Propagation protocol for

SPICEBUSH

Lindera benzoin

| Gregory Hoss

ABSTRACT

In Missouri, we find that fall-sowing freshly collected spicebush (*Lindera benzoin* (L.) Blume [Lauraceae]) seeds removed from their fruits is the most efficient way to produce 1+0 seedlings suitable for conservation plantings. Although seeds are delicate, macerating fresh fruit appears to be an acceptable way to clean seeds and yields more seedlings than sowing air-dried fruits.

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KEY WORDS

seed propagation, seed storage, Lauraceae

NOMENCLATURE

USDA NRCS (2005)

Spicebush fruits ripen in Missouri in September and October. Photo by Gregory Hoss

Spicebush (*Lindera benzoin* (L.) Blume [Lauraceae]) is native to eastern North America, from Maine to Ontario and south throughout the eastern and central US from Nebraska south to Texas and Florida. It inhabits moist or low woodlands and thickets along streams, valley bottoms, at the base of bluffs and cliffs, and along springs and seepage areas of wooded slopes.

Spicebush is dioecious, with male and female flowers occurring on separate plants. In Missouri, it flowers from March to May. Fragrant, yellow flowers appear before the leaves. Fruits ripen in September and October and are borne singly or in clusters. Mature fruits are glossy red, fleshy, spicy, and bear one hard, light brown, speckled seed. The brightly colored fruits and the aromatic character of the plant add to its ornamental value.

A tea made from the bark, twigs, or fruit has been used to stimulate blood circulation, increase perspiration, and treat intestinal worms, dysentery, coughs, and colds. During the Revolu-

tionary War, the fruit was used as a substitute for allspice. During the Civil War, leaves were used as a substitute for tea (Kurz 1997).

SEED CLEANING

On average, spicebush has about 10 000 seeds/kg (4550 seeds/lb) (Vankus and others 2004). Traditionally, spicebush seeds were thought to be very delicate, brittle seeds that would not withstand vigorous cleaning methods. Because of this, our usual method of handling seeds was to air-dry the fruits on screens without removing seeds and then to sow dried fruits into our seedbeds. In addition, Brinkman and Phipps (1974) and Vankus and others (2004) report that seeds are relatively short-lived (1 to 2 y) under ideal storage conditions, with which our experience concurs. For example, fruits collected in 2003, air-dried, and sown in fall 2003 yielded about 1900 seedlings/kg (870/lb), but dried fruits from this same 2003 collection, stored at 1 °C (34 °F) and sown in fall 2004, yielded only about 230 seedlings/kg (105/lb).

Trying to improve our seed-to-seedling efficiency, we have experimented with cleaning seeds and our results show promise. In 2004, we took a seedlot and air-dried half the fruits on screens. For the remaining fruits, we macerated the pulp from the seeds using our Dybvig seed cleaner (Melvin Dybvig, Portland, Oregon; 503.244.1977) at a very low speed. Cleaned seeds were air-dried on screens. We determined that 9.1 kg (20 lb) of dried fruits had the same number of seeds as 5.9 kg (13 lb) of cleaned seeds. We then planted 9.1 kg of dried fruits in the same square footage as the 5.9 kg of cleaned seeds—that is, the same number of seeds per square footage. The yield from cleaned seeds (3390 seedlings/kg [1540/lb]) was nearly 3X that from dried fruits (1160 seedlings/kg [525/lb]). Encouraged by these results, we are repeating the experiment. In addition, we have stored some of the cleaned seeds (air-dried to 8% to 10% moisture content) in sealed plastic bags inside sealed plastic tubs at 1 °C (34 °F) and will evaluate their viability after storage.

FIELD PREPARATION

The spring before outplanting, we amend the soils with 785 kg/ha (700 lb/ac) of $1N:3P_2O_5:5K_2O$ and grow a soybean cover crop. We use Roundup Ready® soybeans so we can control weeds with glyphosate herbicide without harming the cover crop. During early August, we disc under the cover crop and disc the soils several times during the next 6 wk to obtain a smooth soil surface. Soils are fumigated in late September. We mark out and form beds as needed. Beds are prepared with a rototiller, formed, and are typically 10 to 15 cm (4 to 6 in) high and 1.2 m (4 ft) wide.

SEED TREATMENTS, SOWING, AND GROWING

We grow spicebush as a 1+0 crop. Spicebush seeds require a cold, moist stratification. Therefore, we sow dried fruits and cleaned seeds during the fall using a Love™ seeder. Depending on their weight, dried fruits are sown while moving in second gear at a setting of either 3.5 or 4; and clean seeds are sown while moving in second gear at a setting of 8.5. Seeds are sown at least 6 mm (0.25 in) deep to protect them from deer, rodents, and birds. Seeds are mulched with old sawdust to a depth of about 6 to 12 mm (0.25 to 0.5 in) and then topped with a very fine layer (6 mm [0.25 in]) of hydromulch. Seedbeds are irrigated when soils appear to be drying out on warm days. We apply ammonium sulfate ($21N:0P_2O_5:0K_2O:24S$) with a mechanical spreader at the rate of 140 kg/ha (125 lb/ac). The first application goes on seedlings that have been established for at least 5 or 6 wk, often around the last week of May. The last fertilizer application is usually during the last week of July. We irrigate for at least 45 min following all fertilizer applications to remove fertilizer from foliage, which prevents burning, and to incorporate fertilizer into the root zone. We do not root or shoot prune this species.

From August to the end of the growing season, irrigation frequency and duration is shortened and applied only when needed. We harvest (lift) seedlings when most leaves have dropped. Lifted nursery stock is moistened and immediately stored in the cooler until graded, bundled, and shipped. Generally, we lift and grade stock from December through early April and shipping occurs from February to mid-May.

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