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Propagating Northwest Natives®

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Lawyer Nursery, Inc. of Plains, Montana, is celebrating its 50th year in business in 2008. David Lawyer started the nursery in the late 1950s in Western Montana. In 1988, David's son, John Lawyer purchased the former IFA nursery site in Olympia, Washington and this year marks the 20th growing season for Lawyer Nursery's Olympia Farm. Lawyer Nursery began as a bare-root nursery and for much of its history it produced woody trees and shrubs exclusively as field-grown liners. In 2002 we built our first greenhouse in Olympia and since that time we have added additional structures for a total of about 10,000 sq ft. The greenhouses have enabled us to improve some of the products that were previously limited to field production and have enabled us to produce species that could not be grown in the field.

Northwest-native plants have always been a part of the Lawyer Nursery product line. Legend has it that the first crop that David Lawyer produced was a crop of *Amelanchier alnifolia* seedlings which came from seed that he collected in Montana's Bitterroot Valley. Now 50 years later, Lawyer Nursery continues to grow *Amelanchier alnifolia* and many of its cultivars in addition to over 500 species of woody plants grown at three different sites in the Northwest. In Olympia, we are currently producing about 400 species and cultivars of woody plants. Approximately 10% of these species are native to the Northwest, which includes British Columbia, Washington, Oregon, Northern California, Idaho, and Montana. Though Lawyer Nursery has had a great deal of experience growing Northwest natives, the exact propagation protocols for each species seem to be ever-changing. This discussion will outline our production methods for the following species of Northwest Natives: *Acer circinatum*, *Betula occidentalis*, *Chamaecyparis lawsoniana*, *Lonicera involucrate*, *Malus fusca*, *Oemleria cerasiformis*, *Pinus monticola*, *Pinus balfouriana*, *Populus trichocarpa*, *Quercus garryana*, and *Ribes sanguineum*.

***Acer circinatum*.** Vine maple is a Pacific Northwest native that has broad appeal as an ornamental plant. It is botanically related to *A. palmatum* and *A. japonicum*. It is a small (about 25 ft), often shrubby maple that produces excellent color beginning in early autumn. There are several selections of this tree in the trade in addition to the more common species.

Nursery Practice. Seed is collected in late August or early September. It is sown immediately by hand in 8-row beds. We expect 15 lb of fresh seed to produce 10,000 plants at a target density of 60 trees per ft in an 8-row bed. A 2-yr seedling is typically a single or multi-stemmed plant in the 12- to 18-inch range. We also transplant the 2 year vine maple seedlings into a lower density four-row bed for an additional 1 or 2 years to produce a larger liner (up to 3–4 ft in height).

***Betula occidentalis*.** Water birch or mountain birch is a small (15–30 ft) multi-stemmed deciduous tree native to a broad range of Western North America. It is found from Alaska to California from the east side of the Cascades and Sierra to the west slope of the Rocky Mountains. As the common name implies, Water birch is a riparian species associated with stream banks and moist canyon bottoms and

is very tolerant of flooding. It is an attractive tree with copper-colored bark that stands out in the winter landscape.

Nursery Practice. We have produced this crop for many years as a 2-year, bare-root liner, but we grew a contract crop of plugs this season, which I will describe here. This seed, like most *Betula* seed, requires light for germination. This light requirement can be overcome by providing a 30-day cold stratification. This seed was sown without any pretreatment on the surface of Quickpot 60 cells, which is a 9-cubic-inch cell, 60 cavities per tray. The seed we received for this project was rather poor quality, so the seed was sown at 20 seeds per cell. It was sown with the Old Mill Seeder in late May and it was covered with grit after it was thinned, approximately 30 days after sowing. The seed germinated quickly, in about 1 week. The crop was grown inside until mid-August when it was moved outside to harden off. It will finish at about 18 inches. When this crop is grown in the field, a 2-year liner finishes at a height of about 18 inches.

Chamaecyparis lawsoniana. Port Orford cedar is a handsome conifer native to Southern Oregon and Northern California. This is a large tree (200 ft) with graceful blue-green foliage. This plant has been in cultivation since 1854 and there are numerous cultivars in the trade, selected for foliage color or form.

Nursery Practice. We grow Port Orford cedar as a plug-1 product. (A plug-1 refers to a greenhouse 'plug' that is transplanted for an additional year in the field at a low density to produce a larger liner.) Seed generally requires no stratification, but a short cold stratification has been found to both hasten germination and make it more uniform. In mid-April seed is sown eight seeds per cell in a Styro 4S block (160 cells per block). This product can be sold as a 6- to 9-inch plug after the first season or it can be transplanted at a density of 14 trees per bed-ft in a 6-row bed, resulting in a finished product that is a 12- to 18-inch P-1 transplant with an excellent root system.

Lonicera involucrate. Black twinberry is a small deciduous multi-stemmed shrub that can reach a height of 35 ft. It is an attractive ornamental plant recognized by yellow tubular flowers borne in pairs and the distinctive black berries borne side by side and surrounded by a red bract.

Nursery Practice. Twinberry is grown as a transplanted seedling (1-1). (A 1-1 refers to a one-year field-grown seedling that is transplanted at a lower density for an additional year in the field so it is a 2-year-old product.) Best germination is obtained when the seed is given a cold stratification preceded by a shorter warm period. Field sowing in late August fulfills this stratification regimen. Seed is sown at the rate of 0.45 to 0.55 lbs of seed per 10,000 plants at a target density of 32 plants per ft in a 4-row bed. The seedlings emerge the following spring and reach a height of 3-6 inches as 1-year-old field-grown seedlings. We then transplant these seedlings into a 4-row transplant bed at a density of approximately 6 plants per bed-ft. The 2-year 1-1 transplant product is a multi-stemmed plant in the 2-3 ft range. Due to the difficulty of obtaining seed for this crop, we have begun to look at rooting softwood cuttings this season. Softwood cuttings were taken from production seedlings in mid July. These are treated with a quick dip of 1000 ppm IBA (Dip'N Grow®) and stuck directly into 144-cell styro blocks filled with perlite and peat (7 : 3, v/v) mix. These root readily and are then transplanted into 4-row beds.

***Malus fusca*.** Pacific crabapple is the only U.S.A. crabapple native west of the Rocky Mountains. It is found along the west coast from Alaska to California. It is a small, shrubby tree that can reach a height of 40 ft and is associated with wet regions in the low to middle elevations of the range. It has a market as a native plant and a wetland species and has aesthetic appeal for its white spring flowers and distinctive oblong fruit, which is edible.

Nursery Practice. This plant is grown as a 1-0 bare-root liner. Seed is stratified for 60 days and sown in early May. Sowing rate is 1.7 lbs of seed per 10,000 plants. We sow this crop in a 4-row bed with an Oyjord drill to achieve a target density of 32 trees per bed-ft. This plant is not vigorous and a 1-0 liner is typically 6-12 inches. We also transplant this crop to produce a 3- to 4-ft liner as a 1-1 transplant.

***Oemleria cerasiformis*.** Indian plum or osoberry is a large deciduous shrub native to the western slopes from British Columbia south to California. It is the only species of the genus *Oemleria*. In Washington, Indian plum is one of the first woody shrubs to bloom. The whitish green flowers that appear before the leaves are fully formed and are quite showy as early as February. This plant is dioecious, indicating that at least one male tree is required for fertilization. The female flowers set a small plum-like fruit that ripens in mid-June.

Nursery Practice. This crop is grown as a 2-year bare-root liner. Seed is collected in early summer as soon as it ripens and before it is taken by the birds. The seed is sown in the fall, typically from mid to late September. The sowing rate is 8 lb of seed per 10,000 plants. We sow this in an 8-row bed with a target density of about 60 plants per bed ft. The crop emerges in early spring and the germinants seem to be resilient to light frost. It is slow growing and a 2-year liner is typically 12-24 inches tall.

***Pinus monticola*.** Western white pine is a five-needled pine native to the North-western U.S.A. The range extends from British Columbia south to California and east to Western Montana. This is an important timber tree and there are magnificent specimens in Oregon and Idaho that exceed 225 ft in height. This pine, along with most five-needled pines, is susceptible to white pine blister rust, a disease that has devastated the natural stands since it was introduced to the area in the 1930s.

Nursery Practice. Western white pine is grown as a 3-year-old bare-root liner. Because of its susceptibility to white pine blister rust (caused by the fungus *Cronartium ribicola*), only seed from rust-resistant orchard trees is sown at Lawyer Nursery. The seed requires a long cold-stratification period of 90 to 100 days. Seed is sown in mid-April with an Oyjord drill into an 8-row bed. Seed is sown at a rate of 1.7 lb per 10,000 plants at a target density of 60 trees per bed-ft. Like most of the five-needle pines, western white pine seedbeds must be covered in Olympia to protect the emerging seedlings from the crows. *Pinus monticola* is a slow-growing pine and a typical 3-year seedling is 9-12 in. tall. We also transplant this plant and offer it as a 3-2 transplant, which is in the 12- to 18-inch range.

***Pinus balfouriana*.** Foxtail pine is another rather obscure 5-needled pine endemic to California. In addition to the species *P. balfouriana*, there are two subspecies which grow in two distinct high elevation regions of California, one in the northern Coast Ranges in the Klamath National Forest and the other in the Southern Sierra,

within the Sequoia and Kings Canyon National Parks. This pine has short needles which are bunched together tightly at the ends of the branches which inspired the common name of “foxtail.” Foxtail pine is similar to its 5-needled pine relative, bristlecone pine, in that it grows in the high elevation, windswept granite ridges near the timberline. Foxtail pine does not live as long as bristlecone pine, but there are numerous specimens in the Sierra that are over 1,000 years old. We have grown small quantities of this pine for many years for collectors and bonsai enthusiasts.

Nursery Practice. Foxtail pine is grown as a 3-year-old bare-root liner. Seed is sown in May after an 80-day cold-stratification period. The seed is sown into 8-row beds at a rate of 4 or 5 lb of seed to produce 10,000 plants at a target density of 60 trees per bed-ft. This is an extremely slow-growing pine that reaches about 6–8 inches in height as a 3-year-old plant. We also transplant this crop as a 5-year-old 3–2 transplant, which will typically finish in the 9–12 inch range.

Populus trichocarpa. Black cottonwood is the largest of the American poplars and is the largest hardwood tree in western North America. It can reach a height of up to 180 ft. The native range of this species extends from Alaska to northern California and from the Pacific Coast east to western Montana. It is an important timber tree that is utilized for wood and pulp.

Nursery Practice. Our Montana nursery grows an extensive selection of *Populus* species as hardwood cuttings. Scion blocks are maintained and dormant wood is cut in mid-winter and kept in cold storage until spring. In May the wood is cut into 6-inch lengths and stuck into outdoor beds where it roots quickly and puts on 3 ft of top growth. We grew black cottonwood as a 1-year plug to provide scion material for the hardwood cutting program in Montana. Seed is collected after cotton dispersal in early summer. This tiny seed is viable for only a short period, up to 1 year if properly stored, so it must be collected regularly. Cleaned seed is generally obtained, but if a nurseryman receives a bag of cotton instead of processed seed, the first task is to separate the seed from the cotton. The seed can be separated using a series of screens and compressed air. The air will free the seed from the cotton and the cotton turns to felt as it is forced through the screens while the seed accumulates in a catch basin below the screens. The cotton felt is easily separated and the seed is ready to sow. The seed is sown into 198-celled Styro blocks with an Old Mill seeder and placed in the greenhouse in mid-March. The seed does not require stratification, but does require light for germination. The seed is sown at 5.5 seeds per cell in order to achieve maximum fill. The seedlings are thinned 5 weeks after germination so there is one tree per cell. In early June, approximately 12 weeks after germination, the plants are then transplanted into the field. These 1-year plug transplants will finish at approximately 3 ft. These transplanted seedlings will serve as a scion block for hardwood cuttings.

Quercus garryana. Oregon white oak is a magnificent representative of the oak family. It is the only native oak in Washington State and British Columbia. The native range of this species extends from southern British Columbia south to Marin County, California, predominantly west of the Cascades and Sierras. Acorns from this tree were an important food source to the indigenous North American people. It is an intricately branched large tree that can reach beyond 100 ft in height. I have

seen magnificent specimens of these trees in the Willamette Valley, which have been standing for nearly 300 years.

Nursery Practice. For many years we have produced oak liners in the field. Despite a huge effort at lateral root pruning, we have transitioned our oak program from the field to the greenhouse. Typically Oregon white oak would be sown in the fall as soon as the acorns are ripe. Our seed was held in the cooler, at 40 °F until February while we were waiting for containers to arrive. After soaking in running water for 1 day, the seed was kept in perforated bags and covered with moist burlap to prevent desiccation during storage. The seed was hand sown in a Groove Tube 51-celled tray (Stuewe & Sons, Inc., 31933 Rolland Drive, Tangent, Oregon), which is a 4-cubic-inch container. The seed was sown one seed per cell into a bark-pumice mix (20% coarse fire bark, 60% fine fir bark, and 20% pumice) in an unheated hoop house. The seedlings were grown under cover until mid-June when they were transplanted into the field. They will be grown for an additional full season in the transplant bed and be offered as a 2-year P-1 transplant. Starting the acorns in an air-pruned container makes all the difference to the root architecture of the finished product. By inhibiting taproot development in a container, the plants produce a much more fibrous root structure in the upper horizon or rhizosphere compared with the same product grown in the field and root pruned. This improved root development allows the seedling to be successfully outplanted or transplanted into a nursery container.

Ribes Sanguineum. Red currant is medium-sized deciduous shrub, which reaches a height and width of about 8 ft. It is well-loved in the west for its red flowers in April and May. It is native to the Western Slopes of the Cascades and Sierras from Southern British Columbia to Central California. There are several named selections of this species in the nursery trade.

Nursery Practice. At Lawyer Nursery, red-flowering currant is grown as a 1-year bare-root liner. We have had excellent results sowing seed in the fall. The seed requires a long cold stratification, and the best results have been achieved through natural stratification by fall sowing rather than artificial stratification and spring sowing. The seed is sown at a density of 1 lb per 10,000 finished plants. Seed is sown in October in a 4-row bed with an Oyjord drill. It is small seed and must be sown relatively shallow, but deep enough to endure a rainy winter prior to germinating in the spring. It typically reaches a height of 18–24 inches as a 1–0 liner.

Lawyer Nursery will continue to produce woody plant material indigenous to the Northwest. These native plants have experienced an increase in demand over the last 10 years as more people recognize the value of native plants in the landscape because of their disease resistance and water use efficiency. In addition to the many Northwest natives that are currently part of our product mix, we continue to evaluate and add additional native material to our program. The addition of new species adds to the complexity of production, especially with regards to propagation. New propagation techniques and protocols are continuously being developed and implemented in order to produce this material as efficiently as possible.

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