

# POTLATCH BEGINS CONTAINER PRODUCTION AT LEWISTON, IDAHO

Daniel L. Miller  
Research Forester

Richard M. Schaefer III  
Seedling Production Supervisor  
Potlatch Corporation  
Lewiston, Idaho

## I. Operational Activities

A recent survey of our timberlands in Idaho indicates that during the next twelve years we must plant 28,000 acres. This program will result in the restocking of a backlog of problem areas as well as insuring regeneration on areas that are scheduled for logging. To accomplish this we will need 20 million high quality seedlings during this twelve year period followed by an annual requirement of about 3.5 million seedlings. After carefully examining our alternatives, we decided that we should grow our own trees to insure quality stock and proper coordination between the nursery, site preparation activities and the planting operation.

Since our final operation would be small; 3.5 million trees annually, a container nursery was an economically viable alternative. This combined with the flexibility of a one year growth cycle caused us to select greenhouses instead of a bare-root facility.

The greenhouse is located at Lewiston, Idaho on the south bank of the Clearwater River. The elevation is 750' above sea level with hot summers and a dry climate. The complex is composed of three 41' x 108' houses connected by two 21' x 108' shade bays. Two of these houses have totally controlled environments, and the other house is semi-controlled. Since little information or experience was available concerning the type of house we needed, we built both types to determine which best fits our needs.

It has been reported that inland varieties require photoperiod lighting to maintain height growth. To evaluate this, one half of one fully controlled house and half of the semi-controlled house is equipped with photoperiod lights. These provide 40 foot-candles at tree height and are on 30 seconds and off 3 minutes during the night. Lights are switched by a photo cell to come on when outside light intensity drops below 30f-c. To obtain 40f-c we used 300 watt reflector flood lamps mounted 6 feet above the trees spaced on a 7 x 7 foot grid. The outside fixtures are 3 feet from the walls. This spacing provides over 80f-c under the lamps but light intensity between lamps drops to 40f-c. One fourth of one fully controlled house is equipped with 1000 watt high pressure sodium fixtures mounted on a 7 x 9 foot spacing six feet above the seedlings. This arrangement provides 2000-4000f-c at tree height. These lights will be used to evaluate winter crop production techniques.

Producing trees in these various structures with their different types of

environmental control will provide the data and experience base for decisions concerning the type of house to be constructed during future expansion. Our goal is to grow the best trees utilizing the lowest cost structures or combinations of structures appropriate to our regeneration needs and the restrictions of our Lewiston climate.

Our present facility will accommodate from 700 M - 1 million trees, depending on the container used. Future expansion will bring production up to approximately 4 million tree/year.

After much deliberation, we selected the styro-block containers utilizing the quarter block system developed by Phil Hahn.<sup>1/</sup> of this system include easy greenhouse handling and rapid field planting with the backpack system. Also, good root insulation keeps roots cool during the growing cycle and helps prevent freezing during winter storage. The system is not without drawbacks however. The blocks must be filled with plantable seedlings when shipped to the field. This means that seed germination must be high and losses to disease and other factors low.

Our sowing line uses filling and tamping equipment produced by the Plant-a-Plug company. We seed with plexiglass shutter boxes. We developed our own grit spreader using a vibrating feeder that produces an even flow of grit off the table edge and onto moving blocks. After sowing, blocks are loaded directly onto bench tops which serve as pallets and are transported to the houses by lift truck.

The tops are spotted on sawhorses with rollers attached to them. This method has allowed us to leave only an aisle along both walls and one down the center. The tables butt together without aisles between them. When access for thinning or disease control is needed, the tables are rolled on the sawhorses, opening a 20" aisle. Using this method, we can start at one end of the house and, by moving one bench at a time, we can work completely through the house. Eighty-four percent of the floor space is utilized by the benches as opposed to sixty-four percent if we leave 18" aisles between benches. However, since we allowed extra space between blocks for air circulation, only 73 percent of the floor space is occupied by container blocks.

We are currently growing white pine in the size 8 container, douglas-fir in the 2 and 4 container and ponderosa pine in the size 8 container. Current production is approximately 350,000.

## II. Research Activities

We are currently growing trees under several growth regimes to try to overcome early bud set without the use of photoperiod lighting. If we can maintain height growth with high nitrogen fertilizer treatments and low moisture stress, we can eliminate the need for photoperiod lights. This will reduce the cost of future houses.

---

<sup>1/</sup> Hahn, Philip F. Mechanical handling and growing seedlings in a quarter block system.

We are also growing white pine, ponderosa pine, and douglas-fir in Plant-a-Plug 2, 4, and 8 and Styro-7 containers. These seedlings will be planted to test field survival and growth as influenced by container size. These data will permit us to select the economically optimum container by comparing production costs with field survival.