

Fabaceae—Pea family

Laburnum Medik.

laburnum

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Growth habit, occurrence, and use. The genus *Laburnum* includes 4 species of deciduous trees and shrubs native to central and southern Europe (Krüssmann 1984; LHBH 1976; Scheller 1974). *Laburnum* species have been cultivated for centuries, primarily for ornamental purposes. *Laburnum* arches and walks are a popular feature in many large gardens (Wasson 2001). The species is adaptable to many soil types, including limestone, but prefers well-drained soil and light shade (Dirr 1990; Krüssmann 1984; Rudolf 1974). All parts of the plant, particularly the seeds, are poisonous (Krüssmann 1984; LHBH 1976). Seeds and other parts of the plant contain the alkaloid cytisine, which can be fatal to humans and animals (Dirr 1990; Greinwald and others 1990; Leyland 1981). The 2 species and a hybrid of interest are described in table 1.

Scotch laburnum is a small tree with a short, sturdy trunk and flat to round-topped crown; it is considered to be the superior garden species (Dirr 1990). Common laburnum tends to be a low branched, bushy, wide-spreading tree (Dirr 1990; LHBH 1976). Waterer laburnum, a natural hybrid between Scotch and common laburnums, is a distinctly upright, oval to round-headed small tree or shrub (Dirr 1990). The foremost laburnum in cultivation today is Waterer laburnum 'Vossii', a superior tree with dense habit,

racemes up to 60 cm in length, and a tolerance of alkaline soils (Dirr 1990; Krüssmann 1984).

Flowering and fruiting. The perfect, ornate, golden yellow flowers are 1.9 cm long and are borne on 15- to 25-cm pendulous racemes; Scotch laburnum has racemes that are 25 to 38 cm (Dirr 1990). Flowers bloom from May to June, and the flowers of Scotch laburnum and Waterer laburnum 'Vossii' are fragrant (Hillier 1991; Krüssmann 1984). The fruit is a brown legume (pod), 5.1 to 7.6 cm long, with black seeds (figures 1 and 2) (Rudolf 1974). The legume of Scotch laburnum is winged, forming a knifelike edge (Dirr 1990). The seeds are tardily dehiscent, ripening from late August to October (Rudolf 1974). Each legume contains several black seeds (only 1 or 2 for Waterer laburnum 'Vossii'), and good seedcrops are borne annually (Krüssmann 1984; Rudolf 1974).

Collection of fruits; extraction, cleaning, and storage of seeds. Legumes should be harvested from the trees beginning in September through November and spread out on flats in a shed or loft with good air circulation to dry (Macdonald 1986; Rudolf 1974). Newspaper should be placed over the legumes to prevent the seeds from being ejected away from the flats. Seeds are extracted by breaking the legumes by hand or by machine threshing (Macdonald

Table 1—*Laburnum*, laburnum: nomenclature, occurrence, growth habit, height at maturity, and date of first cultivation

Scientific name & synonym(s)	Common name(s)	Occurrence	Growth habit	Height at maturity (m)	Year first cultivated
<i>Laburnum alpinum</i> (Mill.) J. Presl.	Scotch laburnum, alpine goldenchain	S Alps, N Apennines, NW Yugoslavia, S	Tree	6.1	1596
<i>L. anagyroides</i> Medik. <i>L. vulgare</i> Bercht. & Presl.	common laburnum, goldenchain tree	Slovakia & Czech Republic, & Central & S Europe	Tree	6.1–9.1	1560
<i>L. x watereri</i> (Kirchn.) Dipp. <i>L. alpinum</i> x <i>L. anagyroides</i>	Waterer laburnum, goldenchain tree	Observed (1856) wild in Tyrol & Switzerland, now in cultivation	Tree/shrub	3.7–4.6	1875

Sources: Dirr (1990), Hillier (1991), Krüssmann (1984), LHBH (1976).

Figure 1—*Laburnum anagyroides*, common laburnum: legume (**top**) and exterior view of a seed (**bottom**).

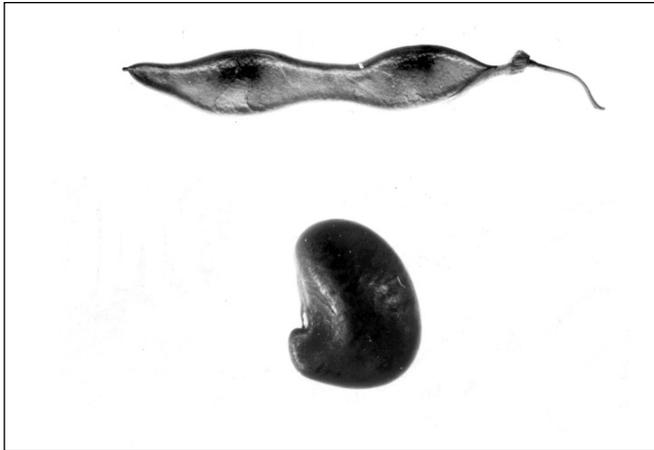
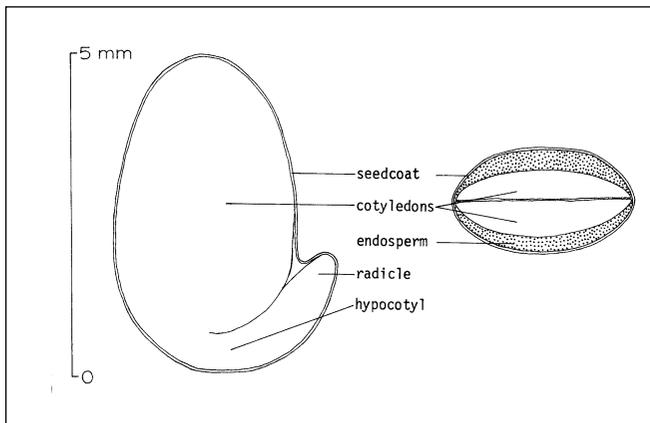


Figure 2—*Laburnum anagyroides*, common laburnum: longitudinal section through a seed.



1986). The seeds and debris are separated by sieving or by using a directed flow of air. About 45 kg (100 lb) of legumes will yield about 11 kg (25 lb) of cleaned seeds (Rudolf 1974). The following values for number of cleaned seeds per weight for laburnum species have been found: Scotch laburnum, 31,966 to 35,004/kg (14,500 to 15,878/lb); common laburnum, 35,273 to 37,478/kg (16,000 to 17,000/lb); and Waterer laburnum, 40,917/kg (18,560/lb); with 85% germination and 90 to 99% purity, depending upon cleaning techniques (Allen 1994). The dried legumes may be stored overwinter in sacks placed in a dry shed or loft. Seeds stored dry in sacks will retain good viability for 2 years (Dirr and Heuser 1987; NBV 1946, cited by Rudolf 1974).

Pregermination treatments. Laburnum seeds do not germinate readily unless the impermeable, hard seedcoat is ruptured by mechanical or sulfuric acid scarification. Mechanical scarification of common laburnum seeds resulted in 99% germination (Stilinovic and Grbic 1988). Dirr and Heuser (1987) reported that 30 to 60 minutes of sulfuric acid treatment resulted in good germination. A sulfuric acid treatment for 80 minutes and storage for at least 8 months improved germination rates for common laburnum (Laroppe and others 1996). A 2-hour sulfuric acid treatment resulted in 68% (Scotch laburnum) and 100% (Waterer laburnum) germination (Dirr and Heuser 1987). Seeds of Waterer laburnum that were collected when the seedcoat was soft (late July in Boston, Massachusetts) and left “as is” or punctured with a needle produced uniform germination in 5 days (Dirr and Heuser 1987).

Germination tests. Testing prescriptions of the International Seed Testing Association (ISTA 1993) call for mechanical scarification by piercing or by removing a piece of the testa at the cotyledon end and soaking seeds in water for 3 hours before testing them at alternating 20/30 °C for 21 days on germination paper. An alternative method is to scarify seeds by soaking them in concentrated sulfuric acid for 1 hour, washing, and germinating as above (ISTA 1993). Tests of treated seeds can also be done at a constant 20 °C for 14 days, and light is not required (Rudolf 1974). Germination rates averaged about 80% in 7 days, and percentage germination about 86% in more than 12 tests (NBV 1946; Schubert 1955, cited by Rudolf 1974).

Nursery practice and seedling care. Scarified seeds may be sown broadcast or in drills in late spring at a rate of 150 to 200/m² (14 to 19/ft²) for lining-out stock and 100 to 150/m² (9 to 14/ft²) for rootstocks (Macdonald 1986). The seeds are covered with 6 mm (1/4 inch) of soil. Field-planting has been done with 2+0 stock (Rudolf 1974). This species can also be propagated by layering and rooting hardwood cuttings taken during the fall and late winter; cultivars are propagated by grafting or budding onto laburnum seedling rootstocks (Dirr and Heuser 1987; Hartmann and others 1990; LHBH 1976; Macdonald 1986; Whalley and Loach 1981, 1983). Micropropagation of Waterer laburnum ‘Vossii’ has been reported, but plants cultured *in vitro* have slowed growth as compared to plants multiplied by grafting (Gillis and Debergh 1992).

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