Oleaceae—Olive family

Syringa L.

lilac

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Growth habit, occurrence, and use. The lilac genus comprises about 30 species of deciduous shrubs or small trees with opposite, usually undivided leaves. The genus name—*Syringa*—is derived from the Greek word *syrinx,* a "pipe," and refers to the hollow shoots. Lilacs are native to temperate Asia and southeastern Europe (Everett 1982) and were probably introduced to America before 1700 (Heriteau 1990; Wyman 1986). They are grown primarily as ornamentals because of their large, showy, and often fragrant inflorescences (Rehder 1940). Lilacs are generally hardy and long lived (Everett 1982). At least 3 species are used in shelterbelts and windbreaks. Four species or varieties grown for conservation purposes in the United States are discussed in this chapter (table 1); their heights at maturity and years of first cultivation are also listed (Hoag 1965; Rehder 1940).

Hybrids and cultivars. Numerous lilac hybrids and cultivars have been developed for horticultural use. These selections exhibit variation in such characteristics as flower color, period of flowering, and growth habit. Krüssmann (1986) reported that more than 900 cultivars are grown, including more than 800 developed from common lilac (*S. vulgaris* L.). The largest collections and numbers of varieties are found in the United States. Persian lilac (*S.* × *persica* L.), previously considered a separate species, is now thought to be a hybrid of *S. laciniata* Mill. (*S. afghanica* C.K. Schneid.) (Everett 1982; LHBH 1976; Wyman 1986); a fixed juvenile form of *S. laciniata* (Krüssmann 1986); or a backcross between *S.* × *laciniata* and *S. vulgaris* with *S.* × *laciniata* = *S. protolaciniata* P.S. Green & M.C. Chang × *S. vulgaris* L. (Griffiths 1994).

Flowering and fruiting. Flowers are borne in panicles that develop on the previous year's shoots. The small, perfect flowers have 4-lobed, funnel-shaped to cylindrical corollas and colors ranging from white to violet, purple, and deep reddish purple. Flowers bloom in spring or early summer after development of the foliage (table 2). Seedcrops are produced annually on cultivated plants. The fruit, a 2-celled capsule, is smooth, brown, woody, oblong, and terete or compressed (figure 1). It ripens in late summer or fall. Each capsule contains 4 shiny, brown, lozenge-shaped seeds that are about 13 mm long, 5 mm wide, and more or less obliquely winged at the base (figure 2). Seeds are covered by a thin, brown seedcoat and a thick layer of living endosperm. Cotyledons are large and well developed.

Table 1—*Syringa,* lilac: nomenclature and original occurrence

Scientific name & synonyms	Common name(s)	Occurrence	Height at maturity (m)	Year first cultivated
***S.* × *persica* L.**	**Persian lilac**	Iran to NW China	1.5–3.0	1614
***S. reticulata ssp. amurensis* (*Rupr.*) P.S. Greene & M.C. Chang** *S. amurensis* Rupr. S.reticulata var. *mandschuria* (Maxim.) Hara	**Amur lilac,** Manchurian lilac	SE Siberia in Amur River region		
***S. villosa* Vahl.** *S. bretschneideri* Lemoine	**late lilac,** villous lilac	N China to Himalayas	3.0–3.9	1882
***S. vulgaris* L.**	**common lilac**	SE Europe	3.0–7.0	1563

Source: Rudolf and Slabaugh (1974).

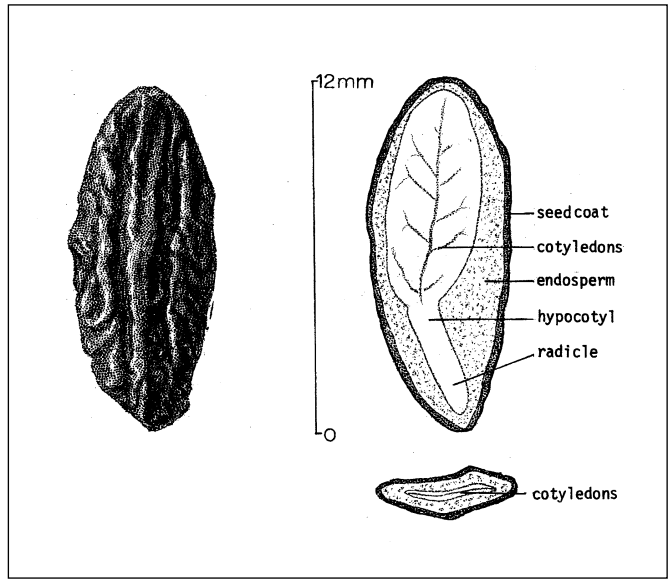
Table 2—*Syringa,* lilac: phenology of flowering and fruiting

Species	Location	Flowering	Fruit ripening
S. × *persica*	NE US, Kansas	May–June	Late Mar–Apr
S. reticulata var. *amurensis*	North Dakota	Early June	—
	Manitoba	June–July	Sept–Oct
S. vulgaris	NE US & Europe	Apr–June	Aug–Oct
	Kansas	Late Mar–early May	—
	W US	Late Mar–mid-May*	—

Sources: Caprio and Snyder (1989), Cummings (1963), Hoag (1965), Hulbert (1963), LHBH (1976), NBV (1946), Rehder (1940), Walker (1968).
*First flowering.

Figure 1—*Syringa amurense*, Amur lilac: fruits (capsules).

Figure 2—*Syringa vulgaris*, common lilac: exterior view of seed (**left**), longitudinal section through a seed (**top right**), and transverse section (**bottom right**).



Collection of fruits and extraction and storage of seeds. Mature capsules are hand-harvested in fall. A late (October 9) collection of Amur lilac capsules yielded seeds with greater germinability than an early (September 10) collection (Walker 1968). Harvested fruits should be spread to dry in a well-aerated room (NBV 1946). Air-dried fruits may be crushed in a macerator. A fanning mill is used to remove impurities, but fanning must be done carefully or good seeds will be lost (NBV 1946). Air-dried fruits may also be stored over winter in paper bags. By spring, many seeds will have fallen from the capsules and can be separated by fanning or sieving.

Data on seed yields are available for only 2 species. For common lilac, 45 kg (100 lb) of capsules yielded 0.9 to 3.2 kg (2 to 7 lb) of cleaned seeds (Swingle 1939). The number of cleaned seeds per weight in 16 samples ranged from 74,956 to 286,598/kg (34,000 to 130,000/lb), averaging 189,630/kg (86,000/lb) (Rafn and Son 1928; Rudolf and Slabaugh 1974; Swingle 1939). Average purity of cleaned lots of common lilac seeds is 60% and sound seeds made up 85% (Rudolf and Slabaugh 1974; Swingle 1939). For late lilac, purity of a cleaned seed sample was 91% and number of seeds per weight was 90,830/kg (41,200/lb).

Lilac seeds will remain viable for up to 2 years if stored in bags or sacks in a dry, well-aerated place (NBV 1946). For longer storage, air-dried seeds should be kept in sealed containers or polyethylene bags at 1 to 3 °C (Heit 1967; Walker 1968).

Pregermination treatments. Dormancy varies among species and seed collections, but is usually not very strong (Junttila 1973a). It may be induced by high temperatures during seed development (Junttila 1971).

In common, nodding (*S. reflexa* C.K. Schneid.), and Hungarian lilacs (*S. josikaea* Jacq. F. ex Reichenb.), the mechanical restraint imposed by the endosperm surrounding the radicle imposes an embryo dormancy at low incubation temperatures (9 to 15 °C). This dormancy is generally relieved by embryo excision, wet prechilling at 1 to 9 °C for periods of 30 to 90 days, or application of gibberellic acid (which increases the growth potential of the embryo) (Junttila 1970a&b, 1971; Walker 1968; Wyman 1986). Mechanical resistance of the endosperm decreases prior to germination. At high incubation temperatures (27 to 30 °C), dormancy is imposed by seedcoat and endosperm restriction of oxygen uptake (Junttila 1970b, 1973a, 1974a).

Embryos are generally nondormant. Some nodding lilac embryos, however, may be dormant at high incubation temperatures during the early stages of maturation, whereas some mature embryos are dormant at low incubation temperatures (Junttila 1973b).

Germination tests. Official rules for testing germination of common lilac seeds prescribe a 21-day incubation at 20 °C (ISTA 1966; Isely and Everson 1965). Junttila (1974b) recommends germinating excised common lilac embryos at 24 °C and seeds at 18 °C. Light is not required (Heit 1968b). Maximum germination of late lilac may be obtained by incubating seeds at 30/20 °C in artificial light with a good supply of water (Heit 1974). Test results for 3 lilac species are shown in table 3. Germination is epigeal.

Nursery practice. Rudolf and Slabaugh (1974) recommend that lilac seeds be sown at a rate adjusted to produce 270 to 430 seedlings/m^2 (25 to 40/ft^2). Macdonald (1993) recommends densities of 150 to 200 seedlings/m^2 (14 to 19/ft^2) for lining-out stock and 250 to 300/m^2 (23 to 28/ft^2) for rootstocks. For some lots of common lilac seeds, yield of usable 1+0 seedlings has been as low as 12% of viable seeds planted. Seeds may be planted in fall without pretreatment (Cram and others 1960; Heit 1968a), or untreated or wet-prechilled seeds may be planted in spring (LHBH 1976; NBV 1946; Rudolf and Slabaugh 1974). Seeds should be covered with 6 to 9 mm (0.2 to 0.4 in) of soil. A mulch may be helpful on fall-sown beds (Heit 1968a;, Walker 1968). Nursery beds should be given half-shade, kept moist, and protected from late spring frosts (NBV 1946). Field plantings can be made using 1+1 stock (LHBH 1976).

Table 3—*Syringa,* lilac: germination test results

Species	% germination		Tests
	Average	Range	
S. reticulata var. *amurensis*	72	64–80	5
S. villosa	77	70–84	2
S. vulgaris	61	33–85	13
	44	—	61

Sources: Heit (1968a&b, 1974), Junttila (1974b), Rafn and Son (nd), Rudolf and

Lilac cultivars are generally propagated vegetatively to maintain genetic constancy (Hartmann and others 1990). Plants are commonly obtained by rooting softwood cuttings under mist. The time-frame for making softwood cuttings, however, is limited to the spring flush of active growth, which extends from slightly before to slightly after flowering, usually a 4- to 6-week period (Macdonald 1993; Wyman 1986). Grafting is often used as an alternative to propagating cuttings, because grafting can be done at any time during the winter. Lilac, privet (*Ligustrum* spp.), and green ash (*Fraxinus pennsylvanica* Marsh.) seedlings are used as rootstocks. Scions cut from vigorous 1-year-old wood should be planted deeply to improve the rooting. Understock can be removed later, thus creating "own-root" plants (Fordham 1959; Hartmann and others 1990).

Root cuttings, budding, layers, divisions, hardwood cuttings, t-budding, and micropropagation are also used for propagation if only small numbers of plants are needed (Everett 1982; LHBH 1976; Macdonald 1993). If vegetative material for propagation is harvested from grafted plants not growing on their own rootstocks, shoots produced by the understock must be avoided.

Lilacs grow on a variety of soils having a pH of 6.0 to 7.5 (Fordham 1959). They do best on moderately rich, moist soils with good drainage and aeration and exposure to full sun (LHBH 1976). Though persistent without care, flowering is enhanced by removal of inflorescences after flowering (deadheading), proper pruning, and periodic fertilization (Macdonald 1993; Wyman 1986).

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