The Washington State Department of Agriculture serves the people of Washington by supporting the agricultural community and promoting consumer and environmental protection.

Our major goals:

- Protect and reduce the risk to public health by assuring the safety of the state’s food supply.
- Ensure the safe and legal distribution, use, and disposal of pesticides and fertilizers in Washington State.
- Protect Washington State’s natural resources, agriculture industry, and the public from selected plant and animal pests and diseases.
- Facilitate the movement of Washington agricultural products in domestic and international markets.

Contact information for gypsy moth and invasive insects:
For questions regarding the gypsy moth and invasive insects, please call 1-800-443-6684. If we do not answer, please feel free to leave a message and we will return your call as soon as possible.

Please visit our website at www.agr.wa.gov.

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Do you need this publication in an alternate format? Contact the WSDA Receptionist at (360) 902-1976 or TTY Relay 800-833-6388.

Every year the Washington State Department of Agriculture’s (WSDA) Pest Program conducts a number of surveys (detection programs). The purpose of these surveys is to prevent the establishment and spread of non-native insects that are a known threat to Washington State’s agricultural products and environmental resources.

During the summer months, there can be as many as 45,000 various insect traps placed throughout the state of Washington.

This primer will help you understand how vital surveys are to the environment and economy. Within this primer are photos and brief descriptions of a few pests we survey each year. We have also included photos of various trap types. It is important to note; traps are typically used for detection, not eradication.
**What are non-native insect pests?**

Non-native insects are those introduced into Washington State from outside their native range or natural habitat.

**Why control non-native insect pests?**

Non-native insects are estimated to cost the United States $137 billion in crop damage and control each year. Changes in foreign trade practices and our increasingly mobile society have increased the rate at which non-native species are being introduced into the United States and Washington State each year.

**How do non-native insects get introduced into Washington State?**

Solid wood pallets and packing material, unprocessed logs, nursery stock and attachment to cars, trucks, airplanes, and ships are pathways through which non-native insects arrive into the state each year.

**How does WSDA control non-native insect pests?**

*Early Detection.* WSDA staff, in cooperation with the United States Department of Agriculture (USDA), conducts annual statewide surveys (detection programs) to detect the introduction of non-native insects and locate areas of potential infestation. Such efforts represent an early warning system for the introduction of potentially damaging insects into Washington State.

*Rapid Response.* When surveys indicate a particular pest is reaching threatening levels, WSDA establishes quarantines to prevent the spread of the insect into new locations, and initiates efforts to eradicate the insect using methods in compliance with state and federal environmental regulations. WSDA also issues pest free certification to insure that nursery and farm products can continue to be exported outside our state.

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**European Gypsy Moth**

- European gypsy moths were first detected in Washington in 1974. Trapping and rapid response efforts have kept permanent populations out of the state.
- WSDA places around 25,000 cardboard traps (pictured below) throughout the state every summer. Sites where moths are caught, especially multiple-catch sites, will be heavily trapped the following summer.
- At the time of this publication, nineteen states in the East and Midwest have permanent gypsy moth populations, resulting in significant environmental and economic costs each year.
- Hundreds of thousands of acres in the 19 states annually are defoliated, quarantined, and sprayed. Examples: 2008 New Jersey, 30,900 acres of trees died. 2009 Maryland, 37,000 acres of vegetation were aerially sprayed to suppress existing infestations.
- Gypsy moths feed on more than 500 species of trees and plants, and reproduces very rapidly. A single female moth can produce up to 500 females the following spring.
- The Asian gypsy moth is a greater threat to forests than the European gypsy moth. Asian gypsy moth females can fly up to 12 miles. European gypsy moth females are flightless. The Asian gypsy moth feeds on a greater number of host trees (over 500 species) including many conifers. Washington has had more Asian gypsy moth introductions than any state in the U.S. They arrive as egg masses attached to ships carrying cargo from Asian ports.
June 2002, Emerald Ash Borer (EAB) was identified in ash trees in Detroit.

Most EAB infested trees died within five years.

Michigan Department of Agriculture (MDA) issued a quarantine of six counties.

Under the quarantine, ash trees, branches, logs, and firewood could not be moved from the infested counties.

Throughout 2002 MDA conducted extensive surveys (detection programs).

EAB detections spurred agriculture officials in Ohio and Indiana to deploy survey teams.

EAB was detected in Ohio in February 2003 and in Indiana in April 2004.

EAB infestations have been detected in 14 states; Illinois, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Virginia, West Virginia, and Wisconsin.

Outreach efforts have emphasized “Don’t Move Firewood”, as firewood movement is a primary method of artificial spread for this pest.

EAB kills stressed and healthy trees and is so aggressive that ash trees may die within two or three years.

Repercussions include decreased property values, loss in the long-term supply of ash wood, decreased air quality, increased electricity use during hot weather, and negative impacts on Native American cultures that use ash wood for traditional crafts and ceremonies.

Detrimental impacts on wildlife and natural ecosystems. As a vital component of forest succession, ash colonizes and stabilizes disturbed areas.

Who benefits from WSDA's insect pest program?

**The State’s Economy.** WSDA's insect control program protects our forests, farms, and nurseries from potentially damaging insects.

**Homeowners.** Insects like gypsy moth and Japanese beetle are a nuisance to homeowners and despoil gardens and backyards.

**The Environment.** Insect pests defoliate and kill trees over extensive areas of forests. Control of these pests protects habitat for fish and wildlife, and helps preserve Washington’s natural scenic beauty.

**Recreation.** By preventing insect pests from infesting our national, state and county parks, residents can continue to enjoy many outdoor recreational opportunities.
**WHAT SHOULD YOU DO IF YOU FIND A STRANGE LOOKING BEETLE OR INSECT?**

- Capture the beetle/insect in a secure container, not paper or cardboard.
- Place the container in freezer for 24 hours, which will kill the beetle/insect, then mail to **WSDA Pest Program, 3939 Cleveland Avenue SE, Olympia, WA 98501**. Be sure to include your contact information (name, phone number and/or email address).
- OR
- Capture the beetle/insect in a secure container, take a few quality photos with your camera or cell phone and email it to **PestProgram@agr.wa.gov**.

Note: Because there are many native beetles/insects that are beneficial to our environment, we would prefer you send a picture rather than freezing the insect. Once our entomologists identify the beetle/insect, we will contact you with their findings.

Also, because there are hundreds of thousands of beetles and insects, it is virtually impossible to identify them without seeing a photograph or specimen.

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**BROWN MARMORATED STINKBUG**

- The Brown Marmorated Stink Bug (BMSB) can cause wide spread damage on fruit and vegetable crops.
- BMSB was introduced into Allentown, PA around 1996 from China or Japan.
- BMSB are established in Oregon and the east coast of the United States. It has established itself as a potential risk to agriculture.
- BMSB was found it Washington State in 2010.
- The BMSB feeds on fruits, vegetables, and other host plants including peaches, apples, green beans, soybeans, cherries, raspberries, and peaches.
- Stink bugs lay eggs under leaves in the spring, develop throughout the summer, overwinter by entering structures. Stink bugs enter through cracks in windows and foundations. Seen in large numbers during September and October.
- Stink bugs produce a noxious odor, as a defense mechanism, that may be a nuisance to homeowners.
- The BMSB has a "shield" shaped body that is characteristic of all stink bugs. The adults are approximately 17 mm.

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**Mt. Shuksan**

*Photo courtesy Dwight Bohnet Photography*

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**Brown Marmorated Stink Bug**

- In 2010, the BMSB produced severe losses in apple and peach orchards. It also has been found feeding on blackberry, sweet corn, field corn, soybeans, tomatoes, lima beans and green peppers.

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*Images courtesy of the Brown Marmorated Stink Bug (BMSB)*
**EUROPEAN GRAPEVINE MOTH**

- The European Grapevine Moth (EGVM), also known as *Lobesia botrana*, is a serious pest of grapes.
- The EGVM was recently discovered in California.
- The EGVM larvae, not the adult moths, are responsible for the damage to grapes.
- Larvae feed on grape bud clusters or flowers and spin webbing around them. Heavy flower damage will disrupt development and yield.
- Second-generation larvae feed on developing grapes.
- Larvae of the third generation - the most damaging - feed on multiple ripening grapes and expose them to further damage from fungal infections.
- The EGVM can undergo two to four generations per year.
- Mature larvae reach a length of 10-15 mm, with the body color varying from light green to light brown. Adults are small, approximately 6-8 mm long.
- Primary host: Grape.
- Secondary hosts: Blackberry, currant, gooseberry, kiwi fruit, olive, persimmon, pomegranate, stone fruit, European barberry, old-man’s-beard or traveler’s joy, spurge flax, carnation, false baby’s breath, St. John’s wort or Aaron’s beard, European privet, smooth sumac, rosemary, bladder campion, red clover, sea squill, and jujube.

**VINEYARD SNAIL**

- Exotic snails consume some plants of agricultural importance. Snails climb plants, making harvesting difficult and spoiling the product. Snails also carry many plant, animal and human diseases.
- The vineyard snail was detected in November, 2005 in Washington State. State and federal plant health officials are conducting surveys statewide for these pests.
- Exotic snails enter the United States through one main pathway - container traffic. With the increase in container movement overseas and domestically, the opportunity for snail infestation increases.
Apple Maggot

Why is the apple maggot a significant threat to fruit crops?

- Directly attacks fruit such as apples, crabapples, cherry, pears, plums, and apricots, making it brown, mushy, and inedible.
- Would have devastating impact on the apple industry, the number one cash crop in Washington.

How the apple maggot is spread

- Mostly by people transporting apples from infested backyard apple trees to non-infested areas of the state. Abandoned orchards and natural spread.

WSDA's apple maggot control program

- Administered in concert with the Apple Maggot Working Group, made up of representatives from WSDA, Washington apple industry, tree fruit research community, and the federal government.
- Consists of three components: survey and Regulatory, administered by WSDA; a control, suppression and eradication administered by county pest boards; and education conducted by Washington State University through its cooperative extension offices.
- Apple maggot trapping program conducted annually. Between 5,000 and 8,500 apple maggot traps placed each summer. Field activities determined by WSDA and Apple Maggot Working Group.

Sirex Woodwasp

- Sirex woodwasp is one of the most common species of exotic woodwasps detected at United States ports-of-entry associated with solid wood packing materials.
- Recent detections of sirex woodwasps outside of port areas in the United States have raised concerns because it has the potential to cause significant mortality of pines.
- Awareness of the symptoms and signs of a sirex woodwasp infestation increases the chance of early detection.
- Sirex woodwasps can attack living pines. At low populations, sirex woodwasp selects suppressed, stressed, and injured trees for egg laying.
- Foliage of infested trees initially wilts, and then changes color from dark green to light green, to yellow, and finally to red, during the 3-6 months following attack (see pictures below).
The light brown apple moth (LBAM), is a native pest of Australia. USDA confirmed the detection of LBAM in California on March 22, 2007. California Department of Food and Agriculture (CDFA) identified the pest in 11 additional counties. Intense control activities have contained LBAM within the initial detection area and effectively eradicated the pest from Napa and Los Angeles counties.

LBAM can damage a wide range of crops and plants including California’s prized cypress, redwoods, oaks and many other varieties found in California.

Agricultural crops that could be damaged by this pest includes grapes, citrus, stone fruit (peaches, plums, nectarines, cherries, apricots) and many others. The complete “host list” contains well over 1,000 plant species and more than 250 fruits and vegetables.

USDA and CDFA are working aggressively to control and suppress this pest before it has the chance to spread requiring greater resources to protect American agriculture and our urban and suburban landscape.

Japanese beetles have been detected in Washington State over the years, but we have never had to conduct an eradication treatment against a reproducing population.

Approximately 2,000 traps are set each year targeting the entire state, with emphasis on areas where past beetle activity has been detected and airfields handling cargo aircraft.

About half our traps are placed around five state airfields – Sea-Tac Airport and Boeing Field in Seattle; Paine Field in Everett; and two military airfields, McChord AFB in Tacoma and Fairchild AFB in Spokane. We also trap smaller airfields that receive airplanes from regulated airfields located in Japanese beetle infested areas in eastern states.

Japanese beetles feed on about 300 species of plants, devouring leaves, flowers, and overripe or wounded fruit. A single beetle does not eat much; it is group feeding by many beetles that results in severe damage.

Adults feed on the upper surface of foliage, chewing out tissue between the veins. This gives the leaf a lacelike or skeletonized appearance. Trees that have been severely injured appear to have been scorched by fire. Odors emitted from beetle-damaged leaves seem to be an important factor in the aggregation of beetles on particular food plants.

Adult Japanese beetles are highly mobile and can infest new areas from several miles away. Usually, however, they make only short flights as they move about to feed or lay eggs.
**Asian Longhorned Beetle**

- The Asian longhorned beetle (ALB) is a large, bullet-shaped beetle about 1 to 1.5 inches long. Shiny and black with white spots, it has exceptionally long antennae that are banded with black and white.
- In the larval stage, the white, worm-like beetles bore into live trees causing sap to flow from wounds and frass (sawdust and other insect waste) to accumulate at tree bases.
- Left undetected, the ALB will girdle the vascular system of trees eventually causing the tree to wither and die.
- ALB larvae bore deep into deciduous hardwood trees such as maple, birch, horse chestnut, poplar, willow, elm, and ash, eventually killing them.
- Damage from infestations in Illinois, New Jersey, and New York has resulted in the removal of more than 30,000 trees and costs to State and Federal governments in excess of $269 million since the discovery in 1996.
- If the ALB were to expand beyond the current quarantined areas, it has the potential to wreak havoc nationwide, affecting such industries as lumber, maple syrup, nursery, and tourism and causing more than $41 billion in losses.

**Citrus Longhorned Beetle**

- Citrus longhorned beetle is native to Asia and occurs primarily in China, Korea, and Japan. It has been found in, and eradicated in Georgia, Wisconsin, and Washington.
- It was most likely introduced on wood packing material or in live plant material. It is known to attack and kill more than 100 species of plants and includes several species in the Citrus genus as well as peach, cherry, pecan, maple, oak, ash, elm, and walnut.
- When mature, they are 1 3/4 to 2 1/3 inches long and about 1/3 of an inch wide with an amber colored head and black mouthparts.
- Adults emerge from April to August. Adults are 1 to 1 1/2 inches long and shiny black with white markings. Antennae are at least as long as the body and have alternating black and white bands.
- Damage includes distinct round or slightly oval shaped adult exit holes on the bark surface, T-shaped oviposition holes, sawdust-like frass or wood pulp around small holes, and larval tunnels in the wood under loose or thin bark.