



Newsbulletin

Tree Seed Working Group

NO. 5 March 1986

A WORD FROM THE CHAIRMAN

The third seed workshop of the Tree Seed Working Group will be held during the summer of 1987 prior to the 21st biennial meeting of the Canadian Tree Improvement Association (C.T.I.A.) in Nova Scotia.

The theme of the first workshop held in Toronto in 1983 was: Maximizing the production and efficient use of improved tree seeds. The workshop had two sessions: 1 - Production and collection of improved seeds. 2 - Utilization of improved seeds. For a brief summary of the papers, consult Newsbulletin No. 1.

Cone and seed pests was the theme of the second workshop held in Quebec City in August 1985. Thirteen papers were presented in three sessions: Cone production, Insect pests affecting seed production and Insect management strategies. The abstracts of the papers were published in the C.T.I.A. proceedings.

What will be the theme of the next workshop? Suggestions from T.S.W.G. members or others should be sent to the chairman or the editor before the next Newsbulletin issue due November 1986. Remember that the workshop is a very good way of meeting persons with the same interest and discussing common problems.

Meanwhile, keep sending in notes or articles for the Newsbulletin. Others would like to hear from you.

Yves Lamontagne

NOTE THESE ADDRESSES

Chairman, TSWG (new address)
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Hugh O. Schooley
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Chalk River, Ontario, K0J 1J0

Queries, comments and contributions to the "BULLETIN" are welcomed by the chairman or the editor.

EDITOR'S NOTES

We now have 126 individuals on the TSWG membership list. This is up from the 105 who responded to our original request for participants. Despite this increase I'm sure our Bulletin is reaching only about two-thirds of the people who should be receiving it. When you finish reading this issue, please take a minute or two to think of someone you know that would profit/enjoy reading the Bulletin but who may not be receiving it: - let them read your copy and encourage them to write to me and get their name on our membership list.

I wish to thank everyone who contributed articles to this issue of the Bulletin. Particular thanks goes out to our seed extraction plant specialists who, together, have provided a great deal of interesting information on their activities.

I am now formally requesting articles for our next issue - in November. I hope again to receive contributions on the broad spectrum of topics of interest to our membership but at the same time I'm pointing to a particular interest group and saying "it's your turn to make a contribution". I would especially like to receive articles from anyone/ everyone across the country who has spent time this year, or in the past, planting orchards. A note on site preparation requirements and costs, orchard design and contents, cultural treatments used and their degree of success or any other topic related to orchard establishment would be welcomed.

Again let me say thanks for your articles - with your participation our Bulletin will be better than ever.

Hugh Schooley

DO YOU WANT A WORKSHOP ON SEED TESTING

During the past few years several enquiries and suggestions have been made regarding

the CFS organizing a workshop, or a series of workshops, on the "Technology of seed testing and germination", for operational foresters and technicians of provincial forest agencies and the forest industry, as well as CFS personnel engaged in research involving seeds. The workshop(s) would be organized around classroom/laboratory "hands-on" sessions to provide participants with direct experience in seed testing and interpretation of test results for field sowing, and would most likely be held in 1987 (fiscal year 1987/88). The objective would be to expose participants to the internationally recognized procedures which Canadian national seed testing rules are being developed, with the purpose of increasing the standardization of tree seed testing across Canada.

As an aid in planning the workshop(s), we are trying to find out who would be interested in attending and if the employing agency would be able and prepared to contribute to the overall cost of the workshop. We are interested in your responses to the following questions:

1. Would you be interested in attending a 3-day workshop (somewhere in Canada)?
2. Are there other staff in your provincial department, company, or other working group who would attend? Also, what are their names?
3. You would be expected to attend the workshop at your own or your employer's expense. Would your agency be prepared to contribute to the cost of the workshop in the form of a registration fee (say, \$100 per participant)?
4. Are there any needs for other workshops concerning tree seed problems?
5. Are you in favour of such workshops on a regional or national basis?
6. What time of the year would you prefer to attend such workshops?

Your earliest response(s) will be appreciated, but by June 15, 1986, at the latest. Response(s) to the questionnaire should be sent to:

B.S.P. Wang
Petawawa National Forestry Institute
Chalk River, Ontario, K0J 1J0

or

G.W. Edwards
Pacific Forestry Centre
Canadian Forestry Service
506 West Burnside Road
Victoria, B.C., V8Z 1M5

ASEAN/CANADA TREE SEED CENTRE

The Canadian tree seed community is developing a unique relationship with the international tree seed community. Through the IUFRO Seed Problems Working Party, and particularly through the National Seed Centre at Petawawa, Canada is supporting third world development in the tree seed field. One example has been Ben Wang's involvement in the establishment of the ASEAN/Canada Forest Tree Seed Centre (ACFTSC) in Muak Lek, Thailand. In addition to Ben's activities in initiating the project and subsequent guidance of its development, an assortment of other seed scientists have been involved as indicated below.

S. Eis	CFS, PFC	
Jan 82 - Apr 83	Seed Development	
A.K. Hellum	U of A, Edmonton	
Jan 82 - Jun 82	Seed Technology	
Feb 84 - Mar 84	Seed Technology	
A.F. Hedlin	CFS, PFC	
Oct 82 - Mar 83	Seed Entomology	
N. Dhir	AFS, Edmonton	
Oct 83 - Mar 84	Genetic Improvement	
D.A. Skeates	OMNR, Maple	
Jan 85 -	Forestry Advisor	

The interest of Canadian scientists is still apparent in present operations. C.W. Yeatman, CFS, PNFI, visited the Centre last year on his return from an

Australian sabbatical. He subsequently has participated with Ben Wang, Kåre Hellum and the writer on the Canadian team, discussing future aspects of the program. Slavoi Eis lectured at a Philippine Seed Collection and Handling Course on behalf of the Centre in November 1985.

The Centre has grown from a dream of its Director, Khun Pisal Wasuwanich and a bare forest site 140 km NE of Bangkok. It is now an operating centre with effective research and technology programs in the biology, origin and health of seeds. The scientific staff were recruited from the ranks of the Thai Royal Forest Department. Their development into seed scientists is due mainly to the driving enthusiasm of the Centre's Director. The Centre's building with labs, offices, library and conference hall is a Thai achievement. It also has a 16 room dormitory for staff and visitors, and housing for staff and advisors. Equipping the Centre has been a Canadian contribution.

Training of Seed Centre staff and conducting training courses for other ASEAN scientists and technicians has been a joint effort between Canada and Thailand. In addition to supporting the academic training of researchers at various Canadian Universities, 14 foresters and technical officers from Indonesia, Malaysia, the Philippines and Thailand have completed a specially designed six-week course on tree seed and tree improvement at Sir Sandford Fleming College, Lindsay, Ontario, and an eight-week on-the-job training program at the Pacific Forestry Centre, Victoria, B.C.; Pine Ridge Tree Nursery, Smoky Lake, Alberta; Ontario Tree Seed Plant, Angus, Ontario; Petawawa National Forestry Institute, Chalk River, Ontario; and the Maritimes Forestry Centre, Fredericton, N.B.

For a newly developed international centre, the achievements to date are remarkable. Three training courses have been held, two at the Centre (Seed Collection and Handling, and Seed testing), and one in Indonesia (Production of Improved Seed).

Again the Canadian scientists took a lead role in conducting these courses. The Centre has hosted research fellowships, and participated with the Faculty of Forestry, Kasesart University, in hosting an International Seed Problems Conference and X-Ray workshop. So many seed workers in ASEAN institutions have been assisted in their careers by Muak Lek programs that it seemed like old home week when participants gathered at a recent ASEAN/Australian meeting in Bangkok. A new seed centre in Bogor, Indonesia is largely staffed by technicians who received training in Muak Lek programs.

The ACFTSC is moving into a new era. The first phase of development had to concentrate on building the Centre, phase II must now place even greater emphasis on reaching out to the Centre's clients, particularly the Philippines, Indonesia, Malaysia, and in its own backyard in Thailand. Networking systems have been proposed. A new publication series, the "Embryon", has been launched and other information and communication systems are a high priority. Training, both at the Centre and in Canada, will continue and the early research and development work at the Centre must be consolidated and continued. The Centre must maintain a firm connection to the international scientific community.

Canada has made a significant contribution to this development. The inputs from the Canadian tree seed community in particular have been responsible for a share in the success story. It is hoped that this relationship will continue. The Tree Seed Working Group is in a position to nurture a parallel offspring around the other side of the world. A truly supportive partnership between the two seed communities could provide real benefit to the development of both.

Douglas A. Skeates
Senior Canadian Forestry Advisor
ASEAN/Canada Forest Tree Seed Centre

RECOMMENDATIONS TOWARDS SOLVING THE WORLD-WIDE SHORTAGE OF HIGH QUALITY TREE SEED

In May, 1984, IUFRO-Project Group P2.04.00 held a Symposium on Seed Quality of Tropical and Subtropical Tree Species in Bangkok, Thailand. The participants at this meeting agreed that current reforestation efforts are inadequate and that there is not enough seed of high genetic and technical quality. Since we have the same complaints, it appears these problems are world-wide in scope. In response to these problems, the participants offered a series of recommendations. Most of these recommendations (leaving out the reference to tropical countries) are written below:

1. Governmental bodies should increase efforts to conserve the genetic resources of indigenous species which are economically important as well as those that have a potential for future utilization. All of these resources are disappearing at an alarming rate.
2. Efforts in exploration, collection, and effective use of genetic resources of trees should be expanded. This expansion should be encouraged and facilitated by the appropriate government agencies.
3. High seed quality is basic to successful afforestation, reforestation and agroforestry programmes. Priority should be given to funding projects designed to control and improve seed quality and ensure the effective use of seeds.
4. Co-operation between individual researchers and research institutes on seed problems should be encouraged and intensified.
5. There are many technical and biological problems which require more intense research inputs. We recommend the following areas for study: a) Criteria for selection of seed production stands and sites for seed orchards; b) Physiology of flowering and seed production and how to stimulate it both in

in production stands and orchards; c) Flowering and seed biology; d) Seed procurement and equipment development; e) Germination ecology to ensure successful natural and artificial establishment of forests; f) Development of standard seed testing procedures that can be carried out with basic skills and equipment; g) Seed micro-organisms, both pathogenic and beneficial; and h) Seed losses to animal predators, and to insects.

It seems to me, and I'm sure you agree, these recommendations are excellent guidelines for our efforts here in this part of the world just as they are for the tropics.

Hugh Schooley

CONE MEASURER AND BAGGER

MM. Normand Talbot and Denis Rivest working for the Québec Ministry of Energy and Resources in the Abitibi-Témiscamingue Region, have developed an apparatus capable of measuring and bagging cones in one single operation. The measurement is automatic and precise.

The apparatus operates as follows:

- Cones are loaded into a large funnel shaped container on the top of the apparatus. They can be loaded by hand, by conveyor or using other machines.
- The cones flow freely down the funnel into a mobile receptacle composed of two compartments whose capacities can be set to any desired volume. This volume is currently 0.5 hl in Québec.
- The receptacle is provided with a roller mounted on bearings which levels out and gently packs the cones.
- When the receptacle is moved to the right, the right compartment of the receptacle is emptied. At the same time, the left compartment of the receptacle is filled up and will be emptied when moved to the left.

- The measured cones flow freely out of each compartment through a hole in the supporting frame and fall into a jute bag that is held open beneath the frame.
- The apparatus is activated by a foot pedal leaving the hands free.

The overall dimensions are 75" X 61" X 25½". It weighs 320 pounds and can be loaded in a pick-up truck by 3 men.

Operational trials have shown that the cone measurer and bagger performs very well with cones of most species provided the amount of resin on the scales does not prevent the cones from flowing freely through the machine.

The Ministry of Energy and Resources has patented the apparatus through the Centre de recherche industrielle du Québec (C.R.I.Q.) which has signed a manufacturing contract with: Harricana Metal Inc., 1675, Route de l'Aéroport Amos, Québec, J9T 3A8, (Contact person Mr. Serge Roch) (819) 732-8381).

Yves Lamontagne

IUFRO SEED WORKERS DIRECTORY

The International Union of Forest Research Organizations (IUFRO): - Project Group P2.04.00 is revising their International Directory of Seed Research Workers. The last version was printed in 1976 and considering the recent surge of interest in seed research a revision is overdue. This summer George Edwards, who is doing the revision will be sending out a questionnaire to collect the required information from researchers. Hopefully, the revision will be available by mid-1987.

George Edwards

CERTIFICATION AND OFFICIAL SEED TESTING, 1985

Despite indications late in 1984 that importers were interested in Canadian seeds from sources other than in the Pacific Region, OECD, seed certification and official testing activities have continued to be limited to British Columbia and the Yukon Territory. In 1985, 2056 kg of seeds from four species (Douglas-fir, grand fir, lodgepole pine and western red cedar), were certified in the "source-identified" category. Grand fir seeds from three sources accounted for 945 kg but almost half of the 26 seedlots certified were lodgepole pine from the Yukon.

Following adoption by the Canadian Forestry Service of "Guidelines for approval and registration under the OECD scheme of untested seed orchards in Canada", three Douglas-fir orchards belonging to CIP Inc., Tahsis Pacific Region, were registered. These are respectively, a low elevation and a high elevation orchard, both containing clonal and open-pollinated stock, and a full-sib (controlled pollination) orchard. Each orchard is regarded as one seed source, but 21 certificates for various quantities of seeds totalling 128 kg were issued. This certification of seeds from orchards officially registered under the OECD scheme is the first in North America.

Official seed testing under the International Seed Testing Association's rules issued 63 certificates representing 2374 kg of seeds, in 1985. Twenty-nine certificates were issued for 1020 kg of lodgepole pine seeds. The bulk of this seed was destined for Sweden, but some went to Norway, Finland and the United Kingdom. Other species tested included Douglas-fir, grand fir, amabilis fir, subalpine fir, western white pine, ponderosa pine, lodgepole pine, jack pine, Sitka spruce, white, black and Engelmann spruce, and western red cedar. The grand fir seeds were imported primarily by Germany, Denmark and the United Kingdom. Austria and Germany purchased some of the Douglas-fir seeds; the remainder were imported by growers

in the northeastern United States, probably for Christmas tree production.

George Edwards

RED PINE IN NEWFOUNDLAND - CAUSE FOR CONCERN

Red pine (*Pinus resinosa* Ait.) is the rarest of Newfoundland native conifers. Its declining numbers has led to some concern but other than recommending the preservation of the few remaining stands little has been done to stave off possible extinction of red pine in this province.

Study by Bruce Roberts (CFS, Newfoundland Forestry Centre) identified just twenty red pine stands, generally confined to central Newfoundland. Of this number, only three stands contain more than a thousand trees. Natural regeneration is not significant in any of the stands surveyed.

A commitment has been made to grow red pine at the Provincial Tree Nursery in Wooddale. Plans are in place to collect red pine seed in 1986 provided cone crops of sufficient quantity are available. A portion of this seed will be supplied to the CFS National Seed Bank at Petawawa National Forestry Institute for preservation.

The 1986 nursery program for red pine will involve the growing of 5000 seedlings. By 1987 it could be expanded to 25,000 seedlings annually. This appears to be quite a modest effort but one has to consider that sites in Newfoundland suited to red pine are nearly as rare as red pine itself.

Woodrow Burry

SEED YIELDS FROM SEED ORCHARD COLLECTIONS IN NEW BRUNSWICK

The first cones were collected from four seed orchards in New Brunswick in 1984. No cones were collected in 1985 because there was no cone crop. The amount of seed

extracted from the 1984 collections was surprisingly high in spite of the young age of the orchard trees.

Forty-five litres of cones were collected from a 6-year-old jack pine seedling seed orchard. This yielded 350 g of seed, equivalent to 780 g seed/hl cones (10 oz. seed/bushel). In another jack pine seedling orchard, of the same age, 3.25 hl of cones were collected. Seed yield was very high, 1385 g seed/hl cones (17 oz. seed/bushel). In comparison, average seed yield from collections made in four reserve stands in 1984 was 580 g seed/hl cones (7 oz. seed/bushel). The high seed yield from such young, unmanaged orchards is very exciting.

In addition, 70 l of cones were collected from a 7-year-old Ottawa Valley white spruce seedling seed orchard. Since the orchard trees were too young to produce pollen, the pollen source was mature trees in the area surrounding the orchard. In spite of this, seed yield was 680 g seed/hl cones (8.5 oz. seed/bushel). As the trees in the orchard become older and larger and produce pollen, seed yields should increase.

Fifty litres of Japanese larch cones were collected from a 7-year-old clonal orchard. The quantity of seed produced was 560 g seed/hl cones (6.5 oz. seed/bushel).

Seed orchard area has expanded rapidly in New Brunswick. By 1985, over 70 ha of black spruce seedling seed orchards and 40 ha of jack pine seedling orchards have been planted. Total orchard requirements for these species are almost satisfied. Roguing is commencing in these orchards and will result in steady genetic improvement of seed being produced. During the last couple of years there has been increased emphasis on establishing clonal seed orchards. Over 45 ha have been established comprised principally of white spruce and tamarack. Clonal seed orchard planting will be completed by 1990 with an additional 40-50 ha being established.

Dale Simpson

SQUIRRELS AND CONES LOSSES IN NEWFOUNDLAND

Since its introduction twenty years ago, the red squirrel (*Tamiasciurus hudsonicus*), has spread across the island of Newfoundland and become well established. Damage to cone crops was apparent but not determined in detail. In 1985 a trapping study in two 3 ha plots in western Newfoundland examined the relationship between the density of squirrels and losses in harvestable cones of black spruce. We found that squirrels were responsible for reducing the number of cones on selected sample trees (15/plot) by 72 to 76% by October. Densities of squirrels were as low as 4/ha in one plot. Many of the cones remaining on trees in October were insect-damaged and it will be interesting to determine whether these cones have fewer viable seeds than cones harvested by squirrels. Perhaps cones ignored by squirrels are less desirable as seed sources due to damage by insects or frost.

I would be interested in corresponding with anyone studying the influence of squirrels on cone crops and would also like to exchange any information on insects affecting the extraction and viability of seeds of conifers, particularly black spruce.

R.J. West
Newfoundland Forestry Centre
P.O. Box 6028
St. John's, Nfld. A1C 5X8

SEEDS BEFORE SEEDLINGS: A BIT OF ONTARIO HISTORY

Did you know that Ontario Government "foresters" initiated their first major reforestation planting operation 75 years ago. Wayne Mutton, writing for Ontario's Natural Resources Magazine "Landmarks" (Vol. 3 No. 3) described the need for reforestation and how the work was started at that time. Seeds collected from Ontario parent trees were sent by rail and boat to Germany. They came back to Southwestern Ontario as seedlings and were planted:

200,000 white pine, 100,000 Scots pine and 50,000 spruce. Soon after this, home-grown seedlings were being produced in the Province's first tree nursery at St. Williams. About the same time a seed extraction plant was set up.

Ontario's planting program has come a long way since these initial efforts. It now operates 9 major nurseries and supports private greenhouse operations which together produce about 150 million seedlings annually. The Province's two extraction plants can process about 27,300 hl of cones each year. In 1982/83 they provide about 15,283 kg -- or about 5,200,000,000 individual seeds. One-half this quantity was utilized.

Note: Just in case you didn't notice, it was a seed collection operation that got the original planting program started and of course seed collections have been necessary to sustain all the planting that has taken place since. As seed workers, we are essential to Canada's continued reforestation efforts. I know this - you know it too. - Let's tell a few people that don't know - then maybe the support for our efforts will increase.

Hugh Schooley

SEED EXTRACTION PLANT ACTIVITIES

Canada Seed Survey

Results of a national tree seed survey appear in the recently published report "Canadian Conifer Forest Tree Seed Statistics: 1982-83", compiled by P.S. Janas. It is available from the Petawawa National Forestry Institute as Information Report PI-X-56. This report summarizes on a provincial and national level, the quantities of cones collected and processed and seed utilized and in storage for major

reforestation species, determines extent of seed supply based on comparisons of seed utilization and seed crop periodicity, and provides a directory of seed extraction plants and storage facilities in Canada.

In 1982-83, 94,288 hectolitres of cones were collected (comprising 34 species), 5.29 billion seeds were used in reforestation activities, and 38,296 billion seeds were in cold temperature storage facilities at the year's end. Based on seeds used, Jack pine, white spruce and black spruce continue to be the most important and widely used forestry species. More than 87% of all seeds used in provincial forestry programs originated from unimproved natural stands, just over 12% came from seed collection and production areas, and only 0.2% was produced by seed orchards, these results being virtually unchanged from those in the previous 1980-81 survey.

P.S. Janas

Newfoundland Seed Extraction Plant Closes

The Department of Forest Resources and Lands has carried out seed extraction and cleaning at the Provincial Tree Nursery near Grand Falls since 1975. The small extraction facility has the potential to meet the Province's demand for seed which are presently about 100 kg (primarily black spruce) of seed annually.

Concern has recently been expressed that the working environment of the facility is unsafe and seed processing has been terminated until major renovations are made to eliminate a dust problem that occurs during seed extraction and cleaning. This closure of the seed plant arises at an inconvenient time since the current inventory of seed in storage could be exhausted within 5 years.

Woodrow Burry

Maritime Forest Seed Centre

The Plant, built in 1976, covers 1000 m². It provides offices and facilities for seed extraction, drying, testing, and seed storage. Six cone drying sheds provide enough space for proper air drying of the cones. Seed cleaning, dewinging and sizing are done mechanically. The extraction plant can process up to 10,000 hl of cones annually, but in an average year it handles 3-5000 hl. The seed vault has a 12,000 kg storage capacity. An expansion of this facility is being considered.

The Maritime Forest Seed Centre offers a full range of services to private and public forestry operations in the Maritime region. In recent years several private operations in the State of Maine and the Gaspé Region of Quebec have taken advantage of the extraction and storage facilities.

John P. Flinn

New Seed Extraction Plant at Berthierville, Québec

The construction of a new \$3,2 million seed extraction plant at Berthierville has recently been completed. The plant, which covers 2 020 m², provides enough space for seed extraction and testing equipment, office rooms and a small cold room. A larger cold room for long-term storage of seeds is planned for next year.

Plant is equipped with "McPherson" kilns that were designed in the United States but built in Québec. The design allows the seed released from opened cones to pass out of the kilns immediately thereby preventing damage to the seed from long exposure to heat.

The cleaning, dewinging and sizing of the seeds are done with the Swedish Hillesjö system similar to the one already in operation at Pine Ridge, Alta.

Sixty to 80 000 hl of cones can be treated annually at the new plant.

A laboratory for seed testing and research is also part of the new plant. It is the only seed testing lab in the province of Québec.

The energy needed by the plant is mainly generated by the heat obtained by burning the empty cones. Oil provides extra heat if needed.

This new seed extraction plant can easily handle the 10 000 hl of cones required annually to provide the minimum amount of seed of various species required by the artificial reforestation program. Quebec is planting about 300 MM seedlings annually. The volume of cones handled may increase five to six fold or more during a good cone crop year.

Yves Lamontagne

Fire Strikes at the Berthierville, Québec Seed Extraction Plant

A fire, suspected to be from criminal origin, occurred at the Berthierville seed extraction plant during the night of November 4, 1985. The fire destroyed three wooden cone sheds covering 3 862 m². Eight farm tractors of different sizes, various material and equipment used in the nursery and 9 530 hl of cones stored in the sheds were destroyed. One exterior wall of the new seed extraction plant, still under construction, was also damaged by the fire. The total loss is estimated to 2,5 million dollars.

The cones lost were from 10 species collected in 1984 and 1985, but not yet extracted. The loss of the 1985 black spruce cone collection is particularly serious. It will have an effect on the sowing schedules in some parts of the province for many years to come, depending on the next good seed year. The loss of nursery material and equipment is also likely to affect the 1986 spring operations.

Fortunately the seed extraction equipment and the cold room for seed storage were not affected by the fire.

Yves Lamontagne

Ontario Tree Seed Plant, Angus

Angus has just completed one of its shortest extraction years in recent history. A total of 5500 hectolitres of cones were extracted with jack pine and black spruce comprising the major percentage of the total.

We have just completed upgrading of our seed storage facilities. A new storage vault complete with electric mobile shelving has been constructed. Our older storage vault has been revamped and mobile shelving added to it. This shelving requires space for only two aisles, one fixed aisle and one that is moveable. The need for a conventional aisle on either side of a shelf is eliminated. We now can store twice as many seed containers within the same storage space.

We are also investigating air filtration within our extraction plant. Our extraction floor was identified as having very high dust levels, too high for staff to work in. At present, people working within this area are required to wear high efficiency face mask-helmets complete with dust filters that provide purified air flow over their faces. This maintains a positive pressure within the faceshield and prevents staff members from breathing in dust laden air. The protective devices have been accepted with very few complaints. Mechanical filtration for the whole plant is our final objective and we have looked at various systems.

Brian Swaile

Satellite Tree Seed Plant in Ontario

The Ontario Ministry of Natural Resources established a satellite seed plant to

process jack pine cones at the Dryden Tree Nursery, Dryden, Ontario (320 km west of Thunder Bay) in 1978. This plant has a capacity of 12,000 hl annually. A total of 8,425 hl of cones were processed between April 1, 1984 and March 31, 1985. The projected volume of cones to be processed April 1, 1985 to March 31, 1987 is only 3,500 hl. The volume is low because there is currently a two year operational supply of seed in storage and the districts are concentrating their collection on often difficult to obtain seed sources which have only small amounts in storage.

The seed extraction process is carried out in the following manner:

- i) the cones are dipped in 65°C water for 2 minutes, then placed in trays on carts;
- ii) the carts are placed in the kiln (30 hl capacity) for 12 hr at 65°C;
- iii) opened cones are tumbled and the winged seed is collected, dewinged in a cement mixer, cleaned with a scalper and fanning mill, and tested for percent dirt content and germination,
- iv) the cleaned seed is tested for moisture content with adjustments made if required, then stored at -2°C in plastic jugs,
- v) the identification of each seed lot processed is filed in a computer to await a request for its use.

This plant supplies the Northwest Region with approximately one billion viable seed annually to treat harvested areas, principally by direct seeding (i.e. aerial, site preparation, hand). The seed is also used for the periodic treatment of wild-fire burnt areas. To assure that all seed requirements are satisfied a seed bank of three billion seed is necessary.

The seed plant has proven to be a definite asset to the Ministry's regeneration program due in part to the foresight of MR. GEORGE BROWN.

J.M. McIntyre - Nursery Superintendent
and
T.R. Myland - Nursery Forester

Highlights from Alberta's Pine Ridge Seed Extraction Plant

The 1985/86 seed processing season was a short one. Some areas of the province had a light to moderate white spruce cone crop with a total of 1269 hl being collected and processed. The cones yielded 1576 kg of clean seed; an average rate of 1379 g/hl. Also collected were 657 hl of douglas fir and 2020 hl of lodgepole pine cones. These produced 499 kg of douglas fir seed and 615 kg of lodgepole pine seed. Germination tests of these new seedlots are currently underway.

Pine Ridge is able to process 86.4 hl of cones in an eight hour shift, therefore the total crop of 3946 hl took only nine and one half weeks, at one shift per day to process. This has been the shortest processing season PRFN has had since it commenced operations in 1978.

Kathy Yakimchuk

New Seed Centre for the Province of British Columbia

The construction of the new B.C. Ministry of Forests Seed Centre got under way in 1985. The 3.4 million dollar facility is being built by the B.C. Government as part of the Canada - British Columbia Forest Resource Development Agreement. It will be located near Vancouver in Surrey, B.C.

The complex will include: cone storage and kilning facilities; Seed processing equipment; Seed storage freezers for 60 000 kilograms of seed; Seed weighing, preparation and cooler space for stratification of seed prior to shipping to nurseries; Seed testing laboratory; and office and staff facilities.

The concepts for the facility were developed by the Ministry with engineering

design by Swan Wooster Engineering Co. Ltd. of Vancouver. The cone drying Kiln, a tray Kiln type, was designed by Lohead-Haggerty Engineering and Manufacturing Co. Ltd. of New Westminster. The tray loading and unloading line is being manufactured locally. The Seed Processing line has been purchased for Hillehog Ab. of Sweden.

The construction began October 1, 1985 with completion set for September 1986 ready for October 1986 operation.

Rob Bowden-Green

A SUCCESSFUL MEETING ON SEED PROBLEMS IN VIENNA

The combination of informal structure and articulate knowledgeable participants provided lively and well-informed discussion at last summer's IUFRO-Project Group S2.04.00 meeting in Vienna, Austria. The meeting covered a variety of topics and species but much of the discussion was relevant to Canadian conditions. Problems encountered in western Europe's older seed orchards are being actively investigated and this research will be of value to us as our orchards mature. Discussions of similarities and differences between our problems and theirs will lead to new approaches and insights into the production of seed and orchard management. Not all research data finds its way into international journals and some is not even published at all. The only way such information is circulated is during the discussion periods and in the personal contacts one establishes at meetings like this one.

The 16 papers presented dealt with:

- temperature effects on pollen development
- seed production in sub-arctic environments
- effects of elevation on seed quantity and quality, branch habit, and volume production

- seed yields from natural stands and orchards
- improved methods of seed collection and storage
- pre-treatment methods to enhance germination

We visited a Seed Testing Institute and reviewed ISTA rules. A seed extraction plant built almost entirely of wood and nearly fifty years old (medium size by Canadian standards) was examined. It had a vertical dryer; cones are dried as they proceed downward through the four stories high system. Extraction, de-winging and cleaning are performed in the cellar.

We visited a clonal seed orchard in the Danube River Valley that contains sycamore, white fir, and European and Japanese larch. Interestingly the larch had been "topped" at a height of 1.5-2.0 metres in order to keep the cone bearing branches within easy reach. The orchard has not yet produced much seed but its location - a dry southerly slope - indicates an excellent choice of site.

The effects of industrial pollution was strikingly demonstrated near the industrial city of Linz. Damage was concentrated on Norway spruce, beech and white fir growing on windward sites and has been observed for about ten years. Symptoms appear as dead foliage in the upper crowns, deformed leaders and generally lowered vigor. This in turn predisposes the trees to killing attacks by Dendroctonus bark beetles. The city sits in an inversion zone and we could see the cloud of haze/smog while in the area.

In mature stands of Norway spruce on steep slopes we saw the patch clearcut method in use. Patch size, (2-4 ha) is limited by law and further cutting cannot take place until the cut areas regenerate satisfactorily. Natural regeneration is abundant, up to 100 000/ha and is subsequently thinned down to 2 500/ha. Erosion is a potential problem on these sites but careful control of disturbances keeps it to a minimum. At higher elevations spruce is also harvested in small clearcuts but

because of poor seed production natural regeneration was minimal. Planting is difficult and mortality was high. Some success was achieved by planting in small favourable micro-sites.

J. Peter Hall

SYMPOSIUM IN POLAND

The IUFRO Working Party S2.01.05 (Reproductive Processes) held a symposium entitled "Flowering and seed bearing in forest seed orchards". The meeting was hosted by the Polish Academy of Sciences in Kornik, Poland, Sept. 2-7, 1985. The symposium was organized into five sessions:

1. Juvenility
2. Physiology of flowering
3. Floral induction
4. Crop protection and economic problems
5. Climatic relationships

The final day consisted of a IUFRO S2.01.00 business meeting.

With over 40 participants from 14 countries, discussions were very lively and informative. The symposium proceedings will be published as a special issue of the journal: Forest Ecology and Management in 1986(?). A number of papers in the proceedings should be of interest to anyone involved in cone and seed production research and/or seed orchard management.

Ron Smith

EFFECT OF POLLEN DEVELOPMENT ON SEED YIELDS ON LARIX IN NEWFOUNDLAND. (A SUMMARY OF A PAPER PRESENTED AT IUFRO-PROJECT GROUP S2.04.00 MEETING IN VIENNA, AUSTRIA, 1985)

Reforestation programs in Newfoundland are expected to use exotic Larix spp. extensively in the future. Seed requirements for propagation are most likely to be met

by the establishment of seed orchards. Studies in Sweden under boreal conditions indicate that massive damage to pollen resulting in failure of the seed crop is a real possibility in Newfoundland. Therefore microsporogenesis was studied on native L. laricina and exotics L. kaempferi, L. decidua and L. eurolepis over a five year period. Trees were studied at a coastal and an inland site. Seed yields were also monitored. Results show few differences between sites but wide year to year, inter-species, and inter-tree variation. Exotic species are in temperature sensitive stages earlier in spring than the native species. Damage was observed in all species except L. eurolepis. However, little casual relationship was observed between temperatures and levels of damage and more significantly between observed damage and the percentage of filled seed. Therefore, it is concluded that seed orchards of these species can be established in Newfoundland without concern that the pollen crop will sustain significant environmentally-induced damage.

J. Peter Hall

AERIAL SEEDING BLACK SPRUCE

If your organization is considering aerial seeding you should read Information Report O-X-370 written by R.L. Fleming, F.F. Forman and J. Régnière in 1985, entitled "Black spruce seed distribution with the Brohm Seeder/Piper PA-18A aircraft combination." This report evaluates 21 trial flights and seeding at 3 prescribed rates. It concludes that satisfactory seed distribution and deposit rates can be obtained consistently if equipment calibration and sowing procedures are carefully followed. Steady winds of less than 10 km/hr do not have a serious impact on seed distribution, however, variable or shifting winds do. This report is available from the Information Services, Great Lakes Forestry Centre, P.O. Box 490, Sault Ste. Marie, Ontario, P6A 5M7.

UPCOMING MEETINGS

Cone and Seed Insects:

IUFRO Working Party (S2.07-01) Meeting

A Cone and Seed Insects Working Party meeting will be held in the French Alps at Briançon, France, from September 3-5, 1986. Registration is \$100 U.S. which includes lodging, meals and the technical field excursion. This schedule will provide September 6 for travel to Ljubljana, Yugoslavia to attend the XVII IUFRO World Congress. Alain Roques with the Forestry Research Department, Centre de Recherches d'Orleans is in charge of organizing the meeting. Those wishing to participate in this conference should submit titles for papers to: Harry O. Yates, III, Chairman, IUFRO S2.07-01, Southeastern Forest Experiment Station, Forest Service, USDA, Carlton Street, Athens, Georgia, 30602, USA.

IUFRO World Congress

The eighteenth IUFRO Congress will be held in Yugoslavia, September 7-21, 1986. This meeting is dedicated to "Forestry Science Serving Society". In practice this means we have borrowed the forests from our children and we have to return the forests to them in a better condition than they had before. For information contact: Congress and Cultural Centre, Kidricev Park 1, 61000 Ljubljana, Yugoslavia.

21st ISTA Congress

The 21st International Seed Testing Congress is to be held in Brisbane, Australia, July 10-19, 1986. The Congress includes two-day preliminary committee meetings, two-day seed symposium, two-day ordinary meeting, and five-day post-congress tours of agriculture or forestry. The seed symposium is divided into 8 technical sessions with the first five devoted to seed problems in the world particularly in the subtropics and tropics in seed production, processing and certification, seed and cultivar identification, germination and tetrazolium testing, seed-borne diseases, testing and treatment, storage and seed vigour. The other three sessions

are "recent developments in seed physiology and biochemistry", "New developments with tree seeds and ornamentals" and "Miscellaneous papers". There will also be a poster session.

Tree Improvement - Theory and Practice

IUFRO working parties on Breeding Theory, S2.04.02; Progeny Testing, S2.04.03; and Seed Orchards, S2.03.03 hosted by The North Carolina State University - Industry Cooperative Tree Improvement Program have organized a conference that will provide a unique opportunity for discussion of current concerns in forest tree improvement. The October 12-17, 1986 meeting to be held at Williamsburg, Virginia, USA, will include four full days of sessions for the presentation of invited and volunteer papers and two half days of field visits to observe nearby operational tree improvement programs in seed orchards, nursery, progeny tests and breeding facilities. A 5-day (October 18-22, 1986) post conference tour south from Williamsburg, Virginia to Charleston, South Carolina will visit research, developmental and operational activities to show the integration of tree improvement research into operational forest management programs on a large and intensive scale. For further information contact Dr. Robert J. Weir, Director, Tree Improvement Cooperative, Box 8002, 1019 Biltmore Hall, School of Forest Resources, N.C. State University, Raleigh, NC, 27695-8002, USA.

Ninth North American Forest Biology Workshop

This workshop sponsored by the Tree Physiology and Tree Genetic and Improvement Working Groups of the Society of American Foresters will be held on the Campus of Oklahoma State University on June 5-18, 1986. Many aspects of forest tree physiology and genetics, tree improvement and forest biology will be discussed and a proceedings will be published. For

information contact Tom Hennessey, Dept. Forestry, Oklahoma State University, Stillwater, OK, USA, 74078.

Genetic Manipulation of Woody Plants

The molecular biology of woody plants is a rapidly expanding field worldwide. To further stimulate the development of knowledge and progress in application to forest, ornamental, food and other trees, an international symposium will be held on the Michigan State University campus June 21-25, 1987.

The symposium program will focus on four major topic areas:

- (1) Tissue culture systems,
- (2) DNA analysis and manipulation,
- (3) Regulation of gene expression, and
- (4) Integration of genetic manipulation into breeding programs

These topics will be addressed by 33 invited speakers from many countries. There will also be an opportunity for contributing papers in the subject areas. For further information and to be placed on the conference mailing list, please write to: James W. Hanover, Department of Forestry, Michigan State University, East Lansing, Michigan 48824-1222, U.S.A.

NEW-PUBLICATIONS

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- Skroppa, T and Tuttunen, R. 1985. Flowering in Norway spruce seed orchards. Silva Gene. 34(2):90-94.
- Wheeler, N.C., Masters, C.J., Cade, S.C., Ross, S.D., Kelley, J.W. and Hsin, L.Y. 1985. Girdling: an effective and practical treatment for enhancing seed yields in Douglas-fir seed orchards. Can. Jour. Forest Res. 15(3):505-510.
- Ying, C.C., Murphy, J.C. and Andersen, S. 1985. Cone production and seed yield of lodgepole pine grafts. Forestry Chron. 61(3):223-228.