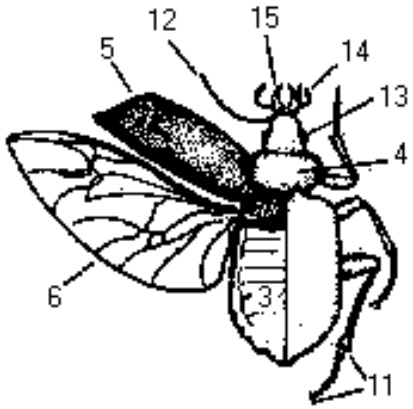
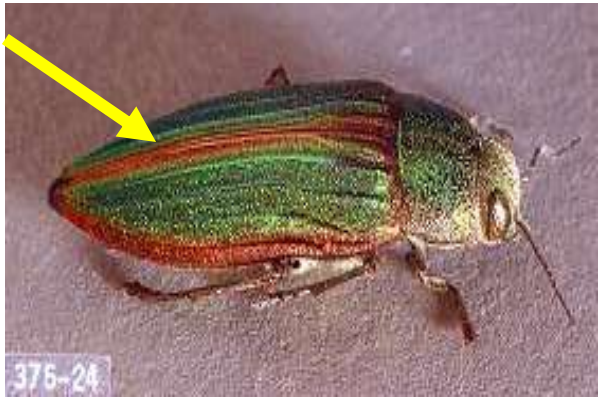
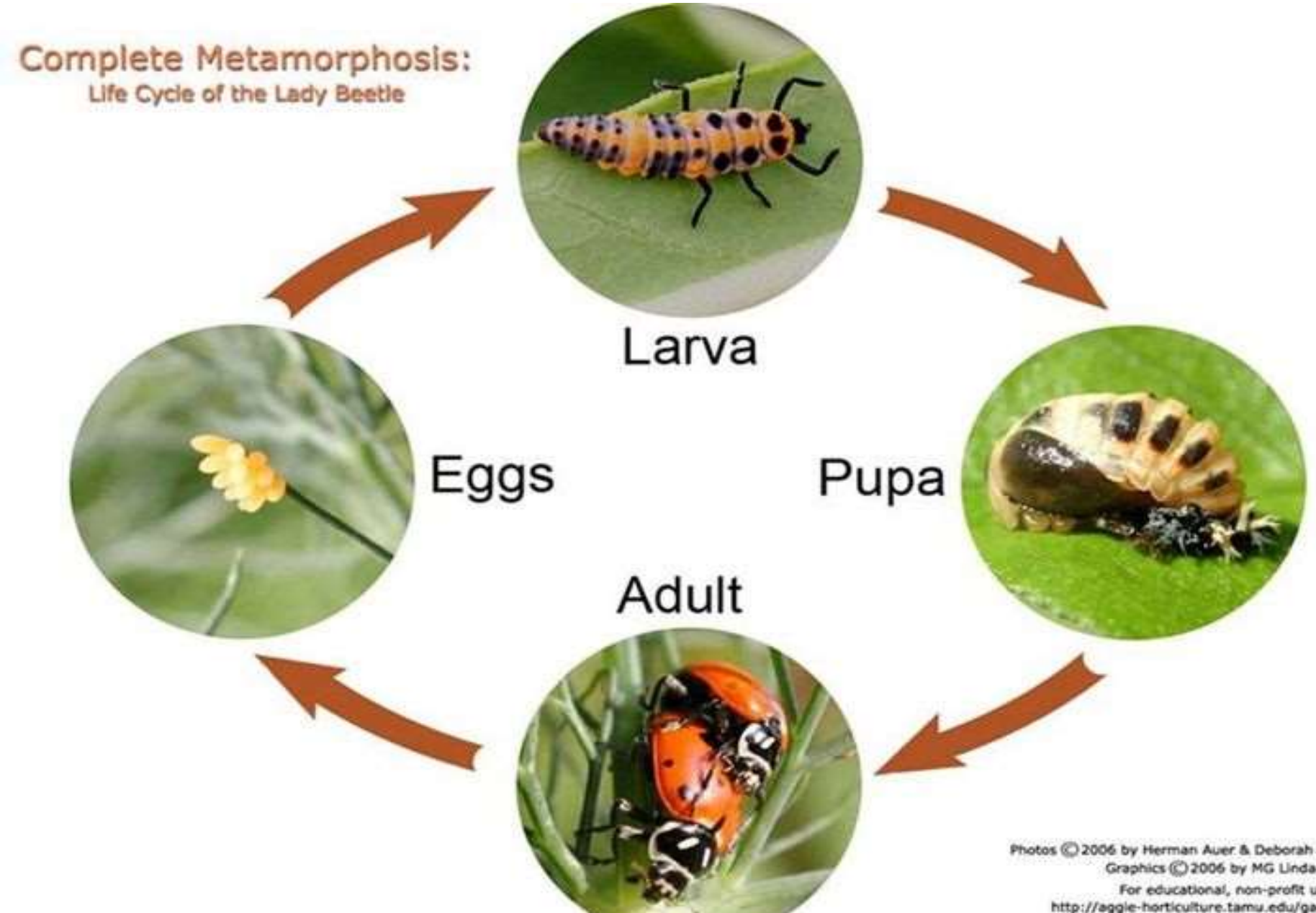
Beetles



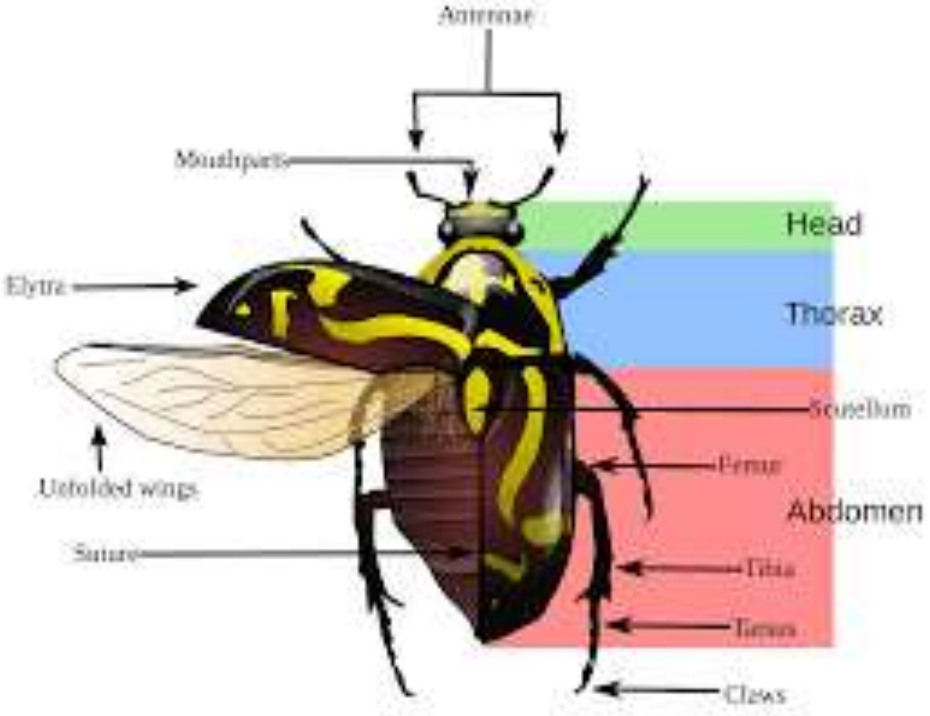


Life Cycle


Complete Metamorphosis:
Life Cycle of the Lady Beetle
Larva
Pupa
Adult
Eggs
Photos © 2006 by Herman Auer & Deborah Repasz
Graphics © 2006 by MG Linda Steber
For educational, non-profit use only
http://aggie-horticulture.tamu.edu/galveston

Wings

Hard shell Forewings (elytra) almost always meeting in a straight line down the back and covering the membranous hindwings that are usually longer than the forewings and are folded beneath the forewings when not in use.



Mouthparts

All beetles, both larvae & adults are **chewers**

Scarab Beetle Larvae

Some Pesky Beetles

Long horned beetles adults on goldenrod

Spruce Bark Beetles

Flour beetle

Soldier Beetle

(Red or scarlet) lily leaf beetle

Some Pesky Beetles

Wood borer (larvae) & & pollinator (adult)

Predator & Pollinator

Stored Product Pest

foliage feeder (adults & larvae)

Predatory Beetles

Some beetles are predators of invertebrates including many pests, which make these beetles a beneficial organism. If you are fortunate, some can be observed on leaves with their prey.

The ladybird beetle consuming an aphid

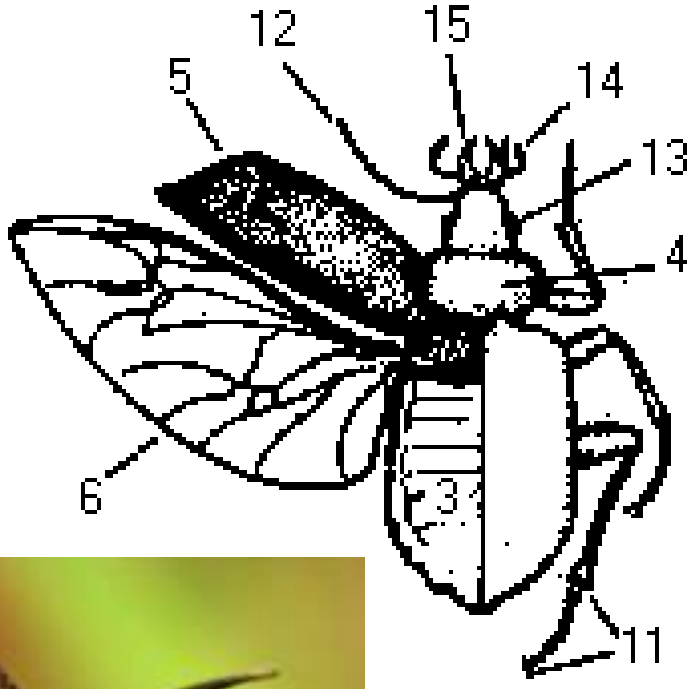
Pollinators

These beetles feed on flower parts while gathering pollen. Beetles are responsible for pollinating 88% of the 240,000 flowering plants globally (USDA).

Black and yellow beetle

Insect, Beetle, Flower, Dandelion

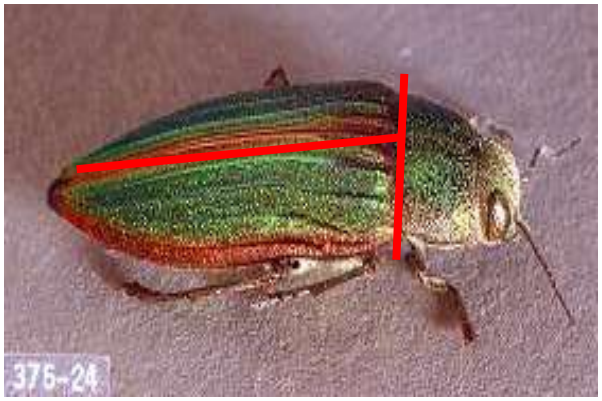
Beetles

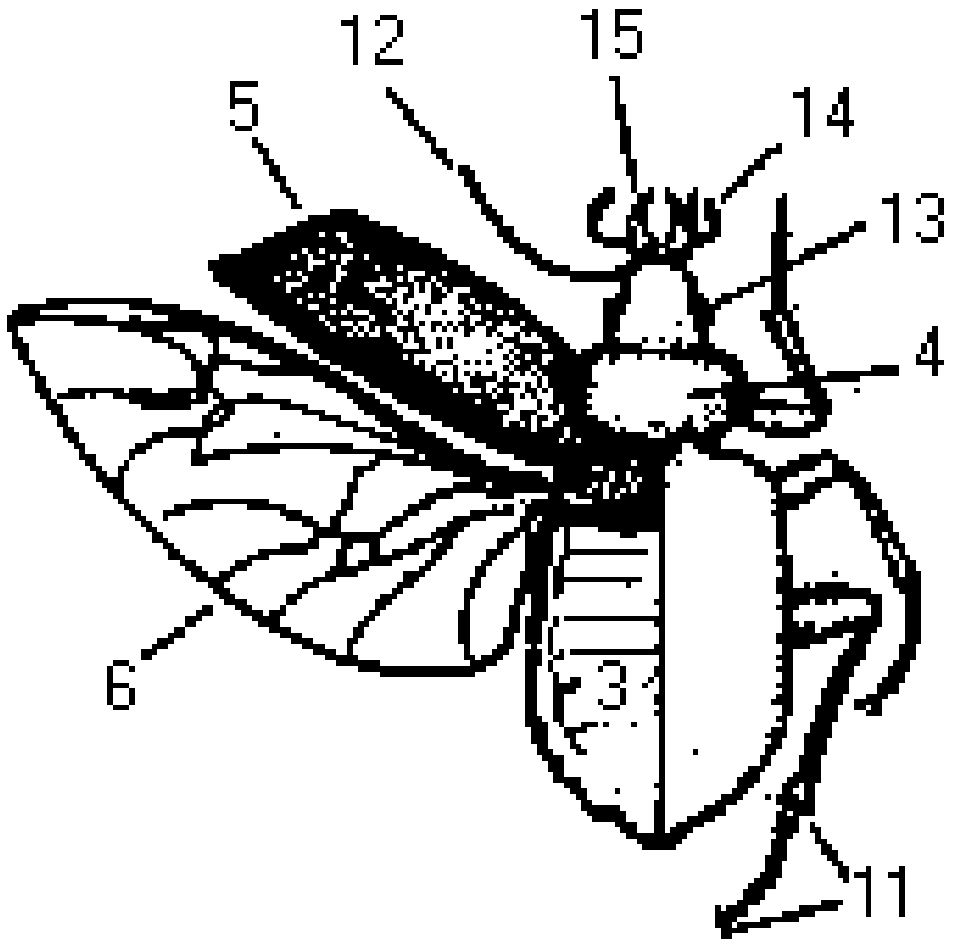


- Wings: 1 pair hard for protection, over membranous wings used for flying
- Straight line where wings meet

Source (change to black)-

Beetles

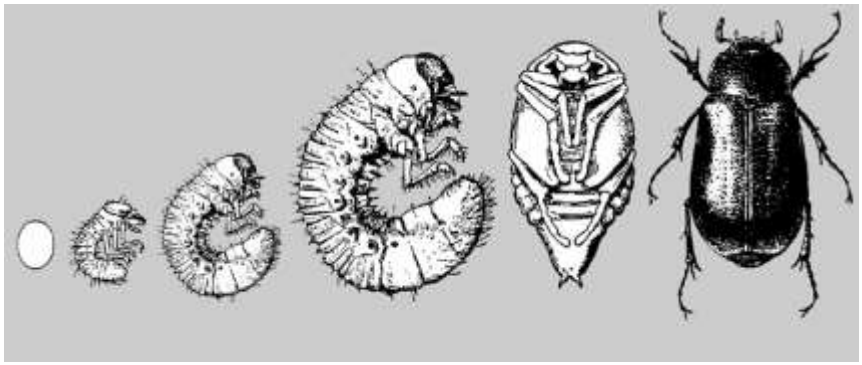




- Wings: 1 pair hard for protection, over membranous wings used for flying
- Straight line where wings meet

Beetle Look-Alikes

Beetles: Complete metamorphosis



http://entomology.osu.edu/bugdoc/Shetlar/462/462InsectOrders/Orders04.htm

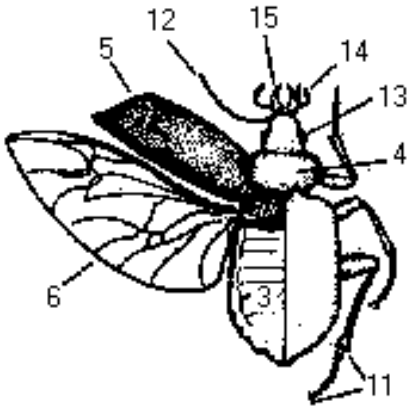
Stink bugs: Incomplete metamorphosis

http://www3.telus.net/conrad/images3/ch_8-04f.gif

Class: Insecta

Order: Beetles

Order: Coleoptera



T

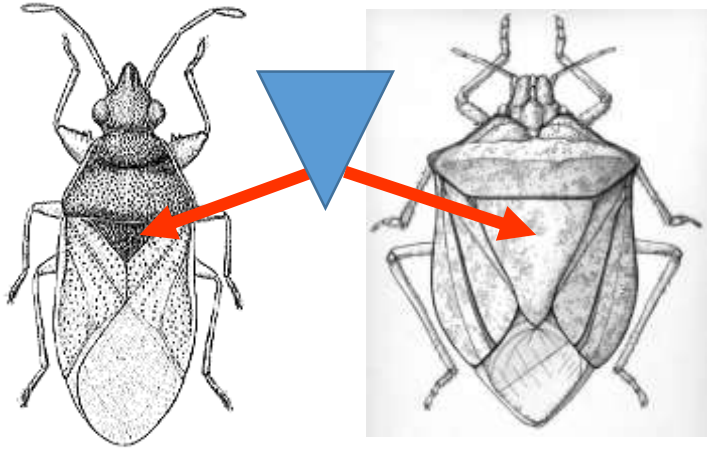
- Wings: 2 pairs (4), hard forewings that meet in a straight line (T) protecting membranous hindwings
- Legs: 3 pairs (4), various types
- Antennae: 1 pair (2), variable types
- Mouthparts: chewing
- Metamorphosis: complete

Class: Insecta

Order: **Hemiptera**

Suborder: **Heteroptera**

Suborder: **Homoptera**



True bugs

- Forewings of two textures
- Upper forewing is leathery
- Lower forewing membranous
- Hindwing membranous
- Triangular scutellum (arrow)
- Nymphs wingless
- Sucking mouthparts
- Metamorphosis: incomplete

Sucking bugs

- Both wings membranous
- Held roof-like

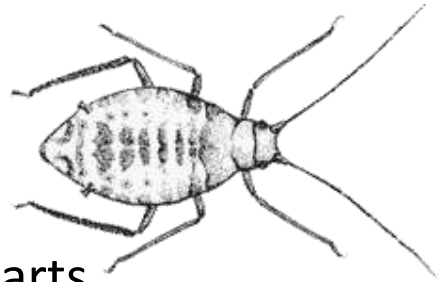
over the body

- Nymphs:

Wingless

Sucking mouthparts

Metamorphosis: incomplete



Drawings http://www.ento.csiro.au/education/insects/hemiptera.html

Defoliators

Root Weevils

Adult Weevil Damage

"W" for weevil

Lilac weevil

Nut leaf weevil

Non-weevil Damage

"C" for caterpillar or cutworm

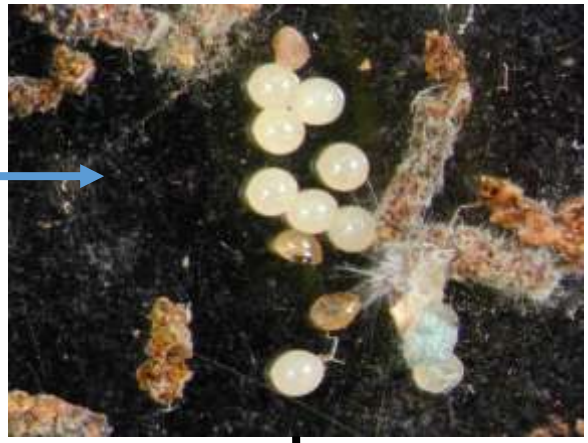
Root Weevil Larval Damage

- Larvae feed first on the fine roots on outside edges and bottom of the container
- Thumb-sized depressions & bare spots
- Move inward and feed on larger roots
- Eventually feed on root crown girdling the plant
- Soil doesn't hold together

Generic Weevil Life Cycle

Adult

No males in most species



Eggs

Larva (several larval instars here)

Pupa:

Resting & transformation

New Weevils Emerging in Spring & Early Summer

need 2-6 weeks of feeding to mature eggs

Emerge April-May

Emerge early May to early June

1

2

3

New Weevils Emerging in Fall and Winter

- Woods weevil complex emerges in late August, peaking Sept.-Oct.
- Feeds abundantly in winter
- Suspected: some egg laying in winter, with most eggs laid in spring as weather warms

Woods weevil complex

a. N.horni;
b. N. incomptus
c. N. montanus

Possibly **nut leaf weevil** and ***Sciaphilus asperatus*** emerge in fall as well.

Defoliators & Skeletonizers

Elm Leaf Beetle,

Cottonwood Leaf Beetle

Defoliators & Skeletonizers

Leaf beetles

Asparagus beetle

Spotted and Striped Cucumber Beetle

- Spotted is here and we are getting increasing reports.
- Stiped is not (I hope).
- Both feed on leaves in spring
- Mate and lay eggs in soil
- Larvae feed on roots
- Adults feed on flowers and leaves.

New

Lily Leaf Beetle

Pest Watch: Lily Leaf Beetle (Home Garden Series). WSU Extension. FS084E. 2pp. https://pubs.wsu.edu/ItemDetail.aspx?ProductID=15661&SeriesCode=&CategoryID=&Keyword=lily leaf beetle

- One generation per year
- Adults overwinter in duff
- Adults emerge when lily shoots first begin to grow
- Mate and lay eggs immediately

New

Defoliators & Skeletonizers

Pest Watch: Viburnum Leaf Beetle (Home Garden Series). WSU Extension. FS202E. 6pp. https://pubs.wsu.edu/ItemDetail.aspx?ProductID=15847&SeriesCode=&CategoryID=&Keyword=pest watch

Photos by T. Murray, WSU

- One generation per year
- Overwinter as eggs
- Hatch in spring and larvae feed on foliage
- Pupate in the ground
- Adults emerge in mid summer

Pea Leaf Weevil

From Extention Bulletin 0903E:

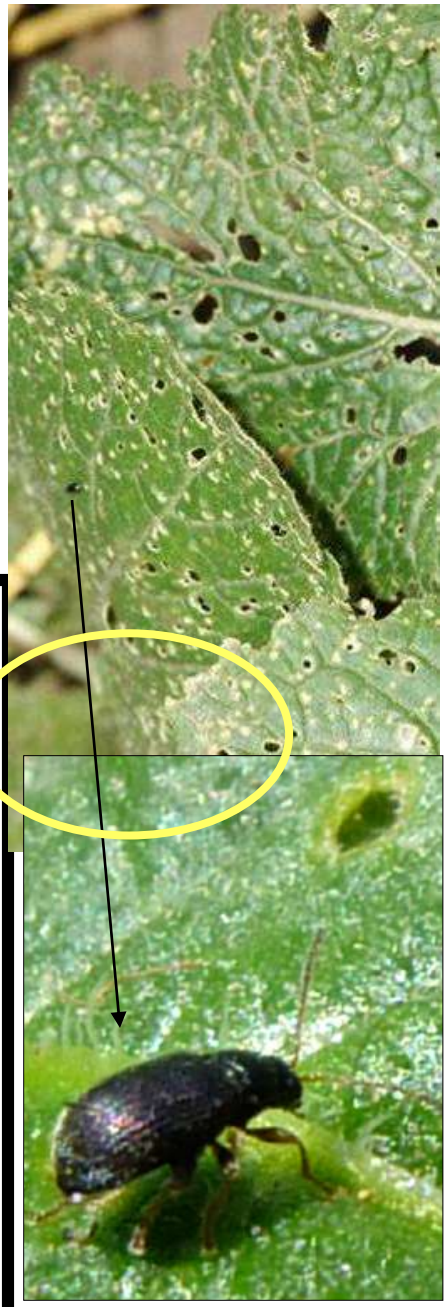
- One generation per year
- Overwinters as an Adult weevil; emerges in **April/early May**?and will fly to its preferred legume - peas.
- Adults eat leaves – may kill the young plants if abundant
- Once plant has 6+ leaves it will survive unless weevils are particularly numerous.
- Larvae feed on *Rhizobium Spp*. nodules on a lot of legumes.

1/5 inch long

Scalloped leaf edges made by the adult weevil

Growing Groceries
A Program of WSU Snohomish County Extension

Flea Beetles



Adults feed on leaves.

Larva feed on roots.

Potatoes, Tomatoes, Bittersweet Nightshade and Brassicas are most effected here.

<u>Life Cycle.</u>

- **Overwinter as adults under soil and leaf litter/lay eggs in early spring.**
- **Eggs hatch in a week or two and the larvae feed until fully grown. Then they pupate and reemerge- multiple cycles a season.**

Skeletonizers

Skeletonizers

Flea Beetles on Vegetables

Potato

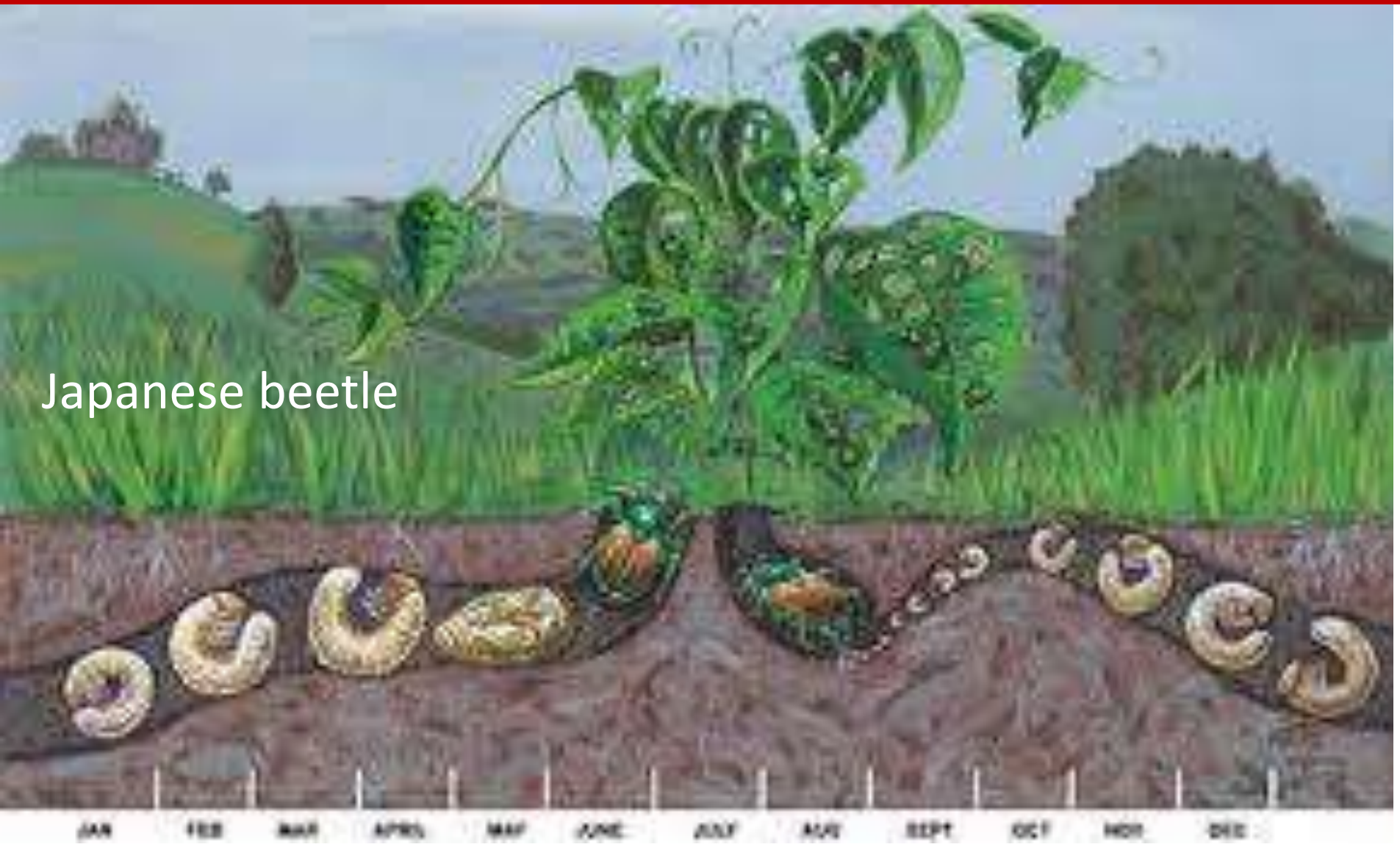
Skeletonizers

Alder and willow flea beetles

- One generation per year
- Adults overwinter in duff
- Emerge in spring and lay rafts of yellow eggs
- Eggs hatch and new larvae begin feeding
- Older larvae feed until mature in August
- Drop to the ground to pupate
- Adults appear a 7 – 10 days later and “feed voraciously until the close of the season”
- Hibernate for winter in the ground

New

Skeletonizer and Root Feeder



New

Skeletonizer and Root Feeder

Japanese beetle

Worst….beetle

….ever!!!

New

Skeletonizer and Root Feeder

Japanese Beetle

One generation per year. Prolific.
Small populations have been detected in WA.
Notify Dave or me if you even think you see a Japanese beetle

Lovely to look at if you are a beetle collector…

…unless….

it’s your flower.

New

Root Feeders

Pest Watch: European Chafer

WASHINGTON STATE UNIVERSITY EXTENSION FACT SHEET • FS078E

WSU Extension *Pest Watch* fact sheets identify new agricultural pests in or near Washington State that pose environmental and economic threats. In the event of a severe pest outbreak, a *Pest Alert* will be issued with emergency pest management and control information.

Introduction

The European chafer (scientific name *Rhizotrogus majalis*, family Scarabaeidae) is a beetle that causes damage to turf and cereal crops when in its larval (or grub) form. Because it is now confirmed as a problem in southwest British Columbia, Canada, it is important that Washington State gardeners and horticultural professionals are aware of this pest, recognize its various life stages, and know how to report new infestations.

Distribution

The European chafer was introduced to the United States in the 1940s on the East Coast. States that are currently infested with the pest include New York, Michigan, Ohio, Maryland, West Virginia, and Indiana. In 2001, European chafer grubs were discovered infesting lawns in New Westminster, the greater Vancouver area of British Columbia, Canada, less than 15 miles from the northernmost border town in Washington State (Fig. 1). Canadian entomologists have since then tracked a slow rate of natural dispersal up to 10 miles from the epicenter.

June-beetle shape and are about 1/2 inch long (Fig. 2). The larvae are C-shaped and white with a dark head capsule. When mature, European chafer larvae have three pair of visible legs and are about 3/4 inch long (Fig. 3).

Other insect larvae that feed on turf include cra
cutworm caterpillars. Crane larvae are legless an
with a retracted head capsule (Fig. 4; see also EB
pean Crane Fly: A Lawn Pasture Pest). Cutworms,
garden plants, are typical caterpillars, not C-sha
prolegs (small fleshy protuberances) on the abd

New

Root Feeders

European chafer

Root Feeders

Ten-lined June Beetle

- Mostly a curiosity
- Larvae feed on roots of pasture or beach grasses.
- 3-4 year life cycle
- Can be a crop or forest nursery pest when crop follows pasture

Root Feeders

Billbugs

- *Sphenophorus sayi*, Say's Billbug
- *S. parvulus*, Bluegrass billbug
- *S. cicatristriatus*

Joseph Berger, www.insectimages.org

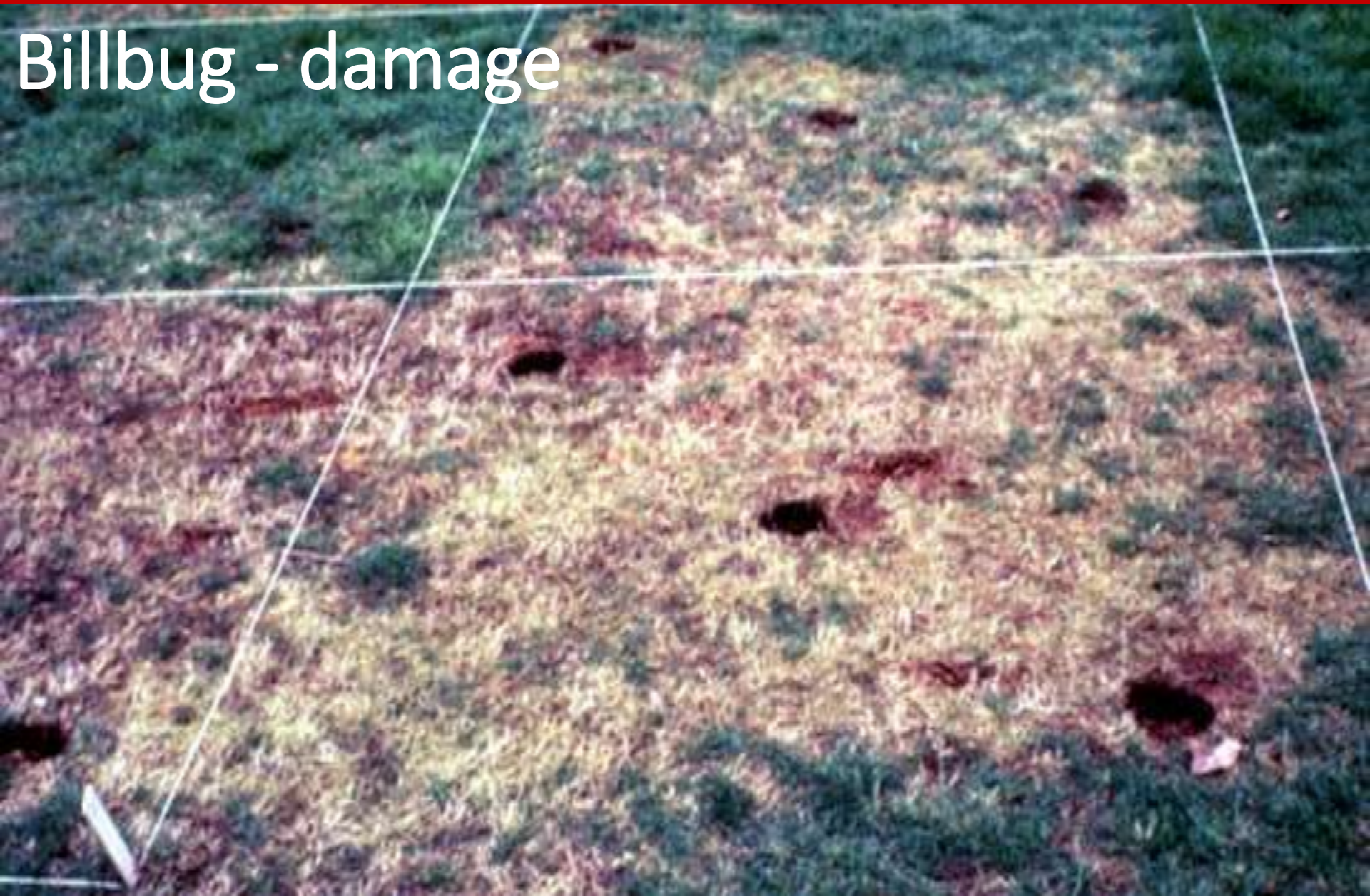
Root Feeders

Billbug - larvae

Root Feeders

Billbug damage (stems pull away)

Root Feeders



New

Growing Groceries
A Program of WSU Snohomish County Extension

Wireworms

- A real problem if you have them.
- Larvae of Click Beetles, can live 3-5 years before pupating.
- By the 5th year they are very damaging.
- Overwinter in the soil.
- Damage potatoes, corn, grains, carrots, melons, beets, and strawberries.

Larvae feeding on corn seed (above), adult beetle (below)

New

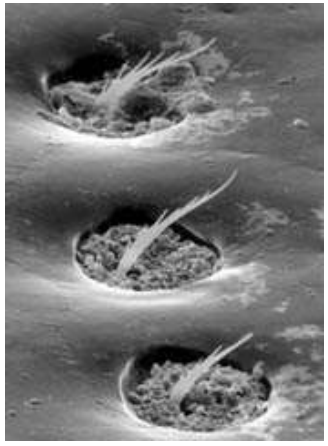
Root Feeders

Wireworm monitoring (and control?)

Monitoring technique

- Bury sprouted wheat or oatmeal in a mesh bag or cheese cloth about 6” under soil.
- Mark the spot(s).
- Pull it up in a few days to a week.
- Wireworms will crawl into the bag and be sticking out

Bark Beetles



Bark Beetles

Dendroctonus sp.

Rounded “rump”

Ips sp.

Scooped out “rump”

Bark Beetles

New

Bark Beetles

California Five-spined Ips

Pest Watch:
California Fivespined Ips—
A Pine Engraver Beetle
New to Washington State

WASHINGTON STATE UNIVERSITY EXTENSION FACT SHEET • FS085E

WSU Extension *Pest Watch* fact sheets identify new agricultural pests in or near Washington State that pose environmental and economic threats. In the event of a severe pest outbreak, a *Pest Alert* will be issued with emergency

Figure 2. Adult male CFI. (LaBonte, ODA)

for the first time in Washington State. As of 2012, CFI has been collected on the eastern slopes of the Cascade Mountain Range east to Lyle and north to Trout Lake, along the Columbia River Gorge, and in the western valleys as far west as Vancouver and north to Toledo (Figure 1). It is unclear if this is a range expansion or a previously unknown historical range. Regardless, this is the first time outbreaks have been reported.

Identification and Life Cycle

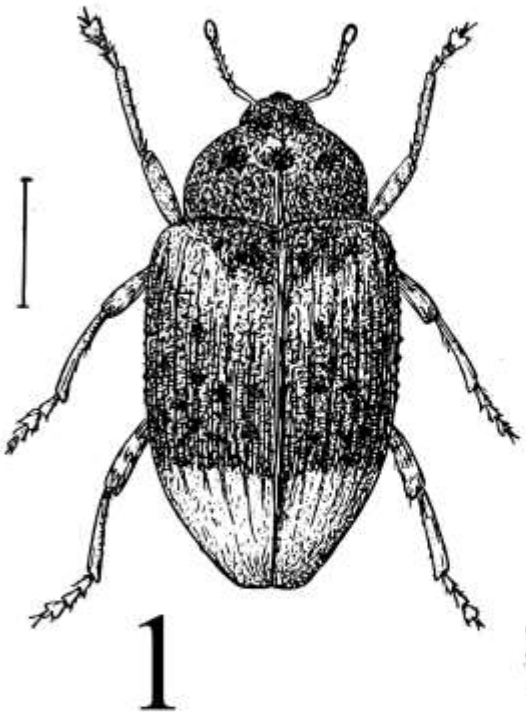
- New pest moving northward
- Host: Ponderosa pine
- Gallery under bark is Y shaped
- Difficult for MGs to watch for because the beetle is small and other bark beetles cause similar damage.

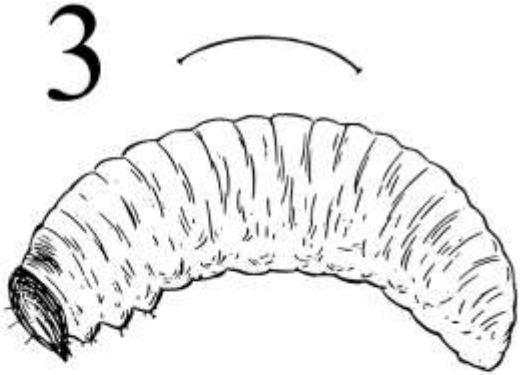
Poplar-and-Willow Borer

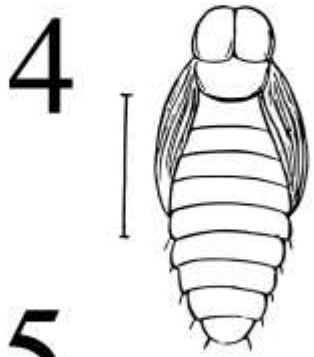
- Serious pest of some willows and poplars
- Susceptibility varies with cultivar or species

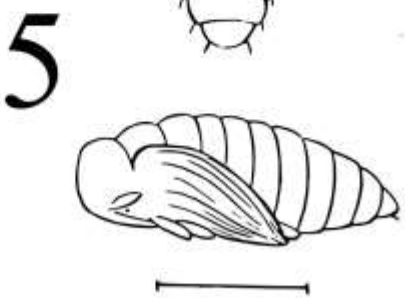
Gyorgy Csoka, Hungary Forest Research Institute, www.forestryimages.org

Poplar-and-Willow Borer









Adults live 3 years, but new adults emerge each year, so that the number of adults laying eggs increases rapidly.

1. Adult
2. Damage
3. Larva
4. Pupa

Poplar-and-Willow Borer

White Pine Weevil

John A. Weidhass, Virginia Polytechnic Institute and State University, www.forestryimages.org

White Pine Weevil

Minnesota Department of Natural Resources Archives,
Minnesota Department of Natural Resources, www.forestryimages.org

Watch

Emerald Ash Borer

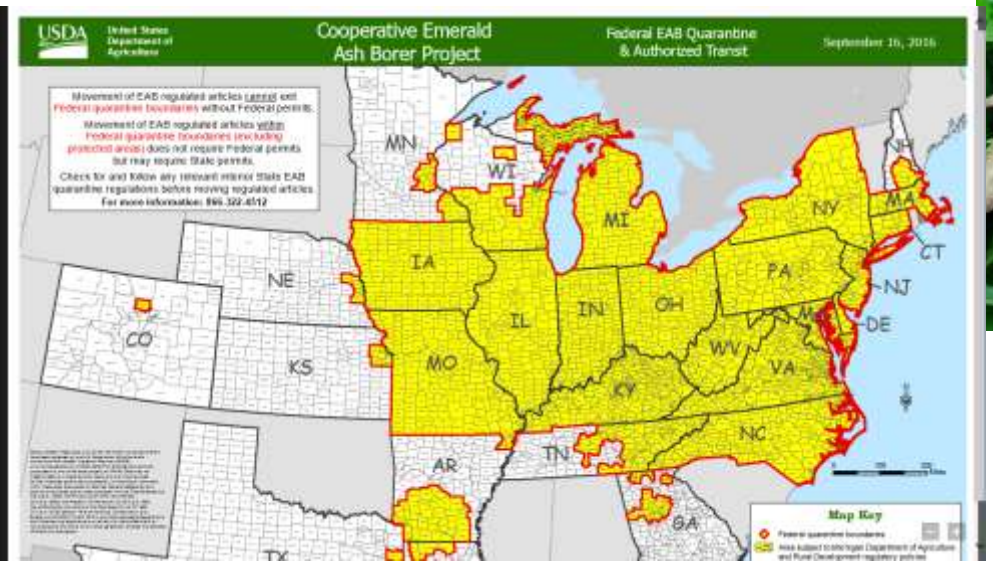
D-shaped hole is typical of most flat-headed borers

D

This is a very tiny beetle 1/3”

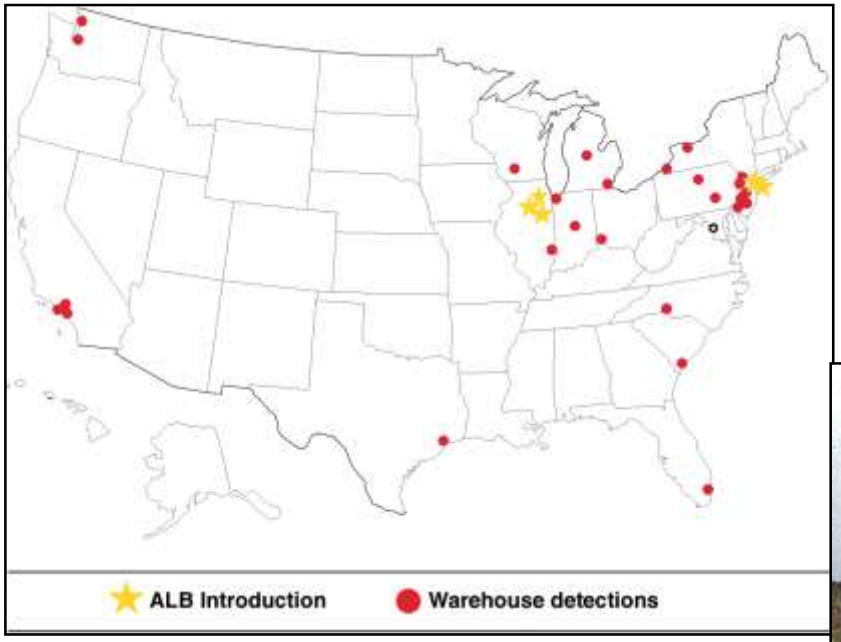
Emerald Ash Borer

- Ash only
- Moving westward and south from infested states
- Moves with firewood



Damage under the bark

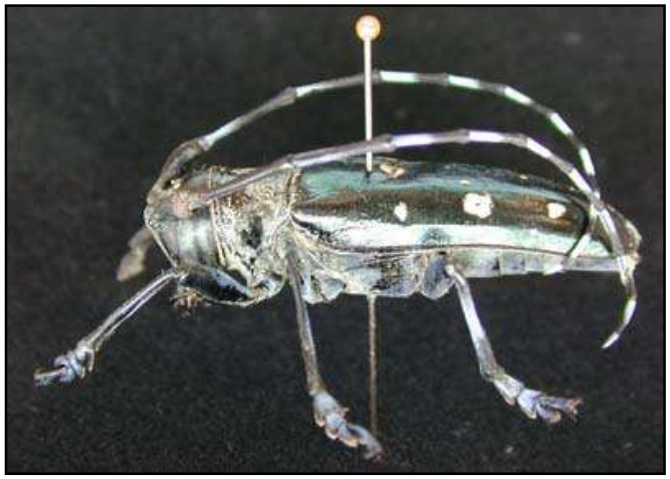
Asian longhorn borer

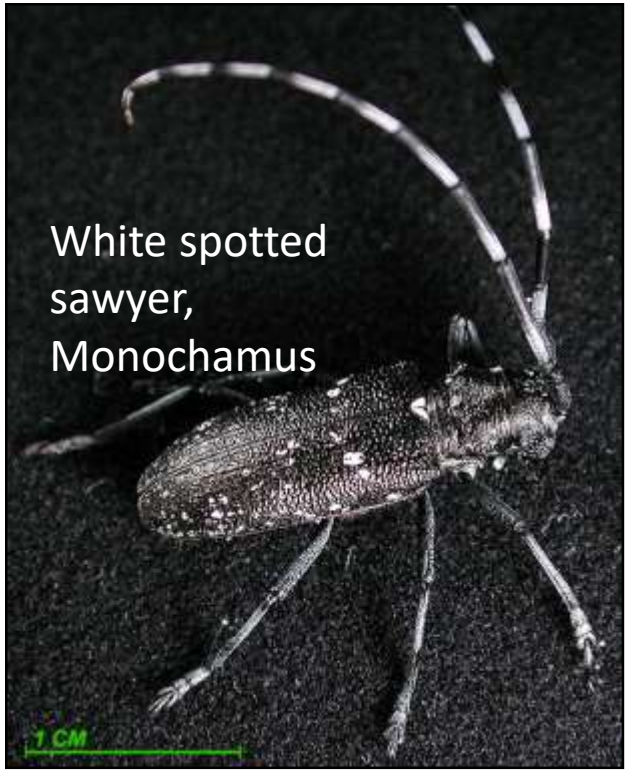


“Since 1996 over 80 million dollars has been spent on Asian longhorned beetle detection and eradication measures.”

Asian longhorn borer

Asian longhorn borer

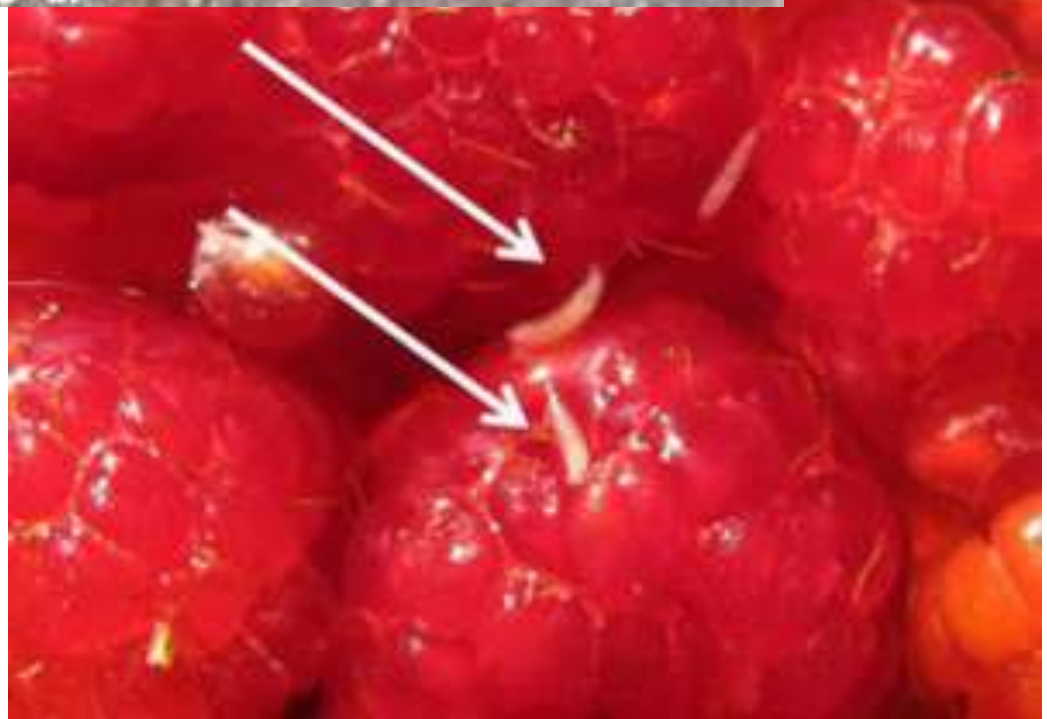




Northwest native longhorned beetles

Fruit Feeders

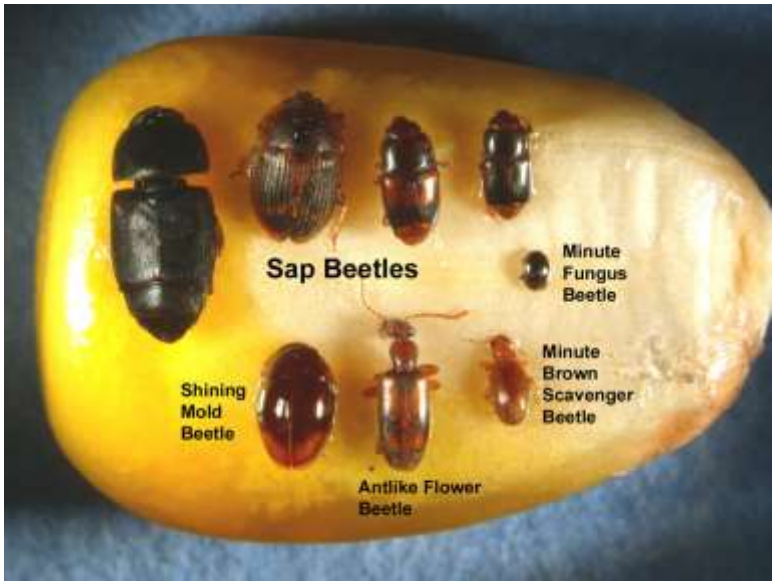
Raspberry Fruitworm



Fruit Feeders

Sap Beetles

- Small adults on fruit.
- Feed on small fruit and some vegetables.
- Often attracted to fruit in compost piles or to fermenting sap.



Comparison of Raspberry Fruitworm and Sap Beetles

Incidental Insects

An undetermined parasite of wood boring larvae

There are a number of insects that emerge from wood framing in houses or firewood. These include wood boring beetles, horntail wasps and parasitic wasps on these pests.

Bark beetle adult and egg

Cerambycidae, or round headed, or long-horned wood borer adults

Golden buprestid a flatheaded, or metallic wood borer

Lady beetles

Yellow or orange eggs are laid upright in clusters.

Orange-and black or yellow-and- black larvae feed on aphids.

Lady Beetles
Come in Many Colors and Sizes

Predators

Ellychnia - lampless firefly relative

Habitat – edge of wooded areas; larvae live in rotten logs

Hosts – other insects

Time of year – Spring

Diurnal – adults do not flash

Larvae are glow worms and live in rotting logs

http://flickrhivemind.net/Tags/ellychnia/Timeline

Predators

Soldier beetles

http://www.insects4sale.com/store/products/721/Soldier-Beetle

- Soldier beetles are found on flowers and foliage during daytime.
- They have soft wing covers (elytra) that don't quite cover the abdomen.
- Predators.
- The orange solidier beetle is commonly found mating in midsummer.
- Small, black. soldier beetles are found in woodlands in spring.

Ground Beetles

Don’t Step on Black Beetles

Rove Beetles.

The many species of predatory rove beetles scurry around at night too. Their thin shape allows them to burrow through soil in search of prey.


Defensive posturing

Larva

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Department of Entomology **Fact Sheets** with many on beetles as weel as other insects.
http://entomology.wsu.edu/outreach/bug-info/

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PLS – **Puyallup Fact Sheets** (Many insects including beetles)
https://puyallup.wsu.edu/plantclinic/pls/

Insects of Washington
https://www.insectidentification.org/insects-by-state.php?thisState=Washington

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