



Newsbulletin

Tree Seed Working Group

No.1, December 1983,

TREE SEED WORKING GROUP FORMED

At the two most recent meetings - the 18th in Duncan, B.C. (1981) and the 19th in Toronto (1983) - of the CANADIAN TREE IMPROVEMENT ASSOCIATION, one-day Seed Workshops were held in conjunction with the main programs. Both workshops were well attended and drew considerable attention from seed workers across Canada. Attendees of the Toronto workshop proposed the establishment of a Tree Seed Working Group (TSWG) comprising scientists, managers and others with similar interests in tree seeds. An ad hoc committee presented the TSWG proposal during the CTIA's Business Session at the 19th Biennial Meeting. Included in the proposal was a recommendation for a third workshop to be held in conjunction with the 20th CTIA Meeting, Quebec City, 1985.

Not only did the CTIA give its approval on both counts, it assured the fledgling TSWG of its support and respect for autonomy in terms of membership organization and arranging meetings. Ben Wang, PNFI (CFS), invited to lead the TSWG into its formative phase, expressed the Group's appreciation for the CTIA's sponsorship and encouragement.

An interim TSWG executive, chosen principally from Ontario and Quebec to simplify communications and organizational meetings during the development of the Group's program,

includes the following well-known seed workers:

Interim Chairman:

Ben S.P. Wang, Canadian
Forestry Service, Petawawa
National Forestry Institute,
Chalk River, Ont.

Members:

Bob Farmer, Lakehead
University, Thunder Bay, Ont.

Fred Haavisto, CFS, Gt. Lakes
Forest Research Centre, Sault
Ste. Marie, Ont.

Yves Lamontagne, Quebec Dept.
Energy and Resources, Ste. Foy,
Quebec.

Doug Skeates, Ministry of
Natural Resources, Maple, Ont.

In addition, George Edwards (CFS, Pacific Forest Research Centre, Victoria, B.C.) volunteered to edit a TSWG "News Bulletin" as newsworthy material becomes available.

OBJECTIVES

The objectives of the TSWG will be kept very broad and inclusive. At the time this News Bulletin was prepared a formal statement of goals had not been prepared. In the interim, the Group's principal aim

WELCOME FROM THE INTERIM CHAIRMAN

Seeds are the most commonly used reproductive material for regeneration of our valuable forest resources, not only in Canada, but elsewhere also. With the increasing demand for artificial regeneration, seeds are starting to receive the attention they deserve from our forest managers. According to Dr. E.K. Morgenstern (University of New Brunswick), Canada's forest renewal program will require more than 7 thousand million viable seeds annually by 1987. The area to be planted or seeded, and the productivity per unit area, will be determined by the quality and quantity of seeds collected. This is a real challenge to seed workers.

Because our human resources are limited, it is absolutely essential that seed workers cooperate and communicate with each other. The formation of a Tree Seed Working Group to bring together seed workers within the Canadian Tree Improvement Association (CTIA) has been discussed since 1979. Success in forming the group was achieved through the efforts of such devoted founding seed workers as Dr. Bob Farmer of Lakehead University, Dr. Graham Powell of U.N.B., Dr. Oscar Sziklai of U.B.C., Mr. Yves Lamontagne of Quebec Ministere de l'Energie et des Ressources, Mr. Doug Skeates of Ontario Ministry of Natural Resources, Mr. Fred Haavisto of CFS, Sault Ste. Marie, Dr. George Edwards of CFS, Victoria, and Mr. Hugh Schooley of CFS, Chalk River. The ad hoc committee are greatly appreciative of the understanding and support of the CTIA membership in aproving the formation of this working group.

As the interim chairman of the Tree Seed Working Group, I invite those who are seed workers and seed users to fill in the questionnaire attached to this News Bulletin. Together, we can form and develop into an effective force for solving many of the seed problems associated with forest renewal in Canada, North America and perhaps other countries. I would welcome constructive comments and suggestions concerning the formation and future development of the TSWG.

Ben S.P. Wang

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may be approximated as the promotion of tree seed science and technology. This will be achieved by promoting seed research, from bud initiation to seed utilization; by identifying seed problems related to forest management and tree improvement; and by promoting an exchange of information on seed related problems.

A more refined statement of objectives will appear in a later News Bulletin. As with all aspects of the TSWG, if you have thoughts or comments on the goals of the group, please pen them to either the Chairman or the Editor.

MEMBERSHIP OF THE TSWG

As is the case with the Canadian Tree Improvement Association, membership in the Tree Seed Working Group will not be limited to Canadians. Colleagues south of the border, indeed any seed workers or seed users within the range of the postal service are encouraged to establish contact with and become a member of the TSWG. Membership is free (!) to all who return the completed questionnaire attached to this News Bulletin. The more people who join, the greater the cumulative expertise of the TSWG - expertise that will make it easier not only to solve seed problems plaguing Canadian foresters, but which could be brought to bear in other countries as well.

IDENTIFICATION OF SEED RESEARCH NEEDS

The ad hoc committee responsible for forging the TSWG, discussed the needs for seed research, a topic raised during the Toronto Workshop by Dr. Robert Farmer (Lakehead University). Seven major areas were quickly identified.

- variation in genetic control of seed germination
- seed population biology and ecology
- seed and cone yield analysis
- seed maturity related to reproductive processes and conditions
- maturation and ripeness indices
- seed crop management: production, procurement and protection
- efficient utilization of seeds

Much more input and discussion by TSWG members is needed before any comprehensive account of research requirements can be documented, however. This task becomes one of the primary goals of the TSWG. On completion, the CTIA will be asked

to endorse the priorities identified and to encourage work in these areas by the appropriate authorities.

Anyone with ideas - large or small - on tree seed research needs is cordially invited to submit them to the TSWG Chairman, Ben Wang. Future News Bulletins will be used for review and discussion. Your input is welcomed - and needed!

THE "NEWS BULLETIN"

The TSWG will distribute a News Bulletin, an informal vehicle for communication with and between its members, on an irregular basis. Four issues, at quarterly intervals, are proposed, but frequency, and size of the Bulletin will be kept very flexible. Content of the Bulletin will depend largely on submissions from TSWG members. Don't rely on your Chairman, and especially the Editor, to fill the spaces. Just about any item dealing with tree seeds will be considered. A few examples, not in any order of priority:

- announcements of forthcoming meetings
- research publication (yours) - abstracts might be included
- research papers you have seen, especially ones that might not be readily available everywhere
- listings of university theses - these often go unannounced yet are often good sources of information, especially bibliographical appointments
- positions available - remember these?
- message board - anyone going anywhere could make enquiries, take photos, gather specimens, bring back souvenirs (?)
- Editorials - these need not be from your Editor (he is already overworked), but should be confined to major areas

- news on local or regional projects or problems that might not receive national attention
- member activities - have you taken on some new work?
- problems - can not find a particular piece of equipment?
Stuck with a problem in the lab, the seed orchard, nursery? Ask for help.

Use your imagination - but PLEASE write!

REPORT ON THE SEED WORKSHOP AT THE 19TH CTIA MEETING

Eight invited speakers, addressing the theme of "Maximizing the production and efficient use of improved tree seeds," presented practical ideas at a one-day Seed Workshop held August 22, 1983, just prior to the 19th CTIA Meeting at the University of Toronto. Co-chairmen D.A. Skeates, of the Ontario Tree Improvement and Forest Biomass Institute (OMNR) and B.S.P. Wang, of the Canadian Forestry Service (CFS) of Environment Canada focussed the workshop on bridging the gap between scientists developing genetically improved seeds for reforestation programmes and the nursery staff and field foresters utilizing these seeds. Although the papers will be published in the CTIA Proceedings, brief summaries follow:

Session 1 - Production and Collection of Improved Seeds.
Chairman: D.A. Skeates

1. C.W. Yeatman. Production of genetically improved jack pine seeds for planting and direct seeding.

Seed supply is no problem in jack pine, an important species in the

boreal forests of Canada. Production of genetically improved seeds must be framed in the context of long-term management objectives and projected seed requirements for artificial regeneration of the species. Implementation of a seed production program requires consideration of local operational and biological opportunities and constraints, and the resources available over time. Each stage of development should produce the best seeds obtainable at that time, in the quantities needed and at an acceptable cost. A plan for seed production and progressive improvement of jack pine was schematically illustrated by steps from logging slash to seed orchard.

2. Y. Lamontagne. Strategies for the production of improved seeds in Quebec.

Quebec's annual target is 10 000 hl of cones to fulfill a regeneration programme of 100 million seedlings and 30 000 ha of direct seeding. Improved seeds are intended only for intensive forestry practices, i.e., plantations. Seed zones, based on forest regions, are defined within each administrative region and seed transfer is kept to a minimum, although superior provenances may be more widely dispersed when experimental results indicate this is advantageous.

Using numerous attributes, plus trees are selected in phenotypically superior stands from across the province; using grid lines no more than 1 tree per 0.5 hectare is chosen. A clonal seed orchard comprises 225 selections in contrast to 350 selections for seedling orchards (jack pine and black spruce). To date, 8 000 trees have been selected, 125 ha of seedling and 4.5 ha of clonal orchards have been

established. All open-pollinated trees will be progeny tested. Provenance studies continue.

3. J. D. Simpson. Progress on improved seed production in the Maritimes.

Tree Improvement programs are in place in all three Maritime provinces. Cooperatives in New Brunswick and Nova Scotia have been effective in promoting tree improvement activities in each province. A total of 140.8 ha of seedling and clonal seed orchards for tamarack, spruce - black, Norway, red and white- and jack and white pine, has been established.

4. R.J. Calvert. Operational collection of spruce seeds in Ontario.

Seed requirements for provincial silvicultural programmes, and specifically for north-central and north-eastern Ontario, are described. Operational collection techniques are compared. Although these related to general collections, the comparative cost data and evaluation of methodologies provide information relevant to collection of improved seeds.

Session 2 - Utilization of Improved Seeds Chairman: B.S.P. Wang

5. B.S.P. Wang. Overview of utilization of improved seeds.

A greater regeneration effort, which means many more seeds, will be needed if the forest resource is to be maintained. Improved seeds are expensive and must be used with care. Seed:seedling efficiencies vary from 18% to 45% so considerable improvement in nursery production can

be obtained. Only 3% of all seeds used presently come from seed orchards, therefore seed quality must be maximized by stringent source selection, collections of mature seeds during good years only, careful processing and up-grading of seeds already in storage. Seed pretreatments to overcome dormancy and thereby stimulate the rate and uniformity of germination, the benefits of cold stratification, and the care of seeds prior to sowing are also important considerations.

6. J. Schiff. Processing and Utilization of Seed for Production of Container Stock for Reforestation in Alberta.

Seed operations in support of Alberta's Pine Ridge seedling production complex are described from seed extraction to seedling handling. Annual cone requirements are 7 000 hl of lodgepole pine and 3 000 hl of white spruce. The plant production target is 36 million bareroot and container seedlings.

7. R.A. Klapprat. Seed Efficiency in Hardwood Tree Seedling Production.

A target of 2.6 million trees, principally hard maple, soft maple, basswood, black locust and red oak, are produced by Ontario's four southern nurseries. An additional 400 000 hybrid poplar plants are raised from cuttings. Seeds are broadcast sown in greenhouse trays, and germinants are hand transplanted into Can. Am. containers. Savings in time and space have been considerable using this pregermination system. Germination under optimum conditions has resulted in higher seedling yields, very important when sowing with specialized seedlots and limited seed quantities.

8. D.A. Skeates. Improved Seed Efficiency through High Density Accelerated Production of Conifers.

The essential goal is to reforest as many productive hectares as possible with the genetically improved seeds available. Triple seeding of containers and the low seed efficiency of seedling production in open nursery beds will not achieve this goal.

Pregrowing or pregermination techniques for greenhouse production systems are discussed. Developments with the cigarette micro-container system at Maple are described with potential applications such as direct transfer to nursery beds as accelerated transplants, and for container production. Improved seed utilization is the principal advantage, but high density stocking in expensive greenhouse facilities, and the exploitation of natural conditions for large container producing, resulting in more vigorous trees, are major considerations.

UPCOMING MEETINGS

1. The WESTERN FOREST GENETICS ASSOCIATION will hold its 1984 Annual Meeting at the University of Victoria, Victoria, B.C., between August 7 and 9. Theme "Genetic Gain: incorporation and implications for forestry".

Contact:

Mr. T. Lietaer, Conference Officer,
University Extension Conference
Office,
University of Victoria, P.O. Box 1700,
Victoria, B.C., Canada V8W 2Y2.

2. The INTERNATIONAL UNION OF FOREST RESEARCH ORGANIZATIONS (IUFRO), Project Group P2.04-00 (formerly Working Party WP S2.01.06), "Seed Problems," will hold a technical symposium on "Seed quality of tropical and sub-tropical species" in Bangkok, Thailand, May 22-26, 1984. An x-ray workshop will follow the symposium. To receive further information, contact either

Dr. Suree Bhumibhamon
Faculty of Forestry
Kasetsart University
Bangkok, 9,
THAILAND

or Dr. Frank Bonner
U.S. Forest Service
P.O. Box 906,
Starkville, MS 39759
U.S.A.

3. IUFRO WP S1.05.04 -- "Production and characterization of forest plants and seed problems". Mar. 19-23, 1984, Curitiba, Brazil. Contact: Prog. Dr. J.G. de Arnjo Carniero, Universidade Federal do Parana, Rua Bom Jesus 650, Caixa Postal 2959, 80,000 Curitiba - Parana, Brazil.
4. IUFRO WP S2.01.00 -- "Trees as crop plants". July 15-21, 1984, Midlothian, Scotland. Contact: Mr. M.G.R. Cannell, Institute of Terrestrial Ecology, Bush Estate, Penicuik, Midlothian EH26 OQB, United Kingdom.
5. ASSOCIATION OF OFFICIAL SEED ANALYSTS, Annual Meeting, June 7-14, 1984, Boise, Idaho.

FRANGLAIS ANYONE? If you would like to see future issues in French, Canada's other official language, make your interests known to Ben Wang or George Edwards.

TREE SEED BIOLOGY AND TECHNOLOGY QUESTIONNAIRE

Anyone wishing to join the Tree Seed Working Group of the Canadian Tree Improvement Association is requested to return this completed questionnaire to the address shown below. You are asked to indicate your interests and areas of work so that groups of people with common concerns can be identified. Please make additional copies for colleagues who may not yet be on the mailing list; if this is not possible, additional questionnaires are available from the Editor.

Under the following headings please indicate your involvements with tree seeds (check as many boxes as you wish). Feel free to provide any additional information - use the back of the form if needed.

I. SEED BIOLOGY Please list your tree species.

1. Development of seed-producing structures
2. Sexual reproduction
3. Seed development
4. Seed morphology
5. Seed physiology
6. Seed biochemistry
7. Seed ecology
8. Seed-year periodicity
9. Seed entomology, seed pathology
10. Other (explain)

II. SEED TECHNOLOGY Please list your tree species

1. Seed certification
2. Cone analysis and yields
3. Cone harvesting
4. Cone and seed handling
5. Seed extraction and processing
6. Seed storage
7. Seed testing
8. Seed use; nursery sowing
9. Other (explain)

III. Which categories best describe you and your work (check and explain)

1. Seed-production research
2. Seed research
3. Testing and certification
4. Tree improvement
5. Seed industry
6. Seed user - direct seeding regeneration
 - container stock production
 - barer-root stock production
 - other (explain)
7. Seed procurement, seed processing

IV. Comments and suggestions (continue on back of form)

YOUR NAME:

(indicate position, e.g. Manager, Tree Improvement Specialist,
Research Scientist, etc.)

ORGANIZATION/AFFILIATION:

ADDRESS:

(include Postal Code, Zip, etc.)

TELEPHONE:

(include Area Code)

LANGUAGE: If you would prefer to communicate in French, please check box.

RETURN TO: B.S.P. Wang, Canadian Forestry Service,
Petawawa National Forestry Institute,
Chalk River, Ont.,
Canada KOJ 1J0.