

6. *Mycosphaerella* Leaf Spots of Ash

Robert W. Stack and Jerry W. Riffle

Two leaf spot diseases of ash are caused by species of *Mycosphaerella*. The disease most common in nurseries is caused by *Mycosphaerella effigurata*, and is known as 'Piggotia leaf disease', 'Mycosphaerella leaf spot', or 'Marssonina leaf blight'. The fungus is pleomorphic, consisting of a conidial stage (*Marssonina fraxini*), a spermogonial and carpogonial stage (*Phyllosticta fraxini*, *Piggotia fraxini*), and a perithecial stage (*M. effigurata*). The other disease, less common but widely distributed, is caused by *Mycosphaerella fraxinicola*, and is known as 'Phyllosticta leaf spot'. The spermogonial stage of this fungus is *Phyllosticta viridis*.

Hosts and Distribution

The foliage diseases caused by these two fungi are distributed throughout the Great Plains wherever ash is grown. All commonly grown species of ash (green, white,

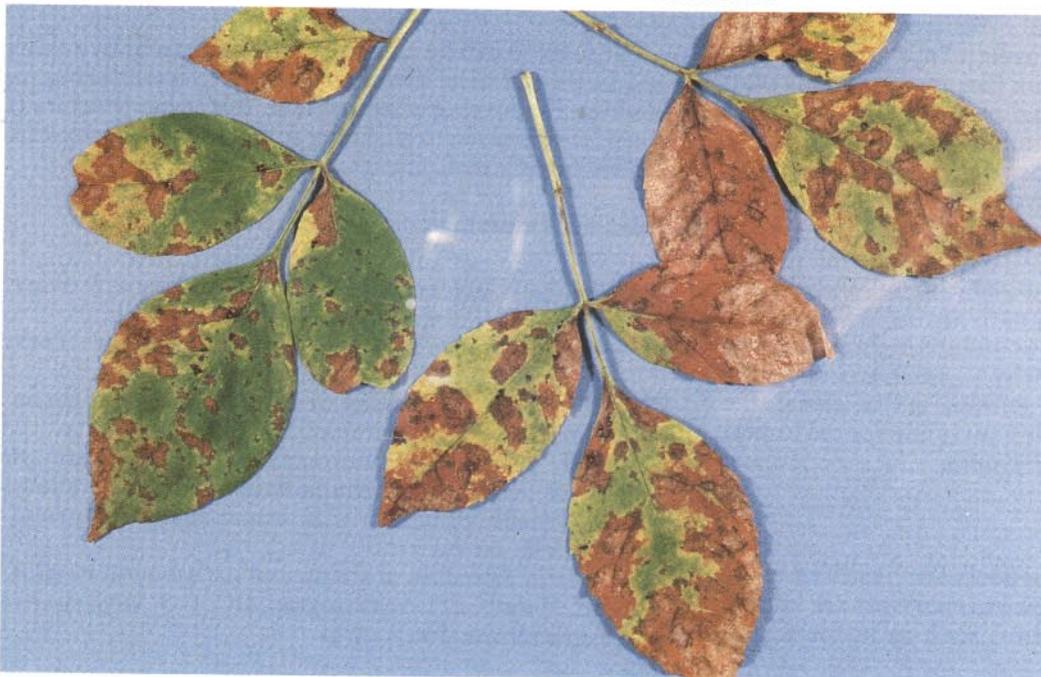
and black) are hosts of these fungi. No resistant species or cultivars of ash are known. Uniformly high levels of infection with little variation among individuals or seed sources have been observed in nursery beds.

Symptoms and Signs

Although usual symptoms of the two leaf spot diseases are distinct, diagnosis is difficult because symptoms may intergrade, both fungi may be present on the same leaf, and the causal agents are pleomorphic.

Phyllosticta leaf spot usually appears as rounded to irregular spots or blotches, typically 0.2–0.6 inch across, in mid to late summer (fig. 6–1). The spots initially are pale green, and turn light brown or tan by early September. In severe outbreaks the spots enlarge and coalesce, blighting entire leaves. The entire crown of large trees may appear scorched during the outbreaks.

Figure 6-1. Leaf spot on green ash caused by *Mycosphaerella fraxinicola*.



Symptoms of *Mycosphaerella* leaf spot first appear in June. Scattered yellow spots, approximately 1–3 mm in size, develop on the upper leaf surface. If the spots are numerous the entire leaf may appear yellow. Conidia are produced in immersed acervuli on the lower leaf surface. Several weeks after the first symptoms appear, numerous small dark stromata, which contain carpogonia and spermogonia, develop over the lower leaf surface. By fall the black stromata give the lower leaf surface a rough sooty appearance (fig. 6-2). The upper leaf surface remains green.

Disease Cycle

Both *M. effigurata* and *M. fraxinicola* develop perithecia in fallen leaves over winter. Ascospores of both species are 2-celled, and are similar in shape but not in size. *M. effigurata* ascospores are 4 by 15 μm , while those of *M. fraxinicola* are 4–5 by 8–10 μm . In spring the ascospores are dispersed by wind to infect new leaves. Infection by ascospores of *M. effigurata* appears as minute yellow spots in June. Two-celled hyaline conidia form in acervuli below spots, and the conidia may cause secondary leaf infections. Phyllosticta leaf spot has only a primary disease cycle; spores produced in the spermogonial stage are not infectious. Infections by ascospores of *M. fraxinicola* do not become evident until mid or late summer in contrast to *M. effigurata*.

Damage

M. effigurata is especially common in nurseries and on young trees where it may cause premature defoliation. In at least one Northern Great Plains nursery the early defoliation caused by this fungus is considered beneficial by the nursery manager as it causes leaf drop before early snowfall.

M. fraxinicola may cause severe premature defoliation on large established trees. If repeated for several seasons, such defoliation might affect growth increment.

Control

Defoliation by either of these fungi occurs too late in the season to cause renewed growth or winter hardiness problems. No specific controls are known for these diseases.

Selected References

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Figure 6-2. Black stromata on lower leaf surface of green ash nursery seedlings caused by *M. effigurata*.

