CANADIAN SILVICULTURE

Winter 2002

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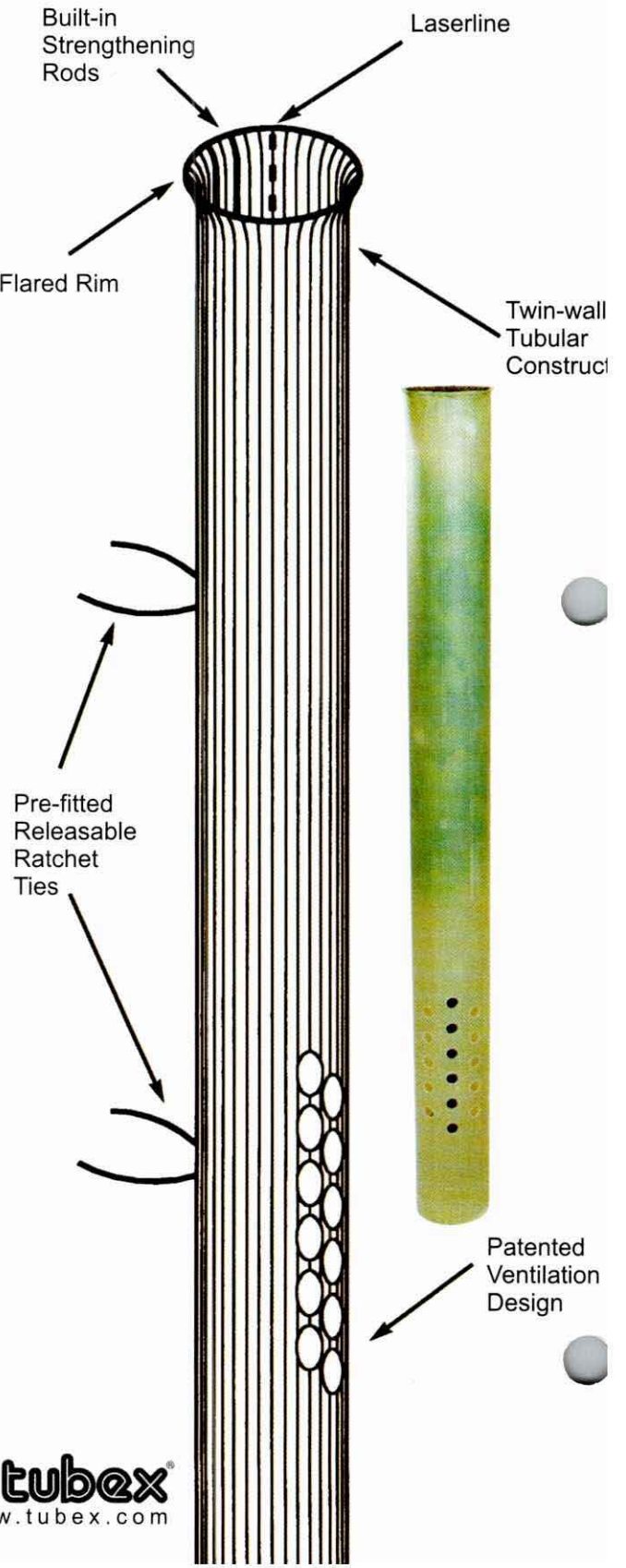

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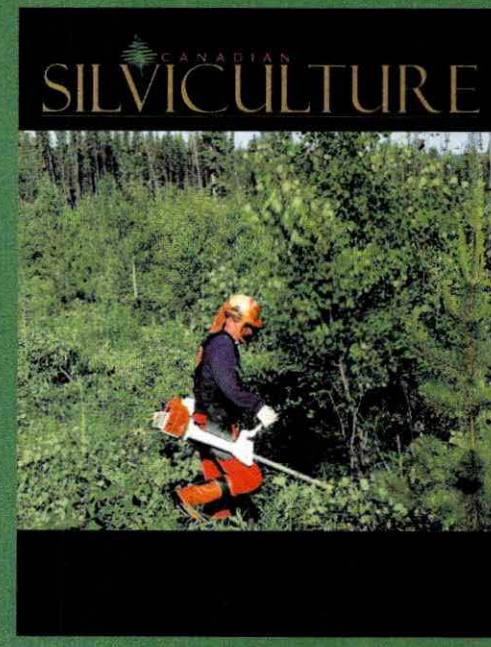


ON THE COVER:
Krzyzstof Koziol, 12-year veteran spacer in Drayton Valley, Alberta, photographed in the moment of felling a poplar to release a planted lodgepole pine. Photographer: Ivan Guyton

FEATURES

DEPARTMENTS

Editorial

Dirk Brinkman, Editor

Fungible Silviculture Language

The goal of Canada's Forest Accord is 'Sustainable Forests': " Our goal is to maintain and enhance the long-term health of our forest ecosystems, for the benefit of all living things both nationally and globally, while providing environmental, economic, social and cultural opportunities for the benefit of present and future generations."

In the Scandinavian's bid to make their regional dominance civilization's next stop north, they cleared most of their forests. But in the emerging global industrial economy of the 19th century, they were the first to reforest their deforested and uneconomic agricultural land. By the end of the last century, the competitive advantages of the Scandinavian's extensive uniform age plantation forests made their industry technology leaders in forestry. Scandinavian forests are often held up as models of sustainable silviculture in Canada.

It is not surprising that Gro Brundtland, Norway's former Prime Minister, chaired the 1987 World Commission on Environment and Development from which today's principles of sustainable development for future generations were articulated.

While principles of silviculture funding have to be framed within the Brundtland Commission's sustainability principles, funding concepts now also have to meet affordability and efficiency tests. The Dane, Bjorn Lomborg's '*the Skeptical Environmentalist*' captures the recent shift to pragmatism facing environmental issues and their eschatological advocates. The gloom and doom predictions of environmentalists have not materialised, while poverty and health care problems remain under-funded. The need for silviculture funding must not be overstated as all programs have to meet the austere economics of pragmatic affordability.

Fungible Canadian Silviculture can be defined as "a set of agreed upon beneficial interventions arising from the theory and practice of modifying the flow of change within a set of natural forest stands in an ecosystem or forestland jurisdiction, to achieve ecological, economic or social objectives of management."

Canadian Silviculture is always differentiated from the silviculture practices common to most of the rest of the world. Canada's forestlands are primarily publicly owned "Crown" land and the Canadian public has consistently directed its forest managers to maintain Canada's natural forest ecosystems and the wide variety of benefits that flow from them.

Silviculture treatments are constantly being adjusted to support the habitat needs of the other species that depend on these ecosystems. Because the terminology of Canadian Silviculture is not differentiated from its use in other parts of the world, discussions of Canadian silviculture practices and concepts are sometimes challenged by environmental critics, who associate undifferentiated terminology with the monoculture silviculture practices of other jurisdictions like the US south, Scandinavia or New Zealand.

Canadians should prefer the term 'forest stands' to 'plantations' in discussing the beneficial interventions of silviculture. British Columbia's plan to establish a 'Working Forestland base' is also using wrong terminology, as there is no plan to exempt licensees from the extensive ecosystem guidelines within the Forest Practices Code.

It is a uniquely Canadian challenge to ensure that interventions that are designed to improve harvest timber volume of value are also "beneficial" in terms of comlex ecosystem values. 'Agreed upon beneficial interventions' have to be well defined and strictly measured to ensure quality.

Over the years, silviculture's set of beneficial interventions have, for the purpose of funding, been divided into two primary groups:

1. *reforestation*, which includes the activities required to establish a free growing forest stand and
2. *tending*, which includes the activities required to protect, improve the harvest volume or wood quality or alter the established forest stand to meet habitat or ecological objectives.

The distinction evolved during the struggle to secure adequate funding for reforestation. The term 'basic' silviculture or 'basic reforestation' was used in British Columbia to distinguish it from tending, which, to further differentiate it, was described by the terms 'Enhanced Forestry', 'Intensive Silviculture' or 'Incremental Silviculture'.

The more neutral and simpler term 'tending' should replace the modifiers "intensive", "enhanced" and "incremental" as both reforestation and tending are basic to sustainable forest management. The use of superlative phrases implies a set of extraordinary interventions and creates an extra challenge for forestland managers to justify what appears to be extraordinary funding.

Even the term incremental silviculture is not fungible. It may be a more appropriate term in that it implies an increase in the increment of growth, but it is used to identify funding that is beyond reforestation or incremental to funding for basic.

Any conversation about extra costs is dead in the water before it begins. If we wish to develop uniquely Canadian Sustainable Silviculture funding, we will have to jettison inappropriate terminology.

Letters to the Editor

Canada would be well advised to concentrate its forestry investment on enhancing the quality of wood produced by native forest species

Dear Editor,

Dirk Brinkman's editorial (Fall, 2001 issue, Canadian Silviculture) suggests that "Canada's negotiated right at Bonn to sink 20 megatonnes of carbon into agroafforestation" is one of the initiatives that will create new directions for Canadian silviculture.

This corresponds nicely with the 20 annual megatonnes of carbon that will have been added to Canada's emissions by population growth which will, if unchecked, double our numbers to 60 million by 2070.

Meanwhile Deborah Bakker implies that Forest 2020 will address Canada's need to compete, with such countries as New Zealand, Chile and Brazil, in the production of great volumes of fiber from fast growing tree plantations.

For Canada to compete in this endeavor, with countries whose financing comes from the same international banking system as our financing but whose investment-intensive trees grow for many more months each year than ours do, is to compete at a tremendous disadvantage. Canada would be well advised to concentrate its forestry investment on enhancing the quality of wood produced by native forest species, many of which are unique to this part of the planet.

Peter Salonius
Durham Bridge, NB

If the product is installed according to the directions on the box, it will stay in place

Dear Editor,

I didn't like the way Robert Seaton, who happens to be employed by a competitor of mine, inaccurately described our product in his Brush Management article. To say that 'problems have occurred with keeping the Brush Blanket in place', is like saying that tree planting can be successful but problems have occurred with seedlings dying. If the product is installed according to the directions on the box, it will stay in place. Just like if a tree seedling is properly planted it will probably live. In other words it is the installer/planter that is not doing the job properly which is hardly the product's fault. I would be interested in seeing the study that Mr. Seaton bases his rodent comments on. I have replanted many areas that have had rodent damage and Brush Blankets weren't used in these areas. Furthermore, the Brush Blanket is a registered product and is used generically in the article. In the future please use the proper term for similar products. They are called 'mulches'.

Instead of Mr. Seaton dumping on our product, he might have highlighted some of the other benefits such as its soil warming properties. Earlier in the article he mentions 'root competition causing growth losses' and goes on to state that 'root competition cannot typically be addressed at time of planting'. Well he is wrong about that. Our product kills most of the below ground competition and is the only product available other than herbicide that does so.

I feel that Mr Seaton's article was poorly researched and reflects badly on your magazine and also damages my firm by dumping on our product. If you are trying to attract advertising money, you might stick to saying positive things about the products that potential advertisers produce and sell.

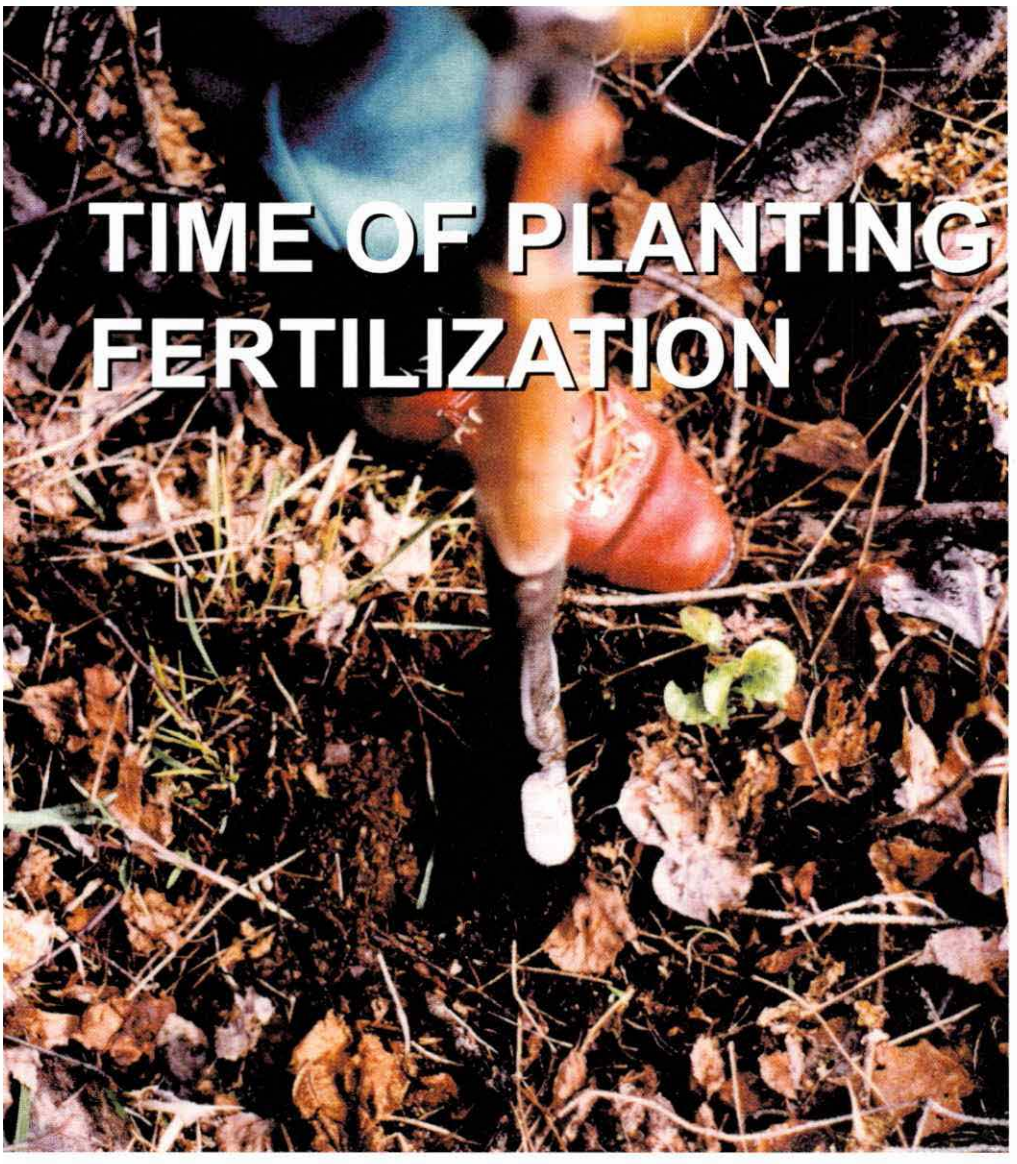
Thanks
Kevin McLaurin

Response to Arbortec regarding the use of the "Brush Blanket" name

In my article "Brush Management at Time of Regeneration", I raised some issues regarding the use of what I called "brush blankets". In using this name I was intending to point to problems which I have noted with a variety of "mulching" products. In no way were my comments intended to apply specifically to the "Brush Blanket" product sold by Arbortec – the "brush blanket" term was used purely in a generic sense. I apologize for any impression that my comments were with regard to this product.

The information I gave with regard to the generic product category were based on personal experience with a variety of products. I have not personally worked with Arbortec's product, and cannot make any comment as to its properties or success.

Robert Seaton



TIME OF PLANTING FERTILIZATION

by Robert Seaton

As with many other species, fertilization has enormous potential to increase growth and yield in forest trees. Volume gains and consequent reductions in length of rotation associated with fertilization probably exceed those associated with any other treatment. These gains also extend the range of sites over which treatments such as pruning, that increase stand value, are economically viable.

One of the most important potential fertilization treatments may be fertilization undertaken at the time of planting. Time-of-planting fertilization has the potential to:

- Reduce planting shock
- Increase growth of planted trees during the first years after planting
- Reduce establishment brushing requirements
- Speed achievement of FG status

The sum of these effects can potentially significantly reduce the costs of establishing a FG plantation, as well as

reducing time to green-up, and other important milestones. However, a number of issues have arisen around time-of-planting fertilization during the past 2 – 3 years including:

- Evidence of negative effects on planter health from some products, probably due to sensitivity to macronutrients, but with some potential for problems arising from exposure to heavy metals such as Cadmium
- Suggestions that application of fertilizers could lead to contamination of human water sources with metals and other substances
- Evidence of increased seedling mortality under some conditions
- Poorer growth results than expected, or growth effects only persisting for one growing season or less

Recent research, undertaken by Brinkman & Associates Reforestation Ltd., has begun to elucidate the conditions under which these issues are of concern, and the steps which can be taken to minimize them.

Planter Health Concerns

Planter health concerns regarding handling and installation of fertilizer products during planting have typically fallen into two broad classes:

1) Irritation to skin and mucus membranes

Irritation effects, including skin rashes and nose bleeds, have been experienced by a percentage of the planters handling fertilizers. A clear causal link exists between fertilizer handling and these effects. Although the biochemical cause of the effects has not been conclusively identified, it appears likely to be associated with exposure to macronutrient formulations such as urea, in dust and solute form.

2) Exposure to heavy metals

To date extensive testing of planters for elevated levels of heavy metals has not been undertaken. Based on the levels of metals found in fertilizer products, compared with potential exposure in other industries where testing has been undertaken, significant effects would not be expected. However, planters do work at much higher metabolic levels than most workers, and job site exposure control is more difficult to undertake, compared with controlled industrial sites.

The primary strategy for reducing planter health problems is to reduce exposure to fertilizers. Strategies to accomplish this include:

- Enhancement of workplace safety through the use of gloves, dust masks and field wash-up stations
- Reduction of dust levels on fertilizer through careful dust control during manufacturing
- Increased packaging of fertilizers to reduce handling and limit worker contact
- Use of less irritant fertilizer forms, such as some organic fertilizers

Potential for heavy metal exposure can also be reduced through minimization of heavy metal levels in the product. Cadmium has typically been the most problematic metal in fertilizer blends, since most other metals are found at levels less than any identified standard.

Cadmium in fertilizers is generally derived from one of two sources:

- Blended micronutrient mixes arising from industrial processes
- High Cadmium Phosphorus sources

Careful formulation of fertilizers using specific targeted micronutrient sources rather than broad blends, and selected low Cadmium Phosphorus sources, can greatly reduce Cadmium

levels. Testing of a broad range of fertilizers has shown Cadmium levels ranging between 1 and 75 ppm. Fertilizers blended to minimize Cadmium content typically show Cadmium at levels between 1 and 4 ppm.

Setting standards for allowable Cadmium levels in silvicultural fertilizers has been difficult. A number of different possible standards have been identified, including:

- 1.6 ppm – The maximum allowable level in soils in Ontario after application of sewage sludge
- 3 ppm – The British Columbia standard for agricultural soils
- 20 ppm – The Canadian standard for fertilizers

Ecological Concerns

Ecological concerns have typically centered around two issues:

1. Contamination of community watersheds with heavy metals

Because the levels of application of time-of-planting fertilizers are relatively low, the percentage increase in levels of metals in the soil is very small –well below 1%. As with planter health concerns, Cadmium is a benchmark element in this regard. Fertilizers with levels below the relevant agricultural soil standards would clearly meet any technical standards in this regard. However, community health concerns may mandate the use of other options, such as food grade organic fertilizers, in community watersheds.

2. Degradation of soil biota and processes

Soil degradation has been a problem associated with fertilization in agricultural soils. Fertilization can increase the rate of breakdown of the organic portion of the soil, leading to loss of structure, and loss of nutrient and moisture holding capacity. However, forestry time-of-planting fertilization typically involves one time point application of small quantities (<15 kg N/ha) of fertilizer, as compared with application of quantities an order of magnitude greater, on an annual basis, in agriculture. Measurable effects on the soil due to time-of-planting fertilization are exceedingly unlikely.

Seedling Mortality

Time-of-planting fertilization has been clearly associated with increased seedling mortality in some cases. Mortality appears always to be associated with excessively elevated levels of macronutrients, especially Nitrogen, in the root zone of the seedling. There are a number of reasons for elevated macronutrient levels, including:

Rapid release of nutrients

Most time-of-planting fertilization products are designed to release some or all of their nutrients over time. Typically, this involves sulfur or polymer coating of prills, or the use of slow release packaging. Flaws in the design or manufacture of the slow release mechanism are the most prevalent cause of seedling mortality. Poor quality slow release coatings, or the improper mixing of different release profiles, can result in a rapid release of Nitrogen and other nutrients. Even in cases where mortality does not occur, excavated seedlings will often show root mortality on the side toward the fertilizer product, and imbalanced root development.

Placement of the fertilizer product

The effects noted above can be exacerbated by placement of the fertilizer product in direct contact with the roots of the seedling. Although some products may usually be safe when placed in contact with the roots, an increased risk of mortality always exists. On the other hand, placement too far from the seedling may result in limited access to the fertilizer for the seedling, and potentially in fertilization of competing species. Typically, placement 2 – 5 cm from the seedling, about 1/3 of the way down the roots, appears to be good. However, specific directions given by manufacturers should be followed. Another possibility is placement 3 – 6 cm directly below the bottom of the seedling.

Moisture deficit conditions

Some slow release fertilizer products absorb moisture through their coating or packaging. This may result in moisture levels within the product exceeding those in the surrounding soil during moisture deficit conditions. The resulting release of exceedingly concentrated fertilizer solutions into a moisture poor environment can cause seedling mortality. Use of properly designed slow release mechanisms and proper placement will minimize the risk of this problem.

Failure to Enhance Seedling Growth

In some cases, application of fertilizers fails to achieve the desired seedling growth enhancement. In cases to date where this effect has been noted, it has been associated with problems in formulation, release or placement similar to those noted above. Typically, one of three problems has been identified:

Failure to release fertilizers

Some cases have been noted where slow release mechanisms resulted in slower than desired release of nutrients. This can be caused by very cold or very dry soils, or by improper design or manufacture of the slow release mechanism. Although this problem does reduce the initial growth of the tree, the fertilizers remain onsite, and will typically release over time, providing at least part of the desired effect.

Poor fertilizer formulation or mixing

Achieving the desired growth effects depend on ensuring that all the necessary nutrients are present. Poor availability of certain critical micronutrients, such as Boron, may result in poor seedling growth even if macronutrients are available at the required levels. Problems with fertilizer mixing may also have this effect. Because time-of-planting fertilization typically involves spot application

Time of Planting Fertilization continued from page 8

of small quantities of fertilizer, uniformity of blending is critical. Poor uniformity can result from poor mixing, or from self-sorting during transport and handling due to uneven prill sizes. This can be a particular problem with micronutrients, which are present at low levels to begin with.

Damage to seedling

Root mortality caused by fertilizer products can also result in poorer growth than expected. In some cases, the fertilized trees may even grow more slowly than unfertilized trees, although this will typically be associated with high levels of mortality in the plantation. As discussed above, proper design, manufacture, and placement of the fertilizer product can minimize the potential for this type of problem.

Species or Site Specific Effects

Recent trials have clearly demonstrated that the degree of success with a specific fertilizer blend and release profile is to some degree species and site specific. For instance, some products recently tested on the B.C. Coast have been highly effective in wetter sites and with Western Red Cedar and Western Hemlock, while showing much poorer performance with Douglas Fir and in drier sites. In this case, the effect appears to be primarily a result of wetter sites causing the fertilizer to release at a rate that matches the nutrient demand of Cedar and Hemlock.

General Conclusions

Time-of-planting fertilization is more complex than might be expected. If the desired growth effects are to be achieved, without compromising planter safety or seedling survival and growth, and without fertilizing surrounding competing species, a number of inter-related factors need to be considered. These include:

Matching expected site conditions and species

The nutrient, moisture and temperature profile of the soils through the growing season will influence the release rates, the nutrients required, and the potential for fertilizer related mortality. While custom mixing fertilizers for each planting site and species is not a viable option, silviculture foresters may want to consider undertaking some spot testing of soil and site conditions, and using two or three different blends to match broad site and species characteristics.

Use of high quality products

The quality and consistency of manufacture of the slow release mechanism is particularly critical. Poor quality coatings or packaging can result in significant seedling mortality.

Minimization of heavy metals and other undesired components

Good fertilizer formulation can reduce levels of undesirable components and compounds to levels that will ensure that planter health and the environment are not compromised. MSD sheets should identify the levels of macronutrients, micronutrients, and metals in the fertilizer.

Ongoing product testing

Ongoing testing of even-ness of mixing, chemical composition, and release profile should be undertaken to ensure product consistency.

Proper product placement

The proper placement of the product must be clearly specified. Planter training should be undertaken to ensure that planters understand the requirements for installation of the product.

Ongoing fertilizer research

Identification of optimal product/site match, and investigation of new products, should be an ongoing process. Adequate fertilizer testing can be undertaken using fairly simple field trial methodologies, with minimal costs. The enhanced results associated with optimal use of fertilization can far outweigh the costs of the research.

Bill C-5, the proposed Species At Risk Act for Canada, continues its slow progress through Parliament. What will it mean for silviculturists when it eventually passes into law, perhaps by Fall 2002?

First, those managing Canada's private and public forests should expect much greater consequences for their operations in the long-term (5 years or more) than the short-term. The federal government has committed to encouraging others, including private companies and land-owners, to take action before it will consider stepping in. The government intends to develop partnerships for protecting species and habitats, through a federally funded Habitat Stewardship Program and through bilateral agreements with the provinces and territories. This recognizes two important realities: that species and habitats are more likely to benefit if the land-owner is a willing co-operator in conservation; and that the provinces and territories hold primary responsibility for Crown lands and inland waters, except in the case of the relatively small areas that are owned by the Government of Canada.

Only if actions by the partners prove insufficient to do the job will the federal agencies be empowered under SARA to enforce the law to protect species at risk. This is an important distinction between SARA and the US Endangered Species Act, which starts with legal steps by the US government and federal prohibitions against many kinds of land management. The Government of Canada has worked hard to ensure people understand that SARA is a "made in Canada" solution and not a carbon copy of the much-criticised US system.

The process for listing and recovering species under SARA is complex, but consists of three major elements. First, a species must be "listed" by the government under the List of Wildlife Species At Risk, based on the recommendations of the Committee on the Status of Wildlife in Canada (COSEWIC), a panel of recognised scientists. The listing of a species will immediately lead to prohibitions against killing, harming, harassing, capturing or taking of species, and the destruction of their residences.

Second, a recovery strategy and an action plan will be prepared for each species, or in the case of the so-called "ecosystem-based" approach, for a group of species. These strategies will be prepared with input from stakeholders, under timelines that vary from one to two years depending on the severity of the risk to the species. Action plans will flow from the strategies and will lay out the details of what will be done to promote the species' recovery.

Third, the recovery strategy will be implemented through voluntary stewardship initiatives or through habitat protection and management required by provincial and territorial governments. This will be where the rubber hits the road, and habitats will start to change.

Silviculturists will find their skills and knowledge are needed both in recovery and action planning and in implementation of habitat plans in the field. Depending on which area of the country they work in and how many forest-dwelling species at risk are present, SARA's requirements for participation by silviculturists and other foresters in recovery planning and management could be a minor issue or a very important one.

Will this uniquely Canadian approach ensure that our country's heritage of wild species and habitats persists? We won't know for many years after SARA takes effect. But all forest and wildlife managers across Canada owe it to posterity to make it work and make it better as time goes by.

More information on SARA, the national Accord for the Protection of Species At Risk, and other endangered species issues is available on the Internet at http://www.speciesatrisk.gc.ca/species/sar/strategy/index.htm.

Brian Nyberg works at the Forest Practices Branch, BC Forest Service, Victoria BC

Beneficial Forest Intervention

by Dirk Brinkman

Comprehensive Funding Principles for Silviculture's Beneficial Interventions

Today's silviculture challenge is to find a secure independent, practical set of affordable funding principles - like those for the reforestation of current logged areas - that will support the goals of sustaining Canada's public forests.

British Columbia is presently undertaking a core service review that revisits fundamental principles of forest management, some of which have not been questioned within government for over 50 years. The Ministry of Forests new Service Plan declares that forest license holders will be responsible for delivery of all silviculture investments on tenures under a defined area management model. But the fundamental principles of funding silviculture are undefined. In the interim, the government is setting up another (perhaps the thirtieth in the history of BC) public fund, the Forest Investment Account which is expected to be abandoned because of inevitable and embarrassing failures in bureaucracy due to an incomplete analysis of how and what silviculture should be funded. This article sets out an interlocking set of affordable and sustainable funding principles for silviculture's beneficial interventions to sustain BC's forest ecosystems, forest sector and dependant workers and communities for future generations. These principles apply equally to other provinces, just as the first principle, after it was introduced in BC in 1987, was adopted by most of the other provinces.

Principle #1: The harvester will reforest each harvested forest stand

The context of how this principle was crafted is elucidating. In the seventies and eighties, deforestation without reforestation had emerged into a growing public motherhood issue competing for an increasing share of General Revenue in each of Canada's provinces. At that time, an increasing percentage of public revenues were being absorbed to pay interest on the growing public debt (today the Pac-man gobbling public revenues is the growing cost of health care) and the US countervailing threat was then also pressuring government to reduce its apparent subsidies to the forest sector.

The solution to secure adequate funding for reforestation was not to continue fighting for a share of the diminishing public purse or setting up another reforestation account. The solution lay in putting in place a principle within which reforestation funding would be both forever secure and completely independent: *each area harvested will be reforested to free growing by the harvester as a cost of the harvest.*

Making industry accountable for reforestation not only eliminated the perception of subsidy, it eliminated the failures of government bureaucracy. The responsibility and cost for reforestation was privatized while maintaining high standards through BC's Correlated Stocking Guidelines for each ecosystem and subzone. Today, however, Principle 1 needs to be restated to include the other temporary forest users whose deforestation of public land is a 'free-rider' and not a part of their operating costs.

Principle #1 restated: All temporary forest users who harvest or deforest will reforest each disturbed forest stand

Temporary harvesters or de-foresters outside the forest sector include, for example, oil exploration contractors who cut seismic lines without reforestation obligations, adding to the oil industry's carbon emissions. In Alberta, seismic lines have displaced over 10% of the productive forest. Alberta's oil industry recently developed algorithms that can use a seismic line of 1.5 meter width that follows ridge contours in order to reduce the deforestation and net carbon emissions. Given notice that deforestation without reforestation will no longer be a free rider without cost will quickly reduce the impact on the forests of the free riding private industrial users.

Principle #2: The harvest licensee will maintain the sustainable volume of value cut

The first principle of Sustainable Forest Management is forest stand based. The second principle is forest area based and staples the obligation to 'maintain a cut' to the rights to the long-term annual allowable cut (AAC).

This principle is easier to administer with area based forest licences but requires the cooperation of quota licensees in each Public Sustained Yield Unit or Timber Supply Area. The new BC government is de-linking forest licenses from mills, which means most licenses will become more marketable resource rights of use, whose value will be further improved when the government grants greater flexibility to

harvest only when the market prices are up. For most licenses, the cost of the silviculture to maintain the cut will be far less than the added value of making these licenses more tradable.

The obligation to maintain the cut does not need a government administered Forest Investment Account trying to resolve impossible issues like regional inequity between various licensee silviculture costs, especially when the particular treatments that may get prioritized in one license will be completely different and not comparable to treatments from another license. It is exactly this kind of complexity that the genius of free enterprise is best designed to problem solve.

An AAC sustaining silviculture program requires a high level of reliable forest inventory. This inventory may need public funding through a Forest Investment Account and should be in the public record.

As the value of the sustained volume cannot be allowed to degrade in terms of species mix or wood quality, future AAC volume will have to be defined as volume of valuable timber, because valuable timber is all that is harvested.

Principle #3: The Crown will share the cost with the licensee of increasing the volume of value cut

There are precedents for funding assistance for tending, not only in Sweden where the government pays 35% of tending costs on private land, but even in the US, whose subsidies for silviculture would astonish Canadians (just visit http://www.americantreeseedling.com/assist.htm. for a sampler). To maintain industry's competitive advantage, the generally undesirable formula of a government Forest Investment Account might be used to partially finance licensees who have silviculture programs to increase their AAC.

The BC Liberal New Era commitment was to "Increase the allowable annual cut over time through scientific forest management, proper planning, and incentives to promote enhanced silviculture." In the run up to the election, now Premier Gordon Campbell set the BC Liberal goal at 100 million cubic meters. The projected MAI for the approximately 23 million hectares of forestland licensed for use today, assuming sound management is over 4 cubic meters per year annual growth makes 100 million a reasonable and possible figure. However, the Ministry of Forests produced an estimate in 1994 still being used today of growing the AAC to 75 million cubic meters based on more set aside for parks and reserves. Whatever the political outcome of the area for the working forests, a 20% to 50% increase in the AAC is possible.

Based on completed inventories for timber licenses, both the percentage contribution by the government fund and the compensation for resource-taking by future governments of the industry funded 'increment' of AAC created, may have to be negotiated, perhaps license by license.

Principle # 4: Permanent Forest users will afforest off-set areas of equal volume of value

Permanent forest users are differentiated from temporary forest users by their long-term displacement of forests; these include rights of way, such as power lines, pipelines, highways (including toll-ways) permanent forest roads and developers. There are precedents for requiring the user to off-set permanent deforestation through an afforestation program on land that has been without forests. A rights of way off-set program has been an environmental policy of Ontario Hydro since the late eighties. The principles of afforestation funding were also defined for the Alberta Heritage Fund in the eighties. While locating land for afforestation is more difficult in BC than other provinces with more extensive farmland, BC does have 300,000 hectares of uneconomic farmland.

Principle #5a: The province will maintain an annual reforestation program adequate to reforest the average area depleted by natural disturbances

In BC, the annual average depletion due to natural disturbances such as pests, disease and wildfires is about 20,000 hectares per year, about 40% of which may benefit from artificial reforestation. There is a small under-funded provincial natural disturbance reforestation program in BC. A fully funded program is necessary to insure licenses affected by a natural disturbance can still meet their commitment to maintain the cut. Such an annual natural disturbance reforestation program is precedented in Ontario's Forestry Futures Trust Fund.

Principle #5b: The federal government will maintain an emergency reforestation fund to reforest catastrophic provincial disturbances

The mountain pine beetle catastrophe in BC, which may deforest over 5 million hectares, makes it clear that the provinces collectively have to insure against extreme forest disturbance events through a federal program. Of course, any areas harvested will be reforested as a cost of the harvest, though all of the salvage wood may not support the full cost. The provincial natural disturbance program will be there to do its part.

Within a comprehensive framework of funding principles and allocated responsibilities, there is no longer room for the federal government to be allowed

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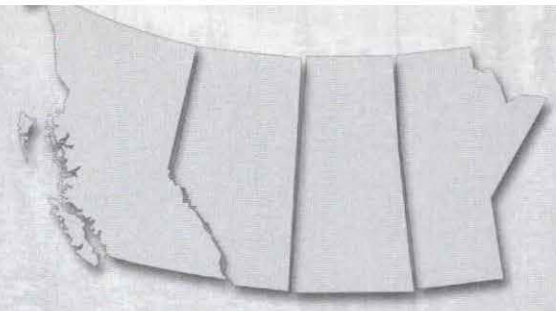
Western Silvicultural Contractors' Association



by John Betts, Executive Director WSCA

WSCA's role critical during these times of policy changes and economic down-turn

Industry associations like the firms they represent are not immune to business cycles. The current downturn in B.C.'s forest sector economy proves this. Even the largest associations seem to be in jeopardy; note the much-publicized case of the Council of Forest Industries. Anxieties over membership and money are afflicting many organizations including the smaller players such as the Western Silvicultural Contractors' Association. Fortunately associations, like their members, generally survive downturns. Although disruptive, these periodic lows are not fatal if organizations and their members are fit and agile and committed to the industry. Still, this particular downturn in the general economy comes at a bad time. A new government in B.C. has embarked on an ambitious review of all government agencies that will lead to many key policy changes. Critical to this process are the credible contributions from industry and business associations. For associations to lose support at this time of major change can seriously set back the interests of their constituents. It means members are being asked to support their association's activities when the natural instinct is to focus on their own immediate survival.

Following are some of the critical issues that the WSCA is dealing with, on its members' behalf. Government is scrutinizing WCB in a potentially profound core review which will significantly alter the role of the agency. Considering whose money supports WCB, all employers have a vested interest in how these changes take shape. As well, everyday project affairs and season-end bottom lines are determined in part by safety requirements, procedures, and equipment regulated by WCB.

Government is rewriting the Employment Standards Act next year. Special consideration has been extended to the silvicultural industry as a result of the previous regulatory review initiated by the WSCA. Now the association has been asked to work with government to ensure the Act continues to provide the regulations' current flexibility and clarity for contractors and workers. This government plans to rely on industries to regulate themselves and will count on the WSCA to help reduce red tape while increasing compliance with the law.

Revolutionary policy changes are being contemplated for the forest industry by government. Some proposals have been so radical they could redistribute tenure and silvicultural obligations changing the marketplace for contractors' services. In this regard no-one is going to look after our interests but ourselves.

With the dismantling of FRBC we continue to see a decline in public funding for forestry in spite of an announced Forest Investment Account. How will the scant funds in this program be allocated? No-one except the WSCA has been paying serious attention to this problem.

There are other issues as well from fire protection and beetles to federal funding and rewriting the Woodworkers' Lien Act. All of them represent opportunities or setbacks for the silvicultural industry depending on how they turn out. Left on their own or up to proxy representation by others the results will not likely be satisfactory.

UPCOMING EVENTS

May 9-11 Forest Expo
Prince George, BC
www.ciwpa.bc.ca

Sept 27-Oct. 3 Canadian Institute of Forestry
2002 Annual Meeting
"Forests Sustaining Communities-
Communities Sustaining Forests"
North Bay, ON
www.cif-ifc.org

Let us know what's coming up in your area.

Association des entrepreneurs de travaux sylvicoles du Québec

Par Monsieur Alain Castonguay

ISSU DE LA CONCERTATION DE LA CCFQ, DU RESAM ET DE L'AETSQ

Un contrat type en aménagement

Tel que nous l'avions annoncé dans l'édition d'avril dernier, l'industrie de l'aménagement forestier s'est concertée pour produire un contrat type destiné à encadrer les relations entre les donneurs de contrats et les exécutants en forêt.

Les trois principales associations provinciales regroupant des entreprises exécutant ces travaux ont uni leurs forces pour produire ce contrat type. Il s'agit de la Conférence des coopératives forestières du Québec (CCFQ), du Regroupement des sociétés d'aménagement forestier du Québec (RESAM) et de l'Association des entrepreneurs en travaux sylvicoles du Québec (AETSQ).

Durant les travaux du Comité interministériel sur le développement de la main-d'œuvre, qui a publié son rapport le printemps dernier, les intervenants ont pu constater que plusieurs entreprises d'aménagement forestier, œuvrant pour le compte d'industriels en territoire public, opéraient sans contrat.

Le 28 novembre dernier, les trois associations ont ainsi déposé leur proposition de contrat type au Comité de suivi qui a été créé pour appliquer les recommandations du Comité interministériel. La rencontre se déroulait dans les bureaux du ministère des Ressources naturelles (MRN), à Québec.

LE COMITÉ INTERMINISTÉRIEL

Le Comité interministériel, formé de représentants des divers ministères concernés (Ressources naturelles, Régions, Éducation, Emploi et Solidarité sociale, Industrie et Commerce) s'est réuni de septembre 2000 à janvier 2001. Son rapport a été rendu public le 25 mai dernier. Outre le RESAM, la CCFQ et l'AETSQ, d'autres partenaires non gouvernementaux avaient été mis à contribution, tels que le Comité de stratégie des ouvriers sylvicoles, Rexforêt et l'Association des manufacturiers de bois de sciage du Québec (AMBSQ).

Dans une lettre destinée aux bénéficiaires de contrats d'approvisionnement et d'aménagement forestier (CAAF) datée du 18 juillet dernier, le ministre des Ressources naturelles, Jacques Brassard, avait fait part des mesures que le gouvernement entendait prendre pour mettre en application les recommandations du Comité interministériel.

Parmi les mesures envisagées, le ministre avait ainsi évoqué la nécessité, pour les usines détentrices d'un CAAF, de conclure des ententes «formelles et écrites» de plus d'une saison avec l'entreprise exécutant leurs travaux. Ces dernières «ne savent pas si elles seront en mesure d'obtenir de nouveaux contrats et ainsi garantir un emploi à leurs travailleurs pour la prochaine saison. Cette situation a des impacts négatifs sur la rétention des travailleurs et sur la rentabilité des entreprises qui les embauchent», écrivait M. Brassard.

LE CONTRAT

Le contrat type proposé par la CCFQ, le RESAM et l'AETSQ est pluriannuel (minimum trois ans) et comporte plusieurs innovations «visant à consolider les entreprises d'aménagement forestier, améliorer les conditions des ouvriers sylvicoles et, en définitive, à améliorer la compétitivité de l'ensemble de l'industrie forestière québécoise», ont indiqué les trois partenaires dans un communiqué conjoint publié le 19 novembre.

La consolidation ainsi recherchée se fera également à travers «un nouveau partage des droits et obligations des entreprises d'aménagement et des industriels. Il apparaît clairement qu'une meilleure sécurité contractuelle et un partage des responsabilités et risques favoriseront l'investissement dans la formation de la main-d'œuvre, en plus de permettre de dégager des marges de manœuvre qui contribueront à améliorer les conditions de travail des ouvriers sylvicoles», ajoute-t-on dans le communiqué.

Les trois associations indiquent que l'adoption de ce modèle de contrat favorisera aussi «une meilleure rétention de la main-d'œuvre, une valorisation des métiers sylvicoles et un meilleur équilibre des responsabilités entre les bénéficiaires de CAAF et les exécutants». Cela faciliterait même les efforts en matière de certification environnementale.

La plupart des clauses du contrat type tendent à offrir un cadre plus stable aux entreprises de l'industrie de l'aménagement. Outre la durée minimale de trois ans et des modalités de renouvellement, on y trouve aussi des clauses concernant :

- la rémunération pour des services rendus en sus des travaux d'exécution proprement dits ;
- des modalités de paiement et de compensation financière pour les délais de paiement ;
- une référence aux exigences ministérielles en termes de qualité à atteindre;
- la responsabilité limitée des exécutants à l'endroit du MRN;
- les délais à respecter concernant la planification préalable des travaux;
- les responsabilités des bénéficiaires en matière d'accès au territoire;
- les compensations versées lorsque des réductions de travaux se traduisent en coûts fixes à supporter pour l'exécutant (exemple: les camps forestiers);
- la médiation et l'arbitrage en cas de litige.

Chaque association est responsable de la diffusion du contrat type auprès de ses membres et doit s'assurer qu'ils sauront l'utiliser dans leurs prochaines négociations avec les donneurs de contrats. Par ailleurs, un suivi sur l'utilisation des différentes clauses sera

réalisé au cours de la saison 2002-2003 afin de mesurer, dans le temps, l'amélioration des conditions contractuelles.

Quant à l'AMBSQ, les membres du Forum Forêt ont pris connaissance des documents concernés lors de leur rencontre du 20 novembre dernier. Le conseil d'administration de l'Association doit quant à lui en prendre connaissance à la mi-décembre. Le vice-président foresterie, Jacques Gauvin, a préféré réserver ses commentaires pour le moment, le temps que les membres de l'AMBSQ prennent connaissance du document.

Les 40 coopératives forestières membres de la CCFQ, les 44 groupements de propriétaires de lots boisés membres du RESAM et les 30 entreprises sylvicoles indépendantes membres de l'AETSQ embauchent une très importante proportion de la main-d'œuvre active en aménagement des forêts publiques.

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Translated Report

By Alain Castonguay

Outcome of the collaborative meetings of the CCFQ, RESAM AND AETSQ:

A Standard Management Contract

As we announced in our April 2001 publication, the forestry management industry has reached an agreement to produce a standardized contract to cover relations between contract issuers and woodlands workers.

The three principal provincial associations linking companies carrying out these functions have joined forces to arrive at the contract formula. These are the Conference of Quebec Forestry Cooperatives (CCFQ), the Group of Quebec Forestry Management Organizations (RESAM) and the Association of Quebec Forestry Service Contractors (AETSQ).

During the activities of the Joint Ministry Committee on the development of forestry manpower, which published its report last spring, participants noted that several forestry management companies, working on public lands on behalf of industry, were operating without contracts.

On November 28, the three associations submitted their proposal for a standard contract to the follow-up committee appointed to implement the recommendations of the Joint Ministry Committee. The meeting took place in the offices of the Ministry of Natural Resources in Quebec City.

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THE JOINT MINISTRY COMMITTEE

The Joint Ministry Committee, composed of representatives of the various ministries concerned (Natural Resources, Regions, Education, Employment and Social Security, Industry and Commerce) met from September 2000 to January 2001. Its report was made public on May 25, 2001. In addition to the RESAM, the CCFQ and the AETSQ, other non-governmental partners were invited to take part, such as the strategy committee of the woodlands workers, Rexforêt and the Association of Quebec Sawmill Operators (AMBSQ).

In a letter addressed to those benefiting from supply and forestry management contracts, under date of July 18, 2001, the Minister of Natural Resources, Jacques Brassard, had announced steps the government intended to take in order to implement the recommendations of the Joint Ministry Committee.

Among the measures proposed, the Minister had emphasized the need for businesses enjoying supply and management contracts (CAAFs) to draw up "formal agreements in writing", and extending over more than one season, with the companies carrying out the work. The latter often "do not know whether they will be able to secure new contracts and thus guarantee employment to their workers for the next season. This situation has a negative impact on the retention of workers and on the profitability of the businesses employing them", Mr. Brassard wrote.

THE CONTRACT

The formula proposed by the CCFQ, the RESAM and the AETSQ is a multi-year contract (three years minimum) that includes several innovations "intended to put the forestry management business on a firmer footing, to better the conditions of woodlands workers and, eventually, to improve the competitiveness of the whole forestry industry in Quebec", according to the joint press release issued by the three partners on November 19, 2001.

The consolidation thus envisaged will be achieved through "a new sharing of the rights and obligations of forestry management companies and of their industrial partners. It appears evident that improved contract security and a sharing of risks and responsibilities will encourage investment in manpower training, as well as introducing a margin of flexibility that will contribute to the improvement of working conditions in the forest," the release continued.

The three associations state that the adoption of this form of contract will also result in "a higher level of labour retention, increased recognition for forestry services and a better balance of responsibilities between the holders of CAAFs and the organisations carrying them out". It may even facilitate efforts to obtain environmental certification.

Most of the clauses in the standard contract tend to offer a more stable framework to companies in the forestry management industry. In addition to the three-year minimum duration with conditions for renewal, there are clauses regarding:

- remuneration for services rendered beyond the normal fulfilling of the contract;
- arrangements for payment and for financial compensation in the event of delayed payment;
- reference to the Ministry's requirements relative to quality standards;
- limited responsibility of contractees with respect to the MNR;
- time limitations with respect to the preliminary planning of work projects;
- responsibilities of contract holders in the matter of access to lands;
- compensation to be paid when work reductions involve fixed costs to be borne by the contractee (for example: lumber camps);
- mediation and arbitration in case of disputes.

Each association is responsible for distributing the standard contract to its members and for ensuring that they know how to use it in future negotiations with contract issuers. Furthermore there will be an evaluation of the application of the various clauses during the 2002-3 season in order to take stock, over time, of improvements to the contract components.

As for the AMBSQ, participants in the Forestry Forum took note of the relevant documents at their meeting on November 20, 2001. The executive of the Association will take the matter under advisement in mid-December. The vice-president (Forestry), Jacques Gauvin, prefers to withhold his comments for the present to allow time for the members of the AMBSQ to become familiar with the document.

The 40 forestry cooperatives belonging to the CCFQ, the 44 groups of woodlot owners affiliated with the RESAM, and the 30 independent forestry companies who are members of the AETSQ employ a very large proportion of the manpower currently engaged in the management of Quebec's public forests.

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New Brunswick Independent Silviculturists Association

by Gaston Damecour, RPF

Silviculture in New Brunswick

Since the mid-90s, New Brunswick's silviculture has been evolving on both the private (30%) and Crown (50%) land-bases along with our provincial wood supply. Noticeable adjustments following the demise of the Federal-Provincial Cooperation Agreements and adjustments to Crown silviculture have resulted in many silviculture contractors changing vocations or shifting their business to Crown lands. This situation seems to be prevalent across Atlantic Canada, not only New Brunswick.

The rationalization of the Provincial seedling production (for Crown Lands reforestation) involved the closure of two of the three provincial tree nurseries concentrating production at the province's Kingsclear tree nursery. The Irving, Fraser (Nexfor) and UPM nurseries and other smaller private nurseries are all very active and provide a significant numbers of seedlings. The province's Madran nursery has recently been acquired by the North Shore Forest Products Marketing Board and is expected to have seedlings for the 2002 planting season on private woodlots.

Crown Lands

The Crown lands silviculture budget (Provincial) has remained flat at about 19 million dollars annually, consequently the area of silviculture has decreased (dollars and hectares treated). While the funding levels are at levels to maintain the current Crown Forest Management Plans' AACs (annual allowable cut), the funding of Crown silviculture continues to be the object of much concern and review.

The noticeable decreases are in cone collection and areas planted (averaging 17.5 million seedlings per year) and more recently in pre-commercial thinning which grew from just over 8 thousand hectares in the early 90's to over 38 thousand in 1997 and since then has decreased to just under 29 thousand hectares in 2000. The noticeable increase in the PCT activities is in plantation tending which grew from just under 8 hundred hectares in the early 90's to just over 9 thousand in the late 90's. Based on the reforestation levels which peaked at over 28 million seedlings in the mid 80's, plantation tending will continue to be an important silvicultural activity.

In addition to meeting the regeneration requirements, planting is now being considered based on the yields from the improved genetics of our seed orchards; a product of our Plus Tree Program which dates back to the early 70's. According to Craig Frame of the New Brunswick Department of Natural Resources and Energy (DNRE), the seed sources, which are now in their second and third generations, offer 10 to 15% gains in volume.

Otherwise, the nature of silviculture activities on Crown land is shifting towards harvest based treatments involving a host of partial removal prescriptions. These prescriptions are now being undertaken by some of the licensees at an operational scale and contribute to both improved yields from the current stand and often to an advanced level of regeneration of local species, both of which improve wood supply. The fiber removed in these interventions results in capturing mortality that would have occurred before the stand was eligible for harvest in the forest management stand harvest selection process. This practice effectively allows harvest area size and adjacency rules to be met within a harvest block while increasing the volumes removed in the same time period as existing scheduled harvesting activities. In the longer term, the advanced regeneration may allow adjacency rules to be met sooner.

The benefits and the practical application of partial harvests at industrial scales are subjects of on-going research. The writer believes that the full range of benefits are not yet accounted for.

Private Lands

Private woodlots account for 1.9 million hectares or 30% of the Province's forests. The mid 90's were characterized by the demise of the Federal-Provincial Cooperation Agreement on Forest Development. Several interim measures were implemented including federal funding up to 1998, however the result was a marked decrease in silviculture activity and contractor capacity. The extensive development and momentum that had been built, over the Federal-Provincial Cooperation Agreement on Forest Development years, have kept forest management activities on private land poised for a come-back through the adjustment period. The following table is taken from the 2001 Private Woodlot Silviculture Manual:

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Year	Funding Area (Ha)	
1995	$3 million	5248
1996	$4 million	7049
1997	$4 million	6850
1998	$8 million	13369
1999	$8 million	14092
2000	**$8 million**	**13212**

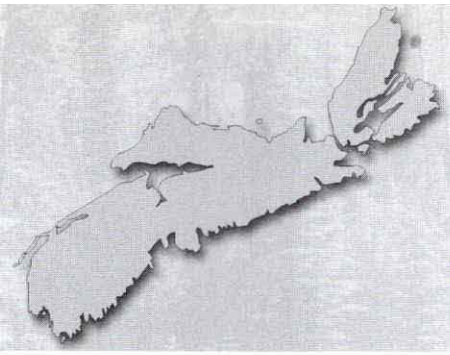
The Private Woodlot Silviculture Assistance Program is administered by the Forest Management Branch of the DNRE. It is delivered by the seven Forest Products Marketing Boards who receive a percentage (10% to 20% max) of the Province's contribution or Base Rates for the delivery administration costs. The standards and costs (excluding administration) are similar to those used on Crown lands. There is a private contribution of approximately 20% from the landowner and/or silviculture funds from the forest industry based on volume of wood delivered ($/m^3). With lower deliveries comes lower funding. Most boards have such arrangements with industry.

According to Bill Hamilton of DNRE, over 70% of the funding is aimed at pre-commercial thinning and plantation cleaning (tending). Of the nearly $8 million, $750,000 is directed at farmland reclamation which requires only a 10% private contribution, reflecting a concerted effort to bring these lands into forest production to increase the provincial forest land-base.

The next generation of treatments is expected to be harvest based, such as semi-commercial thinning. This is brought on by the many years of PCT (pre-commercial thinning) which are now just entering merchantability level in terms of volume per hectare which makes them suitable candidates. The funding of harvest based treatments is a subject for debate. In the writer's opinion, market conditions have changed significantly over the last ten years and the role of Government funding may well be that of encouragement or a catalyst to establish this line of silvicultural activity rather than a mainstay.

Mr. Damecour is a senior consultant and principal of AGFOR and has been instrumental in bringing about significant changes in the forest sector by representing both governments and industries on such issues as health and safety, standards for forestry equipment, industrial relations, wood allocations and forest management policy. He has assisted both communities and businesses in initiating and/or dealing with the various interest groups.

Nova Scotia Silviculture Contractors Association



by Ed Davidson

To say the least, there has been significant change in Nova Scotia over the last few years. Perhaps not so much in the type of work we do but surely in the way money is generated to pay for that work. Years ago silviculture funding was in the form of tax dollars and delivered through a government program. Evolution has now taken us to much more of a "user pay" system. In short, registered wood buyers are responsible for approximately $6.60 per cord of softwood purchased and roughly half that amount for hardwood. This money is intended to pay for forest management with mills then receiving credit points for doing various silviculture treatments.

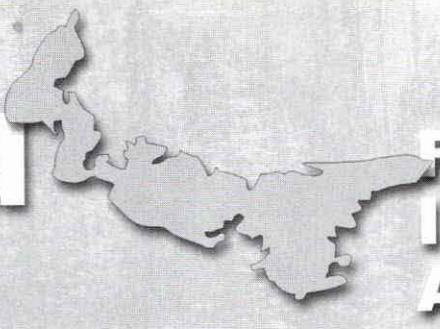
The problem that has come up is that mills are allowed to claim the maximum credit points per hectare of treatment, regardless of what they pay to the contractor. As a result, our new system has generated severe and widespread downward pressure on rates of pay and consequently has lead to a devaluation of service. Compounding the problem is the attitude of a few mills that have threatened to bring in workers from New Brunswick, Quebec or Maine if people here "don't get on board". Long-time contractors have come to the conclusion, that without change, there is no future for them. Many at the entry level are turning their back simply because there is no future for them in Nova Scotia and there is greater reward to be had elsewhere. Even our community college system has indicated to me, in the present environment, they consider silviculture as a job placement of last resort for their students. The lack of standardized and equitable rate system, such as we had only a few years ago, is ultimately threatening the substainability of the workforce. Reports by mills saying they are experiencing difficulty in getting their work done is evidence of the problem. Armed with this knowledge, it's not hard to understand why some people think the industry is on a sickbed instead of enjoying a period of healthy, vibrant growth congruent with the recent levels of harvesting in our province.

Another disincentive which has recently come to light involves mills that qualify for 1/3 funding of their silviculture cost by the provincial government. The province has said all along it will not give credit points based on dollars spent (a system where one dollar of silviculture spending equals one credit point). Instead, each hectare of treatment has a predetermined "credit value". However, one high profile mill revealed that when it came time to submit a claim, they are reimbursed in a manner of credit points being equal to dollars spent but limited to the predetermined "credit value". In other words, if it becomes necessary to spend more than the "credit value" to get work done, they receive no compensation for the additional cost. In echoing the sentiments of others, that mill made it clear they did not feel this treatment was fair and it would be preferable to shift such a cost burden to contractors.

Our new system was authored and introduced by our provincial department of natural resources and was an opportunity filled with tremendous potential. At the time, it represented one of the most significant interventions ever into the way business was done. The time has come for the different partners, including the N.S. Dept. of Natural Resources, to facilitate the resolution of these problems and go forward...before we slip farther back.

On another note, our new Wildlife Habitat and Watercourses Protection Regulations have become law and must be followed when forest harvesting takes place on any woodland in the province. These regulations will affect buffer strips along watercourses, the leaving of legacy trees/wildlife clumps, and the leaving of coarse woody debris. Further details can be had by visiting the government of Nova Scotia website or by contacting any local office of the N.S.D.N.R.

Prince Edward Island Forest Improvement Association



by Wanson Hemphill, Manager

FIA has completed a *Working Towards a Safer and More Sustainable Forest* research report on safety, training and certification in PEI. This report will be available once FIA Directors reach consensus on the 29 recommendations contained in the report.

PEI forest owners are pleased with the December 10 Federal budget announcement of an intergenerational tax-deferred rollover. Private forest owners will be able to transfer their forest property to their children without Capital Gains, providing woodlots are operated in accordance with a prescribed management plan.

A Public Forest Forum was held on December 12 where a number of presenters made the following points:

- PEI forest will be 2/3 hardwood by 2035 with red maple and balsam fir the most common species
- Plantations will represent 17% of the forest by 2035
- Need for much more forest education
- Clearcutting has a place but overused
- A total of 100 cords per acre merchantable wood is possible with thinnings at age 25 and every 7-10 years following
- Lack of training and support for forest industry machine operators and workforce
- If forests used for public good, then forest owners must be compensated for losses
- Public forests should be a model for private forests
- Healthy forests, long-lived species and mixed wood silviculture needed
- Sustainability must be economically viable, socially acceptable and environmentally sound

The PEI Workers Compensation Act was amended to include the following noteworthy changes:

- A 3-day waiting period before compensation begins
- Chronic pain not compensible unless it can be related to an injury
- Stress is not compensible unless it can be related to a traumatic event
- Employer and employee groups must be consulted on WCB Board member selection
- An employer advisor will be hired to help employers with classification, assessments and appeals

These changes take place April 1, 2002.

Wood is still being harvested and sold, although at reduced volumes and prices. While the Maritimes have valid historical and private land arguments for trade exemptions, it is hoped that the softwood dispute can be resolved now for good and not have to go through this period of uncertainty every 5 years by negotiating a settlement to please the Americans.

It seems clear. The earth is getting warmer and weather patterns more extreme. November temperatures were higher than average in every Province of Canada. We know that CO2 emissions from the burning of fossil fuels are causing most of the problem. We are not sure yet what will be the impact of these weather changes on PEI or Canadian forests.

Higher CO2 and dry conditions like this past summer affect tree planting, tree growth, tree range limits, tree water use efficiency and freezing tolerance. Tree species response will depend on the genetic diversity of adaptive traits among and within species. Those trees and tree species that have broader genetic abilities to adapt to extreme growing conditions will respond better to climate changes. Maintaining and using existing genetic variation appears to be very important in tree adaptation and forest health. Using natural drought resistant trees as seed and grafting stock will improve future gene pool potential. Planting these adaptive trees and using more alternate harvesting systems that leave more shade trees will help minimize negative impacts.

Safe and healthy winter,
Wanson Hemphill
treespei@attcanada.ca

Certification
Working Towards Sustainable Forestry

by Joyce Hayne

Professionalism is sweeping the forest industry as a deluge of standards and certifications start changing how forests are being managed. CSA, ISO, FSC and SFI certifications are becoming commonplace in the industry. CSA Z809 (Canadian Standards Association) is a system to continually improve performance towards sustainable forest management criteria. ISO 14001 (International Standards Organization) is an international environmental management system. FSC (Forest Stewardship Council) standards provide consumer recognition by labeling forest products with a logo that distinguishes products derived from land complying with a global set of principles and criteria. SFI (Sustainable Forest Initiative) is a set of standards aimed at all aspects of the forest industry from landowner to producer.

Here's a look at how 3 forest companies across Canada are dealing with these certifications and how they affect silviculture contractors. Following are comments from interviews with Jean-Pierre Martel, Director, Forest Certification at Weyerhaeuser, Chris McDonell RPF, Director-Environment at Tembec and Blake Brunsdon, Chief Forester at J.D. Irving, Limited.

What Standards/Certifications are your companies pursuing?

Jean-Pierre Martel, Weyerhaeuser

We believe that certification is a tool that will help us improve our environmental/forestry performance, improve our social license to operate on public land and provide our customers and other stakeholders a proof that we are practicing good forest management. All Weyerhaeuser operations will be IS0 14001 certified by the end of 2002. We are currently certified in the coastal and interior regions of BC, all of Alberta and all of Saskatchewan. Ontario and New Brunswick will be certified this year. CSA Z809 certification will be complete by the end of 2003. Most of the operations in BC and Alberta are certified and the rest of the provinces will be compliant in 2002-2003. Another objective is to achieve the SFI standard for some private land on Vancouver Island in BC. So far our involvement with FSC has been providing input in the development of the BC Regional Standard.

Blake Brunsdon, J.D. Irving

Irving is solidly committed to independent 3rd party forest certification in order to meet the expectations of the public, our customers and our employees. Today, all 6 million acres that Irving owns or manages are ISO 14001 registered. All the land managed by J.D. Irving, Ltd. in New Brunswick has been 3rd party certified under SFI. We hope to have all our land in Nova Scotia and Maine SFI certified in the next few months.

Irving did have 1/2 million acres of our land in New Brunswick certified with FSC in 1998 but cancelled the certification in 2000 when local FSC standards for the Maritime provinces were endorsed. We felt that these new local standards had a strong anti-industry bias and were much more restrictive than other regional FSC standards. Some of the particular issues leading to our decision to cancel our FSC certificate in New Brunswick were prohibitions on the use of fertilizers or pesticides, and prohibiting the planting of Norway spruce trees. Irving has however maintained its FSC certification on 1/2 million acres that we own in the state of Maine.

Chris McDonell, Tembec

In 1998, Tembec started with ISO 14001 and by the end of 2000, 90% of woodlands operations were certified in BC, Manitoba, Ontario and Quebec. Successful implementation of ISO has allowed Tembec to pursue FSC certification with the same intensity. At present, only 2500 hectares of private land in Ontario have been certified. However, Tembec is pursuing FSC certification on all licensed private and crown land in Canada with plans to certify 7 forests by the end of 2002. The company has been involved in the development of FSC standards in Ontario, Quebec and BC and has found the multi-interest discussions and field-testing process to be very valuable.

What impact has certification had on operations that are compliant?

Jean-Pierre Martel, Weyerhaeuser

The IS0 14001 set the foundation for developing clearly defined environmental expectations for all levels of the staff in the organization. It helped us define which activities could have environmental effects and we then developed detailed plans to manage and, in many cases, reduce the impacts. It helped to develop consistency in operations and ensure that everyone is better prepared for specific situations, such as emergencies.

CSA Z809 provides a framework that has helped us identify the values that are important to our local communities. Both CSA and ISO standards also provide a measurement of performance against objectives so that continual improvement can take place.

Blake Brunsdon, J.D. Irving

The organization has more accountability now to ensure that we meet all our commitments and do on the ground what we say we do. We've been forced to improve our documentation. Rather than just looking at growing and harvesting wood; we have had to pay much more attention to biodiversity and wildlife habitat issues. Today our harvest blocks and our planted areas are more organically shaped, less homogeneous, with more structural diversity.

Chris McDonell, Tembec

Certification can be best achieved when there is a collaborative relationship developed with government, environmentalists and First Nations groups to address such issues as aboriginal involvement in forestry and the establishment of protected areas. As an example, Tembec has partnered with the World Wildlife Fund following "The Living Legacy" land use planning process in Ontario. Additionally, stakeholders are interviewed by certifiers even before an operation gets certified.

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What will be the future impact of certification?

Jean-Pierre Martel, Weyerhaeuser

Because the Sustainable Forest Management Plan (SFMP) is now developed with input from a public advisory group, consisting of numerous stakeholders, it has kept the company focused on key issues that are important to the local community. With better buy-in from the locals, there should be a reduced chance of liability issues arising. The pro-active stance should help us maintain our social license to operate on public lands. We believe that in the near future it will be a competitive disadvantage to not be certified.

However, there is a higher cost to putting a forest management plan together and there will be an extra cost to monitor the performance of each operation. As we start to implement the system, we'll be learning more.

Blake Brunsdon, J.D. Irving

We believe that in the future, third party certification will be mandatory for all forest management programs and operations. Certification will help to drive us all to continually improve our training and our on-the-ground practices. It should help us to focus our attention to consider all aspects and potential impacts of our operations.

Chris McDonell, Tembec

Forests will be managed differently in the future. For example, we will be increasing the amount of commercial thinning and more trees will be retained following harvest. We will be working towards keeping more attributes of forests that have been burned such as leaving larger areas uncut, and keeping live and dead trees around to maintain habitats for small mammals.

What criteria must silviculture contractors meet?

Jean-Pierre Martel, Weyerhaeuser

As with all people operating on a DFA, the silviculture contractors will need to follow the controls that have been developed to manage the documented values and meet the goals, indicators and objectives.

They will also need to report on specific criteria as identified in the plan, as well as ensure that they, and their operators, understand CSA requirements in general.

Blake Brunsdon, J.D. Irving

Contractors and employees will need to be very open-minded and have a commitment to training and continuous improvement. Job requirements will become increasingly more complex. Adequate and ongoing training will be a pre-requisite. This will include formal sit-down training in some instances, as well as constant on-the-job training and a demand for continuou improvement. A lot of the training that we are doing today with our silvicultural workers, in addition to the "standard" work quality and efficiency issues, now relates to biodiversity and wildlife habitat issues, such as why and how to maintain clumps, snags and other wildlife habitat features.

Chris McDonell, Tembec

Training is becoming part of the company culture. As Tembec moved through ISO we held classroom training on health and safety, emergency response procedures and forest fire preparedness.

As FSC is pursued, training will focus more on ecology and biology. There will be a much stronger focus on skills and training to undertake mixed planting to help planters understand which species are most suitable for each area. Some of this training will take place on-the-job to explain the objective behind the new approach to planting and the ecology of forests.

Q What are the implications for contractors?

Jean-Pierre Martel, Weyerhaeuser

Contractors will have to undergo training to understand the company's objectives and policies. Training and reporting functions will be enhanced and contractors will be responsible for following correct operational controls and other requirements as defined in the SFMP. The implications of not fulfilling the CSA requirements could include employment considerations and legal issues where legislation is involved.

Blake Brunsdon, J.D. Irving

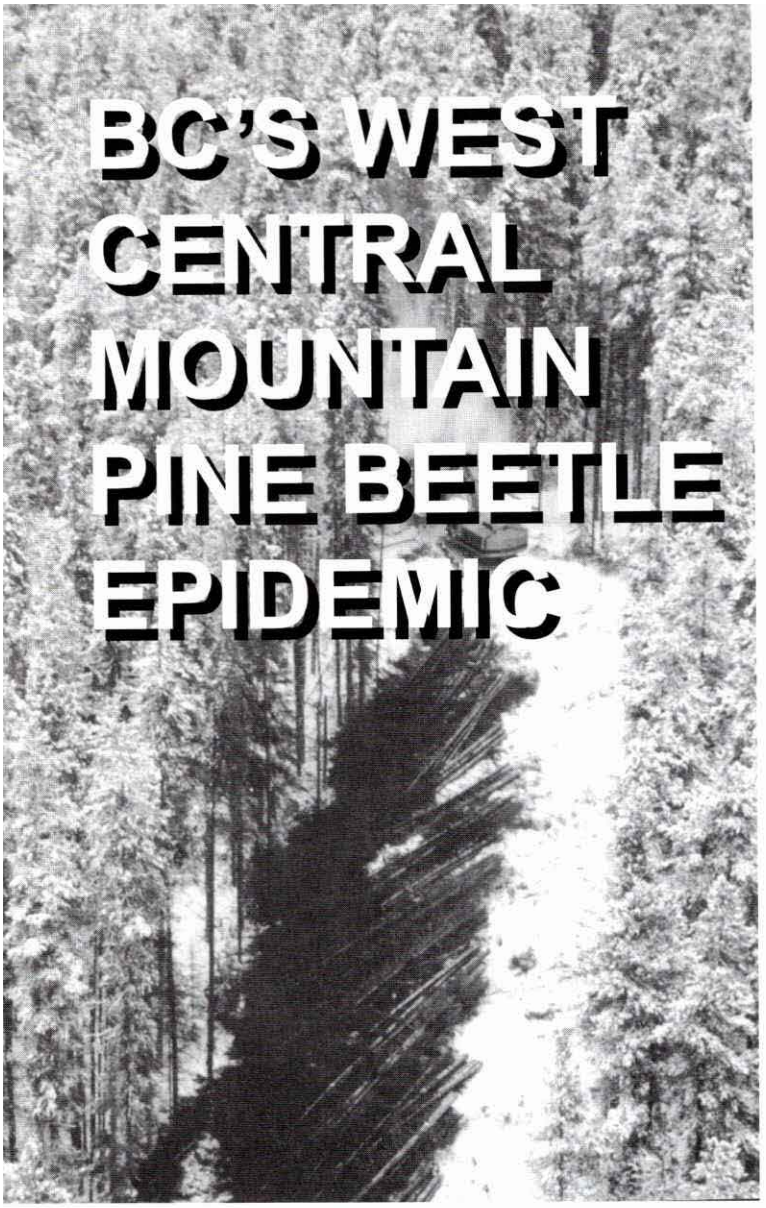
Training certifications may become necessary for silviculture workers and contractors in the future. Already some 3rd party training and worker certification programs are becoming "standard pre-requisites" in some jurisdictions for harvesting operations.

Chris McDonell, Tembec

Contractors will have a role in assisting more natural reforestation. Site preparation will leave patches to create seed beds where remaining trees will provide a natural seed source. Planting will take place in partially harvested stands. The use of partial harvesting techniques and commercial thinning will reduce the use of herbicides.

Sites will become more messy for silviculture contractors as more down woody material (slash) will now be left on the site. More detailed pre-harvest planning will be required. FSC auditors may even want to talk to silviculture contractors to evaluate the steps that they are taking.

BC'S WEST CENTRAL MOUNTAIN PINE BEETLE EPIDEMIC



by Douglas A. Routledge, RPF
Northern Forest Products Association

A natural part of British Columbia's Lodgepole Pine forests, the Mountain Pine Beetle flies during July and August and, at endemic or normal population levels, attacks and kills low numbers of trees that are stressed due to old age or drought conditions. Predators and cold winter weather normally keep populations in check. The last major outbreak of Mountain Pine Beetle in BC was in the mid 1980's west of Williams Lake.

Since 1994 a number of biological, climatic and human land use factors conspired to create conditions suitable for another epidemic outbreak. An outbreak now documented as BC's and Canada's largest forest insect epidemic.

The epidemic is now spread over an elliptical area of BC's west central interior 700 km long and 400 km wide, four times the size of Vancouver Island. Over 73 million m^3 of mature lodgepole pine has been attacked in BC's working forest alone. This represents over $6 billion in potential lumber value including $1.4 billion in potential provincial stumpage losses if the timber cannot be salvaged before it deteriorates.

While the first indicators of the epidemic appeared in 1994, it only attracted local forest industry, forest service and community attention and was only evident in the pine forests of Tweedsmuir Park nestled up against the eastern foothills of the coast mountains. Between 1994 and 1996 records indicate the beetles doubled each year at a rate of 2,500 hectares/year followed by a 3-fold increase of 15,000 hectares in 1997. However, it was the 100,000 hectare seven fold increase of 1998, along with the recognition the problem was not limited to Tweedsmuir Park but was also erupting from resident (local) beetle populations in the working forests, that allowed local concerns to spur the formation of the Cariboo Lumber Manufacturers' and Northern Forest Products Association joint Industry Mountain Pine Beetle Emergency Task Force.

Contributing Factors

Since 1994 mild winters have decreased winter beetle mortality from the usual 85 – 90% to only 10-15% resulting in billions more beetles flying each summer to infest more trees. Compounding this were two consecutive hot, dry summers in 1997 and 1998. That drought stressed large areas of lodgepole pine and contributed significantly to the successful colonization of attacked trees. This accelerated the spread in Tweedsmuir Park and kick-started the expansion of beetle populations resident in the working forest.

Further complicating the situation has been the switch to cool and wet summers the last three years. This has disrupted the beetles' life cycle resulting in different populations flying as late as October. While at endemic levels such disruption to the beetle life cycle and the abundance of water for the trees would likely increase the trees resistance and reduce larvae survival, the sheer number of beetles now flying ensures that successful attacks continue to occur. And the late conclusion to the beetle flight now seriously delays the field work necessary to accurately map out the new attack areas, develop the operational plans and complete the removal of green attack trees before the next season's flight.

Two human land use factors have also contributed to the epidemic. For the last forty years BC's forest service has worked hard to achieve an enviable early forest fire detection and extinguishment program, annually saving millions of hectares of forest from destruction by fire. This has led to large expanses of mature and overmature pine. Saved from fire to contribute to the

sustainable use of the working forest these larger and older trees are more susceptible to beetle attack and can harbor greater numbers of brood beetles. Secondly, a high proportion of these mature and overmature forest areas in the west central working forests were scheduled for harvesting in future decades and so were not currently accessed with roads. The time necessary to construct adequate access allowed the beetles an additional season to expand their populations before aggressive harvesting action could be brought to bear.


Bait Tree

Solutions

Having described the rather desperate nature of this natural catastrophe, you may be asking what, if anything, can be done? At this magnitude of epidemic it is true that human efforts are like swimming upstream. Mother Nature has unleashed a natural catastrophe; our main hope for large-scale control is that Mother Nature will collapse the epidemic before it consumes the majority of the central interior's lodgepole pine stands.

The bark beetles' natural defense against winter cold is to develop an "antifreeze" in their bodies that will protect them from mid-winter temperatures as low as –40°C. However their levels of antifreeze vary with the temperatures during the fall and winter. Nature's help could occur in one of three ways, all to do with cold weather events that would kill large numbers of beetles under the bark before they can fly on and infest new trees.

1 It takes some weeks of increasingly colder fall weather to stimulate production of the beetles' antifreeze leaving the possibility of significant mortality if temperatures were to fall to even –20°C in late October, early November.

2 A mid-winter freeze of –40°C for three or more weeks would also result in significant mortality.

3 A mid-winter warm spell of 3-5 days with overnight temperatures above +5°C followed by a quick drop in less than three days to a week of day time highs less than –20°C.

While it is acknowledged that Nature's help is required to collapse the epidemic, a number of human interventions are possible that will have a delaying effect, reduce the rate of spread and also harvest significant volumes before they incur damage that will reduce their economic value. All of these human actions are focussed on one main goal, maximizing the volume of trees harvested that have brood beetles still under the bark, killing those beetles through debarking and preventing them from flying and infesting more trees. At the height of the epidemic as many as 30 to 40 new trees can be infested by the beetles from a single attacked tree so removing as many of these "brood trees" as possible will contribute significantly as a delaying tactic.

This strategy is a bit like fighting a forest fire, not by following it around salvaging the burned timber after the fire has passed but by attacking the spot fires out front as well as the areas at the leading edge of the fire while you wait for rain.

The specific tools industry and government bring to bear to accomplish this are individual tree and small patch (0-1 hectare) harvesting of broad trees where access is reasonable, small clearcuts up to the size of several city lots (1-5 hectares) where the beetles are more prevalent, and medium sized clearcuts up to a city block or two (5-15 hectares) at the leading edge of the main epidemic or where more volume is required to write off the cost of access. At this stage of the epidemic the normal operational scale harvesting (60 hectares) is reserved for use in addressing large contiguous areas of beetle attacked trees in the main body of the epidemic.

Accompanying the small and medium scale harvesting activity is an aggressive program of hundreds of kilometers of road and trail construction to provide access to the many scattered beetle attack sites. It is important to mention that despite the fact this

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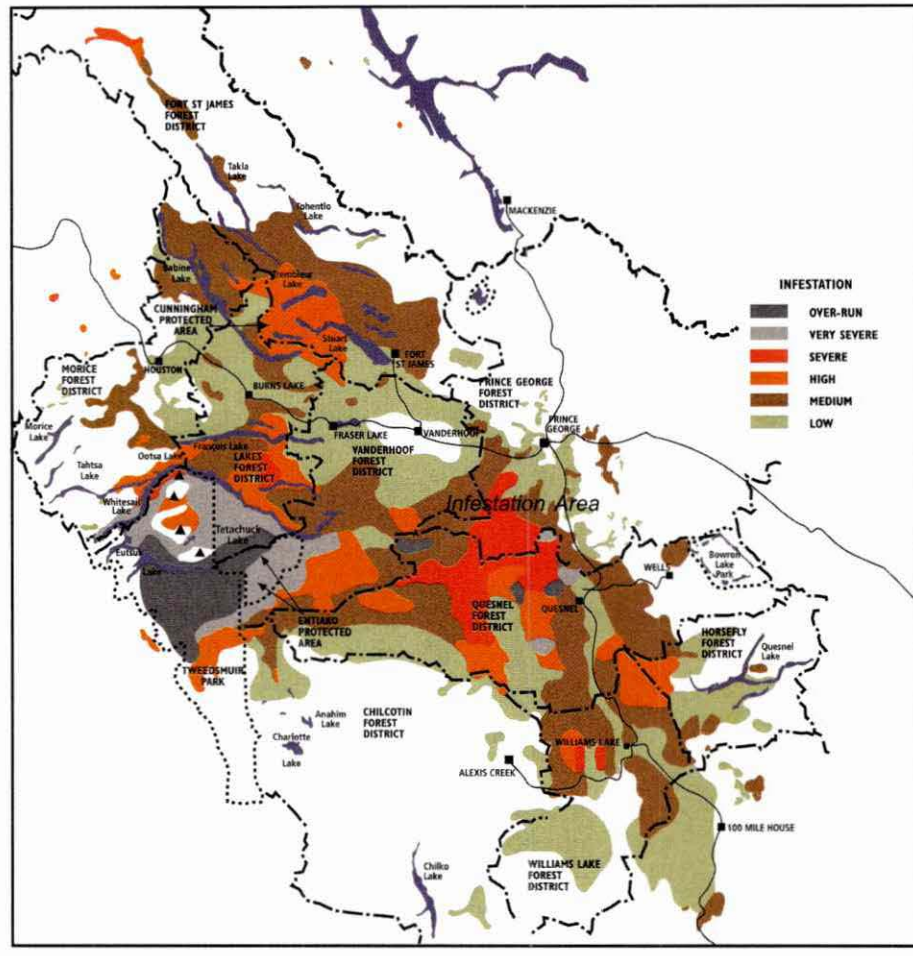
is an epidemic, environmental standards incorporated in BC's Forest Practices Code still apply to field activities used in addressing the beetle epidemic.

In addition to the main tool of harvesting, there are a number of other small-scale non-harvesting tools that are being used to assist in delaying the spread rates. Some small patches of attack and individual attacked trees too far from existing access are felled, cut up and burned with the beetles still under the bark (fall and burn). Small packages of sex attractant beetle hormones are attached to trees during the beetle flight period in an effort to attract beetles into an area already scheduled for harvest or keep them in an area to be harvested (pheromone baiting). And for a short two week period in late summer an arsenic-based pesticide called MSMA, licensed only for injecting under the bark, can be used in isolated circumstances to kill beetle larvae under the bark.



While all of these tools are useful, they only work over relatively small portions of the working forest and so the main tool in the beetle battle remains small and medium-scale clearcut harvesting of trees with beetles still under the bark. This winter over 4,000 forest workers are directing their best efforts to deliver some 13 million m^3 of harvest in this way and an additional 8 million m^3 at an operational scale.

While most of the attention is being focussed on the short-term measures necessary to limit the damage of the epidemic it cannot be forgotten that a huge backlog of attacked and unharvested pine is accumulating in the main body of the epidemic. While this accumulation of dead and dying stands no longer poses a threat to the expansion of the epidemic because the beetles have flown on, these stands do represent a huge potential loss of volume and value with its potential community, contractor and worker disruption. The area these stands occupy is at risk of negative environmental impacts due to wildfire, stream bank damage due to blow down, wetland damage due to changes in water tables, erosion and siltation due to increased runoffs, wildlife habitat alteration, migration corridor disruption, etc. It is not too soon to begin the planning to minimize these longer term negative consequences. This is becoming increasingly important as this winter continues mild and the possibility increases of another 80% expansion of the epidemic to 130 million m^3 of volume attacked.

Some of the possible solutions being examined are medium-term increases in local harvest levels and redirection of timber harvest from adjacent areas, harvesting and storing logs under sprinklers or in water reservoirs to reduce wood deterioration and attracting federal assistance to rehabilitate environmentally sensitive areas that will not be harvested (stream banks, riparian areas, wildlife migration corridors and critical habitat areas). Federal assistance is also being sought to rehabilitate and reforest those areas that will not be harvested and minimize the future impact on workers and communities.

Preventing Future Outbreaks

Even longer term, it is not too late to examine the causes of the epidemic and review our current forest management practices with a view to creating forest landscapes and forest stands that would better withstand such outbreaks in the future. Forest management aspects such as a mosaic of age classes across the landscape, fostering more mixed species stands on the appropriate sites, establishing appropriate stand densities on even aged pine sites, selection harvesting practices in those portions of the working forest having other important environmental values (i.e. riparian management area) and ensuring an appropriate network of roads and trails for quick response to future outbreaks need to be standard "tools of the trade".

The mountain pine beetle, and its cousins the spruce and Douglas-fir bark beetles are natural parts of BC's interior forest ecosystems and will be with us in the future. We would be well advised to ensure our future working forests are more resistant to epidemic outbreaks, not only of this forest insect but also of other forest insects and health factors.

How the Mountain Pine Beetle Attacks Trees

Mountain pine beetles strike during the months of July and August when trees are usually under the most stress from water deficiency.

The female beetles find a new tree and bore through the bark (usually on the lower 15 feet of the trunk) to the cambial area, where they then emit pheromones that attract males and other females. Mating occurs under the bark. Females construct egg galleries up to 90 cm long, parallel to the grain of the wood in the cambial region, and deposit their eggs.

When the larvae hatch in seven to 10 days, they survive in feeding tunnels. When the larvae are fully grown they hollow out a pupal cell at the end of the feeding tunnel and pupate. New adult beetles bore their way out and the cycle is repeated. One generation per year is the rule. Insects over-winter in trees as larvae and adults.

A blue-staining fungi deposited into the sapwood by adult beetles disables the tree's defenses and interrupts the flow of water to the top of the tree. The beetles "girdle" the tree by consuming the cambial layer, stopping the flow of water from the tree's roots to its top. The combination of the beetles and the fungi kills the tree.

One year after being attacked a tree's foliage turns red allowing foresters to survey the damage caused in the previous season effectively from the air. By the time the tree is red, however, the beetles have moved on to another tree. This makes detection of newly infested areas impossible from the air. In order for control efforts to be concentrated in newly attacked stands, aerial survey techniques must be complimented by time consuming ground surveys.

Mountain pine beetles usually infest an area by developing pioneer populations in high spots and in weakened stands on south-facing slopes that have a low-site index. After these pioneer mountain pine beetle populations have grown in size they colonize the larger surrounding area. Beetles can travel 30 kms or more under favourable conditions.

In the case of the west central infestation, the magnitude of the mountain pine beetle population has grown to such a degree that the pioneer populations number in the millions and are successfully colonizing mature timber up to 30 hectares at a time. Small-scale control activities such as fall and burn or snip and skid can be effective with smaller beetle populations or at the leading edge of epidemic areas, but the only effective control for large populations is clear-cut harvesting.

Cyber Silvi

www.radiant.net/harihari

I'd always wanted to plant. Crazy, considering that my brother called it the worst job in the world. He'd planted in Alberta for a fly-by-nighter who served beer for breakfast, hauled trees with his Camaro, handed out hash advances and screwed the crew out of a summer's wages. But hey— like Bilbo Baggins says, bad times, good stories.

My own experience, back in '88 with what is now a national silvicultural contractor, wasn't much better. 85% payment for the season, an entire camp of tree-stashers, food fit for prisoners of the Taliban, the most persistent insects I would see in ten years on the job, and atrocious living conditions (no mess tent, mass giardia, six and seven day shifts). They called me up next Spring, claiming to have remedied the worst of their management ineptitude. For some reason I believed them. I went back, found that Steve Stein ran a tight ship (and crazy nights off), made great money in Thunder Bay, and found myself a career. Planting paid for two years of travelling, six years of school and my first car.

My experiences in Ontario and BC are perhaps illustrative of the challenges and changes that silvicultural contractors have faced. On one hand, some of the atrocious safety, health, labour law and fire regulation violations that marked many planters' '80s experiences are a thing of the past. On the other, cut-throat competition and an ever-greater variety of jobs available to contractors, such as brushing, thinning, spacing and pruning, have made the job for both planters and management ever more challenging.

You probably won't get cryptosporodium from unfiltered camp water these days, but the $200 you *might* make on a good day only goes half as far as it did in '88, and prices are headed south. Your girlfriend's friend says he made $300 a day in Quesnel, but a woman you meet in the pub got tendonitis in Hearst and the contractor won't fill out her WCB form.

What is an inexperienced planter to make of all this?

The website I've developed— **The Treeplanting Web Page (web.radiant.net/harihari)**— is an attempt to give planters what I didn't have when I started: honest information from those who'd been there. Containing input from hundreds of planters and myself, the site has planter-relevant information about things like gear, safety, insects, tampons, quality, pot, bidding, area planting, treeplanting slang and, most contentiously, a section where planters can write uncensored (and anonymous) reviews of their experiences with their employers.

While most contractors are decent people, too many cut corners by sacrificing employee wages and camp conditions to the profit motive. A few routinely lie to employees, run unsafe camps and vehicles, delay payment and impose illegal fines. Too many uninformed planters have horrible first-year experiences. My site attempts to get knowledge of contractors' practices, for better or worse, out into the open. I have received a few calls from contractors with hurt feelings, and hundreds of grateful planter emails, so I suppose that the page is doing what it should: provoking debate. There's a free market for wages, so why not a free market in opinion?

As we move into the 21st century, the industry will have to adapt to ever more challenging conditions, from declining numbers of trees planted to an increase in other types of silvicultural work to wage pressures. I'll continue to hope that my page is part of what could, in the best of all worlds, be an honest and productive conversation between employers, workers and the rest of the industry. Shovels up!

Chris Stolz

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to avoid their appropriate role in sustaining Canada's forests. Canada has acted federally in the past through the FRDA's to help begin the process of funding provincial silviculture needs. The other provinces know they may be seeking national support for a similar catastrophe in the future and Canada must act now to be accountable for its role in keeping our forest nation healthy and together.

Principle 6: Clean up the past two generations of Backlog in the next generation by 2025

The question of what is an affordable cost for cleaning up the legacy of past generations of forest damage can have a simple answer. BC's 'Summary of NSR and Impeded Forest Land 2001 Report' was just revised in January 2002. In the two thirds of the provinces' forests outside of TFLs, there is 1.45 million hectares of impeded land—satisfactorily stocked and not free growing, often to such high densities that growth is stagnant and in need of tending, and 80 thousand hectares of not sufficiently restocked forestland. The impeded and NSR areas are mostly left from pre-1987 logging without reforestation.

In most forest licenses, treating impeded and NSR sites will be the means to meeting the obligations of Principle #2 or #3. Depending on the ongoing global warming negotiations on Land Use Change and Forestry, there is a chance that some backlog areas may qualify in some way for tending for their carbon value. For the time being, however, carbon sink funding cannot be assumed to assist with the backlog. In either case it is unlikely that the previous principles will reforest all backlog, and Principle #6 provides for appropriate silviculture treatments for the net remaining area within the current generation. Backlog treatments must be uniquely Canadian in meeting habitat and complex ecosystem goals and some areas may be better left untreated.

The principle of repairing the legacy of two generations - our own and our parents'- of unsustainable resource use, within one future generation, can also apply to set provincial goals for watershed restoration, restoring fish stream productivity and other natural resource damage.

This set of principles for funding silviculture's beneficial interventions, while self-evident, are far from incorporated into private sector practice or provincial or federal policy. They will require the collective ingenuity of all silviculturalists to implement. In the pursuit of these funding principles, we cannot afford to either overstate the problems or use make-work solutions to deal with the forest's formidable biologically complex challenges.

Canada's world-class professional silviculture practitioners are uniquely suited to meet the challenge of maintaining and enhancing the long-term health of our nation's forest ecosystems. Let's go for it!

Notes from the Ledge

A Heritage of 16 Billion Trees

Canada is known throughout the world for its vast, abundant forests. Every Canadian benefits from this magnificent natural heritage.

It might have been otherwise in this new millennium if it were not for the men and women who, over the last century, accomplished an extraordinary feat – planting 16 billion trees across our nation.

Forest engineers, tree planters, technicians, contractors, researchers and nursery growers have all contributed to this unique effort. Their labour has ensured that Canadians, now and tomorrow, will continue to benefit from our abundant forests and the thriving, innovative forest industry that contributes so much to our economy.

The commitment to conserve our natural heritage and to replant has been passed on from generation to generation and is still with us today. For example, the main objective of Forest 2020, an initiative of the Canadian Council of Forest Ministers, is to bring together the growing demand for wood and the enhanced conservation of our forests. An intensification of production, including the establishment of plantations and silviculture on a defined land base, will allow us to respond with more flexibility to land use challenges.

In commemorating the men and women who planted 16 billion trees for Canada, I am proud to know that the legacy we are leaving our children and grandchildren includes conservation and reforestation.

Thank You

Ralph Goodale
Minister of Natural Resources Canada

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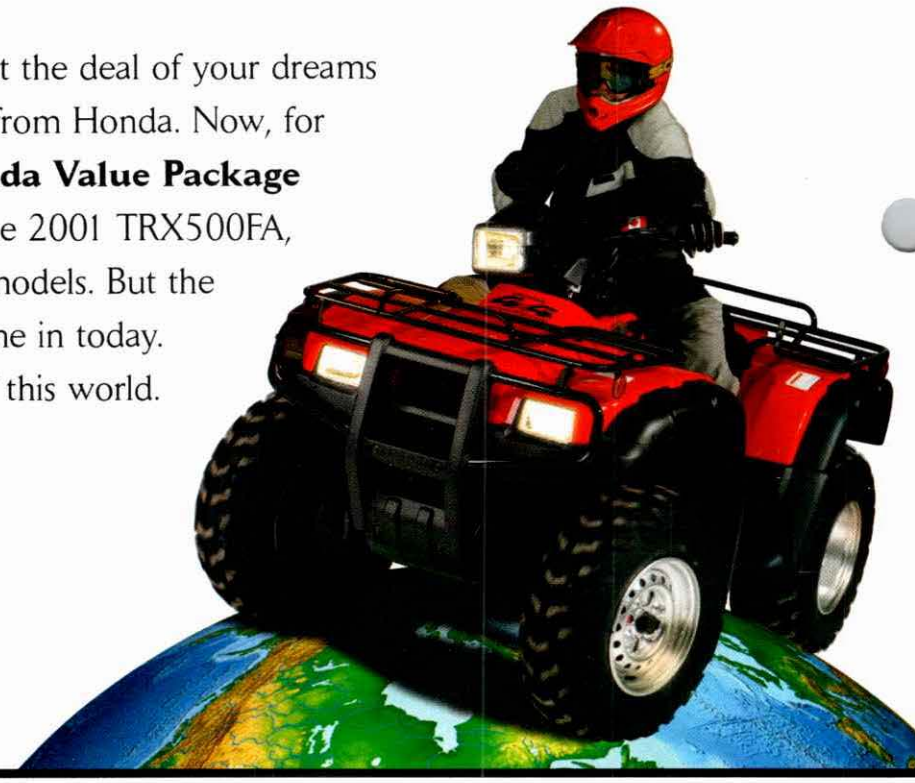

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