FIELD PLANTING CF HEMLOCK IN JIFFY - 7 POTS

by

J. M. Finnis
Silviculturist, Department of Natural Resources
Olympia, Washington

Let us consider some of the steps prior to the actual planting operation. The processes which someone goes through before the planter gets to work. These cover the following points:

1. Why hemlock?
2. What size of tree?
3. The nursery's part - producing the tree.
4. The district's part - planting the tree.
5. Care and maintenance of the plantation.

Let us briefly consider these items one by one.

1. Why hemlock? The bulk of our reforestation activities in the past have been concerned with reforesting clear cut and burn operations in the Douglas-fir region and we planted Douglas-fir. A check of the past production records of any nursery west of the Cascades will show that virtually all the production was Douglas-fir. That is, production for the westside; some westside nurseries produced ponderosa pine for the eastside. Now we are starting to pay more attention to the neglected brush covered lands and here hemlock has a place in our rehabilitation areas.

   Whether we scarify or use herbicides or both, we will have a vegetation problem and an animal damage problem. And in my estimation, the animal damage problem is the most serious and the one furthest away from solution.

   So if we want a more tolerant species because of the vegetation problem, hemlock looks like the answer. Grand fir and Sitka spruce are subject to the balsam woolly aphid, Chermes piceae and tip weevil Pissodes sitchensis respectively. Also hemlock will out-produce fir, volume wise, on a short rotation, and if in the future, our main concern is fiber production, then hemlock is in a strong position. Finally, and this is unsubstantiated by facts and figures, hemlock seems to be less severely browsed than fir.

   So it can be seen that there is a strong case for using more and more hemlock in our reforestation programs.

2. Our previous planting experience with hemlock has been pretty meager and not too happy. I think part of this has been our fault in that we have tried to plant hemlock in the wrong place - often Douglas-fir clear cuts. Our limited experience has shown that acceptable survival

can be obtained where hemlock is planted in areas with some shade which may be live or dead shade. We have not been too happy with 2-0 seedlings and feel that a larger tree is required. In a test carried out with transplants during the winter of 1966-67, we had over 95 survival and this was in a year like 1967. We ascribe ors: success to good quality stock, properly handled and planted in the correct environment.

So we decided that a transplant was what we wanted. Right away this increases the cost very considerably - one extra year in the nursery plus transplanting costs.

At the other end of the size scale we have container planting. Interest in container planting has been hot and cold for years. it probably received its biggest boost from Jack Walters with his bullets. We tended to dismiss container planting as we were thinking almost entirely in terms of Douglas-fir and of bigger, not smaller, trees. Within the State, Jim Dick and Bob Strand have worked with container planting and kept interest alive.

Last year, "Rod" Ward raised several thousand hemlock seedlings in Jiffy-7 pots and during the winter we outplanted these in five locations. We will discuss this in detail later on but at present we are interested in the two extremes as regards to tree size.

1. Transplants

2. Container grown seedlings

This coning winter we plan on planting both types of seedlings on a number of areas to got a side by side comparison. So, at present, we have no answer to the question, "What size?"

3. The nursery's part - producing the tree. I will say little about this phase - the nurserymen have me outnumbered. Suffice it to say that raising hemlock presents problems. The organic content of the soil, the shade and moisture requirements all require special techniques. So if we require transplants in any quantity, we have to understand what this request involves. I am told that many of the sowing problems have been overcome. There are two principal methods of providing the necessary shade, side boards and shade frames or a saran screen !'tout." Extra watering is required and all of these items add up to extra cost. Mention has already been made of the transplanting. There are no special problems regarding transplanting hemlock which makes it any different from fir. The third year in the nursery is not only an additional cost but it puts more strain on the everpresent demand for nursery space - this may be an even more important consideration than cost.

The raising of seedlings in a container, such as the Jiffy-7 pot, presents a completely different set of conditions. Because we have only been raising a few thousand so far, we have done this the hard way - by hand. But I am sure that if we were ever to get into regular production, we are ingenious enough to come up with an efficient assembly line system. We have been putting three seeds in each

pot, hoping to end up with one. Sometimes we get none, sometimes too many. This is probably the largest problem and the one which least lends itself to mechanization. The almost negligible demand for nursery space is an appealing aspect as is the fact that the seedlings are only around for six to nine months.

Private companies and public agencies in Alberta and Ontario are now raising millions of seedlings annually in containers. These are bullets and tubes. So I am sure that there is plenty of knowledge available on the techniques of raising seedlings in containers.

4. The district's part - planting the tree. The traditional way of transporting trees from the nursery to the planting site has been in bales or bags. These are broken on the planting site and each planter carries his trees in a planting bag. The Jiffy-7 pots were on cone-drying screens, about 700 per screen, and the question was - how do we go from here? We put two screens of seedlings in the back of a carry-all and transported them without any additional handling. On arrival at the planting site, we filled planting bags with Jiffy pots. We found they stood up to the handling very well with no adverse effect. Should we go into production, I think we could use shallow cardboard boxes holding 500 Jiffy-7 pots. The seedlings could be kept in these boxes for several weeks provided the pots were not allowed to dry out which is unlikely in the areas where the pots would be used. The great advantage of the Jiffy-7 pot is that they hold together and can be handled in the field. The other Jiffy pots made of compressed peat do not hold together and I have heard reports of seedlings grown in bullets and tubes that fell out in transportation or when handled. We handled and planted frozen Jiffy-7 pots and the survival was unaffected.

Having got the pots to tho planting site, the next question is how to plant them. We made one decision when we started and have found no reason to alter it since. That was, that scalping is required. We found an adze hoe best for scalping. We tried various methods of planting the pots in the scalped area. We used a dibble and a home-made modified core sampler such as soil scientists use. We found the best method was for the scalper, after scalping his spot, to make one blow with the adze hoe across the center of the spot and loosen up the dirt and then the planter can plant the pot in the loosened earth with his fingers. This simple system worked best and no additional equipment had to be carried by the crew. We have a small auger with a gas motor called a little "one and we will try it this coming winter. I am prejudiced against it in advance as I do not fancy carrying it through the woods. Having described how we handled and planted the seedlings, let me briefly describe the types of areas in which we planted them.

1. Highland Cow. Lewis County. An area understocked with second growth and the gaps are filled with a variety of species - scrub alder, vine maple and various herbaceous species. We have taken care of the alder and vine maple with chemicals and are filling in the holes with spot planting.

2. Roundtree south. A routine clear cut. Too open and exposed for successful hemlock planting but worth the effort as a demonstration.

3. Roundtree north. Part of the same clear cut but with a good cover of salmonberry.

4. North Creek. An area with predominantly scrub alder which has been aerial sprayed and planted twice with fir. The salal and Oregon grape flourished after the alder canopy was killed and the deer eat the fir when they come through the ground vegetation. We hope that hemlock will stand the vegetative competition and browsing better than the fir.

5. Cedar Creek. A higher site than North Creek. This area was logged about 40 years ago and now has scattered second growth and an assortment of alder, cherry, big-leaf maple, vine maple, and a little hazel. This "junky" overstory was killed with chemicals and big Douglas-firstock planted. Some of it is doing well. But where the seedlings have been browsed, they are now below the herbaceous canopy and are being suppressed. We think hemlock has a place under these typical "rehab" conditions.

5. Care and maintenance of the plantation. This is really conjecture at this stage. The average height of the seedlings in July was from, 6.5 to 9.0 cm. or about 2.5 to 3.5 inches. Survival, on a random sample of 50 staked seedlings on each area ranged from *N•,* to 10Q% But by last week, August 9th, some mortality had started and some seedlings were starting to show signs of drought stress. It is really too early to predict survival. When planted under the right conditions - Roundtree south is not the right condition, Roundtree north is borderline, but the other three areas should be suitable - under these conditions the seedlings should be able to take the vegetative competition. One situation which is a worry is smothering. The seedlings are so small that a piece of bark or a limb can effectively smother them. Trampling by animals is another hazard.

But it will really be several years before we can definitely assess the results of these trials. However, we should got some leads from this year's work and we plan on testing hemlock in Jiffy-7 pots and transplant seedlings this coming winter.

In the meantime, the nurseryman had better start thinking of the challenges that will face him and how we will overcome them - as I am sure he will.

Question: Are there deeper pots available?

Answer: There is a new model, smaller and longer. It is produced in Norway and will be available in 1969.

Question: What is the cost of the pots used?

$16 per thousand.

Question: How long does it take for the roots to go through the pot?

Answer: About seven weeks.

Question: Is frost heave a problem?

Answer: They will frost heave but not badly.

Question: Did you have any problems with animal damage?

Answer: No.

Comment: One real problem in placing such a small plant in the field is that it could easily be smothered by bark falling off a stump, or by limbs falling on it, or even leaf fall. The right planting situation is important. Smothering is the biggest problem.