

INVASIVE PESTS OF CONCERN TO NEVADA

Biology, Identification & Management



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OVERVIEW

Invasive insects, plants, and other organisms are an ongoing challenge. Invasive species can be particularly harmful to the environment, natural resources, agriculture, food supply and economy. This guide outlines some of the top priority invasive insect pests of concern to Nevada, and how you can help identify and report them.

What is an invasive species?

Invasive species are organisms not native to an environment whose introduction and spread cause economic damage and harm to the native environment and human health. Established populations of invasive species may change the physical characteristics of an environment, introduce diseases, and out-compete native species for resources.

How do invasive species spread?

Invasive species can be spread to different locations in multiple ways, most of which is human caused. The following are some examples of how invasive species are spread:

- Pests hitchhiking on RVs or other vehicles traveling long distances
- Pests hitchhiking in passenger baggage
- Transportation of infested firewood or wood products
- Transportation of infested outdoor gear or supplies
- Boats
- Off-highway vehicles
- Bicycles
- Camping equipment
- Transportation of infested plant matter
- Animal movement
- Natural methods such as weather (wind)

Importance of reporting invasives in Nevada

Preventing the spread of invasive pests is imperative to protecting Nevada's lands, agriculture, food supply, and natural resources. Failure to eradicate or manage invasive insects could have devastating impacts to natural landscapes and environments, habitats for native species, agriculture and food production, and outdoor recreation. Potential infestations could result in:

- Death and decline of forests, trees, and plants in both urban and rural areas (cities, national and state parks, campsites and other outdoor recreational areas) reducing natural habitats and recreational areas
- Risks to overall forest health and resilience
- High economic impact and cost for landowners to manage infestations if populations become established
- Threats to food production and supply
- Public health and safety concerns

What can you do?

People are one of the best tools for mitigating pest introduction and spread. The following examples outline ways you can help keep invasive pests out of Nevada:

- Learn to identify invasive pests and signs of damage using tools like this guide
- Immediately report any pest sightings or suspected pests (contact information available on this page and at the end of the guide)
- Buy and burn firewood where you bought it to avoid the transportation of wood material that could contain invasive species
- Always inspect and clean travel equipment and vehicles before transportation (boats, vehicle tires, camper and RV storage compartments, etc.)
- Always inspect and clean outdoor gear before transportation (shoes/boots, chairs, tents, backpacks, etc.)
- Spread the word about the dangers of invasive species to help raise awareness about the importance of keeping pests out of Nevada

If you encounter an insect that you believe to be an invasive pest, please contact the USDA Nevada Plant Health Director or Nevada Department of Agriculture to report it.

United States Department of Agriculture

State Plant Health Director, USDA, APHIS, PPQ

(801) 975-3311

aphis.usda.gov/aphis/ourfocus/planthealth/ppq-program-overview/sphd/nevada

Nevada Department of Agriculture

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ASIAN LONGHORNED BEETLE

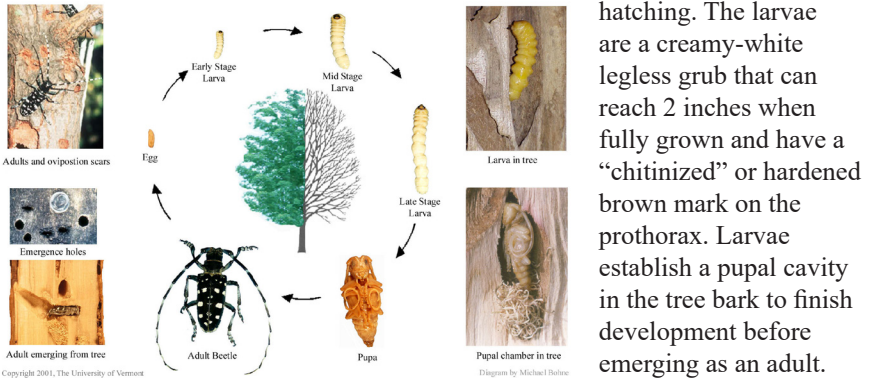
The Asian Longhorned Beetle (*Anoplophora glabripennis*) is an invasive, wood-boring pest insect that is native to China, Japan, North Korea and South Korea. Asian Longhorned Beetle was first discovered in the U.S. in Brooklyn, New York in 1996 and has since been found in Illinois, Massachusetts, New Jersey, Ohio and South Carolina. This pest threatens America's species of hardwood trees.



Identification

Asian Longhorned Beetles are large, measuring 1 to 1.5 inches long. Their bodies are shiny and black with prominent white spots on the wing casings. Antennae are also black and white and can be twice the length of their body. Eggs are white and oblong shaped with slightly concaved ends. They turn

Asian Longhorned Beetle Lifecycle



Hosts

The Asian Longhorned Beetle is destructive to hardwood trees and has a variety of host species. The most common hosts are elm, horse chestnut, maple and willow, but infestations have also been found in birch, ash and poplar trees. Uncontrolled infestations of Asian Longhorned Beetle threaten the hardwood tree populations in both recreational and forested areas.



Damage

Female Asian Longhorned Beetles lay their eggs in “ovipositor pits,” or holes they chew into the tree bark. Once the larvae hatch from the eggs, they tunnel through the heartwood of the tree and feed on the living outer layer of sapwood. This tunneling weakens the tree and disrupts the flow of sap, water and nutrients, making the tree more susceptible to threats like other insect pests. Additionally, too much damage from the larval tunneling can kill a tree over time.



Distribution

While native to China, Japan, North Korea and South Korea, the Asian Longhorned Beetle has been introduced into Austria, Canada, France, Germany, Italy, Poland, Switzerland and U.S. Infestations have been detected in six states - Illinois, Massachusetts, New Jersey, Ohio and South Carolina. Eradications have occurred; however, survey and further eradication efforts continue as all states are considered at risk for this pest. Asian Longhorned Beetle is spread by the transportation of infested wood packing materials such as firewood from hardwood tree species, nursery stock, logs, green lumber, stumps, roots and branches. Many of these materials are federally regulated in quarantined areas to reduce the risk of human assisted spread.

Where to Look

Asian Longhorned Beetles are a threat to hardwood tree species. Signs of damage include holes where eggs are laid, exit holes made by adults, “frass” or shavings protruding from cracks in the trunk, and exposed feeding galleries made by the larvae, which are visible when outer tree bark has fallen off or been peeled away. Initial infestations were detected in industrial parks and urban areas, but National and State parks, forests, and private backyards, as well as forest dependent industries could be impacted.



COCONUT RHINOCEROS BEETLE

Coconut Rhinoceros Beetles (*Oryctes rhinoceros*) are an invasive pest native to tropical regions of southeast Asia. This pest was introduced from Sri Lanka to Samoa in 1909 and has since been detected in Guam in 2007 and Hawaii in 2013. Adult Coconut Rhinoceros Beetles are a threat to coconut production and tree populations as well as causing extensive damage to economically important commercial crops.

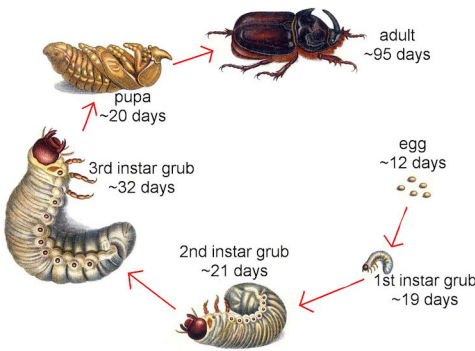


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Identification

Adult Coconut Rhinoceros Beetles are large beetles (1 to 2.5 inches in length) that are dark brown or black with a distinctive horn on their head. They have reddish-brown hairs on their underbelly and females have a cluster of hairs at the tip of their abdomen while males have a smooth, polished abdomen. The male horn tends to be longer than the females. Adult females lay their eggs

in soil or mulch with organic matter, or dead and decaying plant material such as dead palm logs. Eggs then hatch into larvae, which look like “C” shaped creamy white grubs with legs and a brown head. At the final stage before adulthood, the pupae have most of the external characteristics as adult Coconut Rhinoceros Beetle but with a tough, yellow brown exoskeleton.



Hosts

The preferred hosts of adult Coconut Rhinoceros Beetle are coconut palm and oil palm, but many other species of palm like date or fan palm are also at risk. Coconut Rhinoceros Beetle also damage other commercially important plants and trees including agave, banana, cacao, papaya, pineapple and sugarcane. After hatching, the larvae feed on the rotting materials and decaying wood at the egg laying site until they reach the pupal and adult stages.



Damage

Coconut Rhinoceros Beetle has caused significant damage to palm tree populations. As adults, these beetles create bore holes that damage developing tissue at the center of the palm tree crown to feed on the sap. This damage becomes evident as the leaves mature and unfold – the ends of the leaves have “V” shaped cuts or missing sections at the end from the insects boring through the developing tissue. This damage can stunt growth and kill palm trees over time, as well as make them more susceptible to secondary damage from fungal or bacterial infections.



Distribution

The Coconut Rhinoceros Beetle is native to the tropical, humid areas of southeast Asia, and were detected in Guam in 2007 and Hawaii in 2013. Coconut Rhinoceros Beetle is not established in the mainland U.S., however, there is risk of transport of this pest to the mainland states. Coconut Rhinoceros Beetle is likely spread through the transportation of international cargo, infested waste such as mulch, compost or decayed wood, and infested plants in passenger baggage.

Where to Look

Coconut Rhinoceros Beetle may be found in areas with their preferred hosts and may occupy live or dead palms depending on their stage of life cycle. Eggs and larvae may not be seen as they are buried in mulch, soil or decaying coconut logs. Adults are nocturnal which also make them difficult to detect. Signs of infestation include sick or dying palm trees, bore holes at the base of the leaves, and “V” shaped feeding damage to the palm leaves.



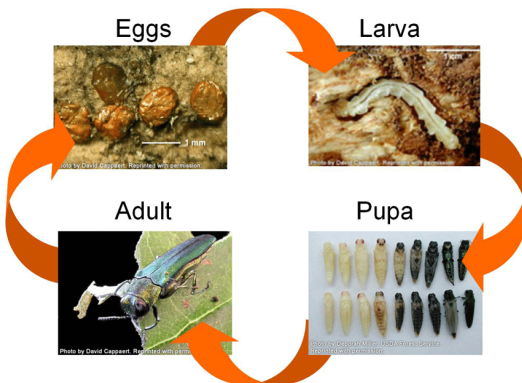
EMERALD ASH BORER

Emerald Ash Borer Beetles (*Agrilus planipennis*) are a pest insect native to Asia. Though it was first detected in the U.S. in Michigan in 2002, evidence suggests they were present for years prior to discovery. Emerald Ash Borer has been detected in thirty-five other states as well as Ontario and Quebec, Canada. This insect may spread by natural means, but also by the transportation of infested timber, firewood and nursery stock. Emerald Ash Borer feeds on ash trees (*Fraxinus* spp.) and is responsible for the loss of millions of ash trees in North America.



Identification

Emerald Ash Borer adults are bright, metallic green and grow to around 1/2 inch long. Males and females are very similar in appearance. The eggs are very small and reddish-brown in color. They may be laid individually or sometimes



in groups. During the larval stage, Emerald Ash Borer are called “flat-headed borers,” or white grubs. They have a clearly segmented body that goes through four growth stages. The pupal stage is the final step before becoming an adult beetle. The Emerald Ash Borer life cycle may be one or two years in total depending on the extent of the infestation.

Hosts

Emerald Ash Borer is known to infest all species of ash trees and are the primary cause of their decline in North America. Ash trees may be identified by the presence of compound leaves and opposite branches and buds rather than alternating. Emerald Ash Borer eggs are laid in cracks in the trees and between layers of bark. After one week, the larvae hatch and bore into the tree to feed. After the larvae overwinter as prepupae and pupate in late spring, they emerge from “D” shaped exit holes.



Damage

Adult Emerald Ash Borer will feed on the leaves of ash trees, but the bulk of damage is done during the larval stage. The larvae bore into the bark of the tree to feed. This feeding creates “S” shaped tunnels that disrupt the tree’s vascular tissues. As a result, the tree cannot transport water and nutrients properly which weaken the tree, causing it to be susceptible to other threats and death. Emerald Ash Borer is responsible for tens of millions of ash tree deaths and is the primary cause of their decline in the U.S.



Distribution

Emerald Ash Borer is native to parts of Asia including China, Japan, Mongolia, North Korea, South Korea, Taiwan and far east Russia. The spread of this pest in the U.S. is extensive, with infestations being detected in 35 states including Alabama, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia and Wisconsin. It is likely there are additional undetected infestations.

Where to look

New infestations can be difficult to detect because damage may not be apparent for up to three years. Infestations occur in different species of ash trees and exhibit a few symptoms. The most prominent symptoms of Emerald Ash Borer infestations are the “D” shaped exit holes in the trunk, splitting bark, and “S” shaped tunnels inside the tree. The exit holes may be oriented in any direction and are a strong indicator of infestation.

Other signs of damage can indicate infestation, but also have other causes. The thinning of the upper tree canopy and the death of branches, as well as the appearance of epicormic sprouting or “suckers” on the tree are other indicators of infestation. Lastly, woodpecker damage can also be a warning sign for Emerald Ash Borer infestation in a tree, however, woodpeckers will attack most trees with insect larvae present.



IMPORTED FIRE ANT

Two species of Imported Fire Ant were introduced to the U.S. at the port of Mobile, Alabama in the early 1900s. Native to South America, black imported fire ant (*Solenopsis richteri*) was detected in the states in 1918 and red imported fire ant (*Solenopsis invicta*) was detected in the late 1930s. It is thought that both fire ant species were brought over in soil used as ballast in cargo ships. Imported Fire Ant infests more than 367,000 acres in the U.S. today and impacts agricultural crops, livestock and equipment in addition to being potentially harmful to humans.



Identification

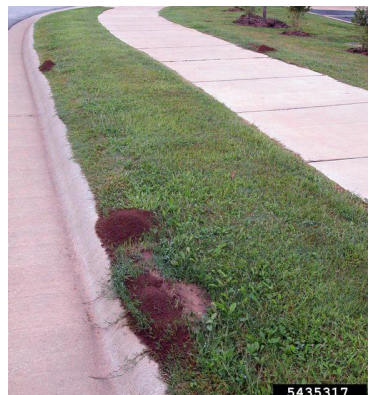
Imported Fire Ants are 1/8 to 1/4 inch long and are reddish-brown or black in



color. These ants are unlikely to be seen during the egg, larval and pupal stages as development occurs in the underground nest. Most larva develop into wingless female worker ants; only males and reproductive females have wings. When their mound or nest is disturbed, Imported Fire Ants tend to respond quickly and aggressively, and may deliver painful and venomous stings with their mandibles.

Hosts

Imported Fire Ant colonies build mounds with soil as their nest, but unlike other ant species, these mounds do not have an opening in the center – ants enter and exit the nest through underground tunnels. These dome shaped mounds range from small to large in size and are commonly built on agricultural fields or urban locations such as picnic areas, golf courses and playgrounds. Imported Fire Ants usually become aggressive if their mound is disturbed and often try to bite or sting intruders.



Damage

Imported Fire Ants are a threat to some agricultural crops as well as being harmful for humans and livestock. They are known to invade and feed on citrus, corn, okra and soybeans. Extensive feeding damage can mean a lower crop yield. Imported Fire Ant mounds may also cause damage to agricultural equipment such as irrigation systems and harvesting machinery. Additionally, Imported Fire Ant stings are venomous and painful for humans, pets, and some livestock animals. Multiple stings or allergic reactions to a sting can cause pustules to form on the skin's surface and may become infected if untreated. Extreme cases have been known to cause anaphylactic shock in humans.

Distribution

Imported Fire Ant has infested over 367,000 acres in the U.S. including areas in Alabama, Arkansas, California, Florida, Georgia, Louisiana, Mississippi, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and Puerto Rico. These insects can be spread by humans through the transport of infested materials such as nursery stock, hay bales, soil and farming equipment. Federal quarantines are in place to regulate high risk commodities and reduce human assisted spread of Imported Fire Ant.

Where to look

The easiest way to spot Imported Fire Ant is to look for their nest. These ants build their mounds in urban and agricultural settings – home lawns, school playgrounds, golf courses, athletic fields, parks and farmland are common places where Imported Fire Ants typically construct their nest. Additionally, Imported Fire Ants sometimes nest in rotting logs, patio slabs, sidewalk or concrete driveway cracks, as well as outdoor electrical boxes or water utility boxes. Do not disturb ant mounds as Imported Fire Ants may react aggressively, repeatedly stinging their target if their nest is disturbed.



JAPANESE BEETLE

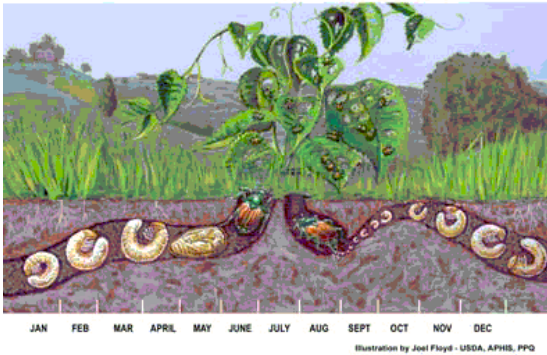
The Japanese Beetle (*Popillia japonica*) is a highly destructive pest to many plant species. They are native to Japan and were first detected in the U.S. in New Jersey in 1916. The Japanese Beetle now has established infestations in the eastern U.S. and has spread to several states west of the Mississippi River. The grubs damage lawns, pastures and turf such as golf courses, while adults feed on foliage, flowers or fruit of ornamental and agricultural plants. With over 300 species of host plants, Japanese Beetles are one of the most destructive urban plant pests and are very costly to control.



Identification

Adult Japanese Beetles are 1/3 to 1/2 of an inch long with a metallic green head and thorax. Their wing casings are a copper color, and they have white patches of hair on the sides and tip of their abdomens. Eggs are creamy white or translucent, and have a rounded or slightly cylindrical shape that will double in size as the embryo develops. The larvae are “C” shaped

white or cream grubs with distinctive brown heads and visible legs. The pupal stage is the last stage of development before emerging as adult beetles.

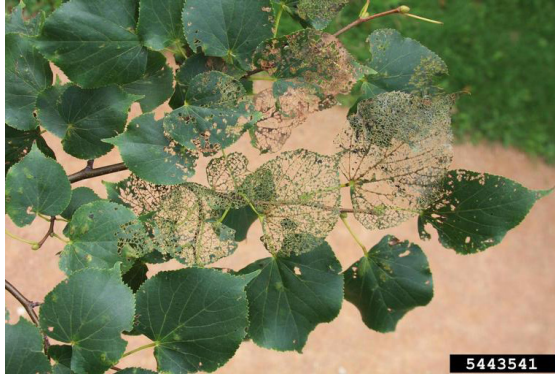


Hosts

Japanese Beetles are known to feed on over 300 species of plants, making them a serious threat to plants in urban and agricultural environments. Some of their primary hosts include ornamental apples, asparagus, blackberries, corn, elms, grapes, limes, maples, raspberries, rhubarb, roses, soybean and stone fruit. Secondary hosts include American mountain ash, birch, buckeyes, chestnut, hollyhocks, poplars, rosemallow, common sassafras, turf grasses and American walnut.

Damage

Japanese Beetles damage plants in both the adult and larval stages. Adults feed on a wide host range of foliage and flowers, which often results in skeletonization of the upper surface leaves. Larvae feed on the roots of grasses in pastures, parks, lawns, golf courses and other areas with turf grass. As roots are damaged, the grass struggles to take in enough water to cope with hot and dry weather, sometimes causing patches of grass to die. Controlling infestations and replacing damaged turf can be very expensive, reaching into the millions of dollars per year.



Distribution

Some areas in the U.S. currently have established Japanese Beetle infestations while others have only partial infestations. States with full or partial infestations are Alabama, Arkansas, Colorado, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont and Wisconsin. Infested states have federal quarantines and regulations in place to prevent the human assisted spread of Japanese Beetle from the eastern U.S. as well as to protect agriculture in the western U.S.

Where to look

Japanese Beetles are more active on warm, sunny days, and may be found on host plants in direct sunlight. Adults often feed in groups. The egg, larval and pupal stages are unlikely to be observed, as this development occurs underground. Common places for Japanese Beetle populations are parks, lawns, pastures, golf courses and turf grass.



KHAPRA BEETLE

The Khapra Beetle (*Trogoderma granarium*) is thought to be native to India and occurs in hot, dry conditions. These small beetles are one of the world's most destructive pests of stored grain products and seeds, and they pose a significant threat to economically important resources in the U.S.

Khapra Beetles were first found in North America in California in 1953 but have since been eradicated. Interceptions of this pest at ports or country boundaries have occurred repeatedly and infestations have occurred in other states. Currently, all infestations have been eradicated from the U.S.



Identification

Khapra Beetles are oval shaped and small, between 2 to 3 millimeters long. They are brown to reddish brown in color and covered in fine hairs. Adult Khapra Beetles have wings but are not known to fly. During the larval stage,



Khapra Beetle are a yellowish white grub with a brown head. Mature larvae can grow to 5 millimeters long, and like adult Khapra Beetle, the larvae also have hairs on their body. Adult mated females live between 4-7 days while unmated females live up to 30 days. Adult males live between 7-12 days.

Hosts

Khapra Beetle larvae feed on and destroy a variety of stored grain products such as barley, flour, maize, malt, noodles, oats, packaged food, spices, wheat and sometimes dried animal feed. Feeding damage often spoils around 30 percent of the product, though up to 70 percent has been reported.

Damage

Most of the damage to stored grain and other products occurs during the larval stage as adults feed very little. Adult females usually lay their eggs within host material, so newly hatched larvae have immediate access to food. Khapra Beetle larvae initially feed on damaged or smaller bits of grain but will attack whole grains as they mature, potentially destroying

the product completely. Rapid reproduction can cause excessive numbers of larvae in the surface layers of grain or host material. Khapra Beetle do not pose an immediate threat for human health, however, stored products contaminated by larval cast skins (empty “shells”) or hair can cause gastrointestinal irritation.



Distribution

Although currently eradicated from the U.S., Khapra Beetle infestations have previously occurred in Arizona, California, Maryland, Michigan, New Jersey, New Mexico, New York, Pennsylvania, Texas, and Baja California, Mexico. Khapra Beetle are suited to hot and dry climates, so many states in North America are at risk for establishment of this pest. Established infestations can be costly and difficult to control, because Khapra Beetle can survive long periods without food or moisture and will often hide in cracks or crevices, making them relatively resistant to many insecticides and fumigants. The cost of eradication of the initial infestation in California in 1953 was an estimated \$15 million.

Where to look

Khapra Beetle are most likely to be found in dry areas that provide shelter from cold and have stored grain products. Examples include warehouses, factories and mills. Signs of an infestation are visible Khapra Beetle adults or larvae, and larval cast skins on dried goods, including animal matter such as dried dog food. Cargo inspections have been able to intercept infested commodities at ports of entry, however, the risk of Khapra Beetle in the U.S. is still considered high.



LIGHT BROWN APPLE MOTH

Light Brown Apple Moth (*Epiphyas postvittana*) is native to Australia and is a major pest of fruits and ornamental plants. It is widely distributed throughout Ireland, New Caledonia, New Zealand and the United Kingdom. The first



mainland detection in the U.S. occurred in 2007 in California, though occasional interceptions of this pest have also occurred in Hawaii. Light Brown Apple Moth is a concern for agriculture due to the wide range of crops and plants they damage.

Identification

Identifying Light Brown Apple Moth is challenging as they exhibit brown color variations that are difficult to distinguish from other brown moths. Generally, an expert level of species confirmation is required. Adults are around 4 inches long and are light brown to yellow in color. Female adults have a dark mark on the hind margin of their forewings while males do not. Egg masses are laid on smooth surfaces of host plants and appear flat with a pebble-like surface. Larvae are around 1/2 to 3/4 of an inch long and are pale yellow-green with light brown or tan heads. The pupal stage



initially appears as a light green chrysalis but hardens and turns a darker brown.



Hosts

Light Brown Apple Moth feeds on a wide variety of plants in different families. They are extremely destructive to agricultural crops and plants as their complete host list includes over 2,000 plant species and more than 250 fruits and vegetables. Prominent hosts include alfalfa, avocado, beans, berries, chrysanthemum, clover, eucalyptus, grape, hawthorn, jasmine, Monterey pine, poplar and rose.

Damage

Light Brown Apple Moth larvae construct nests or “leaf rolls,” which damage the surface of the leaves. Larvae also feed on fruits and sometimes tunnel into the flesh of the fruit itself. Larval feeding on plant buds and leaves reduces photosynthesis which harms the plant’s growth rate and



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may cause plant disfiguration. The amount of damage can sometimes cause fruit to be unmarketable. Light Brown Apple Moth poses a threat not only to agricultural production, but to urban and forest trees such as redwoods, oaks and cypress.

Distribution

Light Brown Apple Moth has been detected in California and intercepted multiple times in Hawaii. Previously, many counties in California and all counties in Hawaii have authorized federal quarantines to reduce the human-assisted spread of Light Brown Apple Moth and prevent further infestation. As of December 2021, USDA has reclassified Light Brown Apple Moth as a non-quarantine pest and federal restrictions have been removed.

Where to look

Light Brown Apple Moth may be spread by the transportation of eggs or larvae infested fruits and vegetables or nursery stock. Signs and symptoms of infestation include visible caterpillars or adult moths. Expert identification is usually required as Light Brown Apple Moth may be difficult to distinguish from other species. Another common symptom of infestation is damaged fruit or vegetables. Light Brown Apple Moth may be found in agricultural environments and urban environments including backyards.



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OLD WORLD BOLLWORM

Old World Bollworm (*Helicoverpa armigera*) is found in many areas of Africa, Asia, Europe, Australia and islands of the Western Pacific. They are a pest to many herbaceous plants and can be detrimental to agricultural crop production. Old World Bollworm was first detected in Puerto Rico in 2014, and Florida in 2015. Currently, Old World Bollworm is not established in the U.S., however, they are considered high risk for invading North America.



Identification

Old World Bollworm has a four-stage life cycle – egg, larva, pupa and adult. Eggs are very small and transition from a yellowish-white to brown and grey. Larvae can grow to 1.7 inches long and range from bluish green to brownish red in color. Pupae are a tan or dark brown color and are found in soil. The



adult moths have a wingspan of 1.4 to 1.6 inches and vary in color. Males are usually yellowish brown, light yellow or light brown, while females are more orange-brown. Old World Bollworm is closely related to the Corn Earworm, (*Helicoverpa zea*) and requires laboratory dissection to distinguish the two species.

Hosts

Old World Bollworm feeds on more than 180 plant species, including important vegetable and flowering agricultural crops. Some of their prominent hosts include corn, cotton, small grains, soybeans, peppers and tomatoes. This pest may be found in both greenhouse and field settings if hosts are available.



Damage

Old World Bollworm's wide range of hosts, reproductive potential and resistance to insecticides make them a serious threat to agricultural crops. Adult females lay eggs singularly or in small clusters on host plants so newly hatched larvae can begin feeding. Damage occurs in the larval stage as the larvae bore into the host's flowers and fruit to create tunnels to feed within the plant. Larvae may also feed on the host plant's leaves. The feeding damage disturbs plant development and may cause plants to bloom early and fail to produce fruit. Additionally, damaged hosts are more susceptible to secondary infection, sometimes leading to rotting fruit or crops.

Distribution

Though Old World Bollworm has been detected in Puerto Rico and Florida, it is not currently established in North America. Interceptions have occurred at ports of entry, and North America is considered high risk for invasion. Old World Bollworm can be spread by the mailing or transportation of infested fruits, vegetables or plants, as well as moths or larvae hitchhiking in international cargo. Additionally, adult moths are also known to be carried long distances by the wind.

Where to look

Old World Bollworm may be found in greenhouse and field or crop environments with host plants available. Common signs of infestation include visible adults or larvae on host plant flowers, fruit or leaves, and holes bored into the base of flower buds, fruit or bolls. Other signs include young fruit dropping prematurely and other visible damage on the leaves or shoots of the plant.



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SPONGY MOTH

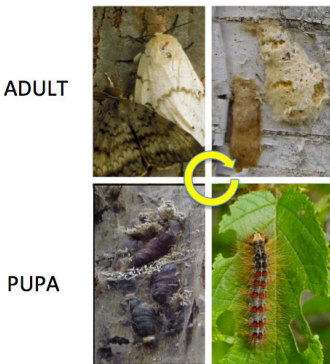
Spongy Moth (*Lymantria dispar dispar*), native to Europe, was first introduced to the U.S. in Massachusetts in 1869. They were brought over to be bred with silkworms to create a hardier variety of silkworm and develop a silk industry in the U.S., however, some of the moths escaped and established the initial population in Massachusetts. Spongy Moth is a severe threat to North America's forests as they feed on more than 300 species of trees and shrubs. Multiple populations are currently established in the U.S. from the northeast to Minnesota.



Identification

Female Spongy Moth are flightless, so they usually lay their eggs on tree trunks or branches. These egg masses are a beige or tan color with a protective fuzzy coating. Once eggs hatch, the larvae or caterpillars chew through the egg mass to feed and eventually pupate. Spongy Moth caterpillars are visually striking – they

have hairy bodies and five pairs of blue spots followed by six pairs of red spots on their back. Fully grown caterpillars can reach 1.5 inches for males and 2.5 inches for females. Female adult Spongy Moth are white with wavy brown or black markings and are larger than males. Males are brown with wavy brown markings and have feathery antennae compared to the thin antennae of females.



ADULT

EGG

PUPA

LARVA
(Caterpillar)

Hosts

Spongy Moth feeds on deciduous trees and has approximately 150 primary hosts, however, they will feed on more than 300 species of trees and shrubs. This pest is a severe threat to North American forests and other tree populations



and can defoliate large numbers of trees in a single life cycle. Common Spongy Moth hosts include aspen, birch, cedar, cottonwood, fruit trees, larch, oak, poplar and willow.

Damage

Spongy Moth damage trees during the larval stage of their life cycle. The caterpillars feed on a tree's leaves for several weeks before entering the pupal stage. Defoliated trees become more susceptible to other pests and diseases, and less vigorous trees may die. In large population outbreaks, Spongy Moth caterpillars can damage thousands of acres of trees in a short period of time, making them a pest of concern for Nevada's tree populations.



Distribution

Spongy Moth currently has populations established in the U.S. They are found in Connecticut, Delaware, the District of Columbia, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia and Wisconsin. Kentucky is considered particularly high risk for Spongy Moth infestation, though the rest of the U.S. is also at risk. Spongy Moth may be spread by humans through travel or transport of items such as nursery stock, Christmas trees, logs or firewood, mobile homes and recreational vehicles, outdoor furniture, boats, trailers, and garbage containers.



Where to look

Spongy Moth's preferred host is oak, but they feed on a wide variety of deciduous trees and shrubs. A predictor of Spongy Moth presence is fuzzy tan or beige colored egg masses – they are typically laid on tree trunks or logs, but may also be found on vehicle tires, backyard furniture, firewood or other sheltered areas, as the females are flightless. Check the undersides of branches and furniture to survey for egg masses. Other signs include visible caterpillars or adult Spongy Moth, as well as defoliated trees.

SPOTTED LANTERNFLY

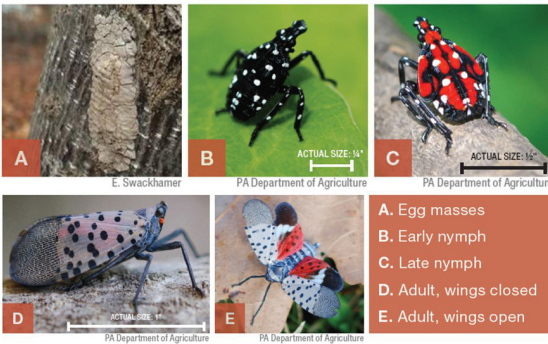
The Spotted Lanternfly (*Lycorma delicatula*) is an invasive pest insect that is native to China. It was first detected in the U.S. in Pennsylvania in 2014, though infestations have since been detected in other states. Spotted Lanternfly is not harmful to humans or other animals but poses a serious threat to several agricultural crops and hardwood trees.



Identification

Adult Spotted Lanternflies grow to around 1 inch long and 1/2 inch wide and have visually striking wings. The forewings are light brown with black spots and have a speckled band at the ends. Their hindwings are scarlet with black spots and black and white bars.

Abdomens are yellow with black bars. Nymphs will appear black with white spots and turn red before becoming adults. Spotted Lanternfly egg masses are yellowish-brown, and most are covered in a gray, waxy coating before hatching.



Spotted Lanternfly egg masses are yellowish-brown, and most are covered in a gray, waxy coating before hatching.



Hosts

Spotted Lanternfly's preferred host is the Tree of Heaven (*Ailanthus altissima*) but are also known to feed on a wide variety of fruit trees, grape, hops, maple, poplar, stone fruit, walnut and willow. The host plant tends to change depending on the insect's stage of development. Spotted Lanternfly lay their eggs on smooth host plant surfaces and other non-host material such as bricks, stones and dead plants. When eggs hatch in spring and early summer, the nymphs will begin feeding on host plants.

Damage

Both adult and nymph Spotted Lanternfly feed on host plants by sucking sap from the stems and branches. This can reduce photosynthesis, weakening the plant, and eventually cause death. As these insects feed, they excrete a sugar-rich fluid similar to honeydew that may attract other insects, like bees and wasps, to the tree. Additionally, this feeding may cause the plants to ooze or weep, resulting in a fermented odor. The sugar-rich substance combined with the fermented odor causes build up and promotes mold growth. If Spotted Lanternfly is allowed to spread in the U.S., agricultural industries such as logging, orchards and grapes could be at risk for infestation.



Distribution

Spotted Lanternfly is native to China but has spread to other parts of Asia including India, Japan, Korea, Vietnam and Taiwan. In the U.S., Spotted Lanternfly populations have been detected in Connecticut, Delaware, Indiana, Massachusetts, New Jersey, New York, Ohio, Pennsylvania, Virginia, and West Virginia. This pest is spread by the transportation of infested materials or materials containing egg masses. Examples include yard furniture, campers and recreational vehicles, farming equipment, stones and other smooth surfaces.

Where to look

Spotted Lanternfly nymphs and adults have very distinct coloring. They often gather in large numbers on host plants and are easiest to spot at dusk or nighttime as they migrate up and down the plant. They can be more difficult to spot during the day as they tend to cluster around the base of the plant or in the canopy for shade. Adults begin to appear in late July and are primarily found on the Tree of Heaven (*A. altissima*) and grapevines (*Vitis vinifera*).

CONTACT INFORMATION

If you encounter an insect that you believe to be an invasive pest, please contact the USDA Nevada Plant Health Director or Nevada Department of Agriculture to report it.

United States Department of Agriculture

State Plant Health Director, USDA, APHIS, PPQ

(801) 975-3311

aphis.usda.gov/aphis/ourfocus/planthealth/ppq-program-overview/sphd/nevada

Nevada Department of Agriculture

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State Entomologist

(775) 353-3767

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Insect Sample Submission Form: <https://agri.nv.gov/uploadedFiles/agrinvgov/Content/Resources/Forms/Plant/Entomology/InsectSpecimenSubmissionForm.pdf>

Shouhua Wang

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(775) 353-3765

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Plant Pathology Sample Submission Form: https://agri.nv.gov/uploadedFiles/agrinvgov/Content/Plant/Plant_Pathology/PlantSampleSubmissionForm-Fillable.pdf

Jake Dick

Noxious Weed Coordinator

(775) 353-3640

JDick@agri.nv.gov

Noxious Weed Notification Form: fs22.formsite.com/NDAnoxiousweed/form1/index.html

OTHER RESOURCES

USDA Hungry Pests Program: <https://www.aphis.usda.gov/aphis/resources/pests-diseases/hungry-pests/hungrypests>

Nevada Department of Agriculture: agri.nv.gov

Don't Move Firewood: dontmovefirewood.org

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