

EXOTIC PEST ALERT

Emerald Ash Borer, *Agrilus planipennis* Fairmaire (Coleoptera: Buprestidae)

An exotic beetle pest that causes significant damage to ash trees (*Fraxinus* spp.) has recently been introduced into North America. The pest is the emerald ash borer, *Agrilus planipennis*, a member of the beetle family Buprestidae. A native of Asia, it is thought that the beetle has been introduced into the country in imported wooden packing material. Ash trees have been widely planted in urban situations in North America and are also economically important as a commercial timber crop. The death of many ash trees, within 2 to 3 years of first showing signs of ill health, is a cause for great concern.

In July 2002 the emerald ash borer (EAB), *Agrilus planipennis*, (Fairmaire) (Coleoptera: Buprestidae) was identified as the causal agent of ash tree decline and mortality, that had been of concern for a number of years in the Detroit metropolitan area. Very shortly after this it was also found in Windsor, Ontario. The infestation is now established across an area covering more than 5,000 square miles of the USA and Canada, 13 counties in south-east Michigan as well as neighbouring Essex County, Ontario. Other more localised outbreaks exist elsewhere in Michigan, Ohio and Indiana. EAB is native in China, Japan, Taiwan, Korea, Mongolia and the Russian Far East.



Above: Adult Beetle
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Right: Infested ash tree showing symptoms of decline, 60% loss of crown density
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may indicate beetle presence. Characteristic serpentine insect galleries can be exposed when pieces of bark fall from damaged trees that have been infested for 1 to 2 years.

What to look for:

- * **Initial thinning or yellowing of the foliage (general or limited to certain branches).**
- * **Bark fissures, 5-10cms in length, caused by the growth of callus tissue produced by the tree in response to larval feeding.**
- * **Woodpecker activity. Woodpeckers strip away small patches of bark, so that they can extract the borers.**
- * **Larval galleries. Typical galleries meander, bending sharply and are packed with frass.**
- * **D-shaped holes, about 3 mm in diameter, produced by emerging adults.**



Left: Bark peeled back on infested ash tree to expose galleries beneath
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Right: D-shaped exit hole
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Host trees

So far EAB has only been found in North American species of *Fraxinus* and there are no data available on the common European species *F. excelsior* and *F. angustifolia*, although they are included as ornamental species at risk in North America. In China, the beetle colonises the Asian ash species *F. mandshurica* (Manchurian ash) and *F. chinensis* (Chinese ash). *Sorbus aucuparia* (mountain ash), is not attacked.

The Symptoms

EAB infestations are usually difficult to detect until the symptoms become severe. Trees exhibit a general yellowing and thinning of foliage, dying branches and crown dieback, typically from the top down. Small trees can be killed in one year, but larger trees can take up to 4 years to die. Sprouting epicormic shoots, small longitudinal splits in the bark or woodpecker activity

Life Cycle of EAB

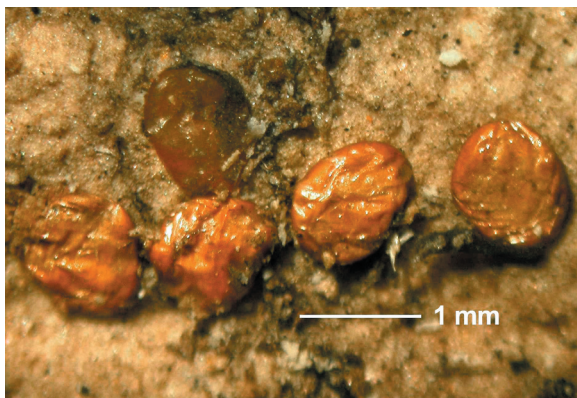
In China the beetle develops through its full life cycle in one year over most of its range and this appears to also be the case in North America. In colder northern areas of China the cycle can take two years.

Adults appear from mid-May to late July and must feed on ash foliage. They are slender elongate beetles measuring between 7.5 and 13.5mm long and are metallic emerald green in colour. Adult females live for about 22 days and males slightly less. The females each produce between 60 and 90 eggs.



Adult beetle
© D. Cappaert

Eggs are laid singly or in small clusters into bark crevices and hatch in 7-10 days



Eggs
© D. Cappaert

Larvae burrow through the bark after hatching and begin feeding in the living water and nutrient conducting tissues of the tree. They produce sinuous tunnels as they feed through four larval stages (instars) and reach a final size of 26-32mm long. Feeding tunnels may extend to 20-30 cm long. As the larvae increase in size the galleries enlarge and fill with brown frass and can eventually girdle and kill branches and entire trees. Larvae feed aggressively until temperatures fall in the autumn, after which they spend the winter in the inner bark in thick barked trees or in the outer wood where the bark is thinner.



Fully grown larva
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The Threat

Ash is an important broadleaf tree in the UK, the second most commonly planted genus, and makes up nearly 15% of all broad-leaved woodlands. Its wood is strong with many uses including the manufacture of ladders, flooring, handles, sports goods and furniture.

Although there is no evidence to date that the emerald ash borer is present in the UK, the increase in global movement of imported wood, wood packaging and dunnage poses a significant risk of its accidental introduction.

In the UK, ash trees can suffer from a variety of root and butt rots that can cause late flushing, thinning foliage and decline leading to eventual death, symptoms similar to those caused by the emerald ash borer. *F. excelsior* can also suffer from a condition called Ash dieback, involving the death of scattered twigs, branches or limbs, especially in the eastern drier parts of the country. Although not fully understood, this may be partially due to root disturbance. Trees with symptoms like these that also show any signs of infestation by the emerald ash borer should be reported immediately.

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