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# INFORMATION FORESTRY

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Best Wishes for 1990
from
Pacific Forestry Centre

Forestry Canada Forêts Canada

# BREAKTHROUGH IN GREY MOULD PROBLEM

A simple, economical and environmentally-safe procedure has been developed that promises to reduce the number of grown seedlings damaged by grey mould.

Grey mould is a major problem in the production of container-grown seedlings in Canada. Caused by the fungus *Botrytis cinerea*, the disease affects nursery-grown Douglas-fir seedlings in particular, either killing them outright or leaving them weakened so that they grow poorly after they are planted.

AFS Applied Forest Science Ltd., a forest research consulting firm in Sidney B.C., recently completed a feasibility study on using ventilation to control grey mould. The $49,760 project was funded jointly by Forestry Canada through FRDA and Supply and Services Canada (SSC).

When seedlings reach a certain height, their branches and foliage entwine to form a canopy. Once the canopy closes overhead, irrigation produces high humidity, creating an ideal environment for grey mould.

In the past, it could take up to 120 hours following irrigation for the canopy to dry completely, increasing the likelihood of spore germination and subsequent infection.

Until now, controlling grey mould required the use of fungicide sprays, a costly way to control the disease, according to Pacific Forestry Centre nursery specialist Dr. Jack Sutherland. "Spray programs are carried out maybe four or five times a year," he says, "resulting in some strains of fungus developing a tolerance to fungicide."

Lowering the humidity beneath the canopy and shortening the time it takes the seedling to dry discourages the growth of grey mould. AFS conceived of the idea of using aerated styroblocks and ventilation to control grey mould.

For its study, AFS modified standard styroblocks by adding six-millimetre holes at every intercavity section, for a total of 135 holes per styroblock. The holes extend through the entire depth of the block so that air can circulate from beneath the block and up under the seedling canopy.

Jack Sutherland (centre), Rona Sturrock (l) and John Dennis (r) check seedling stock for signs of grey mould.

The styroblocks were set on steel-framed benches approximately one metre above the greenhouse floor to allow for ventilation below the benches. The modified styroblocks were vented with either unheated forced air, heated forced air, or unheated unforced air. Coastal Douglas-fir seedlings were grown under standard nursery procedures. Standard unvented styroblocks were used as a control.

Only 25 percent of the Douglas-fir seedlings grown on the vented blocks showed any sign of the disease as opposed to 75 percent of those grown on unvented blocks in the control group. As well, infected seedlings grown on the vented blocks suffered only very light damage to a few bottom needles.

"In fact," says Sutherland, "the cool air performed as well as the heated air, and is probably the best method to use."

Ventilating the seedlings will also reduce significantly the number of pesticide applications, says Peterson, which represents both a cost-saving and an environmentally conscious approach to container-growing.

Since AFS completed its research, two Canadian manufacturers have introduced vented styroblock units to the marketplace.

*Until now, controlling grey mould required the use of fungicide sprays*

# New Seed Test Shows Promise

Forestry Canada-sponsored research (through FRDA) into IDS (incubation, drying and separation), a simple four-step method for improving seed quality, is being tested on a larger operational scale so that the process can be used by industry.

Laboratory work shows IDS increases seed quality and speed of germination and makes germination time for individual seeds more uniform.

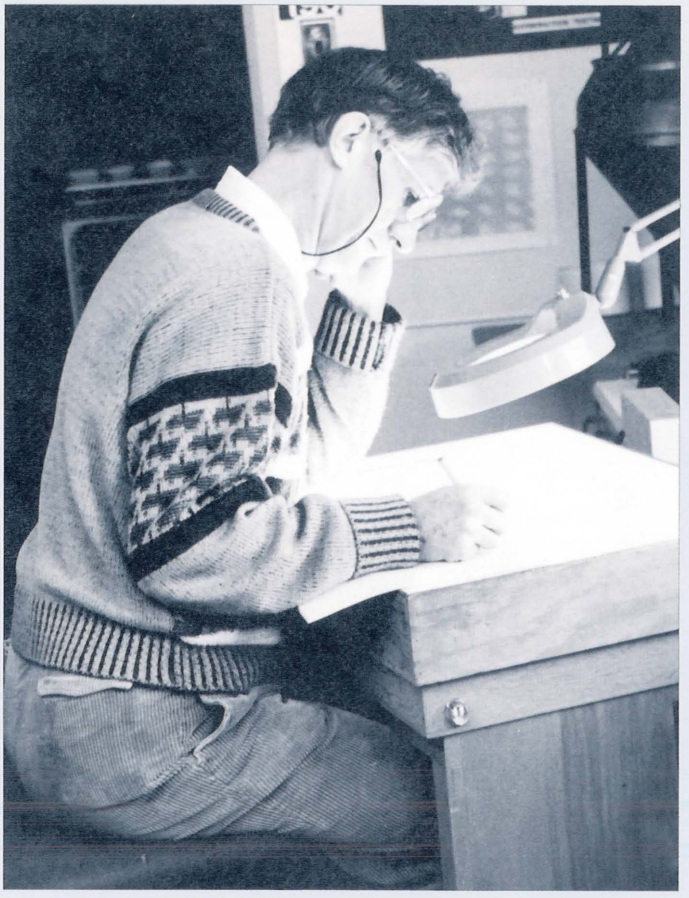
What does IDS stand for?" "It really should be called SIDS" says Dr. George Edwards of the Pacific Forestry Centre, "You soak the seeds, incubate them, dry them and then separate the weak seeds from the strong, those which will germinate from those which won't."

Mechanical seed separators currently available will separate full seeds from empty husks and sort seeds according to size and weight. Unfortunately, existing mechanical methods won't separate viable from non-viable seeds.

"What we do through IDS," says Edwards, "is engineer a weight difference." According to Edwards, the stronger, more viable seeds bind to the water they have absorbed into their tissues. The weaker seeds lose moisture quite quickly when dried, while the stronger seeds remain moist. This difference allows them to be separated. Says Edwards, "the strong seeds sink when they are placed back in the water for separation, allowing us to skim off and discard the weak seeds."

Container nurseries currently sow two or three seeds per cavity to ensure that at least one seedling germinates. It is expensive to carry empty cavities mixed with seedling-filled cavities. But, when more than one seedling germinates in a cavity, thinning is necessary. Since nurseries province-wide deal with millions of seedlings, thinning is also expensive.

IDS results vary with different seedlots. On average, treating a good seedlot with IDS in the laboratory increases seed quality by approximately 18 percent and may result in 95 percent germination or higher. A poor seedlot treated with IDS can, on average, achieve 70 percent germination, a 30 to 35 percent gain. Says Edwards, "A five percent gain may mean money in the bank for the private nursery operator."



George Edwards in his lab.

To date, according to Edwards, IDS has been carried out in the laboratory with predictable results only with small batches (3 to 5 grams) of seeds. FRDA-funded operational trials of IDS with larger batches of seeds (half a kilo or more) are currently being carried out at the B.C. Ministry of Forests' Seed Centre in Surrey. Operational testing will form the basis of an IDS "recipe book" for the industry and is scheduled for completion by March 1990.

Rob Bowden-Green from the Surrey Seed Centre says the process has tremendous potential for the industry. "We're anxiously awaiting the completion of operational testing.

"If we can use this process to upgrade seedlots to a single sow category for container nurseries, 95 percent germination as opposed to 70 percent germination and triple sowing per cavity, it might be possible to eliminate expensive thinning, a tremendous saving when you're dealing with millions of seedlings each year."

"As an added benefit," says Edwards, "the more uniform germination of IDS seeds and quicker germination could allow nurserymen to begin crop management procedures three to five days earlier."

Edwards is optimistic about the operational trials. "It takes time to get reliable test results, but we're committed to seeing the project reach the point of a recipe book for use by industry," he says.

# "Rainmaker" at Pacific Forestry Centre

Would you be surprised to find that here in British Columbia we need a rainmaker? Well strangely enough we do. And here at Pacific Forestry Centre we have our own "Rainmaker", research scientist Paul Commandeur.

According to Paul, "If you wait for Mother Nature to give you the exact amount of rain you want, you'll have to wait a long time." Paul doesn't really make it rain, he just imitates it with his rain simulator.

"It's not a new idea, various literature exists on the subject, mainly from the US, but some from Europe. The agriculture industry is the main user of rainfall simulation so this simulator is probably the only one in B.C. used in forestry," he said.

This particular model is homemade. Paul had it constructed out of spare parts he scrounged, custom-made pieces, and odds and ends just lying around. It is made of an airtight chamber that has a series of drilled holes along its bottom. Capillary tubes are inserted in the holes and the chamber is filled with about 30 litres of water. On top of this is a water tank which holds the same amount. A flow meter is used to monitor the rainfall intensity desired. The adjustable, telescopic legs set the chamber above the earth at about nine feet on flat ground. From this height, the maximum that can be used safely and still be practical, there is approximately a 75% simulation of the kinetic energy of natural rain. For 100% simulation the system would need to be set up at about 10 metres, or 33 feet; too high to be suitable.

"Rainmaker" Paul Commandeur with his "rain machine".

Another problem is that it produces rather high rainfall intensities that would not normally occur naturally. Changing the size of the capillary tubes could give Paul greater control over intensity. Paul has been using the simulator as a tool for looking at the impact of forest management practices on areas such as skid roads and prescribed burn sites, especially with regard to erosion. Because it is relatively new, the rainfall simulator is still in the exploratory stage, but already it has proven itself to be quite valuable, even with a few problems of collection of overland flow.

The tests, about a dozen so far, were conducted during this past summer. Each test took about half a day to set-up and run as the simulator required a slope so that overflow could be caught and measured. Setting up the telescopic legs on slopes is time-consuming, but unless the tank is perfectly level the simulator would "rain" harder on one side than on the other. It has been used on slopes with gradients ranging from 10% to 50%. Steeper slopes could not be tested because of the design of the simulator. The lack of water often created a problem. The tests required all the water the team carried and often sent the crew down the hill to a culvert where they scooped up real rainwater.

Some of the results have been unexpected. For example, on slash-burned sites the level of infiltration went down as the saturation point was reached, but then in a long slow curve it went back ; presumably because the surface ash was washed away. A month later on the same site the same thing happened, but the infiltration curve was less steep.

There are still a few details to be worked out: raindrop size is still not simulated; flat ground cannot be tested easily; and water supply and the effect of wind are still problems. The big advantage is obvious; you can fool Mother Nature. Also no matter how hot it gets, there is always the rainfall simulator to stand under and cool off.

# FORESTRY TO GET HIGHER FEDERAL PROFILE

By the beginning of 1990 it is expected that legislation will have passed through both the House of Commons and the Senate establishing the federal Department of Forestry. Known as the Department of Forestry Act - Bill C-29, it will provide a much-needed federal focus for forestry.

The mandate of the new department will include:

- national leadership in the development and coordination of forest policy and programs consistent with the government's commitment to the principle of sustainable development;
- conducting and fostering research and development in the forest sector; and
- close cooperation in a wide range of areas of forest management and protection in concert with industry, universities, provinces and territorial authorities.

The Department of Forestry Act empowers the Minister to enter into agreements with any individual, organization and government, and calls for an annual report to Parliament on the state of the forest resource and its impact on Canada's economy. The Act also updates and widens the application of the Timber Regulations for the management of federal forest lands.

*The creation of a full department stresses the federal commitment to forestry in terms of its importance to Canada's economy and the environment.*

Hon. Frank Oberle, first federal Minister of Forestry, tabled the Department of Forestry Act in the House of Commons last June.

## A brief history

Federal forestry responsibility was established in 1899 with the appointment of the first Chief Inspector of Timber and Forestry within the Department of the Interior. From 1907 to 1950, forestry was included under the government's mining and resources portfolios, operating under various Acts.

In 1960, the first autonomous Department of Forestry was created under the leadership of Prime Minister John Diefenbaker after unanimous passage in Parliament of the Department of Forestry Act.

Forestry was later to be known, in 1966, as the Forestry Branch of the Department of Forestry and Rural Development, and in 1969, as the Canadian Forestry Service (CFS) within the Department of Fisheries and Forestry; in 1971, the CFS was moved to the Department of Environment.

## 1980's - a pivotal decade

In keeping with its electoral platform, in 1984 the Government elevated the status of forestry by establishing the Cabinet post of Minister of State (Forestry), and moving the CFS to the Department of Agriculture.

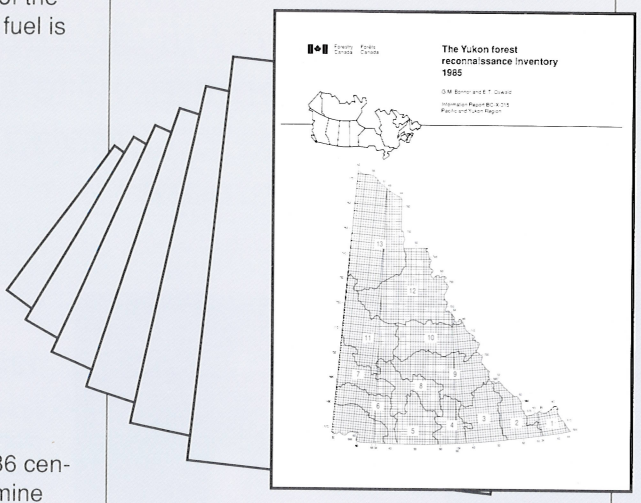
In 1987, a national "Forest Sector Strategy for Canada" was developed by governments, in consulation with industry, labour, academia and environmental organizations. The "Strategy" recommended "...that a full federal department of forestry and forest industries be created."

In September 1988, the CFS separated from Agriculture Canada and received full departmental status operating through Orders-in-Council, thereby giving a higher federal profile to one of Canada's most important resource and industry sectors. The CFS was renamed Forestry Canada in November 1988.

Passage of Bill C-29 will be the final formal step.

The creation of a full department stresses the federal commitment to forestry in terms of its importance to Canada's economy and the environment. This sector requires nothing less than full federal representation.

# PUBLICATIONS AND PAPERS




- **Hog fuel yield factors for British Columbia**

  M.R.C. Massie and G.H. Manning

  The history of utilization of woody biomass for fuel in British Columbia is reviewed. Utilization of the various components of hog fuel is discussed.

  **BC-X-313**

- **The influence of forest sector dependence on the socioeconomic characteristics of rural British Columbia**

  W.A. White, K. Duke and K. Fong

  Data from the 1981 and 1986 censuses are analyzed to detemine the influence of forest sector dependence on various socioeconomic characteristics in rural B.C.'s incorporated communities and territorial subdivisions. The effects of relative population are also presented.

  **BC-X-314**

- **The Yukon reconnaissance inventory 1985**

  G.M. Bonnor and E.T. Oswald

  This reconnaissance inventory of the Yukon Territory is an extensive inventory for broad planning purposes. It provides estimates of areas, wood volumes and forest biomass by major forest types, ecoregions and forest management units.

  **BC-X-315**

- **Program Review - Pacific Forestry Centre - 1988-89**

  A look at the objectives, achievements and goals of the Pacific Forestry Centre on a project by project basis.

- **Proceedings of the 3rd cone and seed insects working party conference**

  **IUFRO - June 26-30, 1988, Victoria, B.C.**
  Compiled by Gordon E. Miller

  Contains 25 papers presented in four technical sessions on cone and seed insect identification and distribution, biology, monitoring, damage and control.

Copies of these publications may be obtained by filling out the enclosed card and returning it to the PFC Information Office.

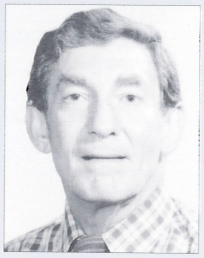
# STAFF CHANGES

## *Welcome to:*

**Brenda E. Callan**

Dr. Callan joined PFC as a mycologist working with our Forest Insect and Disease Survey (FIDS) unit. Brenda is native to Victoria and obtained her B.Sc. at the University of Victoria and her M.Sc. and Ph.D. from Washington State University. Brenda is working with and understudying Dr. Al Funk who retires in 1990.

## *Goodbye to:*



**W.A. "Bill" Bloomberg**

Dr. Bill Bloomberg, research scientist and project leader of the root and stem diseases project at PFC, retired in November after a forestry career that spanned more than 40 years - 29 of them with Forestry Canada.

Bill's area of specialization has been forest pathology research, most recently on dwarf mistletoe and root diseases. His special interests included forest disease survey, impact assessment, and modelling. Friends and colleagues gathered at a retirement dinner held at Royal Roads Military College and provided testimonials and recognition of his four decades of contribution to the forest research sector. Happy retirement Bill!

# PRINCE GEORGE OFFICE ON THE MOVE

Effective December 1, 1989, our Prince George office relocated to the Agriculture Canada Experimental Farm located in south Prince George on the Old Cariboo Highway.

"This is the first step toward the establishment of a forest research facility in Prince George without any loss of the important contribution made by Agriculture Canada to the region," said Hon. Frank Oberle in announcing the move and co-location with Agriculture Canada research staff.

"It is an ideal marriage, considering the multiple land-use concepts and integrated management models now being considered as imperative for Canada's forests."

Mr. Oberle announced some time ago the appointment of a steering committee from the forest sector of the region to advise him and Forestry Canada on the design of the new centre. The steering committee will also suggest possible research priorities for the region, and identify a range of initiatives which would be considered to assist in transferring research and development information to the forest community. Further steps in this process may follow once the committee report has been received and evaluated.

> *"Our goal is to establish a cooperative applied-research centre which will focus on the needs of the region, its individuals and its industries"*

"Our goal is to establish a cooperative applied-research centre which will focus on the needs of the region, its individuals and its industries," said Mr. Oberle.

Agriculture Canada's applied research on soils and forage crops will continue at the Experimental Farm.

Walter Matosevic, Forestry Canada Development Officer, continues to manage the office and can be reached at 963-8631. The new mailing address is: Forestry Canada, R.R. #8, Site 25 Comp. 10, Prince George, B.C., V2N 4M6.

# MIXEDWOOD SYMPOSIUM DREW INTERNATIONAL DELEGATES

More than 400 delegates from as far away as Moscow and Helsinki attended the Northern Mixedwood '89 Symposium co-hosted by Forestry Canada in Fort St. John last September.

The Symposium, and the related trade show and wood products forum, presented the latest developments and research on managing and using the mixedwood resource–aspen and popular mixed with spruce and lodgepole pine.

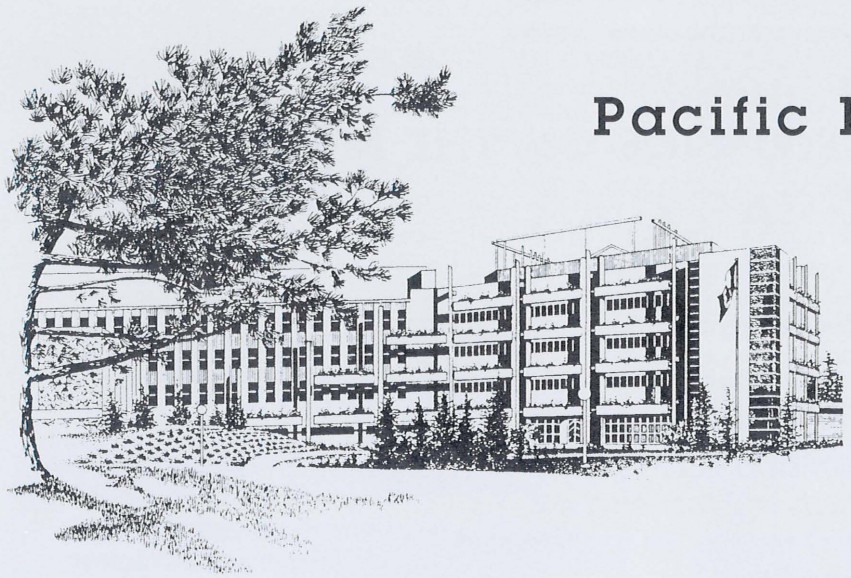
A few short years ago these now valuable trees were routinely burned to make way for farming and ranching. The resource is now the basis for rapid new industiral development and economic growth in northern B.C.

Northern B.C. has the most productive aspen-growing sites in Canada. The new Louisiana Pacific Waterboard Plant in Dawson Creek, new pulp mills planned for Chetwynd and Taylor, two chopstick factories recently announced for Dawson Creek and Fort Nelson, and other projects now on the drawing board depend on careful and continued management of the increasingly valuable mixedwood resource.

Two full days of technical sessions addressed topics like inventory, pest management tools, regeneration, trends in harvesting, ecosystem dynamics, and planning for best use.

The symposium was jointly sponsored by Forestry Canada and the B.C. Ministry of Forests with funds from FRDA. Additional sponsorship came from members of the industrial community and Northern Lights College.

Copies of papers presented at the symposium will be available in late winter or early spring and will be advertised in Information Forestry.



# Pacific Forestry Centre*

25th Anniversary

1990

# Open House '90 !

Take Home a Free Tree Seedling

**Featuring:**

- Computerized greenhouses
- Electron microscopes
- Largest forest insect collection in western Canada
- Forestry computer games
- Biochemical fingerprinting of tree diseases
- Alternatives for chemical pesticides in forestry
- Major forestry development accomplishments
- A host of other dynamic and interactive exhibits

*Plus* ***an invitational Art Show on the Forestry theme***

| | | |
|---|---|---|
| Monday, February 12 | 9-3 | School tours |
| Tuesday, February 13 | 9-3 | School tours |
| Wednesday, February 14 | 9-3 | School tours |
| Thursday, February 15 | | 25th Anniversary Ceremonies |
| Friday, February 16 | 10-9 | General public |
| Saturday, February 17 | 10-5 | General public |
| Sunday, February 18 | 10-5 | General public |

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