

Growing Media Trials at the Montana Conservation Seedling Nursery

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Introduction

The Montana Conservation Seedling Nursery (MCSN) in Missoula produces 750,000 container seedlings annually in containers ranging in size from 66 cm³ (4 in³) up to 61 L (16 gal) pots. The MCSN is a production facility with no research funding. When we encounter a promising idea for improving our seedlings or the efficiency of nursery operations, we rarely perform detailed tests. Our standard is a “quick and dirty test.” If initial results are promising and we can eliminate anticipated risks, we quickly go operational with the change.

Growing media is one of the largest material costs in container seedling production. Frequent price increases have motivated the MCSN to evaluate numerous growing media options. Because we do not have the ability to custom mix on site, we are limited to testing what is commercially available. For years, our standard mix consisted of 50% Sphagnum peat and 50% coarse vermiculite. This mix worked well for all our conifer production. As our species and container size options diversified, and peat and vermiculite prices increased, we began to look at other options. Our goals were to reduce growing media costs and to find the best medium for each species we produced. We evaluated the following factors when testing growing media:

- Cost including shipping;
- Texture and drainage;
- Wetting and drying characteristics;
- Plant response in the media; and
- Species suitable for the media.

Media Testing

The MCSN evaluated the following growing media mixes over the last 6 years:

- 50% Sphagnum peat, 50% coarse vermiculite (50:50 peat:vermiculite);
- 70% Sphagnum peat, 30% coarse vermiculite (70:30 peat:vermiculite);
- 75% Sphagnum peat, 25% coarse vermiculite (75:25 peat:vermiculite);
- 70% Sphagnum peat, 30% Douglas-fir sawdust, nitroform (70:30 peat:sawdust); and
- EKO Compost™ Outdoor Planting Mix (EKO Compost; Missoula, MT).

50:50 Peat:Vermiculite Mix

Advantages, Disadvantages, Current Status—The 50:50 mix has been our standard tried and true medium, so no surprises were found with the results. The medium wets and dries well, and is excellent for conifers and small containers. However, the medium dries too rapidly in deciduous production, and is too light in large containers. The 50:50 peat:vermiculite medium is excellent for growing conifers, but has become costly due to the rising cost of vermiculite and transportation costs. Use of this mix was discontinued in 2005.

70:30 and 75:25 Peat:Vermiculite Mixes

Advantages, Disadvantages, Current Status—Use of either the 70:30 or 75:25 peat:vermiculite mixes would result in a cost savings of approximately 7%. We observed no discernable changes in plant performance. These media wet and dry well, although they dry too rapidly in deciduous production, and are too light for large containers. The mixes were excellent for conifers and small containers, but both 70:30 and 75:25 peat:vermiculite mixes are costly. The 70:30 peat:vermiculite medium was used in 2005 and 2006 for all production. The 75:25 peat:vermiculite medium is currently used for all containers under 1.6 L (100 in³), and some conifer species in larger containers.

70:30 Peat:Sawdust Mix

Advantages, Disadvantages, Current Status—The 70:30 peat:sawdust mix is lower in cost, will reduce excessive growth in deciduous species, but will require changes in our fertilization program. It has caused slow growth and stunting in many conifer species, and it dries very rapidly, requiring an increase in irrigation frequency. We tested the 70:30 peat:sawdust medium on a small scale on numerous species from 2002 to 2004. We found no suitable use for this medium in our operations. Stunting and unacceptable shoot size variation was common in all conifer species. The mix was useful for reducing growth rates in fast-growing deciduous plants, but the quick drying characteristics of the medium resulted in increased irrigation costs.

EKO Compost™

Advantages, Disadvantages, Current Status—EKO Compost™ consists of composted organic matter, Sphagnum peat moss, and pumice. The cost of this medium is approximately 50% less than all other mixes. It is available locally and easy to order. The compost is very coarse, but holds water well in large containers. Unfortunately, the medium does not fill small containers well due to its coarseness, and there is a risk of contaminants and variability in the compost component. The large cost savings with this medium makes it very attractive. We use this medium in all large containers over 1.6 L (100 in³) in volume, and for hardwoods grown in 1.6 L (100 in³) containers. We have not tested the EKO Compost™ medium in smaller containers because of concerns with disease and drainage, especially for conifers.

Conclusions

The Montana Conservation Seedling Nursery currently uses a growing medium of 75% Sphagnum peat moss and 25% coarse vermiculite for all seedling production in containers smaller than 1.6 L (100 in³) in volume. We use EKO Compost™ Outdoor Planting Mix for containers with a volume of 1.6 L (100 in³) or greater, except for selected conifer species. Growing medium with a sawdust component has not worked in our operation, and no further testing is planned. Future testing will focus on using 100% Sphagnum peat moss in our small container sizes.