

A Pocket IPM Scouting Guide for Woody Landscape Plants

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Pine needle scale *Chionaspis pinifoliae*

Hosts: Pine and spruce.

It overwinters in the egg stage under the scale covering; there may be two generations. Eggs and first instar crawlers are red; later instars are yellow. Look for the first crawler stage as Vanhoutte spirea or common lilac are in bloom.

Second generation crawlers are present during bloom of *Hydrangea arborea* 'Grandiflora' or 'Annabelle'. Branches infested with pine needle scale may turn yellow and have poor growth. Heavily encrusted branches may appear stunted.

Management: Several small wasps feed on pine needle scale. Spray infested branches with a horticultural oil when crawlers emerge in mid-May (spirea or lilac bloom). Dead scales will remain on needles for a year or longer.

3mm ■

Pine needle scales, 3 mm long.



Emerald ash borer *Agrilus planipennis*

All ash species (*Fraxinus*) grown in Michigan are hosts for emerald ash borer (EAB). Mountain ash (*Sorbus*) is not a host.

The EAB adult is dark metallic green from about 7.5-13.5 mm long. Females are larger than males.

7.5 13.5mm
7.5-13.5mm



In Michigan most EAB larvae complete development in one year, but some may take 2 or in some cases even 3 years. Development seems faster on weakened trees and slower on healthy trees with few previous attacks. Adult emergence in southern Michigan begins in mid-May to early June (depending on spring temperatures) and peaks from late June to early July. Adults feed on the edges of ash leaves and remain active through July and early August. Females lay eggs on the bark of trunks or branches. Eggs hatch in 7 to 10 days. Larvae tunnel into the cambium,



26-32mm 26 32mm
Fourth instar larvae are 26 to 32 mm long, cream-colored and are flattened like a long, narrow piece of cardboard.

Emerald ash borer - *continued*

where they create S-shaped feeding galleries, packed with fine frass. Larvae are creamy white in color and are found under the bark. Larvae pupate in late April to early May. Adult beetles create a D-shaped exit hole when they emerge from the trunk a few weeks later.

Symptoms: Look for D-shaped exit holes (about 3-4 mm in diameter) on branches and the trunk. The canopy of an infested tree thins out and branches die from being girdled by larvae feeding under the bark. Watersprouts form on the trunk at the juncture of live and dead tissue. Infested trees usually die after several years of heavy tunneling.

Management: This pest is under quarantine in Michigan. Efforts are being made to limit its spread, and track locations where it is found. Send any suspect samples from outside the known area of infestation to MSU Diagnostic Services for positive identification by an expert. Drought stress may make trees more vulnerable to attack by EAB, but healthy trees are also attacked. Imidacloprid applied as a basal soil drench, basal soil injection or trunk injection has



Bark removed to show S-shaped galleries caused by larval feeding.

Emerald ash borer - *continued*

given good protection of ash trees if treatments begin when trees are still healthy. Starting early is important, because imidacloprid soil drenches or basal injections do not provide adequate protection the first year. Saving trees with insecticide treatments is not guaranteed if treatments begin after trees are seriously compromised. Other insecticide treatments are being developed and tested. Consult your local extension educator for current recommendations. For more information visit: www.emeraldashborer.info



Brian Sullivan, USDA APHIS PPQ, www.forestryimages.org

Oak wilt

Cause: *Ceratocystis fagacearum* (fungus)

Hosts: Oaks in the red and black group are the most susceptible; white oaks are less susceptible.

Symptoms: Trees in the red and black oak group undergo wilting and rapid death within a few weeks. Those in the white oak group usually experience the death of a few branches and may live for several years after infection. Water-stressed trees can show symptoms within a week of infection. Symptoms commonly develop in July but may be earlier or later depending on the amounts of rainfall.

How it's spread: This fungus invades the vascular system of oaks. Oak wilt is transmitted by picnic

Infected leaves wilt rapidly, turn brown around the edges of the leaves and usually remain attached to the tree. Browning begins at the leaf tip and spreads downward.



Brown streaking is visible in the sapwood of oaks infected by oak wilt, but the amount can be quite variable.



Oak wilt - continued

beetles (Nitidulidae), which carry spores from infected trees to wounds on healthy trees. Healthy trees may also be infected via root grafts with infected trees.

Management: Positive identification of this disease should be confirmed by sending twig samples to MSU Diagnostic Services. Samples must be from live branches (green or white tissue under the bark) not dead branches (brown or black tissue under the bark).

Collect 3 twigs (at least 1 inch in diameter and 6 inches in length) from 3 different branches with wilting leaves.

Grafts between infected and healthy trees should be mechanically severed. Avoid pruning until the dormant season. If pruning or wounding during the growing season becomes necessary, wounds should be sealed immediately with shellac or a water-based sealer. Red oaks infected with wilt cannot be saved. White oaks with less than 30 percent infection may benefit from fungicide injection by qualified arborists. For more detailed information on oak wilt and its management, see *Oak Wilt in Michigan*, Extension bulletin E-2764.



Wilt symptoms usually begin in the upper branches of the tree and progress downward.

Abiotic injury - improper planting depth

When planting, look for the root flare, and plant the ball with the root flare level with the ground. The kousa dogwood below declined over a period of several years before it died.



Below: The root flare was buried 5" down and topped with a layer of mulch. Be careful when uncovering roots of plants that have been buried for several years. Many roots have developed near the surface. These roots can be killed when uncovered. Adjusting planting depth is best done in spring after the weather settles to allow time for new root growth to develop and to allow the plant to adjust before the ground freezes.



Improper planting depth - continued

Symptoms associated with planting too deep include wilting, stunted growth, chlorosis, dieback, early fall color, scorch, and the development of adventitious roots. Planting too deep restricts the amount of water and oxygen to the fine root systems, lowering the trees vitality. Trees planted too deep are also more subject to canker development and wind throw.



Above: Planting too shallow -- this yew was planted with part of the root ball sticking out of the ground, and the burlap and twine left on. Burlap should be removed if possible or at least cut off the top to allow water penetration into the root ball. Twine should be removed. The root ball should be just covered with soil.