



EUTYPELLA CANKER OF MAPLE

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COVER PAGE:

Photo 1

Typical canker on a sugar maple in the forest.

Photo 2

Close-up of the pathogenic fungus growing under the bark at the upper end of a canker.

Photo 2

Photo 1

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INTRODUCTION

The *Eutypella* canker of maple is found both in the forest and on ornamental trees. On the latter, the aesthetic aspect is most affected because the disease causes a malformation of the trunk. In forests, the loss of logs from the base of trees destined for the saw milling or plywood industry makes afflicted trees practically worthless.

The name of this disease is very descriptive for it includes part of the name of the fungus causing the disease (*Eutypella parasitica* Davidson & Lorenz) and the principal symptom visible on the infected tree (canker). This disease was reported in the literature for the first time in 1937, when it was observed on sugar and red maples in northern Minnesota and Wisconsin. The following year, Davidson and Lorenz demonstrated that *E. parasitica* was the pathogenic agent; they published a good description of the cankers it caused, and an account of the distribution and prevalence of the disease in the northern United States. This disease was reported for the first time in Quebec in 1941. Several subsequent references indicate its more or less constant presence in the hardwood forests of Quebec and Eastern Canada.

HOSTS

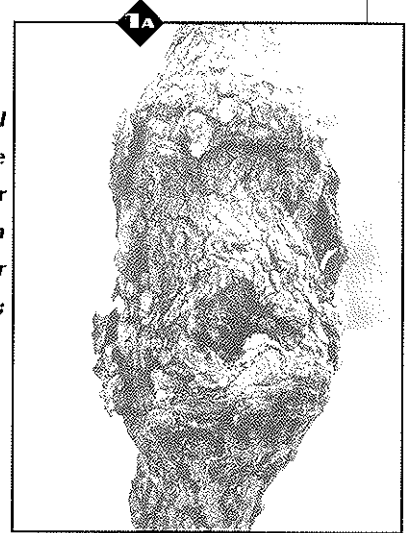
Most maple species are susceptible to this disease. The sugar maple, our most common maple, is the most consistently affected. *Eutypella* cankers are also often reported on red maple and occasionally on Norway, silver, black and Manitoba maples.

SYMPTOMS

The predominant symptom of this disease is a canker, generally located on the tree trunk and composed of two parts: a relatively well-defined area of fungus-killed bark and cambium, and a callus or bulge encircling this dead bark. The bulge can be very pronounced, as in the majority of cases involving sugar maple, or appear merely as a regular swelling around the dead bark, as is often the case with red maple. The canker is always elongated and may be on one side of the trunk or may almost girdle it. Other typical symptoms of this disease are: dead bark that adheres to wood over the entire canker (Fig. 1), a scar, or the stub of a dead branch toward the centre of the canker (80% of the cases), and fungal fructifications in the form of sparse or somewhat clustered black «charred» spots from which protrude the necks of several perithecia, 1 to 6 mm long. Occasionally, in the middle of the canker there is a white fleshy fructification, half

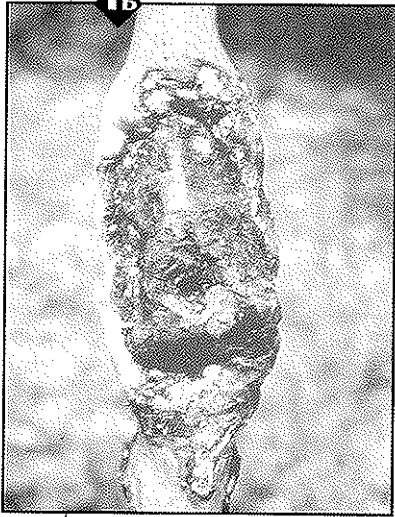
Characteristic symptoms of a Eutypella canker:

dead bark still attached to the tree, scar or dead branch stub at center of canker;



covered by green moss. This is usually *Oxyporus populinus* (formerly known as *Fomes connatus*), a decay fungus that has penetrated the tree through the canker.

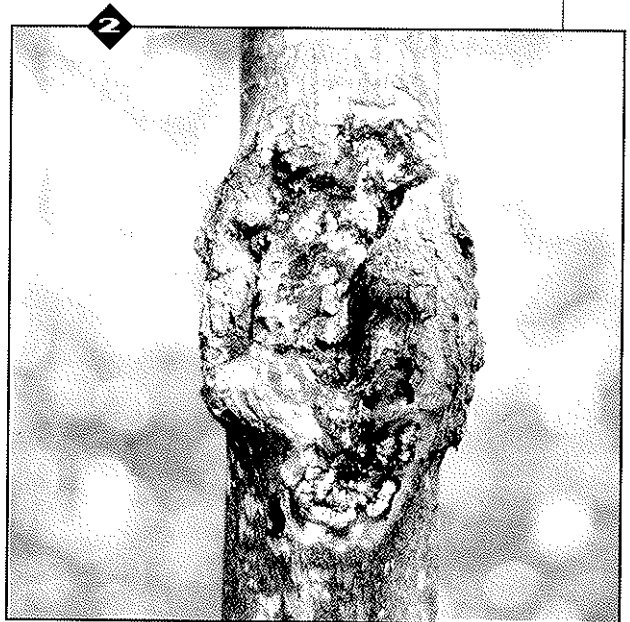
Eutypella canker of maple can be positively identified by removing pieces of bark at the upper or lower end of the canker on the margin between healthy and infected bark. Almost always, this exposes a cream or pale beige mycelial fan of the fungus, of variable



*mycelial fans
under the bark at
the ends of the
canker.*

size, that gives the distinct impression of growing from the canker towards the healthy parts of the tree (Fig. 2). The size of this fan varies according to fungus development and the time required to locate it varies considerably. However, identification generally takes only a few minutes since few cankers resemble it, particularly on sugar maple.

*Close-up of
mycelial fans
growing under
the bark at the
upper and lower
ends of a
canker.*



INFECTION AND DEVELOPMENT

The *Eutypella parasitica* fungus cannot penetrate the outer layers of bark and therefore always need exposed wood to infect a tree. It usually enters (in nearly 80% of the cases) by a scar or stub of a branch broken off near the trunk (Figs. 3a and b), or by a wound exposing the xylem. The sources of infection are spores (reproductive cells of the fungus), produced in fructifications present on old cankers and released during a rainfall. Under normal conditions, spores are carried only about 20 m downwind from a canker. Spores landing on a medium favourable to their development germinate rapidly and produce a mycelium that develops in the inner bark, at the cambium level, and eventually penetrates into the wood. It is this layer of mycelium under the bark, which grows 1 cm or more per year and is mainly visible at the top and bottom of the canker, that holds the dead bark to the trunk. Fungal fructifications will probably

appear on the surface of this dead bark five or six years later (Fig. 3c).

Young maples are generally most susceptible to infection, probably because there are branches on their trunks, they have relatively thin bark, and often also because of the high density of inoculum (spores) present, originating from an old canker on a large tree in the stand. Recent cankers (therefore without fungal fructifications) are rarely observed on trees more than 12 cm in diameter. The smaller the diameter, the greater the chances that the fungus will girdle the trunk rapidly, killing the tree. The tree reacts to the fungus by producing a callus or bulge around the infected part during the season of rapid growth. It is this defensive reaction that produces this characteristic form of canker.

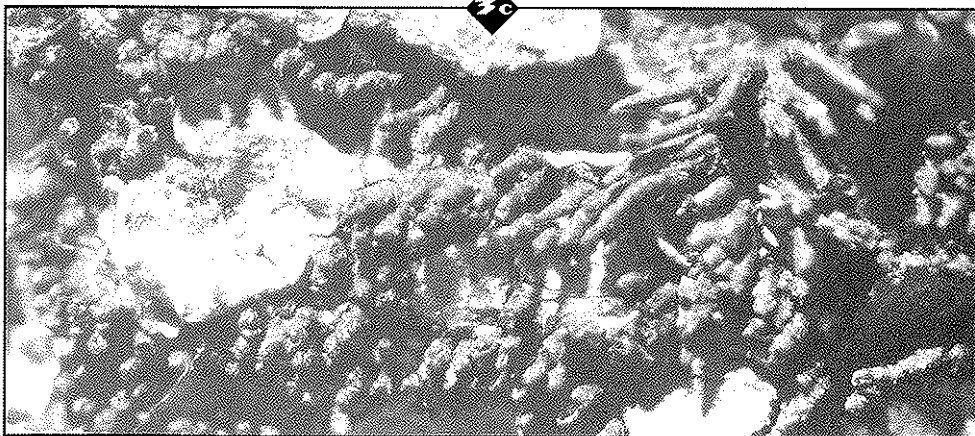
Dead bark still adhering to the wood over the entire canker, and the presence of a dead branch stub or its scar toward the centre of the canker are characteristic symptoms.



Eutypella canker on sugar maple.



Eutypella canker on red maple.



Enlargement (5X) of fungal fructifications on dead bark.

DISTRIBUTION AND IMPORTANCE

This disease is found in the northern part of the natural range of sugar maple, particularly in Ontario, Quebec, and in the eastern and central United States, especially in the states close to the Canadian border.

Of the sugar maples surveyed in New York State, approximately 2.5% were cankered with up to 11.5% in certain stands. In Wisconsin and Michigan, the average was 2.8%, ranging from 0.9 to 6.6% depending on the stand. In one case in Ontario, 40% of the maples in a stand were infected. A recent survey shows an average of 7.4%, with frequency extremes of 2 and 15% in some stands. In Quebec, the first reference in the survey of diseases of hardwood trees placed the frequency of this disease among maples at between 3 and 8%. A more recent report gives frequencies of infection from 2 to 28% in Quebec maple groves.

The canker is an infection court for decay in the tree, rendering it very susceptible to wind breakage.



The significance of damage caused by this disease varies according to the desired use of the individual trees or of the forest as a whole. There is a high mortality attributable to the fungus in trees measuring 10 cm d.b.h. or less. As 90% of the cankers are less than 3.5 m from the ground, the value of the first log of an affected tree destined for plywood or sawing is greatly reduced, if not a total loss. The canker is also an infection court for decay and renders the tree very susceptible to wind breakage (Fig. 4). Cankered trees considerably

reduce the potential productivity of a stand by occupying space that normally could produce other trees of greater value. An old canker left in a stand is also a major source of inoculum and this may result in a high incidence of infection in new growth.

Lastly, on ornamental trees, an enormous canker on a maple in front of one's house is not aesthetic, renders the tree more susceptible to wind breakage, and greatly reduces its lifespan because of the decay that develops in its trunk.

METHODS OF CONTROLLING THE DISEASE

There are two methods of controlling this disease. The first consists in decreasing the number of cankers in the forest through sanitation thinning. Bigger, non-cankered trees are selected for crop trees; sick trees are cut, thus leaving growing space for healthy trees and decreasing the quantity of inoculum in the stand. If possible, cankered trees should be removed from the forest and destroyed or used as firewood. If not, cankers should be cut and placed face down on the ground. This greatly reduces spore release. A stand with several large trees with old cankers generally presents a much higher incidence of

disease than a stand without such sources of inoculum.

A second method, applicable in a small private forest or on ornamental trees, consists in pruning branches 2.5 cm or less in diameter. These pruning wounds heal quickly and prevent later breakage of branches at the trunk, which would leave large scars or stubs of branches that could become infection courts for the fungus.

Lastly, because the fungus invades the stem wood rapidly after spreading underneath the bark, it appears useless to try to eliminate the canker by surgery once a tree is infected.

BIBLIOGRAPHY

- French, W.J. 1969.** Eutypella canker on Acer in New York. N.Y. State Coll. For., Syracuse Univ. Tech. Publ. 94. 56 p.
- Gross, H.L. 1984.** Impact of eutypella canker on the maple resource of the Owen Sound and Wingham Forest Districts. For. Chron. 60: 18-21.
- Johnson, D.W.; Kuntz, J.E. 1976.** Sporulation from eutypella-cankered maples reduced by felling infected trees. Plant Dis. Rep. 60: 448-451.
- Johnson, D.W.; Kuntz, J.E. 1979.** Eutypella canker of maple ascospore discharge and dissemination. Phytopathol. 69: 130-135.
- Kliejunas, J.T.; Kuntz, J.E. 1974.** Eutypella canker, characteristics and control. For. Chron. 50: 106-108.
- Lachance, D. 1971a.** Discharge and germination of *Eutypella parasitica* ascospores. Can. J. Bot. 49: 1111-1118.
- Lachance, D. 1971b.** Inoculation and development of Eutypella canker of maple. Can. J. For. Res. 1: 228-234.

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