Minnesota State Forest Nursery

Bareroot Seedling Production

Kristina Somes | Nursery Supervisor

January 27, 2021
Located 10 miles South of Akeley, Hubbard County

• 150 Acres, roughly 75% in production
• Bareroot and seed extraction facility
• Grow conifers and hardwoods
• Produce 3-6 million shippable seedlings annually
• Process 500-1,500 lbs of seed annually
• Seed Collection
• Seed Processing
• Planting
• Amendments
• Harvesting
• Questions
Collecting Cones/Acorns

• Scout early and often

• Know the characteristics of a good crop (flowering, conelets, reproductive cycle)

• Collect when ripe, not too soon, not too late.
Storage

Conifers

• Processed seed can store under proper conditions for many years!

Hardwood Acorns

• Less forgiving, typically need to be planted right away
Next Step...Planting
Seeding Rates Conifers vs. Acorns

<table>
<thead>
<tr>
<th>Question</th>
<th>Value</th>
<th>Calculated quantity of seeds needed</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many plants are to be produced?</td>
<td>200,000</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>How many years of production is this?</td>
<td>3</td>
<td>200,000 x 3</td>
<td>600,000</td>
</tr>
<tr>
<td>What is the ratio of seedlings to viable seeds?</td>
<td>80%</td>
<td>600,000 - 0.8</td>
<td>750,000</td>
</tr>
<tr>
<td>What is the viability of the seeds?</td>
<td>80%</td>
<td>750,000 - 0.8</td>
<td>937,500</td>
</tr>
<tr>
<td>How many seeds are there per unit weight*?</td>
<td>99,000</td>
<td>937,500 - 99,000</td>
<td>9.5 kg</td>
</tr>
<tr>
<td>What is the purity?</td>
<td>95%</td>
<td>9.5 + 0.95</td>
<td>10 kg</td>
</tr>
<tr>
<td>What volume of the “raw collection unit” (that is, seeds, fruits, or cones) must be collected to obtain the desired weight* of pure seeds?</td>
<td>0.8 kg/hl</td>
<td>10 kg x 0.8 kg/hl</td>
<td>12.5 hl</td>
</tr>
</tbody>
</table>

Is there sufficient capacity for post-harvest storage & timely conditioning for the desired volume of seeds?

* Weight in kilograms (kg) or pounds (lb).
• ACORNS
  • 4-5 bushels per 600 ft bed
  • Anticipate 12-15,000 seedlings

• WHITE PINE
  • 4-5 lbs per bed (25-30K seed/lb)
  • Anticipate 40-50,000 seedlings
Fall vs. Spring Seeding

- When do you want to harvest?
- Does your seed need to stratify?
- Water resources
- Age class
Pre-Emergent Application
Hydro-Mulch
Soil Amendments

• Soil Test!!!

• Know the signs and pay attention
  • Yellowing (often nitrogen)
  • Purpling (often phosphorus)

Fertilizer

• NPK (17-17-17) early spring
• ESN (time release)
• DAP (18-46-0)
• Ammonium Sulfate (21-0-0-24S)
• Fungicide Applications
• Ensign 720 (Chlorothalonil)
• Fitness (Propiconazole)
• T-Methyl 4.5F (Norway Pine)
• Insecticides
• Post Emergent Herbicide
• Fumigation/Soil Sterilizer
Mechanical Control
Seedling Harvesting
Why did the pine tree get in trouble? Because it was being knotty!
Thank You!

Kristina Somes, Nursery Supervisor
Kristina.Somes@state.mn.us
218-652-2385 x222
The Minnesota DNR prohibits discrimination in its programs and services based on race, color, creed, religion, national origin, sex, public assistance status, age, sexual orientation or disability. Persons with disabilities may request reasonable modifications to access or participate in DNR programs and services by contacting the DNR ADA Title II Coordinator at info.dnr@state.mn.us or 651-296-6157. Discrimination inquiries should be sent to Minnesota DNR, 500 Lafayette Road, St. Paul, MN 55155-4049; or Office of Civil Rights, U.S. Department of the Interior, 1849 C. Street NW, Washington, D.C. 20240.

©2017, State of Minnesota, Department of Natural Resources