Contents
Table des matières

The Canadian Botanical Association Bulletin

Bulletin de l'Association botanique du Canada

August / Août 2004 • Volume 37 No. / N° 3

New President's Message

It is an honour and a privilege to be elected the President of Canadian Botanical Association/ L' Association Botanique du Canada, and I accept this position with humility and gratitude. I thank the CBA/ABC members for their confidence in entrusting me with this position and I shall do my best to promote and enhance our discipline and the society, following on the heels of my predecessors.

First, I would like to thank Liette Vasseur for doing a tremendous job for the last 2 years. With her vision, leadership, and hard work the society has moved forward in many areas including the establishment of the Undergraduate Student awards. I would also like to thank Christine Maxwell for the excellent job as secretary of the society for the last 4 years and for kindly agreeing to stay on for another year to provide continuity from one President to the next. To Hugues Massicotte, the society is indebted for the care, concern and vigilance with which he has overseen the society finances with tremendous help from Mel Fischer. To the Directors and Section Chairs, thanks very much for all your work in representing your region and the various sub-disciplines of Botany. A special thanks to Joe Gerrath for looking after the CBA/ABC archives - a major undertaking indeed, and for maintaining the society web page.

By all standards, the annual meeting in Winnipeg was excellent and the credit goes to David Punter and the members of the organizing committee. With their hard work and care and attention to individual needs, the meeting ran very smoothly. The Scientific program was first-rate with 3 symposia, the Plenary session, the teaching panel and excellent oral and poster presentations. The social program was wonderful with the opening reception on Saturday evening, barbeque on Monday and the banquet on Tuesday evenings, and the accommodation was excellent. The after-dinner address by Jennifer Shay was most enjoyable and informative as she gave a historic account of the society. The meeting ended with a very entertaining Auction and the masterful performance by Hugues Massicotte. The society raised nearly $1,000 at the auction - an incredible feat. Thank you.... Hugues.!

On another positive note, the society now has its first two student members on the Board, Jeff Saarela from University of British Columbia and Sandra Chiovitti from Concordia University. We look forward to their active participation in and valuable contributions to the society affairs. Welcome Sandra and Jeff!

(continued on next page)

Canadian Botanical Association

Bulletin
The CBA Bulletin is issued quarterly (in theory in March, June, September, and December) and sent to all CBA members. Comments or suggestions about the Bulletin should be directed to the Editor at the address below.

Information for submitting texts
Texts and illustrations for the Bulletin should preferably be sent to the Editor as electronic documents, nevertheless any medium is acceptable. Any format for texts or illustrations are welcome. Please make sure that scanned pictures are done with a very good resolution (say 300 dpi). The pictures should be made available separately from the text. If you have any question about text submission, please contact the Editor.

For general info on CBA, go to the web site:
http://www.uoguelph.ca/botany/cba/

Association botanique du Canada

Bulletin
Le Bulletin de l'ABC paraît quatre fois par année, normalement en mars, juin, septembre et décembre. Il est envoyé à tous les membres de l'ABC. Tout commentaire concernant le bulletin est apprécié par le rédacteur.

Directives aux contributeurs
Les textes et les images sont de préférence envoyés sous forme électronique, néanmoins, tous les supports de même que tous les formats imaginables sont acceptables. Les fichiers graphiques doivent être de très bonne définition (au moins 300 dpi) et disponibles indépendamment du texte. N'hésitez pas à contacter le rédacteur pour toute information.

Infos générales sur l'ABC à l'url suivant:
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Next issue / Prochain numéro

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New President's Message *(continued from page 33)*

For those of you who were present at the Annual meeting in Winnipeg, you would have heard of the various projects that Martin Dubé has taken upon himself as Editor of the Bulletin. He has been working extremely hard and has started a project of digitizing all volumes of the Bulletin which will then be converted to pdf format and put on a CD. Nine volumes of the Bulletin have already been digitized and Martin expects to have all volumes done by the time we meet in 2005 in Edmonton. Great job.....Martin! You can look forward to buying a CD of all previous volumes of the Bulletin at a nominal price.

A special request to you all..... As you know, there is a major turnover of faculty in nearly all disciplines in Canadian universities including plant sciences. As we recruit new, young, energetic faculty with new vision, ideas, skills and approaches to botany, please make a special effort to encourage them to join the CBA/ABC and to disseminate their ground-breaking and exciting research at its meetings. This society is evolving, as it should, and welcomes new members with novel ideas to maintain its high standards and be amongst the best in the field of botany.

Vipen Sawhney, CBA/ABC President

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(continued on next page)

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Awards of the CBA Annual Meeting – 2004

Presentation texts of Liette Vasseur, past-president, during the awards ceremony.

George Lawson Medal

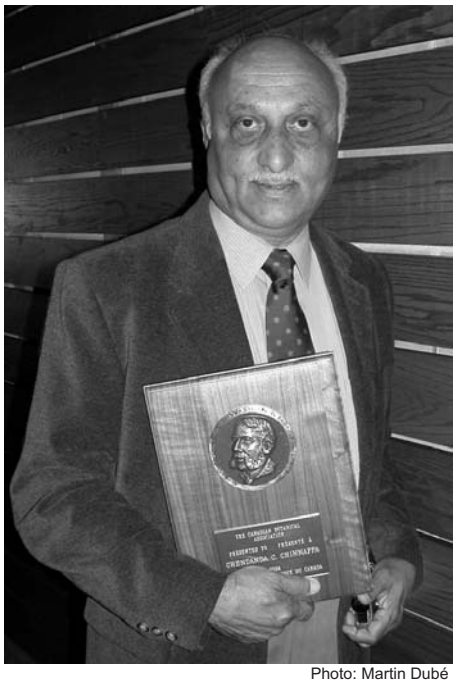


Photo: Martin Dubé

The Lawson Medal was first awarded in 1969. this is the most prestigious award of the association and was established "to provide a collective, formal expression of the admiration and respect of botanists in Canada for excellence in the contribution of an individual to Canadian Botany". It was named in honours of Dr. George Lawson who is generally regarded as Canada's first professional botanist. Lawson was born in Scotland on 1827 and attended the University of Edinburgh. He obtained his Ph.D. from the University of Giessen in Germany in 1857 and accepted an appointment as professor of Chemistry and Natural History at Queen's College (now University) in Kingston, Ontario. He was instrumental in establishing Canada's first botanical garden in 1861 and the Botanical Society of Canada which met from 1861 until 1862. in 1863, he abruptly moved from Queen's to Dalhousie where he became active with the Nova Scotia Institute of Science. He also was a founding fellow of the Royal Institute of Science. From 1885 to 1895, he was secretary of Agriculture for Nova Scotia (similar position as deputy minister). In 1891, he helped establish the short lived (1891-1910) Botanical Club of Canada and was its President until his death in 1905.

This year's award recipient has made his mark in Canadian Botany in many ways. Some extracts from the supporting letters stated: "There is absolutely no one else in Canada doing similar work and his contribution to the botanical sciences is unique. I know of few scientists who have used such a wide range of technical approaches to investigate a problem. If there is a need for a new technique, he goes for it."

Our recipient's interests and efforts have had a broad range. He has supervised the research of more than 15 graduate students as well as 15 postdoctoral fellows. Impressively productive, "he has published in several high impact journals such as Evolution, Systematic Botany, American Journal of Botany, Planta, Plant Molecular Biology, etc. He is author or co-author of over 140 refereed publications and book chapters." His research is novel and groundbreaking and he is known nationally and internationally for his work. His research has been cited highly by others in the field and he has consistently received excellent research support from NSERC. In terms of production, in western Canada, he is also well known by students and general public as the co-author of a book on the flora of Kananaskis published in 1997 by the University of Alberta and University of Calgary Press. For nearly 25 years, his work on the ecological, systematic and evolutionary aspects of Stellaria complex as well as other works of embryology of coffee, reproductive biology of Rosaceae and even on animal cytogenetics make his a great choice for this year's Lawson Medal. It is a great pleasure to ask Dr. **C.C. Chinnappa** from the University of Calgary to come to accept the 2004 Lawson Medal.

Mary Elliott Service Award

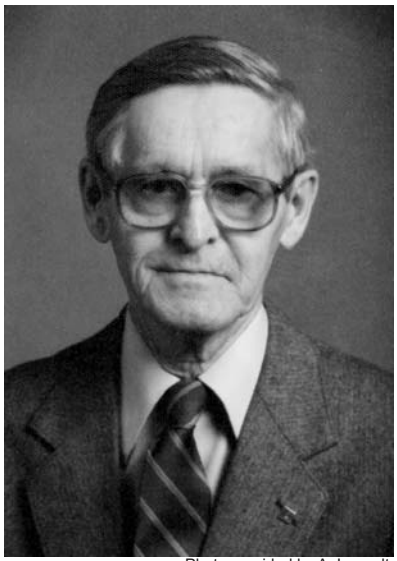


Photo provided by A. Legault

The Mary Elliott Service Award is given each year to a person who has contributed to the work of the Canadian Botanical Association. It was first awarded in 1978 in memory of M. E. Elliott who was victim of a homicide in September 1976. She has just completed four consecutive years of service on the Board of Directors (as secretary, vice president and president) and was beginning her term as past president at the time of her death. M. Elliott was a plant pathologist and mycologist who spent 28 years with Agriculture Canada. In 1975, she became Curator of the National Mycological Herbarium. She was active to identify fungi for the public and contributing to and editing (1970-71) a publication of Biosystematics Research Institute called Greenhouse-Garden-Grass.

This year's award recipient is a little special. During our nomination and selection process, we started looking back also to people who might have been forgotten but had contributed to the Associate in many significant ways. We realised that we have missed several contributors and I think the CBA will need several years to acknowledge all of those who supported and helped make this association strong and productive.

This year's award could not unfortunately make it to the meeting. His name will probably be familiar only to some of you as he mainly contributed several years ago. This year's Award is given to M. **Albert Legault**, retired professor from the Université de Sherbrooke. This is his letter which relates some facts and events of the association, quite pertinent during our 40th anniversary celebrations (exert translated from the French letter).

Photo: Martin Dubé

"Dear Liette:

This is a wonderful surprise to receive your letter from Moncton and it is a pleasure to receive the Mary Elliott Award of CBA/ABC for 2004.

In 1964, along with Bernard Boivin, Lionel Cinq-Mars and Richard Cayouette, we participated at the founding meeting of the Association. In May 1965, a more formal conference was organised by the President Dr. Ludwig and Vice-President Ernest Rouleau. At that meeting, the constitution of the association (containing 5 articles and 13 by-laws) was presented to members for amendments and adoption. A few years later, Dr. Paul Gorham then President of the Association asked a lawyer to translate the constitution in more "legal terms". This was the version that Dr. Gorham asked me to translate into French. I very much remember the challenges of translating this text with all this legal jargon!

I've always been a member of this Association even now as a retired member. I made a point of attending the annual meetings as they were great occasions to meet the botanists of all provinces of Canada such as Argus, Bassett, Brodo, Catling, Cody, McNeill, Mary Moore, Mulligan, Phipps, Jennifer Shay, Small, Margaret and Taylor Steeves, Paul Maycock and how many more.

I greatly appreciated and benefited from the field trips among those: - in 1965, the Ottawa region (with Dr. Small), - in 1966, the Rocky mountains (with Dr. Krajina), - in 1967, the Kingston region (with Dr. Beschel), - in 1976, I organised the trip to Black Lake serpentine in Thetford Mines, - in 1978, the Gros-Morne National Park (with Ernest Rouleau and André Bouchard), and - in 1981, Bruce peninsula and Hamilton's Royal Botanical Gardens.

Through these activities I've established several contacts with other taxonomists and herbarium curators leading to productive exchanges. Started in 1963, the herbarium of the Université de Sherbrooke (named the Rolland Germain herbarium (because of his personal collection) in the 1970's) grew rapidly through the contacts and the help of my undergraduate and graduate students to reach 200,000 specimens in 1986, when I retired.

I would greatly appreciate if you could accept this award on my behalf and express my regards to all members of the association.

Thank you, Albert Legault"

The Iain and Sylvia Taylor Award

This award is the newest one of the CBA/ABC and is given to a student presenting the best poster of his/her research at the Annual Meeting. This award was established in 1999 and honours the many contributions of both Iain and Sylvia Taylor to the advancement of Botany in Canada and their great and critical involvement to CBA/ABC over the years. Both of them have been very active in the association and have served on the Executive and on different committees. Their work always been appreciated by all of the members.

This year – one honourable mention was given to Ms. **Winnie Wang**, Department of Biological Sciences, University of Alberta, Edmonton, for her poster entitled "Some dark septate fungi isolated from the roots of *Populus tremuloides*" This year's winner was Mr. **Tom Hazle**, Department of Biology, University of Ottawa, for his poster entitled "Location and status of the mitochondrial *rps1* gene varies among legumes as a consequence of gene transfer."


From left to right: Vipen Shawhney, Tom Hazle, Winnie Wang, and Liette Vasseur. Photo: Martin Dubé.

John Macoun Travel Bursaries

This cash award, first presented in 1986, was established to provide partial financial assistance for travel to the CBA/ABC Annual Meeting to a student (or students) presenting a paper in the competitions (Lionel Cinq Mars or Iain and Sylvia Taylor Awards). It was named in 1988 in honour of John Macoun (who lived from 1831 to 1910). He was the official botanist of 5 major Canadian expeditions and was in 1881 appointed botanist to the Geological and Natural Survey of Canada. He was also a member of the Botanical Society of Canada and a founding member of the Royal Society of Canada. In the motions presented in 1987 by Bill Crins, "his contributions to the development of Canadian Botany through his extensive travels and collections, scholarships, and teaching, over his long career, make him an eminently appropriate namesake for our travel bursary".

This year, two travel bursaries were given to **William Hrycan** and **Shannon Croutch**, both from the University of Saskatchewan.


From left to right, Vipen Shawhney, William Hrycan, Shannon Croutch, and Liette Vasseur. Photo: Martin Dubé.

Lionel Cinq Mars Award

In 1976, the CBA/ABC established a cash award "for the best oral presentation by a student of his/her research, as a contributed paper at the Annual Meeting". In 1978, the award was named in memory of Lionel Cinq Mars (1919-1973), a charter member of CBA/ABC and a member (one of the Directors) of the first Executive (1965-66). He also served another term as a Director from 1967 to 1969.

Cinq Mars obtained a B.A. from Laval in 1940, a B.Sc. in Agronomy from the Collège d'agriculture de la Pocatière in 1944 and a M.Sc. from MacDonald College in 1949. he worked several years (1948-1962) as a plant pathologist from the federal Department of Agriculture. He was appointed professor of Botany at Laval in 1962. In 1968, he was officially appointed Curator of the Louis Marie Herbarium. He was a captivating professor and an expert field botanist, amassing a personal herbarium of about 10,000 specimens. He was considered an expert in *Viola* and *Amelanchier* genera. He led three field trips for the Montreal Botanical Congress in 1959 and headed the organizing committee for the 1970 CBA/ABC annual meeting at Laval.

From left to right: Vipen Shawhney, Tony Szumigalski, Jacquelyn Boys, Melissa Day, and Liette Vasseur. Photo: Martin Dubé.

This year, two honourable mentions were given to: Ms. **Jacquelyn Boys**, Biology Department, Concordia University for her presentation entitled "Isolation and characterization of microsatellite markers in red pine (*Pinus resinosa*), and Mr. **Tony Szumigalski**, Department of Plant Science, University of Manitoba for his presentation entitled "The functional value of increasing crop diversity in annual crops". This year's winner was Ms. **Melissa Day** from the Department of Botany, University of Manitoba for her presentation entitled "Competition between two *Frankia* strains and to fungal species in the tripartite *Frankia*/ectomycorrhizae/*Alnus rubra* mutualism."

Taylor A. Steeves Award

This award honours the many contributions of Professor Taylor Steeves to the advancement of Botany in Canada. He has made significant Contributions to our current research of plant morphology and development through his research papers and textbooks. He has served as Editor of both Canadian Journal of Botany and Botanical Gazette. As a teacher and a researcher, his displays an enthusiasm for plants and an ability to make even the most complex concepts seem simple to understand.

Gillian L. Murza with Professor Taylor Steeves. Photo: Dennis Dyck.

The Selection committee was composed of Christian Lacroix, Michael Sumner, Ed Yeung and Art Davis and the recipient of the 2004 Taylor Steeves award is **Gillian L. Murza** for the manuscript entitled "Comparative flower structure of three species of sundew (*Drosera anglica*, *D. linearis* and *D. rotundifolia*) in relation to breeding system", published in Canadian Journal of Botany.

J. Stan Rowe Award

This award honours the contribution of Professor J. Stan Rowe who was one of the first chairpersons of the Ecology Section of CBA/ABC. He contributed much to the advancement of Ecology in Canada through his initiatives to encourage Canadian plant ecologists to join CBA and to foster communication with their colleagues around the world. He is well known for his research on the relationship between land form and forest communities, and as an enthusiastic and dedicated teacher. Unfortunately, Rowe passed away this spring. His memory will always be with us.

This year, there was an honourable mention and a winner. The honourable mention went to **Gerardo Reyes** for his manuscript "Factors influencing deer browsing damage to red spruce (*Picea rubens*) seedling in coastal red spruce-balsam fir stands of southwestern Nova Scotia" published in Forest Ecology and Management and co-authored with Liette Vasseur. This year's award recipient is **Jeremy Lundholm** for his manuscript "Temporal variation in water supply controls seedling diversity in limestone pavement microcosms" published in Journal of Ecology and co-authored with Doug Larson.

Alf Erling Porsild Memorial Prize

There is no winner for this year. This prize was established in 1990 as a fund to support the award of a prize for the best paper in the fields of plant systematics and phytogeography published by a student (as senior author) during the previous year. Born in 1901 in Denmark, A.E. Porsild began his botanical career at the Danish Biological Station in Greenland. In 1925, the Canadian government hired him to conduct feasibility studies on the introduction of reindeer in the Mackenzie Delta region. In 1936, he was appointed acting chief botanist at the National Museum then chief botanist of the National Herbarium until his retirement in 1967. His research focused mainly on the northern Canada where he made extensive collection of plants and animals. He was awarded the Lawson medal in 1971. He died in Vienna in 1977.

Luella K. Weresub Memorial Award

In 1982, CBA/ABC received an endowment of $10,000 from Matilda Weresub to establish an award in memory of her sister L.K. Weresub (who lived from 1919 to 1979). She was a well known Canadian mycologist who worked at the Biosystematics Research Institute of Agriculture Canada since 1957. She was a very active member of the association serving as director form 1971 to 1973. Her story is inspiring for young students: born in Russia, she came to Canada at the age of 5. Very bright, she wan a scholarship at Queen's University at the age of 16! Due to depression and family financial difficulties, she completed only a year then worked at radio stations to finally return at Queen's to complete her degree in 1950. She obtained her M.A. in 1952 and her Ph.D. in 1957 form the University of Toronto. As a perfectionist and renowned taxonomist of fungi, she produced publications of the highest academic and linguistic standards. This award was not given for this year's annual meeting.

Stan Rowe — In Memoriam

Photo: Peter Jonker

J. Stan Rowe (1918–2004) wants everyone to love Earth because "the central ecological reality for organisms—25 million or so species—is that all are Earthlings. … An awareness of self as an ecological being, fed by water and other organisms, and as a deep-air animal living at the productive, sun-warmed interface where atmosphere meets land, brings a sense of connectedness and reverence for the abundance and vitality of sustaining Nature." (A Manifesto for Earth, 2004)

Stan passed away on April 6, 2004. Although we are deeply saddened that Earth has claimed back our friend and mentor, there is greater cause to celebrate his contributions. As a gifted speaker and writer, he has left behind a persuasive voice that will continue to beckon us all along a path to healing this planet. Thank you, Stan.

After growing up a preacher's kid at the foot of the Alberta Rockies (Granum and High River), Stan studied at the University of Manitoba and took a job as research forester with the Canadian Forestry Service. At the onset of WWII, he asserted himself as a conscientious objector—his first brush with prevailing laws that resulted in "time to reflect in isolation." The war over, he pursued M.Sc. and Ph.D. degrees and then accepted, in 1967, a position as Professor of Crop Science and Plant Ecology with the University of Saskatchewan; he remained here until his retirement in 1985.

In the early 1990's, Stan moved to New Denver, BC where he lived out his remaining years in the embrace of largely unspoiled mountains and a vibrant community of wilderness activists. Here, leading a march to protest forest clear-cutting and support water conservation, Stan again demonstrated his readiness to sacrifice short-term personal comfort for the long-term wellbeing of Earth. He played his guitar, and with Katherine joined a local choir that regularly played and lead sing-alongs at the senior's lodge.

Stan was easy to befriend, ever so cautious to render judgements, and always attuned to whatever humour might be drawn from the present moment. In New Denver his was a life of obvious simplicity, his office a converted car garage furnished with little more than his books, a computer, and a virtual, international network of email friends and colleagues.

Throughout life, Stan published prolifically. His best known book Home Place: Essays on Ecology (NeWest Books, Edmonton, 1990 and reissued 2002) will endure alongside the writings of the world's other great environmentalists. A sequel titled Earth Alive was completed over a year ago and is eagerly anticipated. Stan also authored the book, Forest Regions of Canada (Queen's Printer, Ottawa, 1959) and published numerous articles. For a collection of Stan's essays see:

In recognition of Stan's enormous contributions to the field of ecology and to the CBA/ABC, the society established the "J. Stan Rowe award" in his honor to be presented annually for the best paper in ecology published by a student at a Canadian University.

Stan. . .. thank you for everything and farewell.

Peter Jonker
University of Saskatchewan

CBA / ABC Meeting 2004

Our CBA Heritage

Banquet Address given on July 29th
at the University of Manitoba, Winnipeg.

by Jennifer Shay

O. C., PhD, Prof. Emerita, University of Manitoba

My role this evening is to introduce to some of you, and remind others, of the background of the CBA, because we have a truly remarkable heritage.

I want to thank for their assistance in assembling this talk, Joe Gerrath, John Stewart, Tom Shay, Patricia Roberts Pichette, Dianne Fahselt. David Punter, Roy Taylor and Iain Taylor.

I'll first outline the events that preceded the founding of the CBA and say a little about its committees and awards. Then I will share a few memories of past meetings before delving into a brief history of botanical exploration in Canada.

In the early 1960's, the Royal Society of Canada asked a committee to look at the role of plant science in Canada. The committee's report advocated the formation of a botanical association. Accordingly, in March 1964, Dr. Paul Gorham, the Chairman of the Plant Biology Division of the Royal Society, organized a meeting in Ottawa of botanists to consider the formation of a Canadian botanical organization. Thirty five people attended (13 from outside Ottawa) and many others expressed regrets.

Some of the points raised were:
- Dr. Cook (Director of NRC Division of Applied Biology) felt that there was a need for an overall organization to speak for the life sciences.
- Dr. Gorham emphasized that any new organization should take into account existing botanical societies. Those with no organization were mainly in the areas of taxonomy, ecology and mycology, perhaps 200 individuals.
- Dr. Coupland, University of Saskatchewan, wrote with strong support and urged speedy action because the Ecological Society of America was proposing a Canadian section.

Many other supportive comments were expressed. The meeting appointed a Provisional Committee from a variety of disciplines to canvas potential members :

Chairman	Dr. Tony Ludwig (Plant Research Institute Ottawa)
Vice Chair	Dr. Jean R. Beaudry (Univ. Montreal, cytotaxonomist)
Secretary	Dr. Roy L. Taylor (Plant Research Institute, systematist)
Members	Dr. Norman W. Radforth (McMaster University, paleobotanist)
	Dr. Chris J. Hickman (University of Western Ontario, mycologist)
	Dr. Robert T. Coupland (University of Saskatchewan, ecologist)
	Dr. Paul R. Gorham (NRC, physiologist)

A possible name was discussed. Should it be plant science or botany? Plans were made to meet at Queens University, Kingston, in June 1964, together with the Canadian Society of Plant Physiologists (CSPP).

Meeting at Queens University June 1964 (At the Queens meeting, rooms were $4.50 per day!)

The Provisional Committee's proposals were:
-to form a national organization of Canadian botanists to parallel the Canadian Society of Plant Physiologists and the Canadian Phytopathological Society. It was hoped that eventually, ecologists, taxonomists and mycologists would form their own societies.

Among the responsibilities of the new organization would be:
- to provide a forum for the presentation and discussion of research findings,
- to support a suitable medium for the publication of research results (initially, to support existing journals, such as the Canadian Journal of Botany)
- to publish a bulletin/newsletter to bring matters of mutual interest to the attention of all Canadian botanists,
- to promote high standards of botanical training in Canadian universities and the support of botany by university administrators
- To encourage a balanced program of botanical research
- to promote an interest in botany and
- to provide a unified voice for botanists in matters of common interest such as financial support for botanical training and research.
- a fee of $2 a year was proposed.
- an Executive Committee to serve until the 1965 meeting was elected.

An Advisory Council was suggested to provide a sounding board for botanical opinion across Canada, with regional, disciplinary and institutional representatives, plus members at large from across the country, including nominees from existing national botanical societies.

At the Queens meeting, there was an all-day discussion of the proposal which was supported by all attendees. A motion to "form an interim organization for botanists without a national organization" was passed. This organization would join with the CSPP and Can. Phytopathological Soc. to form an umbrella organization.

The role of sections or subject areas was discussed by;

Dr. J. Maini	Forestry
Dr. J. Terasmae	Palynology
Dr. R. T. Coupland	Ecology
Dr. J. W. Groves	Mycology
Dr. R. F. Scagel	Algology
Dr. R. E. Beschel	Taxonomy of Higher Plants

55 members paid the provisional membership fee of $2. The group planned a founding meeting for Carleton U., Ottawa in 1965, to include one day of scientific deliberations, a one-day field trip and a half-day business meeting. The Organizing Committee for the Carleton meeting included.

Chair	R. A. Ludwig
Secretary	R. L. Taylor
Treasurer	W. J. Cody
Committee	N. W. Radforth, C. J. Hickman, R. T. Coupland, P. R. Gorham, L. Cinq Mars, and E. Rouleau.

Next day, I presume for some light relief, six carloads of botanists enjoyed a field trip, led by Dr. R. Beschel and participants attended the banquet honouring Dr. D. L. Bailey, the retiring editor of the Canadian Journal of Botany.

Founding meeting May 26-28 1965 of the Canadian Botanical Association at Carleton University, Ottawa. 179 delegates registered. Some of those present at that time are here today. There were pre-meeting field trips.

The main business was to review the proposed constitution and to consider the need for Sections. Financial support had been received from NRC $2,500, and The Royal Society $500. These monies enabled travel grants to be given to some participants and to publish, by the University of Toronto Press, the meeting's colloquium on ''The Evolution of Canada's Flora". A sixth section, General, was proposed and accepted.

The Sections met and appointed committees. Discussions between the Executive and Sections were to take place throughout the year and the question of whether Sections were necessary, would be frankly discussed, and be formally accepted or rejected at the first annual meeting. The draft constitution was accepted and officers were elected.

February 1966:

Dr. Ludwig, who played a key role in forming the CBA, wrote to botanists across the country. More than 250 joined the CBA. The next meeting, in Vancouver, was to be a joint meeting with the CSPP. Thus, the CBA emerged from a Royal Society report and several preliminary meetings due to the dedication and hard work of a small group of botanists.

It had been successfully launched!

The aims of the CBA have changed very little in the 40 years since it was founded. It still provides an annual meeting for all botanists where they can present papers, attend symposia and go on field trips. In this context, the membership and active participation of botany graduate students is strongly encouraged.

The meeting of individuals and exchange of ideas, in the lecture room and elsewhere, brings together scientists from various institutions, from provincial and federal labs, from universities and industry, all with a common interest.

From the outset, the CBA has had a number of Sections reflecting the main areas of botany. The Sections have changed a little over the years and today include Ecology, Mycology, Systematics and Phytogeography, Structure and Development, and Teaching (the latter replaced the General section in 1998). Details about the Sections were published in the October 2003 Newsletter.

Committees

At present, the CBA has six standing committees:
- Nominating
- Membership
- Science Policy (this was established in 1986, to advise the Association on matters of science policy at the Federal and Provincial levels, as they affect the activities of botanists in Canada),
- Awards
- Development, established in 1991, whose role is to try to increase the membership and to raise funds for student bursaries. It complements the work of the Membership committee.
- Last but not least, the Conservation committee.

I'll focus upon the Conservation committee for a few moments. Founded in 1980, it advises the Board on conservation matters. There is a contact person in each region.

The Conservation committee became very active in the mid 1980's under the leadership of Dianne Fahselt. Among other things, Dianne represented the CBA on the steering committee of the Carolinian Canada project, in identifying and protecting critical Carolinian sites. The Conservation Committee had a representative on the Canadian Council on Ecological Areas, and was involved in evaluating grant applications submitted to the World Wildlife Fund. Innumerable letters were written on behalf of CBA giving advice, promoting conservation, and supporting other conservation agencies. For example, the CBA protested cutbacks in the Canadian Wildlife Service that would curtail the study of environmental problems, and wrote letters opposing the construction of highways through sensitive wetland complexes. It supported the establishment of ecological areas throughout the country and prepared lists of botanically-interesting sites. Letters were also written congratulating agencies that made sound conservation decisions.

In 1984, the committee received a grant of $15,000 from the Ontario Heritage Foundation for the study of savannas in Ontario . Site inventories and a report urging the protection of this important ecosystem were prepared.

In 1986, the committee wrote three position papers on:
1. Transplantation as a means of preservation
2. Gardening with wild flowers
3. Re-introduction to increase vegetational cover and native species.

These position papers were very well received. The one on transplantation was later published in the newsletters of the Canadian Council on Ecological Areas and the Plant Conservation Program. It also appeared in Clintonia and in the Natural Areas Journal. Articles relating to botanically-significant areas were also contributed to journals such as the Canadian Field Naturalist.

I hope that this gives you a flavour of some of the activities of the Conservation committee.

Now for a few words about the awards the Association gives

Lawson Medal

In 1969, the CBA established the George Lawson medal in honour of Canada's earliest distinguished botanist. George Lawson was born in 1827 in Scotland. He obtained his PhD in Germany in 1857, and soon became Professor of Chemistry and Natural History at Queens College, (now University) in Kingston, Ontario. In 1860, he helped found the Botanical Society of Canada, which unfortunately lasted for only two years. He also established Canada's first botanical garden in 1861. The following year he moved to Dalhousie. Among his other roles, he was a founding member of the Royal Society of Canada. From 1885-95, he was Secretary of Agriculture for Nova Scotia and helped establish the Botanical Club of Canada which survived from 1891 to 1910. He was its president until his death in 1895. He clearly was interested in uniting botanists across the country.

The award is a formal expression of the contribution of an individual to Canadian botany either for:
1. a single outstanding contribution to botanical knowledge by a Canadian botanist at any stage in their career, or
2. a lifetime contribution to Canadian botany by a senior

researcher.

More than 45 botanists have been honoured by receiving this award.

Mary Elliott Service Award

This is given to an individual for meritorious service to the CBA. It was first awarded in 1978 in memory of Mary Elliott who was a victim of homicide in September, 1976. She had just completed four years on the CBA board, as Secretary, Vice President and President at the time of her death.

Mary was a plant pathologist and mycologist who spent 28 years with Agriculture Canada at the Central Experimental Farm in Ottawa. In 1975, she became Curator of the National Mycological Herbarium. She was also very active in identifying specimens for the public. There have been more than 20 recipients of this award.

Several other awards are given by the Association:

The Lionel Cinq-Mars Award

In 1976, the CBA established a cash award for the best student oral presentation of their research as a contributed paper at the Annual General Meeting (AGM).

Dr. Cinq-Mars (1919-73), who helped found the CBA, worked as a plant pathologist with the Federal Department of Agriculture before becoming Professor of Botany as Laval in 1962. He was an expert field botanist, amassing a personal herbarium of over 10,000 sheets.

The John Macoun Travel Bursary

This cash award, first presented in 1986, was established to provide assistance for travel to the AGM to a student presenting a paper in the Cinq-Mars competition.

John Macoun was the official botanist on five major Canadian expeditions. In 1881, he was appointed botanist to the Geological and Natural History Survey of Canada. He was a member of the Botanical Club (1860-62) and a founding fellow of the Royal Society of Canada. His contributions to the development of Canadian botany through his extensive travels, scholarship and teaching make him an appropriate namesake for the travel bursary.

The Luella Weresub Memorial Award

In 1982, the CBA received an endowment of $10,000 from Matilda Weresub to establish an award in memory of her sister. Luella (1919-79), a mycologist at the Biosystematics Research Institute of Agriculture Canada, was an active member of CBA. She came to Canada from Russia when she was five, and at 16, won a scholarship to Queens University. She only completed one year because of her family's financial difficulties during the depression. For several years, she worked at radio stations but returned to Queens for her degree in 1950, and went on to the University of Toronto for her MSc and PhD. She was well-known for her knowledge of fungal nomenclature, serving on American and International Nomenclatural committees.

The award goes to the graduate student in mycology who publishes the best paper in the current year.

The Alf Erling Porsild Memorial Prize

In 1990, the CBA established a fund to support a prize for the best paper in the fields of plant systematics and/or phytogeography, published by a student in the previous year. Porsild (1901-1977), began his career in his native Denmark. In 1925, the Canadian government hired him to conduct feasibility studies on the introduction of reindeer into the Mackenzie Delta. In 1936, he was appointed Acting Chief Botanist at the National Museum and became Chief in 1946, where he remained until he retired in 1967. He made extensive collections of northern plants and published many important papers.

The Taylor A. Steeves Award

This annual award was established in 1995 to honour the many faceted contributions of Taylor Steeves to the advancement of botany in Canada. Dr. Steeves had a significant input to our understanding of plant morphology and development through research papers and text books. He was the editor of both the Canadian Journal of Botany and the Botanical Gazette. As a teacher and researcher he displays an enthusiasm for plants and an ability to make complex concepts understandable. The award symbolizes these attributes. It is awarded for the best student paper in plant structure and development

The Stan Rowe Ecology Award

Stan Rowe's first degree was from the University of Alberta, his Master's degree in plant ecology was at the University of Nebraska and he followed this with a PhD at the University of Manitoba. He joined the Canadian Forest Service in 1948 and came under the influence of Angus Hills and the inter-relationship of land form and forest communities. He later joined the faculty at the University of Saskatchewan where he was an enthusiastic and dedicated teacher. Stan was a fine field ecologist and an environmental ethecist. The CBA is honoured to have this annual award in his name. It is given to the student with the best paper in ecology at the annual meeting and was first awarded in 1996.

Those of us who knew Stan mourn his recent death.

Iain and Sylvia Taylor Award

This award is given for the best student poster at the CBA Annual Meeting. It was established to honour Iain and Sylvia Taylor for their sustained support of botany and the aims and objectives of the CBA. Iain and Sylvia each served as secretary for the CBA for four consecutive years, and Iain was the President in 1985-86. This award was established in 2000.

Anecdotes

When the last CBA meeting was in Winnipeg, I was the local chairperson. We met jointly with the Genetics Society and the Canadian Tree Improvement Association. The usual flurry of last minute things-to-do was successfully accomplished, the meeting room for the opening session was checked and so on, and I thought that we could all enjoy the wine and cheese reception. When I arrived at the reception, some time later than many eager botanists, I was horrified to see that there were no knives. People were attempting to slice the cheeses with wine glasses! This problem was soon overcome and, judging by the volume of conversation, everyone enjoyed the rest of the evening.

Next morning, feeling somewhat apprehensive I arrived in good time to chair the Opening Session and went to the allotted room, the room I'd checked the night before, only to find it empty. No chairs, no projector - a completely empty room. Panic! The building manager's office was tucked away on the 5th floor. I rushed up there and fortunately found its occupant calmly printing out a "change of venue" notice. Apparently, the staff had not realized that the original meeting room would become part of the room needed for the Awards luncheon at noon that day, so they had moved the chairs and equipment to another large room nearby. Such little incidents certainly make the adrenaline flow.

At that meeting we had an Awards luncheon instead of a banquet because we had organized an evening cruise in the Paddlewheel

Queen on the Red River. It was a beautifully mild evening with food and beverages savored as we floated along. But when we eventually disembarked one of the seats in the bus was empty. No one could recall anyone falling overboard, but the absence of one of our number caused considerable consternation. A careful search of the boat was organized. It revealed a botanist asleep beneath a lifeboat!

The next incident is one all who were present well remember. Patricia Roberts Pichett and her son Marc, aged 9, were with us on a field trip in Gros Morne National Park in 1976. By about 4.0pm, we were at a well-known lookout. Young Marc asked his mother if he could go back to the parking lot. She agreed, as we would not be far behind and off he went, but when we arrived at the parking lot Marc was nowhere to be seen. Patricia hastily retraced her steps, someone contacted the Park Ranger and within a short time, a helicopter and a boat had been dispatched to the area. Patricia found there was another muddy trail near the one we had traversed and followed Marc's footprints till they disappeared. She could hear Marc calling but the wind was so strong he could not hear her. She then met the Park Ranger and together they slowly searched the path to the lookout, the Ranger apparently regaled Patricia with how children when lost often took of their jackets and curled up under a bush to sleep, and how they had rescued some climbers a few weeks earlier, and of others who had not been so fortunate. About 9 PM, Just as they were about to enter a second set of woods, Marc appeared, still wearing his jacket. The relief as he ran into his Mother's arms! His one regret was that he had neither been found by a sniffer dog nor had a ride in a helicopter. He thought he had taken a shortcut.

The CBA's first return to Carleton University was in 1979, when I was the president. That meeting is indelibly etched in my subconscious. Professor Walter Lewis, of medicinal plant fame, was the keynote speaker and his wife Memory was the speaker for the banquet. Upon arrival at the residence we registered and went to our bedroom. Once installed, I decided to have a shower. I undressed, opened the bathroom door and came face to face with a naked male. My retreat was rapid. We did not know that bathrooms were shared between adjacent rooms. The next morning I realized that my introduction to Dr. Lewis had been, to put it mildly, unconventional.

For the banquet, the local committee had arranged two items of entertainment to precede the meal. The first was a very long program, put on by a local group of hand bell ringers. The second was a 1940's type of musical show that no one seemed to find amusing. It went on and on. We did eventually get to the meal. But by the time coffee was served, people had been sitting for a long time and a short bathroom break before the talk seemed like a good idea. What a mistake that was! After the break, only a few dedicated souls returned. The bar was obviously more appealing. Our long-suffering guest speaker was introduced, she told one joke and declared that it was clear that members of the CBA had interests other than listening to her and sat down! After this embarrassment, Tom and I spent a long time apologizing and plying Walter and Memory Lewis's with scotch.

Roy Taylor kindly reminded me of the one meeting he thought most interestingly staged. It was at Lakehead University in 1986. The local committee had decorated the banquet hall with a wonderful array of local trees and bushes, from which bird song recordings issued forth. He remembers it as a great meeting with the spirit of discovery and enthusiasm at its best.

CBA field trips have always been an important ingredient of our annual meetings. Some occur several days before the main sessions, others after. Both require the participants to arrive early or to stay late. Much to our dismay the post-conference field trip in 1988 in Victoria was canceled. Six of us were quite dismayed because our flight plans had been fixed. We eventually located the leader and persuaded him to put on the trip despite the small numbers We had an absolutely wonderful time. This also happened before the meeting in Edmonton in 1991. Field trip leaders are dedicated souls.

At a relatively recent CBA meeting, one of Canada's foremost field botanists offered to lead a field trip to one of his old haunts. A small group had signed up for the trip and we sallied forth. Soon we reached the forest we were to explore. The car was parked and we scrambled into the trees, having some difficulty in keeping up with our intrepid leader. Although it was a cloudy, dull day we saw much that was new to us all and we had an interesting discussion about forest succession during a short lunch break. Then off we went again, over bush, over briar Shakespeare would have said.

At the time we thought we should be back at the car, somewhat to our surprise, we seemed to be nearing a place we had passed some time before. Yes, much to the embarrassment of our esteemed leader, he had to confess that he didn't know where we were. We were lost! It was eventually decided that we should follow a compass bearing, and at least exit from the forest. This we did, and when we at last we emerged we could just detect a small black object a mile or so up the road. We hoped it was the car, and to our relief that proved to be the case. We even got back to town in time for the banquet.

A Brief History of Botanical Exploration in Canada.

In the sixteenth century, "European botanists were fascinated by the plants being discovered by early travelers to the Americas. Although a few native American plants (potato, tobacco, maize and Jerusalem artichoke) were illustrated in Gerald's herbal of 1597, the truly valuable American plants were still unknown.

Travelers have been collecting plants in Canada since the early 1600s. The explorer and apothecary Samuel de Champlain (1567-1635) took special interest in the settlement of the St. Lawrence valley. In 1610, he established a garden at Port Royal, now Annapolis Royal, in Nova Scotia. where he grew several N. American and European plants. At that time, plants were often grown in 'holding gardens' until they could be sent safely back to France.

Peter Kalm (1715-1779), who had studied with Linnaeus, traveled to Canada in 1749 and when he left in 1750, he was heavily laden with all kinds of plants, not only those of interest to the gardener or physician.

In London, in the mid-1700s, the Linnaean system of classification was being widely adopted. From southeastern Canada, and elsewhere, plants suspected of being new, were sent to Europe in the hopes that they would be named by the great Linnaeus.

Younger men were entering the field, foremost was Sir Joseph Banks (1743-1820). In 1766, he sailed to Newfoundland and Labrador, where he made numerous collections. He later traveled to Australia and made the botanical discoveries that were to earn him lasting fame. He was the unpaid Director of Kew Gardens from 1772 until his death in 1820, and President of the Royal Society for 42 years.

In the late 1700s, Andre Michaux (1746-1802) and his son Francois (1770-1855) began their explorations of temperate N. America, and in 1803, published Flore Boreali-Americana in two volumes, with the help of Louis Claude Richard. The flora was based upon first-hand observations and careful comparison of their specimens with those of others previously named. At last, temperate N. America had an account of its native plants which gave precise habitat information . It used de Candole's classification--a modification of the Linnaean and Jussieu methods.

It was about this time that Gilbert White, an English country parson, keen naturalist and prolific correspondent wrote his now famous

letters and I quote from one written to the zoologist Pennant on June 2nd 1778. In it Gilbert White addresses the popular reputation of botany as being merely plant collection and classification. He wrote: '*The standing objection to botany has always been, that it is a pursuit that amuses the fancy and exercises the memory, without improving the mind or advancing any real knowledge; and where the science is carried no further than a mere systematic classification, the charge is but too true. He goes on to say, that the botanist who wishes to wipe out this aspersion, should study the laws of vegetation, should promote cultivation and graft the gardener, the planter and the husbandman on the botanist. Vegetation is highly worthy of attention and produces many of the greatest comforts of life. To plants we owe timber, bread, beer, honey, wine, oil, linen, cotton etc.*' (this was written in 1778).

During the early 19th century, several botanists had made significant collections in Canada. William Hooker (1785-1865) focused his Flora Boreali Americana (1833-40) upon British-dominated parts of the continent. It was based upon extensive field studies, such as those by David Douglas (1799-1834)(- of Douglas Fir fame) , Others collectors were Dr. John Richardson (1787-1865), and Thomas Drummond(1780-1835), both with the second Franklin Land Expedition to the Polar Sea (1825-1827).

Later, John Jeffrey (1826-54) arrived at York Factory in 1850 and worked westwards to BC, collecting for botanical gardens in Scotland. Eugene Bourgeau (1813-77) collected some 60,000 specimens from the Great Lakes to the Rocky Mountains over a two year period (1857-59) with backing from the Royal Geographical Society.

In 1858 George Lawson came to Canada and soon established the Botanical Society of Canada. He was an inspiration for amateur botanists and encouraged them to publish their observations. One such amateur was the Abbe Provancher (1820-92) who published Flore Canadienne in 1862. It treated mainly eastern Canada. and was replete with clear, detailed scientific descriptions and illustrated with line drawings.

Canada's foremost collector John Macoun (1831-1920) began collecting in 1869 and continued to do so until his death in 1920. He collected thousands of specimens throughout Canada, summarized in his Catalogue of Canadian Plants, published between 1883 and 1902. His collections formed the basis of the Dominion Herbarium in Ottawa. John and his son James explored widely throughout much of western Canada.

Another important collector in eastern Canada was Frere Marie Victorin (1885-1944) In 1920 he established the Institut Botanique at the University of Montreal, and the Jardin Botanique de Montreal in 1931. His Flore Laurentienne was published in 1935.

As the northern part of the continent became accessible, botanists moved in. Hugh Raup (1901) of the Arnold Arboretum, with support from the National Museum of Canada, collected in the Northwest Territories and along the Alaska highway.

Malte Oskar Malte (1880-1933), an agrostologist, moved to the National Museum in 1920, he concentrated on the flora of prairies as well as boreal and arctic plants.

Morton Porsild was then active in Greenland. His son Alf Erling Porsild (1901-1977) joined the National Herbarium of Canada in 1936 and was there until 1966. He reported on collections for the Flora of the Canadian Arctic. Nicholas Polunin (1909-1991) covered the eastern Canadian arctic.

In the mid 1960's F. H. Montgomery saw the need for an up-dated national flora and carefully organized 1500 plants, keying them to genus and species in his 'Plants from Sea to Sea', which was illustrated with 870 line drawings. It was useful for both amateurs and professionals.

Today, many floras describe the plants of Canada, from H J Scoggan's four volumes of the Flora of Canada (1978-79), to works for each province and territory, as well as more narrowly-based studies of interesting localities.

This is only a brief sketch of the background to the botanical exploration in Canada. The growth of university-based botany increased substantially in the 1950's and 1960s. Which brings us back to the origins of the CBA. I hope that you noticed that three of the CBA awards bear the names of men who were great botanists.

Finale

I won't pretend that this is either a balanced or a complete view of the background of the CBA, but it does enable us to review the aims and objectives of our Association, which I think you will agree, were set forth in considerable detail by the founding fathers 40 years ago. That the CBA has survived for 40 years is a cause for celebration, particularly when we reflect upon the short lives of its two predecessors. The accomplishments of the scientists whose names grace our awards is a cause for celebration, as is the influence that recommendations of the Association have had locally and nationally.

Decisions such as the protocol to meet in different provinces and in so doing to promote botany, and in championing the preservation of botanically significant areas. And the most recent resolutions passed at the last AGM . These related to invasive species, one supported the efforts of the Botanical Conservation Network in establishing a list of invasive species that can cause risks to natural biodiversity, while another emphasized the need to develop an information network on invasive species in order to better understand their distribution, ecology and impacts on our natural ecosystems.

But what of the future ? Will botany survive as the boundaries in the life sciences become blurred, under, as some call it the juggernaut of molecular biology ? As it becomes more expensive to attend meetings in different parts of this vast country will subject- focused meetings continue to attract specialists at the expense of the CBA? As an association, there is much to ponder. In closing I offer:

The uses of botany

There should be no monotony,
In studying your botany,
It helps to train and spur the brain,
Unless you haven't got any.

It teaches you, does botany,
To know the plants and spot any,
And learn just why they live and die,
In case you plant or pot any.

You learn from reading botany
Or woody plants and cottony,
That grow on earth and what they're worth
And why some spots have not any.

You sketch the plants in botany,
You learn to chart and plot any
Like corn or oats, you jot down notes
If you know how to jot any.

Your time if you'll allot any
Will teach you how and what any
Odd plant or tree can do or be,
And what's the use of botany

(Berton Barley, Science Newsletter 3/9/29)

Poorly Known Economic Plants of Canada - 42. Wild rice (*Zizania aquatica* L. and *Z. palustris* L.)

E. Small and P.M. Catling

National Environmental Program, Biodiversity Section, Agriculture and Agri-Food Canada, Saunders Bldg., Central Experimental Farm, Ottawa ON K1A 0C6

Cereals are grasses that furnish grain for human consumption. These include wheat, rice, corn (maize), barley, sorghum, millets, oat, and rye, and they furnish an astonishing 80% of energy (calories) consumed by humans. The grain from only three of these—wheat, rice, and corn—accounts for about 60% of the calories and 56% of the protein that humans consume directly from plants. Obviously cereal grasses are particularly well suited to being developed as food plants. One of the most exciting new cultivated cereals is wild rice. A northern variety with long and thick grains is the most important commercially. Its genetic resources occur in northern North America, placing Canada in an ideal position to lead in the continuing development of this extraordinarily promising crop, the only native Canadian cereal.

Latin Names

The genus name *Zizania* is derived from a Greek name for a wild grain, not the plants currently included. The epithet *palustris* in the name *Z. palustris* is Latin for swampy or marshy. Similarly, the epithet *aquatica* refers to an aquatic habitat.

English Names

Z. aquatica L.
- *Z. aquatica* var. *aquatica* - southern wild rice (southern zizania)
- *Z. aquatica* var. *brevis* Fassett - estuarine wild rice (estuarine zizania)

Z. palustris L.
- *Z. palustris* var. *palustris* L. - northern wild rice (northern zizania)
- *Z. palustris* var. *interior* (Fassett) Dore - interior wild rice (interior zizania)

The name “wild rice” was coined by analogy when European explorers observed that like common rice (*Oryza sativa* L.) wild rice was a cereal growing in water. The “wild” part of the name is problematical, given that this word can mean 1, undomesticated (not genetically altered by humans) and 2, growing outside of cultivation (either never altered by humans or altered by humans but escaped from cultivation, and perhaps having re-evolved some adaptations for living outside of cultivation). In the genus *Oryza* there are taxa that are “wild” in these senses, and they are called “wild rice.” Indeed, use of the name “wild rice” in scientific articles is often only clear when the genus name is specified. Today there are strains of *Zizania* that are both cultivated and domesticated, so that the name wild rice is no longer as appropriate as in the past. W.G. Dore (1912–1996), who specialized on wild rice, used a hyphen (“wild-rice”) to designate *Zizania*, but this practice has generally not been followed. Occasionally “wildrice” is used for *Zizania*. In the past, “wild rice” was an entirely appropriate name for *Zizania* taxa, since the plants were entirely undomesticated and uncultivated. Obsolete names for wild rice include American rice, blackbird oat(s), Canada rice, Canadian rice, Indian rice (a name also applied to *Oryza sativa* grown in India), false oat(s), manomin (an Ojibwa word that has been interpreted as “good berry,” but see below for additional information), squaw rice, Tuscarora, water oat(s), and zizania.

French Names

Z. aquatica L.
- *Z. aquatica* var. *aquatica* - zizanie aquatique du sud, riz sauvage du sud
- *Z. aquatica* var. *brevis* Fassett - zizanie aquatique estuarienne, riz sauvage estuarien

Z. palustris L.
- *Z. palustris* var. *palustris* L. - zizanie des marais du nord, riz sauvage du nord
- *Z. palustris* var. *interior* (Fassett) Dore - zizanie aquatique de l’intérieur, riz sauvage de l’intérieur

Folle avoine (“crazy oat,” also the plural, folles avoines) was a name used for wild rice by early French explorers.

Morphology

Canadian wild rice species begin their life cycle when the ripe grain (two or more times the length of the long grain of common rice), with the enclosing floral bracts (lemma and palea) firmly attached, falls from the parent plant and sinks into the watery habitat of the plant. It is essential for the seeds to fall in water if they are to survive, since desiccation quickly kills the embryo, which requires moist, cool conditions to overwinter successfully. The awn (on the lemma) of the grain acts like a rudder in guiding the seed to the bottom of the water. The base of the grain is heavy, helping to stabilize it against water currents, and preventing much movement into deeper water away from the parent plant, where the habitat is unlikely to be suitable. Barbs or bristles on the lemma and its awn help the kernel to anchor into the substrate. In time the grain becomes buried, to pass the winter protected. In the spring germination begins with the production of a single root and a thin, ribbon-like, submersed leaf. Eventually a tuft of ribbon-like leaves is formed, with the upper ends of these floating on the water surface (Figure 1).In early summer, a month or so following germination, the stem elongates, extending out of the water. The juvenile aquatic foliage then deteriorates and upright leaves are produced. In mid-summer the inflorescence of the plant develops. The fruit matures by fall, with ripening starting at the tips of the branches. In a large rice bed, ripening extends over a period of about 2 weeks, with mature fruit in wild variants falling at the slightest disturbance.

Fig. 1. Juvenile floating-leaved phase of Zizania palustris *var.* palustris. *Note long, floating, ribbon-like leaves, aligned by the current. (Photographed by W.G. Dore, Rideau River near Manotick, Ontario, 10 May 1955.)*

Wild rice varies in height from 30 cm to 5 m, depending on variety and conditions of growth. A fibrous spreading root system at the basal nodes of the plant anchors it to the substrate. In deep water or soft ooze, roots may appear at upper nodes, much like the prop roots of corn. Four to six leaves are present, and these are usually 1-5 cm wide, and up to 65 cm long. The nodes are densely felted with very small hairs. The leaf sheaths are more or less continuous between the nodes. The midrib of the leaf blade is often nearer to one margin than the other. The stem is hollow except at the nodes. Transverse, parchment-like diaphragms partition the stem into water-tight chambers. Sometimes the plants tiller, with clusters of stalks produced. The inflorescence is a panicle with spreading lower male branches and less spreading upper female branches. Grass flowers are typically subtended by scales called glumes, but these are reduced to a rudimentary ring in *Zizania*. Instead of sepals and petals, grass flowers have two scales, a lemma and a palea. The lemma of each *Zizania* floret often has a long, rough bristle (awn) at the tip, but the palea is unawned. The male florets are 5-17 mm long (excluding awns), and are yellow, greenish, pink, or occasionally dark red. They hang down on threadlike stalks. Six stamens are present—a unique number in Canadian native grasses—and they have bright yellow anthers. The female florets are 5–33 mm long (excluding awns), and they are held erect on short, firm stalks. Maturing grains turn olive brown, and finally dark brown or black. The fruits (caryopses) are 6-30 mm in length. Wild rice grains are longer and darker than common (Asian) rice (Figure 2).

Classification and Geography

The genus *Zizania* has four species. *Zizania palustris* ranges from northeastern North America west through the Great Lakes to south central Canada, and is the predominant species harvested for wild rice. *Zizania aquatica* occurs on the Atlantic coastal plain from central Florida to northeastern North America. Texas wild rice (*Z. texana* Hitchcock) is a very rare, endangered, endemic species known only from Hays County, Texas. Manchurian wild rice (*Z. latifolia* (Griseb.) Turcz. ex Stapf.) is native to and cultivated in Asia, as a vegetable (see below) and for forage. The latter two species are stoloniferous perennials, while the two Canadian species are annuals. The North American species have the male and female flowers on separate branches, but the Manchurian wild rice has them on the same branch.

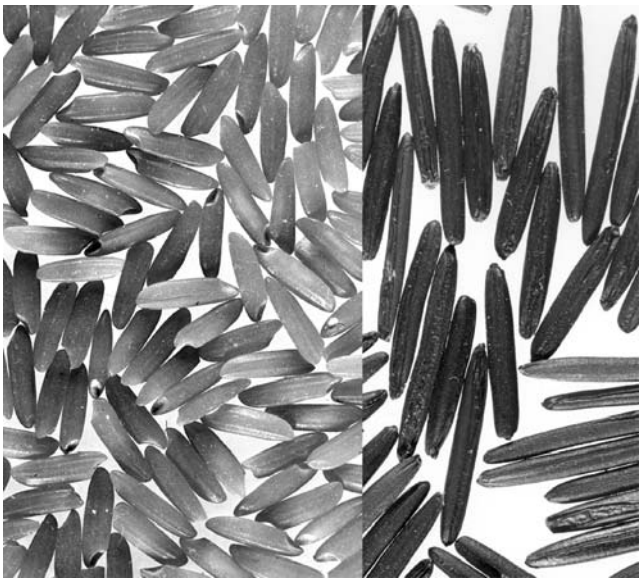


*Fig. 2. Hulled grains of rice and wild rice, at same scale. Left, long-grain variety of rice (*Oryza sativa *'Bluebonnet 50' a cultivar from Texas). Right,* Zizania aquatica *var*. interior *(material collected on the Ottawa River above Cumberland); photos by W.G. Dore.*

Northern wild rice (*Z. palustris* var. *palustris*) (Figure 3) is widespread along shores from eastern New Brunswick to Minnesota, south to western Nova Scotia, through northern New England to northern Indiana. This is the most common variety of wild rice in Canada, and the most important commercially. It produces the largest grain of all of the varieties (often 20 mm, sometimes as long as 30 mm in length) and is sometimes referred to as "giant wild rice." In this case, "giant" refers to the grains, as the plants are often of smaller stature than the other two varieties of commercial importance, *aquatica* and *interior*. Northern wild rice is widely planted, and has persisted and escaped, extending its range.

Interior wild rice (*Z. palustris* var. *interior*) occurs in water up to 30 cm deep on muddy shores along rivers in southeastern Manitoba and adjacent Ontario in Canada. In the United States it is distributed from Lake Michigan to North Dakota, south to Missouri and Texas. Local populations may be the result of planting, especially in Alberta, Saskatchewan, Manitoba, and northern Ontario. This variety generally grows on stream banks and shallows, from which the water retreats in the summer, so that canoe harvesting is very difficult, and collecting is generally done on foot. The grains are not quite as long as those of

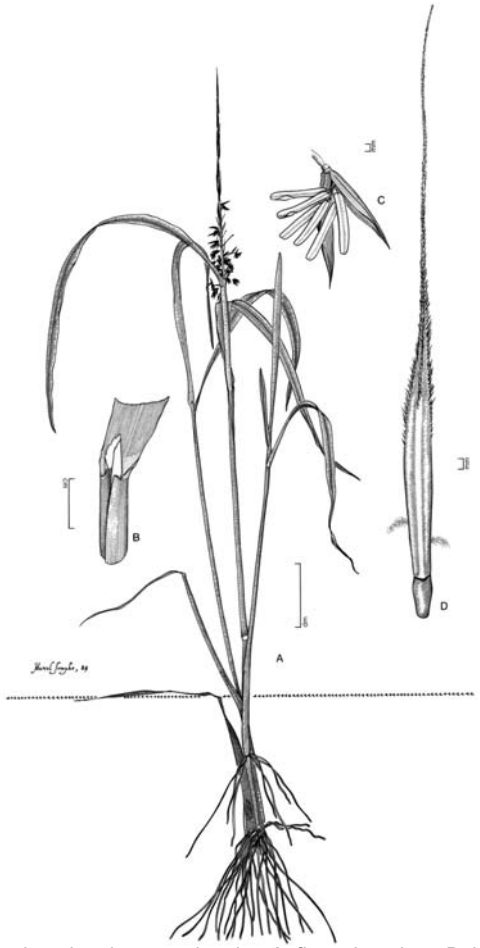


Fig. 3. Zizania palustris *var.* palustris*. A, flowering plant. B, junction between leaf sheath and blade, showing ligule; C, pendulous male spikelet; D, erect female spikelet with long awn. (Drawn by M. Jomphe, Agriculture & Agri-Food Canada.)*

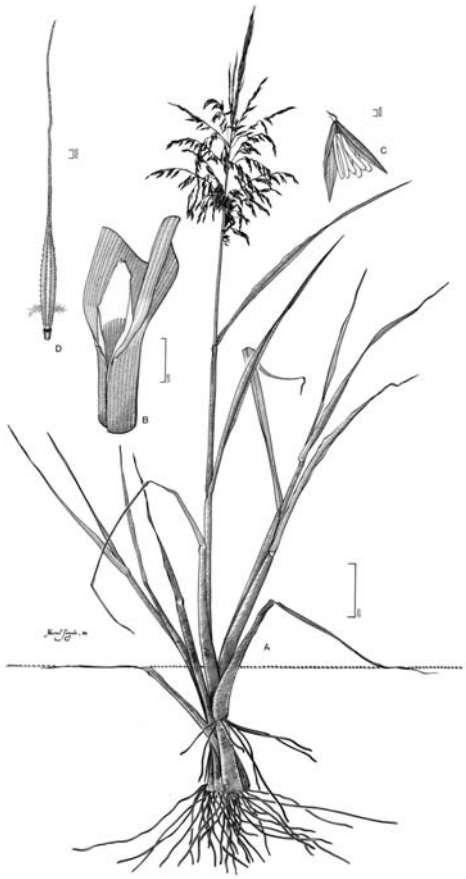


Fig. 4. Zizania aquatica *var.* aquatica*. A, flowering plant; B, junction between leaf sheath and blade, showing ligule; C, pendulous male spikelet; D, erect female spikelet with long awn. (Drawn by M. Jomphe, Agriculture & Agri-Food Canada.)*

Key to Canadian Taxa of *Zizania*

1. Lemmas of pistillate spikelets papery and flexible, dull or sublustrous, bearing scattered short prickly hairs not or only slightly denser at lemma apices; aborted pistillate spikelets 0.4-1 mm wide, often thread-like; plants to 5 m tall; leaf blades (3-)10–72 mm wide .....*Z. aquatica*

2. Plants usually (0.8-)1-3(-5) m tall; leaf blades (5-)10-80 mm wide; ligules (6-)10-20(-25) mm long; pistillate spikelets 7-24 mm long (excluding awns); body of mature female lemma usually minutely roughened; lemma awns 10-90 mm long..... *Z. aquatica* var. *aquatica*

2. Plants usually 0.2-1 m tall; leaf blades 3-12(-20) mm wide; ligules about 3 mm long; pistillate spikelets 5-11 mm long; body of mature female lemma smooth or roughened; lemma awns 1-8 mm long (freshwater tidal flats of the lower St. Lawrence River) .....*Z. aquatica* var. *brevis*

1. Lemmas of pistillate spikelets firm and leathery or hardened, lustrous, sometimes whitish, glabrous or with prickly hairs in lines, the hairs often densely grouped at lemma apices; aborted pistillate spikelets 0.6-2.6 mm wide, not thread-like; plants 1-2(-3 in var. interior) m tall; leaf blades 3-20(-40 in var. interior) mm wide.....*Z. palustris*

3. Leaf blades 3-15(-21) mm wide; lower pistillate branches with 2-6(-8) spikelets; pistillate inflorescences usually 1-8(-15) cm wide, with appressed or ascending branches; lower or middle male branches with 1-15 spikelets; ligules 3-5(-10) mm long; plants 0.7-1.5(-2) m tall..... *Z. palustris* var. *palustris*[1]

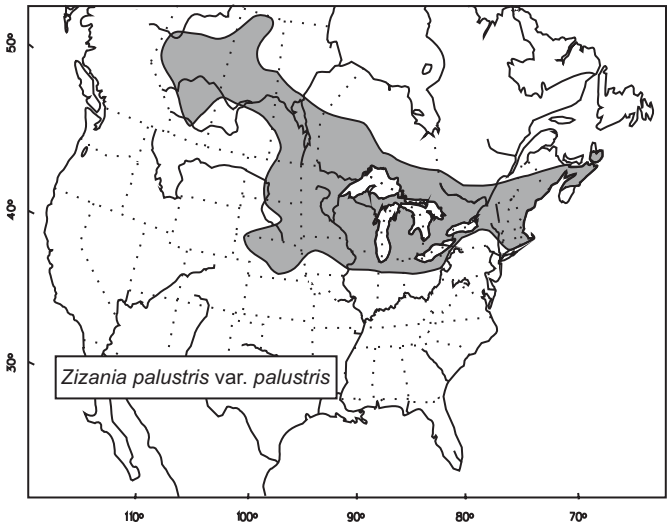
3. Leaf blades 10-30(-40) mm wide; lower pistillate branches with 9-30 spikelets; pistillate inflorescences (5-)10-50 cm wide, with branches ascending to widely spreading; lower or middle male branches with (20-)30-60 spikelets; ligules 10-15 mm long; plants 0.9-3 m tal.....*Z. palustris* var. *interior*

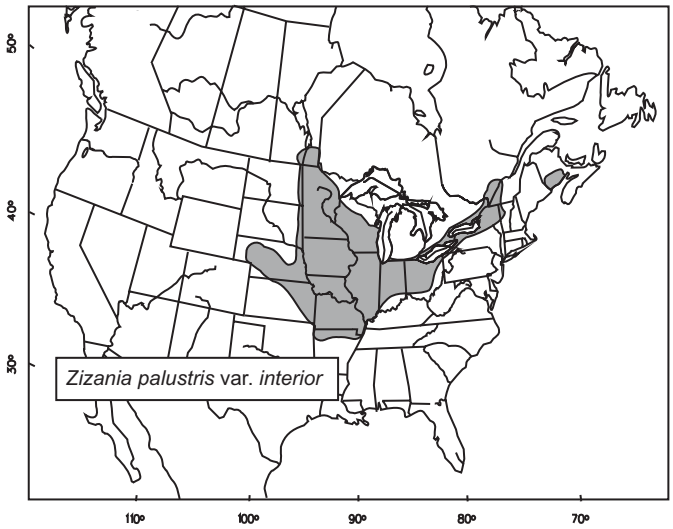
[1] Intermediates between the two varieties of *Z. palustris* are common where their ranges overlap. Moreover, immature specimens are often difficult to distinguish.

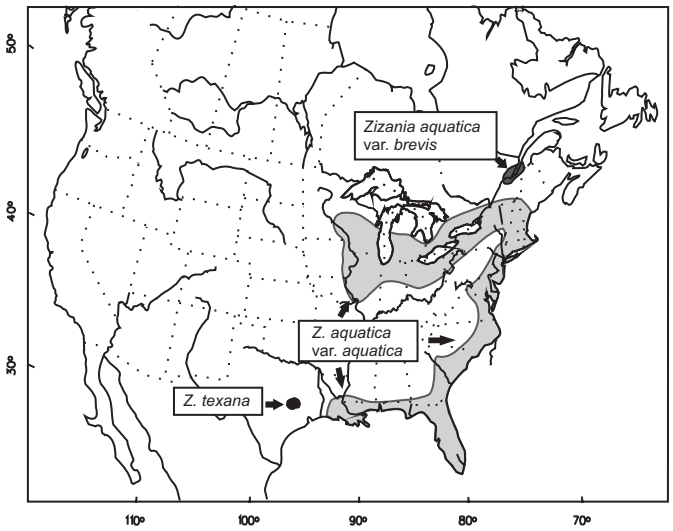
northern wild rice, and consequently are considered less desirable.

Southern wild rice (*Z. aquatica* var. *aquatica*) (Figure 4) is a robust variety that occurs on the shores of the Great Lakes and on muddy shores of streams in southern Ontario and Quebec, ranging southwards to western Florida and Louisiana. It seems to be most successful in very shallow water, where the seeds are more likely to encounter the warm conditions that this variety requires for germination. It is widely distributed in the eastern United States, where it is collected from the wild more than the other taxa, but is present in Canada only along the Great Lakes in southern Ontario, and in the low lands of southwestern Quebec. The grain is slender and thin compared with that of northern wild rice and, for reasons not understood, many of the florets are often sterile. The narrowness and relative shortness of the grain makes it less attractive as food than that of northern wild rice. Although cultivated wild rice has been considered to have been derived from improved selections of Z. palustris var. palustris, electrophoretic evidence suggests that some may be more closely related to var. *interior*.

Estuarine wild rice (*Z. aquatica* var. *brevis*) occurs on freshwater tidal flats (tides occurring twice daily) and tributary streams of the St. Lawrence River estuary in southern Quebec. The variety is distributed about 80 km upstream of Quebec City (at Grondines) to Trois Saumons, about 80 km downstream of Quebec City, on the south shore. The grains are rather small, and estuarine wild rice has never been harvested commercially.







Ecology

The two Canadian species of wild rice typically grow in dense stands in shallow water of lakes, marshes, and sluggish streams. They prefer water with a depth of (15-)30-60(-90) cm, and tolerate fluctuating water, sometimes growing where the water level changes as much as a metre, or more in the case of estuarine wild rice. The plants are very intolerant of stagnant water, although the rate of water flow need not be large. Accordingly, when wild rice is found in lakes or other apparently closed bodies of water, small currents from some source are almost invariably present. In lakes that are marginally suitable, stands are generally concentrated near the inlet and outlet, where the current tends to be constant. The substrate is ideally a muddy bottom, although the species are occasionally found on sand. The Canadian species of wild rice grow best in water that is near neutral or slightly alkaline. The plants are harmed by sulphate concentrations greater than 10 ppm. For the most part wild rice occurs in fresh water and coastal estuaries, but not in the more saline coastal salt marshes and interior salt lakes.

Use as Food

North American species of wild rice have been harvested for millennia, quite probably since aboriginal man migrated to North America at least 10,000 years ago.

The grain was one of the chief foods of Native American Indian tribes in the Great Lakes region. The region of greatest growth of wild rice includes central and northern Minnesota and Wisconsin, and adjacent portions of Canada, an area which has been termed the wild rice district. It is believed that the Indian population was considerably higher in the wild rice district than in nearby areas because of the availability of food. The congregation of waterfowl to feed in the wild rice marshes in autumn greatly improved hunting, thus indirectly increasing the food supply. Native Americans of the Algonquian linguistic family, especially the Ojibwe and Menominee (Menomini), and certain Sioux used wild rice as one of their staple foods, and warred for centuries for control of the rice beds. The Menominee were the most dependent on this crop and so came to be known as the true rice Indians. However, the Chippewas were the largest producers of wild rice. Native Americans gathered the seeds by pulling the grain heads over their canoes and flailing them with paddles. Between 45 and 90 kg of wild rice can be collected in 1 day by this traditional method. The harvested seeds were sun-dried or parched over a slow fire to crack the hulls, then the grain was threshed by tramping, and winnowed. One of the most famous Indian dishes was tassimanonny: wild rice, corn, and fish boiled together.

Fig. 5. "Ojibwa Indian women gathering wild rice" by American painter Seth Eastman (1808–1875). (Source: Schoolcraft, H.R. 1839. Algic researches. Comprising inquiries respecting the mental characteristics of the North American Indians. Harper & Brothers, New York, NY.)

Wild rice was also an essential food of early European explorers and settlers. Fur traders bought large quantities from the Indians during the latter half of the 18th century and the first part of the 19th century, when the fur trade was at its peak. Wild rice was very valuable because it was abundant, easily obtained, nourishing, palatable, and easily stored, carried, and prepared. For much of the 20th century the grain was still a locally important wild food, with sportsmen acquiring the tradition of eating it along with game. Over the past few decades, with the trend toward increasing consumption of natural foods, wild rice has found a place in most North American households. Today, it is harvested for the epicurean market and commands a high price.

Freshly harvested ("green") wild rice has a moisture content of about 40%, and will deteriorate quicky unless processed. To prevent decay, green rice is "cured," generally by drying and aerating the mass of grain. Drying usually is carried out over a period of days, but can be hastened by artificial heat. Many processors deliberately carry out a controlled slow drying, during which some fermentation takes place, in the belief that this improves the flavor. Subsequently, the grains are parched in ovens, a process that drives off residual water and results in the kernels becoming hard, and the grip of the hulls on the grains loosening. De-hulling is carried out by mechanical agitation, coupled with air jets to drive off the lighter empty hulls. Unlike "polished' common rice, the pericarp (fruit wall) is not removed or only partially removed. Only one-third to one-half of the weight of green rice is recovered as processed rice. The rice is usually sold without further processing, although precooking, canning, or incorporation into prepared products may also be carried out.

Fig. 6. First Nations (Mississauga) people preparing wild rice, near Harwood, on the shore of Rice Lake, in central southern Ontario. 1. Woman parching wild rice by stirring over a slow fire. "Curing" by such gentle heat dries the grains so they will not rot (alternatively, the grains were sun-dried on mats, or smoked and heated over a slow fire) and loosens the grip of the chaff (adhering lemma and palea). 2. To separate the kernels from the surrounding chaff, native people "danced" on top of the grains. 3. The mixture was dropped through the air, the heavy kernels would fall straight down and the light chaff would blow away (the process of winnowing), completing the separation. (Source: Fyles, F. 1920. Canada Department of Agriculture Bull. 42.)
Wild rice once dominated the well-known Rice Lake, but today is virtually absent, due to changed in water levels and chemistry.

Wild rice is similar in nutritive value to the common cereals, but is relatively high in protein and low in fat, and deficient in Vitamin A and some minerals. It is rich in nicotinic acid (Vitamin B3), richer in riboflavin (Vitamin B2) than wheat, corn, oats, or rye, and compares favourably with wheat, corn, and rye in content of thiamin (Vitamin B1). Wild rice is very digestible (as is common rice), and is often recommended to patients with stomach disorders.

Wild rice has a chewy texture and a strong, nutty flavor, often compared to hazelnut. Although expensive, it goes farther than regular rice, 1 cup of dry rice making about 3½ cups of prepared rice (Chinese, i.e. common rice typically combines 1 cup of rice and 1¾ to 2 cups of water). Wild rice is a highly nutritious grain, with a better balance of protein components (amino acids, especially lysine and methionine) than conventional rice. The distinctive flavor of this gourmet item is admired by many. Wild rice is frequently served with game, particularly with ducks and other game birds, as it is said to enhance their flavor (indeed, wild rice goes well with all poultry). It is also often served with sautéed mushrooms, onions, or slivered almonds (or other nuts), all of which seem to complement wild rice. Wild rice also goes well with seafood, and is used in stuffings and crêpes. To extend it, wild rice is often combined with other grains, such as brown rice or bulghur wheat (about 1 part wild rice to 2 parts of the other grain is typical). The dark colour of wild rice grains contrasts attractively when combined with white rice and other light-coloured foods.

Wild rice tends to be dirty, and needs to be thoroughly rinsed. It is cooked and eaten like common rice, but requires a longer cooking time (overcooking diminishes the flavour and texture). It can be boiled in salted water, steamed like rice, or baked. Wild rice can even be popped, but this is rarely done.

Wild rice can be pre-soaked for several hours before boiling to reduce cooking time. A shorter method of soaking is to boil the rice for 5 minutes in four times its volume of water, cool it and allow it to soak for 1 hour in a covered container, then drain and reheat with fresh water or broth (using three times the volume of rice), along with a half teaspoon of salt. The water is brought to a boil, the rice added, the heat then reduced and the mixture simmered for about 20 minutes or until tender. Alternatively, leave out the initial soaking step and simply cook the rice for about 40 minutes in three times its volume of water. The rice will expand to about four times its initial volume. Overcooking causes a loss of flavour and firmness, and the rice becomes sticky. Numerous imaginative recipes for preparing and serving wild rice are available on the Web, and some wild rice cookbooks are mentioned below.

Non-Food Uses

Because they dominate some wetland ecosystems and provide food for wildlife, especially waterfowl, the Canadian species of wild rice are often managed in wetland conservation programs. *Zizania* is commonly planted to attract migratory waterfowl to improve hunting. Considerable grain is lost while harvesting wild plants, since the seeds mature and fall at different times, and sink rapidly. The fallen seed is available to waterfowl on the lake bottom in spring and fall. Although not often used for fodder, wild rice can be harvested for livestock feed. Wild rice is highly ornamental, and frequently decorates aquatic gardens.

Agricultural and Commercial Aspects

Until about 1950, natural stands were the only source of wild rice. Experiments were then conducted in Minnesota to grow wild rice as a field crop. By the 1970s, Minnesota took the lead in wild rice production, based on prepared wetland (paddy or aquacultural) cultivation. In this method, *Zizania* is raised in diked, shallowly flooded fields, like true rice (*Oryza*). True rice is established in paddies by transplanting shoots, not seeds. Wild rice seed, however, is sown. Paddies can be drained before harvest, allowing land-based harvesting equipment to be used. In nature, fluctuations of water depth and other variables result in erratic volumes of harvest grain from year to year, while paddy production produces a much more dependable harvest. Yields of 670-900 kg/ha have been realized from wild rice paddies, compared to an average of about 84 kg/ha from natural stands, using the traditional canoe and flail method of harvesting. California, which began paddy cultivation of wild rice in 1978, can produce two crops in one year, and by 1986 the state took the lead in production. In Canada, wild rice is rarely cultivated in paddies, but is harvested both from introduced and natural stands. Saskatchewan is the main Canadian producer, beginning its wild rice industry with introductions in the 1980s. The traditional, labour-intensive, inefficient procedure of hand-harvesting natural and planted wild rice stands from canoes is increasingly being replaced by air-boat harvesters.

World production of wild rice has grown by a factor of 10 since 1976, with the value of the crop increasing from about 1 million to 20 million dollars (U.S.). California produces 65% of the world crop, Minnesota 31%, and Canada 5%. Canada's production statistics are shown in the table below.

Wild Rice Production in Canada
(metric tonnes; source: Saskatchewan Agriculture & Food)

Year	Alta.	Sask.	Man.	Ont.	Canada
1990	68	1093	544	141	1846
1991	27	1098	590	166	1880
1992	9	941	136	68	1154
1993	45	885	45	23	998
1994	68	1089	998	363	2517
1995	23	1179	635	27	2064
1996	23	874	526	91	1514
1997	0	481	590	181	1252
1998	23	1588	318	45	1973
1999	23	994	295	45	1357
2000	0	573	81	91	846
2001	23	994	295	45	1357
2002	23	1996	567	91	2676
Mean %	1.6	65.1	26.4	6.9	100

The wholesale value of the Canadian crop is valued at about $5 million (Canadian) annually. Prices paid by processors for green (off-the-plant) wild rice currently vary from $1.87 to $2.20/kg (processed commercial wild rice represents 40% of the green wild rice weight) . About three-quarters of Canada's

commercially produced wild rice is exported to the United States. About one-quarter of the wild rice consumed in Canada is imported from the United States.

Provinces in Canada and states in the United States have enacted statutes protecting wild rice stands. In general, such legislation requires licences, and forbids harvesting methods that lower the vitality of the stands. Mechanical harvesting is usually prohibited on publicly owned and on reservation lands. In most cases, Indians have exclusive or priority rights to tracts of native wild rice, reflecting the historical dependency of Amerindians on this crop. However, private lands are usually not subject to much restriction, and here paddy techniques and mechanical harvesters are increasingly being used.

Cultivars and Germplasm

A critical event in the domestication of all cereals was the selection of "non-shattering" strains—that is, variants with grains that do not drop off the plant at maturity. The principal difficulty with wild rice as a crop in Canada is the quick disarticulation of the caryopses at maturity. Further, because the grains mature over a period of time, they are shed gradually. These two factors mean that it is necessary to harvest the same plants repeatedly in order to obtain even half of the grains, and harvesting is a difficult operation since the fragile mature infructescences easily shed their grains. Apparently first in 1963, non-shattering lines of Z. palustris were selected. During the 1970s there was considerable development of new varieties in Minnesota. These non-shattering cultivars retain much of their seed for long periods, making harvesting much more efficient. Some of the newer cultivars have been selected for shorter height.

Over the widespread eastern North American range of wild rice species, a number of variants have been documented, indicating extensive genetic variation. Much more study of this variability is necessary. River populations are particularly susceptible to extinction through pollution. Reestablishment of wild rice following decline of some lake populations has proven difficult. Southern wild rice has been replaced by cattail in parts of the lower Great Lakes. Since wild rice is a community dominant, its protection is essential for purposes of biodiversity preservation, as well as for crop development.

The seeds of wild rice are recalcitrant (i.e. they require particular demanding storage conditions). Only 1% of seed can be germinated after 7 weeks of dry storage. This poses problems for the maintenance of seeds in gene banks. The seeds must be stored under cool, moist conditions. Cryopreservation protocols have recently been developed for excised embryos to preserve germplasm of the endangered Texas wild rice.

Prospects

The future of the Canadian wild rice industry depends, curiously, on just how "wild" the wild rice crop will remain. Canadian wild rice has traditionally been collected from natural stands, but the supply is clearly insufficient and unreliable to meet market demand. Wild rice populations have been fairly extensively established in natural bodies of water, using wild seed, but in many cases attempts have been unsuccessful, apparently due to such difficult-to-control factors as insects, diseases, animals, water level fluctuations, and water chemistry. Minnesota and California, which now dominate the wild rice industry, achieved their success in recent decades through the use of domesticated selections of wild rice, cultivating these in controlled (paddy) aquatic systems. For Canada to regain its once dominant role as the world's supplier of wild rice, it should invest in such areas as genetics, breeding, pest control, harvest techniques, and seed storage and processing. Because wild rice is a key inhabitant of wetlands, it will also be necessary to develop a sustainable crop that conserves the habitat and its biodiversity. Three-quarters of current Canadian wild rice production is exported to the United States, and it should be noted that "Export of Canadian wild rice to the US is a volatile issue, with trade actions being taken against imported Canadian wild rice by Minnesota producers in the past" (Ontario Agricultural Value-Added Innovation Network, 2004). Although there have been recent attempts to produce wild rice in Europe, Canada's climate and extensive wetlands are more conducive to wild rice, and a long-term developmental strategy should attempt to diversify the export market to Europe and elsewhere. Of the six kinds of wild rice noted above, northern wild rice (*Z. palustris* var. *palustris*), with its long and thick grains, is the most commercially important. Canada has most of the genetic variation in this variety, and is in an ideal position to play a key role in the future of this exceptional cereal. Of all of Canada's native species, wild rice may be the most deserving of commercial development.

Myths, Legends, Tales, Folklore, and Interesting Facts

- The Ojibwe (Ojibway, Ojibwa) called wild rice manomin, a word derived from Manitou, the name of the Great Spirit, and Meenum, which means delicacy. Ojibwe elders called wild rice Manitou gi ti gahn, or food from God's garden. Wild rice is a sacred food for the Ojibwa, and deeply imbedded in their mythology and ceremonies.
- The Menominee Indians of Wisconsin take their tribal name from their word for wild rice, menomin.
- In 1977 the Minnesota state legislature made wild rice the official state grain.
- In an Ojibwe story, Nanabojo (Nanaboozhoo) was sent on a vision quest by his grandmother and, while canoeing in a lake, discovered a beautiful plant. After finding that the seeds were delicious, he planted some of them in other lakes. In another version of this legend, Nanabojo, returned from an unsuccessful hunt to find a duck on his boiling pot. The duck promptly flew away, but left wild rice seeds floating on the boiling water. The hunter ate the seeds, and later followed the direction the duck had taken, and came to a lake full of wild rice.
- In the Drum Dance, wild rice was blown on the wind in the four cardinal directions (N, E, S, W) to be carried to the Great Spirit.
- In wild rice areas of North America, an elaborate burial and bereavement procedure was sometimes followed by relatives of the deceased. On top of the grave a house was built, with a window on one side into which food was symbolically inserted for the departed soul. Those who participated in a year of bereavement were restricted

from collecting rice without a taboo release. This involved their being spoon fed some of the first wild rice gathered.

- To the Menominee, known as the wild rice people, the grain was considered a gift of one of the Underneath Beings, and sacrifices of tobacco were necessary to insure a good harvest.
- Native People popped wild rice, like popcorn, and sometimes served it with maple sugar as a special treat. The popped rice was sometimes carried by the men when they were out hunting or fishing.
  Many wind-pollinated plants (corn, for example) have separate male and female flowers, and in these cases the male flowers are usually located above the female flowers. This is because the wind carries pollen to other plants, and so the higher up the male flowers are the more easily they will be transported by wind. In wild rice, however, the reverse pattern occurs, with the female flowers above the males. The female flowers of an individual plant mature first, promoting cross-fertilization.
- The base of the stems of Manchurian wild rice (*Z. latifolia*) is often infected by a fungus (*Ustilago esculenta* P. Henn.) that causes the shoots to swell and become tender. These swollen stems are prized as a vegetable in Asia. However, because the fungus causes the plants to become sterile, there is great concern that if it is imported to North America there could be disastrous consequences for the American species.
- It has been calculated that human-made wild rice paddies in Minnesota provide 3,200 duck-use days/ha (a duck-use day means the equivalent of one duck using 1 hectare for 1 day – e.g. 24 ducks using 1 hectare for 1 hour each).

Sources of Additional Information

Aiken, S.G. 1986. The distinct morphology and germination of the grains of two species of wild rice (*Zizania*, Poaceae). Canad. Field-Naturalist **100**: 237-240.

Aiken, S.G., Lee, P.F., Punter, D., and Stewart, J.M. 1988. Wild rice in Canada. NC Press, Toronto, ON. 130 pp. (Also available in French.)

Anderson, B. 1977. Wild rice for all seasons cookbook. Minnehaha Pub., Minneapolis, MN. 173 pp.

Anderson, R.A. 1976. Wild rice: nutritional review. Cereal Chem. **53**: 945-955.

Archibold, O.W. 1995. Wild rice in Saskatchewan: agricultural development in harmony with nature: a reference manual. Saskatchewan Education, Training and Employment, Saskatchewan Agriculture and Food, La Ronge, SK. 99 pp.

Archibold, O.W. 1999. Wild rice research in Saskatchewan: final report. Dept. of Crop Science and Plant Ecology, University of Saskatchewan, SK. 269 pp.

Catling, P.M. and E. Small. 2001. Blossoming treasures of biodiversity: 2. North American wild rice (*Zizania* species) - a wild epicurean crop. Biodiversity **2**(3): 24-25. [online: http://www.tc-biodiversity.org/biosamples.htm]

Darbyshire, S.J., and Aiken, S.G. 1986. *Zizania aquatica* var. *brevis* (Poaceae): a 1983 distribution survey and a scanning electron microscope study of epidermal features. Naturaliste Can. **113**: 355-360.

Dore, W.G. 1969. Wild-rice. Canada Department of Agriculture Research Branch Publication 1393, Ottawa, ON. 84 pp.

Duvall, M.R. 1995. Wild rice (*Zizania palustris*). In Cereals and pseudocereals. (Second in series Underutilized Crops). Edited by J.T. Williams. Chapman & Hall, London, U.K. pp. 261–271.

Hauser, S.C. 2000. Wild rice cooking: harvesting, history, natural history, and lore with 80 recipes. Lyons Press, New York, NY. 173 pp.

Hayes, P.M., Stucker, R.E., and Wandrey, G.G. 1989. The domestication of American wildrice (*Zizania palustris*, Poaceae). Econ. Bot. **43**: 203-214.

Lund, D.R. 2003. One hundred and one favorite wild rice recipes. Adventure Publications, Cambridge, MN. 76 pp.

Manitoba Agriculture. 1984. A Guide to Wild Rice Production. Manitoba Agriculture Agdex 116. 29 pp.

Oekle, E.A. 1993. Wild rice: domestication of a native North American genus. In New crops. Edited by J. Janick and J.E. Simon. pp. 235-243.

Schultz, B. (Editor.) 1979. The wild ricer's guide. Appleseed Press, Berkeley, CA.171 pp.

Steeves, T.A. 1952. Wild rice—Indian food and a modern delicacy. Econ. Bot. **6**: 107-142.

Terrell, E.E., and Batra, L.R. 1982. *Zizania latifolia* and *Ustilago esculenta*, a grass-fungus association. Econ. Bot. **36**: 20-26.

Terrell, E.E., Peterson, P.M., Reveal, J.L., and Duvall, M.R. 1997. Taxonomy of North American species of *Zizania* (Poaceae). SIDA **17**: 533-549.

The 1006 Summit Avenue Society. 1986. Wild rice, star of the north: 150 Minnesota recipes for a gourmet grain. McGraw-Hill, New York, NY. 188 pp.

Vennum, T., Jr. 1988. Wild rice and the Ojibway people. Historical Society Press, St. Paul, MN. 357 pp.

Warwick, S.I., and Aiken, S.G. 1986. Electrophoretic evidence for the recognition of two species in annual wild rice (*Zizania*, Poaceae). Syst. Bot. **11**: 464-473.

Web Sources of Information

Anonymous, undated. Canada's wild rice industry. http://www.agr.gc.ca/misb/spcrops/sc-cs_e.php?&page=wildrice-rizsauvage [A short, very recent review, with several links, most of which were non-functional when tried.]

Ontario Agricultural Value-Added Innovation Network 2004. Rice and Wild Rice. http://www.aginnovation.ca/resourdces/wildrice.pdf [A practical guide for Ontario, with very useful links.]

Ooelke, E.A. and 9 others. 1997. Alternative Field Crops Manual: wild rice. http://www.hort.purdue.edu/newcrop/afcm/wildrice.html [A very good, practical guide.]

Acknowledgments

W.J. Cody (review), B. Brookes (artwork).

Plant Canada Report 2003/2004

by Carol E. Peterson

President: Carol Peterson
Secretary: Paul Cavers

Member Societies and Their Representatives on the Plant Canada Board of Directors

CBA (Canadian Botanical Association) - Vipen Sawhney, Christian Lacroix
CPS (Canadian Phytopathological Society) - Richard Martin, Bruce Gossen
CSA (Canadian Society of Agronomy) - Yousef Papadopoulos, Gavin Humphreys
CSHS (Canadian Society for Horticultural Science) - Yves Desjardins, Shahrokh Khanizadeh
CSPP (Canadian Society of Plant Physiologists) - H. S. (Deep) Saini, Rob Guy
CWSS (Canadian Weed Science Society) http://www.cwss-scm.ca/ - Glen Sampson, Jerry Ivany.

This year has seen some changes to the membership of Plant Canada. First the bad news - the Canadian Society of Soil Science has withdrawn. As the current president Ed Gregorich explained, their council wanted to retain more flexibility for their society to meet with other Earth Science groups. Now for the good news - the Canadian Society of Horticultural Science has joined Plant Canada. A very warm welcome to this group.

Brainstorming Session

Representatives from all member societies met in Guelph on June 23, 2004 to discuss a wide variety of issues, some of which will be brought to the next meeting of the Board of Directors for consideration. Minutes of the meeting can be obtained from the secretary, Paul Cavers.

Most Recent, Past Meeting

In June of 2003, members of the CBA and CSPP enjoyed the Plant Canada meeting in Antigonish, NS. Heartfelt thanks to David Garbary and his team of organizers and volunteers who hosted a splendid meeting with down-east hospitality.

Future Meetings

2005 in Edmonton, AB June 15 – 18, with a possible extension to June 19. Here is some information from the chief organizer, Michael Deyholos.

What is Plant Canada 2005?

Plant Canada 2005 is the first joint meeting of the six Canadian scientific societies listed above. The meeting will be hosted on the University of Alberta campus, which is situated in the heart of Edmonton and serves over 34,000 students. With an expected participation of more than 600 conference delegates, Plant Canada 2005 will be an excellent opportunity to network and to exchange ideas about plant biology.

Scientific Program
The scientific program is designed to highlight Canadian research, to strengthen ties between the memberships of the various scientific societies and to provide opportunities for students to make presentations to a national audience. Three plenary sessions, sixty mini-symposia, and several special evening sessions have been organized to accomplish these goals.

Social Program
With an average June daytime high of 20 C° and 17 hours of sunlight daily, where else but Edmonton in the summer? This climate will allow visitors to enjoy long evenings on patios along Whyte Avenue, as well as the conference banquet at Fort Edmonton Park. We have also organized a number of optional excursions to places of cultural or scientific interest, including the Muttart Conservatory, Devonian Gardens, Elk Island National Park, Ukranian Cultural Heritage Center, and West Edmonton Mall.

Membership of Organizing Committee : Shaffeek Ali, CWSS, Randy Currah, CBA, U of A, Mike Deyholos, CSPP, U of A, David Ehret, CSHS, AAFC Agassiz, Denis Gaudet, CPS, AAFC Lethbridge, Roisin Mulligan, CBA, U of A, Dean Spaner, CSA, U of A. I am sure Michael (or the organizer from your society) would welcome your ideas for the ambitious conference they are in the process of organizing.

2007 in Saskatoon, SK : Lead organizing group: Canadian Phytopathological Society. Contact at this time: Richard Martin.

Other Items

Plant Canada was represented at two meetings of the Agricultural Institute of Canada (AIC) facilitated by the Canadian Agri-Food Research Council. The AIC is moving toward forming an umbrella organization, the nature of which is still under discussion.

The following are available upon request (cpeterson@uwaterloo.ca) :
- A list of the Plant Canada Board of Directors with mailing addresses
- Full reports on the AIC meetings of Nov. 15, 2003 (by Paul Catling) and Apr. 24, 2004 (by Carol Peterson)
- Full report on a meeting with CFBS Nov. 15, 2003 (by Paul Catling)

Done on July 22, 2004.

Turning Teachers and Students on to Plants

Report on the Teaching section Panel discussion held at the Winnipeg meeting, June 29th 2004.

by Christine D. Maxwell, Chair of the Teaching Section

A discussion on this topic took place with four panelists participating. The four were **Dr Kate Frego**, Biology Department, University of New Brunswick, Saint John campus. Kate is well known to most of us as a founding member of the teaching section, and a person who has won several teaching awards for her lively and enthusiastic teaching. **Dr Barbara McMillan** of the Faculty of Education, University of Manitoba. Dr. McMillan, who studied Mycology at the University of Manitoba, is now a specialist in early years science education. **Aileen Najduch**, a science consultant in charge of curriculum, program development and implementation, with the Manitoba Department of Education, Citizenship and Youth and **Dr Bill Paton**, Brandon University, currently the chair of the education and curriculum committee of the Manitoba Association of Plant Biologists (MAPB).

Panelists of the Teaching Section workshop, from left to right: Aileen Najduch, Dr. Barbara McMillan, Christine Maxwell, Kate Frego and Dr. Bill Paton.

Christine Maxwell opened the session with a few statements about the lack of enthusiasm for plants shown by many students entering universities. This has been an on-going problem, which has resulted in the downsizing of Botany departments in Canada and the rest of the world, and the integration of existing Botany departments into Biology departments. She suggested several possible reasons for this including the nature of school curricula, lack of enthusiasm for plants by teachers, poor teaching at the university level and a lack of media focus on plant biology. She raised the question as to what role the CBA/ABC might play in changing the situation.

Dr. McMillan started the proceedings by reviewing the existing science curriculum in Manitoba, which does include botanical topics from Kindegarten up to Grade 10. She felt that the focus of the curriculum in these grades is excellent resulting in enthusiastic students and teachers, and that it ties in well with the other science topics. She also added that Science is not mandatory in the upper grades in the province, and that it is at this stage that the interest and enthusiasm is lost. She suggested that one of the reasons might be that the teachers and students become more tied to textbooks and memorization and that this leads to disenchantment. She shared some anecdotal comments from friends of her son, who graduated from high school two years ago, about studying plants, which suggested that they had not found botany very interesting. " It is too hard..if they dumbed it down it might be better" " Plants don't do anything". In response to the question about the role of the CBA/ABC she suggested that sharing our interest in research with students and teachers would be helpful. Children generally are unaware of the nature of research, but if it is presented in a way which captures their interest, then this could promote an awareness and interest in plants. Dr McMillan also showed the audience examples of a series of books for children titled " Scientists in the field" which illustrate the lives and work of several types of scientists for example a zoologist and an archaeologist. She thought it would be wonderful to have one available on a botanist.

Aileen Najduch agreed that students might become more interested in plants if they are physically involved in botanical research. She suggested involvement in biomonitoring projects and in projects such as Plant Watch can be catalysts to raising the level of enthusiasm. However, she realized that there are some problems, one of which is the fact that the best time of year for such projects is the summer when the children are not in school. She thought that teachers would respond favorably to access to and contact with researchers in universities, but for many of them there is a lack of time available to establish links.

Kate Frego outlined her own situation in which she is the only botanist in her department. Unlike the situation in Manitoba, the school curriculum in the Atlantic Provinces does not include plants and tends to be human oriented. Kate had attempted to attract local teachers with a series of workshops on plants, however, she had had no response from the teachers and felt that this could be because they had little time available. Kate also explained that as a high school student she had not been exposed to botany as a subject, and did not think that the school curriculum was the only problem. Her first interest in botany developed at the university level when personal contacts with particular faculty members kindled her interest in plants. She has reached the conclusion that contact with teachers, acting as role models, guides many students into a particular discipline. In addition, she feels that plants are not perceived as charismatic and students may not always see the relevance of plants in their lives. One way to change this might be to use examples of food and medicinal uses of plants in courses. Kate also explained that many students are concerned about possible job opportunities after graduation and that it would help if we could show them what their options would be. In addition to the above suggestions, Kate had a list of ideas which included keeping botany as a required course for Biology majors at the university level, keeping plants in the news and where possible hiring students to help with research projects. In

response to the question of what action the CBA/ABC might take, she felt that exchanging ideas on teaching methods and talking about teaching at our meetings is a really good start, but that perhaps we could do more to publicize career options.

Dr Bill Paton reported that unlike many of those present, he is in a Botany department which is increasing the number of faculty. He suggested that as botanists we should try to remember what turned us onto plants in the first place. It might be some of the characters that taught us at the university level, and he gave some interesting examples! In particular he felt that students at the elementary level are very enthusiastic about plants in their natural settings and that we should encourage teachers to be involved in local natural history groups and then pass on the information to their students. He also made the point that young students participating in Science fairs often have projects involving plants, but the older children tend to lose this interest. He suspects that the problem is that there is a lot of rote memorization involved in Biology and this can turn students off.

In response to the question of what the CBA/ABC members can do to change the situation, Bill suggested that we should get involved at the local level with the teachers, provide services to help them and encourage them to be interested in the local natural history. He also suggested that it is possible to play an active role in the development of school curricula, as MAPB has done in the past. As far as the media is concerned, he said that contact with science reporters in the local press, radio and TV stations is important and welcomed by the media. This can help raise the profile of plants to the general public.

In the general discussion that followed these presentations, several other important points were made and these are summarized below.

Liz Straszynski, a teacher at the University of Toronto Schools, appreciated the importance of field trips and natural history, but also recognized that species diversity in downtown Toronto was not particularly great. Given the shortage of time available to teachers, she thinks that if botanists were able to provide teachers with information on exciting experiments with plants, that were relatively easy to do in class, then they would readily accept them and use them in the classroom.

Iain Taylor is convinced that contact with elementary and high school teachers is of vital importance. He also suggested that it is the teachers at all levels that spark the interest in plants. He gave an example of a professor at UBC who is able to excite students in a bryology course, and suspects that in part this has resulted in an increase in enrollments in plant courses. He further suggested that we should also recognize the value of peer teaching.

Spencer Barrett talked about the importance of good teaching at the first year level. There was an increase in the number of students in upper year Botany courses at the University of Toronto, which he felt was attributable to the nature of the first year biology course, which has a high enrollment (1600). The course had been developed with the help of the media centre and those involved in pedagogy at the university, following some suggestions from the Dean of the Faculty of Medicine. Four top researchers lecture in the course, using their own research as examples. This means also that there is an emphasis on Canadian research which makes the material more relevant. The course is based on evolutionary biology and ecology and taught in such a way that plants and animals have equal weight. He likes to point out to students that plants are outstanding organisms for answering questions.

Vipen Sawhney agreed that the greatest challenge is at the first year level, and if students can develop an interest at this level, they are more likely to choose to take more botany courses in the upper years. This prompted a question about how university faculty learn to teach. At some institutions courses on how to teach are provided for new faculty. In a growing number of universities, candidates for tenure track positions are required to present both a teaching and a research seminar as part of the hiring process, as a way of ensuring that it is good teachers who are successful applicants.

Richard Staniforth agreed that first year teaching is important, but also suggested that the content of courses is critical. He wondered how many students get enthused about Kreb's Cycle and the life cycle of pine!

Each of the panelists gave a brief summary of some of the ideas they thought were most important in turning teachers and students on to plants. Aileen Najduch thought that a combination of good teaching at all levels and demonstrating the relevance of plants in our lives were important factors. Barbara McMillan suggested that interacting personally with students and having less reliance on textbooks and memorization is important. She feels that students are not generally being made aware of the excitement in botany and that the members of the CBA/ABC should engage in more self-promotion. Kate Frego agreed that good teaching was really important and also felt that good first year teaching was of particular importance. Establishing links with teachers and providing them with resources would also be beneficial. Bill Paton reiterated that encouraging the younger children through the study of natural history was vitally important in addition to making the study of plants an interesting and positive experience.

Author's comments

I would like to thank the four panelists for participating and providing such wonderful insights on the topic.

I would also like to thank the audience for their participation in the discussion. I believe that including the panelists there were about 50 people present which is a fairly high number given the number of conference registrants.

I have taken the comments shown here from the videotape of the event, however, I was not able to include every comment made. I apologize if I have misquoted anyone or left out any comments that perhaps should have been included! My thanks to Cindy Ross for arranging the vidoetaping.

CANADIAN BOTANICAL ASSOCIATION
L'ASSOCIATION BOTANIQUE DU CANADA

DRAFT POLICY
ON GENETICALLY ENGINEERED PLANTS

Submitted to the CBA/ABC Board of Directors for further consideration and amendment by:

Iain E.P. Taylor
Professor, Department of Botany and Botanical Garden
Associate Member, UBC Centre for Applied Ethics

July 15th 2002

Genetic engineering, a new technology that developed very rapidly during the last decade of the 20th century, has led to exciting new opportunities for commercial development. As with all new technological developments, there has been significant new financial investment by academia, industry and government, but there has been a strong tendency to accept alleged benefits without rigorous assurance that disadvantages have been properly identified and examined.

In so far as plant genetic engineering technology exists and has become highly sophisticated and widely used in a wide range of research, teaching and agro-forestry applications, the Canadian Botanical Association/L'Association Botanique du Canada (CBA/ABC) accepts that the development of the technology and its applications will continue.

- It is CBA/ABC policy to advocate the continued development of genetic engineering as an important tool for research to understand the control of plant processes.
- In so far as new developments and applications have occurred faster that the understanding of the biological and environmental impacts of genetic engineering, it is CBA/ABC policy to encourage members to become proactive in research on the short and long-term impacts of engineered plant releases.
- It is CBA/ABC policy to encourage members with ecological expertise, especially those who study the impact of ecological changes, to undertake research that clarifies the uncertainties surrounding release of genetically engineered plants.
- It is CBA/ABC policy to provide formal, expert and credible input to national provincial and local government on matters pertaining to development and application of genetic engineering technology.
- It is CBA/ABC policy to work constructively and collaboratively with academic, industrial and government researchers to ensure that the research documentation to support or oppose applications for commercial release of genetically engineered plants be of the highest quality. This should include the results of research that addresses both the positive and negative forms of any particular question, e.g. "will the introduction be ecologically harmful?" and, "will the introduction be ecologically safe?"
- It is CBA/ABC policy to provide rigorous answers to public questions about genetically engineered plants and to advise the public of the validity of claims made by both advocates and opponents. CBA/ABC encourages those members with expertise in these matters to make themselves available as expert advisers, but to refer questions that are outside their areas of expertise to those who do have such expertise.

Please send comments, suggestions, amendments, additions etc to:

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