

The Canadian Sweet Chestnut

-Newsletter of the Canadian Chestnut Council-

Issue # 73 – December 2018



<http://www.canadianchestnutcouncil.ca>

Council Mission - to help restore the American Chestnut to the areas of Canada it once occupied.

Current Priorities

- 1) Breeding resistance
- 2) Breaking Isolation / Establishing Genepool Nodes
- 3) DNA Analysis
- 4) Survey of existing chestnut trees in the wild

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 - **American Chestnut Foundation Research Initiatives** – Dr. Jared Westbrook, Director of Science, American Chestnut Foundation

Summary of presentations at the 30th AGM of the Canadian Chestnut Council held Saturday Oct 20, 2018

Opening Address : Chairman Ron Casier

With this AGM, we acknowledge a special anniversary of the founding of the Canadian Chestnut Council. Thirty years ago, a group of dedicated volunteers, organized the council to preserve and restore the American Chestnut under the leadership of late **Dr. Colin McKeen** and **John B Gartshore**. Since that beginning, there has been an unbroken chain of dedicated volunteers who have served on the council and continued the work of our founders. Many of you sitting out there are part of that commitment, which passed the torch to the present council. Dr. George Collin a former Treasurer was a tremendous fund raiser and chestnut enthusiast. The gavel I am using today is from our former secretary Mr Charles Hooker.



Chairman Ron Casier

After the tenth anniversary, the council laid the plans for a systematic breeding program of hybrid crosses using pollen from **Dr. Sandra L. Anagnostakis** of the Connecticut Agriculture Research and Experimental Farm and 26 native wild American Chestnuts. The late **Gil Henderson** became the council's benefactor in 2000 by providing land for the first research plot at Onondaga Farms and arranging a home for the Canadian Chestnut Council here at the Tim Horton Children's Camp. **John Hill** our longest serving current director has kept and continues to fulfill Gil's vision for the American Chestnut at Onondaga Farms with approximately 14,000 chestnut trees on site. The late Harley Hotchkiss was another benefactor providing the Riverbend Farm site. For eighteen years, our breeding program initiated by Dr Adam Dale and carried on by Dr. Dragan Galic has grown to approximately 17,000 chestnut trees at three research plot locations. Thousands of hours of pollinations, inoculations, measurements, harvests, cross selections followed by more plantings of F1 and F2 and soon F3 generations were performed by a dedicated band of chestnut enthusiasts. My involvement began on the twentieth anniversary, when director Murray Alward invited me to the meeting and nominated me to the board. Serving as a director, then vice chair and currently chair, my enthusiasm for the American Chestnut and restoring the species to its original ecological, economic and cultural roles in the environment and society has only grown. It is my sincere hope that there are individuals sitting here today that will join the Canadian Chestnut Council and serve on the board for the next decade. As you will hear in the science reports that follow, progress is being made in all areas but there is still more that needs to be done. You can be part of saving the American Chestnut. In reviewing the past year, the Canadian Chestnut Council had a few challenges to overcome and some significant successes.

* Our application to renew our Blight Resistance Breeding for another three years with the OMNRF SARF (Species at Risk Fund) was not accepted this year. Fortunately, we have had the ability to work through the short fall and will be resubmitting a new application this autumn.

* The tissue culture and micro-propagation project that you were presented with at last year's AGM by Christie Lovat has been terminated. Mc Gill University required all funds in advance and our grants work in the opposite way. We receive the funds as reimbursement of costs incurred. We were

not able to resolve the mechanics of this. We hope to find another opportunity for tissue culture at future date.

* Dr. Duane Falk delivered his review on the work of the blight resistant breeding program to the science committee. The review reflected that progress that has been made but also indicated some improvements and suggestions. Efforts are being made to implement these improvements in the methodology of the program.

* After several summer droughts in the past, weather wise, the chestnut trees loved the heat and rain this past growing season. One metre growth was common with some trees putting on nearly two metres of growth in the research plots.

*The additional moisture also assisted with the planting of various gene conservation nodes, which continue to expand, and the addition of “breaking isolation” sites. Conservation Authorities and even Provincial Parks continue to be willing hosts for the gene conservation nodes.

*Our outreach program to the public has continued with participation in Ontario Woodlot Association’s AGM in Shakespeare, Ontario; numerous American Chestnut presentations to various organizations such as the Ontario Federation of Hunters and Anglers; and the “Chestnut or Chest Not” activity to 4000 grade 6&7 students for the ninth year at the 10th annual Carolinian Forest Festival at Springwater. This activity involved the students performing four soil tests to determine the suitability of the site for an American Chestnut planting.

It has also been an eventful year in the greenhouses and fields for the council. Today you will hear firsthand reports on the various on-going projects from our dedicated lead scientists and researchers. In Addition, Dr. Jared Westbrook the Director of Science of the American Chestnut Foundation will share his knowledge and expertise with the species in the United States.

It promises to be a great program and I hope you enjoy and learn from the presentations and are as enthusiastic about the afternoon as I am.

Ron Casier
Chair.



Dr. Dragan Galic



Dr. Brian Husband

Canadian Chestnut Council Research Activities 2018

Dr. Dragan Galic / Dr. Brian Husband

Dr. Dragan Galic reviewed the following three programs of the Canadian Chestnut Council during 2018.

- Breeding for Resistance
- Breaking Isolation
- Establishing Gene Nodes

A summary of all these initiatives may be found in the September 2018 edition of this newsletter.

<http://www.canadianchestnutcouncil.ca/docs/newsletters/CCC%20-%20October%202018.1.pdf>

Dr. Brian Husband commented on two projects he and his colleagues have been leading this past year.

- DNA Analysis
- Survey of existing Chestnuts in the wild.

DNA Analysis - The population genetic analysis of American chestnut in Canada, based in the lab of Dr. Brian Husband at the University of Guelph, continues to make good progress. There have been two main developments. First, the initiative has been joined by Sophia Stoltz, a M.Sc. student who will complete the DNA work as part of her thesis research. She will provide the continuity and full-time commitment needed to complete this project successfully. Second, as part of her thesis, Sophia has completed additional sampling in the United States (from Maryland to Pennsylvania), which will allow us to better understand whether, and how, the northern periphery of the chestnut population differs from the centre. Sophia has completed most of the DNA isolations and testing, and is now collecting the genetic data for all of her samples from Canada and the U.S.

Survey of existing Chestnuts in the wild – a comparison was conducted between the 2014/2015 vs. the original 2001/2001 survey. Over 800 trees were visited and the health and habitat of the tree were compared to the tree's original condition. Overall, there has been a significant increase in the chestnut blight, and increase in die back and a decrease in the number of trees that are reproducing. Overall, a

20% loss in the number of live trees was observed. Without intervention, the existing wild population is unsustainable. Environment, geography and weather also play a role in survival. (Next issue of newsletter)

Restoration of the American Chestnut: A marriage of breeding and biotechnology – Dr. Jared Westbrook – Director of Science, The American Chestnut Foundation



Dr. Jared Westbrook (left) visits the Onondaga Farms Chestnut Plot with John Hill (right)

Dr. Westbrook reviewed the holistic approach that has been adopted by The American Chestnut Foundation (TACF). The TACF looks to integrate three primary approaches (3BUR approach) - Breeding, Bio – Control and Biotechnology in its efforts to restore the American Chestnut.

Breeding -the breeding initiative has focused on backcross breeding the native American Chestnut with Chinese Chestnuts. The Chinese Chestnut has genetic resistance to the chestnut blight. Over 30,000 B3F2 trees have been planted in seed orchards at TACF’s Research Farms at Meadowview. The traditional selection criteria for resistance was reviewed. More recently the TACF has adopted an accelerated progeny testing method “small stem assay”. This method which involves the greenhouse inoculation of small stem samples, allows for the testing of more variables and at an accelerated rate (1yr. vs. 3yr. in field).

Biotechnology – the TACF has partnered with the State University of New York, College of Environmental Science and Forestry (SUNY-ESF) in a project that sees a transgenic insertion of the oxalate oxidase gene (OXO) from wheat into the American Chestnut genome. This gene provides blight resistance to the resulting American Chestnut. Field tests have confirmed resistance and the partnership is pursuing regulatory approval for distribution.

Bio - Control – the use of hypo viruses to control blight is the third initiative of the 3BUR approach. It has been found that certain viruses weaken the pathogen (*C. parasitica*) responsible for the spread of the blight.

Dr. Westbrook also noted that the American Chestnut was also subject to Phytophthora root rot caused by a soil-borne pathogen, *Phytophthora cinamomi*. Root rot is spreading and is predicted to be an issue in Canada over the coming years. Moving forward, for American Chestnut restoration to be successful, the progeny will have to be resistant to both blight and root rot.

2018 Donor's Leaf Awards (January-December)

White Leaf (\$25+ to \$99)

Robin Cunningham
Neil Castagna
Sandra Short
Paul Faires
John Hill
Doug Fagan
Wes Horley
Janet Kellam
Cedric Bail
Neil Stein

Green Leaf (\$100-\$249) Bronze Leaf (\$250-\$499)

Stan and Clara Wortner	Terry and Candace Anderson
Douglas Desmond	Dorothy MacLeod
Kathleen Potter	Ron Casier
Dolf Wynia	Brenda Elliott
Dragan Galic	
Peter Smith	
Tim Casson	
Gordon Chinnick	
Brian Wheeler	
Hugh Garrioch	
Adam Dale	
Peter Rice	
Charles Hooker	
Christian Schroeder	

Silver Leaf (\$500-\$999)

William Barnett

Gold Leaf (\$1000 or more)

Walter Zimmerman
Peter and Annita Bergen

HELP IS NEEDED - there are over 15,000 chestnuts in stratification at the Simcoe Research Station and an email blast to help plant for those who can get to Simcoe will be coming out in February.

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Interim Directors – Don Campbell, Nathan Munn, Pete Smith