

MN 2500 AGMI-5898

AG-MI-5898-C
1992

MINNESOTA EXTENSION SERVICE

UNIVERSITY OF MINNESOTA

Ash Yellowws in Minnesota



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Ash yellows is a plant disease induced by a mycoplasma-like organism (MLO). It has all the traits of animal and human mycoplasmas except that it cannot be grown on artificial media. Consequently, testing for the presence of this organism is considerably more sophisticated and costly than most disease cultures.



Approximate distribution of ash yellows.

Ash yellows has been confirmed on a number of ash trees in the Minneapolis/St. Paul and Rochester areas. Nationally, the disease has been reported in a roughly east-west band extending from Iowa to Ontario, southern Quebec and eastern Massachusetts. The southern edge of the band extends along west-central Missouri and east to southeastern New York State. The disease occurs in scattered localities adjacent to this band, including several areas in Minnesota.

White ash, *Fraxinus americana*, is the most susceptible; green ash, *F. pennsylvanica*, is intermediate in susceptibility; and black ash, *F. nigra*, is thought to be the least susceptible at this time. Green ash is the dominant ash species in landscape and natural areas in Minnesota.

SYMPTOMS

The only reliable diagnostic field symptom is the presence of witches brooms on the trunk and major limbs. Witches brooms are a proliferation of small branches which originate at a single point; each of these branches sprouts at the nodes giving the shoots a bushy appearance (Figure 1). Leaves on brooms tend to be small, simple and chlorotic (pale green to yellow) (Figure 2). Witches brooms are positive proof of ash yellows. However, healthy ash trees commonly form sprouts on the trunk called epicormic sprouts which might be mistaken for witches brooms.

The first visible symptom of ash yellows to develop after infection is a permanent reduction in growth (Figure 3). After several years of minimal growth, leaves often appear in tufts at the ends of branches. Leaves may fail to attain normal size and appear chlorotic. Branch dieback occurs following dormant periods. Small roots collected from symptomatic trees can be tested for the presence of the ash yellows mycoplasma.



Figure 3. A decline in growth after infection is evident by the closeness of the outer annual growth rings.

Poor growth or decline symptoms can also result from poor site conditions or other mechanical, environmental, chemical, insect or disease influences. It is important to determine the cause of the symptoms on each tree. For example, bushy growth is common on small branches along highways where salt spray often kills the tips of the branches.

DISEASE CYCLE

At this time the mechanism by which ash yellows is spread in the field is unknown. Certain leafhoppers and the meadow spittlebug are highly suspect in northeastern United States.

Trees of all ages can become infected. Once the organism is in the plant, it inhabits and destroys the phloem tissues. Symptoms develop on young ash one year after infection, while an incubation period longer than one year is likely in large trees. In white ash, root damage precedes other symptoms, suggesting that top symptoms are at least partially due to root mortality.

Ash yellows is not known to be transmitted through seeds, but it can be transmitted by grafting.

CONTROL

Proper maintenance (fertilization, irrigation and pest control) of infected trees is suggested, as chemicals will not eradicate the disease from infected trees.



Figure 1. A proliferation of pale green to yellow shoots, called witches brooms, are common on the lower trunk during the last stages of decline.



Figure 2. Simple, yellowed leaves characteristic of witches brooms on a young sapling in a natural stand.

CONCLUSIONS

Infected trees do not recover. However, trees intermediate in susceptibility may live for many years. Landscape management practices which reduce plant stress, principally watering, may extend the life of infected trees.

Until further information is available on the epidemiology of ash yellows, the use of ash should be reduced.

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This publication was produced by the Minnesota Extension Service, Educational Development System, in cooperation with the Minnesota Department of Natural Resources, Division of Forestry; and the U.S. Forest Service, Northeast Area State and Private Forestry.

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