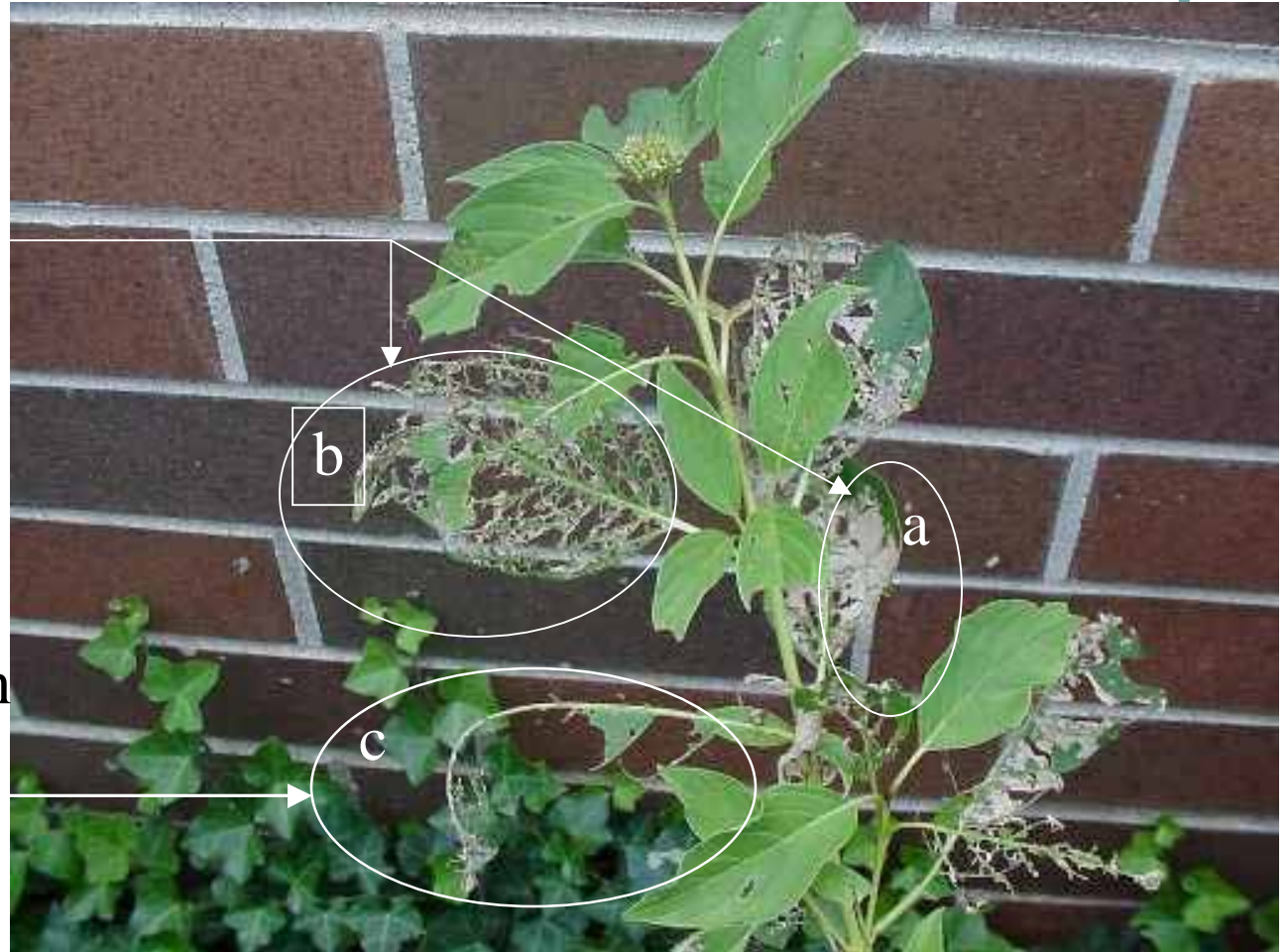


Leaf Symptoms- Defoliation= Parts missing

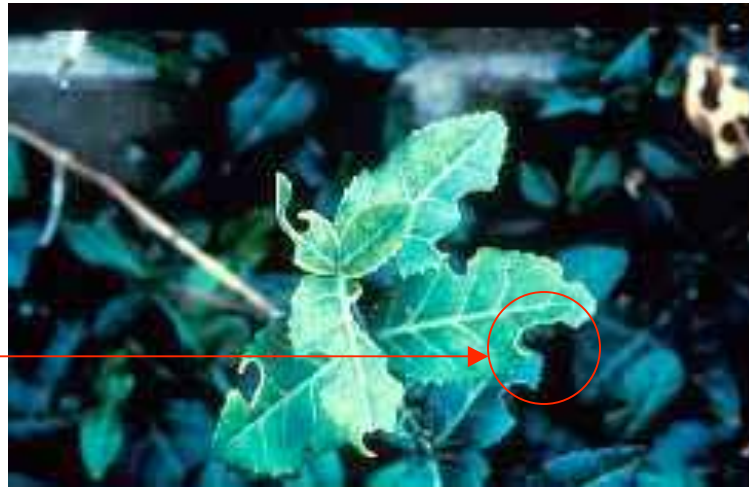
Skeletonization
(all veins remain)

Complete defoliation
(all leaf tissue consumed)



Leaf Symptoms- Leaf notching

Irregular pattern



Circular pattern



Skeletonization



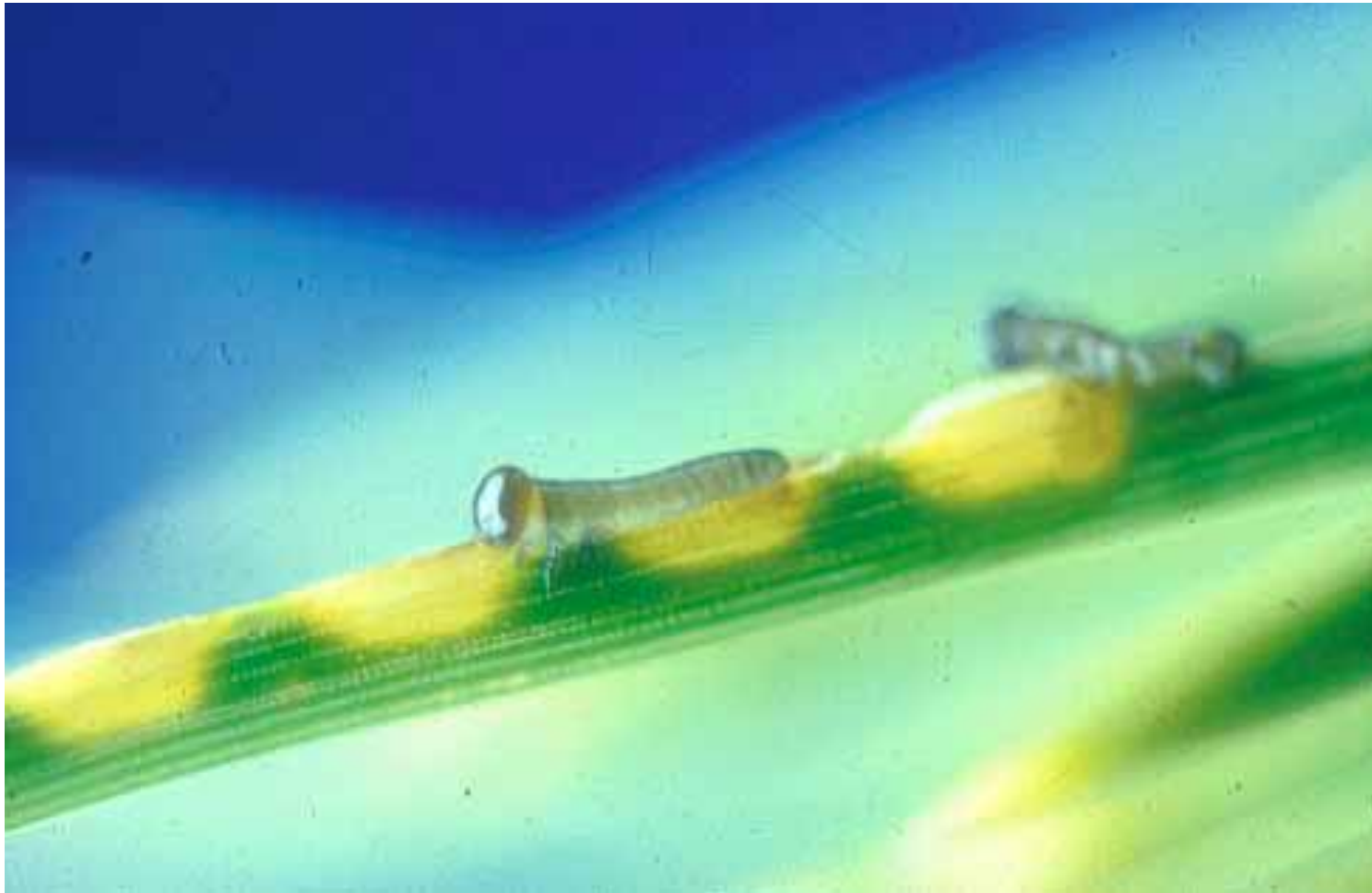
Defoliation by European Pine Sawfly, *Neodiprion sertifer*



Adult European Pine Sawfly



First Instar European Pine Sawflies



European Pine Sawflies Damage



Defoliation by Pine Sawflies



European Pine Sawfly



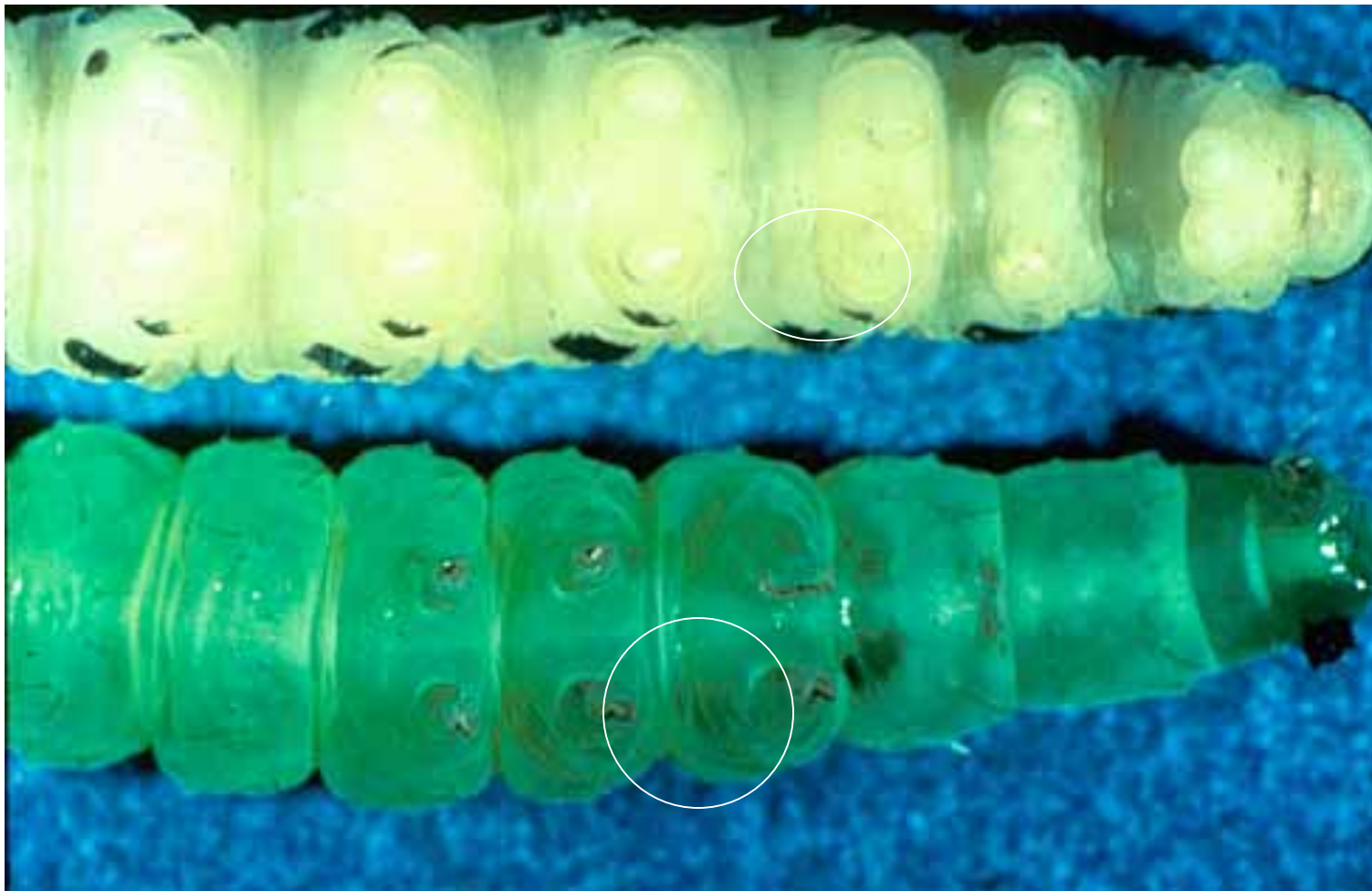
Pupal cases of European Pine Sawfly



How to Distinguish Between a Caterpillar and a Sawfly?



How to Distinguish Between a Caterpillar and a Sawfly? II



White Pine Sawflies



Red-headed Pine



Pentatomid Plant Bug Predator Feeding on Introduced Pine Sawfly



Pear Slug Sawfly on Cottoneaster



Pear Sawfly, *Caliroa cerasi*



Rose Slug



<http://www.agnr.umd.edu/users/hgic/diagn/broad/roseslug.html>

Dogwood Sawfly Injury and Larval Size

Skeletonization
(all veins remain)

Complete defoliation
(all leaf tissue
consumed)





Late Stage
Dogwood
Sawflies

Poplar Leaf Beetle



Elm Leaf Beetle



Elm Leaf Beetle Defoliation (Skeletonization)



Adult Elm Leaf Beetle (***)



Elm Leaf Beetle Larva and Eggs (***)



Adult and Pupa of Elm Leaf Beetle



3

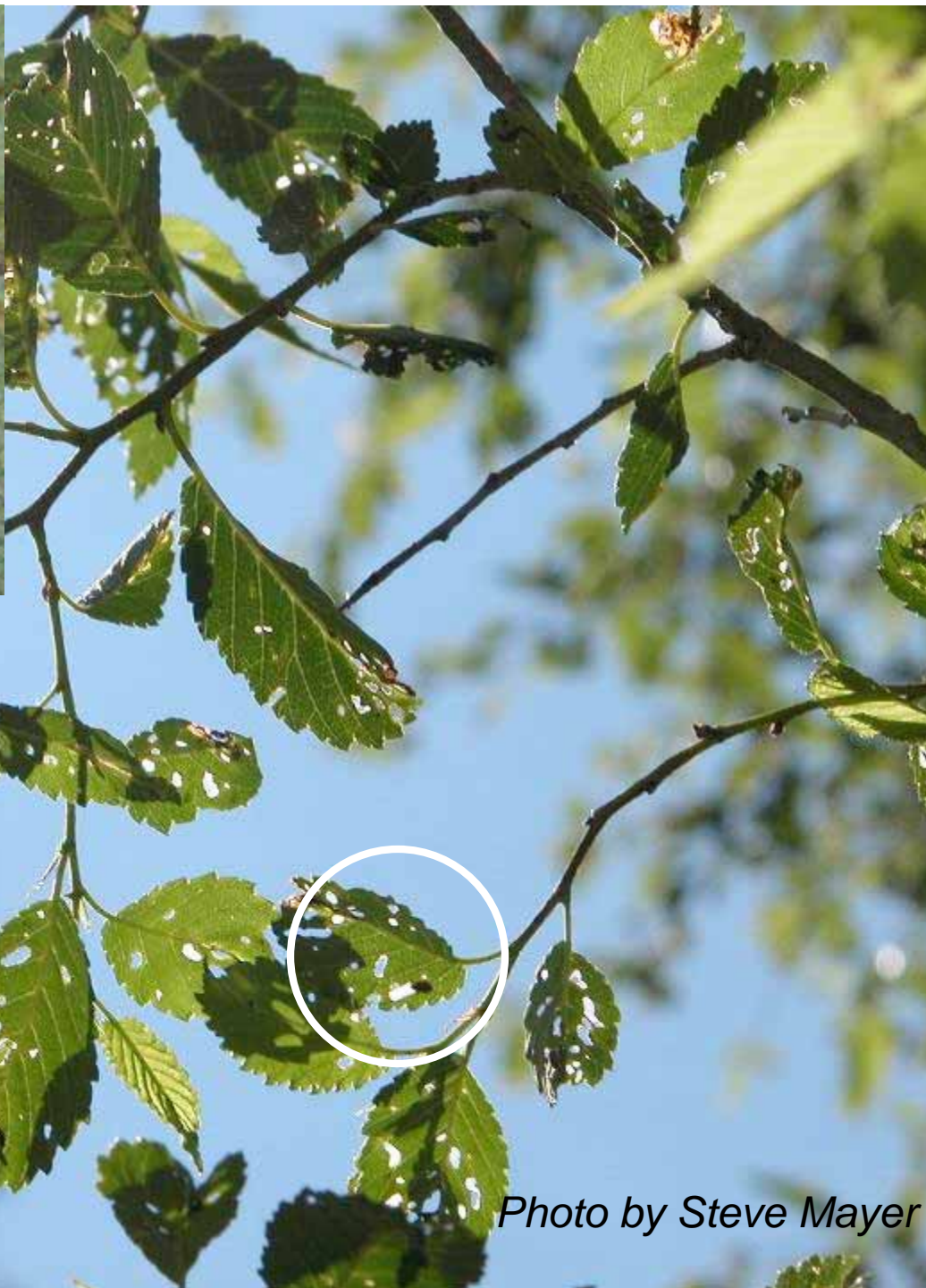


Photo by Steve Mayer

Elm Flea weevil *Orchestes alni*

- First found in 2003 in multiple locations of Midwest including West Lafayette
- OW adults emerge in May to feed on Elms through early June
- Eggs laid in leaves produce June mines
- Adults emerge in late July and feed on leaves till they overwinter.

Japanese Beetle; *Popillia japonica*



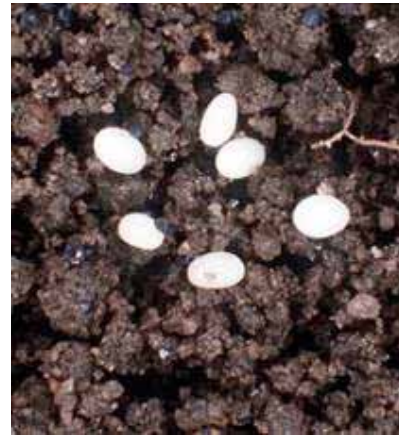
Linden Skeletonized by Japanese Beetle



Japanese Beetle



Japanese beetle, *Popillia japonica* Newman (Coleoptera: Scarabaeidae)



cluster of eggs.



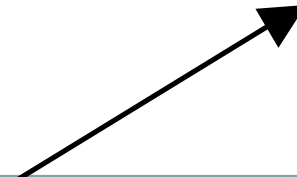
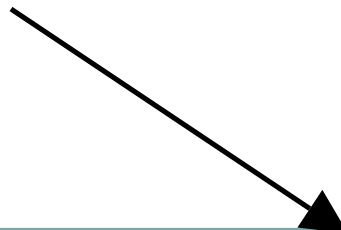
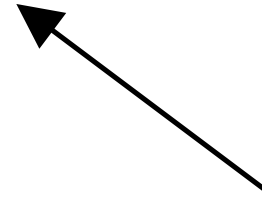
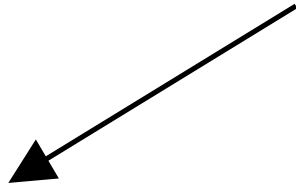
Japanese beetle larva.



Japanese beetle pupa.



Adult Japanese beetle



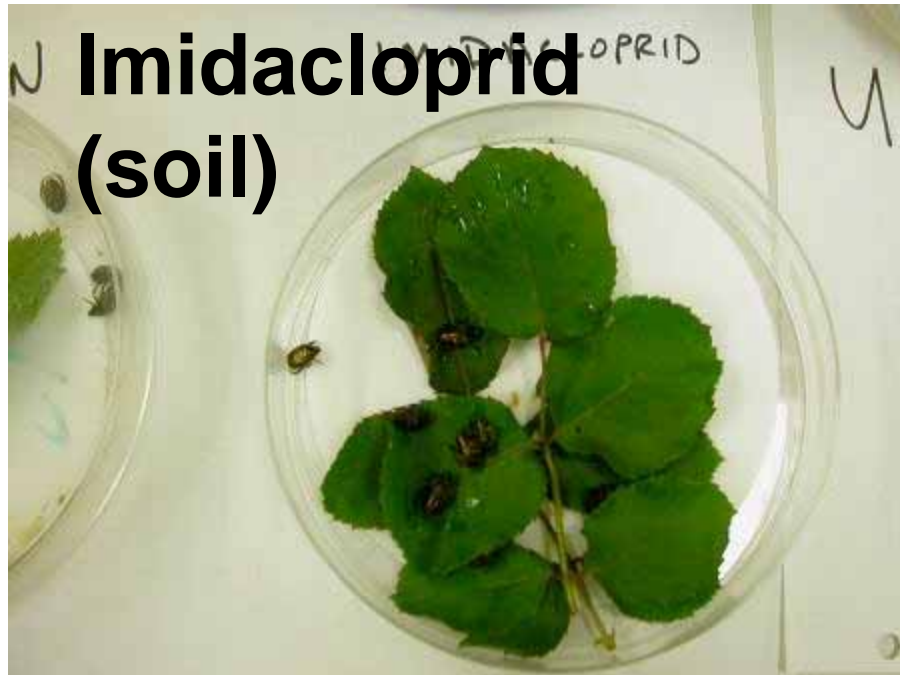
Foliar Rescue Treatments

Pyrethroid

- Deltamethrin – Deltaguard
- Bifenthrin - Talstar
- Cyfluthrin - Mavrik
- Lambda cyhalothrin- Scimitar Carbamate
- Carbaryl – Sevin

Controlling Japanese Beetles on Roses





**Sevin
(foliar)**

**Azadirachtin (Azatrol)
(soil)**

Soil Applied Products

- Imidacloprid (Merit and others)
- Dinotefuran (Safari)

Good Short term Protection (< 3 Day)

- Pyola (Neem + Canola)
- Neem Away
- Azatrol

Not Recommended

Not Effective (NE) or Phytotoxic (PT)

- Orange Guard (PT)
- Garlic Guard (NE, PT)
- Hot Pepper Wax (NE)
- Surround Kaolin (NE)

Transportation of Japanese Beetles in Cargo Planes



Asiatic Garden Beetle



D. Shetlar Photo

Asiatic garden beetles feeding & mating

Adults feed at night

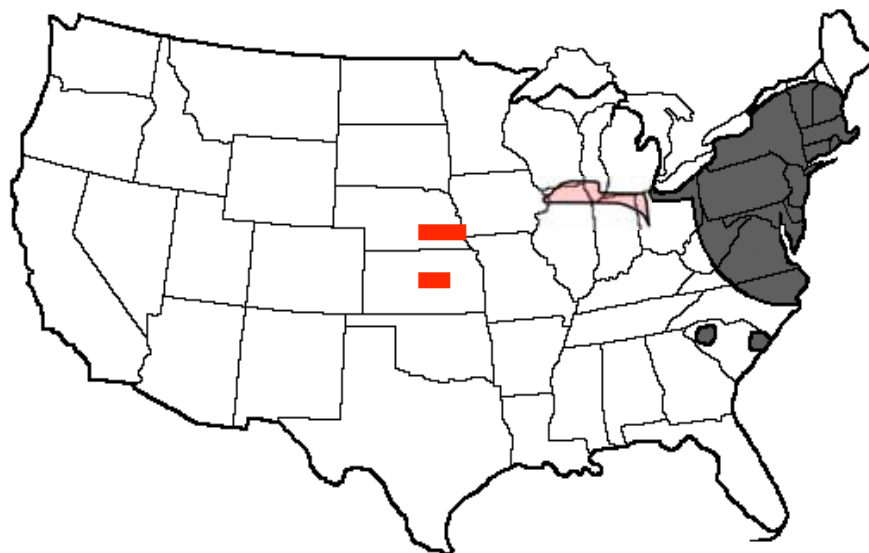
Adults shred leaves in perennial beds

Larvae a pest of perennials, minor problem for turf

Asiatic Garden Beetle Pest Threat: Perennials, flowers

- Adult feeding- at night
 - Flowers (aster, dahlia, mum, roses)
 - Foliage, trees and vegetable crops
 - Shred leaves, like a caterpillar
 - Found in groups during July and Aug in flower beds
- Larval feeding
 - Roots of perennial plants, flowers and vegetable crops
 - Turf a secondary problem

Asiatic Garden Beetle

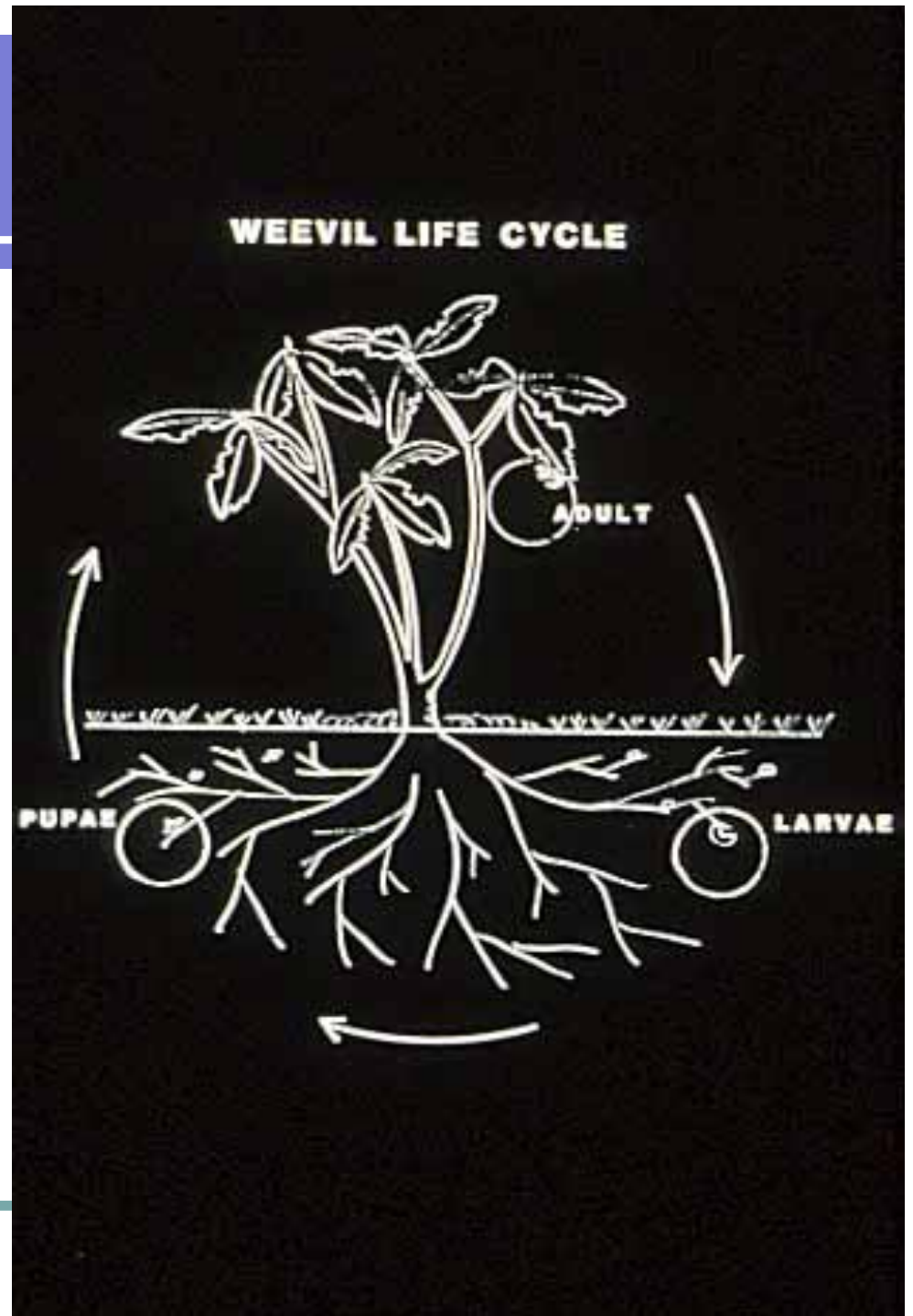


Asiatic Garden Beetle (2000) 
Projected Distribution (2006) 
Indiana Finds (2007) 

Black Vine Weevil; *Otiorhyncus sulcatus*



Weevil Life Cycle



Irregular Notching of Black Vine Weevil



Circular Notching of Leaf Cutter Bee



Removal of strips of leaf tissue between veins



Garden Slugs

