LauraceaeCLaurel family

Lindera Thunb.

spicebush

Victor Vankus, Kenneth A. Brinkman, and H. M. Phipps

Mr. Vankus is a botanist at the USDA Forest Service=s National Tree Seed Laboratory, Dry Branch, Georgia; Drs. Brinkman and Phipps retired from the USDA Forest Service=s North Central Forest Experiment Station.

Growth habit, occurrence, and uses. The genus *Lindera*CspicebushCcomprises 80 species of deciduous or evergreen trees or shrubs (Huxley and others 1992). The 3 deciduous species (table 1) native to the United States are generally found in moist woodlands, usually as understory plants. Common spicebush is a deciduous shrub to 4.6 m tall; it has been cultivated since 1683 and is valuable for wildlife food and environmental plantings. The fruits are eaten by grouse (*Bonasa umbellus*), quail (*Colinus virginianus*), pheasants (*Phasianus colchicus*), and other birds (Grimm 1957). The dried fruit has been used asa substitute for allspice and the leaves, bark, and fruit for their medicinal properties as a treatment for coughs and colds (Bremness 1994; USDA Forest Service 1948). Both common and Japanese spicebushes (table 1) are utilized by the horticultural industry for their spring flowers and aromatic and colorful fall foliage (Huxley and others 1992), and common spicebush is commonly used as a root stock for cuttings of Japanese spicebush (Boyle 1997). Pondberry and bog spicebush are both much less abundant than common spicebush and have much smaller ranges (table 1). Pondberry was listed as an endangered species by the US Fish and Wildlife Service in 1986.

Flowering and fruiting. The yellow to yellow-green flowers of spicebush are dioecious or polygamous and appear from March to May before the leaves (Fernald 1950). The fruits, which begin developing in May, are red drupaceus berries ripening in August or September (Rehder 1940). Each fruit contains a single seed that is light violet-brown with flecks of darker brown (figures 1 and 2). The affects of sun and shade habitats on flower production, sex ratio, and resulting population dynamics of common spicebush have been studied by Niesenbaum (1992) and Cipollini and others (1994).

Collection of fruit; extraction and storage of seed. Spciebush fruits should be collected at maturity from August to October (Van Dersal 1935). Seed crops can vary from year to year. Seed collectors must pay careful attention to fruit maturity to ensure that seeds are collected at the optimal time and to limit loss of seeds to birds. Fruits collected before maturity had seeds with low or no viability (Boyle 1997). The fresh fruits should be de-pulped in water, the pulp floated off, and the seeds thoroughly air-dried (Brinkman and Phipps 1974). Seeds should not be stored or planted still within the berry. There are about 10,000 seeds/kg (4,550/lb). Forty-five kilograms (99.2 lb) of fruits of common spicebush yields about 7 to 11 kg (15 to 25 lb) of seeds (Brinkman and Phipps 1974). Common spicebush seeds usually lose their viability soon after maturity, but storage at 1 to 5

°C will prolong viability for 1 to 2 years (Boyle 1997; Murphy 1997).

Pregermination treatment. Common spicebush has a dormant embryo that responds to warm incubation for 30 days at 25 °C followed by 90 days of moist stratification at 1 to 5 °C (Schroeder 1935). Good results were also obtained with 120 days of moist stratification in peat or sand at 5 °C (Barton and Crocker 1948; Brinkman and Phipps 1974). In another test, Olney (1960) reported best results after stratifying seeds for 105 days in sand at 5 °C. Dirr and Heuser (1987) believe that seeds of Japanese spicebush should be stratified cold for 3 months, and they also reported 85 to 90% germination with 3 months of cold stratification for common spicebush. Seeds of pondberry sent to the USDA Forest Service=s National Tree Seed Laboratory in 1993 (in accordance with a permit issued by the USDI Fish and Wildlife Service for the purpose of germination and propagation) were germinated using 3 different stratification schemes. Each scheme (table 2) produced good results. Some seeds germinated during the 28-day warm cycle of the warm-cold stratification scheme. This would suggest that the dormancy present in common spicebush may not be present to the same degree in pondberry.

Germination tests. Tests may be made in moist peat or sand at a constant temperature of 25 °C, or at alternating temperatures of 30 °C in the day and 20 °C at night. Germination rate may be 70 to 100% in 14 to 28 days for treated seeds, and total germination should range from 85 to 100% (Brinkman and Phipps 1974). Tetrazolium staining and excised embryo tests will also provide accurate testing information. Excised embryos can develop into seedlings if they are not damaged during excision.

Nursery practice. Common spicebush seeds should be sown in the fall and mulched over winter. The mulch should be removed in April or May before germination begins. Stratified seed may be sown in the spring. From 70 to 80% of the sound seeds can be expected to produce seedlings (figure 3). Spicebush grows well in sandy soils of pH 4.5 to 6.0 (Brinkman and Phipps 1974; Laurie and Chadwick 1931).

References

Barton LV, Crocker W. 1948. Twenty years of seed research at Boyce Thompson Institute for Plant Research. London: Faber and Faber. 148 p.

Boyle M. 1997. Personal communication. Willow Springs, MO: Hicks Seed Co.

Bremness L. 1994. Herbs. New York: Dorling Kindersley. 304 p.

Brinkman KA, Phipps HM. 1974. *Lindera,* spicebush. In: Schopmeyer CS, tech. coord. Seeds of woody plants in the United States. Agric. Handbk. 450. Washington, DC: USDA Forest Service: 503B504.

Cipollini ML, Wallace-Senft DA, Whigham DF. 1994. A model of patch dynamics, seed dispersal, and sex ratio in the dioecious shrub *Lindera benzoin* (Lauraceae). Journal of Ecology 82(3): 621B633.

Dirr MA, Heuser Jr CW. 1987. The reference manual of woody plant propagation: from seed to tissue culture. Athens, GA: Varsity Press. 239 p.

Fernald ML. 1950. Gray=s manual of botany. 8th ed. New York: American Book Co. 1632 p.

Grimm WC. 1957. The book of shrubs. Harrisburg, PA: Stackpole Books. 522 p.

Huxley A, Griffiths M, Levy M, eds. 1992. The new Royal Horticultural Society dictionary of gardening. Volume 3. New York: Stockton Press: 89.

Laurie A, Chadwick LC. 1931. The modern nursery, a guide to plant propagation, culture and handling. New York: Macmillan. 494 p.
Murphy K. 1997. Personal communication. Plains, MT: Lawyer Nursery.
Niesenbaum RA. 1992. Sex ratio, components of reproduction, and pollen deposition in *Lindera benzoin* (Lauraceae). American Journal of Botany 79(5): 495B500.
Olney HO. 1960. Growth and translocation during the after ripening of seeds with resting embryos [PhD thesis]. Newark, DE: University of Delaware.
Rehder A. 1940. Manual of cultivated trees and shrubs hardy in North America. New York: Macmillan. 996 p.
Schroeder EM. 1935. Dormancy in seeds of *Benzoin aestivale* L. Contributions of the Boyce Thompson Institute 7: 411B419.
USDA Forest Service. 1948. Woody-plant seed manual. Misc. Publ. 654. Washington, DC: USDA Forest Service. 416 p.
Van Dersal WR. 1938. Native woody plants of the United States: their erosion-control and wildlife values. Misc. Publ. 303. Washington, DC: U.S. Department of Agriculture. 362 p.

Figure 1—*Lindera,* spicebush: seed, × 3.

Figure 2—*Lindera,* spicebush: longitudinal section through a seed, × 5.

Figure 3—*Lindera,* spicebush: seedling development at 2, 3, and 10 days after germination.

Table 1C*Lindera,* spicebush: nomenclature, occurrence, and uses

Scientific name & synonym(s)	Common names	Occurrence
***L. benzoin* (L.) Blume** *Benzoin aestivale* (L.) Nees	**common spicebush**, northern spicebush, Benjamin bush, feverbush, wild allspice	Maine to Ontario & Kansas; S to Florida & Texas
***L. melissifolia* (Walt.) Blume** *Benzoin melissifolium* (Walt.) Nees *Laurus melissifolia* Walt.	**pondberry,** southern spicebush, Jove=s fruit	North Carolina to Missouri; S to Georgia & W to Louisiana
***L. obtusiloba* Blume** *Benzoin obtusilobum* (Blume) O. Kuntze *L. cercidifolia* Hemsley *L. obtusiloba f. velutina* T.B. Lee	**Japanese spicebush**	Japan, Korea, & China
***L. subcoriacea* B.E. Wofford**	**bog spicebush**	North Carolina S to Florida & W to Louisiana; also New Jersey

Source: Brinkman and Phipps (1974).

Table 2C*Lindera,* spicebush: stratification treatments and germination

Species	Stratification (days) Warm	Cold*	Percentage germination	
L. benzoin	30H	90	C	
	C	105	C	
	C	120	C	
	C		90	85B90
L. melissifolia	28I	91	100	
	C	56	84	
	C	119	88	
L. obtusiloba	C	90	C	
L. subcoriacea	C	C	C	

Sources: Barton and Crocker (1948), Brinkman and Phipps (1974), Dirr and Heuser (1987), Olney (1960), Schroeder (1935).

* 1 to 5 °C.

H 25 °C.

I 20 to 30 °C.