Some insect pests of concern for California

Nursery Advisory Board meeting

June 2025

Kyle Beucke
Primary State Entomologist

Strawberry blossom weevil

Anthonomus rubi (Herbst)

(Coleoptera: Curculionidae)

→same genus as boll weevil.

Small (2.5-3 mm), black.

Native to Old World. Present in northern Africa, Asia, and Europe (including Mediterranean).

A-rated pest in California, USDA reportable.

Life history

One generation per year.

Adults feed on leaves, stalks, flowers, and fruit, causing damage.

Adults overwinter in leaf litter.

Adult female lays eggs (May-June) in buds of hosts, all in the Rosaceae: Strawberries, *Rubus* species, and *Dasiphora fruticosa* (shrubby cinquefoil), and possibly wild rose (*Rosa* sp.).

Life history (continued)

Larva feeds on pollen in the bud, in the process destroying it.

Significant losses (over 60%) of strawberry and caneberry are reported in Europe.

Photograph: Warren Wong (bcinvasives.ca)

Signs of strawberry blossom weevil

Severed, dead or dying flower buds.

Photographs: Warren Wong (bcinvasives.ca)

Signs of strawberry blossom weevil (continued)

Adult feeding damage on fruit.

Signs of strawberry blossom weevil (continued)

Adult weevils on flowers or other parts of plant.

Introduced to Canada and Washington

First specimens found in British Columbia in 2019.

Follow-up surveys confirmed infestations, some of which are on the Canada-United States border.

Hosts: Strawberries, *Rubus* species (wild and cultivated, including raspberry), *Rosa* spp.,

iNaturalist reports suggest it is present in Washington state.

Map from iNaturalist.org

What is at risk?

California crops:

Strawberries: $2 billion (2020)

Raspberries: $406 million (2020)

What is at risk? (continued)

Two native California *Rubus* species are known hosts.

-Possible environmental impact.

-Easier spread into/across the state.

Rubus spectabilis (salmon berry). Northern coastal California.

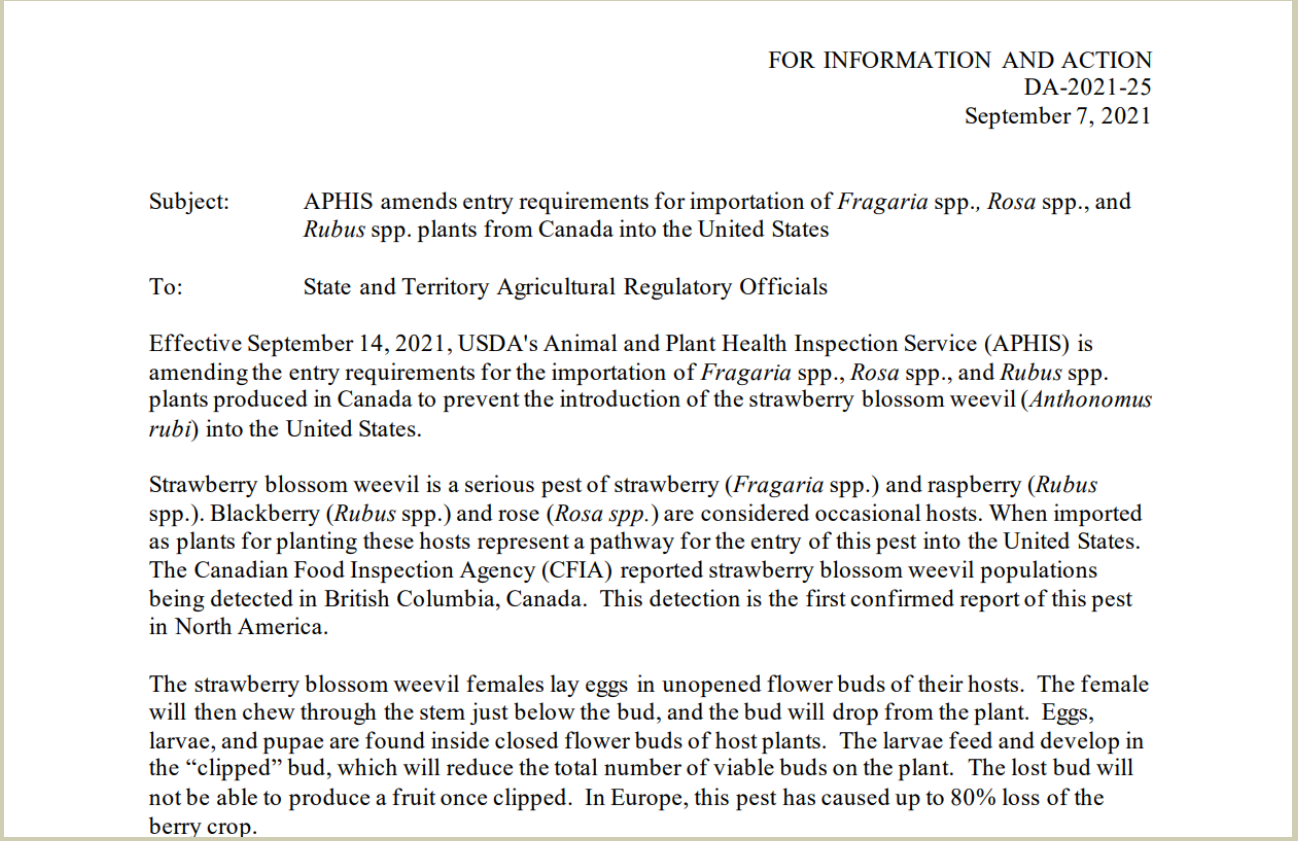
Rubus parviflorus (western thimbleberry). Widespread along coast and in mountains.

Buff Corsi (California Academy of Sciences)

How can we keep it out?

International (trade):

USDA has amended import requirements for host material from Canada.



FOR INFORMATION AND ACTION
DA-2021-25
September 7, 2021

Subject: APHIS amends entry requirements for importation of *Fragaria* spp., *Rosa* spp., and *Rubus* spp. plants from Canada into the United States

To: State and Territory Agricultural Regulatory Officials

Effective September 14, 2021, USDA's Animal and Plant Health Inspection Service (APHIS) is amending the entry requirements for the importation of *Fragaria* spp., *Rosa* spp., and *Rubus* spp. plants produced in Canada to prevent the introduction of the strawberry blossom weevil (*Anthonomus rubi*) into the United States.

Strawberry blossom weevil is a serious pest of strawberry (*Fragaria* spp.) and raspberry (*Rubus* spp.). Blackberry (*Rubus* spp.) and rose (*Rosa spp.*) are considered occasional hosts. When imported as plants for planting these hosts represent a pathway for the entry of this pest into the United States. The Canadian Food Inspection Agency (CFIA) reported strawberry blossom weevil populations being detected in British Columbia, Canada. This detection is the first confirmed report of this pest in North America.

The strawberry blossom weevil females lay eggs in unopened flower buds of their hosts. The female will then chew through the stem just below the bud, and the bud will drop from the plant. Eggs, larvae, and pupae are found inside closed flower buds of host plants. The larvae feed and develop in the "clipped" bud, which will reduce the total number of viable buds on the plant. The lost bud will not be able to produce a fruit once clipped. In Europe, this pest has caused up to 80% loss of the berry crop.

How can we keep it out? (continued)

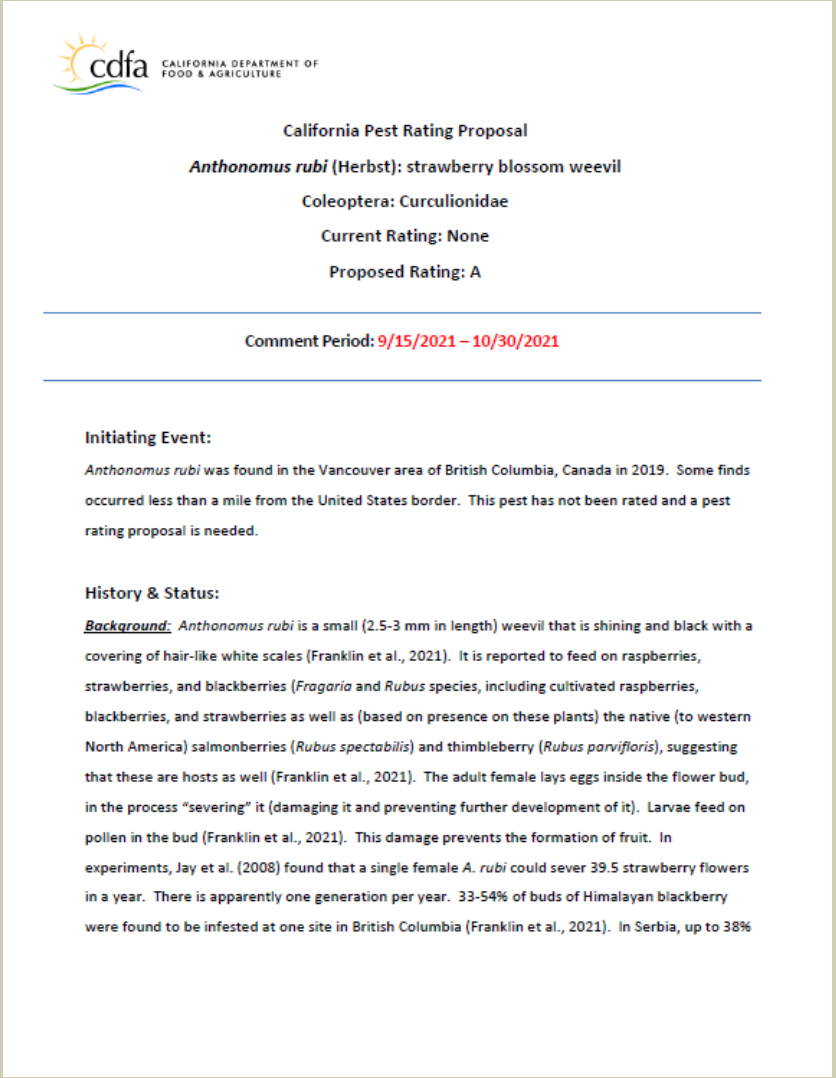
Domestic (trade):

Rubus plants from Oregon:
Most (?) plants do not flower prior to shipment = low risk.

Pest rating proposal

Pest rating proposal posted; public comment period ended October 2021.

Anthonomus rubi is an A-rated pest in California.



cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal

Anthonomus rubi **(Herbst): strawberry blossom weevil**

Coleoptera: Curculionidae

Current Rating: None

Proposed Rating: A

Comment Period: 9/15/2021 – 10/30/2021

Initiating Event:

Anthonomus rubi was found in the Vancouver area of British Columbia, Canada in 2019. Some finds occurred less than a mile from the United States border. This pest has not been rated and a pest rating proposal is needed.

History & Status:

Background: *Anthonomus rubi* is a small (2.5-3 mm in length) weevil that is shining and black with a covering of hair-like white scales (Franklin et al., 2021). It is reported to feed on raspberries, strawberries, and blackberries (*Fragaria* and *Rubus* species, including cultivated raspberries, blackberries, and strawberries as well as (based on presence on these plants) the native (to western North America) salmonberries (*Rubus spectabilis*) and thimbleberry (*Rubus parviflorus*), suggesting that these are hosts as well (Franklin et al., 2021). The adult female lays eggs inside the flower bud, in the process "severing" it (damaging it and preventing further development of it). Larvae feed on pollen in the bud (Franklin et al., 2021). This damage prevents the formation of fruit. In experiments, Jay et al. (2008) found that a single female *A. rubi* could sever 39.5 strawberry flowers in a year. There is apparently one generation per year. 33-54% of buds of Himalayan blackberry were found to be infested at one site in British Columbia (Franklin et al., 2021). In Serbia, up to 38%

How can we keep it out? (continued)

Natural spread:

Considering:

Anthonomus rubi was found on the United States-Canada border and is apparently in Washington state.

Native host plants are widely distributed along the west coast.

→There do not appear to be any barriers to natural spread through the PNW to California.

Summary

Strawberry blossom weevil is a threat to California agriculture and environment.

It is established in Canada and is apparently present in the Pacific Northwest of the United States (Washington state).

The primary mode of its spread to California is likely to be natural spread.

Agave

Family: **Asparagaceae**

Genus: ***Agave***

Native to the Americas. Highest diversity in Mexico.

California:

- Four native species.
- Wide variety of non-native species grown as ornamentals and (to a much lesser extent) crops.

In the past, agave was grown in California primarily as an ornamental.

Agave americana (non-native)

Agave shawii (native)

Agave utahensis (native)

Agave agriculture

Fiber (sisal): *Agave sisalana*.

Syrup

Spirits (in Mexico) (tequila and mezcal): *Agave tequilana*, *A. angustifolia*, etc.

In Mexico, ~100 species of *Agave* are used by humans in some way.


Agave sisalana


bales of sisal fiber (Brazil)


Agave tequilana

mezcal

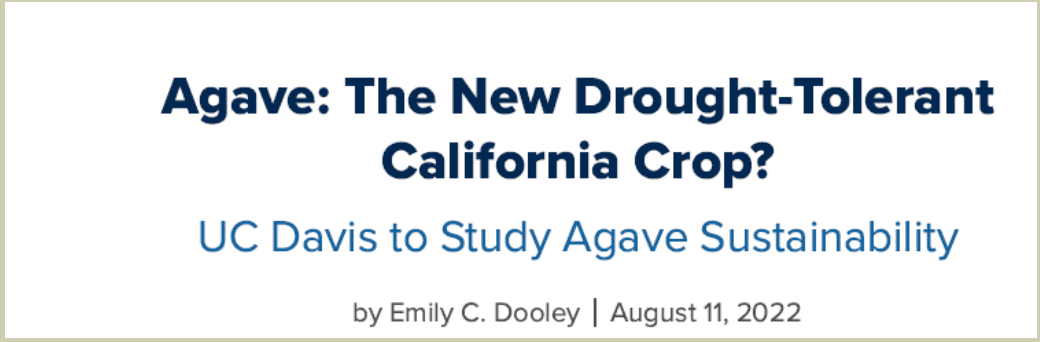
Agave as a crop in California

In recent years, there has been a surge in interest in growing agave for spirits in California, with limited production since 2019.

- **Low water requirements** (3 inches of water/year, compared to 50 for almonds and 30 for tomatoes).
- **Growing demand for agave spirits** (e.g., tequila and mezcal made up 29% of spirits sold in U.S. bars in 2023).

California acreage: From ~50 to 200 acres (2024). *Agave tequilana*, *A. americana*, *A. mapisaga*, *A. salmiana*, etc.

Research underway. e.g, $500,000 specialty crop block grant to California Agave Council: *Pioneering Drought and Climate Resiliency Through Education andTraining for the Emerging California Agave Industry*.



Agave pests

At least 273 species of insects associated with *Agave* species in Mexico.

Some agave pests already occur in California, e.g.:

Agave weevil (*Scyphophorus acupunctatus*)

Larvae tunnel through and feed on the base and upper roots.

May help spread rot fungi and bacteria, e.g., *Aspergillus niger* and *Erwinia carotovora.*

Andrade 2022; Cuervo-Parra et al., 2019

Agave pests (continued)

However, high diversity of agave in Mexico and limited scale and diversity of agave agriculture in California suggests **potential for new agave pest introductions to California.**

Gusano rojo del maguey (mezcal worm): A pest…

Comadia redtenbacheri (Lepidoptera: Cossidae)

Not known to be present in California

Larvae feed on *Agave* species. They tunnel through and feed on the bases of leaves and the stems.

One generation per year.

Damage often kills the plant.

Control: Removal of larvae from plant and insecticides.

And a food

Larvae are eaten as a food in Mexico, especially in southern and central Mexico.

They are considered a delicacy; one liter of worms can cost almost $70!

Harvesting these larvae usually means killing the plant (potential environmental impacts).

Spotted lanternfly

Lycorma delicatula (White) (Hemiptera: Fulgoridae)

Large (up to 25 mm long) and colorful.

First detected in the United States in 2014 (Pennsylvania).

Most important pathway for long-distance movement is likely egg masses on a variety of objects.

Lays eggs on any flat surface (e.g., tree trunks, vehicles including trains, furniture).

Feeds on >100 species of plants but has a strong preference for tree of heaven (*Ailanthus altissima*).

Grape is another preferred host and is apparently the only crop that is significantly impacted by this pest in the eastern United States.

Photographs: USDA

Finding spotted lantern fly

Inspect all parts of tree of heaven or other host for SLF signs and symptoms.

1st –3rd instars have broad feeding preferences and are typically found on herbaceous plants and new growth. Cannot feed through thick bark.

4th –instar SLF nymphs begin feeding on woody tissues.

Younger adults move between hosts readily

Adult SLF feed on a narrower range of plants, e.g., TOH and grapes.

Finding spotted lantern fly : Sooty mold and honeydew on vegetation

Sooty mold on vegetation.

Photo by Emelle Swackhamer Pennsylvania State University, Bugwood.org

Searching for egg masses: (Penn State has great presentation on this)

- Binoculars highly recommended!
- Prefer undersides of larger branches that are larger than 1.5-2 inches in diameter
- Most laid above 3 m above ground (research finding) Keller et al. 2020
- Check man-made structures, typically laid in protected areas if population densities are low.

Photos by Emelie Swackhamer, Penn State University, Bugwood.org (left) and Kenneth R. Law, USDA APHIS PPQ, Bugwood.org (right).

Report a Pest

Pest Hotline: 1-800-491-1899

Have you seen a new or unusual plant or pest in your area?
If so, you can play an important role in protecting California agriculture and your environment by reporting the sighting of a plant or pest that you suspect may be a new invasive species in your area.

- Report a Pest Web App
- Report a Pest Sighting Form

Thank you!