

In Praise of the American Smoke Tree

Gary L. Koller and Don O. Shadow

Have you ever wondered why one introduced species within a genus flourishes in the nursery and landscape industry while a native American plant with notable traits remains obscure? An example of this occurs in the genus *Cotinus*. *Cotinus coggygria* Scop., the common smoke tree or smoke-bush, whose native range extends from South Europe to Central China, is frequently seen in residential landscapes here. It is sought after because of its many fine qualities: a long period of midsummer floral and fruit ornamentation, showy plumose fruit panicles (which create the smokelike effect that gives the plant its common name), vivid autumn foliage colors, ease of culture, and longevity (the oldest plants extant at the Arnold Arboretum are 108 years old and healthy). Our native American smoke tree, *C. obovatus* Raf., on the other hand, is rarely seen. It is often missing even in the horticultural literature. Older books on landscaping omit it completely. When it is included, it is described in almost disparaging terms: "the fruiting panicles are not showy — it is useful only for autumn color — where the smaller smoke tree will suffice, the American species can be omitted." Writers always attempt to compare the American species with its Asian relative. We have observed fruit panicles in the wild that are quite showy, though it is fair to say that those on the Arboretum's trees are not. We shall lay

comparison aside here and give our native species the attention it deserves.

Robert A. Vines, in his book *Trees, Shrubs and Woody Vines of the Southwest*, states that *Cotinus obovatus* occurs on "rocky limestone hills of Texas, Oklahoma, Arkansas, Missouri, Alabama, Tennessee and Kentucky. Nowhere very abundant or widespread." Thomas S. Elias, in *Trees of North America*, says that it generally grows in limestone soils of dry, rocky slopes, in mountain canyons, or on high hills. It is found at elevations up to 1000 m. Because it inhabits locations with hot humid summers and relatively mild winters, many assume that it will not thrive under the soil and climatic conditions of northern landscapes. Yet we have found a planting as far north as the Landscape Arboretum at the University of Minnesota. Dr. Harold Pellett, on the staff there, told me that the arboretum had had success with seed of a cultivated plant from the Morton Arboretum in Lisle, Illinois, in 1963. Today, one of the resultant seedlings, which grows in an exposed site, is nearly 5 m tall. It is stem hardy at temperatures above approximately -25°F . The minimum temperature at which the roots are cold hardy has not yet been determined. Information on the original native locale of this plant is unavailable. A more cold-hardy genotype may yet be found.

A second welcome feature of the Amer-



ican smoke tree is its adaptability to various soil conditions. In Tennessee it occurs on south-facing rock outcroppings of limestone, where the pH is 6.5 to 7.0. Very little soil is present on top of the rocks, so the roots must invade the cracks and crevices to anchor the plant and obtain moisture and nutrients. In the same area it also grows in sites with better soil, where it associates with *Juniperus virginiana*, *Rhus aromatica*, *Viburnum prunifolium*, *Cercis canadensis*, and *Quercus prinoides*. At the Arnold Arboretum a 102-year-old specimen flourishes in highly acidic soil near the edge of a meadow. Peter Del Tredici, of the Arnold Arboretum staff, observed the plant thriving in alkaline clay soils in the Chicago area. Excess soil moisture, however, may detract from optimum autumn foliage coloration.

The relatively low stature (8 to 12 m) of this tree makes it suitable for small or crowded landscape sites, where it can serve as an alternative to dogwood, crabapple, and hawthorn.

The fall-foliage colors of this tree are stunning. At the Arnold Arboretum few plants match it in terms of brilliance and intensity. In full sun the colors are scarlet, orange-scarlet, and claret and in shade apricot, gold, and yellow. A. C. Downes acclaimed the plant for its fall colors in 1935 in *The Gardeners' Chronicle*: "seen with the autumn sun shining through its translucent leaves, decked out in all shades of flaming orange and scarlet, it has been a sight not easily forgotten. . . . It is just the translucent quality of its foliage that causes the warm fiery glow that is its great charm. Other

plants can show colors as vivid in themselves (as, for example *Rosa nitida*), but their thicker leaf blades rob them of the wonderful effect. . . ."

Soil moisture and soil nutrition seem to affect autumn brilliance. One writer suggested that when grown on rich soil that is high in nutrients, the resultant lush, soft growth produces poor fall color. A. J. Anderson, in a 1945 issue of *The Gardeners' Chronicle*, said "the most beautifully colored examples I have seen are growing on an exposed, dry bank of poverty stricken soil. A moist, rich medium should definitely be avoided as it always results in vigorous, sappy growth which is detrimental to autumn coloring." Fall weather also seems to affect color brilliance. At the Arnold Arboretum one plant varies from very colorful to dull depending on sunlight and temperatures in early October. In the wild, autumn color varies substantially from one plant to the next.

Emerging spring leaves exhibit colors from soft bronze to purple, which are particularly attractive with backlighting, which exposes the sparse hairiness of the leaf surface. Summer color of fully expanded leaves is a dark green.

The bark of the American smoke tree provides pattern and detail in the winter landscape. Bark plates have bases lifted slightly and pulled away from the stems, creating a fish-scale-like effect. The scale pattern varies among individuals, and the plant could benefit from selection for this characteristic. Plants must reach approximately 20 years of age before the mature bark pattern develops. At this point the plant can be pruned to expose the bark to view. The bark can be an interesting focal point of a winter landscape. The tree can also be planted en masse to

A 102-year-old American smoke tree (*Cotinus obovatus*) at the Arnold Arboretum. Barth Hamberg photo.



create a mini-forest of textured stems.

Cut logs of the American smoke tree match *Juniperus virginiana* in durability and longevity and have been used as fence posts and walking sticks. When the tree is cut for logs or burned over by fire, the stump has the ability to resprout quickly, resulting in multi-stemmed specimens. As a result, most wild plants are multistemmed and not very straight. Color on freshly cut wood samples varies from bright yellow to pale orange. Extract from the wood was an important source of a natural dye, especially during the Civil War period.

Flowers and fruit are borne in large terminal panicles. Attached to the upper end of each panicle are slender stalks clad in fine hair. These create the smokelike effect, which in the wild varies in color (from light brown to fleshy tones and pale purple), size, and density. The sexes occur usually on separate plants but occasionally on a single plant. In the horticultural literature the male plant is reported to be superior for "smoke production." All of these factors suggest that selection could produce a more beautiful tree. Fruiting is said to be sparse in the wild. Seed is often difficult to find, as squirrels gather it before it ripens.

The height of the plant varies considerably, though this may be attributable to environmental conditions. The largest plant documented is a national champion tree at the Deane Hill Country Club in Knoxville, Tennessee. The tree is 13 m high, with a crown spread of 10 m, and a trunk girth of 1.5 m. The oldest and largest plant at the Arnold Arboretum came from seed sent by Charles Mohr of Mobile, Alabama, in 1882. As of February 1984 this plant stands 9 m

The common smoke tree (*Cotinus coggygria*).
Pamela Bruns photo.

Arboretum to Distribute American Smoke Tree to Friends

During spring 1984 the Arnold Arboretum will distribute approximately 3000 plants of *Cotinus obovatus* to Friends of the Arnold Arboretum. The plants were specially grown for the Arboretum at Shadow Nursery, Inc., a wholesale grower in Winchester, Tennessee, near the natural habitat of *Cotinus obovatus*. Don Shadow scouted the area for suitable plants from which to take cuttings and chose several for brilliance of autumn foliage. Stock plants grew as wild invaders beneath the electric power lines, where they had been cut back to prevent their interfering with the wires. Don's staff fertilized these plants in situ and hoped that the power company would not spray the chosen ones with herbicides. It did not, and vigorous succulent growth ensued. This verdant vegetation became the basis for our plants.

tall, with a crown spread of 8 m and 5 stems arising from ground level, of which the largest two are 45 cm in circumference. In poor soils and under harsh environmental conditions in the wild, the plant can be found in spreading thickets free of other species. Such varied growth habits allow great opportunity for the selection of individuals for specific purposes.

Growing the American Smoke Tree

Vegetative propagation is successful in early summer. Cuttings are taken just before the new season's growth begins to harden, and the soft fleshy tip of each cutting is pinched off. They are trimmed to 15 or 20 cm long and dipped quickly in I.B.A. in methanol or treated with Hormodin Number 3. They are then planted outdoors in ground beds covered with plastic tents and protected with 47 percent shade cloth. The cuttings are misted for 15 seconds every 15 minutes. This watering regime is critical, for if mist is maintained too long cuttings rot

and quickly deteriorate. As soon as the cuttings begin to root, mist is reduced and then discontinued, and the plastic removed. The cuttings should be allowed to dry out between waterings. Rooting can take place in as little as 16 days but typically requires 4 to 6 weeks. When cuttings resume growth in early spring, successive crops can be taken for quick stock increase.

By the end of the first growing season, the rooted cuttings are 0.6 m tall. By the end of the second year, after transplanting and pruning, multiple-branched specimens can reach 1 to 1.5 m tall. If the plant is to be grown as a standard, all but the most vigorous branches must be removed.

In autumn plants should be subjected to one or two light frosts and then covered before temperatures reach the low 20s. Water and moisture in winter storage need careful attention as the plants are vulnerable to rotting. Rooted cuttings, as well as larger plants, transplant easily. Both need to be tested for container growing. These trees hold great promise for use in raised and streetside planters, as they thrive in the most harsh environments in the wild.

Seed propagation does not seem to be viable on a commercial scale, for the seed crop is usually unreliable. However, hobbyists and plant breeders should attempt crosses between *Cotinus obovatus* and *C. coggygia* in search of superior garden forms.

Peter Drummer, a propagator at Hillier Nursery in England, has hybridized *Cotinus coggygia* 'Velvet Cloak' with *C. obovatus*. Drummer plans to show superior seedlings at the Royal Horticultural Society show in London, after which the best will be named. The characteristics making Drummer's plants distinct are flowering spikes far superior to those of *C. obovatus*. Some measure 30 cm high and 28 cm wide and are deep

pink in color. According to Drummer, the hybrids seem to root more freely than *C. obovatus*.

At the Arnold Arboretum we have rooted cuttings of one of Drummer's seedlings. The resultant plants exhibit a summer foliage color with a purplish cast and have exceptional vigor. Cuttings taken in May 1983 were 1.5 m tall by September and might have been taller if they had not been pinched at the top to harden stem tissue before winter set in. Drummer states that his seedlings made 1.5 to 1.8 m of growth during the 1983 season. Gardeners can look forward to the continuing development of this fine new line of garden plants.

References

- Bean, W. J. 1980. *Trees and Shrubs Hardy in the British Isles* 8th ed. London: John Murray.
- Correll, D. S., and M. C. Johnston. 1970. *Manual of the Vascular Plants of Texas*. Renner, Texas: Texas Research Foundation.
- Downes, A. C. 1935. "Rhus cotinoides." *The Gardeners' Chronicle*, 98: 350.
- Elias, Thomas S., 1980. *Trees of North America*. New York: Van Nostrand Reinhold.
- Forest Trees of Texas* 1963. Bulletin 20 Texas Forest Service, College Station, Texas.
- Green, G. R. 1934. *Trees of North America*, vol 11 Ann Arbor, Michigan: Edwards Brothers
- Harrar, E. S., and J. G. Harrar. 1946. *Guide to Southern Trees*. New York: McGraw-Hill
- Korn, B., Jr. 1982. "Six New National Champion Trees Found in Tennessee." *Tennessee Nursery Digest*, 4 (5): 10.
- Sargent, C. S. 1905. *Manual of the Trees of North America*. Boston: Houghton Mifflin.
- Small, J. K. 1933. *Manual of the Southeastern Flora*. New York: J. K. Small
- Vines, Robert A. 1960. *Trees, Shrubs and Woody Vines of the Southwest*. Austin, Texas: University of Texas Press
- Wyman, D. 1971. *Shrubs and Vines for American Gardens*. New York: Macmillan.

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