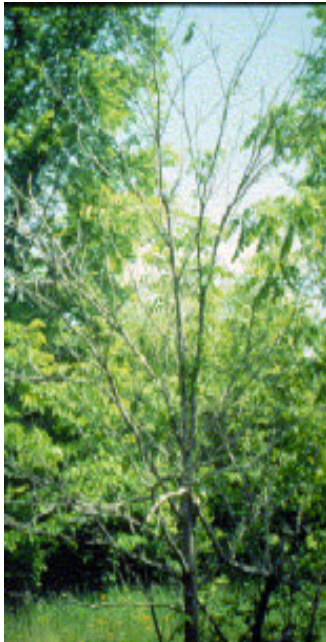


DISTRIBUTION OF BUTTERNUT CANKER (*SIROCOCCUS CLAVIGNENTI-JUGLANDACEARUM*) IN EASTERN CANADA



A butternut tree heavily damaged by *Sirococcus clavignenti-juglandacearum*, the causal agent of butternut canker

INTRODUCTION:

Butternut (*Juglans cinerea* L.) trees in Canada and the United States are endangered by butternut canker disease. Infection by the fungus *Sirococcus clavignenti-juglandacearum* V.M.G. Nair, Kostichka & Kuntz, causes branch and stem cankers that can result in severe damage to the tree and often whole tree mortality. It was first reported from Wisconsin in 1967, but the causal agent was not described until 1979. Scientists do not know how long this disease has existed in North America, however they believe it was introduced. In Canada, butternut canker

was first collected in Quebec in 1990, and then in Ontario in 1991, and in New Brunswick in 1997. It is known from the aging of cankers, that the disease has been present in Ontario for at least 20 years.

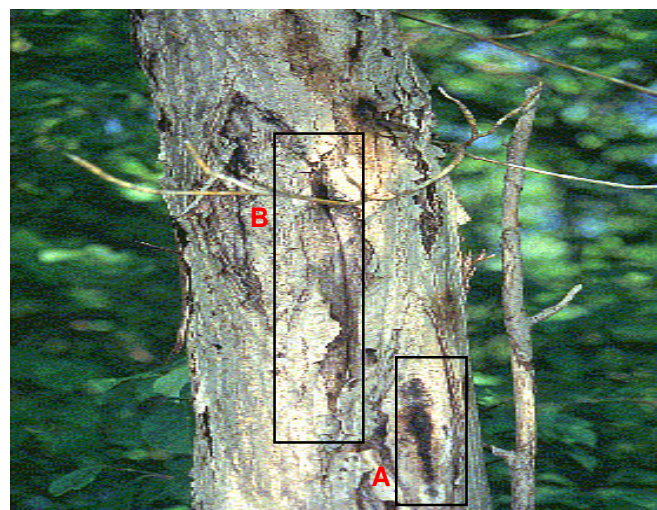
LOCATION:

The natural range of butternut extends throughout the north-eastern United States and southern-most parts of Ontario, Quebec and New Brunswick. In Canada, butternut is not an important timber species and grows as scattered trees, or in small groups among other hardwoods. However, ecologically, it is an important source of wildlife food, especially in the northern part of its range where walnut is not present. Butternut canker is currently known to exist throughout the range of butternut in Ontario and Quebec, with limited distribution, at present, in New Brunswick. In 1990, butternut was listed as a

sensitive species in the United States by the US Forest Service, and in most states where butternut occurs, it is listed as a species of concern, largely due to this canker disease.

MANAGEMENT IMPLICATIONS:

Trees of all ages and growing on all sites are susceptible to infection by this canker disease. Infection continues to spread and develop around the branches and main stem, eventually girdling and killing the tree. Older cankers may also serve as



Active butternut cankers show a symptomatic black exudate (A) and old cankers (B), which the tree has attempted to heal-over, are indicated by seams in the bark.

entrance ports for other decay fungi, further reducing the commercial value of the wood. Dead butternut trees and those showing poor vigor as a result of numerous infection sites (cankers), should be removed from managed woodlots, thereby lowering the inoculum load within the stand. The most obvious symptoms of the disease are the elongated, sunken cankers that form on the bark. These cankers are frequently associated with wounds, but also with leaf and bud scars. During the spring and early summer, an inky-black fluid exudes from cracks in the canker (*see photo*, area A). In the summer, the cankers appear as sooty black



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patches, often with whitish margins. The cambium layer beneath and surrounding the canker will be dark brown to black in color and dead. Cankers are perennial, and bordered by successive layers of callus tissue (*see photo*, area B). Infection often originates in the lower crown and spreads downward as spores from the cankers are washed by rain along the branches and main stem. Other members of the walnut family (*Juglandaceae*) also show some susceptibility to the disease when inoculated artificially. In Quebec, seedlings of black walnut (*Juglans nigra* L.) infected with the disease have been reported by tree nurseries. However, damage to black walnut is limited to small branch cankers; severe infections on black walnut in forests or plantations have not been observed to date. Further studies in Quebec have shown that the fungus is associated with the fruits of black walnut and butternut and the disease can be transported to new sites on the fruit.

SOURCES OF RELEVANT INFORMATION:

Davis, C.N.; Myren, D.T.; Czerwinski E.J. 1992. First report of butternut canker in Ontario. *Plant Disease* 76: 972.

Harrison, K.J.; Hurley, J.E.; Ostry, M.E. 1998. First report of Butternut canker caused by *Sirococcus clavigignenti-juglandacearum* in New Brunswick, Canada. *Plant Disease* 82: 1282.

Innes, L. 1998. *Sirococcus clavigignenti-juglandacearum* on butternut and black walnut fruit. pp 129-132 in G. Laflamme, J.A. Berube, R.C. Hamelin, editors *Foliage, shoot and stem diseases*. Proceedings of the IUFRO WP 7.02.02 meeting, Quebec City, May 25-31, 1997. Natural Resources Canada, Canadian Forest Service, Sainte-Foy, Quebec. Info.Rep. No. LAU-X-122.



Fruits of butternut and walnut infected with *Sirococcus clavigignenti-juglandacearum*.

Innes, L.; Rainville, A. 1996. Distribution et détection du *Sirococcus clavigignenti-juglandacearum* au Québec. *Phytoprotection* 77: 75-78.

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