Canadian Chestnut Council

. . . on the Chestnut Trail

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Opening Comments by Colin

Spring has come once again and we wonder about the challenges that another growing season will bring. Our winter weather was variable but there should not be very much, if any winter injury to chestnut populations. We hope that southern Ontario's milder weather in February and March did not induce bud break too soon. In the last few years, chestnut growth has suffered more from late spring frost than from winter injury. (Colin McKeen, Chair, Canadian Chestnut Council)

Logo Contest for CCC

The CCC needs a logo for its letterhead and for promotional items such as T-shirts, etc. Here's a chance to test your artistic skills in our contest for a suitable logo. This is open to all CCC members, their family and friends... in fact anyone with an artistic bent. Your drawings can include one or more of the following... leaves, twigs, burrs or nuts. The artwork should be black (ink, print, NOT pencil) on white 8 1/2" x 11" paper. Artwork can be mailed to the CCC secretary or brought to the November '95 annual meeting. Prizes are $50, $30, and $20. All artwork becomes the property of CCC.

Some Personal Experiences with the American Chestnut - John B. Gartshore

Once when I was a small boy, I went back to my favourite tree to gather nuts, and found about 20 adults and teenagers were stealing my nuts. Some of them had climbed the tree and were sawing off limbs to get to the nuts. I told them to stop but they only laughed at a small boy and I came home in tears.

Every fall I looked forward to gathering chestnuts in our woodlot. I could sell some of them, but the rest I kept and we would roast them on our kitchen woodstove. The nuts were delicious.

The going price for chestnuts at that time was $4.00 - $5.00 for a six quart basket.

Chestnut wood was average for heating. It burned well but with too many sparks which kept us on our toes when we removed the firescreen to get more heat.

Chestnut lumber was an excellent building material. Most of the large logs were sold and used in frame construction and finishing. It was strong and had good nail holding qualities. The smaller trees were used as fence posts and rails as they were very easy to split and resistant to decay. The most popular use of chestnut lumber was for finishing homes because the wood had an attractive grain and a beautiful creamy gold colour. Unfortunately it was usually stained dark brown.

After I completed public school, a great uncle sent me to a private boarding school, Ridley College in St. Catharines. As you can imagine, this was quite a change for a country boy. After some unhappy experiences, I learned to survive with difficulty.

The school had one mid-term weekend in October, and one thing I looked forward to were the chestnuts. I couldn't wait to get to the woods, but disaster waited me. All my favourite nut trees, that the pioneers had left when they cleared the land, were gone, dead.

After a few years, it was the most dismal sight looking over our woodlot, it resembled hanging skeletons with all the chestnut trees standing without bark. This was in the 1930's depression when wood was only worth about $20.00 per thousand feet.

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After overseas service in W.W.II, I returned to take over the farm. Because of their resistance to decay, the chestnut trees were still sound, but a boring beetle invasion created worm holes in the lumber. I made changes to our house and farm buildings. I used chestnut rafters, studs, and beams. Outside siding too, with great abandon. Fortunately, I had one large log sawn in boards 12" to 22" in width. Showing more foresight than usual, I had stored these above the granary in the barn. When my daughter, Jacqueline and her husband built their own house on the property, I had found a good use for my chestnut boards. To retain as much thickness as possible, I did not plane the boards, but put them directly to a sanding machine. Rather than tongue and groove them, we cut a 1" overlap. Her hall and living room walls were panelled from floor to ceiling with the boards standing upright.

In 1948, when I took a course at Penn State University, I took time to visit the Forestry Department, because the American Chestnut is the Penn State tree. To find out what research was being done for its survival. I was distressed to learn they had given up all hope for this resource and had written it off completely.

For many years I suffered my loss of the chestnut trees alone, and then a group was formed to try to do something about it. This group became the Canadian Chestnut Council. There were many interested people, some with no memories of the fast-growing chestnut tree with so many varied uses.

Your interest and support of the Canadian Chestnut Council could some day see this beautiful tree as a very valuable resource in Southern Ontario and Eastern North America.

Note... Mr. John Gartshore is an enthusiastic supporter of CCC, and a charter director. Mr. and Mrs. Gartshore live on Auchinburn Farm, R R #3, Dundas, Ontario. If you have a chestnut story to tell, please send it to CCC for printing in a future newsletter.

Annual Meeting - 1994

This was held November 5, 1994 at the Horticultural Experiment Station, Simcoe. Attendance was good and the program was excellent. An illustrated presentation re Chestnut Research by Dr. Greg Boland, was a highlight of the meeting.* Also, there was good audience participation, plus reports from directors and from Stan and Arlene Wirsig of the New York Chapter, American Chestnut Foundation. We heard reports re growth of chestnut trees, new chestnut plantings and recent sightings of older, more mature trees that were not previously recorded. Promotional videos re chestnuts both from New York State and a Hamilton TV broadcast were shown. Charter Director, John Fingland decided to step down due to possible relocation. He has been an active director since formation of the CCC, and will be missed. The membership elected Donald Fick, of Aylmer, as our 12th director for 1995 - 97. Our present list of directors is included with this letter. Directors who have served their 3 year term are eligible for re-nomination to the board.

** Dr. Boland's presentation is summarized on pages 5 and 6 of this newsletter.*

Annual Meeting - 1995

This will be held Friday, November 3rd at the headquarters of the Grand River Conservation Authority, Cambridge, Ontario. You are invited to attend and hear more about the chestnut restoration program in Canada. Also, plan to participate in the discussions. You may be greatly interested in the findings of other enthusiasts as they will be, in your comments.

Burford Meeting

On February 16th, a meeting was held at the Grand River Conservation Authority Nursery near Burford. Activities of the CCC were explained to an audience of more than 50 people. Bruce Graham, Nursery Superintendent, showed two audio-visual movies. The shorter movie discusses a few aspects of the current recovery of the American Chestnut observed in the GRCA area. Bruce also reports that interest is growing in the Mini-Chestnut Museum located at the Nursery. Lumber for a chestnut floor in the log cabin is being donated. Other artifacts have been promised. The CCC is very grateful to Bruce for his keen promotional interest in chestnut restoration.

Forest Gene Conservation Authority

The CCC has become a member of the Forest Gene Conservation Authority. One of its primary goals is to ensure that the diversity of the germplasm of all woody tree species found in Ontario is preserved. It is important that the chestnut be adequately represented in this recently formed Conservation Association's plans. Our forest tree resource has been dwindling in the province for several years. Via FGCA, action is now being taken to preserve this heritage. We can all share in it.

Niagara Falls Official Tree

The American Chestnut has been named the official tree of Niagara Falls. Following a Canadian-American ceremony planting trees in cities of Niagara Falls in Ontario and New York State, the City Council of Niagara Falls, N.Y. passed a resolution naming the American Chestnut its official tree. The planting program which is to become an annual Earth Day/ Arbor Day event, is sponsored by the Niagara Falls, N.Y. Conservation Advisory Council and the Niagara Falls Ontario Planning and Greening Committees. (Copied from The Bur, Newsletter of the New York State Chapter of the ACF.)

Nutmeats

Interest is growing in Canada in the use of nutmeats. Chestnut kernels are unique for they are high in carbohydrates and low in oil content. Because of their main ingredients they are more akin to the grain cereals than to the meats of other nuts such as hickory, walnut, pine nuts, beechnuts, etc.

Because of their high carbohydrate content, the after harvest storage of chestnuts is often a problem. Infection of the nut with penicillium blue mold is frequently observed. A considerable percentage of the chestnuts imported from Europe are often found moldy when they arrive in our grocery stores in the late autumn.

A young entrepreneur in the culinary field has been seeking advice about after harvest handling of chestnuts. This may be an area for critical study when chestnuts become an important crop once again.

Tannin Content of Chestnuts

One of the reasons for the great importance of the chestnut tree to our pioneering forebears was because of its tannin content. Tannin imparted rot resistance to fence and telephone posts, fence rails, railway ties, etc. Chestnut tannins were also important to the tanning industry, particularly in the harness trade of earlier years.

If anyone has information about Ontario tanneries in which chestnut bark and wood was used for the extraction of tannins, would they please contact the CCC?

Transplanting Shock

Why do some seedlings do well and others fail to grow for one or two years? This question is often encountered, and a bit of research has enabled us to give the following answer.

Any transplant, woody or herbaceous, suffers from the shock of a move. Bare-rooted transplants suffer most. Transplants of an herbaceous type, like tomatoes, peppers, spanish onions, tobacco, etc., suffer less than most woody types. Transplanted tree seedlings may suffer serious injury because the complex relationship involving "mycorrhiza" (that mass of fungi that cluster around the roots) has been disturbed. When these fungi are torn loose from the tree's roots they require time and favorable conditions to re-establish themselves. Many of the essential elements (minerals) enter the tree's roots via the mycorrhizal fungi. If these fungi are destroyed, the tree will find it difficult to survive. To reduce the shock of transplant injury, do not allow the seedling to starve for water. Keep the growth of grasses and weeds at least 12 inches away from the tree stem. Keep the soil around the roots moist by frequent

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watering (once a week during July and August). A deep mulch of wood chips, sawdust, straw, etc., is also of great benefit in preserving moisture.

Once a tree seedling is forced into a summer dormancy because of dry soil, it seldom starts regrowth until late in the growing season. New growth in chestnut late in the season usually results in a soft growth that does not harden off and thus becomes prone to winter injury.

Fertilization

If fertilization is carried out, it is best done early in the spring (April or May). Don't apply any fertilizer during the year of transplanting. Use fertilizer very sparingly during the second year. When fertilizing trees it is always advisable to apply the fertilizer around the exterior drip line of the branches. The fertilizer should be applied in holes made with a bar 10 to 12 inches below the soil surface. Do not over fertilize. Blended commercial fertilizers such as 10-10-10 or 15-15-15 are generally OK.

Protection

Nuts, sapling growth and young trees are attractive food for wildlife. Squirrels, rodents, rabbits and browsing animals find the chestnut very palatable. Young seedlings usually profit from some kind of protection. Plastic tree shelters such as Tubex and Pro-gro tubes have given varying responses. In exceptional circumstances chestnut seedlings have been reported to grow 60 inches high in one year when given the protection of plastic shelters. Comparable tests have shown red oak and chestnut seedlings to respond similarly. The effectiveness of tree shelters is enhanced by ensuring that other good growing practices are followed.

Shelters made from wire mesh have been found quite adequate by some growers. Sound advice is... know the enemy and use the required precautions!

Pruning

Where the chestnut tree is being grown and what type of tree form is desired will determine whether pruning is required. If a tall timber tree is the objective, it would be well to prune off the lower branches in the third or fourth year. If a good nut-bearing tree growing in the open is wanted, little or no pruning may be necessary. Eventually, the lower branches die, if the exposure to sunlight becomes a limiting factor. Chestnut sometimes produced double or triple stemmed trees. These may be undesirable and one or two stems may be removed when pruning.

Membership Contributions

Thanks to the many persons who have renewed their support to CCC through generous contributions. These now qualify for tax deduction, due to our recent "charitable status" arrangement with Revenue Canada. Please note the upper right corner of page 1 of this newsletter to indicate the year of your latest "paid up" membership status.

CHESTNUT BLIGHT AND BIOLOGICAL CONTROL IN SOUTHERN ONTARIO

Summary of a presentation made at the
Annual Meeting of CCC, 1994

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Many of us are familiar with the history of the American chestnut in North America; once a dominant tree species within the Carolinian ecozone that, through the introduction of an exotic plant disease called chestnut blight, was reduced to the status of a threatened or endangered species within 50 years. However, due to the ability of the American chestnut to resprout from stumps, this species has persisted in localized areas within southern Ontario and elsewhere. More than 91 such sites were identified in southern Ontario in 1983 but many more sites are probably known but have not been catalogued. At most of these locations, the pathogen is still present and, as new sprouts grow and develop, they eventually become reinfected and subsequently die. This cycle of regrowth and reinfection has allowed the species to persist, despite the presence of the pathogen.

Chestnut blight was also introduced to Europe where it caused a similar epidemic of disease in European chestnut. However, several trees were identified that displayed unusual cankers that did not result in the death of infected trees. These "healing" cankers were associated with isolates of the pathogen that contained fungal viruses. Inoculation of virulent-type cankers with the "hypovirulent" isolates of the pathogen often resulted in conversion of a virulent-type canker to a hypovirulent-type and the tree continued to survive and grow. This discovery resulted in an effective method of biological control of chestnut blight in many European countries that, over a period of 10 to 25 years, became established as a sustainable, naturally-regenerating form of biological control.

Hypovirulent isolates of *C. parasitica* have also been reported from North America but attempts to use these isolates as biological control agents have not been as effective. The ability to transmit hypovirulence to virulent isolates of the pathogen is restricted by the presence of biological barriers called vegetative-compatibility groups that prevent the exchange of the fungal viruses among isolates of the pathogen. Biological control of chestnut blight in North America does not appear to be as successful because of the presence of a larger number of vegetative-compatibility groups than in Europe.

Our studies on chestnut blight have been in progress for four years. Our long term goal is to implement a classical biological strategy by releasing selected hypovirulent isolates of *C. parasitica* into southern Ontario that will naturally disseminate, infect existing virulent isolates, and thereby reduce the severity of chestnut blight. Concurrently, we are mapping the distribution of surviving trees and working with the Canadian Chestnut Council to distribute seeds and seedlings to areas outside of the naturally-occurring range of disease. In this two-pronged approach we are attempting to reduce the severity of disease in the short term, and protect the germplasm of the tree in the long term. Eventually, we are hopeful that the American chestnut tree can become re-established throughout the Carolinian ecozone.

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Numerous examples of healing cankers have been identified through previous surveys in southern Ontario by Drs. C.D. McKeen and John Ambrose. Isolates of the pathogen recovered from these healing cankers were analyzed in our lab to determine if hypovirulent isolates of the pathogen were naturally present. All of these isolates were evaluated for hypovirulence and compared to known hypovirulent isolates from Europe and the United States. Of 36 isolates examined from 1990-1993, five isolates were strong sources of hypovirulence, in comparison to others which were more moderate or variable. These results established that naturally-occurring hypovirulent isolates of chestnut blight are present at several locations in southern Ontario, and that these hypovirulent isolates are associated with healing cankers.

Virulent and hypovirulent isolates were also examined to determine the degree of vegetative compatibility among isolates in Ontario. Up to 13 vegetative-compatibility groups were identified among 35 isolates, suggesting that hypovirulence would not spread to all isolates of the pathogen. However, we did find that up to 80% of the virulent isolates could be converted by using a combination of six hypovirulent isolates from Ontario, the United States and Europe. Several of the hypovirulent isolates were found to be "multi-donors" because they could transmit hypovirulence to several vegetative-compatibility groups. These isolates are particularly promising as effective strains for use in field inoculations.

The Arner tree continues to be studied as a unique phenomenon. This large tree has had several large "healing" cankers on its lower trunk for more than 15 years, yet these cankers have healed and the overall growth of the tree has not been impaired. From this tree, one of the most promising hypovirulent isolates, the "Arner" isolate, was recovered by Dr. C.D. McKeen, and used in inoculation experiments of other trees in 1990-1991. To date, more than 50 sites in southern Ontario have been inoculated with the Arner isolate. Observations of these inoculation sites are in progress but preliminary results have determined that the Arner isolate often kills young chestnut sprouts ($\leq$ 2.5 cm dbh) within 2-3 years after inoculation. However, on larger sprouts ($>$ 2.5 cm dbh), healing cankers often develop. These healing cankers sporulate heavily, which will promote the natural spread of hypovirulence in southern Ontario. Attempts to convert virulent cankers to hypovirulent on established trees are being examined and assessments of several inoculation sites are in progress. In addition, inoculation of several hypovirulent isolates in a "cocktail mix" were initiated in 1993-94. Interactions between hypovirulent and virulent isolates, and the conversion from virulent to hypovirulent are being monitored. Such interactions progress slowly in field environments and, therefore, will require several years for full evaluation.

In the next two years, we will be concentrating on a more "prescriptive" approach to treating trees with hypovirulent isolates. Samples from individual trees will be returned to the laboratory to determine which hypovirulent isolate will be most effective at converting the virulent canker. Then, the prescribed hypovirulent isolate will be inoculated into the tree. Also, we are evaluating existing and new hypovirulent isolates more exhaustively to identify the best isolates for use in field inoculations, and to identify factors that are important for the natural transmission and spread of hypovirulence. Finally, we will be mapping the distribution of surviving trees in the province to determine any changes in abundance and distribution of American chestnut that have occurred since the last survey of 1982-83.

Through these studies, we hope to evaluate the potential of using hypovirulence as a biological control strategy for chestnut blight in Ontario, and to develop more effective methods for promoting the recovery of American chestnut from this disease.