Silver Maple: A Victim of Its Own Adaptability

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Few native American trees have a broader range than *Acer saccharinum*. The species occurs naturally in New Brunswick in northeastern Canada, west through northern Michigan, Wisconsin, and Minnesota, south on a line from southeastern South Dakota to eastern Oklahoma, east to northern Georgia, and back northeast to Maine and New Brunswick—an area covering a third of the continental United States. It is adaptable over the entire country excepting only the lower, subtropical, portion of Florida. It grows most vigorously on the rich, well-drained alluvial soils found along the rivers of the Midwest. In some of the river valleys and floodplains of northern Missouri, eastern Nebraska, Iowa, southern Wisconsin, and Illinois, it is the dominant canopy species. In New York State it is found near swamps in the company of green ash (*Fraxinus pennsylvanica*).

The range of environments that *Acer saccharinum* tolerates gives a clue to its success. It can tolerate longer periods of inundation than most other species; in one instance, mature trees succumbed only after two years of constant inundation. It is usually found in soils with a pH above 4.0 (in cultivation, the recommended range is 4.5 to 7.0), but it tolerates the extreme acidity of muck and peat soils of pH 2.0 to 3.3. This unusual degree of adaptability to different environments—the key to silver maple’s wide distribution—results from its distinctive set of biological attributes.

**Biological Attributes**

*Acer saccharinum* is a fast-growing deciduous tree found on wetland sites, especially along riverbanks and lake edges. It generally reaches fifty to seventy feet in height at maturity with a forty- to fifty-foot spread, but under protected conditions it can achieve much greater size. The national champion silver maple, in Michigan, was 125 feet tall, 22.58 in circumference, with a crown spread of 111 feet in 1975. At 120 feet in height, the Arnold Arboretum’s centenarian, planted in 1881 next to the wet meadow not far from the Arborway entrance, also measures at the species’ upper range in height. Its short trunk, which divides into several large branches to form a rounded crown, is typical of open-grown silver maples. If growing space is more constricted, the species develops a long, straight stem with a thin crown. Young stems and branches are smooth, but older branches and trunks develop a darker gray surface, scaly and shaggy, with long, narrow flakes. Its most common name is derived from the silver-colored underside of its leaves; other names are soft, white, and river maple.

Silver maple manifests several morphological adaptations to wetland conditions. In response to inundation, seedlings put out adventitious roots above the soil surface, in some cases after the original root system has been destroyed by prolonged soil saturation. Abnormally large lenticels are also responses to soil saturation; they are thought to increase oxygen uptake. And the tree’s shallow root systems are a mechanism used by several plants to survive the anaerobic condition that occurs underground during periods of saturation.

The species’ reproductive cycle also illustrates adaptations that contribute to its success. As a genus, maples attain reproductive maturity over a range of ages; in this respect, the silver maple falls near the middle of the group, with a minimum seed-bearing age of eleven years. Seasonally, however, it develops earlier than most maples; together with red maple (*Acer rubrum*) it is the earliest maple to flower and seed, and its seeds germinate immediately in early summer, often sprouting on top of the soil where they fall. Silver maple’s flowers are preceded by thick reddish buds that turn greenish yellow,
At 120 feet in height, the silver maple that grows along Meadow Road is the tallest tree in the Arboretum. Nearly 120 years in age, it has survived the icestorm of 1921, the hurricane of 1938, and the pruning subsequent to those and many other storms.
similar to those of *A. rubrum* but slightly larger. The buds appear before the leaves, in late winter or very early spring, with males and females crowded separately on nearly stalkless clusters. Flowering on each tree is generally completed within a very short period—a day or so—and often the blossoms drop before the leaves fully develop. Therefore, the period of pollen receptivity is typically less than a week.

The ripening period for the winged seeds (technically, *samara*) is likewise very concentrated, with all the seeds being released within less than two weeks. Long-distance dispersal is ensured because the V-shaped samara, attached by a flexible, threadlike stem, can be released from the tree only by a strong wind; after release its mobility is further enhanced by its propeller-like motion. Seeds germinate most successfully when they fall on moist, disturbed soil with leaf litter or other organic matter.

The seedling at first requires full sun to establish itself, followed by partial shade—a pattern well adapted to environments common to silver maple. The tree’s early fruit formation and seed dispersal, together with immediate germination, allow the seedlings to begin growing unhampered by dense canopy and competitive cover; later they take advantage of thickening canopy and groundcover to meet the need for shade. However, while some moisture is essential for germination, seedlings may be stunted if the soil is saturated, in which case a drier soil is needed to allow them to recover. Nature usually fulfills this requirement with the shrinking of streams and rivers in summer and the attendant drying of the banks.

As an abundant producer of early seed crops, silver maple is an important food source for a wide range of birds (grosbeaks, finches, wood ducks, wild turkeys, other game birds) and small mammals (squirrels and chipmunks). Its early buds are also of value to squirrels in late winter when their stored resources are depleted. Even the tree’s bark is used—as food for beavers—and white-tailed deer and rabbits browse its foliage. And because of its propensity to develop trunk cavities, silver maple often shelters breeding birds (woodpeckers, wood ducks, goldeneyes, owls) and nesting mammals (raccoons, opossums, squirrels, and bats).

**Silver Maple in Cultivation**

The very aspects that make *Acer saccharinum* valuable in the uncultivated environment make it problematic in urban and suburban settings.
For example, the ease with which cavities form in its soft wood indicates the species' susceptibility to storm damage, insect predation, and fungal infestation. Its generous scattering of samaras produces uncontrollable litter, and its shallow, hydrophilic root system can wreak havoc with paving and groundcovers, as well as choke sewer lines and water mains.

Michael Dirr's description of Acer saccharinum reflects these problems: "Broken limbs, limited ornamental attributes, and a gross-feeding root system that buckles sidewalks and clogs drains have inhibited its planting. The fastest growing maple species, it is at the same time the most susceptible to breakage in storms." However, he goes on to conclude that it is "[a] reasonable choice where few other species will grow or where there is need for a truly fast-growing shade tree."

An assessment by Donald Culross Peattie thirty years earlier, in A Natural History of Trees of Eastern and Central North America, differs greatly. Peattie's description of silver maple verges on the exultant. Unlike Dirr, he sees in it not a battered tree of "limited ornamental attributes," but one that can make "a railroad station look like a home, and [adds] a century to the appearance of a village street." For Peattie, Acer saccharinum is "a magnificent Maple with short columnar trunk and long branches which, at least in the lower half of the tree, sweep grandly down toward the ground and rise again near the tip in a gesture of airy grace. In the upper tree the branches are apt to be ascending, so that the outline . . . is somewhat pagoda-like." It is "wraith-like" in winter with a "fine, flaky, gray bark . . . almost silvery"; its fruits in spring are "dragonflies' wings"; it is in "full beauty" in summer, when "every breath of wind is sure to set the foliage to spinning," or in storms, when it is "whipped into continuous whitecaps, a threshing and seething and flashing . . . silver." In the autumn, "it turns . . . a pale clear yellow" while retaining its silver undersurface, so that "the greenback leaf of yesterday becomes a banknote."

Peattie attributes the supposed flaws of Acer saccharinum to overly pragmatic landscape architects who complain of its susceptibility to insect pests, ice and wind damage, and its comparatively short life—complaints to which he responds, "It may be that we should always listen to cautious and sensible people, and not allow ourselves to think too highly of a tree that will perhaps only live three times as long as we do."

Clearly Peattie's arguments, unlike Dirr's, are based on aesthetics rather than practicality. However, both writers limit their discussions to Acer saccharinum as they have seen it in cultivation. Indeed, most opinions of the species have been based on its behavior in situations where it would not naturally occur. Just because a plant is adaptable enough to grow on a certain site does not mean it should be planted there; and inappropriate siting appears to be a major source of silver maple's present poor reputation.

A review of the literature shows that over the course of this century, the use of Acer saccharinum in cultivated landscapes, particularly as a street tree, has been viewed with increasing disapproval by "experts," including those of the U.S. Department of Agriculture's Department of Forestry. The species continued to be popular in both public and private landscape designs until well into the twentieth century—one of this century's most celebrated landscape designers, Beatrix Farrand, considered it "the most graceful American hardwood, far surpassing any other tree." Nonetheless, in theory if not in practice, a slow shift in attitude can be detected at the turn of the century.
A silver maple is at left in this lush planting by Beatrix Farrand at Dumbarton Oaks in Washington, DC.

The increasing negativity contrasts sharply with the literature of the preceding decades. A. J. Downing in his influential and multi-editioned *Treatise on the Theory and Practice of Landscape Gardening* (1841) not only included *Acer eriocarpum* (as silver maple was then known) among “the finest hardy Deciduous Trees,” he approvingly quoted François André Michaux:

> In no part of the United States is it more multiplied than in the western country, and nowhere is its vegetation more luxuriant than on the banks of the Ohio. There, sometimes alone and sometimes mingled with the willow, which is found along these waters, it contributes singularly by its magnificent foliage to the embellishment of the scene. The brilliant white of the leaves beneath, forms a striking contrast with the bright green above, and the alternate reflection of the two surfaces in the water, heightening the beauty of this wonderful moving mirror, aids in forming an enchanting picture, which, during my long excursions in a canoe in these regions of solitude and silence, I contemplated with unwearied admiration.

—The North American Sylva, 1817

Thirty years later, in his 1870 *The Art of Beautifying Suburban Home Grounds*, Frank J. Scott, an influential authority on landscapes for suburban estates who counted himself among the disciples of Downing, wrote:

> There ought to be but one variety of street tree on the same block, at least, and the longer the continuity is kept up the nobler will be the effect. . . . For wide avenues [where alone such great spreading trees as the elm, sycamore, silver maple, and silver poplar should be planted] . . . thirty feet is the least distance that any street trees should be planted from each other.”
E. H. Wilson photographed this picturesque silver maple in the valley of the Connecticut River, Massachusetts, April 1925.
But what Scott gave with his right hand, he took away with his left:

This native maple, so common on the banks of western streams, has become, perhaps, too great a favorite for street planting.

He found it wanting in comparison with the sugar maple; furthermore:

The head of the silver maple does not break into good masses of light and shade until it is old, and in the mean time the projection of its numerous spreading branches scatter the light on a great number of small points, and develop no broad, deep, or well-defined shadows.

But the author of the 1897 Lawns and Gardens: How to Plant and Beautify the Home Lot, the Pleasure Ground and Garden was not at all ambivalent; he nominated silver maple "the most useful and ornamental of our deciduous trees." In 1905, with The Tree Book, the potential shortcomings of silver maple begin to dominate the literature:

The silver maple is a tree to count upon. . . . It is a lazy man's tree, for it comes vigorously from seeds, and bears transplanting, even when there are radical changes in soil and in climate to be met. It is a rapid grower, soon giving ample shade. But rapid growth implies brittle, weak wood, as a rule. Slow-growing trees like elms should always be alternated with soft maples, to replace them after their brief race is run.

In 1920, serious concerns were being raised by no less an authority than the U.S. Department of Agriculture. In that year, its publication on street trees included three objections to the use of silver maple:

The first is its brittle wood, which at an early age is easily broken by ordinary windstorms and causes it when a comparatively young tree to become unsightly. The second is its shallow rooting, which has a tendency to destroy pavements and also makes it difficult to grow grass near the trees. The roots also will grow into sewers. The third is a tendency to decay, the tips of

the limbs frequently die, leaving the whole top of the tree bare of leaves and the wood decays quickly, especially if the bark is broken. For this reason, it does not stand pruning as well as most other street trees, and it probably has been pruned more ruthlessly than any other tree, unless it is the Carolina Poplar.

These recommendations were seconded in 1922 by the president of the American Tree Association.

By the mid-1930s proponents of the species had to concede that "... [the] Silver Maple has fallen into disfavor for planting purposes, yet it still remains the most frequently met and best known of the maples." In 1939, Cleveland municipal authorities noted with some exasperation that although the disadvantages of the species were well known, *Acer saccharinum* continued to be the most frequently used street tree:

... [its] only virtue seems to be that it is hardy in a city environment and is a fast grower. For the latter reason especially, and because it is cheap, it is the usual species chosen by the allotment operator for planting new streets, and outlying sections of the city are only too apt to carry on their newly developed tree-lawns a full quota of silver maples.

In that same year the Massachusetts Forest and Park Association simply omitted *A. saccharinum* from its lists of recommended trees. By the 1940s the omission from municipal plant lists was commonplace, and in some cases it appeared on lists of undesirable trees.

The major reason for silver maple's fall from nineteenth-century grace into twentieth-century ill repute appears to be its indiscriminate use as a street tree. Scott's recommendation in 1870 was predicated on a generous spatial allotment, and his image of a broad avenue with gracefully sweeping tree branches predated the now-ubiquitous powerline. The conflict between *Acer saccharinum* on the one hand and modern streets with their powerlines and confined planting spaces on the other was one that the tree could not win, since the pruning required to accommodate these new conditions would supposedly exacerbate its "weak wood" problem. Ironically, the very ability of silver maple to tolerate a wide range of soil and

Alfred Rehder photographed this silver maple in Jamaica Plain, Massachusetts in summer 1900 and again in winter 1904
moisture conditions, together with its fast growth, contributed to overexuberant use of the species in situations ill suited to its other biological characteristics.

Interestingly, the British, who now use *Acer saccharinum* primarily as a specimen tree, have always been and are still enamoured of it. “The Silver-leaf Maple (*Acer dasycarpum*) is one of the most graceful of trees,” the eminent British horticulturist William Robinson wrote in 1907. “[In] early spring it is covered with myriads of reddish flowers; then its leaves, green above, silvery-white below, turn in autumn to a varied colour.” On a current British website, silver maple is described as “by far the most successful of the eastern American Maples...it forms a bushy crown of attractive green leaves each spring, which seem to resist attack by insects better than other nearby trees.” This characteristic may in fact be a clue to the most appropriate use of *A. saccharinum* in the cultivated landscape. Rather than relegate it to sites of “rugged conditions,” as Dirr suggests, perhaps it should be positioned where it can grow and spread, protected from strong winds—the charmed circumstance of much of the British Isles.

The recent development of several cultivars may also encourage a reevaluation of the species. The most widely available is ‘Silver Queen’, which is nonseeding. Others—‘Pyramidale’ is one—possess a strong central leader for structural soundness. As Peattie says of it, they “impart to every streambank where they grow, to every big red Hoosier barn and little white house, to all the village streets and the long straight roads where they have been planted, an air at once of dignity and lively grace, a combination rare in a tree as in a human.” And what can Dirr say to that?

**Bibliography**


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