A WORD FROM THE CHAIRMAN

At the business meeting of the Seed Workshop held during the 20th biennial meeting of the Canadian Tree Improvement Association in Quebec City, I was elected chairman of the Tree Seed Working Group; (TSWG) for a two-year term.

I would like to thank very deeply Ben Wang who acted as interim chairman since the establishment of the Group in Toronto, two years ago. Ben, along with other founding members, has been very active in defining the objectives of the Group and setting up a membership directory.

During the same meeting, Hugh O. Schooley from the Petawawa National Forestry Institute has been named Editor of the News Bulletin in replacement of the first Editor, George Edwards. Our sincere thanks to George for his fine job during his term. I hope that members of the TSWG will keep Hugh very busy by sending him notes and articles for the Bulletin.

The recently (1984) formed Cone and Seed Insect Working Party (CSIWP) has been affiliated to the TSWG. Mr. Peter de Groot from the Forest Pest Management Institute has been appointed coordinator for the party and will strongly encourage researchers of that party to submit anything of interest to the TSWG News Bulletin.

Our sincere thanks are extended to Mr. Peter de Groot and to Dr. Jean Turgeon, both from the FPMI for organizing the workshop under the theme: Cone and Seed Pest. A report on the seed workshop; at the 20th CTIA meeting is presented in this issue of the News Bulletin.

I would like to end my first message by urging every researcher or worker in seeds or related fields to let other people know who they are and what they are doing by sending short (or long) notes or articles for the News Bulletin.

We often hear that an informal written vehicle for communication should exist in a group but once it is finally underway, submissions from members do not come so that the Bulletin dies. Let’s hope it won’t happen with ours. Meanwhile, thanks to the previous contributors and please write again.

Yves Lamontagne

NOTE THESE ADDRESSES

Chairman, TSWG
Yves Lamontagne
Service Pépinières et Reboisement
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200B Chemin, Ste-Foy
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Hugh O. Schooley
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Chalk River, Ontario, KOJ 1J0

Queries, comments and contributions to the “BULLETIN” are welcomed by the chairman or the editor.
EDITOR'S NOTES

IUFRO: Internation
Union of Forestry Research Organizations

In 1984 the IUFRO produced a listing of their “Working Group” structure (IUFRO News, No. 45 (3/1984). Just in case you don’t know or need to be reminded, interested researchers are welcome to contact the leaders of these groups for information and/or to participate in group activities. The groups of special interest to your editor are listed below:

• S2.01-00, Physiology: Reproductive Process, Chairperson, R. M. Rauter, Ontario Ministry of Natural Resources, Whitney Block, Queen’s Park, Toronto, Ontario, M7A 1W3, Canada.

• S2.03-03, Breeding: Seed Orchards, Chairperson, R. Weir, North Carolina State University School of Forest Resources, P. O. Box 5488, Raleigh, North Carolina, 27607, USA.

• S2.07-01, Entomology: Cone and Seed Insects, Chairperson, H. O. Yates, USDA Forest Service, Southeastern Forest Experiment Station, Forest Sciences Laboratory, Carlton St., Athens, Georgia, 30602, USA.

• P2.04-00, Seed Problems, Project Leader, F. T. Bonner, USDA Forest Service, Southern Forest Experiment Station, Forest Tree Seed Laboratory, P. O. Box 906, Starkville, Mississippi, 39759, USA.

These groups are also of interest to most TSWG members but there are many other groups that may also be of interest. If you are not aware of the variety of IUFRO Working Groups, I would suggest you contact your forestry library for the complete listing.

Hugh Schooley

THINK TREE SEEDS

Did you know that under the sponsorship of the Canadian Department of Agriculture and the Canadian Seed Growers Association, March 1986, will be Nationally designated as “Good Seed Month”. This action, unfortunately, will be made without any reference to tree seed because the designation is solely concerned with pedigreed agricultural seed. An appreciation of the value of forest tree seed will have to come at some later time — soon we hope.

Remember all the recent press coverage ‘our disappearing forests’ and other forest crises have received. All this coverage was made without any mention of the value of tree seeds in the solution of such problems. Don’t you think it’s about time our interests in tree seed got some special recognition? After all, seed is essential for forest preservation. Also, the provision and utilization of seed are the first steps in all reforestation programs.

Staff at the National Tree Seed Centre is considering the spearheading of a campaign to foster public, industrial, and governmental recognition of the important role tree seed plays in forestry. Can you help in such a campaign? What can you do to promote an appreciation of tree seed? Let us have your ideas and if it’s reasonably possible, a campaign leading to an appreciation of tree seed will be launched in 1987. Send comments and suggestions to Hugh O. Schooley, National Tree Seed Centre, Petowawa National Forestry Institute, Chalk River, Ontario, KOJ 1J0.

FIRST SEED ORCHARD SEED COLLECTED IN NEW BRUNSWICK

Tree improvement activities in New Brunswick became a cooperative, unified effort when the New Brunswick Tree Improvement Council was formed in 1976. Since that time, industry, the provincial and federal governments and the University of New Brunswick have worked together in close harmony.

The establishment of seedling seed orchards has continued for the past eight years and has been supplemented during recent years by clonal orchards. The autumn of 1984 saw the first crop of cones collected from two of these seed orchards! Cones collected from a jack pine seedling orchard yielded 4 kg of seed while a collection from Japanese larch clonal orchard produced 280 g. This is only the beginning of great things to come.

Dale Simpson
SEED TESTING NEWS

The International Seed Testing Association's new international rules for seed testing which were adopted at the 20th International Seed Testing Congress in Canada, 1983, have become effective since July 1, 1985. The English version of these rules was published as Volume 13, No. 2 of the journal Seed Science and Technology. Copies of the new rules are available from: The Secretariat, ISTA, P. O. Box 412, CH-8046, Zürich, Switzerland. (Cost 35 Swiss francs plus postage.)

Ben Wang

SEED ORCHARD “EXPANSION BOOM” IN QUEBEC

In his speech to the banquet of the recent CTIA meeting in Quebec City, Jean-Pierre Jolivet, the Quebec Minister responsible for forests, commented on seed orchard establishment in the Province. He pointed out that “7 or 8 years ago, there were practically no orchards. Today there are a little more than 300 hectares established.” Now they are beginning a spectacular increase in orchard development. “The Province’s objective is to have 1,900 hectares of established orchards by the end of the 1980’s.” I’m sure we all wish the Province, Good Luck with this program. Your ambition and foresight are envied by the rest of Canada.

Hugh Schooley

UPDATE ON NATIONAL TREE SEED BANK

The National Tree Seed Centre’s Seed Bank at the Petawawa National Forestry Institute contains a wide variety of source-identified, high physical quality seed of native and exotic forestry species for use by researchers in Canada and abroad. Last year, for example, the Bank shipped 759 seedlots of 141 species to clients in Canada and 14 other countries.

An up-to-date seed inventory list will be published later this autumn to supersede Information Report PI-X-39. The following species represent recent additions to the Bank:

- Abies amabilis
- A. concolor
- A. fraseri
- A. nephrolepis
- Acer pensylvanicum
- A. spicatum
- Alnus cordata
- A. hirsuta
- A. nepalensis
- A. sibirica
- Betula platyphylla
- Fraxinus chinensis
- Picea koraiensis
- P. meyeri
- Pinus bungeana
- P. cembra sibirica
- P. kesiyaa
- P. merkusi
- P. strobiiformis
- P. tabulaeformis
- Sorbus americana
- Ulmus glabra
- U. laevis

Following a two year national seed collection project, the Bank has assembled a large number of single-tree and bulked seed collections of the five native alders (Alnus crispa, rubra, rugosa, sinuata and tenuifolia) from most regions in Canada. The collections of northern B.C. red alder are particularly exciting because trials conducted in Quebec suggest that these sources may be winter hardy in much of Eastern Canada.

Other notable additions to the list since 1984 include:

- red spruce from two indigenous stands in Ontario
- several collections of Betula pendula and pubescens from West Germany
- Scots pine from a rogued seed orchard at PNFI which contains clones exhibiting desirable Christmas tree characteristics
- 20 seedlots of 5 species from Newfoundland
- Pitch pine (P. rigida) from one of Ontario’s largest stands (Long Mountain)
- Upper Ottawa Valley single tree collections of white spruce
As a result of the addition of a full-time seed technologist, Mrs. Bea Kelley, to the Seed Bank project, we will be able to provide germination and thousand-seed-weight statistics for the 2,198 seedlots (comprising 115 species and representing 26 countries) contained in the new list.

Persons interested in receiving information about the Seed Bank or a copy of the current list should write to: Mr. P. Janas, National Tree Seed Centre, Petawawa National Forestry Institute, Chalk River, Ontario, K0J 1J0.

Peter Janas

INSECTS AND POLLEN PRODUCTION

At the recent Cone and Seed Pest Working Group Workshop in Quebec City it was suggested that more effort be directed toward determining the impact insects have on the production of pollen by coniferous trees. Some of this type of work was done during the summer of 1984 in New Brunswick. The study involved semiweekly monitoring of tagged microsporangiate strobili on jack pine Pinus banksiana, tamarack Larix laricina, and black spruce Picea mariana. Results are summarized here.

Jack Pine: Between May 15 and May 22 sawflies were observed ovipositing into the microstrobili of jack pine. Adult specimens captured by a Malaise trap were identified as Xyela minor and Xyela pini. On May 22 Xyela sp. larvae were collected from the microstrobili. Subsequent examinations showed these larvae to be very common. For example the dissection of 25 clusters of strobili collected June 4 (early pollination period) showed that every cluster was infested. There was an average of 22 strobili and 22 larvae per cluster. Often a strobilus contained more than one larva. An average of 77% of the strobili in a cluster were damaged and the mean amount of volume loss per infested strobilus was 25%. From this it was estimated that roughly one-fifth of the volume of microstrobili collected on June 4 had been consumed by xyelid sawflies. Eight days later most of the microsporangiate strobili had released their pollen and nearly all the sawflies had left the strobili. Xyelid sawflies were the most serious pests of jack pine microsporangiate strobili.

Larvae of the jack pine budworm Choristoneura pinus pinus were found feeding on the strobili from late May to mid-June. The budworm was the second most common insect associated with these structures, but was far less important than the sawflies. Lepidopterous larvae Coleotechnites canusella and Syngapha abrusa and Cecidomyiid larvae Cecidomyia resinicola and pininiopsis were also found to feed on jack pine microstrobili.

Eastern Larch: Insect damage did not appear to be a significant factor in reducing the amount of pollen from eastern larch. There was a small amount of feeding damage by lepidopterous larvae Choristoneura fumiferana and Coleotechnites laricis before pollination was complete. However, all tagged microstrobili survived to produce pollen.

Black spruce: Damage to the microstrobili of black spruce was slight. The maximum average strobili volume consumed by insects from weekly dissections was 2.7%. Only one of 50 tagged strobili failed to develop sufficiently to release pollen. Feeding by the spruce budworm was responsible for almost all of the damage. Pollination occurred during the first week of June.

Peter A. Amirault
Northern Forest Research Centre
Edmonton, Alberta

CONE AND SEED PEST WORKSHOP

The 20th biennial meeting of the Canadian Tree Improvement Association at Quebec City in late August was preceded by a day long TSWG/CSWP Workshop. About 55 participants were welcomed by (later to be elected) CSWP coordinator Peter de Groot. A total of 13 papers were presented in sessions dealing with:

1. Cone Production; moderator Yves Lamontagne.
2. Insect Pests Affecting Seed Production: Biology and Importance; moderator Jean Turgeon.

In this writers opinion the highlight of Session 1, and probably the whole workshop, was a paper prepared and offered by Bill Baker (for Marie Rauter and Celia Graham). This presentation was an excellent summary of a forthcoming Ontario Ministry of Natural Resources Book on "Establishment Guidelines for Seed Orchards."
Many researchers are aware that this text has been in preparation for several years and are anxious to receive a copy. I encourage everyone interested in seed orchards to write the OMNR office at Queen's Park in Toronto and encourage them to expedite the book's publication. Interesting papers on the Status of Seed Orchards in Canada by Kris Morgenstern, Seed Crop Assessment by Bill Baker (for Ron Calvert) and Seed Collection and Processing for Ben Wang were also presented.

Session 2 offered four papers that did an excellent job of indicating the important insect pests of our major conifer species. Insects of Douglas-fir, pine, spruce and larch were discussed respectively by Don Summers, Paul Syme, Paul Syme (for Les Magasi) and Lee Eady.

Session 3 was initiated by a summary of recent advance in insecticide spray technology, by Charles Vincent, which was oriented to machinery for use in orchards. Gary Grant spoke on the use of sex pheromones particularly as an insect monitoring tool. The other papers all concerned insect management strategies: for Douglas-fir, by Gordon Miller; for spruce and pine, by Willard Fogal; and for larch, by Peter Amirlaft. It appeared from these papers that the control of most pest species is possible, however, considerable work is still necessary to up-scale research studies to operational levels.

Complete abstracts of the workshop papers will be published in the CTIA proceedings in early 1986.

Hugh O. Schooley

CSPP/ASPP ANNUAL MEETING 1985

The joint Annual Meeting of the Canadian and American Societies of Plant Physiology was held on June 23 - 28 in Providence, Rhode Island. A wide range of topics was examined at the Annual Meeting, including many papers dealing with seed physiology. Although most of the studies on seeds dealt with non-tree species, the techniques used, as well as the problems examined, have close application to conifer seeds.

Some of the studies reported at the meeting that would be of interest to tree seed workers included: understanding the mechanisms of dormancy; enzyme metabolism during germination; chemical composition of seed reserves; characterization of isoenzymes; biochemical changes of seeds to anoxic and heat stress; characterization of seed hormones; pre-sowing seed treatments; physiology of low temperature and water stress; changes at the DNA level during development and germination; seed deterioration; and others.

This Annual Meeting provided a good opportunity to learn about some of the latest theories and techniques of seed physiology (as well as other topics of plant physiology), of which some new ideas and methods may be applied to examine various problems of conifer seeds.

Abstracts of papers for the above subject matter discussed can be seen in the 1985 Supplement to Plant Physiology.

Jack A. Pitel

CONIFER SEED SYMPOSIUM

A symposium: "Conifer Tree Seed in the Inland Mountain West", was held August 5 - 7, 1985, at the University of Montana, in Missoula, Montana. Its purpose of updating and consolidating information and research on cones and seeds of species native to the eastern slopes of the coastal Rocky Mountains was well accomplished. The symposium began with a keynote address by J. D. Brewley, Chairman, Department of Botany, University of Guelph, who spoke on "Seed Conservation Problems: Natural and Unnatural. The program that followed this talk included sessions on cone and seed biology; cone prediction, collection and processing; seed orchard and seed production area management; and effects of biological factors on seed production. These sessions included review papers respectively by J. N. Owens, University of Victoria, B.C.; G. W. Edwards, CFS, PPFC, Victoria, B.C.; J. Konishi, B.C. Ministry of Forests, Victoria, B.C.; and C. H. Halverson, U.S. Fish and Wildlife Service, Fort Collins, CO; and G. E. Miller, CFS, PPFC, Victoria, B.C. These speakers and a summary of the meeting presented by Stanley Krugman, Director of Timber Management Research, U.S. Forest Service, Washington, D.C., were of course the highlights of the meeting. However, significant contributions were also made by most of the speakers presenting specific research or technical reports.
In particular, two topics generated an unusually large amount of discussion. First, during seed tests, at what stage should germination be considered successful? It was concluded that the most meaningful results are obtained when germinants are grown to the open cotyledon stage and their vigor is assessed. Second, who gets more seed, the squirrels or the cone collectors? It was concluded that squirrels are by far more effective collectors than man can ever hope to be. However, robbing the squirrels of their cached cones is a good way to collect seed providing the cones are handled properly.

A proceedings of this meeting will be published. Watch for it as I'm sure it will contain useful information for everyone interested in cone and seed work.

Hugh O. Schooley

SEED PROBLEMS UNDER STRESSFUL CONDITIONS

IUFRO (P.04.00 Seed Problems) Project Group Meeting was held in Vienna, Austria, June 3 - 8, 1985. The symposium papers were devoted heavily to discussions of single and multiple environmental factors and their effects on seed. Factors of light, temperatures, dehydration, dormancy mechanisms, genetics, insects and pathogens and pollution were discussed. Most of these papers were very interesting from the view that one needs to know much more about our native trees wherever we are. However, they did not address the title of the symposium well. This may have been too much to hope for anyway because we need to define the condition "normal" before we know what "stressful" is.

There were 46 participants at the symposium representing 22 different nations. The Austrians were superb hosts and a very good time was had by all.

A. K. Hellum

REVIEW OF SEED PRODUCTION BY NORTH TEMperate TREE SPECIES

Dr. John N. Owens and M. D. Blake of the University of Victoria, under a Canadian Forestry Service, PRUF Contract, have written an excellent report entitled "Forest Tree Seed Production: A Review of Literature and Recommendations for Future Research". This was a tremendous task not only because of the diversity of conifer and hardwood species covered but also because reproductive cycles are long and often complex and because many aspects of study are needed to fully understand cause of variable seed production.

The authors have taken a broad approach to seed production based on a developmental framework which puts each stage of the reproductive process in perspective. Specialists in various subject areas will be able to identify incomplete treatment or omitted literature. However, the report has not been written to update specialists, but rather to familiarize everyone interested in seed production with all aspects of the reproductive process.

The following topics are examined:

1. Variation in reproductive cycles;
2. Times and patterns of floral initiation;
3. Environmental factors affecting floral initiation;
4. Floral induction and enhancement;
5. Pollen and pollination;
6. Gametophyte development and fertilization; and
7. Seed development.

The most relevant literature dealing with the development, physiology, and ecology of these processes are reviewed. Wherever possible, cultural, physiological, or management techniques which have been shown to affect seed production are also examined. A summary, and recommendation for future research, conclude each chapter. Appendices include tables which summarize results of flower induction experiments on many tree species.

This report is being published by Petawawa National Forestry Institute as Information Report Number PI-X-53. Copies may be obtained from: Technical Information and Distribution Centre, Petawawa National Forestry Institute, Canadian Forestry Service, Chalk River, Ontario, K0J 1J0.

Hugh Schooley
B.C. HAS PRODUCED A SEED ORCHARD DIRECTORY

In the recently released publication entitled "Seed Orchards of British Columbia", Pauline Hanson has compiled pertinent information on all B.C.'s orchards. Each orchard is identified by the species grown, its name, location, owner, agency, supervisor, mailing address and telephone number. A brief outline of development history, objectives, size, design and predicted seed production are also provided. Copies of this publication may be obtained from: Information Services Branch, B.C. Ministry of Forests, 1450 Government St., Victoria, B.C., V8W 3E7.

Ben Wong

SLIDES TO ASSIST IN TEACHING JACK PINE REPRODUCTION

Mary I. Moore, an independent, Ottawa Valley Botanist has produced a teaching-aid package of 33 transparencies (35 mm) with descriptive text that outlines the reproduction of jack pine Pinus banksiana. The slide series illustrates reproductive structures as they appear on the tree and also as they appear in stained, slide mounted sections viewed through a microscope. This teaching aid has been well received by several institutions who have commented on the scarcity of this type of illustrative information. It is available for $65.00 (Canadian) from: Mary I. Moore, P. O. Box 159, Deep River, Ontario, K0J 1P0.

Hugh Schooley

HANDBOOK FOR TROPICAL SPECIES

A long needed handbook, "Seed Collection and Nursery Techniques of Tropical and Sub-tropical Species" is now available. This handbook contains first: a general description of principals commonly applicable to cone or fruit collection and nursery practices, and second: a specific description of silvics, physical characteristics of cones or fruits and seeds, germination requirements and behaviour, and salient points for the collection, handling, processing, storage and sowing of seed from 116 species. There are beautiful drawings illustrating the fruit, seed and young seedlings of each species. This handbook was written by H. Z. Wang, H. Y. Wang, S. Y. Chang, S. Y. Liu and Z. G. Wei and is available from: The People's Printing Office, Gwang-Xi, People's Republic of China.

Ben Wang

TESTS FOR SEED VIABILITY

The recent publication "Quick Tests for Tree Seed Viability", B.C. Ministry of Forests, Land Management Report No. 18, outlines procedures for testing seed viability not previously documented for trees. These are the hydrogen peroxide, the tetrazolium, the x-ray and the x-ray contrast tests. The basis, advantages and disadvantages, a detailed description, and an evaluation of each test is provided. Each procedure is augmented with notes and illustrations to assist in interpretation of test performance and results. This manual is written for a wide audience — researchers, seed technologists, tree breeders, nurserymen and anyone interested in the rapid assessment of tree seed quality — and assumes the user has had no previous experience.

Copies are available for $5.00 (Canadian) from Queen's Printer Publications, Parliament Buildings, Victoria, B.C., Canada, V8V 4R6.

Carol Leadem

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 Briancon, 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 XVIII IUFRO World Congress. Alain Roques with the Forestry Research Department, Centre de Recherches d'Orléans 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.

Canadian National Forestry Congress

The sixth National Forestry Congress will be held in Ottawa, April 9 - 10, 1986. This meeting is cosponsored by Canadian Institute of Forestry and Canadian Forestry Association. For information contact: Argyle Communications Inc., 220 King St. West, Toronto, Ontario, M5H 1K4, Canada.

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 sub-tropics 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. The deadline for submitting symposium papers is December 31, 1985.

NEW PUBLICATIONS


