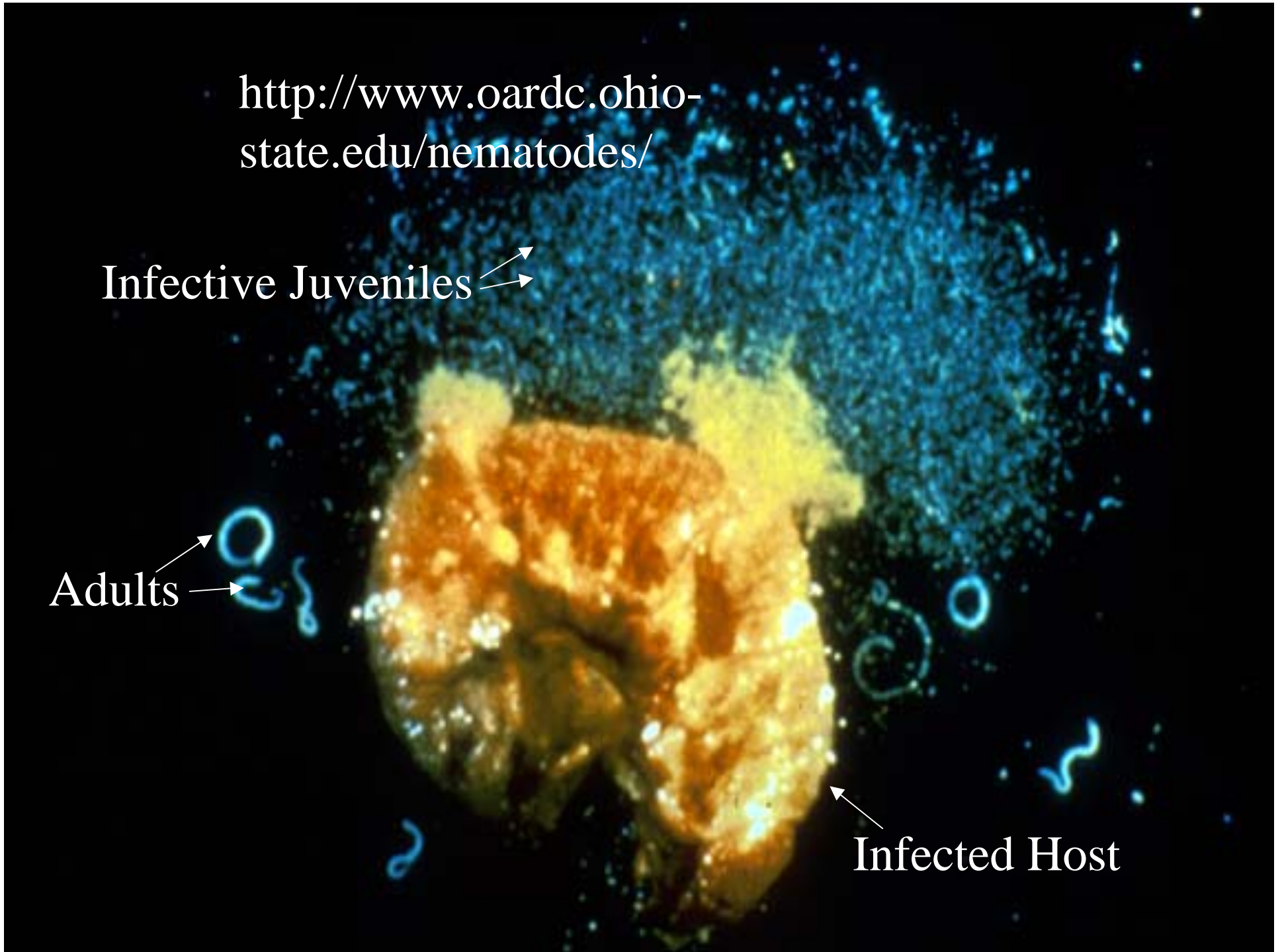


<http://www.oardc.ohio-state.edu/nematodes/>

Infective Juveniles

Adults

Infected Host







Where can you learn more about the natural enemies?

<http://www.agriculture.purdue.edu/acorn/acornsearch.aspx>



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Alternative Control Guide

search>> **Minute pirate bugs**

Minute pirate bugs



J.R. Ruberson

Natural Enemy Type: predator

Commercially Available: <http://www.cdpr.ca.gov/docs/dprdocs/goodbug/organism.htm>

Life Stage of Attack: Nymph and Adult

Comments: They feed on flower nectar from spring- and summer-flowering shrubs and plants.

Food and Shelter: Corn Goldenrod Alfalfa Yarrow Caraway Cosmos Mints Goldenrod

This Natural Enemy Attacks: Leafhopper Aphid Corn Earworm or Tomato Fruitworm Fall Armyworm Onion Thrips Potato Leafhopper Twospotted Spider Mite Green Cloverworm Thrips Potato/Tomato Psyllid