

**What you need to  
know about the  
management of**

**the Emerald Ash  
Borer (EAB)**



**Guidelines for  
hiring tree care  
services to manage  
urban trees**

## What is an Emerald Ash Borer?

The emerald ash borer (EAB) is a metallic green wood-boring beetle of about 1 to 1.5 cm in length that attacks all native species of ash trees, typically killing them in two to three years. Its larvae bore tunnels under the bark to feed on inner bark tissue. The tunnels cut the flow of nutrients and water to leaves, causing the tree to die. Native to China, this invasive species was discovered in Windsor Ontario in 2002. Since then, the pest has spread into other areas of Ontario and Quebec and to 15 states in the USA.



Tunnels made by the EAB larva within a tree

For more information about the EAB, visit the Canadian Food Inspection Agency (CFIA) website at: [inspection.gc.ca](http://inspection.gc.ca)

This booklet has been designed for homeowners and other people who need to manage the emerald ash borer within an infested urban area. It will help you determine if you have ash trees on your property and if they have been infested by the emerald ash borer. We recommend that if you suspect your tree or neighbourhood is infested with emerald ash borer, that you consider management options including pesticide treatment or tree removal without delay. This booklet will provide you with information to guide your decisions.

Remember, ash trees on your property that have been affected by the emerald ash borer can become a safety hazard and you are responsible for dealing with the hazard effectively.

## Ash Trees

Ash trees can grow to 30 meters (m) in height and are a common species in the urban forest. Ash have a compound leaf 13 to 30 centimeters (cm) in length. A compound leaf has more than one leaflet on its stalk base. Ash trees have five to nine leaflets per leaf depending on the species.



Ash have a characteristic pattern of branches that is similar to maple in that the twigs emerge from the branch opposite to one another. Most other tree species in Ontario have an alternate pattern of branches.

Designed by:

Design Services, Information Production  
City Clerk's Office, 2012 — 12454



The bark on young trees and younger branches tends to be smooth and grey although it sometimes appears reddish on some species. Over time, the bark becomes rougher and forms ridges and furrows.

Some older ash trees have a characteristic diamond pattern to their bark.

## Recognizing Trees that are Infested with EAB

In the early stages of infestation, when the EAB population is fairly low; it is difficult to detect whether a tree has EAB or not. Methods have been developed by experts to determine if a tree is infested, but without detailed review, the level of infestation within a tree is hard to determine. EAB symptoms may not show up for 2 or 3 years after the tree has been infested.

Signs of EAB infestation include: yellowing foliage, thinning tree crowns and dead branches. Heavy seed production may also be seen near the end of the tree's life, as trees can produce a heavy seed crop in reaction to stress. You may also see on the tree bark splitting or discoloration and characteristic D-shaped exit holes that are about 3 mm in diameter. New shoots may be seen sprouting from various places on the trunk as the tree dies.

Woodpeckers feeding on EAB larvae and the resultant damage to the bark, may be seen on the tree as well. Eventually, the bark from a dead tree will begin to peel away exposing the larval galleries beneath.

See "A Visual Guide to Detecting Emerald Ash Borer Damage" for more information, visit: [cfs.nrcan.gc.ca](https://cfs.nrcan.gc.ca); (select Publications; and enter the document id # '26856')



Healthy ash tree



Ash tree showing signs of crown thinning due to EAB



Extensive thinning of foliage and new shoots sprouting from the tree trunk



Tree almost completely dead



Significant crown dieback and sprouts



Dead tree with peeling bark showing larval galleries beneath



Characteristic D-shaped exit hole about 3 mm in diameter



Woodpecker feeding on EAB larvae

## Management Options for Ash Tree Owners

If large trees are located near buildings or areas of active use, they will become hazardous when they die. Trees must be managed either through pesticide treatment or through tree removal.

### What you need to know

- EAB only affects ash trees
- both healthy and weakened trees are attacked
- EAB attacks trees of all sizes from 1 cm in diameter and larger
- infested trees die quickly and become hazardous
- you are responsible for maintaining the trees on your private property
- do not plant ash trees

### Pesticide treatment

Studies indicate that pesticide treatment for control of insect pests (insecticides) have been able to preserve ash trees. Ash trees which are still healthy and structurally sound can be protected if treated with registered<sup>1</sup> insecticides. It is recommended you assess your trees immediately to determine whether this is the best course of action for your tree(s).

<sup>1</sup> Pesticides are registered by the Pest Management Regulatory Agency, Health Canada, a Federal Agency. Products available in USA may not be available in Canada.

Your ash tree is a good candidate for injection if:

- it is located in an area that is infested with EAB
- the tree is in good overall health, with limited branch dieback or decline
- the tree is structurally sound and large enough to sustain injury from drill holes
- the tree will be expensive or difficult to remove and replace.
- The tree has significant value to you



### Injection of a pesticide into a healthy tree

TreeAzin™ insecticide has been shown to be effective in the control of EAB and extending the life of ash trees. In order for the uptake of TreeAzin™ to be successful, it needs to be applied between the months of May and the end of August. TreeAzin™ provides 2 years of protection against EAB, depending on tree health and EAB populations at the time of injection.

There is some evidence to suggest that populations of EAB will drop to a non-threatening level once the initial killing wave moves through the landscape. As a result, the number of treatment cycles may be reduced. Landowners should monitor their trees and any information on the status of the beetle population in their area.

For more information on TreeAzin™ Systemic Insecticide, visit: [bioforest.ca](http://bioforest.ca)

For more information about why ash trees should be protected, see: [emeraldashborer.info/files/conserv\\_e\\_ash.pdf](http://emeraldashborer.info/files/conserv_e_ash.pdf)

## Tree Removal

Where tree removal is necessary, it is strongly recommended that you hire a tree care company that employs arborists to perform the work. Tree removal can be complex and should only be performed by those who are trained to know how to perform work safely and have the equipment to do so. When tree removal is necessary, it is best to have the tree removed as soon as possible. If removal of dead trees is delayed, they become hazards and can be more expensive to remove.

### What is an arborist?

An arborist is a professional that is knowledgeable about tree biology and physiology and has experience in the practice of arboriculture, which is the cultivation, management and study of individual trees.

### Why you should hire a company that employs arborists?

Tree work is very dangerous. It is recommended that you hire a company or person that knows how a tree should be maintained to ensure tree health and to address safety concerns. An arborist can also determine when a tree can no longer be maintained and should be removed due to health, structural concerns or safety and other reasons that may impact long-term viability. Tree removal around buildings, vehicles and wires present special challenges.

## What qualifications should an arborist have?

The tree care industry is not regulated. However, many arborists choose to become certified by the International Society of Arboriculture (ISA), a non-profit professional organization that supports tree care research and education around the world. The ISA provides the latest information and techniques to their members and certified arborists.

In order to become certified, it is necessary to pass a written examination. To maintain certification, the arborist must keep current of innovations in the tree care industry through training and participation in educational seminars every year. Certification can attest to the tree knowledge of an individual and that they understand accepted practices. Certification cannot guarantee quality of performance; however, certified arborists are governed by the Certified Arborist Code of Ethics with the ISA.

For more information about the International Society of Arboriculture, visit [isa-arbor.com](http://isa-arbor.com).



Aerial device and crane

## What services can an arborist provide?

- assessment of tree health and diagnosing insect and disease problems
- treatment for pests/diseases
- cabling/bracing procedures to reinforce a weak structure or branch attachment
- fertilization
- soil aeration
- tree removal and stumping
- tree planting
- removal of tree debris
- pruning – includes
  - removal of branches that are dead, dying, infested by pests, diseased or damaged by storms
  - growth that interferes with other branches, wires, structures, traffic or pedestrians
  - efforts to improve tree structure, or restore crown balance.

These services can support tree maintenance and health but only registered insecticides will prevent decline caused by emerald ash borer.

## How can I find an arborist?

You can find tree care companies and arborists in the Yellow Pages under “Tree Services” or by location through the International Society of Arboriculture website: [Treesaregood.org](http://Treesaregood.org). You should only hire a company that specializes in tree work and has the proper equipment. You want to ensure that you are getting quality work that will be performed in a safe manner and meet your expectations.



Professional arborist

Before you hire a company or arborist, we recommend you get two or three estimates. It is a good idea to get estimates in writing and to read the document carefully to see if the estimate includes all the work you would like them to perform, such as removal of all brush and wood, stump removal, etc.

While not common, accidents – even fatal accidents – can happen while work is being performed. You need to know that the company and its workers are insured for any injuries or damage, so that you as a homeowner are protected from liability.

Don't automatically accept the lowest bid. You should also consider the credentials and written specifications for the job. You may also want to check references or look at other properties where the arborist has performed work.



## What questions should I ask when hiring an arborist?

- **Do you have liability insurance, Workers Safety and Insurance Board (WSIB) coverage or equivalent?** Liability insurance provides coverage for damages resulting from work and WSIB coverage provides for workers in the event of injury or death. Homeowners insurance does not usually cover contractors performing work on site.
- **Could I have a copy of the WSIB clearance certificate and the insurance coverage once we decide to move forward with this work?** Companies with proper coverage should be able to easily produce these documents.
- **Is your crew trained?** Often qualified workers are trade recognized (i.e., they possess certificates from recognized colleges and/or trade associations such as the International Society of Arboriculture).
- **Will you use specialized equipment such as a bucket truck or crane? Do you own the equipment?** If not, insurance certificates, both liability & WSIB should be produced for any subcontractor.
- **Are you a member of the International Society of Arboriculture, Ontario Commercial Arborist Association, Tree Care Industry Association, or the American Society of Consulting Arborists?** These are professional associations that promote and provide continual training to workers and company owners on safe and efficient operations specific to the industry.
- **Is tree work your sole source of business?**
- **How long have you been in this business?**
- **Can you provide references?**
- **Do you provide a written estimate?**
- **Is there a charge for an estimate?**
- **Does the estimate include the clean up and removal of all brush and wood?**
- **If I would like more work done, what is your hourly rate?**
- **When can the work be done and how long will it take?**
- **Do I have to be home when the work is done?**
- **What form of payment is accepted (cash, credit card, etc.) and when is payment due?**



Specialized equipment

## What things may influence price?

- Proximity to fixed objects, or targets such as:
  - hydro lines
  - driveways
  - structures (houses, garage)
  - busy roadways
  - landscape features (fountain, gazebo, pool, etc.)The closer and/or significant the targets, the more complex the work becomes. This can increase costs.
- Accessibility issues: for example, a tree located in the front yard has easier access and can take less time and equipment to remove than a tree in the back yard. Different equipment may be required depending on accessibility.
- Material or debris left on your property will reduce time and/or equipment and can reduce costs.
- Additional services such as stump removal and re-sodding can require additional visits to the site and increase costs.



- Current state of tree structure: is the tree dead or alive? Is there any rot in the tree, or splits in the trunk/branch unions or branches? These details affect how difficult or unsafe the job is and can increase the cost.
- Size: the larger the tree, the more work involved to remove it and the greater the cost.
- Proximity, if a number of trees in the same area require removal, it may reduce the per tree cost.

## Disposal of Ash Material

Moving ash material and firewood outside of the regulated zone for emerald ash borer is prohibited. If you are in an area that is regulated for the EAB, local tree care companies will know where to dispose of ash material. However, if you have recently trimmed or cut down your ash tree, please contact your municipality or the Canadian Food Inspection Agency (CFIA) for directions on disposal.

**To find out whether you are in a zone regulated for EAB, visit: [inspection.gc.ca](https://inspection.gc.ca).**

## Tree Planting

As living organisms, trees naturally die and must be periodically replaced to sustain the benefits they provide.

### Trees:

- improve air quality by trapping pollution particles that cause breathing problems
- absorb carbon dioxide and other gases and provide us with oxygen
- reduce air temperature when water evaporates from the leaves
- intercept rainfall resulting in reduced storm water runoff and improved water quality
- provide wildlife habitat
- reduce noise pollution by acting as a sound barrier
- may increase property values by up to 30%
- reduce air conditioning needs by up to 40% when deciduous trees are planted on the west and south sides of homes

- lower winter heating costs by up to 10% when evergreens are planted on the north side of homes to act as windbreaks.

Cities generally lose tree canopy due to development of infrastructure and housing. Trees can be replaced by municipalities and conservation authorities on publicly owned lands, but generally these make up less than 50% of the area of potential tree canopy. It is critical that private landowners also contribute to the maintenance of the tree canopy, if the full benefits of the urban forest are to be realized.

The cost of tree planting varies greatly depending on the size of tree selected.

Tree nurseries use different methods for defining the size of their tree stock based on species and general size of the tree. Some nurseries measure tree size by caliper (stem diameter) in millimetres (mm). According to the Canadian Nursery Landscape Association, deciduous tree size is described by the caliper for larger trees. The measurement is taken at a height greater than 15 cm above ground level for trees with a caliper of 40 to 100 mm. Trees larger than 100 mm caliper are measured 30 cm above ground level. Evergreen trees and some smaller tree stock may also be measured by height (ht) in centimetres. For further information, refer to the Canadian Nursery Landscape Association website at: [canadanursery.com](https://canadanursery.com)

## Typical tree sizes available in nurseries:



- ① tree in a 6" diameter pot, 1 m in height or greater



- ② bare root tree, 30 mm caliper, 2-3 m in height



- ③ tree in a 15 gallon pot, 30 mm caliper, 2-3 m in height



- ④ tree in a wire basket 60 mm caliper, 2-3 m in height

The installation of a larger tree (example number four above) requires specialized equipment and is therefore more expensive. Smaller trees are easier to install by landscapers or homeowners.



### Crane lifting wire basket tree

Some arborists will plant trees, but there are a variety of other landscape companies that can also provide this service. See [landscapeontario.com](http://landscapeontario.com) or inquire at a local garden centre. A tree is a long-term investment and you should plan in advance what kind of tree is most suitable to your needs. Some considerations include:

- **Location** – sufficient room to grow without interfering with buildings, utilities, access routes and where there is enough soil to support it.
- **Species** – size, shape and form of tree suitable to your location now and in the future.
- **Price** – some tree species are more expensive than others. Price can be affected by supply & demand, as well as costs to grow a tree to retail size (slower growing trees are in the nursery longer, therefore require more care).
- **Native versus non-native species** – consider native species first, as this will generally help to support conservation of Ontario's biodiversity. If a non-native species is preferred, consider whether it will cause harm to nearby native forests or ravine areas through seed dispersal. Some species such as Norway maple compete with native species in natural forest conditions and are an invasive species that must be managed.
- **Size** – if you want an instant tree replacement you may want a larger tree. Is there access to allow for heavy equipment to lift the tree into place? A 60 mm caliper tree, planted in a wire basket, is commonly

used in parks and schoolyard plantings, where trees are subject to possible damage from activities in the area. Smaller trees, 30 mm caliper or less, are quite suitable for many residential area plantings. Ten years after planting, you may not be able to spot the difference between 30 mm caliper and 60 mm caliper planting stock.

In some areas there are programs in place, from not-for-profit organizations, to assist with tree planting advice or installation.

When you do plant a tree or have a tree planted for you, remember to water it frequently. Don't let the area around the tree dry out (area with mulch in the picture below). The main cause of tree death for newly planted trees is lack of water.



Newly-planted tree

## Partners in the Development of this Brochure

Ontario Ministry of Natural Resources

Ontario Commercial Arborist Association

City of Toronto

Printing and Distribution funded by  
the Ontario Ministry of Natural Resources  
Ontario Species Centre Partnership Fund



*Catalyst for research and response*

Printed 2012

