

Lilac/Ash borer and Emerald ash borer – How do controls of these two insects overlap?

With the establishment of emerald ash borer (EAB) in a part of Colorado there are now two wood boring insects that will be commonly countered – EAB and the lilac/ash borer. This is a cause of some confusion as there are some similarities, but also some important differences in the life history and habits of these species and in the way they are managed.

A Comparison of Life History and Habits

The **lilac/ash borer** (*Podosesia syringae*) is the larva of a type of moth (i.e., a caterpillar), specifically a type of clearwing borer (Lepidoptera: Sesiidae). It is native to North America and is mostly damaging to trees in stressed sites, such as along streets and parking lots. White ash is somewhat more susceptible than green ash.

The **emerald ash borer** (*Agrilus planipennis*) is the larva of a type of beetle, specifically a type of beetle known as a “metallic wood borer” in the adult stage and a “flatheaded borer” in the larval stage (Coleoptera: Buprestidae). It is native to Asia and is a highly aggressive borer; although stressed trees may be more susceptible and decline more rapidly from infestation, all ash trees can be killed regardless of original condition. Green ash is somewhat more susceptible than white ash.

Lilac/ash borer is one of the earliest wood boring insects to be active in the growing season, with adults often beginning to emerge from trees in late April. Eggs are laid on the bark surface and egg laying is concentrated on the lower trunk. Most egg laying occurs in May and early June, with the egg laying and egg hatch period largely concluded by the middle of June.

Emerald ash borer is somewhat later in emerging from trees. It is likely emergence will usually begin in early May, but emergence may extend for a couple of months. After emergence the adults have a period when they move to the crown of the tree where they feed on leaves as eggs mature. Females then begin to lay eggs, which are laid on the bark surface, and egg laying can occur on the trunk and limbs throughout the tree. Most egg laying likely will occur from late May through early July, with the egg laying and egg hatch period largely concluded by mid-late July.

After egg hatch the larvae of the lilac/ash borer tunnel through the bark and feed in the interior of the tree. They may feed under the bark, where they can produce irregular gouging wounds. Also larvae do considerable amounts of internal tunneling, particularly at the base of the tree, which can riddle the trunk and affected branches. External symptoms may appear in the form of deformities of on the trunk and branches where extensive injuries occurred under the bark and some epicormic branching is not uncommon.

After egg hatch the larvae of the emerald ash borer tunnel through the bark and feed in the interior of the tree. They do almost all feeding just under the bark, making meandering feeding tracks that girdle the tree. External symptoms often are a progressive overall thinning of the canopy of the tree and some epicormic branching may occur.

A Comparison of Management

Lilac/ash borer is easily managed by use of a spray of insecticide that is applied to the trunk and lower branches. The insecticides used are either some persisting pyrethroid (e.g., permethrin, bifenthrin) or chlorantraniprole (Acelypryn), all of which have excellent ability to control young caterpillars upon contact. Sprays are optimally applied either immediately before or coincident with the time when eggs are beginning to hatch.

There are several means to control emerald ash borer, which are summarized in the document *Control Options for Emerald Ash Borer in Colorado* (<http://bspm.agsci.colostate.edu/files/2014/02/EAB-control-options-February-11.pdf>). Almost all involve use of insecticides that move systemically in the plant and are applied to target the adults when they feed on leaves before laying eggs and the young larvae as they begin to feed underneath the bark. Most widely available, easiest to apply, and least expensive is a soil application of imidacloprid. Other common EAB treatments include a trunk spray of dinotefuran, and trunk injections of either emamectin benzoate or azadirachtin. Additional treatments that can be used for EAB control include trunk injected imidacloprid, soil applied dinotefuran, or whole tree sprays with persisting pyrethroid insecticides.

The trunk spray of a persistent surface applied treatment typically used for lilac ash borer control is not appropriate to control emerald ash borer. Although these insecticides (at least permethrin and bifenthrin) can kill emerald ash borer upon contact, when used for lilac/ash borer control they are applied a bit too early for EAB control and are not applied to the whole canopy.

Whole tree sprays of persisting pyrethroid insecticides can control EAB, but to do this reliably the first application would best be made a bit later (e.g. midMay) and then reapplied a second time 4-6 weeks later. If done in this manner then these treatments may effectively kill adults on foliage and kill larvae as they hatch from eggs on the surface. However, these whole tree sprays are not generally used for EAB control as they require two annual applications, require whole tree spraying with all its attendant problems (e.g., drift, greater effects on non-target species, restrictions with wind conditions), and are more costly than the systemic insecticide options.

Imidacloprid soil treatments (soil drench, soil injection) or trunk injections used for EAB will not be effective against lilac/ash borer. Most fundamentally this is because the active ingredient, imidacloprid, is not very effective against larvae of moths – and lilac/ash borer is the larva (caterpillar) of a type of moth. Effective use of imidacloprid for wood boring insect is largely restricted to beetle larvae of the flatheaded borer family – such as bronze birch borer and emerald ash borer.

The dinotefuran trunk spray used for EAB control does not make any label claims for control of lilac/ash borer and there is no evidence that it controls this insect. That being said, dinotefuran does have some activity against caterpillars and the timing of the treatment does coincide well with the most susceptible stage of lilac/ash borer (newly hatched larvae). Further study may show that this treatment has some ability to control both species – or it may not.

Until this is demonstrated the dinotefuran trunk spray cannot be considered effective for control of lilac/ash borer.

The azadirachtin trunk injection used for EAB control does not make any label claims for control of lilac/ash borer and there is no evidence that it controls this insect. That being said, azadirachtin does have some activity against caterpillars and the timing of the treatment does coincide well with the most susceptible stage of lilac/ash borer (newly hatched larvae). Further study may show that this treatment has some ability to control both species – or it may not. Until this is demonstrated the azadirachtin trunk spray cannot be considered effective for control of lilac/ash borer.

The emamectin benzoate trunk injection used for EAB control does include label claims for control of clearwing borers such as lilac/ash borer and there is good evidence that it incidentally does control this insect when used for EAB control.

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