

Landscape tree diseases: Part 2: Anthracnose disease on Chinese elms

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THIS ARTICLE, THE SECOND PART OF AN OCCASIONAL series discussing diseases of landscape trees, addresses anthracnose on Chinese elms, one of the most common trees in urban landscapes.

The Chinese elm (*Ulmus parvifolia*) (Fig. 1), sometimes called the evergreen elm or lacebark elm, is a much favored, handsome, and highly adaptable tree that finds a variety of uses in street, park, commercial, or home landscapes. Desirable traits include fast growth rate, ease of culture,

Figure 1. The Chinese elm (*Ulmus parvifolia*), sometimes called the evergreen elm or lacebark elm, is a much favored, handsome, and highly adaptable tree that finds a variety of uses in street, park, commercial, or home landscapes. Fullerton, CA.



Figure 2. Small, tan, brown, black, or tar-like spots on leaves are the first symptoms of anthracnose on Chinese elms. Santa Monica, CA.

and generally graceful, upright habit with long-arching, even pendulous or weeping branches. Although deciduous in cold-winter areas, some cultivars are essentially evergreen in most of California and the low deserts of the Southwest U. S., where they may briefly drop many of their leaves in late winter but then quickly flush out with fresh, new growth. Other than its graceful habit, its most striking ornamental feature is the showy, smooth, whitish trunk with thin bark that flakes in small patches to reveal mottled patterns of gray, green, olive, brown, and orange.

Adaptable to a wide variety of situations and conditions, the Chinese elm performs adequately in confined spaces, like parkways, medians, and parking islands, is tolerant of heat, cold, aridity, wind, air pollution, and compacted, poorly drained, or alkaline soils, and is even resistant to Dutch elm disease and phloem necrosis. *Sunset Western Garden Book* lists the Chinese elm for zones 8 to 9 and 12 to 24, meaning that the mostly evergreen cultivars can be grown reliably in nearly all of coastal California, the Bay Area, the Central Valley, most urban areas of southern California, and the low deserts of California, southern Nevada, and western Arizona. Deciduous cultivars can be grown in other parts of the U. S. and are reliably hardy to about 0 to -10 F. The only serious drawback of the Chinese elm is its propensity to regenerate readily from seeds, with unwanted seedlings spontaneously appearing throughout the landscape, leading many to consider it an invasive and



Figure 3. Leaves heavily infected with anthracnose drop prematurely, resulting in sparsely-leaved branches. Vista, CA.

aggressive species. However, when well trained and cared for, the Chinese elm has few rivals in the landscape for gracefulness of habit, showy bark, and ease of culture.

Unfortunately, despite these attributes, an anthracnose disease can sometimes be a serious problem on Chinese elms. Anthracnose is a collective term referring to a group of fungal diseases on many woody plants, vegetables, and even turf grasses. Several different fungi cause anthracnose and the diseases encompass a multitude of symptoms, including sunken, sometimes dark lesions or cankers on stems or trunks, leaves, and flowers and fruits. Fungi that cause anthracnose produce their sexual spores in a fruiting body called an acervulus, which is a dark eruption in the epidermis from which the spores push outward. Several well known tree species seem particularly susceptible to anthracnose, including sycamore (*Platanus*), ash (*Fraxinus*), oak (*Quercus*), maple (*Acer*), and elm (*Ulmus*). Fungi that cause anthracnose generally are most infective during wet conditions, when splashing rain and wind spread spores, and in the presence of soft, new, young growth, which is

Figure 4. Anthracnose cankers are sometimes visible on small branches and twigs. Carlsbad, CA.



particularly susceptible to attack. Thus, in California fungi that cause anthracnose are typically most active or infective during rainy periods in late winter and early spring when new growth flushes on trees. Mature leaves and dry conditions reduce disease spread. With deciduous trees the fungi overwinter on infected twigs, branches, and fallen leaves and, with the proper conditions in spring, infect new growth. If favorable conditions prevail successive generations of the fungi can infect new growth later in the season.

The fungus *Stegophora ulmea* causes anthracnose on Chinese elms. Symptoms of anthracnose on Chinese elms include small, tan, brown, black, or tar-like spots on leaves (Fig. 2). Infected leaves may become curled or distorted. Heavily infected leaves drop prematurely and, in severe instances, branches or even the entire tree may defoliate (Fig. 3). Superficial cankers are sometimes visible on small branches and twigs (Fig. 4). Because Chinese elm is mostly evergreen, foliar symptoms can persist all year.

However, the most spectacular symptom of anthracnose on Chinese elms are the conspicuous, large, deeply

Figure 5. The most spectacular symptom of anthracnose on Chinese elms are the conspicuous, large, deeply sunken, elliptical, cankers on branches and trunks. Beverly Hills, CA.



sunken, elliptical, vertically oriented cankers with swollen margins on trunks and branches (Figs. 5-8). Not only unsightly, these cankers, if sufficiently deep and extensive, can destroy nutrient- and water-conducting tissues, effectively girdling the trunk or branch and or compromising their structural integrity. (Figs. 7-8) A street planting of young Chinese elms 15 to 20 feet tall with nearly all having large, deep cankers on their trunks is a bizarre if not disturbing sight.

It is unclear how the fungus infects or causes cankers on trunks and branches but many appear at or near the junction of pruned-out branches (Fig 9). Further study is needed on the role that pruning branches may play in the development of trunk and branch cankers. Cankers on the lower parts of trunks have been noted on Chinese elm in other parts

of the U. S. but have been attributed to other fungi and are mostly associated with wounds on small, young landscape trees in excessively wet conditions and nursery trees.

Fungicides do not provide reliable control of anthracnose on Chinese elm. Sanitation, such as pruning out and properly disposing of infected twigs and small branches in winter and periodic, year-round collecting and disposing of fallen leaves, may offer some control. Adjust sprinklers so water is not striking the foliage or trunk. If cankers are extensive and deep, consider removing the branch or replacing the tree.

The most reliable management strategy for anthracnose on Chinese elms is to plant resistant varieties. The cultivar 'Drake', introduced by Monrovia Nursery in the early 1950s and noted for its mostly sweeping upright

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Figure 6. (Left) Anthracnose cankers are typically vertically oriented and have swollen margins. Beverly Hills, CA.

Figure 7. (Right) Sufficiently deep and extensive anthracnose cankers can compromise the structural integrity of the trunk. Irvine, CA (see Fig. 8 for the opposite side of this trunk).



habit with only slightly weeping branches, is resistant to anthracnose. The cultivar 'Brea', introduced by Keeline-Wilcox Nursery about the same time and that may not be distinct from 'Drake', is also resistant. In contrast, the cultivar 'True Green', sometimes called 'Evergreen' or 'Sempervirens' and noted for its more rounded form of more weeping habit, is susceptible and should not be planted where anthracnose is problematic.

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Although not so identified, part one of this series was Hodel et al. (2009).

Photos by Donald R. Hodel.

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Figure 8. (Left) The opposite side of the trunk shown in Fig. 7 also has a deep, extensive anthracnose canker that compromises its structural integrity. Irvine, CA.

Figure 9. (Right) Anthracnose cankers on trunks and branches often appear at or near former pruning wounds. Vista, CA.

