***Rhus glabra* L.** smooth sumac
ANACARDIACEAE

Synonyms: *Rhus borealis* Greene
Rhus calophylla Greene
Rhus canadensis Mill.
Rhus carolineana Mill.
Rhus cismontane Greene
Rhus occidentalis (Torr.) Blank. (additional synonyms: Institute of Systematic Botany 2003).

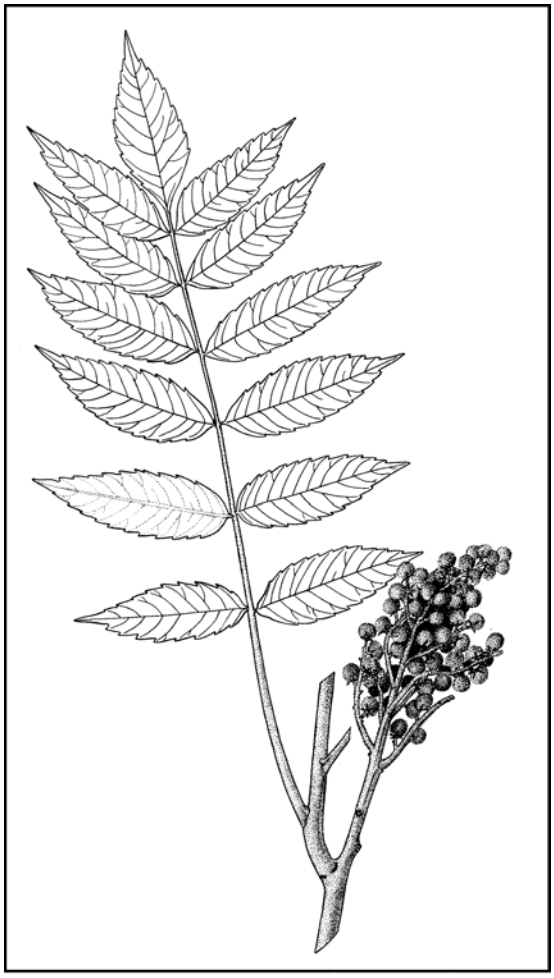

Illustration source: USDA-Forest Service collection, Hunt Institute

General Description.—Smooth sumac, also known as common sumac, Rocky Mountain sumac, red sumac, scarlet sumac, lemonade sumac, western sumac, and white sumac, is a deciduous shrub or a small tree from 0.5 to 6 m in height and 1 to 18 cm in stem diameter. It usually has a single gray-brown stem but often occurs in clonal thickets formed by suckers from horizontal roots. The relatively few branches and twigs are thick, have a soft pith, and large, horseshoe-shaped leaf scars. Stems and branches ooze a milky-resinous sap when cut. The alternate leaves are uneven, pinnately compound, up to 46 cm long, and support seven to 29 leaflets. Leaflets are almost stalkless and have serrate edges. (Clark 1973). The foliage turns a brilliant red or scarlet during the fall. Small, greenish-yellow flowers are grouped in tight, 15- to 25-cm terminal panicles. The fruits are dry, hairy, red to scarlet drupes that contain one hard ovoid, dark-gray nutlet. The fruits have a tangy, sour taste (Johnson 1995). Smooth sumac is dioecious (male and female plants) (Wyman 1969). Total above-ground dry biomass may be predicted by the equation: dry weight = 1.5130 + 0.6292 D^2H, where D = diameter at 1 cm above groundline, H = total height and r^2 = 0.974 (Reeves and Lenhart 1988).

Range.—Smooth sumac is native to every state of the United States (except Alaska and Hawaii) and from Nova Scotia to British Colombia and south into northern Mexico (Abrams 1951, Fire Sciences Laboratory 2003, Natural Resources Conservation Service 2003). However, it is most common in the eastern half of United States north of Florida (Hutchison 2003). It has been planted widely as an ornamental but has not been reported to have naturalized outside its native range.

Ecology.—Smooth sumac prefers rich, well-drained soil but will grow on excessively drained, sandy soils and eroded sites without topsoil. In much of the Eastern range, it grows as a seral species on disturbed sites such as logged areas, abandoned fields, neglected pastures, old construction sites, strip mines, stream overflow areas, roadsides, and fence rows (Hutchison 2003). In Western areas it grows in stable communities on mountains, hillsides, and canyons. The species is used as a climax indicator in a number of shrub-

grassland communities (Fire Sciences Laboratory 2003). Smooth sumac usually grows with full sun but tolerates partial shade. It grows from low elevations in many areas and up to 2,100 m in Arizona (Kearney and Peebles 1951).

Reproduction.—Smooth sumac flowers from May to late July, depending on location. Fruits ripen in September and October and persist through the fall and winter (Fire Sciences Laboratory 2003). The flowers are pollinated by bees (Rowe and Blazich 2003). Smooth sumac produces at least some fruits and seeds nearly every year (Fire Sciences Laboratory 2003). There are about 2,000 seeds per well-formed panicle (Browse-Shrub and Forb Committee 1985), much less in some areas and during dry years. Rowe and Blazich (2003) report 50,600 to 105,600 fruits/kg and 52,800 to 277,200 seeds/kg. Plummer and others (1968) found 137,700 seeds/kg in samples from Utah. Air-dried fruits collected by the author in Utah averaged 0.0202 $\pm$ 0.0004 g/fruit. Seeds separated from them averaged 0.0103 $\pm$ 0.0002 g/seed or 97,000 seeds/kg. The seeds are dispersed principally by birds and form a soil seed bank (Fire Sciences Laboratory 2003). Once individual plants are established, horizontal roots sucker to form clonal thickets.

Nursery plants are usually produced from seed, although production from cuttings is also done to preserve favorable traits of select strains (such as assuring only female plants). Rootstalks pulled up from wild stands in the early spring when the ground is wet will survive almost 100 percent if planted properly (Plummer and others 1968). Seed can be collected in quantity by hand in fall or early winter. Seeds may be separated from the fruits by rubbing or beating followed by screening (Rowe and Blazich 2003) and can be stored for as long as 5 years without loss of viability (Fire Sciences Laboratory 2003). Scarification to break physical (endocarp) dormancy may be done by a 3 to 4 hr soak in concentrated sulfuric acid (Rowe and Blazich 2003) or emersion for less than 1 min. in boiling water (Li and others 1999).

Growth and Management.—Smooth sumac has a moderate growth rate of 30 to 46 cm in height per year (Michigan State University Extension 1999). Although clones may last much longer, individual stems are not long-lived, perhaps 2 to 10 years. It requires more than ordinary maintenance to keep smooth sumac from spreading vegetatively. One method of keeping plants in check is to establish them in soil space limited by rock or concrete barriers (Clark 1973). The tops are killed by fires, but underground rhizomes (7.5 to 30 cm deep) are not damaged and sprout vigorously, increasing the density and extent of smooth sumac stands. Seeds from the soil seed bank are also stimulated to germinate. Spring fires are more beneficial than late summer fires (Fire Sciences Laboratory 2003). When it is necessary to control the plant, it is recommended that they be lopped during or shortly after flowering and the sprouts spot-sprayed with glyphosate (Hutchison 2003).

Benefits and Detriments.—Smooth sumac helps protect the soil in disturbed areas, adds to the aesthetics of wildlands, and furnishes food and cover for wildlife. The fruits are eaten by a wide variety of birds (Johnson 1995). Smooth sumac foriage is rated poor in both energy and protein value (Fire Sciences Laboratory 2003). White tail deer (*Odocoileus virginianus*) browse it during fall and winter but do not weaken the plants (Strauss 1991). It is also browsed by mule deer (*Odocoileus hemionus*) (Fire Sciences Laboratory 2003). Smooth sumac is valued as an ornamental for its brilliant red and scarlet fall colors and because it can be planted almost anywhere in the Continental United States. It is particularly useful for vegetating sandy banks and for low screens (Clark 1973) and has been recommended for establishing "living snow fences." The species has been planted to revegetate roadsides and cuts, landfills, and strip mines (Fire Sciences Laboratory 2003, Plummer and others 1968). In addition to using dried leaves as an adulterant for tobacco and making drinks from the fruits, Native Americans employed smooth sumac to treat a large number of ailments, particularly mouth and throat sores, burns, to control diarrhea, and to promote urination (Fire Sciences Laboratory 2003, Giese 1996, Moerman 1986). Basis for medicinal uses may be found in the fact that methanol extracts of ground branches were effective (although not as effective as commercial antibiotics) against total of 11 species of bacteria. The antibacterial compounds were identified as methyl gallic acid, gallic acid, and the methyl ester of 3,4,5-trihydroxybenzoic acid (Saxena and others 1994). Some people develop allergic dermatitis after contacting the sap, but the species is not as dangerous as many other *Rhus* species (Clark 1973). Thickets of smooth sumac can prevent the development of tree seedlings through shade and root competition and arrest succession (Putz and Canham 1992).

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