



Department  
for Environment,  
Food & Rural Affairs

## Plant Pest Factsheet

# Round-headed apple tree borer

## *Saperda candida*



Saperda candida (SAPECN) - <https://gd.eppo.int>

**Figure 1.** *Saperda candida* – A newly emerged adult female. Adults measure up to 25mm in length. © EPPO

## Background

The Round-headed apple tree borer (*Saperda candida*), also known as the Saskatoon borer, is a longhorn beetle native to North America. Its larvae are highly damaging and considered economically important pests, primarily feeding on plants in the rose family (*Rosaceae*), including fruit trees and widely grown ornamental species.

In the summer of 2008, an isolated outbreak of *S. candida* was discovered in Europe for the first time. Adults and larvae were found on Fehmarn Island in northern Germany (Schleswig-Holstein). This led to the species being placed on the EPPO (European and Mediterranean Plant Protection Organization) alert list. Initially, the outbreak was concentrated in a 30-year-old avenue of urban trees, affecting species such as *Sorbus intermedia* (Swedish whitebeam), *Malus* (apple), and *Crataegus* (hawthorn). Since 2008, surveys have confirmed the beetle's continued presence at the original site and in new locations nearby, where it remains under monitoring and eradication efforts.

Climate models suggest that much of Europe, including the UK, has environmental conditions similar to regions in the USA and Canada where *S. candida* is naturally found. Given the widespread availability of suitable host plants, there is potential for this beetle to establish and become a more serious and damaging pest in Europe.

To mitigate this risk, *S. candida* has been added to the EPPO A1 list and is a regulated quarantine pest in both the EU and GB.

## Geographical Distribution

**North America:** Found in Canada (Alberta, Manitoba, New Brunswick, Nova Scotia, Ontario, and Saskatchewan) and across much of the United States, including Alabama, Arkansas, Connecticut, Delaware, Florida, 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, Virginia, West Virginia, and Wisconsin.

**Europe:** Germany (isolated findings on urban trees of *Sorbus intermedia*, *Malus* sp. and *Crataegus* sp., on the island of Fehmarn (Schleswig-Holstein) in the villages of Johannisberg and Mattiasfelde).

## Host Plants

The Round-headed apple tree borer primarily feeds on plants within the rose family (*Rosaceae*). Known host species include *Amelanchier alnifolia*, *Amelanchier canadensis*, and other *Amelanchier* species, as well as *Aralia* sp., *Aronia arbutifolia*, *Betula* sp., *Borkhausenia intermedia*, *Cotoneaster* sp., *Crataegus* sp., *Cydonia oblonga*, *Malus coronaria*, *Malus domestica*, *Malus pumila*, *Prunus avium*, *Prunus domestica*, *Prunus persica*, *Pyracantha* sp., *Pyrus communis*, and *Sorbus americana*.

## Description

**Egg:** Eggs are smooth and measure 3–4 mm in length by 1 mm in width. They start out as a light cream colour but gradually darken to a shade of rust-brown over time.

**Larva:** The larvae resemble other longhorn beetle larvae and lack any distinct features that allow field identification to species. When fully grown, they reach up to 38 mm in length and are yellowish-white, legless with clearly segmented sections (Fig. 2 left). The only pigmented areas are the first thoracic segment (just behind the head), which appears light brown (due to the presence of a plate), and the mandibles (jaws), which are black.

**Adult:** Small, growing up to 25 mm long and 8 mm wide. Their appearance is distinct from any native British longhorn species (Fig. 1). They have a brown body with two narrow, parallel white stripes made up of fine hairs running along the upper surface. The underside is fully covered in short white hairs, while their legs and antennae feature short white or blue-grey hairs. As with many longhorn beetles, the antennae of the males and females are different lengths with the females having noticeably shorter antennae than males.



**Figure 2. Left:** *Saperda candida* - larva (Image: James Solomon, USDA Forest Service, Bugwood.org). **Right:** *Zeuzera pyrina* - larva. (Image: © Crown copyright courtesy Fera Science Ltd.). Both with a *Malus* sp., and at the same scale.

## Biology

The following account is based on observations from its natural range in North America. Adult beetles emerge between April and June and are active from May to September. When they emerge the adults feed on the bark of small twigs as well as the hosts foliage for about 10 days before mating occurs. The females then lay their eggs individually in extended cuts (6-18 mm in length) that they chew in the basal 25 cm of the host trunk. Up to 6 eggs can be laid on the same tree and each female may lay up to 30 eggs over a period of 75 days. Multiple females may lay eggs on the same trunk. The eggs hatch in 15 to 22 days and the newly emergent larvae begin to feed downwards into the sapwood under the bark making winding galleries, each eventually creating an oval chamber in which they spend their first winter. The next spring, the larvae start feeding again in the sapwood. This is revealed by distinctive piles of red ejected sawdust-like droppings (frass) that they push out of their tunnels, which collect on the ground around the infested tree. By the late summer of the second year the larvae are about half grown and still feeding in the sapwood where they will spend a second winter. Feeding is completed the following summer at which time the larvae bore into the heartwood to create a pupation chamber filled with frass and long wood fibres. In the third winter the larva remains dormant in this chamber. Pupation commences the next spring over a period of about 3 weeks with the newly formed adults remaining in the pupal chamber until their outer shell (carapace) fully hardens for about 2 weeks before chewing their way out through the bark and emerging as fully developed adults. In warmer regions in the south, the beetle's life cycle can be completed in just two years. However, in colder northern areas, lower temperatures slow development, extending the cycle to as much as four years.

## Dispersal and Detection

Some adult beetles have been reported to fly several hundred meters before laying their eggs, but most females lay their eggs close to the trees where they emerged. The Round-headed apple tree borer can also be spread through the movement of infested living host plants and wood products, including firewood, round wood with bark, and wood packaging material. This dispersal can occur both locally and internationally via trade.

Although adult beetles are very distinctive, they are mostly nocturnal, making them difficult to spot. The larvae are also difficult to detect because they feed inside the lower stems and trunks of their host trees. Typically, the first visible signs of an infestation are host plant symptoms.

A careful inspection near ground level may reveal elongated oviposition scars on the bark where eggs were laid. Other signs of infestation include brown sap stains, depressions in the bark, reddish sawdust like droppings (frass) pushed out of cracks, and holes in the bark. Infested trees often appear unhealthy, with fewer pale-coloured leaves. Young or heavily infested trees may produce excessive blooms before dying as their fruit ripens. Circular holes (5–6 mm in diameter) in the bark indicate that adult beetles have

successfully emerged, however, these holes alone do not confirm the presence of this species.

If trees have broken stems or trunks near ground level, they should be examined for larval tunnels, frass deposits (droppings), and larvae. However, larvae of the leopard moth (*Zeuzera pyrina*, Fig. 2 right), a native pest that is not regulated also develop in many of the same host trees as *S. candida*, creating similar damage and symptoms. To confirm their identity, larvae must be extracted and examined. Leopard moth larvae can be distinguished from round-headed apple tree borer larvae by their visible legs, golden-yellow colour, black head; black plate on the first thoracic segment (the section just behind the head), and black spots on the body.

## Economic Impact

Until the mid-20th century, the Round-headed apple tree borer was a highly destructive pest, causing significant economic damage to orchard trees in North America. However, with the introduction of modern pest management techniques and the use of pesticides targeting other pests, its impact on orchards has been reduced. Despite this, *S. candida* remains a serious threat to various ornamental trees and shrubs.

This beetle primarily targets young trees between 3 and 10 years old, though it is not limited to this age range. The larvae feed on the host plant's vascular tissues (tissues responsible for transporting water and nutrients), disrupting the flow of nutrients and water in the host. In severe cases, they completely girdle the trunk, cutting off circulation and killing the tree. Additionally, feeding damage weakens the host, making it more susceptible to infections from pathogens such as fungi and bacteria.

One major concern is the link between the damage caused and the development of fire blight—a bacterial infection caused by *Erwinia amylovora*. This pathogen specifically affects plants in the Rosaceae family, leading to further decline in infested trees.

## Pest Management and Reporting

Longhorn beetles are difficult to control because their larvae and pupae develop inside the host plant, where they are shielded from insecticide treatments and most predators by the surrounding plant tissue. Insecticide sprays can be effective against adult beetles—but only if they come into direct contact with the treatment or consume treated plant material. However, many pesticides that have been proven effective against the Round-headed apple tree borer in North America are not approved for use in the UK or EU.

Physical control methods include extracting larvae using a hooked wire or cutting along their tunnels with a sharp knife. However, these approaches are labour-intensive, may not remove all larvae, and leave the host plant vulnerable to secondary infections. As a result, the only completely effective way to eliminate larvae is to destroy the infested plant.



In North America, at least three species of native wasps from the Braconidae family parasitize the larvae, helping to reduce their numbers naturally. Unfortunately, these beneficial wasp species do not exist in the UK or Europe, limiting biological control options.

Suspected outbreaks of *Saperda candida* or any other non-native plant pest should be reported to the relevant authority:

**For finds at garden centres, plant nurseries or private gardens in England and Wales, contact your local APHA Plant Health and Seeds Inspector, or the PHSI headquarters, in York:**

Tel: 0300 1000 313

Email: [planthealth.info@apha.gov.uk](mailto:planthealth.info@apha.gov.uk)

**For Scotland, contact the Scottish Government's Horticulture and Marketing Unit:**

Email: [hort.marketing@gov.scot](mailto:hort.marketing@gov.scot)

**For Northern Ireland, contact the DAERA Plant Health Inspection Branch:**

Tel: 0300 200 7847 Email: [planthealth@daera-ni.gov.uk](mailto:planthealth@daera-ni.gov.uk)

Web: [www.daera-ni.gov.uk/topics/plant-and-tree-health](http://www.daera-ni.gov.uk/topics/plant-and-tree-health)

**For finds in the wider environment:** <https://treealert.forestresearch.gov.uk/>

For additional information on UK Plant Health please see:

[planthealthportal.defra.gov.uk/pests-and-diseases/uk-plant-health-risk-register/](http://planthealthportal.defra.gov.uk/pests-and-diseases/uk-plant-health-risk-register/)

[planthealthportal.defra.gov.uk/](http://planthealthportal.defra.gov.uk/)

[www.gov.uk/plant-health-controls](http://www.gov.uk/plant-health-controls)

[www.gov.scot/Topics/farmingrural/Agriculture/plant/PlantHealth/PlantDiseases](http://www.gov.scot/Topics/farmingrural/Agriculture/plant/PlantHealth/PlantDiseases)

[daera-ni.gov.uk/topics/plant-and-tree-health](http://daera-ni.gov.uk/topics/plant-and-tree-health)

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