

A Balancing Act: Saving Trees from Exotic Pests While Promoting Pollinators and Beneficial Insects

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For the past 30 years or more, tree care professionals have been managing destructive insects by minimizing pesticide use and encouraging predators and parasitoids that naturally keep pests under control. This approach is referred to as Integrated Pest Management (IPM), and it uses specific strategies for preserving beneficial insects called Best Management Practices. In most states, landscape professionals must attend educational classes on pesticide safety and best management practices to receive their pesticide applicator license, a requirement for purchasing restricted use pesticides. Minimizing pesticide use along with implementing other IPM practices protects water resources from pesticide runoff, minimizes the exposure of people, pets and wildlife to pesticides, and provides stable long-term pest control instead of the frequent boom and bust pest cycles associated with the prophylactic use of broad-spectrum pesticides. If you want to see the boom cycle just spray an entire garden area with a pyrethroid insecticide and come back about 6 weeks later. You are very likely to find outbreaks of aphids and spider mites. Natural control works great if we don't mess it up.

The primary reason tree care professionals use pesticides is because of the devastating impact of invasive pests from Europe and Asia. Invasive pests multiply and sometimes completely destroy species of North American plants for two reasons: (1) our North American plants may lack natural defenses (resistance) to invasive pests from Europe or Asia, and (2) invasive pest populations may build rapidly because we do not have the right predators and parasitoids to control them as in their native habitat.

Emerald ash borer, hemlock wooly adelgid and Japanese beetle are currently some of our most destructive invasive insects. If we want to preserve ash and hemlock trees or prevent defoliation of linden trees, pesticides are required. However, when insecticides are used for invasive pests they may impact pollinators and other beneficial insects and mites, including predators and parasitoids that keep plant pests under control. This creates a dilemma: ***how do we save ash, hemlock and other threatened trees while minimizing the impact on pollinators and beneficial insects?***

Best Management Practices to Protect Ash trees (*Fraxinus* spp.) from emerald ash borer

Emerald ash borer is steadily spreading throughout the Eastern United States, and even into some western states. It is killing all the ash trees in forests, woodlots and managed landscapes. Insecticides are available to homeowners and professionals that will preserve individual trees, but all of these insecticides are potentially toxic to pollinators and beneficial insects. Ash trees

can be an important source of pollen for bees and other beneficial insects during a two-week period in early spring when they bloom. They do not produce nectar. Because ash trees flower in early spring, pesticide movement into pollen can be minimized by using a systemic neonicotinoid (imidacloprid, clothianidin or dinotefuran) applied as a basal soil drench, a trunk-injection or as a basal trunk spray in mid- to late May, after ash trees are done flowering. At this time we do not have adequate data on the amount of systemic pesticide that will move into ash pollen one year after application, but treating ash trees after they are done flowering will minimize the impact on pollinators the following year. In general, dinotefuran usually does not persist in treated trees as long as imidacloprid, and is unlikely to persist into the following year. The most widely used product to protect ash trees, Treeäge, contains emamectin benzoate as the active ingredient. One trunk injection will provide protection for 2 – 3 years. At this time we do not know if emamectin benzoate will appear in ash pollen the following spring, but if it is used in late May after ash trees are done flowering, the impact on beneficial insects will be minimized. Foliar sprays of insecticides are not recommended because spray drift can kill beneficial insects on flowers, shrubs and trees 50 m or further away.

Best Management Practices to Protect Linden Trees, Roses and Others From Japanese Beetle

Protecting linden trees (*Tilia cordata* and *Tilia americana*) from Japanese beetle requires some planning because they are highly attractive to pollinators when they bloom in mid to late June. It is not uncommon to see thousands of bees and other pollinators on one tree. This means that no pesticides should be used on linden trees until they are done flowering. Fortunately, few Japanese beetles emerge until linden trees are done blooming. Standard insecticide sprays (carbaryl, bifenthrin, cyfluthrin and other pyrethroids) used to protect linden trees, roses and other favorite food plants for Japanese beetle are highly toxic to pollinators and other beneficial insects. Spraying linden trees after they are done blooming will minimize the impact on pollinators, but be careful to avoid drift onto any flowering plants nearby. Also, chlorantraniliprole (Acelepryn) or flupyradifurone (Sivanto) are alternative insecticides that provide good control of Japanese beetles as a foliar spray, but are much less toxic to bees. Hybrid tea roses bloom all summer, so Acelepryn or Sivanto would be the safest products to use. Spray in early morning or evening to avoid spraying when bees are present. Rugosa roses are becoming more popular as a flower shrub in the landscape. Rugosa rose foliage is not skeletonized by Japanese beetles, but the beetles may feed on flowers. Again, Acelepryn or Sivanto would be the safest products to use.

For more information on best management practices to protect bees and other beneficial insects, see the MSU regional extension publication, ‘Protecting and Enhancing Pollinators in Urban Landscapes’. You can read or download the 30-page bulletin at:

bit.ly/IPMpollinators

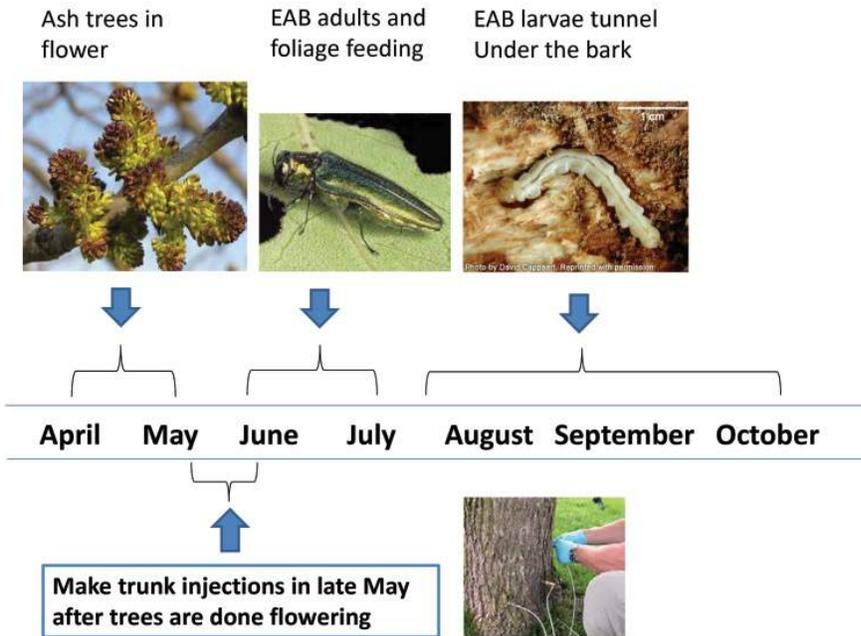


Figure 1. Best timing of trunk injections to protect pollinators when protecting trees from emerald ash borer.

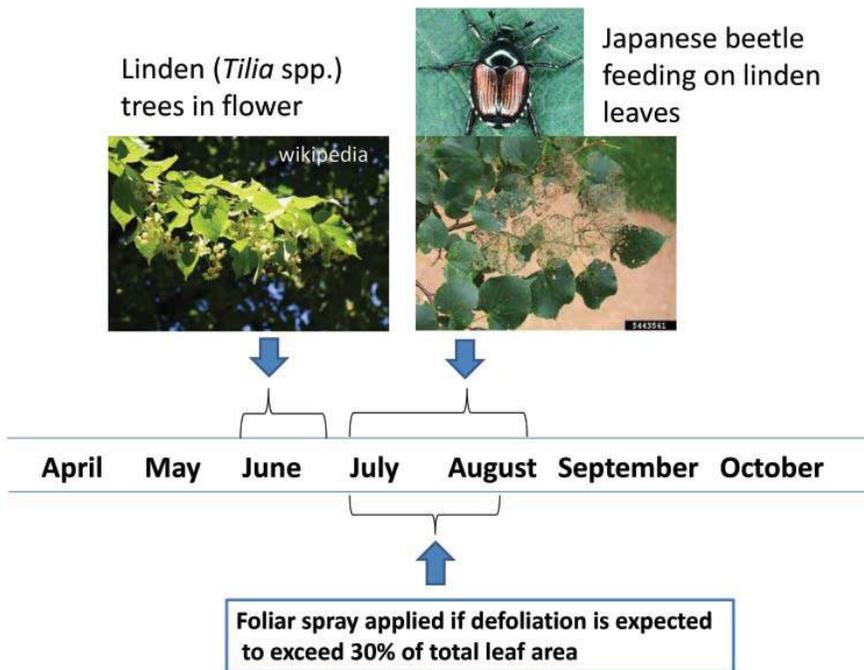


Figure 2. Best management practices for treating linden trees, roses and other plants that may be defoliated by Japanese beetle.