



PLANT DISEASES

Birch Problems

Many growers plant river birch in our area to avoid bronze birch borer problems seen on European white birch. With the right site, some supplemental care, and some luck, the river birch trees will thrive. As you might expect, there can be problems, and this year has been no exception. We are seeing birches with chlorosis problems, branch dieback, and even death in a few cases.

To get the most out of any plant species, you need to place it on the right site. According to Dr. Michael Dirr, a well-respected plantsman and author, river birch is best adapted to moist soils. He says it will survive in drier soils. It also does best in a slightly acidic soil, with 6.5 or below preferred. Chlorosis develops in high pH situations.

We have seen recent cases where birch trees grow normally in the spring, then all of the leaves on a branch or two quit growing, wither, and die. Eventually the affected branches die too. Often the tree has yellow-green leaves with branch tip death.

There are many diseases of birch, but few cause the dieback symptoms described. Leaf blights will not cause such injury, nor will viruses or wood rots. Potential pathogens involved in this decline are the canker fungi (*Botryosphaeria*, *Nectria*, *Physalospora*, *Diaporthe*, and many others) and a dieback disease caused by a fungus named *Melanconium*. The dieback disease is actually closely related to canker problems. In all cases the tree is infected when under stress. *Melanconium* dieback is known to cause a progressive dieback of upper branches, especially following periods of drought. We certainly had drought conditions last summer, fall, and winter to set up the decline process. The canker fungi could also infect trees predisposed by drought, injuries, flooding, borers, and so on. Usually more than one factor is involved, and it is impossible to determine which one started the decline.

Birches in the Midwest are also very likely to develop chlorosis, because so many of our landscape soils have a high pH. The iron or manganese in the soil are bound at high pH levels and cannot be absorbed by the plant. Foliage appears yellowed with

green veins. Branches may die from the tips back, or entire branches may die. The tree canopy becomes progressively thinned.

Each birch in decline will be different, because the stress will vary with each tree and on the particular site. There is no current disease epidemic on birch. In most cases it appears that early drought stress compounded by high pH soils has probably stressed these trees, predisposing them to infection by canker and dieback fungi. There will be no easy cure. Remove dead limbs to avoid problems with wood rot. Water the trees in periods of drought stress, providing at least an inch of water per week. Consider using a shredded bark mulch over the root system to maintain a more uniform soil moisture. Test the soil and find out what pH level the tree is growing in so that you can determine whether an acidic fertilizer is needed. Look for cankered areas on the wood and remove these where possible. Last, do some research to find out the particular needs of the birch species you have planted. If planting a new birch, do the research first. Consult Report on Plant Disease 603, *Iron Chlorosis of Woody Plants: Cause and Control*, for details on how to manage this problem. The publication is available in Illinois Extension offices or on the Web at <http://www.ag.uiuc.edu/%7Evista/horticul.htm>. (Nancy Pataky)

A Wealth of Pesticide Information!

Out of curiosity, I checked the Internet search engine Google (<http://www.Google.com>) to see how many Web sites mention the word “pesticides.” I was surprised to find 8,500,000 listings (up from 2,710,000 on this date last year)! Clearly, the Internet is loaded with information about pesticides. However, like you might expect with any topic, some of this information is trash, some of it is incomprehensible (unless you’re trained in toxicology), and some of it is treasure.

This article points to several objective, easy-to-understand resources available to anyone with questions on pesticides and their effects on human health and the environment. Whether you’re an individual with a question about a specific pesticide, or a commercial pesticide applicator wanting to improve pesticide-related communications with your clients and the public, these resources should prove useful.

Written for the nontoxicologist, **EXTOXNET** (<http://extoxnet.orst.edu/faqs/index.htm>) is a cooperative effort by Extension toxicologists and chemists of five land-grant universities: University of California-Davis, Oregon State University, Michigan State University, Cornell University, and the University of Idaho. From the EXTOXNET home page you can access Pesticide Information Profiles for specific information on health and environmental effects. The Frequently Asked Questions address exposure to pesticides and other toxicants in our environment. Topics include adverse health risks, diet and cancer, food safety issues, household hazardous waste, indoor air pollution, pesticides, safe drinking water, sensitive populations, and soil (gardening and chemicals).

Purdue Pesticide Programs (http://www.btny.purdue.edu/PPP/PPP_pubs.html) does a tremendous service by producing comprehensive yet easy-to-read pesticide information. According to coordinator Dr. Fred Whitford, "These publications are written for professionals who work in government, universities, associations, and also for the general public who want to understand pesticide issues beyond the headlines." Sample publications include these:

- Pesticides and Wildlife (PPP-30)
- Pesticide Toxicology, Evaluating Safety and Risk (PPP-40)
- Pesticides and Ecological Risk Assessment (PPP-41)
- Pesticides and Epidemiology (PPP-43)
- Pesticides and Human Health Risk Assessment (PPP-48)
- Pesticides and Risk Communication (PPP-52)

The **National Pesticide Information Center** (NPIC) is a toll-free telephone service serving any caller in the United States, Puerto Rico, or the Virgin Islands. NPIC provides objective, science-based information about a wide variety of pesticide-related subjects, including pesticide products, recognition and management of pesticide poisoning, toxicology, risk assessment, and environmental chemistry. NPIC's Web site (<http://npic.orst.edu>) is an excellent resource for these topics as well. Excluding holidays, you can call NPIC 7 days a week from 8:30 a.m. to 6:30 p.m. (CST) at 800-858-7378. You can also contact NPIC by fax (541-737-0761) or e-mail (npic@ace.orst.edu). (*Bruce E. Paulsrud*)

Hosta Viruses

We have seen several disease problems on hostas in the past few years, including anthracnose, Sclerotium blight, and foliar nematodes. A few problems have been found in the last few years in Illinois. Fusarium root and crown rot causes leaf yellowing, stunting, rotting of roots, and death of crown tissues. Viruses have been

the most troubling to hosta growers. They may cause stunted growth and various odd leaf-color patterns. These include ringspots, mosaic, speckling, and discoloration.

Several hosta viruses have been reported in scientific literature, including hosta virus X, tomato ringspot, impatiens necrotic spot, and arabis mosaic virus. The University of Illinois Plant Clinic can positively identify all of the problems just described except viruses. We can identify symptoms that suggest a virus, but we cannot make positive identification of viruses. Virus particles cannot grow on lab media. They cannot be seen with a compound microscope, but they can be detected with specialized enzyme-linked immunosorbant assays called ELISA tests. If symptoms suggest viruses, a private lab offering serological tests is suggested. One lab that can help is AGDIA, in Elkhart, Indiana. For information on services and costs, go to <http://www.agdia.com>. There are separate images of hosta infected with arabis mosaic virus, hosta virus X, and tomato ringspot virus on the Web site under "slide show." Virus diseases cannot be eradicated from a plant. Usually infected plants need to be removed and destroyed. Transmission varies with the virus, so identification is helpful for disease management.

Carefully inspect any hostas that are planted into your gardens. Do not plant any with disease symptoms or that "look funny." Beware of reduced-priced plants that you might want to nurse back to health. If purchased, these plants should be isolated until health is regained. Only then should they be planted into the garden. (*Nancy Pataky*)

INSECTS

Scouting Watch

Cottony maple scale crawlers have hatched throughout the northern half of Illinois. Crawler sprays will be effective at this time, including acephate (Orthene), bifenthrin (Talstar), cyfluthrin (Tempo), insecticidal soap, malathion, and summer oil. Before treating, check for the twice-stabbed lady beetle larvae and adults. Adults will be about 1/8-inch in diameter, round, black beetles with two red spots on the back. Their larvae will be up to about 3/16-inch long grayish-white, fuzzy blobs that move slowly on the branches and leaves. If this beetle is present in fairly large numbers, the crawler spray will probably kill no more scale than these insects would eat if they were not killed by the spray, and it will probably cause the scale infestation to last longer than if spray was not used. Of the suggested crawler sprays, insecticidal soap and summer oil will be less damaging to the lady beetles.

Bagworms have just hatched in northern Illinois, but they have been out in central and southern Illinois for about 3 weeks. It is time to spray in central and southern Illinois for these insects, but in northern Illinois wait until the end of the first week of July. This allows the bagworms to finish their blowing from tree to tree so that one instead of two sprays provides control. In central and southern Illinois, one application of *Bacillus thuringiensis* kurstaki (Dipel, Thuricide), cyfluthrin (Tempo), spinosad (Conserve), trichlorfon (Dylox), or *Steinernema carpocapsae* insecticidal nematodes should provide control at this time. Cyfluthrin is not labeled for use in nurseries.

Flea weevil adults are out feeding on Siberian and other elms in northeastern Illinois. These weevils will feed on the leaves for a while, eating holes in them, before seeking overwintering sites. Sprays of acephate (Orthene), imidacloprid (Merit), carbaryl (Sevin), cyfluthrin (Tempo), or other labeled pyrethroids will reduce the numbers that emerge to feed next spring. Earlier this spring, we recommended only acephate and imidacloprid because the systemic action of these insecticides would have provided control on the leaf-mining larvae as well as control the adults. At this time, there should be no more larvae this year, so the contact insecticides carbaryl and cyfluthrin that will kill only the adults can be used. (*Phil Nixon and Morton Arboretum*)

Emerald Ash Borer

Although it is not here—yet—it is important to be aware of (and on the lookout for) of the emerald ash borer, *Agrilus planipennis*, an exotic pest first discovered in North America in 2002 in Michigan and Ontario, Canada. A native of China, Japan, Korea, and Mongolia, the emerald ash borer is suspected to have entered on infested crates, pallets, or dunnage. The insect is presently in Michigan, Ohio, Indiana, and Canada. Emerald ash borer attacks ash trees, including green, white, blue, and black ash. Green ash is the most preferred species. The beetle has killed an estimated 8 to 10 million ash trees in Michigan, and about 40,000 trees have been removed since the infestation started. Emerald ash borer is in the same family (Buprestidae) and genus (*Agrilus*) as the bronze birch borer (*Agrilus anxius*) and the two-lined chestnut borer (*Agrilus bilineatus*).

Emerald ash borer adults are slender, elongate beetles about 1/2-inch long. They are metallic, and coppery-green in color. Adults are primarily active from late May through mid-August, with peak activity in mid-June. The adult emergence, or exit, holes are 1/8- to 1/6-inch wide and “D-shaped,” just like exit holes of the bronze birch borer. Adult activity is

dependent on weather conditions, as adults tend to rest on tree surfaces during rainy or cloudy weather. Adults may live from 3 to 6 weeks, feeding on small quantities of plant leaves. They tend to colonize the upper area of large trees and will attack trees with 1/2-inch calipers or higher. Adults are very “good” fliers and can disperse 1/2 to 4 miles in 24 hours. Adult females can lay 50 to 90 eggs, although the range can be anywhere from 2 to 258 eggs, based on laboratory studies. Eggs are laid individually on the bark surface or just under the bark, inside cracks and crevices of trees, from June through July. After 1 week, eggs hatch into larvae that are white, flat, and 1/2 to 3/4 inch in length. The larvae eventually bore through the bark and start feeding.

Fully grown larvae, which are about 1 to 1-1/4 inch long, possess small pincer-like appendages on the last abdominal segment. They feed in the cambial region of the trunk or branches, including the phloem and sapwood region, from June through October. They create “S” or serpentine-shaped galleries that are packed with frass. The extensive galleries created by the larvae under the bark disrupt translocation of water and nutrients in the infested tree. Damage by the larvae occurs from August through October, when plants are most likely to be stressed by heat and lack of moisture. Epicormic shoots (water sprouts) will sprout from the main trunk of declining trees. Small vertical splits in the bark are a typical symptom of trees infested with larvae. The emerald ash borer overwinters as a full-grown larva in the outer bark or the outer inch of sapwood. Pupation occurs in the spring. The emerald ash borer has a 1-year life cycle in Michigan, but there are indications that it may have a 2-year life cycle. However, this is still being evaluated. Infested trees are typically killed within 1 to 3 years, depending on the density of larvae present. Although emerald ash borer tends to feed primarily on ash trees, it will also feed on walnut (*Juglans* sp.) and elm (*Ulmus* sp.).

The emerald ash borer is difficult to monitor because the adult females do not produce long-range pheromones. The monitoring technique used in Michigan involves girdling green ash trees and coating the tree with about a 1-foot band of sticky tanglefoot. Emerald ash borer is primarily spread by the movement of infested firewood; Michigan has instigated fines of \$4,000 against anyone found transporting ash tree firewood out of the quarantine zone. At present, there is no insecticide program that is effective for eradication.

For homeowners, application by trunk injection of systemic insecticides such as imidacloprid from late May to early June has been suggested. However, treatments are needed each year. And if a tree is infested with larvae and numerous galleries encircle

the tree, the galleries may block the movement of the insecticide active ingredient from the reaching the points beyond the galleries, which means that applications have to be initiated before the tree is infested. An early indication that emerald ash borer larvae are present is heavy woodpecker damage to trees as woodpeckers feed on the larvae.

The key to minimizing problems with the emerald ash borer, or any invasive insect species, significantly impacting the ecology of landscapes is to plant a diversity of tree species. It is important to avoid monoculture (single species) plantings. I think we should know this by now after the experience with Dutch elm disease.

You are probably wondering what Illinois is doing to prepare for the eventual arrival of the emerald ash borer. A group of individuals from the Morton Arboretum, the University of Illinois, and other agencies and organizations are working to be ready. An “Emerald Ash Borer Readiness Plan” has been created and is available at <http://www.agr.state.il.us/Environment/Pest/emeraldashborer.pdf>. The primary action being taken currently is to survey existing ash trees to detect any early indications. If you suspect that you have the emerald ash borer, contact your county extension office or the Illinois Department of Agriculture (IDOA).

Numerous Websites, including the three listed here, provide information and pictures that professionals

and homeowners can access to determine if they have emerald ash borer:

- <http://www.michigan.gov/mda>
- <http://www.emeraldashborer.info>
- <http://www.na.fs.fed.us/spfo/eab/index.html>

(Raymond A. Cloyd)

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