SOWING DATES AND RATES AND THEIR EFFECT ON PRODUCTION OF STOCK

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Sowing rates and dates control many factors relative to size and type of trees desired. First of all a nurseryman must determine what kind of tree is desired. If a nursery is new, experimental sowing rates must be made to determine which sowing rate gives the desired stock. In addition to desired size and type of stock, some consideration must be given to what rate can be used to obtain an economical nursery stand. A seed bed that has too low a density probably will not give the desired stock; in addition, the cost of care for these trees on a per tree basis is much higher. Likewise, when a seed bed density is too high, you will not obtain the stock desired; and expensive thinning may be necessary.

There are many different ways that the sowing rates can be calculated. When we plan to ship 100 M trees, we know we must sow for more than 100 M because we are going to grade out a percent of the trees that grow to shippable age. Some nurseries have a. grade out factor that will be considerably higher than others. The grade out factor must be determined by the nurseryman before any sowing rate can be calculated. The next determination the nurseryman must make is the difference between field emergency and the laboratory germination tests. Field emergence will usually be 10% to 15% below the laboratory germination tests. Occasionally field emergence will equal laboratory tests. For example: this past spring one of our seed lots that was ten years old had a laboratory test of 67%. Because the seed was old we added an additional 5% loss factor. When the seed germinated in the field, it actually had a germination percent of 71%. As a result of the added loss factor and actual germination being higher than the laboratory test, the seed bed density was too high and the seed beds had to be thinned. Losses after emergence usually vary between 5% and 10%, but at some nurseries they may run much higher.

Sowing Rate Formula Used At Wind River Nursery

Planned production x (Gradeout % i Planned Prod. %) = Sowing Schedule

(100 M) (15% 100%) = 115 M

No. seed per lb. x purity x germ test = Viable seed per lb.

(43560) x (98% x 81%) = ($3^4$577)

Viable seeds per lb. x (Field emergence -- losses) = Trees per lb. of seed

(34577) x (85% - 10%) = (25932)

Sowing schedule Trees per lb. of seed = lbs. seed to sow

(115 M) (25932) = 4.43 lbs. seed to sow

Sowing dates like sowing rates greatly influence the type and kind of tree desired. Western white pine when sown in the fall not only gives much better germination than when stratified and sown in the spring, but also it will be much larger. Some Douglas fir such as that from seed sources east of the Cascades will be much larger when sown in the fall. When sown in the spring, it is difficult to make eastside Douglas fir break bud the second time; but when sown in the fall, it can be made to break bud and grow another 2 inches.

If a nursery is located where the growing season is short, advantage must be taken of all the season. To make use of all the growing period available, sowing must be done as early in the spring as danger of freezing is over. At the short season, nursery sowing dates will probably determine whether or not the seedling will make a second growth. When sowing has not been done early, the stock will still be growing when the early frost strikes in the fall. Where the growing season is longer, early spring sowing is not as critical. However, even here early spring sowing will eliminate frost damage when the occasional early fall frost strikes.

On the west coast the trend is toward much larger nursery stock than previously. In order to produce larger stock, the Nurseryman must utilize all the tools available to him. Two of the most important are sowing dates and rates. By selecting sowing rates a great deal can be done in controlling size and type of stock produced. Choice of sowing dates will assist in controlling size and type of stock, and will also eliminate possible frost damage.

In summary, there are three questions a nurseryman must answer:

1. What kind and type of stock is desired?

2. What sowing rates and dates in combination with other practices will give the desired stock?

3. Will sowing rates, dates and other practices fall within economic management of the nursery?

II. Panel Discussion of New Nursery Equipment and Processes

A. Mr. John Ellis, Colorado State Forest Service, Panel Chairman. Subject: Potted Seedlings for Fain and Forest.

Mr. Ellis presented his topic with slides with the statement that the Colorado State Forest Service has been potting seedlings for five years. This is a new method or new procedure for insuring survival of difficult sites; such as places where there is a low rainfall of 12 to 13 inches annually. The process of potting is 30 to 40 years old. This process uses eight women and two men. The rate of production is approximately per day. We have an overhead irrigation system and we spray the pots once every 3 weeks. We handle bare root and potted stock.

1. Mr. Ellis was asked if the roots were placed by hand or by machine, and if root damage occurred from use of the machine as opposed to when it was done by hand. Mr. Ellis answered that it was done by a hand-operated machine by a single person, and there was no significant root damage.

2. Mr. Ellis was asked if there was anything better than tar paper for potting trees. He explained that tar paper impregnated with aluminum foil gives better growth and survival.

B. Mr. Homer S. Ward, L. T. Webster State Forest Nursery, Olympia, Washington. Subject: Nursery Equipment and Processes.

   1. Mr. Baldwin asked if the tractor pulling his tree transplanter had a plugged carburetor due to the slow speeds. Mr. Ward said that he did have but it was discontinued. With that carburetor they could get their speed down to about 12 feet per minute.

C. Mr. G. Tyson and Mr. R. Rollins of the Tree Nursery at Indianhead, Saskatchewan, Canada substituted for Mr. H. Clark and showed colored slides of their nursery and answered various questions relating to the equipment shown on the slides.