

RECENT DEVELOPMENTS AT MT. SOPRIS TREE NURSERY

John R. Scholtes
Nurseryman, Mt. Sopris Tree Nursery
Region 2, US Forest Service
Carbondale, Colorado

Mt. Sopris Nursery is experiencing some of the same production stresses that many other Forest Nurseries are presently experiencing. We are involved in the same catchup or "plant the backlog" program that most of the other U.S. Forest Service Nurserymen are dealing with.

This year we sowed for production of 10.5 MM bareroot trees. It does not appear likely that this production level will drop for the next 10 years or so. In addition, we have added a greenhouse and shadehouse to the Nursery. We have just completed the greenhouse phase of our first container crop. This is a crop of over 450 M Engelmann Spruce. These were grown in 10 cu. in. Ray Leach cells. We have sown for a second crop of 443 M Engelmann Spruce and will sow for 460 M lodgepole pine in September. These will be grown in 6 cu. in. Ray Leach cells.

The bareroot operation is both demanding and challenging. We are working on some much needed changes, studies and trials. We are making plans to convert the Skinner oscillator system to an impact head type system. We are planning container vs bareroot out planting trials. Other problems include, soil fertility, PH buffering, seeding, moisture monitoring, winter protection, bird protection and many other perpetual problems will continue to challenge us at Mt. Sopris. I hope that we can report on successful results of a number of ideas we will try on these problems in the future.

At this meeting, I wish to focus on the equipment that we used to sow the greenhouse. Our equipment is simple and economical to buy and in some cases build; yet we have had excellent results with the system we have put together.

Our greenhouse was purchased from Nexus Corp. It is a gable roof house composed of gables. We have 12,600 sq. ft. This is all in one cell without dividing walls between gables. We have 9,240 sq. ft. of bench area.

The shadehouse is of the same construction as the greenhouse so far as the skelatonal frame. It is covered with well weathered snowfence.

Our potting mix is a near 50% peat, 50% vermiculite, mix. We specify sphagnum peat moss with a 4.5 or lower PH. Our vermiculite is a coarse grade sold by GSA as an insulation. I can not give you a commercial grade other than that it is about 3/16" minus material. We are presently using a rented cement truck as a mixer. Our recipe is 12 six cu. ft. bags of compressed peat, 24 four cu. ft. bags of vermiculite and 100 gallons of water. Because the mix comes out slightly moist, we have not experienced any problems with wetting the mix after sowing.

We are elevating the mix onto our filling table with a flat chain elevator we had on hand. Since a very small headhouse was constructed, we are using our packing shed for the filling operation. The plan was to save construction dollars and utilize existing buildings. This sounds great, but the material handling problems created have proved it to be penny wise and dollar foolish.

The main feature I wish to present is our filling table. Because of time limitations and lengthy procurement problems, we were forced to design our own homemade device. This consists of a bin for mix and space for four persons to work. Trays are placed down into an opening and set on a spring suspended shelf. The shelf is jarred up and down by a cam shaft located below it. Power to the cam is provided by an electric motor and gear reduction box which is designed to drive the cam at about 150 RPM.

Templates are used to restrict the mix to the top surface of the cells and lessen spillage. Three to four workers provided ample numbers of filled well tamped trays to supply our operation. We have averaged 128 trays or over 25 M pine cells and 99 trays or 9.5 M super cells per hour. This allows filling our greenhouse in less than five days with a 12-13 person crew.

We also built a tamper of dowels glued to a plywood sheet to press the mix down and allow seeding and gritting room on top the mix.

We use different tools for the super cells. The template was cut to provide individual openings for each of the 98 cells in the super cell tray. And of course, the dowel board press is constructed with larger dowels and wider spacing.

Seeding is accomplished with three shutterbox type seeders. Seeds are placed on the face of the seeder and drop into holes in a slide. These holes are designed to hold the desired amount of seeds per cell. Then the seeder is placed over the tray and the slide is moved to align the filled holes with larger holes beneath and the seeds drop into the cells. We found that two seeders limited our first loading operation so we went to three seeders to keep up with the three to four fillers.

Another development we have achieved is mechanizing the gritting operation. We cover with #2 perlite. We started with running a Scotts spreader on a track over top of the trays. This proved to be a slow arduous task. So we set the spreader in a frame and motorized it with an electric motor. We used a 50:1 gear reduction box to slow the machine down to proper speed. Trays are pushed under the unit on a roller conveyer at the speed required to give the depth of grit desired.

Next is our automated transport system to the greenhouse. We could maybe improve on this "Cushman-pallet" system, but actually it worked quite well. The trays or "Cushmaned" directly into the greenhouse and to the awaiting table loading crew. Between Cushman loads, this crew sets up more tables and touches up the grit by hand as needed.

Tables are 7' wide and 18-20 ft. long. We leave one center isle across the house. Our isles are 18" wide.

As you can see, the first crop was very successful. The tops average 8-10 inches high, which is really a couple inches more than we would have preferred. Stem caliper is good and we have numerous lateral branches developing. This crop is planned for planting yet this fall on the Routt, San Juan, and Arapahoe-Roosevelt N.F. Root development has advanced so that the rootball remains intact when removed from the container. The plants are now setting terminal buds.

We will keep the grand daddy of the first crop at the Nursery. It is now 16" tall.