



Oak wilt: A value-chain perspective on an emerging urban forest issue

Following the confirmed identification of oak wilt in the Niagara Region in June 2023, Vineland's Greening the Landscape Research Consortium and Plant Responses and the Environment program sought to provide information on this emerging issue.

What is oak wilt?

Oak wilt is a vascular disease caused by the fungus *Bretziella fagacearum*, attacking and growing through the xylem of oak trees. As the tree attempts to wall-in the fungus and control its spread, it also limits the movement of water and nutrients, so that the tree starts to decline. Oak wilt is typically characterized by the early browning or dropping of leaves.



The appearance of leaves collected from a tree infected with oak wilt (left). Note that leaves are not curled as expected when leaves brown/drop due to typical drought stress. In heavily impacted trees, pressure pads of bark swelling from the trunk are apparent where mats of the mycelia network of the fungus are growing (right). Photo credit: Monique Sakalidis, MSU Depts. of Plant, Soil and Microbial Sciences & Forestry (left), Pat Kerr, Landscape Ontario Horticultural Trades Association (right).

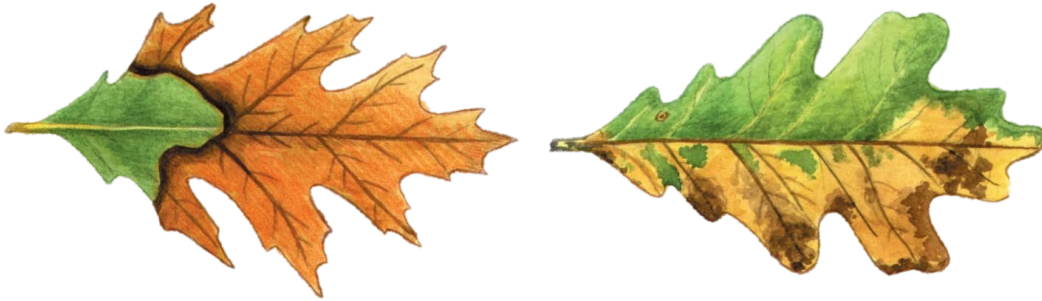
The fungus can be transferred from tree to tree by small sap beetles (Nitidulid beetles) looking for wounds in the bark through which they can enter and feed on sapwood. A beetle would have needed to visit a tree infected with oak wilt in order to carry and spread the disease to a previously uninfected tree. Typically sap beetles don't travel more than a few kilometres and most new fungal infections occur through the direct contact of grafted roots underground. Therefore, any long distance movement of oak wilt is likely due to individuals transporting freshly cut wood from an infected region.

If you are interested in learning more about this disease, the [Invasive Species Centre](#) has compiled excellent information related to the detection and management of oak wilt.



What should I do if I suspect my trees have oak wilt?

You should identify the species and review its symptoms. In addition to dropping brown leaves, you may also notice bulges under the bark where the fungus is sporulating, most often in late fall or early spring. Red oaks, such as Pin oak and Northern red oak, are the most susceptible to oak wilt and will show symptoms almost immediately, declining within weeks of infection. On the other hand, White oaks will not be as clearly symptomatic as they tend to live with the fungus for many years before succumbing to the disease.



Red Oak Group

- Northern red oak, Pin oak, Bear oak, Shumard oak, Black oak, Northern pin oak, Scarlet oak
- Rapid wilt, decline within one season

White Oak Group

- Bur oak, White oak, Swamp white oak, Chinquapin oak, Dwarf Chinquapin oak, English oak
- Slow wilt, surviving several to many years

Photo credit: United States Department of Agriculture (USDA)

If you believe your trees are infected with oak wilt you can reach out to the CFIA (cfia_surveillance-surveillance_acia@canada.ca) for more information. The Invasive Species Centre in Sault Ste. Marie, ON also has set up a hotline (1-800-563-7711) to report incidences of the disease.

How can oak wilt be prevented from spreading once an infected tree is identified?

Infected trees should be removed and disposed by a trained certified arborist to prevent further spread. It is recommended that affected wood be either burned or chipped and dried for at least one year to minimize cross contamination or transfer to other trees. Tree stumps resulting from tree removal must always be removed or buried. Cut wood can also be covered by a tarp with no holes and with tarp edges buried to prevent any access of sap beetles into the wood.

Adjacent oaks that may have root grafted to the affected trees are likely to become infected below ground, even if they do not immediately show signs of the fungus in their canopy or bark. Therefore, oak trees planted in close proximity to affected trees may need to be removed and oaks beyond the immediate perimeter may require root severing. For specific recommendations on the area in which root grafts should be severed, please see exoticpests.gc.ca/control-details/disease/2

Now that oak wilt is confirmed in our region, it is extremely important not to unnecessarily wound oak trees by cutting, damaging or breaking the bark, particularly between the months of April and August when beetles are most active.

Evidence-based recommendations for the urban tree value chain:



Seed collectors:

- There is no evidence to suggest the disease is transmitted by acorn stock
- Be on the lookout for Red oaks that may show resistance to oak wilt



Tree nurseries:

- There may be an increased hesitancy to plant Red oaks not showing some resistance to oak wilt
- There may be increased demand for White oaks instead of Red oaks in oak-preferred areas



Soil & amendment suppliers:

- Track sources of oak wood mulch, being careful not to use freshly chipped oak from infested trees. Chips will need to be treated (either by heat, drying, composting) prior to re-use.



Landscape contractors:

- Monitor trees for oak wilt and prevent any stresses possible (ie. watering during droughts and limiting spongy moth impacts)
- Avoid planting clusters of oaks in order to prevent future root-grafting
- Do not trim or wound any oak trees between April and August. Paint any necessary wounds (e.g. trimmed downed limbs or injection holes) during the spring/summer months with pruning paint or latex paint immediately (within a few minutes) to prevent contamination from beetles
- Chip all cut oaks and dry for at least one year before re-using



Municipalities:

- Consider creating or updating backyard tree removal bylaws to prevent the trimming/removal of oaks during the spring/summer months when the potential spread of the fungus into tree wounds is greatest
- Tree trimming crews should avoid wounding oaks during the summer months and they should paint wounds with pruning paint or latex paint within minutes when trimming can't be avoided
- Oak wilt will likely move through the landscape more slowly – similarly to Dutch Elm Disease and less like Emerald Ash Borer (EAB), so while planning is important, the timeframe will be more prolonged
- Although the treatment used for EAB to slow the decline of trees is not the same for oak wilt, there is not an immediate need to create a plan for oak removal
- Consider creating an internal chain of responsibilities so that when oak wilt is found in your jurisdiction, all precautions are taken to notify the CFIA in an efficient and timely manner and prevent further spread during removal, storage and disposal



Homeowners:

- Monitor your oak trees and prevent any unnecessary wounding
- Do not move firewood
- Take care of your mature trees as you would any other shrub or plant on your property. Water trees during drought and aim to keep other pest and disease stressors to a minimum (i.e. spongy moth)