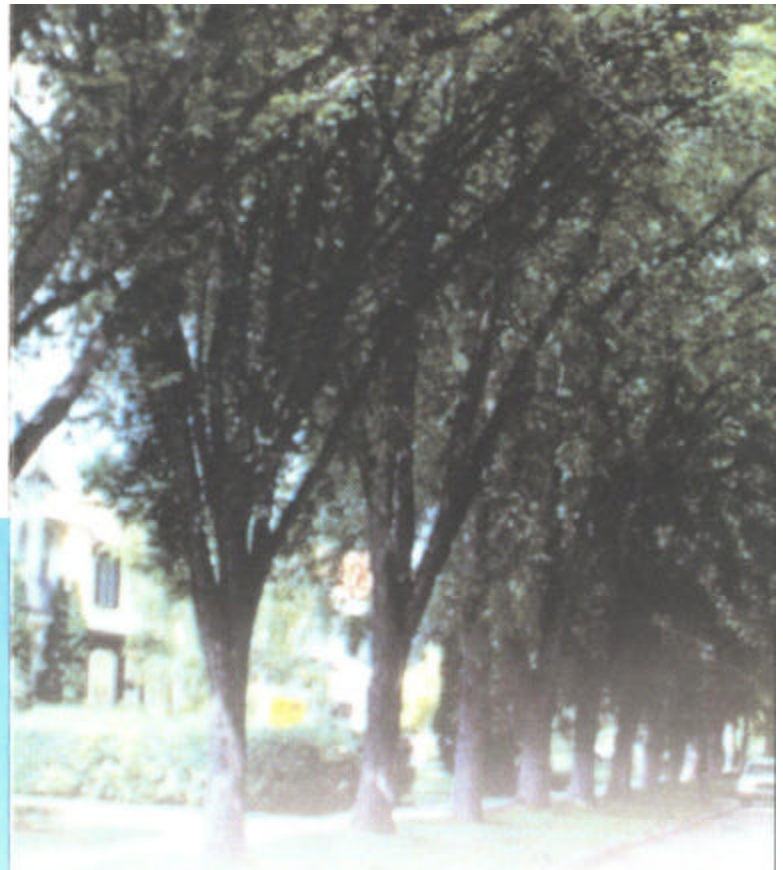


Dutch Elm Disease

Learn How You Can Protect
Manitoba's Elm Trees



Dutch elm disease (DED) has had a devastating impact on Manitoba's native elm tree populations since its arrival here in 1975. Hundreds of thousands of elms have disappeared from the Manitoba landscape. Thanks to the Province of Manitoba's DED management program, most of the elms in our cities and towns have survived the onslaught. Management of DED is regulated under Manitoba's *Dutch Elm Disease Act*.

American elm is a large, stately, shade tree species capable of surviving our harsh climate and the stresses of urban environments. The disappearance of this unique tree from our communities would be tragic. Our challenge is to keep the elm trees we still have. This pamphlet provides you with some basic information about DED and how to save our magnificent elm trees.

Protecting
& Managing
our Future

Manitoba 
Building for the Future



What does an elm tree look like?

Leaves of American elms are uneven at the base, dark green, oval, veined, have saw-toothed edges, and a pointed tip. Elm trees are vase or umbrella shaped with rising branches from a single

trunk. The bark is dark grey/brown and furrowed, with broad intersecting ridges and a rough flaky appearance. In cross-section, the bark has alternating brown and beige layers.

How can I tell if my elm has DED?

In early summer (mid-June through July) you'll notice a sudden **wilting** of leaves on one or more branches, usually at the top of the tree. Leaves will curl, yellow, then turn brown but do not always fall from the tree (**flagging**). With late summer infections, leaves may droop, become yellow and fall prematurely. Trees that are infected very late in the season usually produce small, sparse leaves the following spring.

DED can spread quickly throughout the tree. The most definitive indication of DED is **brown streaking** in the sapwood of infected branches that can be seen by peeling back the bark. When sampling an elm tree for symptoms, sterilize your cutting tool after each cut.



DED flagging



DED streaking

How is DED spread?

DED is spread in three ways:

1 **Native elm bark beetles** cause most of the spread of DED in Manitoba. They are tiny, dark brown insects that only feed and breed on elm trees. Native elm bark beetles spread DED primarily when feeding on healthy elm trees, but they only reproduce in diseased and dying elm trees and logs, especially those dying of DED. Young beetles, emerging from the bark of diseased trees, are covered with DED spores. New DED infections occur when the young beetles move to healthy trees, and during their feeding leave disease spores behind in the feeding wound. The main strategy of a DED program is to prevent these beetles from reproducing by removing breeding material. This material



actual size = 3mm

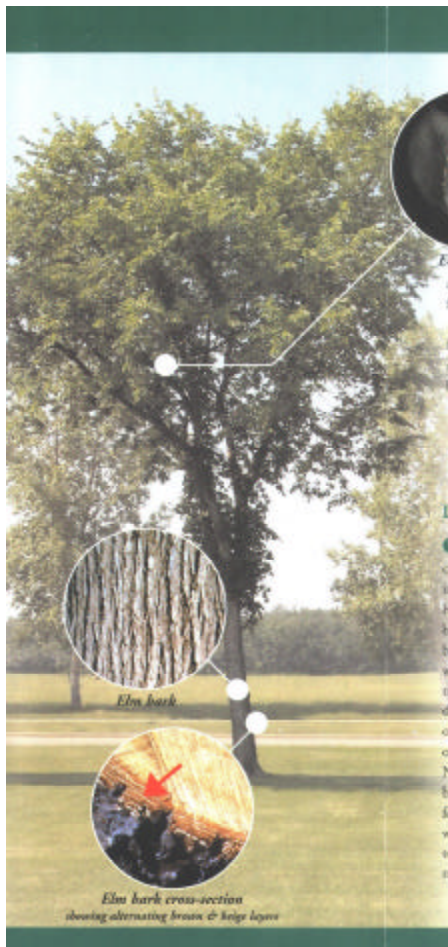
includes stored elm wood, and diseased and dying elms.

2 **Root grafts** between diseased and neighbouring healthy elm trees can also spread DED. This is why tree mortality often progresses along a row of elm trees on boulevards or in shelterbelts.

3 **Pruning tools** become contaminated with the DED fungus when they come in contact with infected elm wood. Disease symptoms are not always present, especially in fall and winter. It is extremely important to sterilize all equipment with methyl alcohol or a ratio of 1:4 bleach to water mixture before and after working with each elm tree.



DED streaking on a branch sample



Elm bark



Elm bark cross-section showing alternating brown & beige layers

Four Steps to Prevent and Control DED

Step 1 Tree Maintenance & Monitoring

Tree Maintenance Keep elms in healthy condition through proper tree care (pruning of dead or damaged wood, regular watering and fertilizing). **Do not prune between April 1 and July 31**, because pruning wounds attract elm bark beetles and make the tree vulnerable to DED. Remember to always sterilize your pruning tools before starting to prune another tree.

Monitoring Watch your elms for symptoms of DED. If you suspect a tree is diseased, contact the appropriate authority listed on the back of the brochure.

Step 2 Sanitation

Sanitation involves regularly eliminating any breeding sites for elm bark beetles. This includes removing all diseased or declining elm trees, dead branches, all elm firewood and any pruned-off branches. Sanitation should occur at least once a year. Elm firewood is a major source of DED and greatly contributes to the spread of the disease. It is illegal to store and transport all elm wood.

Removal of elm trees can occur any time of the year. Elms must be cut flush with the ground and either burned, buried, or chipped immediately. Contact your city, town, or RM office for on-site burning regulations and for the location of the nearest elm disposal site.



Illegally stored elm firewood

Step 3 Basal Spraying to Control the Beetle

Basal spraying refers to pesticide applications to elm trees by a licensed professional to control elm bark beetles. Over winter, the beetles only stay at the base of the tree, so basal spraying the bottom half metre of elm trees is a very effective method for reducing DED. Spraying should be carried out from August to the end of September.

Step 4 Fungicide Injections

Fungicides are injected directly into elms to prevent the DED fungus from growing in the tree. Injections to diseased elm trees are possible but their scope is limited. Fungicide injections must be performed by a licenced injection specialist in order to guarantee proper application. The procedure is most effective when the leaves reach full size in early summer. Injections are relatively expensive and must be repeated every few years. This treatment is most commonly used for high value elm trees.



DED Management in Manitoba

DED is managed jointly by the province and participating communities through the provincial DED management program. The City of Winnipeg's DED management program is supported by the provincial government. These programs have operated for more than 25 years and have been successful in limiting the loss of elm trees from this deadly disease. Most communities that manage DED have been able to retain a large portion of their mature elm shade tree population.

Assistance is available to all property owners throughout Manitoba who require information about identifying elms, DED symptoms, as well as DED prevention and management methods.

The Status of DED Research

The goal of DED research is to reduce the incidence of DED. It is unlikely that we will be able to fully eradicate the disease, but improved control methods would significantly reduce the number of diseased elm trees in infested areas.

Current research areas include:

- examining how the DED fungus affects elm trees
- studying the habits of elm bark beetles
- determining why some naturally occurring elm trees appear to be resistant to DED
- breeding of disease resistant elms varieties
- developing fungicide injections

Some Other Problems You May Have With Your Elms

Slime Flux

A common condition called slime flux or wetwood causes a foul smelling liquid to leak from the trunks of trees staining the bark. Slime flux is not DED related. It is caused by bacteria and is more unsightly than harmful to the tree. Slime flux usually occurs at a pruning wound or at the junction of two major limbs.

Cankerworms

You may have seen sticky bands wrapped around many tree trunks in your community. These bands are called tanglefoot bands and they help prevent spring and fall cankerworm moths from climbing up the tree to lay eggs. Cankerworm feeding can cause severe defoliation which stresses and weakens trees. Stressed elm trees are more attractive to elm bark

beetles, so banding trees and reducing cankerworms will aid in the prevention of DED. Tanglefoot bands also play a small role in trapping elm bark beetles.



What is DED?

DED is a fungal disease that blocks water movement in elm trees leading to the death of the entire tree. DED usually kills within a couple of weeks though in larger trees the process can take from one to two years.

Which trees get DED?

American elm is very susceptible to DED. The introduced Siberian elm (sometimes referred to as Chinese elm) is less susceptible to the disease, but occasionally becomes infected and dies.



Siberian elm



American elm

For More Information

If you're not sure about the symptoms you are seeing on your tree(s) or you have other questions related to Dutch elm disease, call the numbers below.

Manitoba Conservation

Forestry Branch – DED Management Program
Forest Health and Renewal
200 Saulteaux Crescent
Winnipeg, Manitoba
R3J 3W3

In Brandon 726-6444
all other areas 204-945-7866
or toll free 1-866-626-4862

Web Site:

www.gov.mb.ca/conservation/forestry/forest-urban/u-contents.html

The City of Winnipeg

986-7623