GarryaceaeCGarrya family

Garrya Dougl. ex Lindl.

silktassel

Wayne D. Shepperd

Dr. Shepperd is a research silviculturist at the USDA Forest Service=s Rocky Mountain Research Station, Fort Collins, Colorado.

Growth habit and occurrence. The genus *Garrya*Csilktassel*C*consists of 14 New World species ranging from the Pacific Northwest to Panama (Dahling 1978). Only those in the United States and Mexico are considered here. *Garrya* is a highland genus occurring in chaparral and coniferous forests above lowland deserts, in semiarid regions, or in coastal or near-coastal conditions, and may vary in size from low shrubs to trees (table 1). First discovered by David Douglas in the Pacific Northwest in 1826, *Garrya* was named in honor of Nicholas Garry, the first secretary of the Hudson Bay Company (Dahling 1978). Alternatively classified in *Garryaceae* and *Cornaceae* by various taxonomists, *Garryaceae* will be used here, after Dahling (1978) and Kartesz (1994).

Use. Wavyleaf and canyon silktassels and bearbrush are planted as ornamentals in many areas of the world (Dahling 1978). The graceful catkins and stately shape of these species make them desirable landscape shrubs. Introduced into cultivation between 1842 and 1902, silktassels have also been used for erosion control (Rehder 1940; Reynolds and Alexander 1974). Native plants are browsed by domestic livestock, deer, and bighorn sheep (*Ovis canadensis*) (Reynolds and Alexander 1974). Wavyleaf silktasssel will tolerate arid conditions, low fertility, sandy soils, and a wide range of pH values (Ridgeway 1973).

Although known to be toxic, stem extracts of *G. laurifolia* Benth. are used as an antidiarrhetic throughout rural Mexico, and bark extracts were reportedly used by Native Americans to treat fever (Dahling 1978). Ashy silktassel was used as a laxative and to treat colds, stomach aches, and gonorrhea by Kawaiisu Indians (Moerman 1986). Whole-plant extracts of ashyleaf and wavyleaf silktassel plants native to Arizona have been found to contain gutta-percha, a natural rubber. This is the first reported occurrence in *Garryaceae* (Roth and others 1985).

Flowering and fruiting. Flowers are dioecious. Both appear in axillary or terminal catkinlike racemes in the spring (Reynolds and Alexander 1974); however male flowers are minute (Dahling 1978). Silktassels are well adapted for wind pollination. Several species hybridize, most notably bearbrush with ashy silktassel and eggleaf silktassel with *G. laurifolia* (Dahling 1978; Mulligan and Nelson 1980).

Silktassel fruits are persistent, 2-sided berries that appear green and fleshy when young but become dry and brittle at maturity (Dahling 1978) (figures 1B3). The fruit is globose to ovoid and relatively uniform among the species included here, averaging 7.2 mm long by 6.2 mm wide and producing from 1, 2, or (rarely) 3 seeds that are 2 to 3 mm in diameter (Dahling 1978).

Collection of fruits. Ripe fruits may be gathered by stripping them from the branches onto canvas, or hand-picking them from the bushes. Because the fruits may be infested with insect

larvae, care must be taken to collect only sound fruits (Reynolds and Alexander 1974).

Extraction and storage of seed. After twigs, leaves, and other debris have been sifted out, fruits are run through a macerator and the pulp and empty seeds floated off or screened out. Seeds may also be extracted by rubbing the fruits over a fine-mesh screen and floating off the pulp and empty seeds in water (Reynolds and Alexander 1974). Fifty kilograms (110 lb) of dry bearbrush berries yield about 25 kg (55 lb) of cleaned seeds. Cleaned seed densities range from 37,500 to 72,800 seeds/kg (17,000 to 33,000/lb). About 85 to 99% of the seeds will normally be sound (Reynolds and Alexander 1974). Storage methods suitable for most shrub species should also apply to silktassel seeds.

Pregermination treatments. Seeds of ashy silktassel and bearbrush will not germinate without pretreatment because of embryo dormancy (Mirov and Kraebel 1937; Reynolds and Alexander 1974). Some seeds of Wright silktassel exhibit embryo dormancy, whereas others germinate well without pretreatment (Reynolds and Alexander 1974). Because of this variability, seeds of Wright silktassel should also be pretreated before testing or sowing. Recommended pretreatments for these species include stratification at 2 to 5 °C in moist sand, vermiculite, or sphagnum moss for 30 to 120 days (Reynolds and Alexander 1974; Mirov and Kraebel 1937), followed by soaking for 17 hours at room temperature in a 100-ppm solution of gibberellin. However, germination of bearbrush was also improved by stratification in moist sand for 90 days at greenhouse temperatures followed by 90 days at 5 °C (Reynolds and Alexander 1974).

Germination tests. Germination tests have been done on pretreated seeds placed in sand, vermiculite, Kimpak J , and sphagnum moss under light for 30 to 60 days, and at temperatures alternating diurnally from 25 to 13 °C, or from 30 to 20 °C (Reynolds and Alexander 1974). Seeds of Wright silktassel had germination capacities of 47 to 86%. Seeds of ashy silktassel germinated best at temperatures between 10 to 15 °C, but poor at 23 to 27 °C. Low-temperature stratification alone does not always result in satisfactory germination of bearbrush (Reynolds and Alexander 1974).

Nursery practice. Seeds of Wright silktassel should be sown in the late winter after 90 days of stratification in moist sand. Sufficient viable seeds should be sown to produce about 100 seedlings/m^2 (9 seedlings/ft^2). They should be covered with about 1.2 cm (2 in) of soil and a light mat mulch. Seedlings are ready for outplanting at age 2 years (Reynolds and Alexander 1974).

Silktassels can also be vegetatively propagated in the nursery. Tip nodal cuttings of wavyleaf silktassel 8 to 18 cm (3 to 4 in) long that were collected in late summer through November, then basally treated with 0.8% indole butyric acid (IBA) and bottom-heated at 20 to 21 °C, successfully rooted within 6 to 8 weeks (Ridgeway 1973). The growth medium should be well drained and only misted during the day. Silktassels are sensitive to root disturbance when actively growing, so dormant potting is recommended (Ridgeway 1973); however, they will not tolerate high fertility in the potting compost. It is difficult to achieve economic rooting percentages unless selection of cutting material, and porosity and hygiene of the rooting medium are carefully controlled (Ridgeway 1985).

References

Dahling GV. 1978. Systematics and evolution of *Garrya*. Contributions from the Gray Herbarium of Harvard University 209: 1B104.

Kartesz JT. 1994. A synonymized checklist of the vascular flora of the United States, Canada, and

Greenland. 2nd ed. Portland, OR: Timber Press. 813 p.
Moerman DE. 1986. Medicinal plants of native America. Ann Arbor: University of Michigan, Museum of Anthropology. 910 p.
Mirov NT, Kraebel CJ. 1937. Collecting and propagating seeds of California wild plants. Res. Note 18. Berkeley, CA: USDA Forest Service, Pacific Southwest Forest and Range Experiment Station. 27 p.
Mulligan BO, Nelson EC. 1980. *Garrya* × *issaquahensis* Nelson (*G. elliptica* Lindl. × *G. fremontii* Torr.) in cultivation in western USA and Ireland. UW Arboretum Bulletin 43(3): 10B15.
Rehder A. 1940. Manual of cultivated trees and shrubs. 2nd ed. New York: Macmillan. 996 p.
Reynolds HG, Alexander RR. 1974. *Garrya,* silktassel. In: Schopmeyer CS, tech. coord. Seeds of woody plants in the United States. Agric. Handbk. 450. Washington, DC: USDA Forest Service: 420B421.
Ridgeway D. 1973. Production of *Garrya elliptica*. Combined Proceedings of the International Plant Propagators' Society 23: 177B180.
Ridgeway D. 1985. Propagation and production of *Garrya elliptica*. Combined Proceedings of the International Plant Propagators' Society 34: 261B265.
Roth WB, Carr ME, Davis EA, Bagby MO. 1985. New sources of gutta-percha in *Garrya flavescens* and *G. wrightii*. Phytochemistry 24(1): 183B184.

Figure 1—*Garrya fremontii,* bearbrush: berry (A) and seed (B).

Figure 2—*Garrya wrightii,* Wright silktassel: berry and seed.

Figure 3—*Garrya fremontii,* bearbrush: longitudinal section through a seed.

Table 1C *Garrya,* silktassel: occurrence, elevational range, and growth form

Species	Common name	Occurrence	Elevation (m)	Growth form
***G. buxifolia* Gray**	**dwarf silktassel**	N California, S Oregon chaparral, associated with pine at higher elevations	60B2,133	Brushy shrub
***G. elliptica* Dougl. ex Lindl.**	**wavyleaf silktassel**	Central Oregon to Santa Cruz Island, California; coastal & higher elevations inland	3B840	Shrub < 6 m
***G. flavescens* S. Wats.**	**ashy silktassel**	Pacific Coast states, SW US, Baja California; canyons, deserts, mtns	450B2,740	Shrub < 6 m
***G. fremontii* Torr.**	**bearbrush**	S Washington to central California; Sierra Nevada & Cascades	150B2,740	Shrub
***G. glaberrima* Wangerin**	C	Scattered locations in mtns of Coahuila, Neuvo Leon, & Tamaulipas; between lowland deserts & highland conifer forests	1,487B2,740	Small tree
***G. grisea* Wiggins**	C	Baja California; upper Sonoran & transition communities	1,370-2,423	Shrub 2B4.6 m
***G. laurifolia* Benth.**	C	Central Mexico to Central America; semiarid shrub communities	610B3,566	Tree < 11 m
***G. longifolia* Rose**	C	S Mexico on volcanic slopes	1,280B2,650	Small tree
***G. ovata* Benth.**	**eggleaf silktassel**	Arizona, New Mexico, Texas, N Mexico; mtns above lowland deserts	610B2,560	Clumped shrub 2B4.6 m
***G. salicifolia* Eastwood**	C	S Baja California; sandy loam soils	1,554B1,830	Small tree
***G. veatchii* Kellog**	**canyon silktassel**	S California, Baja California; lower mtn chaparral & riparian communities	230B2,600	Shrub
***G. wrightii* Torr.**	**Wright silktassel**	Arizona, W Texas, N Mexico; arid Sonoran & transition communities	914B2,133	Shrub

Source: Dahling (1978).