

AZDA Targets-Exotic Beetles

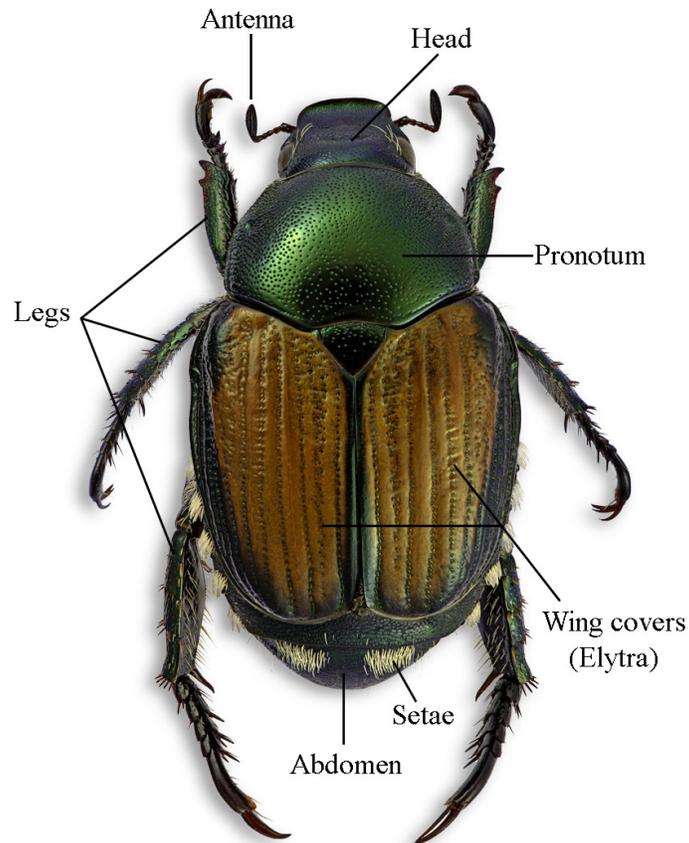


A Visual Aid



Introduction

The beetles are insects in the order Coleoptera, which means, ‘sheath wing.’ They represent the largest group of living creatures on the planet and are characterized by having their front pair of wings hardened into wing covers known as elytra (singular: elytron). The following example shows the basic parts of a beetle that will be referred to later:



Worldwide, approximately 400,000 beetle species have been described in some 30,000 genera within 180 or so families. They range in size from the South American Titan beetle, *Titanus giganteus*, measuring over 150 mm (~6 inches) to the smallest, a Central American Featherwing beetle, *Scydosella musawasensis*, measuring only 0.325 mm (~0.01 inches), which happens to also be the smallest free-living insect in the world. Currently, we have 49 exotic A-rated beetles on our pest list, 11 of which are highlighted here alphabetically by scientific name. These beetles are either targeted by our trapping and inspection programs, or are considered more likely to be encountered in quarantine than the others on our pest list. This work does not attempt to detail the pest risk presented by the included species, or even say much about their biology, immature stages, or taxonomy. Rather, this is intended to be a quick visual guide for field recognition of adults, with just enough pest information to stimulate the reader towards further investigation. The last figure (fig. 12), Life-size Body Line-up, is designed to show the various beetles as they would be seen with the unaided eye, from largest body length to smallest, and in such a way that their relative sizes could be compared to each other and to a life-sized penny.

This educational guide is for internal department use only.



Figure 1. The Emerald Ash Borer, *Agrilus planipennis*

- **Field Description:** 7-9 mm (~ 0.35 in.) Body narrows towards the posterior end and is bright metallic green in color.
- **Distribution:** Native to north-eastern Asia. In the U.S., it is now found in 35 states, from Arkansas, Missouri, and Wisconsin, then east to Georgia, and up to New York. An isolated infestation has been found in northern Colorado, but is under eradication.
- **Hosts and Damage:** Attacks only ash trees in the genus *Fraxinus*. Damage principally caused by larvae feeding on the inner bark, which disrupts the tree's ability to transport water and nutrients. D-shaped exit holes are caused by young adults emerging after pupation from within their host.

Figure 2. The Asian Longhorned Beetle, *Anoplophora glabripennis*

- **Field Description:** 17-40 mm (0.7 – 1.5 in.) Shiny black with numerous white spots scattered over the wing covers. Legs and antennae are distinctly banded black and blue or blueish-white. Antennae are very long, up to two times the body length. Pronotum has a single large spine on each side.
- **Distribution:** Native to China, Japan, and Korea. Introduced into New York, New Jersey, Massachusetts, Illinois, Ohio, and Canada. Populations in some of those areas are currently under various levels of eradication.
- **Hosts and Damage:** Many types of healthy or stressed trees are attacked, including, box elder, sycamore, maple, birch, poplar, willow, and elm. Adults feed on leaves and soft bark. Larvae are the most damaging stage. Larval feeding starts just under the bark, but then moves deep into the heartwood of the tree. Pupation takes place in the heartwood. Heavy infestations will structurally weaken and eventually kill the host tree.

Figure 3. The Square-necked Grain Beetle, *Cathartus quadricollis*

- **Field Description:** 2-4 mm (~0.2 in.) Reddish-brown in color. Pronotum nearly parallel-sided (square) with each corner ending in a rounded knob. Body flattened, wider than thick. Antennae distinctly clubbed at the end.
- **Distribution:** Likely native to South America, but now globally distributed. In the U.S., found throughout the Southeast from Texas to Florida.
- **Hosts and Damage:** Numerous stored products are attacked, especially wheat, barley, and dried fruits. Both adults and larvae consume food products and can develop large populations in a short time. Adults are also known to feed on other stored product pests.

Figure 4. The Southern Potato Wireworm, *Conoderus falli*

- **Field Description:** 6-10 mm (0.2 – 0.4 in.) Body brownish to dark brown. Legs noticeable lighter than the body. Pronotum widest posteriorly, ending in sharp points that point towards the rear.
- **Distribution:** Probably native to the Neotropical regions of Mexico, Central and South America. Introduced and now common throughout the potato growing regions of the Southeastern U.S. Introduced and well established in California.
- **Hosts and Damage:** Primarily potatoes and sweet potatoes. Corn, cotton and sorghum have also been reported as hosts. Adults attack young plants by boring into the stems near the soil surface, weakening the plant, causing wilting and eventual death. Underground roots and tubers are also attacked by the larvae.



AZDA Targets-Exotic Beetles



A Visual Aid



Fig. 1
Emerald Ash Borer
Agrilus planipennis



Fig. 2
Asian Longhorned Beetle
Anoplophora glabripennis

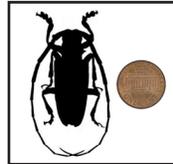


Fig. 3
Square-necked Grain Beetle
Cathartus quadricollis



Fig. 4
Southern Potato Wireworm
Conoderus falli



Figure 5. The Pecan Weevil, *Curculio caryae*

- **Field Description:** 8-12 mm (~0.3 – 0.5 in.) Rostrum (“nose”) long, about the length of the body. Legs long.
- **Distribution:** Native to the Southeastern U.S. from Texas to Florida. Introduced into Eastern New Mexico and is currently under eradication there.
- **Hosts and Damage:** All hickory and pecan species in the genus *Carya* are attacked. Both adults, using their long rostrums, and larvae feed on the inside of the fruit causing different kinds of damage at different stages of nut development. Damage can range from adults introducing fungi, to complete loss of the edible kernel by larval feeding, and early fruit drop caused by both stages.

Figure 6. The Sugarcane Root Borer, (SRB) *Diaprepes abbreviatus*

- **Field Description:** 9.5-20 mm (~0.4 – 0.75 in.) Black with a covering of minute orange, red, white, and sometimes yellow scales. These scales are loosely attached and can be rubbed off easily as the beetle moves. This gives the SRB a highly variable appearance of black stripes on a light colored background.
- **Distribution:** Native to the Caribbean region. Introduced and established in Florida, Louisiana, Texas, and California.
- **Hosts and Damage:** More than 270 plants in 59 different families have been reported as hosts, including all citrus species. Primary damage is caused by larvae feeding on the roots of their host. Adult feeding damage causes a distinct notching of the leaves that resembles damage caused by grasshoppers or leaf-cutter bees. Sometimes, twig girdling by the adults can occur.

Figure 7. The Yellow-margined Leaf Beetle, *Microtheca ochroloma*

- **Field Description:** 4-7 mm (~0.3 in.) Predominately dark brown to black with the margins of the wing covers marked with yellow to light brown.
- **Distribution:** Native to South America. In the U.S., introduced throughout the Gulf States, from Texas to Florida and then up to Georgia and North Carolina.
- **Hosts and Damage:** Large number of cruciferous crops are attacked, including, cauliflower, broccoli, turnip, cabbage, collard, mustard, and radish. Both adults and larvae feed on the foliage, and if left unchecked, can skeletonize all of the foliage, killing the host.

Figure 8. The Japanese Beetle, *Popillia japonica*

- **Field Description:** 8-11 mm (~0.3 – 0.5 in.) Metallic green pronotum with bronze or coppery-brown wing covers that don’t completely cover the tip of the abdomen. There are five patches of white setae on each side of the abdomen and one pair of white setae on the last exposed abdominal segment.
- **Distribution:** Native to Japan. Now widely distributed throughout most of the Eastern U.S., except Florida. Introduced, but then eradicated in California, Oregon, and Nevada.
- **Hosts and Damage:** More than 300 species of plants are known hosts. Primary hosts include: many types of grasses, apples, plums, peaches, roses, limes, grapes and corn. Adults feed above ground on fruit, foliage, and flowers causing a skeletonization-type of damage. Larvae are usually found feeding on grass/turf roots, which can cause large regions of dead grass to appear.



AZDA Targets-Exotic Beetles



A Visual Aid



Fig. 5
Pecan Weevil
Curculio caryae



Fig. 6
Sugarcane Root Borer
Diaprepes abbreviatus



Fig. 7
Yellow-margined Leaf Beetle
Microtheca ochroloma



Fig. 8
Japanese Beetle
Popillia japonica



Figure 9. The Red Palm Weevil (RPW), *Rhynchophorus ferrugineus*

- **Field Description:** 25-42 mm (~1.0 – 1.5 in.) Highly variable in coloration. Often, the body coloration is made up of shades of mostly rusty red with dark spots and lines. However, many different color variants are known, ranging from almost completely red to completely black.
- **Distribution:** Native to Southeast Asia and Melanesia, the RPW can now be found in Africa, the Middle East, and Europe, and in North America in the Caribbean. The RPW was detected in California in 2010, but is now considered eradicated there.
- **Hosts and Damage:** Restricted to palms. Individual eggs are laid in small holes made by the female using her rostrum, and usually near open wounds on the trunk or near the crown. Upon hatching, larvae feed and move towards the interior or down through the tree crown and then towards the interior. Feeding by adults and larvae can structurally weaken the palm, cause fronds to droop and drop, and eventually kill the tree. Considered the most damaging pest of palms in the world.

Figure 10. The South American Palm Weevil (SAPW), *Rhynchophorus palmarum*

- **Field Description:** 30-50 mm (~1.2 – 2.0 in.) Usually black in color, but some varieties have been found that approach the typical red and black RPW color-type.
- **Distribution:** Native to Mexico, Central and South America and the Caribbean. Now established in California. Detected in Texas in 2012 and reported “present” there in 2014. Current Texas population status is uncertain, but presumed established. One dead SAPW was found in Yuma in 2015 on the ground next to a SAPW trap. No others have been detected in Arizona.
- **Hosts and Damage:** Reported to feed on 35 different plant species in 12 families, but is primarily a pest of palms. Damage to palms is very similar to that caused by RPW with the addition that feeding SAPW infect palms with a nematode that causes Red-ring disease, a disease that causes fronds to yellow and wilt. The nematode is not known to be established in the U.S.

Figure 11. The Khapra Beetle (KHB), *Trogoderma granarium*

- **Field Description:** 2-3 mm (~0.1 in.) Body oval and somewhat flattened. Wing covers reddish-brown with vague mixture of patterns composed of brown, whitish, and yellowish setae. Pronotum often darker than wing covers.
- **Distribution:** Native to areas of India to Africa. Established in many Mediterranean, Middle Eastern and Asian countries, and in Russia. However, determining accurate global distribution is difficult because countries that declare an infestation are subject to negative political and/or economic impacts due to stringent trade restrictions imposed by other countries. The KHB is not known to be established anywhere in the Americas, Australia or New Zealand.
- **Hosts and Damage:** Numerous kinds of dry stored grains and other products are attacked, including, cotton, sunflower, barley, corn and wheat. Adults do not feed or fly and do little damage. Larvae are external feeders, consuming whole grains and other stored products.



AZDA Targets-Exotic Beetles



A Visual Aid



Fig. 9
Red Palm Weevil
Rhynchophorus ferrugineus

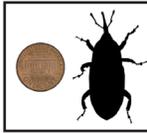


Fig. 10
South American Palm Weevil
Rhynchophorus palmarum



Fig. 11a
Khapra Beetle
Trogoderma granarium
dorsal



Fig. 11b
Khapra Beetle
Trogoderma granarium
lateral



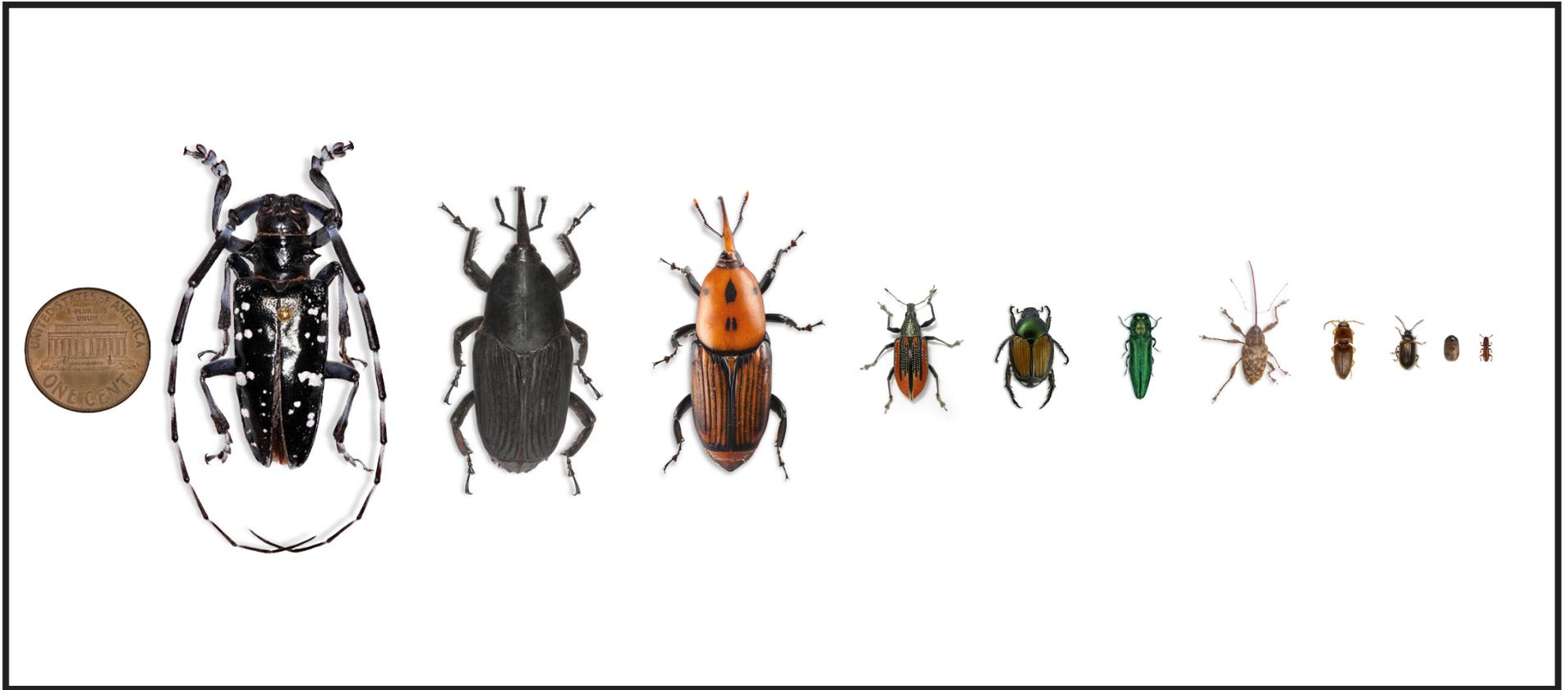
AZDA Targets-Exotic Beetles



A Visual Aid



*Fig. 12. Life-sized Body (when printed) Line-up
Penny = 19 mm (3/4 in.)*



**Chris Baptista, Entomology
Plant Services Division
April, 2019**

