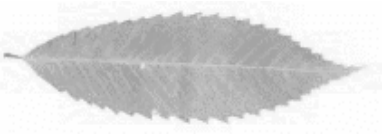
The

Canadian Sweet Chestnut

- Journal of the Canadian Chestnut Council



Issue # 50 September, 2009 http://www.uoguelph.ca/~chestnut

In this issue: - The AGM...Member' Correspondence...2009 Plot Work...OMNR Correspondence...and more!

Annual General Meeting Comes to Onondaga Farms

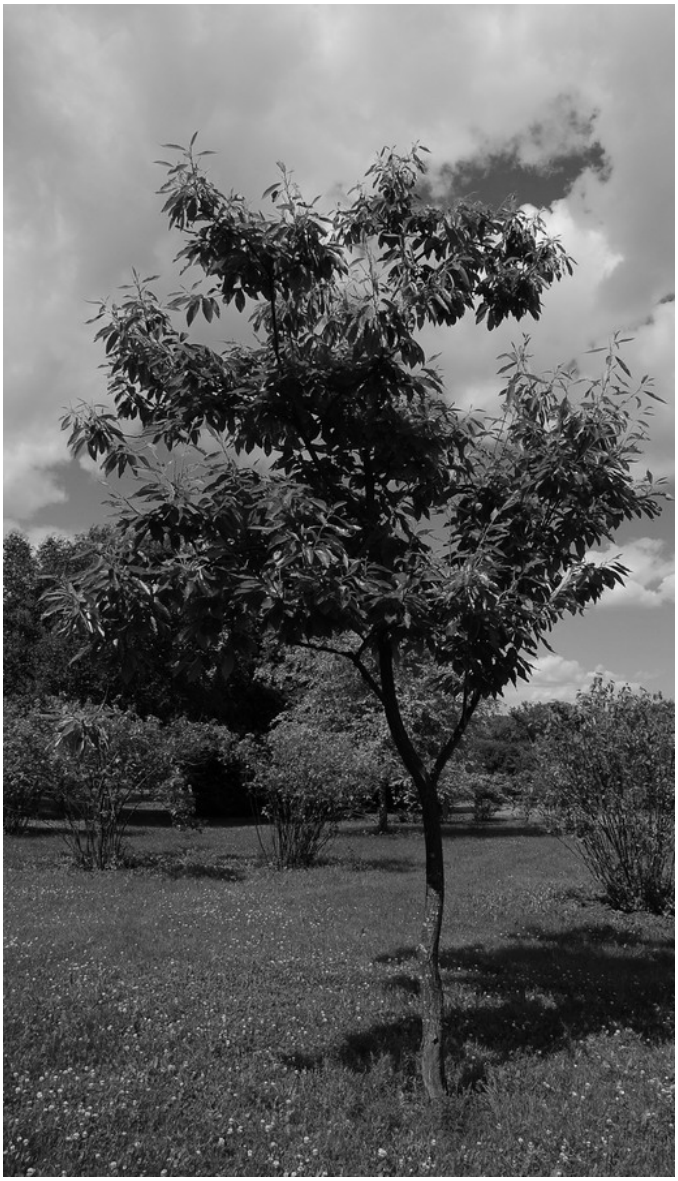
10:30 am, 31 October, 2009

The Canadian Chestnut Council will hold its 21st annual general meeting at Onondaga Farms, near St George, Ontario on 31 October. All members and others interested in restoring the American chestnut tree are welcome.

The agenda this year features both domestic and guest lectures, a presentation by Ms Kelly Schafer of her new educational DVD and a tour of John Hill's chestnut nursery.

A free lunch will be served.

There have been a number of changes to the Board of Directors in the past year, and the approval of the members will be solicited during the business part of the meeting - but not until we have all had lunch.



The Agenda

10:30 - Registration
11:00 - Greeting by the Chairman
Mike Nemeroski Memorial
Thanks to retiring directors
Kelly Schafer's presentation
Breeding and research reports
12:00 - Lunch in the Molly Henderson Lodge
1:00 - Business meeting: Chair's report, Treasurer's report, Elections
- Keynote speaker: Danijela Muricmladenovic, OMNR
- Closing remarks
3:00 - Tour of the Chestnut orchard

Mr Murray Alward, Manager of Riverbend Farms, replaced Mr Doug McKeen as Chair and will act in that capacity until the annual general meeting. Mr Ron Casier is the acting Deputy Chair. They will present themselves to the meeting for re-appointment as Executive members of the Board. Other candidates will likely be applying for election and re-election as Board members.

This is your opportunity to meet your directors face to face and tell them your concerns or seek planting advice. We hope to see you there.

The Canadian Chestnut Council

The CCC is a scientific and charitable organization with the mission to restore the American chestnut. All its officers volunteer their services both in the field and at the desk. The CCC annual meeting, the web site and this Newsletter dispense information to generate support for saving and restoring this once-important forest tree.

EditorialS

Board Changes

The column to the left has changed in the last few months. Chair Doug McKeen resigned, to be replaced by Mr Murray Alward until the annual general meeting. Mr Ron Casier agreed to be Deputy Chair.

A word also about our Honorary Directors, who nobly support the CCC with their counsel and assistance from distant places. . They generate local interest while supporting the CCC in a variety of ways. Dr Peter Rice has moved to Ottawa but remains a director.

At the last Annual General Meeting we were blessed with younger directors armed with fresh ideas. The next AGM will, we hope, add to our Board more members with new guidance.

Newsletter Changes

We turned over Pages 7 and 8 to Dr Terry Anderson, former Chair, who offers a technical explanation for some CCC experimental procedures. The renewal and report forms will reappear next issue.

In Memoriam

Mr Mike Nemeroski, former Director and avid chestnut breeder and grower, passed away this Spring, leaving a legacy of fond memories and more. A detailed report is included in this newsletter.

Mike was an avid CCC member who devoted much of his life to his favourite tree and the CCC. We shall miss him greatly.

The Endangered Species Act

Mr Ron Casier was appointed Liaison Officer to the Ontario Minister of Natural Resources at a recent meeting of the Board of Directors. He will relate to the ministry the CCC's concerns, and suggest ways to enable the CCC to continue its work.

Ron is armed with the knowledge, contacts and diplomacy needed for this task. He has received a reply from the Minister; it is reprinted in full on Page 4. We hope that a reassuring report will be available from the Ministry at the AGM.

Membership Fees

At its September meeting, the Board of Directors reluctantly raised the cost of annual membership from $15 to $20.

Costs have risen for everything from fertilizer to stamps, with fuel prices somewhere in there as well. The recession has made it difficult to raise funds from corporations as well. In short, to continue its work, the CCC must seek additional funds from its members.

We did not take this step lightly, and trust that the increase will not be cause for withdrawing member support for the restoration of a crucial Canadian tree.

Please help us restore the American chestnut to its former glory by renewing your memberships for 2010. The year of expiry is annotated on your address label.

Correspondence

From Ottawa

For a while now I have been looking to buy a Chestnut tree for my front yard but have been unable to find a nursery that stocks them. I found your email address on the **Canadian Chestnut Council** site and thought that you might be someone to contact about information to either buying or growing my own Chestnut tree. I live in Ottawa and have fond memories of the chestnut tree that used to grow just down the street.
Any information you could give me (even a push in the right direction or someone else I should contact) would be most appreciated. - Mark Lindsay

I think your questions are best answered by the current [April] issue of the Canadian Chestnut Council newsletter, the "Canadian Sweet Chestnut."
Let me recommend Mr Ernie Grimo as a possible source of commercial American chestnut nuts and seedlings. He is the most knowledgeable nut-tree man I know.
I'm puzzled by your statement, as few American chestnuts grow in North America now. If there are any in Ottawa, I would appreciate street addresses or other site data as the CCC is compiling locations for future breeding. The trees that attract you may be Horse chestnuts (an imported species), which provided me with "conkers" to compete against others when I was much, much younger. American chestnuts are smaller (less than an inch in diameter) and slightly flattened, and there are three in a more softly bristled husk . - Ed.

The tree I was referring to was a Horse Chestnut tree. Sorry for raising hopes. I would still like to get my hands on a Horse Chestnut tree or at least a seed though. - Mark

from Buckhorn, Ontario

I am part owner of a one acre lot up in Buckhorn but that's as close to the country as I get. We have plans to develop a small B&B type structure on it …it's full of rocks and weed trees right now! - Ian Harvey

I'd like to encourage you to use that acre. There is satisfaction in doing what you want to do. Start this fall and plant trees.
Do some research. Poplars grow fastest and can be harvested in 20 years; they are good for pulp wood. Red pines are, in my opinion, most resistant to disease and infection and grow fairly fast. White pines are beautiful and grow a little faster, but they are vulnerable to white pine blister rust and the weavil. Black walnuts grow well on sandy loam and are fairly easy to take care of. Be very cautious about following Ontario government suggestions. Plant at a spacing of 10 x 10 feet (410 trees per acre) or closer. If you want to save yourself considerable labour, plant only conifers and watch them grow; the hardwoods will seed themselves in over the next 50 years. Planting hardwoods is heartbreaking.
Some trees are shade tolerant, some are shade intolerant and some fall between. Some trees are self-pollinating; some aren't. Few books will tell you the difference. - Ed.

From Norval, Ontario

I came across two wild chestnut trees last week. They are on a farm north of Highway 7 near Norval Ontario.
Both trees were quite healthy. One was about 8" BHD, the other was a copse of three trees, the largest 18" BHD.
The lady on the farm said she planted the trees back in the 50's from nuts she got from a grower in the Niagara region. The trees had catkins and lots of burr-comb on the ground. There may be more trees in the surrounding woods.
The [owners] were quite excited about the trees and hope to have someone look at them. I can show someone where they are if they are of any interest. - Gerald Martyniuk

I'm sure someone will be out to look at them. Thanks! - Ed.

From Eastern Ontario

Who would I contact in order to possiblily get a chestnut seedling/sapling or two (or threee, four...) to plant in my yard? My interest is obviously seeing the American Chestnuts return to their former glory and as a birder, I do my best to plant mast/cover species to attract birds. As a resident of Eastern Ontario, I know that chestnuts are not "native" but could they stand a chance here?
As I understand it, Oaks (seem to) offer some protection against the blight when near each other. I have Red Oak on my property (as well as Sugar Maple, and I have planted Silver Maple and will be planting Red Maple, White Ash, Ironwood, Shagbark Hickory, Black Cherry, American Elm amongst others. - Martin

The CCC's treees - both hybrid and pure native American chestnut - are too precious to sell or give away; they are research material and the basis of future blight-free generations. However, some directors collect nuts in the fall and often give away extra nuts or potted seedlings at the AGM or in the early Spring. Transport is always a problem.
The CCC has recorded American chestnut trees growing in the Ottawa area, Thunder Bay and North Bay. I don't think you need to worry.
The CCC has not really researched the effect of immediate environment on American chestnuts, but our tree registry offers an opportunity. We are aware that the soil must have a pH of between 4.6 and 6.0 - ie, very acidic. - Ed.

Wild turkeys love chestnuts.

OMNR Responds to the CCC

Mr Ron Casier, the CCC's Liaison Officer to the Ontario Ministry of Natural Resources, received a reply from the Minister as follows:

"21 August, 2009
Dear Mr Casier:

"Thank you for your letter regarding an agreement under the Endangered Species Act, 2007 (ESA). I am pleased that the Canadian Chestnut Council (CCC) is planting American chestnut within and outside of its native range as well as supporting efforts in the hope of achieving blight resistance.

"The activities involving the hybridization of American chestnut with other Castanea spp. are consistent with the thinking of the American Chestnut Recovery Team. We believe that in order to effectively recover the species, it is necessary to continue to investigate the potential of these hybridization efforts. As a result, an agreement under the ESA for these activities would allow the CCC to remain compliant while undertaking further research into blight resistance.

"The out-planting chestnut seedlings within and outside its native range by the CCC is also consistent with the thinking of the recovery team. These activities can also be included in the agreement, provided that they contribute to the protection of the species.

"The agreement would include authorization for any of the activities involving pure American chestnut such as the backcrossing of hybrid trees to pure American chestnut trees, the inoculation of American chestnut trees with chestnut blight serum and the out-planting of American chestnut seedlings both within and outside their native range.

"In all likelihood, this agreement will be time limited, with requirements to report back to the Ministry of Natural Resources (MNR) on the effectiveness of the approaches outlined in your letter of June 12, 2009. The activities would be evaluated by MNR over time to ensure that they continue to be consistent with the goals of the ESA for the protection and recovery of the American chestnut.

"I would like to suggest that you continue your discussions with Ron Gould, Aylmer District Office's Species at Risk Biologist, in order to draft the content of an agreement. Mr Gould can be reached at (519) 773-4745 or ron.gould@ontario.ca.

"I appreciate the efforts of the CCC in working toward protection and recovery of the American chestnut species. Thank you again for writing.

"Sincerely,
(signed) Donna Cansfield
Minister of Natural Resources"

Update - The Endangered Species Act

In the April, 2008 issue of The Canadian Sweet Chestnut, the Endangered Species Act (ESA) was described for the benefit of tree growers. Since then, the CCC has endeavoured to learn exactly what our members will be allowed to do to preserve the American chestnut.

This article is intended to update our members. It is not yet definitive (obviously), but may offer limited guidance.

On 30 June 2008, the ESA (passed by the Ontario Legislature in 2007 came into effect. It prohibits destruction (Para 9(1)(a) and possession (Para 9(1)(b) of extirpated, endangered and threatened species, and lists some five pages of species that fall under the ban, including the American chestnut tree.

Then-Chairman Dr Terry Anderson, and others, attempted to contact the ESA authority, the Minister of Natural Resources (MNR), the Hon. Donna Cansfield, to explore the limits of the Act. No response was forthcoming, but it was rumoured that implementing regulations (to be passed by Order-in-Council) would be promulgated.

This year, with the Act now in effect and some 2,500 American and hybrid chestnut trees growing in CCC plots, an exemption for CCC members became more urgent. Several parallel approaches to the government have been pursued, with mixed results. They are documented below.

The following letter was submitted to the MNR 2 April, 2009.

Madam Minister:

The Canadian Chestnut Council (CCC) is concerned that the Endangered Species Act (ESA) of 2007 will force an end to the efforts of the CCC to restore the American chestnut tree to the forests of Canada. The CCC Chairman has directed me to write to you to ascertain if the CCC is conducting activities that can be prosecuted under the ESA.

The American chestnut (*Castanea dentata*) was infected by the blight carried into North America from Asia, and all the trees were destroyed. (In 1947 the passing of the last chestnut in Ontario was noted by Dr. Sherwood Fox of the University of Western Ontario; since then, no chestnut has ever been discovered that predates that time.) The few hundred American chestnut trees now living in Canada grew from shoots from the roots of blighted and dead trees.

Unlike other endangered species, the enemy of the chestnut is neither man nor habitat destruction, but probably the most lethal forest tree pathogen ever to have found its way to North America: *cryphonetica parasitica*. The tree remains very popular, as it provides rot-resistant hardwood, beautiful furniture material and edible nuts for humans and wildlife. Although chestnut has not been growing for decades in its original zone, the blight remains and continues to threaten the tree.

Various methods have been tried to restore the American chestnut, but have not succeeded. It is the considered opinion of the CCC Board of Directors that hybridization appears to promise the best chance of producing a timber type chestnut that can survive in the forest despite the ever-present blight. The aim of the CCC is to produce such a tree.

The American Chestnut Foundation (TACF) in the USA has for some years been cross-breeding the American chestnut with Chinese and Japanese chestnut trees, which are highly resistant to the blight but have poor stature. Once a first (F1) cross has been made, pollen from those trees is used to fertilize the flowers of native (pure) American chestnuts, to produce seedlings that are 75% American and 25% Asian (BC1F1). This back-crossing is continued for three more generations, retaining only trees that demonstrate blight resistance during scientifically conducted tests, until a BC4 generation is grown; then those trees are inter-crossed to produce BC4F2 and BC4F3 generations. Inter-crossing reinforces the Asian blight immunity while maintaining the stature and general physical characteristics of the American variety. TACF now has such trees and will soon begin to distribute seedlings.

Legal difficulties caused TACF to apply patent protection to their product, which greatly limits possible future distribution here. The aim of the CCC is to emulate TACF in Canada, so that blight-resistant trees with the stamina to survive our climate, and without legal restrictions, can be created here.

Paragraph 9(1)(b) of the ESA forbids “possession” of extirpated, endangered and threatened species, and the ESA authorizes a fine of $250,000 and one year in jail for every unit of listed species found in a person’s possession. Corporations (eg, the CCC) can be fined $1 million per item and each director can be fined $250,000 and jailed for one year, per possessed unit. The American chestnut tree is listed as “endangered.” Black’s Dictionary of legal definitions states that anyone having control over a thing “possesses” it. The CCC therefore fears that it and its members could be in violation of the ESA and should not pursue the CCC’s goal.

The CCC is a nonprofit charitable organization of volunteers. Our Board of Directors includes several members with PhD and Master degrees in plant science, and is assisted by a volunteer University of Guelph biology professor and by a paid graduate student. It was given two three-year grants of operating funds by the Ontario Trillium Foundation. It has also been supported over the past 21 years by dues and donations from almost 200 enthusiastic members and grants from environmental groups. It would appear that the work of the CCC is recognized by both the Ontario government and other groups as being worthwhile.

Therefore, the CCC asks you, as implementing authority for the ESA, whether an amendment to the ESA is contemplated to exempt from prosecution those who are trying to restore this endangered species to health.

At present, the ESA provides only that a certificate of exemption may be applied for, "may" be granted and can be withdrawn at any time. As it takes from four to ten years to grow each tree generation for cross-breeding, some long-term assurance of immunity is required. Can the Minister offer assurance that a long-term CCC program would be immune from prosecution?

Will you assure the CCC that hybrid chestnut trees produced by the CCC - with American stature and characteristics and the blight resistance of the Asian varieties - will be allowed to grow in Ontario?

Finally, I respectfully request a written reply to this letter, signed by yourself, to assure the members of the CCC and its Board of Directors that they will not be prosecuted for their work.

Yours sincerely,

(sgd) Charles Hooker, Secretary, Canadian Chestnut Council

The following reply was received, dated 8 April:

"Thank you for your letter to the Honourable Donna Cansfield, Minister of Natural Resources, dated April 2, 2009, regarding the Endangered Species Act and the efforts to restore the American chestnut tree.

"Your correspondence has been brought to the Minister's attention and you will receive a more detailed response in the near future."

(sgd) Rick Winston, A/Correspondence Manager

Meanwhile, Chairman Doug McKeen emailed a similar request to Scott Smithers, MNR Area Biologist, Kemptville District, and received the following response, which was directed to him via the Ottawa Stewardship Coordinator:

2 March: "Seeds collected from cultivated trees, and trees grown from seed that wasn't collected from the wild, are OK for planting as long as they are **NOT planted in the wild**. [Emphasis by the originator - Ed.] They can even be bought and sold. Butternut is the only one that has the 'if you don't buy it, it can be planted in the wild' exemption. The only way to go about doing this, if you wanted to plant the chestnut seedlings in the wild, under the ESA would be to apply for a recovery permit.

"[As you probably know, planting American chestnut outside of its native range is somewhat controversial and according to some, it is not consistent with the draft recovery strategy for the species.]

"Hope this helps, and doesn't end up putting a wrench in your plans...Heather"

Heather Zurbrigg, Species at Risk Biologist, Butternut and American Ginseng (705) 760-4286

Dr Greg Boland (University of Guelph) received from Ms Barb Boysen (FGCA) an extract from a new regulation implementing the ESA, as follows.

Ontario Regulation made under the Endangered Species Act, 2007 - Excerpts of Sections 5 and 12:

Butternut

5(1) Clause 9(1)(a) of the Act does not apply to a person who kills a butternut tree that occurred naturally if, in the opinion of a person or member of a class of persons designated by the Minister, the butternut tree is affected by butternut canker to such a degree that it is not necessary to retain the tree at its current location to support the protection or recovery of butternut.

(2) Clause 9(1)(a) of the Act does not apply to a person who kills a butternut tree if,

(a) the tree did not occur naturally but was cultivated;

(b) the cultivation of the tree was not required by a condition of a permit issued under Section 17 of the Act; and

(c) the tree is killed by or at the direction of the owner or occupier of the land on which the tree is located.

(3) Clause 9(1)(b) of the Act does not apply with respect to a butternut tree if, pursuant to subsection (1) or (2), clause 9(1)(a) of the Act did not apply to the killing of the tree.

(4) Clauses 9(1)(a) and (b) of the Act do not apply to the taking, possession or transport of a butternut tree for the purpose of transplanting it if,

(a) the tree did not occur naturally but was cultivated;

(b) the cultivation of the tree is not required by a condition of a permit issued under section 17 of the Act; and

(c) the tree is killed by or at the direction of the owner or occupier of the land on which the tree is located.

(3) Clause 9(1)(b) of the Act does not apply with respect to a butternut tree if, pursuant to subsection (1) or (2), clause 9(1)(a) of the Act did not apply to the killing of the tree.

(4) Clauses 9(1)(a) and (b) of the Act do not apply to the taking, possession or transport of a butternut tree for the purpose of transplanting it if,

(a) the tree did not occur naturally but was cultivated; and

(b) the cultivation of the tree was not required by a condition of a permit issued under section 17 of the Act.

(5) Clause 9(1)(b) of the Act does not apply to nuts from a butternut tree.

Commercial cultivation of vascular plants, etc

12(1) Clauses 9(1)(a) and (b) of the Act do not apply in respect of a vascular plant species to a person who is engaged in the commercial cultivation of that species, if,

(a) the person cultivates the species without the use of any material from the species, such as seeds, roots or cuttings, that was taken from the wild in Ontario on or after the date the species was listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;

(b) the person is not engaged in cultivating the species in the wild in Ontario;

(c) the person is not engaged in cultivating the species in a manner that is likely to spread disease to, or compromise the genetic integrity of, wild populations of the species; and

(d) not later than three months after the species is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species, the person gives the district manager of the Ministry written notice of,

(i) the person's name, address, telephone number and e-mail address,

(ii) the species that the person is engaged in cultivating and the cultivar, if any, that the person is engaged in cultivating,

(iii) the source of the genetic material for the species that the person is engaged in cultivating, and

(iv) the location where the person is engaged in cultivating the species.

(2) Clause 9(1)(b) of the Act does not apply to,

(a) the purchase, sale, lease or trade by any person, or the offer by any person to buy, sell, lease or trade,

(i) a living or dead plant that was cultivated pursuant to subsection (1),

(ii) any part of a living or dead plant that was cultivated pursuant to subsection (1);or

(iii) anything derived from a living or dead plant that was cultivated pursuant to subsection (1), or

(b) the possession or transport by any person of anything that the person acquired pursuant to clause (a).

(3) Clause (2)(b) does not apply to the possession or transport of anything for the purpose of growing a member of the species in the wild in Ontario.

Ms Boysen also wrote an article in the Ontario Woodlot Association newsletter "Sawmill & Woodlot Report," Winter/Spring 2009 issue, entitled "Butternut and the Endangered Species Act, 2007." It should not be assumed to address the American chestnut - only the butternut.

- C Hooker

Canadian Chestnut Council Donors

(Oct 1/08 to Sept 31/09)

We acknowledge and sincerely thank the following Canadian Chestnut Council member's for donations in excess of their annual dues. These donations make a great difference in the work of the Chestnut Council and help to prepare for our release of a blight resistant American Sweet Chestnut for Canada.

White Leaf (up to $99)

Murray Alward
George Amaola
Marjorie L. Anderson
James Barnett
Dorit Bartmann
Warren Beacham
Anita Bergen
Greg Boland
Douglas Campbell
Jocleyn Clarke
Robin E Cunningham
Adam & Diane Dale
Douglas Desmond
James Donowick
Henry N Driedger
William Dyck
Paul Eisenbartt & Marney Cuff
Don Fick
Clem & Gladys Fisher
John Flys
Dragon Galic
Alison Gibson
Dr Wilfred E Goodman
Marlene Hepburn
John Hill
J G Ivey
Keith Johnston
Lionel Lustgarten
Gunar Kravalis
Gerald Martyniuk
Alex McPherson
Cora Munn
Tom Pellar
Peter Rice
Chris & Kelly Schafer
Ten Penny Co. Ltd.
Stanley Wortner

Green Leaf ($100 to 249)

Mary Jane Amey
Terry Anderson
Ron Casier
George Collin
Alex T Landon
Arthur Loughton
Wilfred S Goodman
Michael R Margetts
Doug & Mary McKeen
Darcie McKelvey
Gordon & Susan Miller
Wilson Pate
Barbara Rycquart

Bronze Leaf (250 to 499)

Peter Bergen
G M Graham
Krystin Schroeder

Silver Leaf ($500 to 999)

W E Barnett
Frank Chanda

Gold Leaf ($1000 & more)

H N Hotchkiss
Colin Mc Keen

Mike Nemeroski Memorial

George Collin
Arthur Loughton
Rachel Riddle

In Memoriam - Mike Nemeroski

Former Director Mike Nemeroski passed away in July after an illness that progressed over the past two years.

Mike was a mainstay of the Canadian Chestnut Council. He pressed the Board of Directors to attempt measures that appeared impossible, but with his help were carried out successfully.

Mike was born in Saskatchewan in 1934. There he developed a love for nature that began with a fascination over the flight of birds.

In 1943 Mike's family moved to near Simcoe, Ontario, and then to the present family farm near Port Dover. When he found American chestnut shoots growing from an old stump, his curiosity was aroused and he became an ardent supporter of the tree for the rest of his life.

Mike joined the Canadian Chestnut Council in the early 1990s and continued to support it until his death. He was a most active pollinator; first he would reconnoiter American chestnut trees to ascertain when best to pollinate them; then at the proper time he would encase selected flowers in white plastic bags, return later to apply hybrid Chinese-American pollen obtained from the USA, and in the fall he would be back to collect the nuts and annotate their origins.

He is famous for his homemade "cherry-picker" that he fabricated to reach the best chestnut flowers near the tops of trees. Mike mounted an extension ladder to the tailboard of his pickup truck with two ropes, extended the ladder to reach the treetops and climbed heedless of danger to apply his pollination skills. That is not a recommended technique for a young man; yet Mike did so in his seventies.

Mike spent hours driving thousands of kilometers to locate surviving American chestnut trees and to pollinate them. He grew seedlings at his home and distributed them freely to anyone willing to plant them, driving to the recipients' residences to deliver them.

An irrigation system was required at Riverbend Farms, where a water source is nowhere near the planting site. Mike scoured the market for best prices and quality, bought the materials, set the base pipe supports in concrete, attached irrigation pipe and installed electrical connections. The pump was not designed for the available electrical service; so Mike modified the pump.

It was Mike who noticed weakness in chestnut seedlings in a University of Guelph greenhouse. He suggested that the soil pH was at fault; the soil was tested and found to be near neutral, whereas a pH of 4.6 to 6 was demanded. His keen observance saved the first batch of CCC seedlings from disaster.

It was Mike who first detected the threat offered by the federal Species at Risk Act (SARA) and the Ontario Endangered Species Act (ESA), and brought them to the attention of the Board of Directors before the ESA was passed into law. His alertness gave the Board time to develop a strategy to pursue OMNR approval for continuing its work in hybridizing the American chestnut.

Mike was an active Nominating Committee Chair, finding and persuading suitable candidates to join the CCC Board of Directors and to undertake essential services. He also enjoyed making picture frames of American chestnut wood that he had husbanded carefully - and then giving the frames away.

Mike was handicapped by his ill health for the last two years of his life, but refused to quit his appointment as Director until his illness overcame his persistence and forced his retirement.

It was learned after his death that Mike had committed his carefully maintained chestnut lumber - a very scarce commodity since the blight struck Ontario - to the Canadian Chestnut Council. He also willed a very substantial donation to the CCC, which will be devoted to planting work in his memory. Here was a man who selflessly cared for the American chestnut and ensured that this glorious tree will not disappear from the nation.

A memorial fund recently began spontaneously when a member suggested it be started. It has already grown substantially and will also be used to care for the CCC's American and hybrid chestnuts. But Mike's real memorial is the trees growing at Riverbend and Onondaga Farms - a living tribute to his dedication.

Late News

At its meeting 9 September, the CCC Board of Directors decided too explore the possibility of establishing a Mike Nemeroski Memorial Fund, to which memorial donations and Mike's bequest would be assigned to yield interest or other gains for long-term use. That would ensure that the CCC has some funds to continue despite temporary shortages of funds. The matter is being investigated and will be reported on again.

Response to the Peer Review Committee's Comments and Recommendations

by Dr Terry Anderson, Plant Pathologist (retired)

The PRC provided the CCC with an excellent review of the breeding project and I thank all the committee members for donating their time and expertise to the review. In response to some of the suggestions by the PRC, I believe those regarding the current screening technique and preliminary screening results were a concern of the PRC and are certainly a source of ongoing controversy within the executive of the CCC. I would like to present my thoughts on the need for a modified screening technique for the F1 generation, additional results and modifications to our plans in response to the PRC recommendations. I refer specifically to the PRC concluding remarks: "Developing a practical and reliable resistance screening protocol is critical to achieving the breeding goals at minimum cost."

An effective method for screening and breeding for resistance was developed by Dr Fred Hebard of TACF utilizing back crossing and intercrossing of advanced breeding lines with selection for resistance at each generation.. Highly resistant Chinese germplasm, selected after rigorous screening by trunk inoculation, is recommended for the first cross to produce F1 trees. TACF has numerous chapters at diverse locations, many volunteers and many thousands of native trees still existing in the wild for use as native parents. The CCC did not initiate its breeding program in exact accordance with this method and as a result the F1 screening program was modified.

The CCC initiated the breeding program because the number of American chestnuts that were producing nuts in Ontario were in decline due to blight and other diseases. It was felt that this germplasm was valuable because it was representative of the northern area of chestnut adaptation and was unique to Ontario and the only way to preserve it was to add resistance from an exotic resistant source. The CCC rejected an offer of resistant pollen from TACF because of a germplasm agreement that would give TACF final approval on the distribution of resistant trees. The CCC decided to accept pollen from hybrid trees from Connecticut that had not been previously tested for resistance. In summary, the CCC has an F1 population composed of unique native germplasm that the CCC has no hope of replacing or re-collecting because of limited volunteer and financial resources, and this population has an unknown level of resistance provided by an untested source of resistance. In addition, the current ESA legislation prevents further collection of chestnut germplasm from the wild. I offer this as an explanation of why the CCC science group sought an alternative, non-destructive means of selecting suitable parents for the F2 generation by short term branch inoculation versus the accepted long term trunk inoculation method that could result in the death of the CCC collection before crosses or additional sources of resistance can be inserted into the program.

In response to your summary of specific technical suggestions, I offer the following comments:

The likelihood of success in developing blight-resistant chestnut trees that are 100% C. dentata of Canadian origin (i.e., breeding program goal #1) is low.

I agree with this observation and it was the basis for initiating the CCC breeding program. Dr Dale feels that there is at least some partial resistance in native trees. This feeling is shared with a few other members of the CCC; Dr John Ambrose, Dr Greg Boland and Barbara Boysen (MNR) come to mind. I discussed this with Dr Dale and he agreed to keep the focus of the breeding program on hybrid development. Some advanced generations of a few native-x-native crosses will be produced for evaluation and comparative purposes.

The standard set to develop blight-resistant hybrid trees of at least 92% Canadian origin (i.e., breeding program goal #2) may be unnecessarily costly to achieve based on the available breeding materials.

I agree with this conclusion, but feel that we need to evaluate the F2 material to better assess the potential of our breeding material. Recent information from TACF indicates that some intercrosses of F3 material are losing resistance. We may be better off to inter cross F2 material but this is a decision that the CCC Board must entertain after we have F2 results.

Results of the preliminary resistance tests did not show significantly stronger blight resistance in the hybrid progeny than in the pure C. dentata selections, which may indicate that hybrids do not offer significant resistance advantage – at least for the current generation hybrid progeny.

This result is of great concern to the science group as well as other board members. These results can be attributed to the following: a) unsuitable inoculation technique, b) non-pathogenic blight isolates, c) resistance in the native trees, or d) lack of resistance in the resistant sources.

a) No one in the science group feels branch inoculation is as effective as trunk inoculation in assessing long term blight resistance. The reasons for selecting branch inoculation were presented above. Anagnostakis (1992) inoculated branches of older trees (up to 40 years old) and found some differences in rate of canker elongation after 114 days. Kubisiak et al (1997) were able to use canker expansion data from trunk inoculations after 3.5 months in the molecular mapping of blight resistance. There have been no additional published results of branch inoculation of chestnut; however others have used branch inoculation of other trees such as poplar to study disease development and resistance (Griffin et al, 1984). Dr Dale analyzed the first 2 years of data based on the rate of expansion of lesions (recommended by TACF) on branches.

In a limited study of 8 trees, we compared lesion lengths that developed on branches during the summer (2008) with lesion lengths that developed on the trunks of the same trees over a 12 month period and found a correlation between rate of lesion expansion over the summer and lesion area on the trunk. This suggests that branch inoculation is an indicator of results obtained with trunk inoculation. Additional branch-trunk comparisons were initiated this year (2009). We are also modifying our branch technique in an attempt to improve it.

We moved the inoculation points further from the trunk to reduce the incidence of secondary trunk infection. Following Dr Hebard's suggestions we attempted to inoculate only on the west or north side of branches and used branches that were >3/4 inches in diameter where possible in an attempt to reduce variation.

I feel that when repeated for 2 years the short term branch inoculation technique is suitable to select the more resistant parents from each family for potential use as F2 parents, while preserving germplasm for additional crosses or other scientific studies. We expect the trees have a limited life span because of the possibility of natural infection.

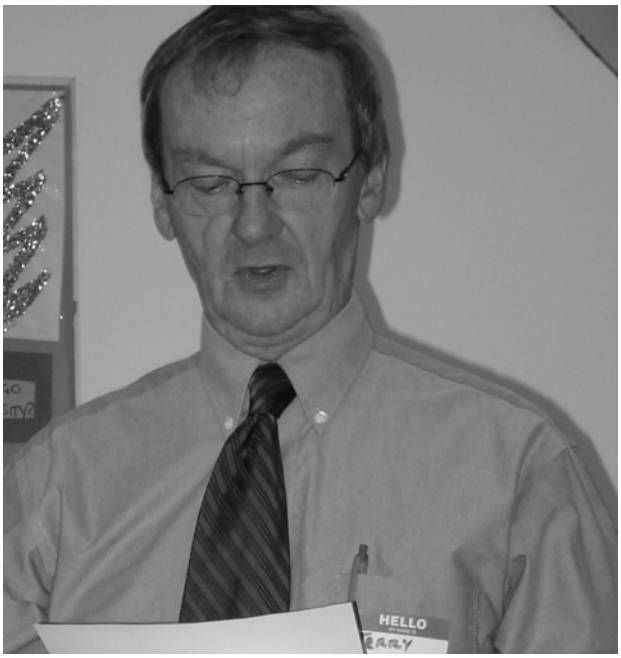
As suggested by the PRC, the R2T8 source of resistance is the only one that shows any promise at this time and will be used in crosses in 2009 if trees are suitable for crossing. In addition, the CCC is investigating the possibility of obtaining resistant pollen from TACF to augment its sources of resistance. This will require a board decision regarding the TACF Germplasm Agreement.

b) Non pathogenic blight isolates would explain why hybrids did not appear more resistant than native trees. In 2008, we evaluated 4 additional isolates. Two isolates were isolated from infected chestnut seed in 2008 in the event that the U of Guelph isolates used in screening had lost pathogenicity during storage. One was hypovirulent and another was considered weakly pathogenic in laboratory tests with apples. Results indicate that pathogenicity of old and new isolates was similar and loss of pathogenicity was not a problem in our current isolates. In addition, lesion lengths were similar but not directly comparable to those that developed on trunks of native trees and F1 Nanking hybrids over a similar time period (Hebard, 2003, [Table 4]). Even using a highly resistant Chinese parent, there was little difference between the native trees and the F1 hybrids in that particular study.

c) Some non-host-specific resistance may be present in native trees, but it should not be greater than specific resistance available in exotic germplasm.

d) Our source of resistance may be weak but this needs to be tested by top-crossing our better performing trees and evaluating in the F2.

The recovery of resistance and confirmation of major gene resistance in the hybrid progeny are high priorities, and ultimately determine the quality of the hybrid breeding material and the likelihood of future success with the hybridization breeding approach.



Dr Terry Anderson

I believe that the recovery of resistance will be determined in the F2 generation and, as stated above, additional sources of resistance are being sought.

It is critical that the breeders work closely with a pathologist who can help to culture and evaluate strains of C. parasitica, so that an effective and reliable blight resistance screening protocol can be used

The pathologist and breeder have worked closely to date, but more input is required from a pathologist who has a functional laboratory and can provide additional pathology support as required (cultures, pathogenicity testing, analysis, communication, etc). This support should be sought by the CCC. *In addition to pursuing the current breeding program, it is recommended that the CCC develop a working relationship with the American Chestnut Foundation (ACF) to evaluate some of their lines under Ontario conditions as well as working with them to develop lines adapted for this area.*

I believe that the CCC and TACF have a good relationship at present. Establishment of a working relationship would require signing of a formal agreement. We could send seed from native Ontario trees and F2 material to Meadowview for evaluation under Virginia conditions with their isolates. I believe the appropriate location to evaluate our material is locally because there is a large environmental effect with both trunk and branch inoculation. No 'races' of the pathogen have been identified but it may be better to screen with local isolates.

The breeding strategy/approaches used by TACF for developing blight resistance may be very helpful to the CCC. TACF approach is proven, effective, and practical, and may provide a faster, more cost-effective way to achieve the CCC's breeding goals.

The breeding strategy/approaches advocated by TACF will be incorporated into the CCC screening and breeding plans when we begin to test the F2 populations. This will include trunk inoculation.

The CCC might also consider engaging government agencies and nut and timber industries to secure more resources to support its long-term breeding program.

These are excellent suggestions. There is no reason why we could not approach the timber industry. We have not had funding from the nut growers because they are a small industry but we have had their support in our public relations and outreach programs.

Once again I would like to thank the PRC for their work and hope that the above provides an update of our activities in response to your suggestions and concerns. - Dr T Anderson

References

Anagnostakis, S. L., 1992. Measuring resistance of chestnut trees to chestnut blight. Can J. Forest Research.22: 568-571

Kubisiak,T. L., Hebard, F.V., Nelson, C.D., Zhang, J, Bernatzky, R., Huang, H., Anagnostakis, S.L. and Doudrick, R.L. 1997. Molecular mapping of resistance to blight in an interspecific cross in the genus Castanea. Phytopathology 87:751-759

Hebard, F.V. 2005. The backcross breeding program of the American chestnut foundation. In proc.of conf. on restoration of American chestnut to forest lands. Stiener, K.C. and J.E. Carlson (eds) 1-17