



Photo by Don Kurz

# Propagation Protocol

## for Ninebark (*Physocarpus opulifolius*)

GREGORY A HOSS

Ninebark (*Physocarpus opulifolius* (L.) Maxim. [Rosaceae]) is a small shrub, 1 to 3 m (3 to 10 ft) tall. The shrub is multi-stemmed, spreading to 2.5 m (8 ft). Bark peels off in thin papery strips, resembling the number nine in shape, exposing brown inner bark. It occurs naturally on gravel bars, rocky banks and bluffs along

**KEY WORDS:** bareroot, nursery, seeds,

**NOMENCLATURE:** (plants) USDA NRCS (1999); (insects) ITIS (2000)

streams and moist thickets, often overhanging the water. This species is adaptable to a very wide range of soil and site conditions, from moist to dry, acid to alkaline, and gravelly to heavy clay. It will grow in partial shade to full sun and is found from Quebec west to Minnesota, South Dakota and Colorado, south to Oklahoma to Georgia and north to New York. Although sometimes used in landscape for border screens and hedges, its ragged appearance makes it more suitable for wildland plantings. Ninebark grown at the George O White State Forest

Nursery in Licking, Missouri, is used by private landowners and on public land primarily for erosion control, wetland plantings, and wildlife habitat (Figure 1).

### SEED COLLECTION AND STORAGE

Small white, 5-petaled flowers bloom from May to June. Flowers are about 6 to 8 mm (0.25 to 0.33 in) in diameter and form in many-flowered, flat-topped clusters. In Missouri, fruits ripen from August to early October and are small, dry pods hanging in drooping, papery

clusters that resemble bellows. Each pod contains 2 to 5 yellowish, shiny seeds.

We collect seedpods in late September. To allow them to further ripen and dry, we place them in elevated wooden boxes with standard house screen on the bottom. The very small seeds (< 2 mm) often fall through the screen, so we clean the floor before placing pods in the boxes and sweep up any seeds that fall through. Once pods have dried and begun to open we tumble them in our custom-made tumbler made of wood and 6-mm (0.25-in) mesh screen that resembles a bingo game tumbler. Seeds fall to the floor and pods remain in the tumbler. Again, we sweep up the seeds and further clean them using a Clipper (Blufton, Indiana) with a 1-18 screen and the fan set at the lowest possible air flow.

Seeds excess to our annual needs are dried down to about 8% moisture content, placed in plastic bags inside sealed drums, and frozen at about -15 °C (5 °F). We have had good success germinating seeds stored 5 y at this temperature. Since seeds remain viable in storage, we collect surplus seeds in good seed years.

### CULTURAL PRACTICES

We always sow ninebark in fall (October). Seeds are drilled using a 7-row Love/Øyjord seeder. To get the very small seed to flow properly in our seeder, we mix seeds 1:1 (v:v) with sifted oak sawdust. We take sawdust, place it on window screen, and shake. Fine particles that sift through are mixed with seeds. Remember that the Love seeder calibrates based on total seed weight so to be accurate, crop seeds must be reweighed with the sawdust and the total weight used in calibration.

We plant our ninebark seed at approximately 0.45 kg of the seed and sawdust mixture per 98 m<sup>2</sup> (1 lb/1050 ft<sup>2</sup>) of bed space. Seeds per kg varies widely, but 2.2 million (1 million/lb) is average. This is about 1770 seeds per linear m (540 per linear ft) with the 7-row seeder and may sound high, but ninebark typically has low viability. Over the years we have found this planting rate to produce well-stocked seedbeds of 110 to 130 seedlings per m<sup>2</sup> (10 to 12/ft<sup>2</sup>).

Seeds are sown to a depth of 3 to 6 mm (0.125 to 0.25 in). We have sown seed deeper, but if germination occurs, it can take as much as a month longer. Seedbeds are covered with about 6 to 12 mm (0.25 to 0.5 in) of sawdust applied with a manure spreader. We then apply a thin layer of hydromulch to cover the sawdust and keep it from blowing away.

Ninebark is one of the earliest seeds to germinate at our nursery. It is up by late March. Occasional frosty mornings do not seem to hurt new seedlings. Beginning in late May we spread dry ammonium sulfate, 21N:0P<sub>2</sub>O<sub>5</sub>:0K<sub>2</sub>O:24SO<sub>4</sub>, at a rate of 140 kg/ha (125 lb/ac) over the crop, water it in, and repeat this application 4 to 6 times from late May to the end of July. At this rate, we apply about 45 to 68 kg (100 to 150 lb) nitrogen during the growing season. We irrigate regularly throughout the growing season and occasionally spray for leafhoppers (Homoptera: Cicadellidae) using a systemic insecticide (Astro [Permethrin]) at 75 ml/ha (1 fluid oz/ac).

Our minimum grade is 30 cm (12 inches) of height but most of our 1+0 seedlings are 46 to 92 cm (18 to 36 in) tall, with a caliper of 3 to 12 mm (0.125 to 0.5 in). During the last 4 y we have averaged about 5000 deliver-

able seedlings per kg of sown seed (11,000/lb). Ninebark is lifted in December or January (or whenever it is fairly dry as the large root mass makes lifting very difficult when soil is wet), placed into cold storage (0.5 to 1.5 °C [33 to 35 °F]), and kept moist. We have had excellent outplanting survival using this propagation protocol.

### REFERENCES

- [ITIS] Integrated Taxonomic Information System. 2000. Biological names. Version 4.0 [on-line database]. URL: <http://www.itis.usda.gov/plant-proj/itis/itis-query.html> (accessed 30 Oct 2000).
- USDA NRCS. 1999. The PLANTS database, Version 3.0. URL: <http://plants.usda.gov/plants> (accessed 30 Oct 2000). Baton Rouge (LA): National Plant Data Center.

### AUTHOR INFORMATION

Gregory A Hoss  
Nursery Superintendent  
George O White State  
Forest Nursery  
Missouri Department of  
Conservation  
14027 Shafer Road  
Licking, MO 65542  
hoss@gmail.conservation.  
state.mo.us



Figure 1 • A successful crop of 1+0 ninebark at GO White State Nursery.

Photo by Gregory A Hoss