***Acer spicatum* Lam.** mountain maple
ACERACEAE

Synonyms: none

General Description[1]**.—**Mountain maple is a tall, deciduous shrub or clumped small tree that grows 3 to 10 m tall and can spread to form dense thickets (Dirr 1998; Gleason and Cronquist 1991; van Gelderen and others 1994). In the northern part of its native range mountain maple reaches a maximum height of 6 m (Sullivan 1993). Leaves are opposite, simple, three-lobed or obscurely five-lobed, coarsely and irregularly serrate, dark yellowish-green, glabrous with impressed veins (adaxial), lighter green and pubescent (abaxial), truncate to cordate at the base, and 5 to 13 cm long and wide (Dirr 1998; Gleason and Cronquist 1991; van Gelderen and others 1994). The leaves turn yellow, orange, or most frequently brilliant red in the fall. Stems are grayish pubescent when young, developing a purplish-red color on the upper surface. Leaf scars are narrowly crescent shaped (Dirr 1998). Buds are approximately 0.6 cm long, stalked, pointed, red with minute, appressed, grayish hairs, and with two to four valvate scales (Dirr 1998; Gleason and Cronquist 1991). The flowers are small, greenish yellow, in fascicles of two to four, borne in erect 3 to 8 cm long panicles. Each flower is functionally either pistillate or staminate, although the non-functioning structures still exist in the flower, reduced to a greater or lesser extent. Staminate flowers drop soon after the pollen is shed (De Jong 1976). Each flower is borne on a slender stalk about 1.3 cm long and the panicles are found at the branchlet tips. The bark is thin, brown to reddish-brown, smooth, becoming furrowed or warty with age (Dirr 1998). The fruit is a 2.5 cm long, two-winged samara, bright red when mature, with divergent wings at an acute or right angle. The chromosome number of mountain maple is 2n = 26 (Gleason and Cronquist 1991).

[1]Illustration from: USDA Forest Service Collection, Hunt Institute for Botanical Documentation, Carnegie Mellon University, Pittsburgh, PA. Accession number: 6725.0495.

Range.—Mountain maple occurs from Newfoundland to Saskatchewan, south to Connecticut, Pennsylvania, Ohio, and northeastern Iowa, and in the mountains to North Carolina and Tennessee (Gleason and Cronquist 1991).

Ecology.—Mountain maple prefers rich, moist, acid, well-drained soils with low, diffuse light (Dirr 1998; Sullivan 1993). These sites include cool woods with humid climate and year-round precipitation, rocky slopes and flats, along streams, in ravines, and on moist hillsides. Mountain maple also grows well on podzol soils, talus slopes, and in forested bogs (Sullivan 1993). Mountain maple can form a canopy on cliff faces. Mountain maple is an understory or subcanopy shrub that is tolerant of deep shade, but also grows well in full sun, has medium moisture and fertility requirements, and colonizes the understory as pioneer tree species decline (Sullivan 1993; USDA, NRCS 2002). Mountain maple is not salt tolerant, and has low drought tolerance. Release of mountain maple by canopy tree harvest allows the shrub to dominate the site within 5 to 10 years, suppressing the growth of spruce and fir seedlings for at least 35 years (Sullivan 1993). In undisturbed, mature red pine-white pine sites in northeastern Minnesota, mountain maple forms a dense, high shrub layer with beaked hazel and American hazel that inhibits reproduction of later successional species, such as balsam fir and spruce (Sullivan 1993). Eradication of mountain maple is sometimes necessary for tree regeneration. The weevil, *Phyllobius oblongus* L., is especially damaging to mountain maple (Johnson and Lyon 1991). The larvae feed on the roots, mature, and overwinter in the soil. Adults are brown weevils that defoliate mountain maple. They are found throughout the northeast into Michigan and the border provinces of Canada (Johnson and Lyon 1991). *Kabatiella apocrypta* (Ell. et Ev.) v. Arx (anthracnose pathogen) causes minor damage to mountain maple, although severe infections can led to

premature defoliation (Sinclair and others 1987). Mountain maple is also susceptible to attack by *Verticillium dahilae* Kleb. (verticillium wilt), *Phyllactinia guttata* (Wallr.:Fr.) Lev. (powdery mildew), *Nectria* sp. (nectria canker), *Cristulariella depraedens* (Cooke) Hohn. (leaf spot/blight), *Pseudomonas syringae* pv. *syringae* van Hall (bacterial leaf spot and dieback), *Phyllosticta minima* (Berk. and M.A.Curtis) Underw. and Earle (leaf spot), *Rhytisma* sp. (tar spots), and *Venturia acerina* Plakidas ex Barr (leaf blotch) (Farr and others 1989; Jones and Benson 2001; Sinclair and others 1987).

Reproduction.—Mountain maple staminate flowers and pistillate flowers occur on the same plant. Some individuals may flower completely with staminate flowers. Mountain maple is predominately duodichogamous (producing flowers in three consecutive phases, male-female-male, during anthesis), with a small part of the population protogynous (stigma receptive before the pollen is shed) (van Gelderen and others 1994). Low temperatures appear to favor development of female flowers and flowers with less reduction of the non-functioning parts. (van Gelderen and others 1994). The shrub blossoms in May to June after the leaves are fully developed; fruit ripens in September to October, with seed dispersal in October to December (Zasada and Strong 2000). Mountain maple is insect pollinated (Sullivan 1983) and the seed is wind disseminated. Seeds of mountain maple need to be stratified for 90 to 120 days at 5 ºC for good germination (Dirr 1998). Mountain maple does not build up a seed-bank and seedling establishment is better on undisturbed soils (Sullivan 1993). Seedling reproduction of mountain maple does not result in dense, competitive stands, as can be the case with its vegetative reproduction. Mountain maples frequently layer, giving them the potential to develop relatively complex clones of varying size and morphology (Zasada and Strong 2000). Mountain maple can reproduce by sprouting from underground lateral stems, rarely from root suckers, and colonies usually develop following disturbances by browsing or cutting (Sullivan 1993). Propagation of mountain maple by cuttings taken early in the summer produces strong plants (van Gelderen and others 1994).

Growth and Management.—Mountain maple is a slow to medium growing shrub or small, short (crooked) trunked tree of bushy appearance (Dirr 1998). It is hardy in zones three to seven at high elevations (USDA Plant Hardiness), and starts to decline at 40 to 50 years of age (Sullivan 1993). Mountain maple is girdled at the root collar by low, surface fires, and can re-sprout from underground stems (Sullivan 1993). A severe, hot fire is necessary in order to kill the roots. Mountain maple can withstand repeated and heavy browsing, producing new growth even when 80 percent of the annual twig growth is removed each year (Sullivan 1993). Mountain maple is an understory or subcanopy component in a number of northeastern forest associations (Sullivan 1993). Cutting mountain maple near the ground level, clear-cutting, and spraying with 2,4-D in the spring will increase the availability of new growth for deer and moose browse (Sullivan 1993). Burning can be used to suppress mountain maple in order to promote reproduction of other, more desirable tree species.

Benefits.—Mountain maple is a nutritious browse species for moose, white-tailed deer, cottontails, snowshoe hares, woodland caribou, beavers, and ruffed grouse (Sullivan 1993). Mountain maple is sometimes planted as an ornamental, but has little landscape value excluding its brief fall color display and colorful samaras.

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