Grading of Stock for Transplanting and Field Planting

By F. W. Deffenbacher

Why Grade Trees?

Let's look at tree grading from two approaches: survival and economics. These are two distinctly different things to consider when grading trees yet are very closely related.

Survival of trees after they leave the nursery is a must if nurseries are to continue to fulfill their vital function. The nurseries must produce a tree that will grow after it is planted in the field. After the nurseries have produced the tree that will grow then comes proper planting. However, until nurseries have produced this tree they should not cry poor planting. To do this the nurseries must eliminate all potential losses possible. If there is any question about a tree surviving after field planting it should be discarded at the nursery.

A tree that has been injured in any way-either to top or roots- should not be packed for shipment. An injured tree must recover from the shock of the injury as well as the shock of planting. This often is more than the tree can do. Even though the injury is very small, the tree should be discarded.

Just as important as discarding the injured tree is discarding the underdeveloped or poorly developed tree. The tree that does not develop in the seedbed in all probability will always be an inferior

tree. A tree that cannot withstand the competition **in** the seedbed under ideal conditions certainly cannot after being planted in the plantation. Whether environment or some inherent characteristic causes improper development makes no difference. The tree that does not develop should be graded out at the nursery. The planting of deformed or poorly developed trees is analogous to •a farmer raising deformed or poorly developed produce for market.

It is felt by most nurserymen there are a number of trees shipped that should be graded out. These are the trees for which no grading standard exists.. For example: two trees of the same species and source handled in identical manner-one lives, the other does not. The one that does not **live is** the one the nurseryman would like to be able to recognize and grade out prior to field planting. As far as I know there is no known indicator for these trees.

To set up a hard and fast set of tree grading standards to be used at all nurseries would be a fallacy. For. example, Douglas-fir from different sources responds quite differently when grown under the same conditions. Also one source might produce a better tree in two years than another in three years. The standards for one source might cull out the entire lot of another. The standards for a nursery with a very long growing season should differ considerably from one with a short season. I feel each species and source should have its own grading standards. This system of grading is more difficult to administer, but if it will produce better trees in the plantation, a nurseryman should not hesitate to use it. I feel the nurserymen with the assistance of the planting men should develop the standards for each species and source each year. Items to be considered by the group setting up grading-standards are as follows:

Root development **and** Form

2. Top development and Form

3. Root -4.Top Ratio

Caliper desired by planting men•

5. Injuries

The economics of tree grading must also be.. considered. We all know we cannot throw away 95 percent of the trees we produce and still have it economically feasible to plant trees. The average cost of trees grown at the nurseries is about one cent per tree. 'This includes present grade out.. It costs about five cents per tree to plant in the field. The total cost for planting is about $40.00 per acre. The cost per-living tree in a plantation with 60 percent survival would be 9.66 cents.

If by increasing the grade out, survival could be increased, at what point must grade out stop? By increasing present grade out 'standards by 20 percent, tree cost bat the nursery would be 1.25 cents

per tree. If the increased grading would boost survival by 5 percent, over-all cost per living tree would be less.

In summary, I would like to say that throwing away a few more trees at the nursery may be a good investment.

Discussion on Precedings Panel

Question: "Have you tried transplanting your culls, and if you have, what, are the results?"

Reply "No, we haven't."

Comment by Longo "I go along with that. We tried to transplant some culls a year ago last spring and they ended up as 2-1 culls."

Coonrod: "In Region 4, this year, we had 231,000 2-1's that we asked Region 6 to transplant again because they're short on trees."

Thompson: "What we didn't bring out was the uniformity of size. You might grade the size but have two different sizes. It would be much greater help to the man planting those trees if they were all uniform, rather than have jumbos in with regular stock or small ones with regular stock.

"I think the economy of making two grades can be ruled out as general practice, because with two grades of trees you not only increase the cost of grading, but you also have this problem of a given size bundle or package. Those trees are not going to get the care that the ones do that are going through the grading operations faster. I'm very much against two particular grades among a lot of trees."

Deffenbacher: "If you are machine planting, you're going to get a wide variety in survival. There's a different depth of planting in your machine with a small tree than with a large tree when you've got them in the same bundle."

Thompson: "The thing that's particularly important in machine planting-- I wonder if our friend from the South could tell of experience down there."

Barber: "The effort in the South is to get uniform seedlings **in** the nursery. I think our seedling uniformity is such that we can work right along. You watch a man with a machine as he comes along to little seedlings missed on the grading table and he'll flip it over his shoulder go on to the next one and keep going."

Rindt: "I believe that is the crux of the whole thing; it's the subject of this panel discussion. One of the jobs of the nurserymen in raising good trees is to not only raise good stock but uniform stock to get away from these evils. I'd like to reassure Mel on some of these trans-plants too, that very often a grade out as to size is not necessarily a cull. For instance, I know what your standards are for size. You

want exceptionally large trees, and on the .strength of the cull, they wouldn't be culled as undesirables, but you can hold them over longer periods in the nursery."

Coonrod "We knew that you were culling those out simply because they don't have the standards that you do have on root length. We knew that was the kind you were transplanting for us. They were not strictly culls but did not come up to our standards."

McDaniel: "I would like to say that in our rehabilitation program in Oregon we're sorting ourtrees, that is, Douglas-fir, to a 5-inch minimum with a good root and a good caliper and anything above that goes into our bundle. Then we keep what we call runts from 3 to 5 inches, which Frosty and I were discussing at noon hour. They also are planted in their respective areas.

"They try to choose fair sites for them, but I think the planting chief in our Tillamook burned area is just about ready to throw out the runts as we call them. Now, if that tree were transplanted, and we had a market for it, with Christmas tree buyers that would buy. Douglas-fir, we might see a potential there. But I know I and also the field planning force in the Tillamook Burn are in favor of throwing them away and of maintaining a minimum height of five inches and over, plus a good caliper for diameter on the five-inch minimum stocks."

Comment

"Well Vern, as I understand it, 'you're making one bale five inches and over. It may be five inches or it may be eleven inches."

McDaniel: "Right. We pack from three to five inches in another bale. By the time you get that bale packed, it looks like you've packed a bunch of 1-0's. The trees that were packed as of last year were beautiful trees, if I do say it, and the average was around nine inches.

"The results in the field are very outstanding. Those larger trees take right off and the other ones just mope along. They seem to be more susceptible to rabbits and deer damage. In a lot of ways they're just not responding like the larger trees. So I think some of you fellows who had visits from the German foresters know that some of them are real cranks when it comes to really sorting trees. One of them gave me the devil when I told him what we were doing,. and he said,'You know we transplant and then we throw away 30 percent of our transplants. But we're getting the survival in the field, and I think the time is coming when we're going to sort more heavily. "It's just as Long said. We're coming to thinner plantings, from the 15 to 20 Douglas-fir per linear foot or probably 35 to 40 per square foot. We're making more uniform tree grades. While I'm on my feet--I don't want to take my panel's time--but I'd like to state that we're starting a process, another program of two forms of root pruning; and have with me three or four blueprint diagrams of our lateral root pruner. It will be here so

that you can see it. We're figuring this year that we'll do our lateral root pruning first as of next spring and then our horizontal root pruning next. What we're trying to do is build a more compact, denser root system in about a six-inch rectangular area and we hope this works out."

Lyle Hojem: "If I might add one more point--Walt and Carl are talking about the buyer's end of the nursery production. They're talking about the man planting on the planting machine. He needs two different kinds of trees in a separate bale and we all know Douglas-fir does not grow quite uniform there's considerable variance in the see sources. So is it feasible in the nursery to bale two different sizes of good trees, or is it not? I think that's the question Carl and Walt had in mind."

Lyle Baker: "I'd like to add something to that which might help. Vie have found that in trying to sort the seedlings in the nursery that way, in two sizes, it increases the cost by about one-third more. You have an additional cost of running across the table to sort. Also, in line with these transplants, last year when we graded some of the Forest Service stock, the smaller stock, although it didn't come up to the grade that was specified, we re-ran that and took out what we thought was cull, that is, the crooked stem ones and the trees that had stripped roots, etc. We threw them out in the second sorting process and transplanted the ones that were under specifications and I think that a transplant of that type will come up to the caliper of the older stock, in one year. I think the trees that we have now that were transplanted that way would indicate that. In one year of transplanting they will continue to grow and get just as big caliper as the other ones."

Don Baldwin: "Root pruning was mentioned here. What does the panel think of root pruning?"

Coonrod: "In Region 4 we don't do any of it, unless there are long stragglers when we cut them off."

Deffenbacher: "We prune all our 1-0 stock just before it starts the second year growth. Also, anything we are going to hold for 3-0, we prune again."

A considerable amount of discussion on root pruning followed.

Tremblay: "I hate to mention fertilizer again but you know, in agricultural crops, when we band fertilizer in a band with row crops, the roots proliferate around that banding. So there's a possibility of getting these roots proliferated in a certain area by banding them with the fertilizer."

Lyle Hojem: "We've been banding with our liquid fertilizer, but so far we haven't noticed any significant results."

There was further discussion regarding fertilizer banding.

Carl Larquist: "In R-5 we root prune our ponderosa pine at the end. of the first growing season. Then we, prune off only the tap root and lift them. We don't root prune any of the roots that are .left. We try to keep all of them. We hadn't been doing that before, but we found out it's an excellent idea to leave all of the lateral. roots you can and put them in the hole as tight as you can, because the moisture in California is very limited and it takes a lot of roots to pick it up."

Charlie Rindt to Coonrod:

"All the stuff that's transplanted for R-4 that's 2-1 is root pruned at the time of transplanting. The only thing we don't do for you is root prune it after it is lifted."

Coonrod: "It is all root pruned in the bed?"

Rindt: "Yes, your stuff is root pruned in the bed."

Jack Long: "I think it **is** important for nurserymen to inspect planthg jobs after mortality isshowing up, and by examining the dead trees determine whether the tree should have been culled or not, or why."

Coonrod: "We've had trouble **in** the past with trees coming loose in the bundles and drying out during the truck haul. We cull them at the time of planting. We haven't had any such trouble lately."

DeJarnette: "Have you any other questions? If not, before we close this out, I'd like to add a planting man's idea to the effect that I do believe we cannot afford to try to save :all the trees for field planting. There were some good points made in that direction."