

# CANADIAN SILVICULTURE MAGAZINE

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SUMMER 1995

In this issue:

**Early pruning  
of Douglas Fir**

**More Swedish  
root snarls**

**Petter's 2020 vision  
for BC's forests**

plus regional silviculture  
reports from across Canada

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## ON THE COVER

Silviculture worker  
pruning a stand of trees.

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# CANADIAN SILVICULTURE MAGAZINE

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## Pruning UI and trickling stumpage

Dirk Brinkman

Lloyd Axeworthy has submitted to Cabinet a plan to change UIC in ways that will affect seasonal silviculture workers. This will change our industry. It may change it for the worse, unless it is coupled with a parallel initiative to federally fund off-season silviculture work.

The new plan will penalize frequent users of UI, and force UI recipients to more aggressively seek other jobs or retrain or lose their claim.

The silviculture industry must ensure this initiative doesn't undermine the pool of committed, experienced silviculture workers, who now rely on UI to bridge the off season where biological windows prevent year-round employment.

Now is the time for the silviculture industry to stand together in demanding the federal government take responsibility in helping to alter the seasonal work patterns of silviculture workers, without pushing them out of their careers.

The Ministry of Human Resources should enter into creative discussions with provincial governments to develop a new era of FRDA-style agreements specifically targeted to provide off-season work, such as pruning, for seasonally unemployed silviculture workers.

Previous FRDAs contributed to the volume of on-season work, loading UIC with more claimants. As well, previous FRDAs did not allow for creative long-term funding proposals. Those agreements were cost inefficient for the federal government. Especially when some of the work was done by provincial social assistance recipients, who were then shifted onto the federal dole.

However, federal funding specifically

targeting off-season work and the workers employed during the normal biological windows could be coupled with the proposed UI changes, to both reduce UI costs and improve forest management across Canada.

BC's Ministry of Forests collected stumpage of \$1.7 billion in 1994, reaching their goal of \$600 million in "Super Stumpage" for the new Crown Corporation, Forest Renewal BC. They are on the way to collecting \$1.8 billion for 1995, according to the Coast Forest and Lumber Association.

However, the "Super Stumpage" flowing from Forest Renewal BC is unlikely to increase field silviculture in this province because it is allocated based on the social or political benefits of community-based and unionized, forest-worker job creation.

At their winter 1995 conference, BC silviculture contractors were unanimous in their disagreement with this FRBC policy. They opposed the establishment of artificial trade barriers within the province, by requiring contractors to be local and by subsidizing the development of local or unionized competition.

At the conference, contractors expressed the following specific priorities:

- the avoidance of inter-regional trade barriers to ensure efficiency (e.g., restricting contractors from bidding because they are based outside a definition of a local area, despite the fact they may have worked in that area for many years)
- equal opportunity for existing contractors (as opposed to support for new contractors)
- assuring that a student workforce can

- access a share of work
- maintenance of training funding in check, i.e., no subsidies artificially sustaining inefficient make-work for identified groups

When the value-added forest sector was targeted for FRBC funding, the existing value-added industry successfully lobbied FRBC to recognize their concern over subsidies to start-up or existing companies in their industry. Somehow the business hardships of value-added manufacturing seem to be more real to FRBC than the hardships of the silviculture industry.

BC contractors do have members on each of the Land and Resources, and Community and Labour committees, representing silviculture concerns. But the fact that the silviculture industry does not agree that the purpose of "Super-Stumpage" should be to subsidize uneconomic communities and jobs seems to be difficult to communicate.

The silviculture industry has been the most efficient way to deliver silviculture interventions, and sustainable community benefits flow from this.

Fifty-two percent of Vancouver's employment depends on forest resources, according to the Forest of Alliance BC. Many silviculture workers are seasonal and from Vancouver. Forest Renewal BC and its navigators seem to miss the reality of silviculture and seasonality.

BC's silviculture industry has been assured there is enough FRBC funding for everyone and that some will soon spill over to them. We are still waiting for the "Super Stumpage" boom to trickle down into the forest. ♦



## ***Oops, CSM coneheads strike***

**Dear Editor:**

The cover photograph CSM (Spring 1995) is attractive, and appropriate for a silviculture magazine, but it is printed upside down! Anyone acquainted with seed production and reasonably observant about things silvical should know that the seed cones of the true firs remain erect throughout their development.

Furthermore, when the cones dry and then break upon maturation, the cone scales, their subtending bracts, and the winged seeds fall away from their respective cone axes, and the axes remain as erect, dead, woody structures where they were borne on the branches.

Several of these from an earlier cone crop are visible (upside down) in the background of the picture.

Incidentally, the small red-brown cones in the picture are ones that died shortly after the period when the cones were receptive to pollen, possibly in response to insects feeding around the bases of the cone axes.

Knowledge of silvical features is the underpinning of sound silviculture. Let us not convey erroneous images that suggest lack of silvical know-how!

You should, however, be comforted somewhat by knowing that you are not the first to have made such an error on the cover of a forestry publication — or

even in a "dendrology" text.

**Graham R. Powell, Professor, Faculty of Forestry and Environmental Management, University of New Brunswick**

## ***BC attitudes "interesting"***

**Dear Editor:**

On our recent trip to Vancouver, we found the varied attitudes towards root deformation very interesting, particularly the different attitudes to the stability and fungi problems associated with root deformation.

We still do not really understand why the BC MOF organization is so one-way oriented concerning new concepts for growing seedlings. The former situation here in Sweden was that the National Board of Forestry owned their own nurseries, which complicated things for them as they also had the responsibility for the observance of the silvicultural law. Now these two organizations are separated, which makes it much easier for the government to act objectively and with an open mind in questions concerning seedling types and regeneration.

The discussions concerning regeneration questions in Sweden are going high, as evidenced in *Skogs Eko*, the largest silvicultural magazine in Sweden with about 300,000 readers. The debate concerning unstable plantations has turned quite open now.

**Anders Lindstrom and Lars-Ove Sandberg, Swedish University of Agricultural Sciences**

## ***Root-form debate familiar tune***

**Dear Editor:**

Your editorial on root-form problems is interesting. Is it time to have a good look at our 1978 Symposium and decide whether we may have papered over the genuine concerns expressed by Håkon Hultén and others? Anders Lindstrom was involved then, and may at last have got our attention. How hard it is to change ideas!

What comes to mind is the Ontario reforestation establishment's efforts to continue using paperpots — in spite of frost heaving, numerous cases of root spiralling, lack of degradation of the paper and seedling instability — because:

1. it could cast a bad light on the judgement of those who chose the system;
2. it would probably be expensive to change the system;
3. statistics piled up over ten years would be meaningless; and
4. any reported failures would make the whole forest industry appear incompetent to the public.

Of course not many people use paperpots anymore. Sound familiar?

*...continued on page 6*

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## New hydraulic pruner

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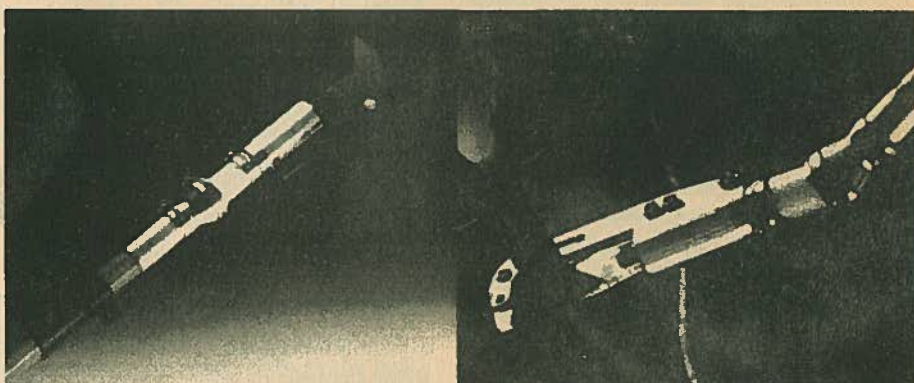
For more information, call 514-562-8872.

## Brushcutting attachments available

**M**any new trimming and cutting attachments have been added to the Stihl line in the past few years. For its gas brushcutters and trimmers, Stihl offers twelve different cutting attachments in more than 30 versions. Some of the most popular include:

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*Jonsered's hydraulic pruner gives "hand tools" a whole new meaning.*

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*Stihl offers more options for your brushcutter or trimmer.*



...continued from page 6

I'm trying not to appear too partisan to your critical eye, but I do have to say that in order to extract a seedling from a Styrofoam block or a multicell pot, you have to grow the roots to the soil-binding stage. Because containers cannot economically go to the field, extraction occurs at the nursery. Overwrapping is therefore necessary, too. Our Rootainers system extracts easily, and lets you pull a seedling before it is root-tight, although I have to admit that there is a lot of handling, and if you take a Rootainer to the field you have to bring it back, clean it and handle it once more before it is ready to use again. Nevertheless, the seedling's health is maintained right up to the moment of planting when you use Rootainers this way.

Growers prefer hard wall containers over peat plugs because they have less

difficulty keeping them moist. The extra humidity necessary in a peat plug system makes the threat of botrytis or Keithia blight more dangerous, too.

Midway in the editorial you mentioned the problem of armillaria, and here I wondered about a couple of phenomena that could cause this. One is the fact that solid wall containers are hard to fully sterilize over five years, and perhaps replacement type containers like Rootainers would work better. The other was the memory of the sound of roots being ripped out of Styrofoam blocks on a visit to Campbell River a couple of years ago when the FNABC had a meeting at Courtenay. Ripped roots and root hairs allow entry of pathogens, even if roots are wearing "rubber gloves" of mycorrhizal fungi. And Jiffy plugs have to be cut apart at the bottom.

I must mention the air pruning on slit

sides products sold by BCC and Lannen. Here again, although the roots are directed to the sides and ought to give good lateral root development, in order to extract the seedlings, you have to get plugs fully rooted and soil bound. There is also the possibility of a bonsai effect here that is of an unknown quantity. Right now, when it appears we need some really independent research, governments don't have the money. So industry will have to do it. There is a possibility since we are a member of LUSTR-Coop, that we could get some both long- and short-term work going with the people at Lakehead University.

Keep up the good work. Ideas have to change. Otherwise the sun would still be going around the earth.

**Henry A. Spencer, President & General Manager, Spencer-Lemaire Industries Ltd.**

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## Scientific Panel Report "turning forestry on its head"

The Clayoquot Sound Scientific Panel has released three final reports with 127 recommendations. According to panel chair Dr. Fred Bunnell, they're "turning forestry on its head." One report notes that, despite changes to the size of cutblocks, "major impacts of clearcutting and associated road construction remain." The panel recommends changing to "variable-retention silviculture systems."

Other recommendations include:

- "a shift in both planning and implementing harvesting— from a focus on the trees removed during harvesting to those retained"
- "designating the entire hydrosiparian zone as a special management zone"
- "with sensitive areas, implement high levels of retention— at least 70%"
- "forest reserves, based on credible biological and physical criteria, are designated at the watershed level before the delineation of harvestable areas"

The "blue-ribbon" panel was set up by the BC government in 1993 to review existing forest practices in Clayoquot Sound and recommend changes to ensure they are sustainable. BC Forests

Minister Andrew Petter has committed his government to a "fast review" of the recommendations and to "announce an action plan shortly." Environmental groups such as Greenpeace have praised the report but warned "without immediate implementation of the Panel's recommendations, the industry should expect further contract suspensions and cancellations." The reports are available from BC's MOF.

## Soil matters as carbon sink

The National Research Council reports that "the organic matter of prairie soils has decreased by nearly 50% in the less than 100 years they have been under cultivation. A reversal of this trend is required in order for prairie soils to maintain their productivity."

According to Dr. Brian Fowler at the University of Saskatchewan, "Recent evidence suggests that the organic matter increase associated with reduced tillage and extended rotations could provide an important sink for greenhouse gases such as CO<sub>2</sub>."

Modifying soil and forest floor disturbance by alternative harvesting and site-prep techniques may become a similar CO<sub>2</sub> sink opportunity for forest management.

## Wood smoke contributes to health problems

"Wood smoke and vehicle exhaust contribute to... at least 82 premature deaths, 69 extra hospitalizations for lung disorders, 283 extra emergency room visits for asthma and 71 extra visits for chronic bronchitis or emphysema. Fine particulates are so small that they remain suspended in the air and can be inhaled deep into the human respiratory system.... in addition to actions already being taken to reduce wood smoke,... we are committed to bringing in the toughest automobile emission standards in the world." This study was conducted by Dr. Vedal of UBC medical faculty for the Ministry of Environment, Lands and Parks.

## Tree pollution?

The US Environmental Protection Agency (EPA) reported that hydrocarbons emitted by trees can combine with the high levels of nitrous oxide in urban centres under the powerful rays of the sun to produce a variety of chemicals that contribute to smog. Some news reports interpreted this to mean that trees are polluters.

...continued on page 34

## BEAR ENCOUNTER SURVIVAL GUIDE

by James Gary Shelton

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# Early pruning of Douglas fir: Production rates and product implications

*S. E. Reutebuch, Research Forester, USDA Forest Service, Pacific Northwest Research Station, Seattle, WA & B. R. Hartsough, Professor, Biological and Agricultural Engineering, University of California*

*Note: Edited paper presented to the American Society of Agricultural Engineers (ASAE), International Winter Meeting, Chicago, IL, Dec 14-17, 1993; and originally published by ASAE as Paper No. 937505 for this meeting. Use of trade or firm names in this paper is for reader information and does not imply endorsement of any product or service by the US Department of Agriculture (USDA). For bibliographical references, contact the authors.*

**P**runing of trees has been practiced for at least the past 2000 years. It is mentioned in the Old Testament of the Bible; and the Romans had a deity, Coinquenda, designated as the goddess of pruning. The idea of pruning to produce clearwood was introduced in England by the early nineteenth century.

Pruning has been undertaken for a wide variety of purposes. However, the primary objective of pruning forest trees has been the production of knot-free clearwood. Such clearwood is highly valued because of its superior strength, uniformity in machining, and visual appearance. Clearwood has been produced naturally in many parts of the world where old-growth forests with large trees have occurred. In these forests, trees have grown long enough for the branches on their lower boles to die, fall off, and then be covered over by a thick sheath of knot-free clearwood. As these large old-growth trees have been replaced by second-growth forests, rarely are trees grown to a size sufficient to produce appreciable quantities of clearwood. This is particularly true with Douglas fir in the Pacific Northwest region.

For the same diameter class, there are no differences in the volume or value of lumber and veneer produced from old-growth and naturally regenerated young-growth Douglas-fir trees. This is because all old-growth trees contain virtually the same knotty core as young-growth trees – the old-growth

trees have simply been allowed to grow longer and larger, encasing the knotty core. Due to the long persistence of dead branches, the only way to increase the volume of clearwood in young-growth stands is to artificially reduce the volume of the knotty core inside a tree by pruning branches earlier in the life of the tree. The earlier that pruning occurs, the smaller the knotty core will be.

However, pruning of live branches can reduce subsequent tree growth, or even kill the tree. The timing of pruning requires a careful balance between the amount of live crown removed, the desired size of the knotty core, and the

expected size of the tree at harvest time.

## New Zealand early-pruning regimes

The concept of very early pruning for maximum production of clearwood has been most extensively developed in New Zealand over the past four decades. From 1979 through 1983, a group of New Zealand researchers, known as the Radiata Pine Task Force, carried out the first integrated series of studies on early, heavy pruning in forest plantations. These studies examined the silviculture, product implications, and economics associated with early pruning of Monterey pine.

The Radiata Pine Task Force concluded that the most profitable silvicultural regimes were those that produced trees with a large-diameter butt log that contained a very small defect core surrounded by a thick sheath of clearwood.

To grow such trees, the Radiata Pine Task Force recommended wide spacing between trees, coupled with pruning in multiple stages to minimize the size of knotty core inside the butt log. This multiple-stage pruning usually consists of three to four pruning lifts that produce a five-to-six metre clear butt log. Each lift is scheduled when all of the following criteria can be met:

1. the branches from approximately 2 m of bole can be removed;
2. the resulting diameter over the branch stubs (DOS) will be below a specified maximum, usually in the range of 14 to 18 cm; and



*Pruning for clearwood was introduced in the 19th century.*



3. approximately 3 to 4 m of live crown will remain after each lift.

In New Zealand, given the fast growth rates of Monterey pine, all three of these criteria can only be met during a very short window of time (usually less than one year) for each lift. If any one of the lifts is delayed beyond this optimum pruning window, profitability is greatly reduced.

### Early pruning of Douglas fir

Although a considerable amount of research has been conducted in New Zealand on the silviculture of Douglas fir, only recently have New Zealanders begun to test early pruning regimes in Douglas fir that are similar to those described above for Monterey pine. Elsewhere in the world, many researchers have studied the effects of pruning Douglas fir to various levels of live crown retention. Unfortunately, the vast majority of these studies were conducted in plantations that contained far more trees per hectare than are currently recommended to maximize return on investment, and pruning was usually carried out after trees were far too large. Lumber recovery studies of stands that were pruned late have produced only modest increases in clearwood, and in at least one study, late pruning reduced the value of lumber recovered.

### Prune early, prune heavily

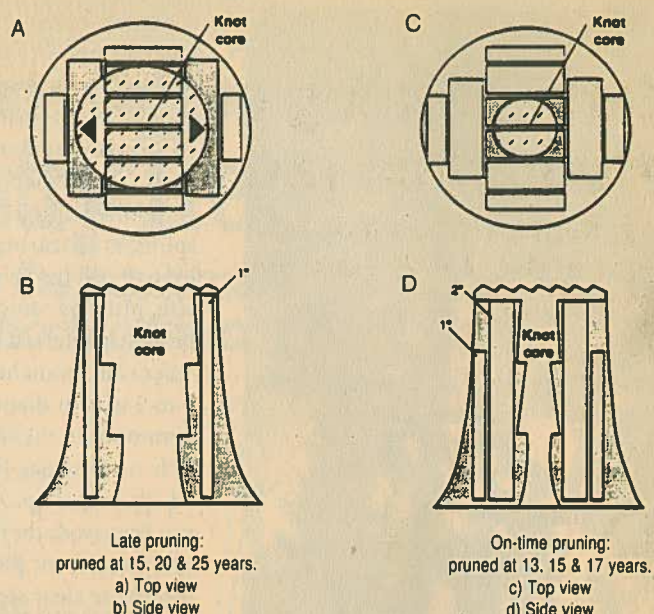
A small number of Douglas-fir trees that were pruned early in stands with low stocking have been destructively sampled. Economic analyses have strongly suggested pruning should be carried out as early and as heavily as possible without significantly slowing tree growth. One prediction suggests early pruning would increase the net present value (NPV) of a stand to C\$2,300 per hectare, compared with a NPV of only C\$570 for the same management regime without pruning.

As shown in Table 1, this analysis also predicted that delaying pruning by only seven years would decrease NPV to C\$250! This represents a change in NPV of C\$2,050 resulting simply from modifying the timing of pruning a few years.

The timing of each pruning lift has a much larger impact on expected financial returns than pruning costs. In the example in Table 1, discounted pruning costs were cheaper in the late pruning treatment. However, this modest cost reduction was trivial compared to the opportunity cost associated with the large knotty core that resulted from late pruning. Fig. 1 illustrates the effect late pruning has on the geometry of the knotty core and the impact of the resulting knotty core on clearwood recovery.

The analysis in Table 1 supports the following general guidelines being used for pruning coastal Douglas fir in BC:

1. Pruning should be carried out in three lifts.
2. The first pruning lift should be carried out when average diameter at breast height (DBH) in a stand is 10 to 12 cm. This will result in a DOS between 12 to 16 cm after pruning.
3. Approximately 2 m of the bole should be pruned in each lift, leaving approximately 50% of the live crown after each pruning operation.
4. The second and third lifts should be completed early enough to maintain a uniform DOS of 12 to 16 cm throughout the entire length of the pruned butt log.
5. Pruning should only be carried out on good growing sites in stands that have low stocking so that the growth rates of pruned trees are not slowed due to competition with surrounding trees. Thinning is required after the final pruning lift to maintain high levels of diameter growth and maximum clearwood production.



**Figure 1.** Distribution of clearwood lumber from late and on-time pruning regimes

Not surprisingly, these guidelines follow the same concepts that are used in New Zealand when pruning Monterey pine.

### Early-pruning product implications

In addition to the large increase in clearwood recovery associated with early pruning, several other improvements in log qualities have been reported as a result of live-crown pruning. Many researchers have noted that live-crown pruning of Douglas fir accelerates the formation of higher density mature wood in the pruned section of the bole. This higher density wood is stronger than juvenile wood. When Douglas-fir trees are heavily pruned, diameter growth in the lower portion of the pruned bole is temporarily reduced, but diameter growth at the top of the pruned section near the base of the live crown is not as heavily impacted. This shift in the distribution of diameter growth has the effect of reducing the pruned log's taper, thereby increasing clearwood recovery.

There are several benefits that favour early pruning of live branches over late pruning of dead branches. Radial diameter growth is highest during the first 15 years of growth. Live branches

...continued on next page





*Pruning branches earlier in a tree's life increases clearwood.*

*...continued from previous page*

are generally smaller and softer, making them easier to sever. Live branches have live branch collars that accelerate healing over time. Since they are smaller in cross-section when pruned live, the occlusion area is smaller than it would be if pruning was delayed until after the branch died. The bark is considerably thicker around large, dead branches. Therefore, even when cut flush with the bole, a dead, bark-encased stub remains. This stub is equal to the thickness of the tree bark.

It usually takes three to five years before the diameter of the bole has increased enough to initiate the occlusion process over this stub and often over ten years for the dead branch stub to fully occlude. Occlusion time for a properly pruned 2 to 3 cm live branch stub is usually two to four years on a good growing site. By pruning early and reducing the occlusion time, there is less opportunity for insects and pathogens to colonize the pruning wound. Reduced insect and disease damage results in increased recovery of higher grade lumber.

#### **Quality standards for early pruning**

To maximize clearwood production, early pruning must not only be performed at the optimum time, but it

must also be done properly. Only well-spaced trees with good form should be selected for pruning. Branch stubs should be cut flush with the branch collar without damaging the collar itself. The branch should be cut smoothly without leaving jagged splinters or tearing bark from below the branch. All branches, regardless of their size, must be removed. Small, dead branches referred to as "whiskers" and epicormic branches that are only 1 to 5 mm in diameter are very common on the lower 1 to 2 m of the bole on Douglas-fir trees. If these whiskers and epicormic branches are not removed, they persist for many years and form pin knots that degrade otherwise clear sections of the bole.

#### **Equipment requirements for early pruning**

To achieve the above listed quality standards, pruning equipment must be capable of cutting up to 5 cm branches without damaging the branch collar or leaving long stubs. Pruning equipment must be economically operable in rugged forest conditions and a wide range of weather conditions. Because of the requirement to maintain a uniform defect core, it must be economical to make multiple entries into a stand. Equipment must be capable of pruning boles in the diameter range of 8 to 15 cm, without causing damage to the thin bark found on young trees.

There is some skepticism associated with mechanized pruning due to the difficulties faced by mechanization efforts. To maintain or decrease costs, production per person must be increased, which is difficult to accomplish because the time per tree for each manual pruning lift is only a few minutes or less. Equipment has

trouble accessing stands before the first thinning and on steeper terrain. The requirement for a small defect core favours multiple lift pruning. This shifts the balance away from equipment that has relatively high move-in and travel times compared to actual pruning times.

#### **Problems with mechanical pruning systems**

Although a wide variety of mechanized pruning equipment has been developed and tested in many different parts of the world, manual tools and methods are used almost exclusively in New Zealand, Chile and Canada where production pruning is being conducted on a large scale. No mechanized systems have yet been reported that can compete economically with manual methods and still meet the demanding quality standards associated with early pruning.

In New Zealand between 1979 and 1985, the Silvicultural Engineering Research Group and its predecessors at the Forest Research Institute tested 24 mechanized pruning systems. None of these systems were recommended for production pruning use. The results of many of the tests were not published.

Pole-mounted chainsaws, such as the Jonsereds/Algoma K12, produced excessive tree damage and poor pruning quality because of limited visibility and flexure of the poles. A Rau reciprocating saw and McCulloch Roto-bit auger pruner both caused unacceptable damage to the trees. The former produced severe vibration.

Several mechanical shears were tested. They were limited in branch size capacity but caused little if any stem damage. The hydraulic Robinson Limb-Lopper was tested in low pruning and with a pole extension for medium

**Table 1. Impact of timing of pruning on Net Present Value**

Pruning Ages			Harvest Age	Clearwood Yield	Net Present Value
(years)			(years)	(Mfbm)	(C\$)
—	—	—	60	0	570
15	20	25	60	26	250
14	17	20	60	43	1050
13	15	17	60	63	2300



pruning. Pruning times per tree were about one-third longer than for manual methods. Pneumatic shears powered by a separate compressor were too difficult to move around in the stand. A Maibo pneumatic shear was modified to reduce gas consumption, but still required three-to-four 5-kg bottles of carbon dioxide per day per pruner. This high gas consumption rendered it uneconomical.

Hand-held or pole-mounted circular saws must be guarded to prevent bark damage, but the guards limit branch size and access in trees with heavy branching. The guards usually required branches to be cut from below, causing the saws to bind with larger branches. The hand-held Kioritz/Kaaz was compared with a jacksaw for first lift pruning. Lower branches of larger trees had to be climbed because the circular saw had less reach than the jacksaw. The circular saw was 14% faster than the jacksaw but caused more damage. Although smaller branches were removed quickly and cleanly, two hands were required to keep the blade from jamming when cutting larger branches.

The original Sachs Tree Monkey was tested in Australia. The first 1.5 m of the trunk must first be cleared to get the device on the tree; therefore, it was not applicable in first lift pruning. A Sumitomo Tree Monkey was tested and pruned less expensively than the Swiss model. However, it had similar problems cutting big branches and passing over knobby whorls. It tended to shave swellings and jammed easily.

Motor-manual units driven by central non-carried power units, such as the Treewitch, were difficult to move because hoses or cables caught on branches and other obstacles. In addition, and like the Tree Monkey, they were not well suited to multi-lift pruning of smaller trees, and they produced unacceptable levels of tree damage. Although these climbing machines may be capable of pruning larger trees in a single lift at a lower cost than manual methods, very little clearwood was present in 47-year-old trees that were pruned 23 years earlier

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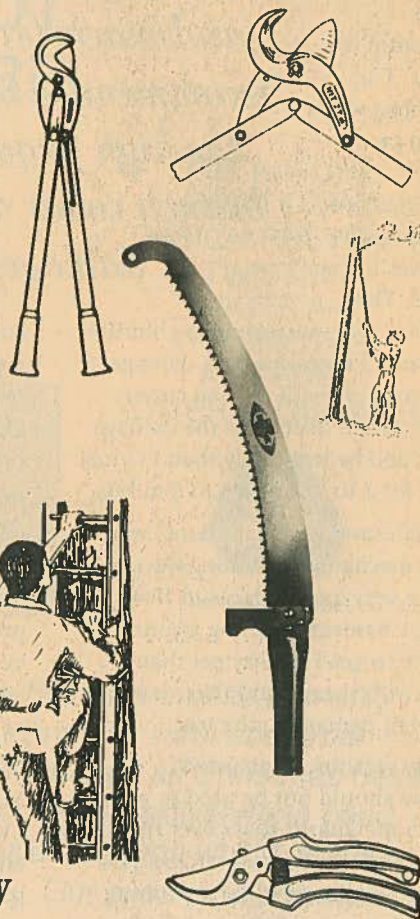
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using one of these machines. Dimpled grain and pin knots were quite common in these trees as a result of small, dead whiskers left on the trees after pruning.

A prototype machine-mounted pruner was developed by the Commonwealth Scientific and Industrial Research Organisation in Australia. The cutting head was mounted on a vertical telescoping boom and used chisel-type knives to cut branches. The

production rate was promising but the knives caused excessive bark damage. A similar machine with milling cutters was expected to overcome the damage problem and be less costly than manual pruning for 2 to 4 m and 4 to 6 m lifts.

Small chainsaws with bar guards were the only mechanized pruning devices used on a very limited basis in New Zealand. Chainsaw pruning requires more care to get a quality cut than pruning with shears, and there is a high potential of damage to the tree.

For safety reasons, unguarded chainsaws should not be used to prune above 1.5 m. Guards that cover the tops of the bars allow chainsaws to be used at greater heights. Chainsaw-pruning off of ladders is not recommended because of safety concerns.

### Manual pruning tools

Many different manual tools have been developed for pruning. The simplest are clubs that are used to knock off branches. Although production rates are generally high, these devices are not recommended because they often

shatter the branch and leave jagged or splintered stubs. Other impact pruning devices such as axes, brush hooks, and machetes are also not recommended because of the high frequency of branch collar

and stem damage, as well as shattered, jagged and long stubs. A wide variety of pruning saws have been developed. Quality standards can be met when pruning with handheld saws.

However, many operators routinely damage branch collars in a production environment. Because of poor visibility, flexing of the pole, and maneuverability problems, excessive damage often occurs when pole saws are used. In addition, production rates of both types of saws are slower than those achieved by using hand shears and ladders.

Many types of shears have been tested over the years. The Porter Pruner #2 and the virtually identical Hit #27 pruner have withstood the test of time and are the preferred tools for production pruning in New Zealand,

where approximately 100,000 hectares are pruned annually. Their drop-forged, scissors-type cutting heads are durable and easily maintained. The shears were highly modified after purchase to increase their cutting capacity

*...pruning devices such as axes, brush hooks, and machetes are not recommended because of the high frequency of branch collar and stem damage...*

and to improve their efficiency and ease of use. A specialized holster is used to carry the shears and a simple knife used for removing epicormic branches and dead whiskers. This knife consists of a 300 mm section of a 25 mm wide hacksaw blade inserted into a rubber handle.

In conjunction with shears, specialized lightweight aluminum ladders are used for upper-lift pruning. Several types have been developed, but the most popular type is a one-piece ladder that leans against the tree.

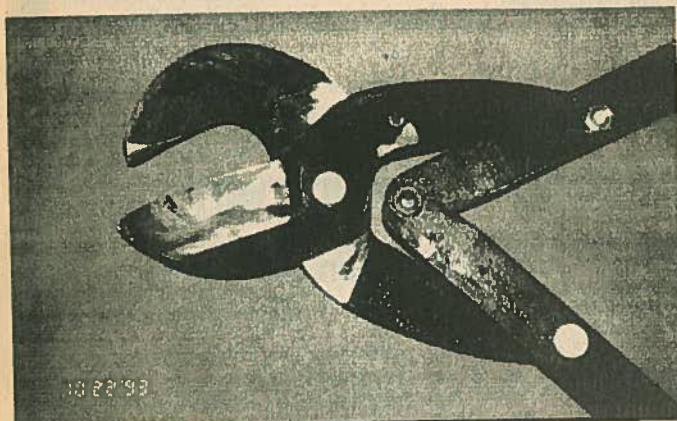
These ladders are narrower than general construction ladders, but still wide enough to comfortably accommodate both feet on a rung. They have pointed feet that are jammed into the ground to increase stability and a wide, wooden cross-member at the top, specifically designed for standing on. There is a wide band of nylon webbing at the top of the ladder that is placed against the tree to prevent bark damage.

Ladders are produced in many lengths by many New Zealand companies. The most common lengths are 2.4 m and 4.2 m. These lengths are used for the second and third pruning lifts, respectively.

### Pruning production rates and costs in young Douglas-fir stands

As there were no pruning contractors in North America experienced with multi-lift, shear-ladder pruning under forest conditions, a time-motion study of experienced workers pruning in a ten-year-old Douglas-fir plantation was conducted in New Zealand.

Work study information was collected for approximately 340 trees in the first pruning lift and for 230 of the larger trees during the second pruning lift. DBH of pruned trees ranged from 6 to 22 cm. Average DBH was 13 cm and 15 cm for the first and second lifts respectively. A utilization rate of 72% was observed during the study. This rate is close to the standard 75% utilization rate used for computing expected production in New Zealand.



**Figure 2.** Pruning shears.





*Ladders should be wide enough to comfortably accomodate both feet.*

A subjective hindrance rating was used to characterize walking difficulty while the pruner walked through and over tree foliage, brush and other obstacles. The following definitions of the four levels of hindrance were used: not hindered; hindered; continuously hindered; and constantly struggling.

#### **Pruning production rates**

Estimated productivity for the first pruning lift (0 to 2 m) is shown in fig. 3. First lift production varies from a low of 16.5 trees per productive hour, when pruning large diameter trees in difficult walking conditions, to a high of 21.5 trees when pruning small trees in easy walking conditions.

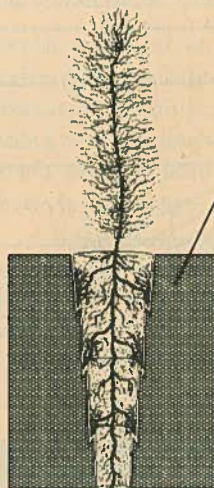
Estimated productivity for the second pruning lift (2 to 4 m) is shown in fig. 4. Second lift production varies from a low of 21 trees per productive hour, when pruning large diameter trees in difficult walking conditions, to a high of 27 trees when pruning small trees in easy walking conditions.

Since no data were collected on a third lift pruning operation, the second lift regressions were also used to simulate a third lift, from 4 to 6 m. Walk/select times were increased by 25% for the third lift to account for carrying, climbing, and descending the longer ladder. This factor was based on a comparison of second and third lift data for pruning Monterey pine. Estimated productivity for this simulated third pruning lift (4 to 6 m) is shown in fig. 5. Third lift

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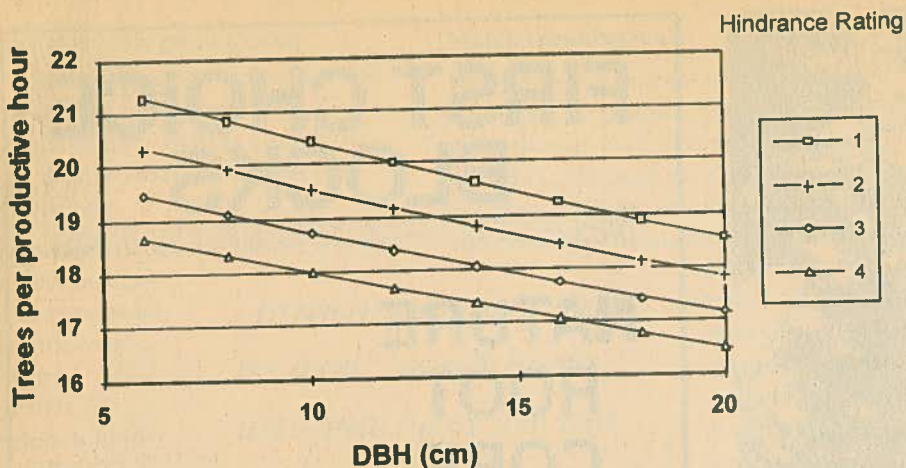
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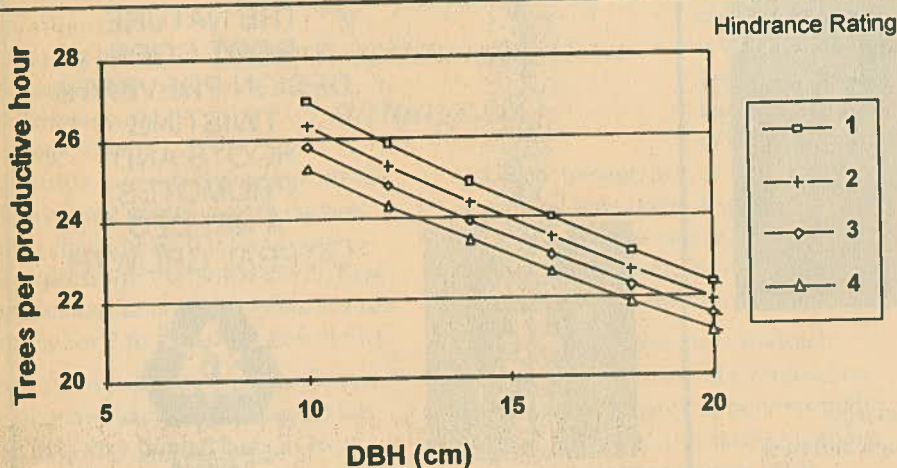


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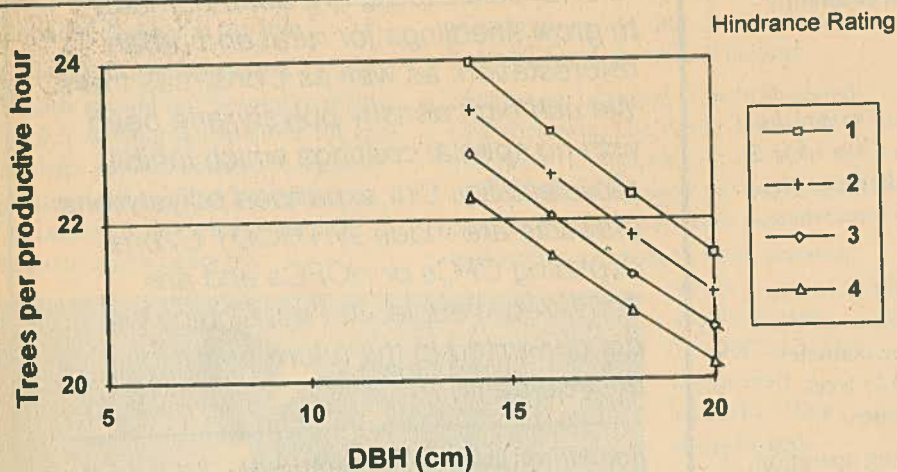




**Figure 3.** Estimated productivity for first lift pruning (0-2 m).



**Figure 4.** Estimated productivity for second lift pruning (2 to 4 m).



**Figure 5.** Estimated productivity for third lift pruning (4 to 6 m).

### Estimated pruning costs

Hourly costs were computed for the three pruning lifts. A productive life of 800 scheduled hours (i.e., half a year) was assumed for all equipment. Other assumptions included:

#### 1. Labour

Basic rate: \$10/scheduled hour  
Overhead and insurance: 50%

#### 2. Equipment costs

Shears: \$100 purchase price + \$50 modification cost  
Tool belt/holster and knife: \$25  
2.4 m ladder (2nd lift): \$100  
4.2 m ladder (3rd lift): \$200

#### 3. Shear maintenance cost: 100% of initial cost

Differences in the hourly costs for each pruning lift are negligible, ranging from \$15.41 to \$15.53. These hourly costs, combined with the production estimates for hindrance rating 2 shown in figs. 3, 4, and 5, and a utilization rate of 75%, were used to generate estimates of pruning costs per tree for each lift as shown in fig. 6.

Assuming a moderate hindrance rate of 2, pruning costs for the first lift ranged from a low of approximately \$1.00 when pruning small trees (5 cm DBH), to a high of \$1.15 when pruning large trees (20 cm). Pruning costs for the second lift ranged from a low of approximately \$0.80 when pruning small trees (10 cm DBH), to a high of \$0.95 when pruning large trees (20 cm). Pruning costs for the third lift ranged from a low of approximately \$0.90 when pruning small trees (15 cm DBH), to a high of \$1.00 when pruning large trees (20 cm).

### Observations

The cheapest pruning lift is the second lift, followed by the third lift, with the first lift being the most expensive. The main reason for this is the increased time it takes to remove the large number of epicormic branches and dead whiskers that occur in the first lift. This element accounted for 37% of the pruning cycle time in the first lift, compared with only 14% of the cycle time in the second and third lifts. Also, because of the slow initial height

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production varies from a low of 20 trees per productive hour, when pruning large diameter trees in difficult walking conditions, to a high of 24 trees when

pruning small trees in easy walking conditions. These are relatively low production rates, compared with those commonly achieved when pruning Monterey pine.

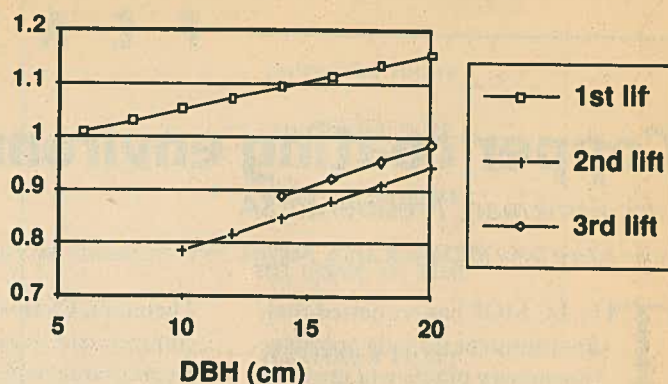


growth of Douglas fir, the distance between branch whorls is shorter in the lower portion of the bole, resulting in more branches per metre to be removed in the first lift.

Carrying a ladder tends to slow travel time between trees during the upper lifts. However, tree selection time is reduced because only trees that were pruned in the first lift need be evaluated. In addition, it is usually quicker to evaluate the next tree to be pruned when perched on a ladder high above slash and brush. The ladder is sometimes used to reduce travel time in heavy brush by laying it on top of brush and slash, and then using it as a bridge to the next tree.

Although multi-lift, manual methods currently appear to generate the highest return on investment from pruning, research into mechanized methods may reduce costs and the requirement for highly trained forestry workers. High incidence of branch collar and bark damage currently limit the use of many pruning tools. Research is needed to determine to what extent such damage decreases clearwood recovery, and what is the opportunity cost of such damage. Further research is needed to develop better methods for removing epicormic branches and small, dead whiskers that cause pin knots when not removed.

Reasonable guidelines for early pruning have been formulated. However, research is continuing to determine optimal stand stockings and associated pruning intensities for a wide range of growing sites. The majority of current



**Figure 6.** Estimated pruning costs per tree, with a hindrance rating of 2.

research is focused on pruning Douglas fir. Similar studies are needed with other tree species. Pruning, coupled with subsequent thinning, increases understory growth. Research is needed to determine what effects this increased understory growth has on wildlife populations and the diversity of plant species in second-growth stands. ♦

*The authors wish to thank the following people for their assistance: Mark Petruncio, University of Washington; Ken Mitchell and Frank Barbour, BC Ministry of Forests; Mike Massie, Nawitka Resources Consultants; and Les Jozsa, Forintek Canada.*

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# Copper coating environmental review

Dirk Brinkman, President CSA

Note: Edited letter to Drew Brazier, Nursery Services Section Manager, BC MOF, June 19, 1995.

The BC MOF has requested that Environment Canada approve the nursery practice of growing seedlings in copper formulations (with which Styro block containers are coated) with a hearing on July 3, 1995.

To the best of my knowledge, notice has not been given to other stakeholders on this issue, such as silviculture and nursery workers, contractors, environmental organizations, the BC MOE, manufacturers of styrene and copper sulfate, and suppliers of alternative systems.

The province has invested billions of dollars in plantations using various versions of the Styrofoam containers without an up-to-date review of current options.

As a result, the BC forest renewal industry is selecting an option that will prove to be untenable in the future, while simultaneously neglecting to allocate adequate time and resources now to the search for viable alternatives.

Indeed, forestry is an art whose reckoning is postponed for many years, as we wait to see whether or not our decisions work out.

The day of reckoning has come for Sweden's choice of

container systems (see excerpts this CSM from *Skogs Eko/Forest Echo*, a Swedish silviculture magazine with 300,000 readers). One thing is clear from the Swedish experience: proceeding in the same way in Canada, without considering all consequences and options, would be utter folly.

Therefore, CSM will continue its commitment to exploring the copper coating issue, with particular emphasis on existing alternatives that can withstand the most rigorous environmental audit.

What follows are questions related to the practice of copper coating. In the interest of an open debate, CSM looks forward to receiving responses that may be included in future issues.

## Not reviewed soon enough

According to a letter published in CSM last fall, copper coating has been going on for the past eight years without BC MOE or Environment Canada review or approval. Why was such an approval not applied for earlier?

## Other agencies

Has the use of copper coating been reviewed by the federal Ministry of Health and Welfare, the federal Ministry of Agriculture, or the provincial Pesticide Control Branch?

Environmental agencies in many European countries have refused applications for the use of copper formulations on seedling containers. This suggests there is good reason to

review this practice with some care.

## Recycling waste containers

Styrene manufacturers maintain that the combination of copper and Styrofoam results in unrecyclable toxic landfill. Are there practical recycling uses for waste copper-treated

Styrofoam containers?

First Choice has indicated that the volume of retired Styrofoam containers (most of which have been treated), stacked at BC and Alberta nurseries in 1994, would fill 17 km of semi-loads.

The European bans relate to concerns about copper leaching into the water table from the nurseries and landfill sites.

The BC MOE's recent initiative to reduce the volume flowing into northern landfill sites identified a significant percentage of the volume as coming from reforestation operations throughout BC.

BC MOF responded by focusing on improving the design of recyclable tree boxes and encouraging nurseries to return their used boxes. However, a good portion of those 17 km of semi loads is still toxic landfill, and this should also be of great concern to the BC MOE.

Has this ministry been contacted and its views on toxic waste disposal solicited?

## Leaching into nursery water tables

In order to be toxic to roots, copper compounds need to be soluble. As a result, copper compounds gradually leach away during the growing process.

Many nurseries are near residences and municipalities where water quality is of increasing concern. Adding copper, copper sulfate or similar toxic compounds to the pesticides, fertilizers and other chemicals currently leaching through from many nurseries, may create unanticipated cocktails. Has this problem been thoroughly reviewed?

## Defining copper levels

Perfecting the level of coating so that foresters are pleased with the field

*...environmental  
agencies in many  
European countries  
have refused  
applications for the use  
of copper formulations  
on seedling containers...*



results has taken growers and manufacturers many years. Too heavy an application of copper sulfate inhibits root growth too severely. As many planters have experienced, this results in the seedling container falling apart. On the other hand, too light a coating has minimal root-form modifying effects. Planters are still seeing variation in the field and the results are not always optimum because of coating that's either too light or too heavy.

Is there a summary of the whole array of copper formulations and applications, and their operational benefits?

Will the BC MOF application be for particular levels? Does the application include other chemicals used as root inhibitors by nurseries? Does the application encompass only certain solutions of copper ions or the use of copper in all solutions?

#### **The benefits?**

Copper coating is used on the container because it is toxic to seedling roots, stopping the growth of the roots along the container wall. It "burns" the root-ends touching the container wall, so that after planting, new root growth from behind the blackened tip becomes lateral root egress into the warmer, moister, more nutrient- and oxygen-rich forest floor with its symbiota. The result is improved seedling growth.

While there has been considerable improvement in performance, has this performance been well quantified? For example, to what degree has field performance of seedlings grown in untreated Styrofoam containers been compared to other Canadian options?

#### **Copper's post-planting, growth-inhibiting effects**

Some US studies claim the continued presence of copper sulfate on peat containers and in seedlings inhibits seedling growth long after planting. Has a literature review been done to assure this is not a factor?

In his article, "Growing in Copper-treated Containers Requires Greater Awareness," Eric van Steenis describes how, during growing-period irrigation, copper ions eventually leach into container peat and into seedlings. (See van Steenis' article in MOF's *Seed and Seedling Extension Topics*.) Has there been an analysis of the degree of residue present in seedlings, on their roots or in peat containers after planting?

Copper is a nutrient at low levels, and a toxic at the levels it is used to inhibit root growth. Are the levels of copper in the peat still inhibiting growth after planting?

The presence of copper ions on the container wall can adversely affect nutrient uptake during the nursery stage. In the nursery, this is compensated for with additional fertilizers. However, no such supplemental fertilizing is readily available in the field.

While there may be improved seedling growth due to improved root form, are we losing the growth potential of seedlings due to the possible continuing growth-inhibiting effect of residual copper?

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### Air-pruning better option

If the above is true, then air-pruning, the method selected by Swedish and eastern Canadian foresters, may be preferred. Have growers or Styrofoam container manufacturers experimented with air-pruning designs?

If air-pruning is a better alternative to copper coating, then the environmental review application may be erroneously and unnecessarily seeking to obtain permission to "live with" the hidden costs of forest renewal.

### Copper-treated trees and microrhizii

If there is any presence of copper sulfate on the roots in the field, it would inhibit the symbiotic support to the seedling's roots of microrhizii, reducing the nutrient transfer to the tree. Has the relationship between copper sulfate residues and microrhizii been studied?

### Copper and micro-organisms

Has the potential effect on other micro-organisms in the soil been studied? There may be a beneficial effect inhibiting armillaria. Is the cumulative effect beneficial or are there negative side-effects?

### Nursery worker exposure

Copper sulfate manufacturers maintain that their product is used in agriculture as a fungicide and herbicide, and that considerable restrictions apply to its exposure to workers. Nursery workers coating the containers are usually suited up with protective clothing.

Has the effect on nursery workers and

planters who handle the copper sulfate residues been studied? Some nursery workers complain that, when immersing or spraying the Styrofoam containers, they inevitably get the copper solution all over themselves. Have nursery workers been interviewed and their concerns addressed in BC MOF's presentation?

### Treeplanter exposure

To my knowledge, treeplanters have not been interviewed, nor have there been tests to determine if treeplanters should have health concerns related to absorbing copper sulfate from containers. In the past eight years, planters have been planting without the benefit of gloves, since they are advised, on many copper-treated seedlots, that the seedlings are "pesticide free".

Seedlings grown in copper sulfate are currently not marked "pesticide treated". But would this warning not be appropriate, even though the copper formulations are registered as "growth inhibitors" rather than as pesticides?

Perhaps there is no health issue. However, now that BC MOF is seeking approval of this practice, appropriate studies and informed assurances should be given to workers in the nursery and in the field.

### Forest Practices Code

Has the BC MOE, through the perspective of the new Forest Practices Code, examined copper coating and the introduction of copper sulfate into the forest floor? The Code admonishes logging and silviculture contractors to exercise absolute control over any

polluting substances that could be introduced into the forest ecosystem during operations.

### Defining relationships between BC MOF, nurseries and manufacturers

The relationship between the BC MOF and the Styrofoam container growing system and its manufacturer has always been close, as well as very successful.

Is the BC MOF application on behalf of the ministry's Green Timbers and Surrey Nurseries, on behalf of all nurseries, or on behalf of/with a particular manufacturer or manufacturers?

### BC MOF's role in renewal products

Are all products available to the BC reforestation effort today being considered equally?

Some years ago, the Swedish government stopped endorsing any particular system and got out of growing seedlings. Some researchers argue this has resulted in a far higher and more appropriate level of objectivity in the government's stewardship role in forest management.

Is it appropriate that BC MOF take a position in favour of copper coating in its procurement practices, and research and professional opinions? Finally, are there sound enough reasons for this continuing bias? ♦

*Note: Eric van Steenis' article, "Growing in Copper-treated Containers Requires Greater Awareness," (from Seed and Seedling Extension Topics, Volume 7, No. 2) was not available to CSM for reprinting but may be obtained through the BC MOF.*

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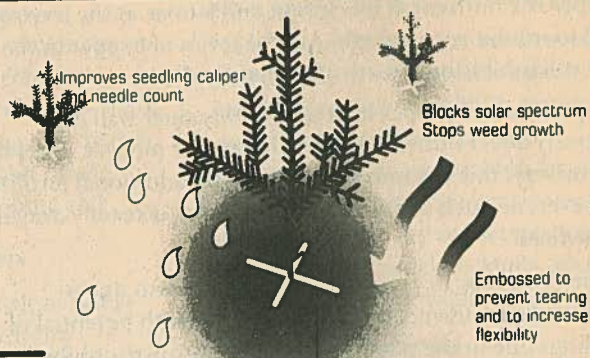
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Cross cut in centre for seedling to poke through



# Swedish root snarls: the tangle goes on

*Note: Skogs Eko (Forest Echo) is a Swedish silviculture magazine with a circulation of 300,000. In its April 1995 issue, the magazine featured the Swedish root form debate, of which excerpts are translated below. The same questions concerning Sweden should be of concern to those who are responsible for forest renewal in Canada: How are the billions of seedlings planted in Canada performing? Can we trust today's seedlings?*

**N**orthern Sweden, 1970 to 1985, fifteen years of intensive treeplanting, one billion paper pots and about 800 million hiko (a hardwall plastic container) seedling.

Now the reports are coming: almost every seven- to eight-year-old paper-pot pine and 70% of the H Kopperfor pine have deformed roots. Moreover, crooked stems and broken roots are common.

Who is responsible – the forest owners, the seedling producers, or the researchers? And not least: does one dare trust today's seedling materials?

## Thirty nursery compensation claims

There have been thirty nursery claims filed before the National Board of Forestry (to recover the payment for seedlings). All of them have been declined for two reasons: first, it is not clear whether the damage is due to there being something wrong with the seedlings; and second, the claim should have been made within two years. So far no one has filed a claim in the courts to recover all the costs arising from these damages. The lawyer informed judges this would be a very

difficult case, since among other things, one had to prove the person who sold the seedlings has shown neglect.

## Scotch pines show stability decrease

Every fourth planted Scotch-pine lodge-pole has some kind of disturbance in its stability, as shown by an investigation done by SVS. Two-hundred hectares of private hardwall container plantations, five and twelve years old, have been studied. Thirty-thousand hectares of the plantations in

...continued on next page

SKOGS EKO

Plant-special

Nr 1 April 1995

Täckrot fortfarande riskgrupp

Svamp - träd ett idealpar

Massdöd i planteringar

Varning

ROT SNURR

-härvar snurrar vidare

Norrland 1970-1985. Femton år av intensiv skogsplantering. 1 miljard papparpot. 700-800 miljoner Hiko-planter.

Ne kommer rapporterna. Nästan varje 7-8 årig papparpotell har deformationer, nästan 70 procent av Hiko-tallarna. Stamskrök, rotrött, svampangrepp är vanligt.

Vissa är anmärkningsvärda, plantproducenternas förklaringar.

Och, inte minst: Vilket man lita på dagens plantmaterial? Skogliga lotter runt bland tillnå skogsägare, tillplantor med plasttrumpen, papparpotell och förvarv.

En skogsfoto

Swedish silviculture magazine Skogs Eko in a tangle over root deformation.



...continued from previous page  
the northern parts of Sweden are inferior and have to be replanted because of twisted roots. No measurements were done in the field, and government foresters estimated these figures.

### **Synthetic fibres in paper**

The paper pot lasts five years and does not compost. The name "paper pot" is a market fraud. In reality, the seedlings were wrapped in plastic. Tests show the paper was manufactured with synthetic fibres.

### **Government should take responsibility**

The (Swedish) government invested four-million Swedish kroner on developing paper pots for plantations from the late seventies to 1982. Today the paper pots are still there while the plants fade away.

### **Crooked pulpwood, no thanks**

Crooked pulp wood results in a higher percentage of bark in the fibre.

### **Impossible to detect damage**

As a buyer, it is in many cases impossible to discover damage to roots after storage. It may be hard to judge the root form of the seedling. Therefore, it should be a requirement that the nursery carry out serious root quality tests before delivery. The tests should confirm:

- ❑ the root structure of the seedling is not twisted or deformed in any way;
- ❑ the period of growing roots and tops

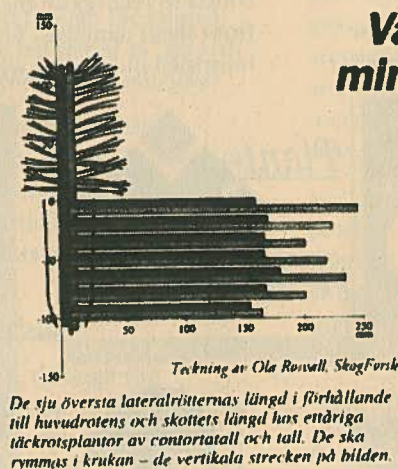
- in the nursery did not exceed that which can be accommodated by the size and type of container;
- ❑ the seedling has active root tips (high growth potential);
- ❑ the seedling is single seeded or thinned before planting; and
- ❑ the seedling has a green and fresh colour, and is not infested by molds or fungi.

### **Plants with bad roots sold**

Root deformations improve with time; however, while stability is increased to some degree, the crooked stems are still there. This results in disturbances in the fibres and a caved-in bark within the root.

Because of this, the strength in the root system is decreased and the risk for the number of leaning trees is increased. Moreover, stem and root failures also increase, reducing the strength and elasticity of the fibre, resulting in the tree's inability to resist heavy snow falls or windy conditions.

This is based on a study of 20-year-old plantations of Scotch pine containers grown in paper pot and hardwall containers. In the root system of every second



Getting to the root of it all.

planted tree, the scientists found rhizomorphs of armillaria, a root pathogen that affects growth and survival of trees. Armillaria was not found on any of the naturally regenerated trees.

### **Improving root stability**

Factors other than species, nursery culture, and container type may risk stability problems in the field. The consequences of root deformations are worse in fine soils and compact cold soils, which are poorly aerated.

The concentration of severe unstable cultures to northern parts and high altitudes of Sweden is probably due to a stunted growth of bottom roots, resulting from low soil temperatures combined with spiraling roots. Soil tillage that improves and opens up the structure may reduce the risk of poor stability. ♦

### **Var 4:e tall hade minskad stabilitet**

Var fjärde planterad tall och contortatall har någon form av störningar i stabiliteten. Det visar en undersökning gjord av SVS i Norrbotten. 200 hektar privata täckrotsplanteringar, 5 och 12 år gamla, har studerats.

2 proc. av planteringarna i Norrland inklusive Värmland är undermåliga och måste göras om på grund av rotsnurr (33.000 hektar). Inga mätningar är gjorda i fält. Skogsvårds-konsulenterna, i många fall även med rollen av plantförsäljare, har uppskattat arealerna för privatskogsbruket.



(roots are air pruned)

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# Canada's oldest forestry institute faces axe

Kelley Egan

*Note: Edited article from the Ottawa Citizen.*

**P**eter Kourtz, a forester with a Ph. D. and a mind that forages from robotics to canoe building, probably knows more about how Canada fights forest fires than anyone else. He's been tangling with this enemy, which destroys 2.5 million acres of forest every year, for more than 30 years.

In the '60s, the front line meant eyes and lookout towers; now, it's artificial intelligence, lightning sensors and predictive models.

"Yeah. My whole life, my career," he says, slicing off the skin of a banana in the cafeteria of the Petawawa National Forestry Institute.

There is resignation in his voice, the words not a boast but a lament. To save about \$5 million annually, the federal government is closing the institute, Canada's oldest, which first began studying forestry in 1918.

About 40 professionals will scatter to research centres in Quebec City, Sault Ste. Marie, and Fredericton. About 95 other people will lose their jobs.

The government can move jobs and concentrate programs, streamline and devolve all it wants, but a visitor to the institute discovers this: There is a considerable price to be paid, in currency that is human, and in science that is precious.

At age 53, Kourtz has decided to leave his government job, taking three decades of expertise with him into the private sector.

And he's likely taking Jacob with him.

Jacob, named for the ladders that form its legs, is a walking robot, an odd-looking platform with car batteries and six computers.

Kourtz's idea, still years from fruition,

is to create a team of robots that can march into a field of planted conifers and cut out the unwanted growth between them.

The potential value, he says, is enormous because of the millions of small trees planted every year in Canada. With tending, land would produce two or three times as many trees, at a fraction of the labour costs.

So far, Jacob can march along fine. Kourtz and a team of students are trying to fine-tune the vision system so that it "sees" the difference between the planted tree and the weed.

Kourtz figures the vision dilemma is two-thirds solved. The remainder won't be finished at PNFI: Kourtz is trying to spin Jacob into a second private-sector venture.

The array of research done at Petawawa, a clump of buildings in a 100-square-kilometre forest, is mind boggling.

One group is studying genetics and biotechnology; another is looking at how global warming will affect the growth of the forest; another is comparing methods of regenerating white pine.

On the way to a cryogenics lab – frozen home to seeds of endangered trees – Pierre Charest taps at a photograph on the wall. "That's the oldest plantation of tissue-culture derived trees in the world," he says, the plot right here in Petawawa. Charest is slated to move to Quebec City. Fortunately, his science is fairly portable.

For seven years now, he has worked on the genetic engineering of trees and is now trying to figure out how to control the flowering of the black spruce. (The idea is to make the tree

sterile first, so that it does not "pollute" the wild spruce.)

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# A global future for forestry

*FAO conference in BC: Turning policies into practices*

*Tania Wegwitz, Canadian Forest Service*

A seminar of worldwide significance will take place in Prince George, BC, this fall. Scheduled to take over the Prince George Civic Centre from September 9 to 15, the United Nations-sponsored, Joint FAO/ECE/ILO International Forestry Seminar on Forest Practices will bring together over 30 countries and several hundred delegates to discuss the changing face of forestry.

This collective of experts, policy makers, researchers and operational foresters will tackle the challenge of transforming sustainable forest policies into feasible and workable practices.

Not only will this international forestry seminar serve as a forum for sharing forestry techniques, but it is expected the gathering will lay the groundwork for an international forest practices code.

Established forty years ago, the Joint Food and Agriculture Organization (FAO), Economic Commission for Europe (ECE), and International Labour Organization (ILO) Committee on Forest Technology, Management and Training was formed in response to the collective desire of member countries to improve and promote "best practice" forestry.

Since its creation, the Committee has helped the world to adopt new and progressive techniques as our perception of "best practice" forestry has evolved. Unlike some organizations that choose to focus on the theory of resource management, the FAO/ECE/ILO Joint Committee has always

concentrated on developing practical methods based on the needs of the people who work and live in the forests.

Like its mandate, the FAO membership has also developed and grown over the years. The upcoming Prince George event represents the first time in FAO history that eastern European countries will attend. In all, organizers expect over 300 delegates to participate, their countries of origin spanning everywhere from North and South America to Europe, Africa and Asia.

The Seminar is being organized with the help and support of the Canadian Forest Service, the BC Ministry of

Forests, the University of Northern BC and the Northern Forest Products Association. While the

conference will focus on the needs of the global community, Canada will be in the spotlight both inside and outside the seminar.

Keynote speakers and Working Group chairs include faculty from BC universities and the Canadian Institute of Forestry (CIF), Canada's national professional and technical forestry institute.

Several field tours are also scheduled for the seminar, allowing delegates the opportunity to explore central BC's ecosystems and landscapes. The tours will also give participants the opportunity to learn more about Canadian forestry accomplishments, and local forest management issues and practices. Optional tours of BC's coastal ecosystems, northern boreal forests and the Rocky Mountains will also be

offered after the seminar.

During the seminar, delegates will take part in one of five Working Groups to discuss specific issues connected to the global challenge of developing sustainable forest policies and practices. The recommendations and resolutions of the Working Groups will then be combined and presented to the delegates at the end of the seminar. It is expected that these recommendations and discussion will form the basis of an international code of forest practice. ♦

*For additional details, please contact FAO/ECE/ILO International Forestry Seminar at (604) 563-8833.*

*...the gathering will lay  
the groundwork for an  
international forest  
practices code...*

*...continued from previous page*

The next step, once the tree is sterile, is to alter the genetic makeup so that trees can be made more disease- or drought-resistant.

Within ten years, he estimates, genetically altered trees will be commercially available.

"There is no quick fix in forestry," notes Kurt Johnsen, a young tree physiologist. "That's what makes Petawawa such an invaluable place."

**The Issue:** The Canadian Forest Service, its budget cut from \$220 million to \$95 million, has decided to shut the Petawawa National Forestry Institute, one of eight research centres in Canada.

**Impact:** The closure will save roughly \$5 million annually; at least 80 people will lose their jobs. Of 55 professionals, about three-quarters will be transferred. The Visitor Centre, which attracts 8,000 people a year, will be shut.

**Reaction:** Liberal MP Len Hopkins and PSAC are fighting to keep the 77-year-old institute alive. ♦



# NSFPA studies forest worker certification

*Note: Article reprinted from Forest Times, February 1995 issue.*

**P**eople involved in silviculture work are known, throughout Canada, by many different titles. Employment category types include forestry workers, silviculture workers, thinning and clearing saw operators, forestry crew persons, forest firefighters, and so on.

Just as diverse as the titles, are the employment requirements. In some provinces, completion of secondary school is necessary; in others, the completion of a specialized program in silviculture, with several months of on-the-job training, is mandatory.

To address this diversity, the Safety and Training Committee of the Nova Scotia Forest Products Association (NSFPA) has been looking into establishing a forest worker certification program for this province. The objectives of such a program would be to: 1) create a more qualified, highly skilled, forest worker; 2) enhance the image of the forest worker; 3) ensure that workers enter the workforce with basic entry-level skills in safe chain saw and machine operation; 4) maintain or possibly reduce future Worker's Compensation premiums; and 5) create a more mobile workforce.

"There is a real need to have forest workers recognized as the professionals they are," said Steve Talbot, NSFPA Executive Director. "The program will help establish the credibility of these workers. It will also assure those involved in the forest sector and the general public that these workers have met minimum safety and training standards."

Initially three categories of workers have been identified. These are chain saw, spacing saw and machine operators. A working group has been formed to develop a concept for the proposal and has completed a draft discussion paper on the topic.

"In 1995, the Safety and Training Committee will actively pursue the development of a framework for implementing a certification program to meet the needs of the Nova Scotia forestry workforce," said Talbot.

Efforts to provide consistent education and training in the silviculture field have been ongoing since the late '60s in Nova Scotia. From 1970 to present, the Canada/Nova Scotia Cooperation and Forestry Agreements have further promoted the importance of training for silviculture workers.

Currently, forestry worker training programs are offered through provincial community colleges and the Forestry Regional Industrial Training Committee.

Nationally, study in the area of certification began in September 1993. At that time, the Canadian Council of Forestry Ministers (CCFM) established a representative industry, labour and government committee (the 6.5 Committee), to assess the feasibility of a certification system for silviculture and forest workers.

The 6.5 Committee concluded its assignment late in 1994 and determined that a structure is in place in Canada for providing national certification for workers. However, there was no consensus among industry, labour, and government representatives for recommending the establishment of a national certification system.

Nova Scotia supports national certification as does Newfoundland and Quebec. As well as Nova Scotia, currently both Newfoundland and New Brunswick are working towards establishing provincial certification.

New Brunswick and Alberta, and the Canadian Silviculture and the Canadian Pulp and Paper Associations, support the establishment of national

occupational skill standards. The provinces of Ontario and Manitoba do not support provincial or national certification, but prefer to place their emphasis on good training programs being provided to their silviculture and forest workers.

The 6.5 Committee made three major recommendations to the CCFM. The first was that a national certification program be undertaken when there is sufficient support. In the meantime, industry and labour should be encouraged to initiate a process to standardize occupational skill standards for the silviculture and forest worker labour force. They also recommended the CCFM work towards "mutual recognition" and "harmonization" of minimum occupational standards for the silviculture and forest worker labour force in Canada. The final recommendation was that a review/evaluation of the support for certification be undertaken within two years. ♦

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# NS forests without a future?

G. Warren Murley, Group Venture Association, Amherst, NS

Note: Edited letter to Federal Minister of Natural Resources, June 9, 1995.

Nova Scotia is not the smallest province in Canada, but it comes a close second. There are statistics that can make this province unique – such as 52% of its forested land is owned by private woodlot owners.

The fact that this percentage of woodland is controlled by the private sector is probably one of the facts that is going to save Nova Scotia from becoming a wasteland.

The volume of cutting going on in this province right now is not being supported by an equivalent amount of forest improvement, and the end result of that statement is that the colour of Nova Scotia will change from green to light brown.

As a lifelong resident of this province and an employee in the forest industry, my future in this province is coming to an abrupt end.

The cost of forest improvement work is high for individual landowners to carry on their own. For the last seventeen

years, the federal and provincial governments have been assisting these landowners, through various agreements over the years, with forest improvement work on their properties. This assistance was some assurance for a future for the forest industry in this province, but I think we can safely say now that the tide has turned.

First of all, in the fall of 1994, at a conference to "develop a strategic direction for Nova Scotia's Forest Sector," figures were given to Ed Bailey from the Department of Natural Resources that indicated the \$8.1-million forest improvement program, in place at that time on private woodlots, was not enough to sustain the levels of cutting taking place.

Since that conference in Amherst, NS, the demands on the forests have increased as a result of increased stumpage prices. The present federal government, in its Spring budget, has decided it is not interested in assisting the private woodlot owner with

financial help for forest improvement work – add to that the recent announcement by the provincial government that it can only see its way clear to put \$2 million on the ground for the remaining nine months of the fiscal year of 1995-1996.

Another decision that was made on June 1, 1995, was that the provincial government is no longer going to fund the administration costs for the 18 Group Venture Companies or Cooperatives. Under the new funding formulae negotiated with the province, approximately 80% of the administration costs of these Venture Companies have been paid by the province.

Where do all these decisions leave Nova Scotia with regards to the future of its forests?

We have a greater demand on our forests, fewer improvement dollars to replace the forests, and less than half the administration to monitor the program – not a very bright picture of the future.

A soft-landing or phase-out program would allow some time for private landowners to prepare ways to support a forest improvement program. ♦

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# Le Sommet de la forêt privée

*Alain Thibeault, Ministère des Ressources Naturelles, Division de l'assistance technique forêt privée*

*N.B. Les orientations sont tirées du document cahier des propositions remis au sommet de la forêt privée. Gouvernement du Québec, MRN, 1995, Depot legal. Bibliothèque nationale du Québec, 1995. ISBN 2-550-24593-8.*

**E**n décembre 1994, François Gendron, Ministre des Ressources Naturelles, a annoncé la tenue d'un sommet sur la forêt privée qui se tiendra à Québec les 26, 27 et 28 mai 1995. Il mentionne organismes et personnes suivantes: Syndicat des producteurs de bois - Antonio Dallaire, M.R.C. Maria Chapdelaine - Rosaire Fournier, Stone Consolidated - Jacques Girard, Scierie Lachance - Gérard Lachance, Société sylvicole Mistassini - Jean Paquet, Ministère des Ressources Naturelles - Alain Thibeault et Secrétaire du comté - Daniel Fillion.

Ce comité a pour mandat de planifier la consultation de la région:

- ☐ tenue de tables de réflexion régionale impliquant tous les organismes du milieu
- ☐ tenue de réunions de réflexion: une au Lac St-Jean; une au Saguenay
- ☐ préparation d'un rapport représentant la position dans la région

La consultation devait porter sur tous les aspects de la forêt privée:

- ☐ l'implication des propriétaires forestiers
- ☐ l'implication des partenaires locaux et régionaux
- ☐ le rôle de l'état
- ☐ l'état de la forêt et son aménagement
- ☐ l'encadrement des interventions forestières
- ☐ l'accès au marché
- ☐ l'organisation de la mise en valeur
- ☐ l'appui professionnel
  - a) la formation
  - b) l'aide technique
  - c) la recherche et le transfert de connaissances
    - les organismes de mise en valeur
    - conclusion

Ce rapport est terminé et acheminé à un comité directeur provincial qui analysa les rapports de toutes les régions en vue de la tenue du sommet.

C'est donc suite au sommet que les grandes orientations qui s'appliquent au nouveau programme de mise en valeur de la forêt privée en 1996-1997 sont présentées.

## **La protection du milieu forestier**

Une loi cadre signifiant clairement l'engagement du Québec dans le respect des principes de développement durable sera proposée à l'assemblée nationale. Le pouvoir de réglementer en la matière appartient aux municipalités.

## **Le financement de la mise en valeur**

Le gouvernement du Québec remet en vigueur le crédit forestier sous la forme de garanties de prêts. La contribution des partenaires dans un fonds forestier est la suivante:

- ☐ le producteur forestier: il assumera une partie des coûts des travaux de mise en valeur (20%)
- ☐ l'industrie forestière: elle versera un montant fixe sur la base d'un taux par mètre cube (20%)
- ☐ le gouvernement du Québec: il injectera des fonds sur la base de crédits votés à l'assemblée nationale qui contribuera pour 60%

## **La mise en marché**

Elle demeure régie par les syndicats de producteurs de bois.

## **L'organisation de la mise en valeur**

Des agences de mise en valeur de la forêt privée sont créées à la suite d'une entente entre les partenaires sur un territoire à déterminer (M.R.C.).

Les agences sont constituées des partenaires actuels du sommet:

- ☐ le monde municipal
- ☐ les propriétaires de lots boisés
- ☐ l'industrie forestière
- ☐ le gouvernement du Québec

## **L'impôt foncier**

Modifier le régime actuel d'imposition foncière des lots boisés de façon à inciter les propriétaires à aménager leur forêt.

## **La connaissance de la forêt privée**

La nécessité d'améliorer la connaissance de la forêt privée fait l'unanimité, il faut développer les outils nécessaires à une meilleure connaissance de la forêt privée.

## **L'appui professionnel aux propriétaires**

Favoriser le développement d'un aménagement forestier durable en mettant en place les mécanismes d'appui professionnel nécessaires.

A chacune des orientations un plan d'action permet de mettre en place le nouveau programme pour 1996-1997.

Ce nouveau fonctionnement permettant aux partenaires de s'impliquer directement dans le développement de leur milieu. ♦

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*René Ouellette,  
President*



# 2020 vision for forest sector

Andrew Petter, BC Minister of Forests

Note: Edited version of speech originally presented to Price-Waterhouse Conference, March 15, 1995.

Some people would like to believe that the political party I represent is hostile to business, suspicious of profits, and an obstacle to the creation of wealth and employment.

Profits for publicly traded, BC-based forest companies were minus \$350 million in 1991; in 1994 they were \$800 million – a turnaround of more than \$1 billion. Capital expenditures in the BC forest industry were \$1.43 billion in 1991. Statistics Canada's survey of Investment Intentions shows the figure for 1995 will be \$1.86 billion – an increase of 30%. Direct employment in the BC forest industry was 91,000 in 1991; in 1994 it was 105,000 – an increase of 15%, or 14 thousand jobs.

I am certainly not going to take all the credit on behalf of the BC government for those undeniably healthy numbers. I recognize that there is a cycle to the

forest products industry that has played its part. But it does give me a good lead-in to the following main points:

1. The BC government understands a healthy BC economy requires a healthy forest sector, and a healthy forest sector requires a competitive rate of return.
2. Times are currently quite good for the BC forest sector. But this was by no means an automatic occurrence.
3. We need to recognize that, despite the fact that profits, investment and employment are currently at healthy levels, we can't take it for granted that those levels will be sustained – a point to which I devote most of my remarks.

*...direct employment in the BC forest industry was 91,000 in 1991; in 1994 it was 105,000...*

jobs that sustain healthy communities across BC) was in jeopardy.

Taken collectively, these problems had ominous implications for the long-run health of our forest sector. The new government in 1991 had a choice. One option was to remain reactive to all of these pressures, and in essence, manage the decline of BC's most important industry. The other option was to take a proactive approach and

attempt to deal head on with these problems. We chose the second option.

We put in place land-use planning initiatives to end the valley-by-valley confrontations and to create greater certainty over the extent of the commercial forest land-base. Complementary to this was the creation of the Forest Land Reserve. We began work on a Forest Practices Code to ensure BC forest practices would, overall, be managed according to the highest standards. Complementary to this, we began a concerted effort to show the public in BC and the rest of the world the changes taking place.

We also initiated a Timber Supply Review to lead to a better understanding of what harvest levels were sustainable if current management practices were maintained; and as importantly, to develop a better understanding of what opportunities there are for expanding harvests above projected levels, and what we need to do to realize those opportunities.

*...continued on page 30*

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### The last three years

It was by no means automatic that, in 1994, the forest sector would have a very good year. When the current government came to office in 1991, there were a number of major problems confronting BC's forest sector. Most notably:

- ☐ land-use conflicts which were resulting in a "war in the woods" and valley-by-valley confrontations;
- ☐ a serious erosion in public confidence (both domestically and internationally) in the standard of forest practices in our forest industry;
- ☐ disturbing questions and uncertainties about the sustainability of timber harvest levels in BC; and
- ☐ a sense that the "social contract" implied in BC's forest policy (i.e., the creation and maintenance of good



## Second Canadian Urban Forests Conference

This conference is sponsored by the National Community Tree Foundation, the Canadian Forestry Association and the Windsor Parks and Recreation Board.

*Theme:* TBA

*Location:* Windsor, ON

*Date:* July 16-20, 1995

*Contact:* (519) 255-6270

## 1995 CIF/IPC Annual Meeting

Over 300 people involved in the forest industry, fisheries, wildlife, environment, government, research, engineering and other related fields will meet to discuss integrated resource management in a time of unprecedented change in forestry.

*Theme:* Integrated Resource Management: Results in Action

*Location:* Halifax, NS

*Date:* August 20-24, 1995

*Contact:* (613) 234-2242

## International Forestry Seminar

The UN-sponsored, Joint FAO/ECE/ILO International Forestry Seminar on Forestry Practices will be bringing delegates together from over 30 countries to discuss the changing face of forestry. In particular, the gathering will lay the groundwork for an international forest practices code.

*Theme:* The Changing Face of Forestry

*Location:* Prince George, BC

*Date:* September 9-15

*Contact:* (604) 563-8833

## Advanced Forest Herbicides Course

Current techniques and principles of Integrated Forest Vegetation Management will be examined in reference to the broader scope of Integrated Resource Management. Topics include: environmental impact evaluation methods, human health concerns, evaluation management options, program management and conflict resolution.

*Theme:* Planning, Implementing and Evaluating Integrated Forest Vegetation Management

*Location:* Thunder Bay, ON

*Date:* September 23 - October 1, 1995

*Contact:* (705) 949-9461

## Ontario Boreal Forest Management

In the context of today's realities and challenges, such as the new Crown Forest Sustainability Act, this workshop will provide increased knowledge of ecosystem structure, composition and function — as well as insights into necessary tools and practices.

*Theme:* Advancing Boreal Mixed Wood Management

*Location:* Sault Ste. Marie, ON

*Date:* October 17-19, 1995

*Contact:* (705) 949-9461

**To list your event, please send your correspondence to:**  
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Finally, we put in place, with invaluable assistance from industry, labour, environmentalists, aboriginal leaders, and community representatives, the Forest Renewal Plan and Forest Renewal BC.

This initiative will provide an estimated \$400 million per year for incremental investment to enhance investment in the land base; enhance environmental values; add additional value in all phases of the forest practices cycle; and through all of these measures, enhance employment and thereby restore the forest-sector social contract to good health.

All of this hasn't been easy. And it hasn't come without opposition. But I am confident that, as a package, it is supported by a growing consensus of public opinion. Without that public support, I do not think we should assume that the forest sector would face a healthy economic environment. So I am not going to take the credit for a banner year in 1994.

But I would like to suggest that without the measures we began putting in place three years ago, the climate the forest sector had to operate in would not have been as good as it was.

### *What of the future?*

While times do seem to be quite good right now, it is important to acknowledge that there are anxieties about whether these good times can be sustained. I don't want to be labelled the Bobby McFerrin of Forests Ministers: "Don't worry, be happy."

In particular there are concerns about the fibre supply: Will we be able to sustain anything like current harvest levels in the future? I think we should start by asking the following question: What do we mean by sustainability, and under what conditions will timber harvested at current levels be sustainable?

### *Three notions of sustainability*

Virtually everybody accepts the need to achieve sustainability. But that concept means different things to different groups. With respect to BC's forests, there are three principal notions of sustainability that need to be considered: to environmentalists, the concept of sustainability focuses on ensuring the viability of forest ecosystems; to the forest products industry, the concept of sustainability

focuses on the maintenance of timber harvests; and finally, to the public at large, and in particular to those in forest-based communities, the concept of sustainability focuses on the need to ensure that the forest sector continues to provide for community stability and maintains the high-paying jobs that have supported BC's increasingly high standard of living.

In the past, many people would have us believe that these aspects of sustainability are in conflict with each other: that we cannot maintain our fibre supply, maintain employment levels and be careful stewards of our forests.

In other words, there seems to have been a presumption amongst many people that we cannot achieve all three aspects of sustainability, and that society must choose amongst them. I just don't accept this. And I don't accept it on two fundamental levels.

First of all, I believe that we as a society have demonstrated over the past few years that we have the resources, creativity, openness, and overall commitment to be able to realize sustainability in all of its aspects. Secondly, and perhaps more fundamentally, I have come to the conclusion that it is not possible to achieve any aspect of sustainability without achieving all three

simultaneously.

Here is my reasoning: society will not accept the prescriptions for a healthy environment if they result in the winding down of the province's single most important industry. But neither will society support the industry if it degrades the forest environment. Nor will that industry be able to garner wide

support if employment and community stability aren't provided. Environmental sustainability, fibre

### *...I don't want to be labelled the Bobby McFerrin of Forests Ministers...*

sustainability, and employment and community sustainability will rise and fall together. Rather than being contradictory, they are complementary.

And it is precisely because of the complementary nature of these "sustainabilities" that the government has put in place the initiatives I mentioned above: Land Use Planning; Forest Land Reserve; Forest Practices Code; Timber Supply Review; Forest Renewal Plan. They all hold together and support each other.

In short, I believe we have, in a remarkably short period of time, put in place a comprehensive framework of policies and instruments to achieve sustainability of our forest sector.

In fact, I know many people think we have tried to do too much too quickly. But I feel strongly that we really had no alternative. The challenges facing us in the BC forest sector were comprehensive and immediate; we had some serious catching-up to do, and we just could not wait or do this on a piecemeal basis.

### *The need for targets*

We need to avoid the pitfalls that great social philosopher Yogi Berra warned us about when he said: "If you don't know where you are going, you'll probably end up somewhere else." Given the three aspects of



sustainability, you won't be surprised to hear me suggest that we need to pursue three targets simultaneously:

- i) a target for maintaining the health and integrity of the forest environment;
- ii) a target for the annual timber harvest from Crown and private lands in BC; and
- iii) a target for forest sector employment levels.

While there will be tension inherent in simultaneously meeting these targets, there cannot be, as I suggested above, any contradiction amongst them. They must be worked on together and rise and fall together. Targets, as I intend them here, are best understood as "plausible challenges". They are not preordained, and there is sufficient scientific, economic and social uncertainty surrounding forestry to make it impossible to predict or guarantee these targets will be achieved. But with sufficient creativity, will and resources, they may be achievable. And establishing them provides the motivation and the organizing principle around which to mobilize all of the tools that we have established over the past few years. To state the obvious, targets give us something at which to aim.

### ***The healthy forests target***

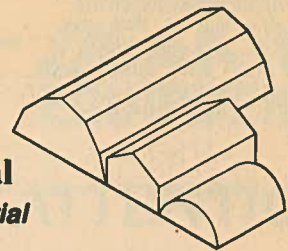
I do not wish to belabour the need to target the maintenance of the health and the integrity of the forests. I will simply repeat that sustainability just won't happen without a sustainable forest ecosystem.

### ***The timber harvest target***

Probably of most interest is the concept of a target for annual harvest levels. It would be premature and presumptuous for me to state now what level of harvest to target. Targets must be "plausible challenges", and we need to do more work with various stakeholders before we put our first

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# Project Shelter



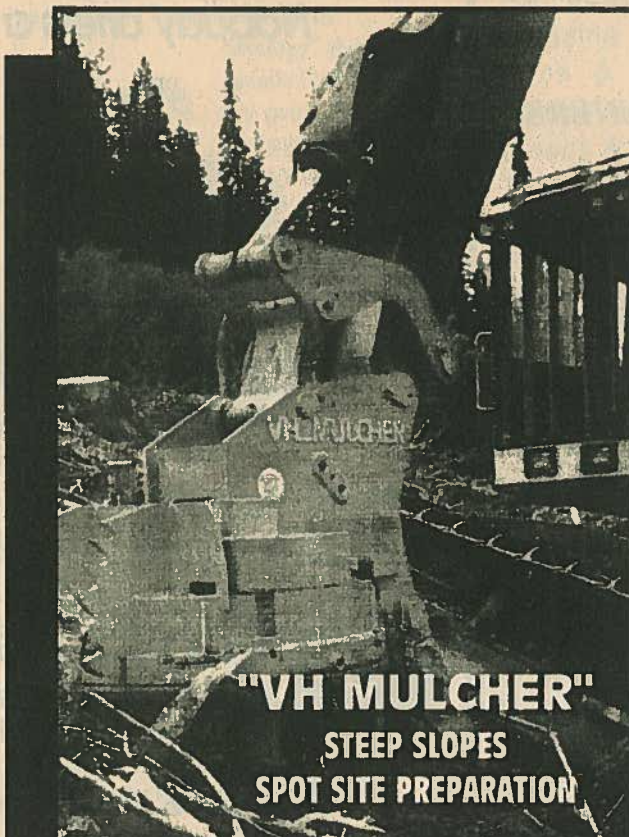
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target up. But I don't think it is out of the question that, twenty-five years from now, we could be harvesting as much wood, if not more in BC, than we currently are.

There will be a number of elements to plan to meet any target: better information arising from research in such areas as growth and yield; continuing improvements in silviculture activities; enhanced utilization; alternative harvesting approaches to access wood that would

otherwise be inaccessible; maximizing the enhanced forest zones established in land use plans; and so on. Of course, pursuing these directions will be facilitated by the Forest Renewal Plan.

### *The employment target*

With respect to the employment target, I need to be as straightforward as I can be: I do not believe that I, as the Minister of Forests, can support a target to sustain the harvest levels in BC if it is not possible to couple that with a commitment to maintain employment

levels in the forest sector. I do not believe it would have support from the public at large. Industry will need to buy into this if we are going to make all of this work.

What will be the elements of making this feasible? Very simply, it will entail adding value throughout the forest product cycle: harvesting timber in a more careful, and often more labour-intensive way; sorting logs comprehensively so they truly go to the highest and best use; more processing beyond the primary breakdown stage;

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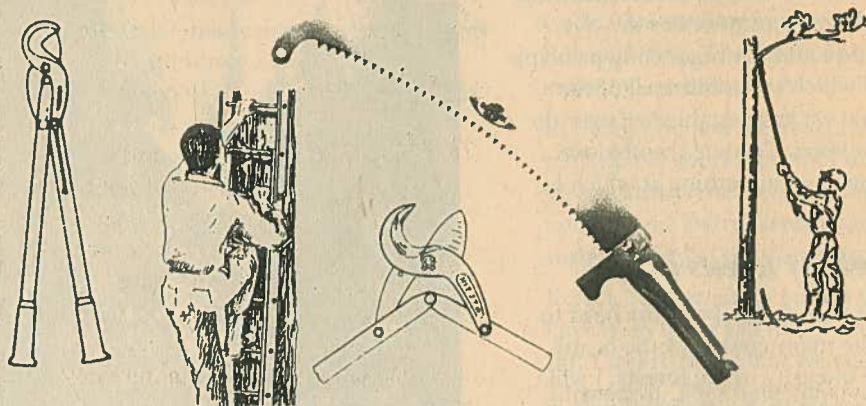
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and more intensive silviculture investment in future harvests. We will need to pursue:

- ❑ replacement of some primary breakdown capacity with value-added manufacturing (even if we are able to stabilize harvest levels, we all know there is excess capacity at the primary breakdown level in this province);
- ❑ appropriate incentives for doing more with each unit of fibre;
- ❑ investments in training and marketing; and
- ❑ a JobLink strategy to help workers move to new job opportunities created in the sector.

### *Targets are dynamic*

All these initial targets should be seen as starting points. My notion of targets is a dynamic one. We will, in an iterative way, want to revise them from time to time as we learn more about our forests, and as we learn more about our capacity to respond to challenges.

On that latter point, my reading of history is that humans have an amazing, almost infinite, capacity to respond to challenges and to continuously improve on what has been done before. I have no reason to believe that we will be any different in managing BC's forests.

Along the way, we will make investments that don't always measure up to somebody's notion of net present value, when looked at in the context of strictly private returns, or in the context of an individual forest stand.

But if we look at it in the context of what will be needed to keep the forest sector as a whole healthy and stable, I believe we should be able to convince

even the hardest of number crunchers that these will be acceptable costs of doing business.

### *Conclusion*

To ensure the continued health of the forest sector in BC, we need to build on what we have achieved over the past three years. We need to take the tools we have put in place, and motivate them with explicit targets for a healthy forest environment, and healthy timber harvest and forest-sector employment levels.

I want to engage forest sector stakeholders in this targeting process, and in particular, will be looking to the Forest Sector Strategy Committee for assistance. The objective for this should be a collective vision for the situation twenty-five years from now: call it the 2020 Vision.

2020 Vision should entail not just targets for the three key criteria, but also well-defined strategies to get there. In particular, a "Second-Growth

Strategy" that details how we are going to manage our forests in the future, and a "Value-Added Strategy" that details how we are going to maximize the wealth and

employment opportunities in the forest sector.

It is a project that I am excited about and a project that this government is uniquely placed to carry out, based on the framework we have put in place and the relationships we have developed over the last three years.

I hope that enough key individuals throughout the forest sector share my enthusiasm and will work with us to make it happen. ♦

*...to ensure the continued health of the forest sector in BC, we need to build on what we have achieved over the past three years...*



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Upon closer reading, the EPA research shows that the benefits of urban trees far outweigh their natural hydrocarbon emissions and byproducts. However, this factor explains the continued presence of some chemicals that the US Clean Air program was supposed to have eliminated at source.

## BC Forest Practices Code proclaimed

The new Forest Practices Code (FPC) became the law of BC forests on June 15, 1995. The eighteen regulations that comprise the Code cover areas ranging from silvicultural practices and road construction to soil conservation and forest fire prevention. Al Gorley has been named the executive director in charge of the FPC. Gorley is the manager of the Prince George forest region, and will keep that position while co-ordinating the start-up of the code.

## Private land will be subject to BC Forest Practices Code

The San Juan River Watershed Report reveals extensive damage to salmon habitat, including 428 landslides since 1952, on private lands on the south end of Vancouver Island. "Private land logging must not be allowed to destroy a public resource," said Vicky Husband of the Sierra Club, who made the San Juan report public after obtaining it from MOF through the Freedom of Information Act.

Public reaction to the release of this report triggered the declaration by Forests Minister Andrew Petter that, by September 1995, the Forest Practices Codes will apply to private lands. The San Juan River watershed is owned and logged by M&B, Pacific and Timber West. Steve Lorimer of Timber West commented that the right of private land owners to select the "best economic use" for their lands may be impeded by the Forest Practices Code.

Husband claims that "The watershed of

this world-class salmon stream will take maybe, one hundred, two hundred or three hundred years for nature to repair."

## Canada's forests not being replanted

*The State of Canada's Forests* (1994) reports that less than half the area harvested in Canada is treated with artificial reforestation. While many ecosystems regenerate naturally after harvesting, few regenerate the high-value forests that were harvested without some intervention to mitigate effects of clearcutting.

Studies in Ontario have documented that Canada's boreal forests are particularly vulnerable to conversion from valuable softwood stands to primarily hardwood forests.

The falling reforestation rate in Canada results from the phasing-out of federal funding for forestry. In "have-not" provinces, such as Manitoba and Saskatchewan, logging companies are not required to reforest all areas they harvested at their own cost. The provincial governments claim they cannot afford to pick up the tab.

In addition, there is little money available for reforesting the 22-million hectares of forestland that burned in wildfires during the 1980s. While much of that may have regenerated naturally, in many areas natural regeneration

cycles after fires take several decades to restore the area to a productive forest.

The declining rate of reforestation, combined with increasing rate of fire and harvest deforestation, is an alarming trend for the northern temperate forests. Especially against the backdrop of the 1980s with five of the hottest years in the last century—probably as a result of global warming.

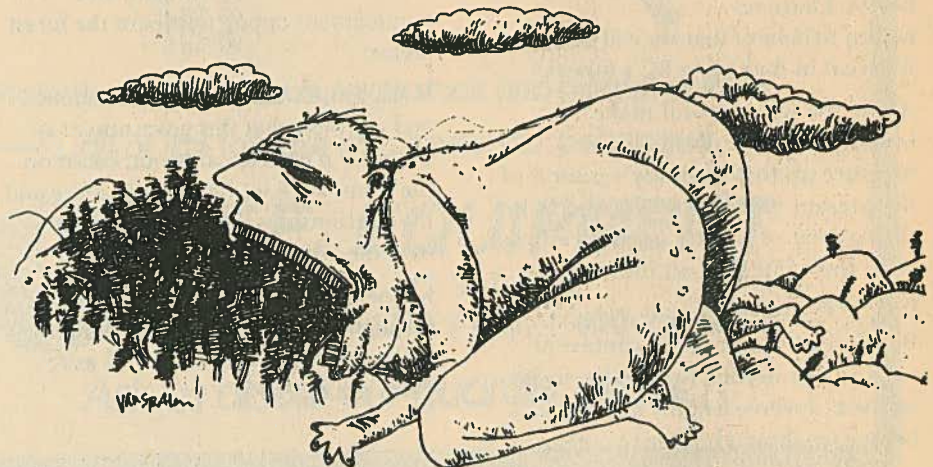
Each year both the industrial and recreational values of healthy forests climb to record highs. If the trend to less government and deficit reduction results in the depletion of this resource capital which fuels the economy, we only have ourselves to blame.

- Canadian forest harvested: 969,000 hectares
- Canadian forest replanted: 452,000 hectares.

## Cutting back all over

Forestry Canada is not the only one facing funding cutbacks. In Sweden, Garpinberg University's Forest Yield Group of 150 researchers and professionals is being shut down due to government funding cutbacks.

Some researchers will be scattered to larger centres such as Lund and Uppsala, but the Forest Yield Group closest to the working forests will largely dissolve. Some sub-groups may re-emerge as private research consultants. ♦



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