



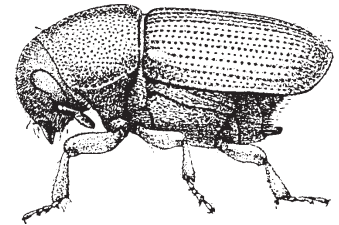
Ornamentals

Dutch Elm Disease

Pest Fact Sheet **45**

Introduction

Dutch elm disease is caused by a fungus that is carried from tree to tree by elm bark beetles. The disease was first described in Holland in 1920 (where the name originated) and was first found in the eastern US in the early 1930s. It was and still is one of the most destructive shade tree diseases in the US today. All elm species except Siberian and Chinese elms are affected, but the American elm is most severely affected.



Description

Disease symptoms: The first symptom to appear is wilting or "flagging" of the leaves. The wilted leaves curl, turn yellow, then brown, and drop off the tree. Defoliated twigs usually die quickly. Dead branches may appear on only a portion of the tree. The tree may then die branch by branch over a period of several years. The process is more rapid on young or fast-growing trees. Sometimes an entire tree will develop disease symptoms and die within a few weeks. When trees are planted close together, the fungus may be spread from infected trees to healthy trees through root grafts.

When the bark of infected twigs and branches is peeled back, brown streaking or mottling is visible on the outer layer of wood. In a cross section of the branch or twig, the browning appears as a broken or continuous ring in the outer rings of the wood. If the bark is peeled back from dead branches or trees, tunneling of elm bark beetles can be seen (see diagram). These symptoms of Dutch elm disease are sometimes confused with those of drought injury or feeding by the elm leaf beetle; however, in these cases, there is no discoloration in the sapwood and no tunneling. Two species of bark beetles carry the Dutch elm disease fungus, the European elm bark beetle (*Scolytus multistriatus*) and the native elm bark beetle (*Hylurgopinus rufipes*). They are stout, reddish-brown beetles, about 1/8" long. They feed on the twigs, often in the crotches, of healthy elm branches.

Life cycle

The beetles overwinter as larvae in their tunnels, pupate in the outer bark and begin to emerge and feed in May. They can be found continuously from May to September. Egg-laying extends over a considerable time, and there is a second (and possibly third) summer generation each year. Elm bark beetles will only lay eggs in dead or dying elm tissue.

The fungus overwinters in the wood of infected, dying trees and produces spores in the bark beetles' tunnels, where the beetles may pick up the fungus spores as they tunnel into an infected tree. The fungus spores are spread to healthy trees when the adult beetles emerge, fly to healthy trees and feed on the twigs. Throughout the summer months, the fungus grows and spreads in the tree's vascular system, causing the symptoms described above.

Cultural control

- Destroy dead elm material (logs, dead trees, etc.); if logs are stored, remove bark.
- Prune infected branches as soon as first symptoms are observed. Prune at least 12 inches below infected tissue. (Practical only if 5% or less of the tree is showing flagging symptoms.)
- Physically destroy root grafts between adjacent trees.
- Plant resistant species or cultivars (*New Harmony*, *Princeton*, *Valley Forge*).

Chemical control

Consult your county Extension Educator (see county office telephone listing below) for specific pesticide recommendations.

Summary


Causal agent	Fungus
Disease vector	Elm bark beetles (or by root grafts)
Damaging stage of vector	Adult
Overwintering stage of vector	Larva
Number of generations per year	2 - 3
Time of year when damage is done	May - September
Major symptoms	Flagging, wilting of foliage, browning of current year's growth ring (sapwood)

UNH Cooperative Extension County Office Telephone Numbers

Belknap (603) 527-5475	Carroll (603) 539-3331	Cheshire (603) 352-4550	Coos (603) 788-4961	Grafton (603) 787-6944
Hillsborough Goffstown (603) 641-6060	Merrimack (603) 796-2151	Rockingham Brentwood, NH 03833 (603) 679-5616	Strafford (603) 749-4445	Sullivan (603) 863-9200

Stop! It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. If unsure of registration status of a particular pesticide product, contact the NH Division of Pesticide Control at (603) 271-3550. Store pesticides in their original containers in a locked cabinet or shed away from food. Dispose of unused pesticides or empty containers safely, according to NH regulations. If you suspect pesticide poisoning, call the New Hampshire Poison Control Center at 1-800-562-8236.


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