

## IPM Series: Birch Trees

Symptoms	Possible Causes	Notes
<b>Leaf Yellowing</b>	Bronze Birch Borer Witch Hazel Gall Aphids Leaf spots, Blotches, Anthracnose Leaf Rust Cankers	Late summer, leaves near the top Small yellowish insects on underside of leaf Various spots and blotching Orange-yellow pustules on lower leaf surface Girdling cankers
<b>Wilting</b>	Drought	Dry sites, newly transplanted trees
<b>Branch dieback</b>	Bronze birch borer Root damage Dieback & Canker Diseases, Wood Decay Fungi	Branches near top of tree Forks of branches, upper branch dieback, trunk cankers
<b>Leaves Eaten</b>	Dusky Birch Sawfly	Sawflies eat from margins
<b>Leaf Blotches</b>	Birch Leafminer	Blotch mines scattered over leaf
<b>Leaf Distortion</b>	Witch Hazel Gall Aphid Leaf Blister	Leaves develop "corrugations" or pockets Reddish or yellow-green blisters
<b>Leaf Drop</b>	Witch Hazel Gall Aphid Bronze Birch Borer Transplant Shock Leaf Spots & Anthracnose Drought or Improper Watering	Leaves fall prematurely

### Common Cultural and Site Problems of Birches

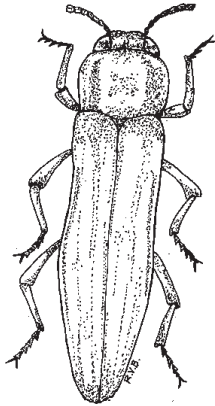
Most people associate birches in the landscape with the look of the European white birch. However, the variety of birch best suited to Maryland's climate is the river birch, *Betula nigra*. The best cultivar of river birch for the landscape is 'Heritage' which has a similar growth habit to white birch, but has exfoliating bark in colors ranging from beige to salmon. Heritage birch is more tolerant of heat and drought than white birch and is also more resistant to insects and diseases. Birches need fairly moist soil to thrive which makes them poor choices for dry sites. Their shallow root system, combined with their need for

water and fertilizer, makes it difficult to grow turf within their dripline. Since birches are susceptible to sucking insects that secrete honeydew, they should not be located over patios or parking areas. When transplanting birches, the older leaves near the interior part of the tree may turn yellow and fall within a week or two of planting. For best success birches should be transplanted in the spring. To avoid unsightly bleeding sap, pruning should be delayed until leaves emerge in the spring. Pruning should be completed before mid-summer or done in early fall after trees shed their leaves. Birches in general are not long-lived trees and older trees are more susceptible to wood boring insects.

## Insects

### The Bronze Birch Borer

*Agrillus anxius*



Adult



Larva

Damage initially appears in late summer as yellowing and dropping of leaves near the top of the tree. The top of the tree may die by the winter. The larval stage of the borer causes the damage by tunneling under the bark and feeding on the living tissue just under the bark (cambium). The tunneling is visible as raised ripples in the bark. The borer usually attacks branches 3/4 inch in diameter or larger near the top of the tree.

Most of the larvae pupate in late spring and emerge as adult beetles sometime in late May. Others may emerge later in the summer depending on when they hatched the year before. The emerging adults leave telltale D-shaped holes in the bark. The adult beetle is 1/2 inch long and metallic, deep greenish-bronze (almost black). They are very quick and active and feed on the foliage of the tree. After mating, the female lays eggs in cracks or wounds on the tree. These hatch quickly and the larvae bore into the wood. There is evidence that freezing temperatures are needed in order for the larvae to develop further. Some larvae do not pupate in the spring, but spend another summer as a larva, and emerge the following summer. Full grown larvae are white, about 3/4" long, with a wide flat area behind the head. They are a type of flatheaded borer

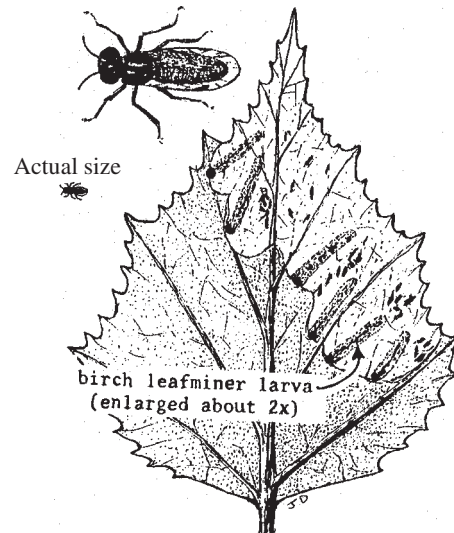
**Control:** European white birch is highly susceptible to the bronze birch borer and should not be used in landscape plantings in Maryland. A species of river birch, known as 'Heritage birch', is relatively resistant to this pest making it a more desirable landscape plant. There are no chemicals registered that will reliably kill the active larvae under the bark, so control depends entirely on pruning out infested branches as soon as they are noticed.

### The Birch Leafminer

*Fenusa pusilla*

The damage appears as pale, swollen blotches on birch leaves. Each mine contains the small, grub-like larva of a tiny wasp called a sawfly. The leaf blotches eventually shrink and turn brown. In severe infestations, virtually every leaf may be damaged by mid-summer. Severely infested leaves may fall off.

The leafminer larvae overwinter 1 to 2 inches deep in the soil beneath the tree. They pupate in the spring (early May), and winged adults emerge about the time the new leaves are half expanded. After mating, the female lays eggs on the leaves and the newly hatched larvae bore in. They feed for about 2 weeks inside the leaf, then drop to the soil and pupate. There are 3 to 4 generations during the course of a summer. This pest prefers laying eggs on new leaves of gray, paper, and white birch. Therefore, the first generation is the most destructive.



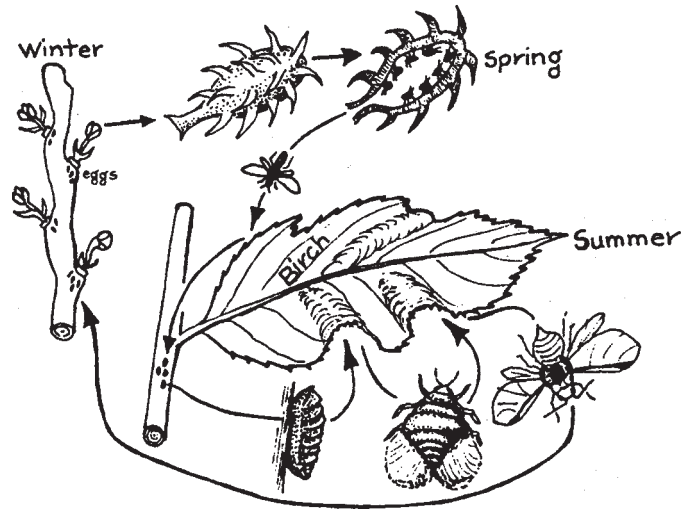
**Control:** This pest rarely attacks black, yellow, or river birch. A registered pesticide can be sprayed at label rates when the new leaves of susceptible birches are fully expanded in May for control. New terminal leaves should be examined every week or two during the summer and if numerous new mines are seen developing, additional sprays may be applied. There appears to be no effective biological control for this imported pest. When buying a pesticide, be sure the type of pest and plant you want to spray are on the label.

### Spiny Witch-hazel Gall Aphid

*Hamamelistes spinosus*

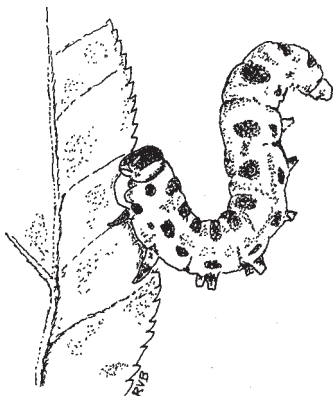
This aphid is a common pest on birch, particularly river birch. Injury from this aphid ranges from premature leaf drop to dead twigs and branches. It has a complicated life cycle in that it alternates between two hosts: birch (*Betula*) and witchhazel (*Hamamelis* spp.) The aphids become active in the spring when the leaf buds are opening. The growth and reproduction of the aphids is rapid, and the leaves soon develop characteristic "corrugations". The corrugations on the undersides of the leaves fill

with aphids and a white granular material. Winged aphids develop on the birch leaves then seek witch-hazel on which to lay eggs and complete the life cycle. This activity takes place before the end of June.



**Control:** Examine the undersides of leaves for beneficial insects such as ladybird beetles and their larvae, predaceous midge larvae, Syrphid fly larvae, lacewing eggs and larvae, and parasite activity. Descriptions of these beneficial insects may be found in Home and Garden Mimeo #662, *IPM: A Common Sense Approach to Managing Problems in Your Landscape*. Any combination of these predators and parasites may give sufficient control without having to spray with an insecticide. If damage is heavy, spray tree with a registered systemic insecticide. Coverage of the lower surfaces of the leaves is critical, as the aphids are fairly protected in the corrugated folds of the leaves.

### Dusky Birch Sawfly *Croesus latitarsus*



Yellowish-green larvae, resembling caterpillars may be seen feeding along the edges of leaves. Branches may be stripped of foliage and small trees may be defoliated. The dusky birch sawfly feeds on various species of birch, but prefers gray birch. The full-grown larvae are about an inch long, yellowish-green with shades of black, a row of black spots along their sides, and black heads. There may be several generations a year, and larvae may be found from spring until fall. The larvae are gregari-

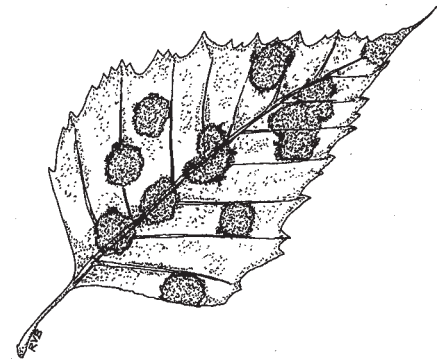
ous, feeding in groups. They feed along the edges of leaves and are often seen with their back ends reared up in the air, appearing S-shaped. Damage is usually limited to a few branches, but they may defoliate young trees. The adult of this insect is a wasp. They overwinter in a cocoon in the topsoil and adults emerge in May and June.

**Control:** If the infestation is light, try hand picking the larvae. Although they resemble caterpillars, they are not. Therefore, B.t. (*Bacillus thuringiensis*) is not effective against this pest. A residual insecticide registered for use on birch may be used.

## Diseases

### Leaf Spots, Leaf Blotches, Anthracnose, and Leaf Blister

*Glomerella cingulata* (*Colletotrichum gloeosporioides*), *Discula betulina*, *Septoria betulae*, *Cylindrosporium betulae*, *Marssonina betulae*, *Taphrina carnea*, and *T. flava*



Leaf spots on birch can be caused by several different fungi. The fungi *Septoria* and *Cylindrosporium* produce small spots without definite borders. *Colletotrichum* causes larger brown spots with a brown to black border. *Discula* and *Marssonina* cause anthracnose diseases, which are characterized by broader large spots called leaf blotches, that, under optimum disease conditions, run together to form larger blotches. Leaf blotches tend to have indefinite margins and cause the remaining leaf tissue to turn yellow. Under severe conditions anthracnose diseases can cause premature defoliation. *Taphrina carnea* causes reddish leaf blisters and curling while *T. flava* causes light green to yellow leaf blisters on birch leaves in the spring. Later in the summer these blistered or puckered areas usually turn brown and fall out leaving holes in the leaves.

**Control:** Leaf diseases on birch in the landscape are usually not severe enough to warrant chemical spray controls. Disease symptoms are more severe in cool wet spring weather. On young trees, where it is more critical to maintain an adequate number of healthy leaves, sprays of copper or sulfur fungicides during bud break and leaf expansion can lessen disease severity. Practical control in the landscape also includes raking up fallen leaves. Prune out shading vegetation such as nearby trees and shrubs to promote better sunlight penetration and air movement.

## Leaf Rust

### *Melampsoridium betulinum*

This disease can be easily identified by the powdery bright orange yellow pustules on the lower leaf surfaces. Upper leaf symptoms are generally brown angular spots with yellow borders that may run together to form larger spots which result in defoliation. This disease can also cause a blister rust on larch. In the forest, both hosts may be severely affected. This disease, however, can persist indefinitely on birches independent of larches. Symptoms on birch are more severe in the spring and fall.

**Control:** Cleanup of fallen leaves and sprays of copper-based fungicides in the spring during budbreak and leaf expansion will help to lessen disease severity.

## Upper Branch Dieback and Canker Diseases

### *Melanconium betulinum*, *Botryosphaeria dothidia*, *B. obtusa*, and *Nectria galligena*



These fungal diseases cause cankers on the branches and trunks of birches. Young cankers are slightly darker in color than adjacent healthy bark and appear slightly sunken. As cankers enlarge they kill the living woody tissue within the branch or trunk. Canker growth may cause the bark along the edges to crack and fall away exposing the dead wood underneath. After a canker enlarges enough to girdle a branch or trunk, the portion above the canker dies. Small twigs are killed more quickly than larger branches. Symptoms may include progressive upper branch dieback, disfigured branch growth, or target-shaped areas on trunks with concentric rings of dead bark.

**Control:** There are no chemical controls for cankers and they cannot be stopped once they become extensive. Pruning affected branches back to healthy wood is the only control measure available. Stressed trees should be fertilized and watered during dry periods to promote better tree vigor.

## Wood Decay Fungi

### *Piptoporus betulinus*, *Fomes fomentarius*, *Inonotus obliquus*, *Phellinus laevigatus*, and *Ganoderma applanatum*

These fungi usually attack weakened or stressed trees and live in the wood where they cause the decay. Dead or dying branches become rotten and develop shelf or hoof-shaped structures growing out of the bark.

**Control:** There are no chemical sprays to control these organisms. Prune back infected portions to healthy wood, avoid wounds and maintain trees in good vigor.

## PROTECT THE BAY

### USE PESTICIDES AND FERTILIZERS WISELY ALWAYS READ THE LABEL AND FOLLOW ALL DIRECTIONS AND SAFETY PRECAUTIONS.

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#### References:

Johnson, W.T. and Lyon, H.H. 1988. *Insects That Feed on Trees and Shrubs*. Cornell University Press, Ithaca, NY. 556pp.  
Pirone, P.P. 1978. *Diseases & Pests of Ornamental Plants*, 5th Ed. New York: John Wiley & Sons. 566 pp.  
Sinclair, W.A., H.H. Lyon, and W.T. Johnson. 1987. *Diseases of Trees and Shrubs*. Ithaca, N.Y.: Comstock Publishing Associates, Cornell University Press. 574 pp.

Adapted in part from Davidson, J.A. and M.J. Raupp. 1988. *Insect Pests of Birch Trees*, Entomology Leaflet #58.

Drawings of Witch Hazel Gall Aphid, and Birch Leafminer by John Davidson, Department of Entomology, University of Maryland. Drawings of Bronze Birch Borer, Dusky Birch Sawfly, Marssonina Leaf Spot and Nectria Canker by Raymond V. Bosmans, Regional Specialist, Home & Garden Information Center.

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