

## Developing New Woody Plants at a B&B Nursery®

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Johnson's Nursery, Inc. is a 600-acre B&B nursery stock producer. The nursery grows a wide range of woody landscape plants hardy to U.S.D.A. Zone 4b. A small propagation department supports the nursery operation by providing it with liners not readily available from outside sources. In addition, the propagation department develops improved plants for the nursery operation. At our company the propagation department has been viewed as a research and development branch of the nursery. Plant development has taken place primarily through the selection of open-pollinated chance seedlings that have occurred during the production process. We evaluate superior seedlings we find over a number of years and if proven worthy, we introduce them into the trade. We have not done any controlled crossing or hand pollinating of our plants. Our simple selection process can best be understood by telling the story of the origin of our introduction, *Fraxinus pennsylvanica* 'Johnson', Leprechaun™ green ash.

Leprechaun™ green ash originated in a row of seedling green ash understock. The dwarf tree was easily noticed because of its size — about one-third that of the rest of the seedlings in the row. Its tiny leaflets and its internodal lengths were also about one-third scale. We tagged and labeled the possible new cultivar to make sure it didn't end up in the next step of production or, worse yet, being grubbed. We propagated the new plant before moving it to a stock block.

Over the next 8 to 10 years we evaluated our new cultivar, propagated it several different ways and sent wood to other growers for evaluation. We had the plant tested to make sure the dwarf character of the tree was of genetic origin and was not caused by a pathogen. We worked with J. Frank Schmidt and Sons Nursery of Boring, Oregon to patent, trademark, and market the new tree.

Chance seedlings like the original Leprechaun™ green ash are found in the nursery each year. We find them in all phases of the production cycle, from the seedbeds to the transplant beds to the finished tree and shrub blocks. We actively look for variants at all stages of growth. We have made numerous new selections from a wide assortment of genera. *Cornus racemosa*, *Pinus sylvestris*, *Viburnum nudum*, *Aesculus turbinata*, *Malus sargentii*, and *Quercus xschuettei* (*Q. bicolor* × *Q. macrocarpa*) are a few.

Often times initial selections are made of young seedlings in the seedbeds or in the transplant beds. Certain characteristics can be quickly identified in the early stages of a plant's life. For instance, foliage characteristics such as leaf form and color and even disease resistance can be selected from very young plants (example: Septoria leaf spot on *Cornus racemosa*). We have found narrow-formed plants as well as dwarfs when plants were very young (example: Dwarf Leprechaun™ green ash, and narrow, upright selections of *Pinus sylvestris*). Plants tolerant of high pH soils also show up in young seedling crops (example: *Quercus xschuettei*). It is also possible to sacrifice large numbers of young seedlings of marginally hardy species with the hope of finding a few hardy individuals (example: *Viburnum nudum*).

As plants move through the production cycle, selection continues. We regularly walk blocks of mature seedling plants that are ready to be sold B&B, looking for

possible new cultivars. These older plants give the plant selector additional characteristics to evaluate such as flower and fruit, as well as a more definitive assessment of form, fall color, disease resistance, hardiness, and branching habit (Example: *Malus sargentii* Select A, Firebird™ crabapple, selected for colorful, persistent red fruit, disease resistance, and annual bearing).

A key component of our plant development process is our stock block. We move most of our selected plants or propagules of them from the production areas to the stock block. This makes evaluation of the many selections easier because the plants are in one location.

To increase our opportunities of finding chance seedlings, we sometimes grow seedlings from plants of interspecific hybrid origin. We take advantage of the increased variation often present in crops of seedlings from hybrid plants (examples: *Malus* 'Coralcole', Coralburst™ hybrid crabapple, *Magnolia* hybrids, and *Quercus* hybrids).

Developing new plants has oftentimes been viewed as a complicated, highly technical endeavor. At our nursery this is not the case. It's just a matter of screening for and identifying the improved plants that regularly show up in nursery production fields.