

Container Seedling Handling and Storage in the Rocky Mountain and Intermountain Regions

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Abstract: An overview of the Rocky Mountain Native Plants Company (RMNP) and its container production program is presented. Descriptions are given of the greenhouse, woody plant nursery, bareroot nursery, and other programs at RMNP. Discussion is also provided concerning the effect of potting containers on root formation.

Keywords: container nursery, native species

Overview

Rocky Mountain Native Plants Company (RMNP) was founded in 1997 as a private conservation nursery specializing in site specific native plant production for the Rocky Mountain Region. The company is on the western slope of the Rocky Mountains in Rifle, Colorado, near Glenwood Springs. Their employment is approximately 22 full-time individuals, with staff increasing seasonally to include an additional 20 employees as installation, field, and greenhouse personnel. The nursery is situated on a 74.6-ac (30.2-ha) site in Garfield County with native soil conditions consisting of predominantly silty loam.

The annual production of RMNP consists of approximately 1.5 to 3 million plants, comprised of nearly 350 species, 100% of which are indigenous to the Central Rocky Mountain and Intermountain Region. Facilities include 16 greenhouses of various sizes and construction, a 17-ac (7-ha) container nursery, a 5-ac (2-ha) bareroot nursery, and a 10-ac (4-ha) cultivated and linear wetland nursery.

Container Production

RMNP container soils consist of a mixture of peat, coir, perlite, vermiculite, and scoria with micronutrients, gypsum, and *Gliocladium* added. Soil mixes vary according to species type and hydrologic preference. In addition, mycorrhizae or *Frankia* (specifically for *Purshia*, *Shepherdia*, and *Alnus*) are added to soil mixes for many woody species.

Water is derived primarily from Harvey Gap Reservoir, and secondarily from the Colorado River. All greenhouse water is processed through reverse osmosis, then ozonation.

Most woody species are produced in 5-gal (19-l), 1-gal (4-l), 1-qt (1-l) containers, and 10-in³ (164-cc) Ray Leach SuperCells™. In addition, selected woody species are produced by bareroot propagation in seed beds, with the number of species as well as the total number of plants produced per species increasing by the year. Forb species are produced in 1-gal containers and 10-in³ cells. Graminoids are primarily produced in 10-in³ cells, with 1-qt and 1-gal materials produced for selected wetland species. Winstrips in 5.5-in³ (90-cc) containers, as well as plants in 3-in³ (50-cc) containers, are grown by contract only.

Production Protocol

RMNP site collects as many of its seed types as possible to ensure that they reflect the genetic sources most common to the respective watersheds of their area. Seeds are pretreated to break dormancy, then germinated in a propagation house for approximately 6 weeks. For cutting stock, cuttings are taken at the appropriate time of the year (often spring or fall), then placed under fog irrigation until rooted. Normally germination is accomplished in miniplugs—288-cells for forbs and woody species and 521-cells for graminoid species.

Once adequately rooted, materials are moved to a holding house under overhead irrigation. These materials are normally held for not more than an 8-week period. Materials are then transplanted into SuperCells™ and moved into bottom-heated, gutter-connect structures. Materials are held in these structures for an average of 12 weeks. Herbaceous materials (graminoid and forb) are moved “as is” to cold frames. Woody materials are transplanted to 1-qt (1-l) containers and moved to cold frames. Cold frames are covered with double layer polyethylene during the winter or shadecloth and insect netting to facilitate interstate certification and transport during spring, summer, and fall. Heaters are used within the cold frames to maintain winter temperatures above 38 °F (3 °C). After 1 year as 1-qt materials, woody plants are transplanted to 1- and 5-gal (4- and 19-l) containers, depending on market demand, and then moved to a container nursery.

Additional Considerations _____

For many applications, RMNP prefers to utilize 1-qt (1-l) materials in preference to 1-gal (4-l) materials, since the 1-qt materials cost approximately 50% less than 1-gal materials.

In addition, 1-qt materials are easier to handle and transport. A case of 25 1-qt containers occupies approximately 2 ft² (0.2 m²) versus 8 1-gal containers/2 ft². Finally, 1-qt containers have an approximately 9-in (23-cm) rooting depth versus 1-gal containers having a 6-in (15-cm) rooting depth, allowing better access to groundwater and improved erosion control. Conversely, 1-gal materials have better resistance to predation and alkalinity.

For similar reasons, RMNP prefers to use SuperCells™ over F-32 (2.25 x 2.25 x 2.25 in [6 x 6 x 6 cm]) containers. The rooting depth of the SuperCells™ is almost three times greater than the F-32 containers, allowing greater accessibility to groundwater and increased resistance to erosion. Finally, 10-in³ cells fit 98/1.5 ft² (0.14 m²) versus 2.25 containers fitting 32/1.5 ft².

RMNP prefers the darker container color of the recycled Super Cells over the traditional white or lighter colored cells. The light colored cells allow enough light transmittance to cause a greening of rhizomes and an eventual degradation of the affected roots. RMNP staff have also noticed reduced moss and liverwort problems with the darker containers. In addition, the darker containers are made from recycled plastic.