

Canadian Chestnut Council (CCC)

... on the Chestnut Trail

Rural Route # 1
Orangeville, ON., L9W 2Y 8

NEWSLETTER # 23
July 2000

The NEWSLETTER of the CANADIAN CHESTNUT COUNCIL (CCC)

The CCC is a non-profit organization with the important mission to restore a threatened species. Since the council's inception in 1988 membership has quadrupled. In other areas it has shown evidence of strong growth and leadership.

The Newsletter has attempted to be a memory of the Council's activities and achievements. It also tries to keep readers informed of its future.

Because the written word may not always be adequate, the CCC annual meeting held every autumn strives to arouse interest in why this once important forest tree should be restored.

Hopefully through these two publicity channels, and the web page on the internet, concerns and needs of the chestnut enthusiasts are met.

Let our motto be - alone each of us can do a little - together we can do much more!

Colin D. McKeen, Editor
62 Westmorland Ave.
Orangeville, Ont. L9W 2Y8
Tel. 1-519-941-9513.

LETTERS to the EDITOR

Dear Dr. McKeen: "I have memories of picking bushels of chestnuts in Middleton Township of Norfolk county in 1929 with my family. The harvested nuts were sold by my parents and made about \$300.00. That was money in those days."

René Gossens, R.R.#2
Otterville, Ontario.

Dear Dr. McKeen: "Your Newsletter is informative, but I would like to see more coverage of, and attention paid to chestnut tree plantings, both individually and generally, in Ontario (perhaps the Maritimes as well), and how they are doing. How the weather is affecting individual plantings in certain areas - lack of moisture, excessive heat, etc? Have plantings in certain areas suffered from damage from deer, mice and disease, etc?

Roderick Taylor, 85-57 Forest Ave.,
Hamilton, ON., L8N 1X3.

Response- An answer to these questions is a tall order for there have been more than 200 plantings spread over 35 counties in Ontario. Consequently, accurate reports are not valid for most of the trials. That said-- it can be stated that some plantings have done well, others have not, and a few have not survived beyond a year or two. In the main, where the site has been appropriate and well prepared, the success of the planting has been a reflection of the after-planting care.

The Canadian Chestnut Council

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LETTERS to the EDITOR (cont:d)

As has been mentioned several times in previous newsletters, lack of adequate soil moisture has been a very important factor affecting rate of growth and survival. Chestnuts, like other young deciduous trees cannot adequately compete with grasses and weeds for soil moisture until they attain a height of two metres (seven feet) or more. In grass or weed environments young chestnut trees often show the deleterious effects of moisture stress a month after leaf-out.

Like our children, trees require a lot of attention during the stages of early growth. Young and also old trees have to be protected from damage caused by deer-browsing and stem girdling by mice in the winter. Chestnut growers are urged to attend CCC annual meetings where programs often devote considerable time on the topic "Growth Requirements of Chestnuts".

Readers are reminded that a booklet entitled "Growing American Chestnuts" is available from the American Chestnut Foundation, 400 Main St., P.O. Box 4044, Bennington, VT. 05201, USA.

The booklet contains much sound information on how chestnuts may be successfully grown.

-- The Editor

DISCOVERY of a *C. dentata* TREE GROWING at SAULT ST. MARIE, ONTARIO :

Late in 1999 John McLaughlin MSc., R.P.F., notified the CCC of the existence of a *C. dentata* tree growing on a residential lot in Sault St. Marie, Ont. To have his identification confirmed he mailed in collected twigs, burrs and leaves. The tree has a trunk diameter (dbh) of 56.5 cm (22.7") and with a height of 16.8 m (about 52').

Growing at a latitude of 46.4 degrees it is the most northerly tree in Ontario. The germplasm may represent excellent cold hardiness qualities.

On a similar latitude there is a report of a chestnut tree growing in Marquette, upper Michigan.

DR. DAVID FAIRCHILD'S ACCOUNT of the FOREIGN ORIGIN of the CHESTNUT BLIGHT PATHOGEN:

Dr. David Fairchild was born in 1869 at Michigan State College, East Lansing, MI. Building on his early education exposure to the biological sciences he became a world-wide explorer and plant naturalist. For many years he was associated with the Department of Agriculture in Washington D.C. Through his global associations he was instrumental in increasing the number, and improve through introduction, the quality of fruits and vegetables of the United States.

The following account of the evidence for the foreign origin of the chestnut blight was taken from his autobiography "The World Was My Garden", Charles Scribner's Sons, New York and London, 1938, Pages 405-06.

"By now, the whole country had become alarmed by the threatened disappearance of the American chestnut. Haven Metcalf and C. L. Shear were investigating *Endothia parisitica*, the virulent fungus disease which attacked the chestnuts, and they were puzzled to know where the causative agent came from.

According to certain pathologists, the fungus was a native American species, but its virulence and rapid spread convinced Metcalf and Shear that it was of foreign origin. By 1913, it had already caused a loss of over twenty-five million dollars, but this was insignificant compared with the loss which would ensue when the disease reached the forests of the southern Appalachians. Meyer had already sent in the Chinese chestnut (*Castanea mollissima*), a species distinct from the American, and it had grown rapidly and trees of it had been distributed. I had it growing at "In the Woods" and expected it to bear in a year or so.

One morning in May, Dr. Shear came to see me to discuss his and Metcalf's theory that chestnut-bark disease must be of foreign origin, probably Chinese. As they had heard Meyer was in Eastern China, they wondered if he could look for the disease there. Meyer was not a trained pathologist, but I felt confident that he would find the disease if it were common on the Chinese trees. Dr. Shear sent Meyer a fragment of bark with a description of the disease and I instructed him to send back samples of Chinese bark in case he discovered any which seemed infected by the blight.

On June 13, only a short time after my letter reached him, we received a cablegram from Meyer saying he had discovered a chestnut bark fungus which seemed identical to the American form. In about three weeks, a letter came from him containing a small piece of bark not over two inches square. I looked at it doubtfully, not being familiar with the character of the disease, and wondered why Meyer had cabled with such confidence. When I took it over to Metcalf's office, he lifted the bit of bark in his slow, deliberate way and studied it carefully with his hand lens.

"It looks like it," he said. "The fungus strands are quite characteristic. However, cultures will soon show. We'll let you know as soon as they mature."

The next week both Metcalf and Shear appeared bringing test tubes containing six cultures. They had inoculated three of them with fungus from the piece of Chinese bark sent in by Meyer, and three from the diseased bark of an American chestnut. The cultures all looked alike to me. Apparently Meyer had found the chestnut blight endemic in China.

Ten days later, Shear found the characteristic ascospores of the fungus on Meyer's cultures, and later in the summer he sent test tube cultures made from Meyer's material out to "In the Woods" and inoculated my Chinese chestnut tree from them. The characteristic cankers were slow in developing, but ultimately disfigured the tree. The Chinese chestnut proved somewhat resistant to the disease, and, although the fungus did a great deal of damage, it did not kill the tree outright as it had the American chestnuts. In less than three months, the fact was established beyond a doubt that chestnut blight was introduced from the Orient, and probably arrived on nursery trees some time in the late eighties or nineties.

DR. DAVID FAIRCHILD (cont'd)

It is now over fifty years since this pest was introduced. Last summer when I saw the hillsides in the Appalachians dotted with the tragic dead crowns of what had once been magnificent forest trees, I felt like saluting the pathologists who are working to prevent a repetition of this calamity in the future. I regretted any feeling of impatience I may have had towards their quarantines and inspections.

Accounts have been published in *The Journal of Heredity* of the experiments which have been carried on ever since our American chestnuts perished. No less a genius than Walter Van Fleet took a hand in the cross-breeding, and with a certain degree of success too. But the American chestnut tree attained greater size than any of the Oriental trees, and finding a cross to replace it as a forest tree has not been accomplished. The most that can be said is that the Chinese chestnut and some of its hybrids are less susceptible to the blight than the American species, and, as orchard trees, are capable of producing good nuts."

NORMAN BORLAUGH, NOBEL LAUREATE, COMMENTS on TACF BREEDING PROGRAM

Dr. Norman Borlaugh, a plant breeder of world renown, who played an outstanding role in the Green Revolution of the 1960s & 70s was a Founding Director of the American Chestnut Foundation and is now an Honorary Board Member comments as follows:

".....I have been fascinated by the progress that has been made in the incorporation of blight resistance into the American Chestnut. All who have collaborated in this adventure, are to be congratulated for the progress that has been achieved.

I can fully appreciate the importance of this project, for I was a young forester working in Northeastern Forest Experiment Station in the early 1930s when the last of the big chestnuts were being killed by the blight. I was too young and inexperienced at the time, to really understand its implications.

But as I continued my studies, and especially when I went into plant pathology, I came to realize what a disaster I had visioned in those early years.

After shifting from my forestry career to genetics and plant pathology and breeding of wheat, where I worked in innumerable counties around the world, I have come to appreciate the great genetic variation in pathogens of our crop and forest trees. For that reason, I am especially fascinated by the work you are doing.....

With best wishes for continuing success on this very worthy program -- the TACF Breeding Program for incorporating chestnut blight resistance into the American Chestnut -- I remain,

Sincerely, Norman E. Borlaugh"

The foregoing account of Borlaugh's recent letter to TACF was published in "The Chestnut Tree Newsletter" (Pennsylvania Chapter of The American Chestnut Foundation, Vol. 5, No.2, June 2000)

CCC AGREES UPON A BLIGHT RESISTANCE-BREEDING PLAN

At a directors' meeting held in mid-June a template for a chestnut blight resistance-breeding plan was laid out and agreed upon. This was an important decision and the implementation of the plan will give the CCC the greatest challenge it has faced to date. Hopefully, project-funding and an appropriate site for growing the hybrids will be in place before the year's end. Work on both of the latter aspects has been underway for several months.

The GENETIC BASIS in BREEDING PLANTS for CERTAIN CHARACTERISTICS

What is involved in breeding for disease resistance, etc. and on what fundamentals are such a project established? These are frequently asked questions. It involves the transfer of genes in and among species, and selecting out the desired characteristics. In chestnut, such qualities as blight resistance, cold hardiness, strong fast-growing stems producing central leaders (apical dominance) and perhaps nut size are sought.

Within and among the species the genes are transferred to the progeny through crossing (natural and planned pollination). Each offspring acquires its own complement of heritable genes. The study resulting from the interaction of genes is called genetics.

The real founder of genetics was an obscure Augustinian monk, Abbot of a monastery in Brün, not far from Vienna, Austria. Gregor Mendel was his name and he was born in 1822. This humble seeker after the truth loved to experiment in his cloister garden with garden peas. He mated many different kinds showing variations in such traits as flower colour, seed characteristics, tall and dwarfed stem growth, etc. His findings were published in a small scientific journal about 1860. They attracted little attention. He died in 1884 almost unknown.

One important fact established by Mendel from his garden was that certain inherited qualities are strong and others are weak. The strong qualities he called dominant, the weaker ones were called recessive. Recessive means that a particular character may remain hidden for one generation only to appear again in the next generation.

Mendel's great discoveries of the inheritance of pea characters gathered dust in libraries for more than 30 years. Then around 1900 three scientists discovered the Mendelian Laws and the study of genetics began. This science has made great strides in the 20th century.

In Canada, the impetus for disease resistance breeding was triggered by the serious rust epidemics in Prairie cereal crops in World War I. Early successes in cereal breeding led to the expanded use of Mendelian genetics in many agricultural and floral crops.

In chestnut, blight resistant is dominant over susceptibility, but not fully so. Resistance to blight in chestnut comes from a species originating in China and Japan. Pollen is taken from the resistant parent *C. mollissima* (Chinese) or *C. crenata* (Japanese) and applied to the receptive sex organ of *C. dentata* which serves as the female parent. The reverse cross introduces sterility problems. In nature, 'blockers' interject themselves to prevent the process from being simple -- so scientists say. Fortunately 'blockers' in chestnut breeding are becoming understood and are being circumvented. Consequently, breeding programs are advancing. The future looks bright.

17th ANNUAL MEETING of the AMERICAN CHESTNUT FOUNDATION (TACF)

The annual meeting will be held at Abingdon, Virginia, from October 19 - 20, 2000. Abingdon is near TACF's Meadowview Research Farms. The guest speaker will be Dr. Fred Paillet. He is a noted geophysicist who has visited stands of European chestnuts (*C. sativa*) while on a research mission to the Caucasus region just east of the Black Sea. Although details of the meeting are not available at this time, they should be soon. Undoubtedly there will be an opportunity to see many of the detailed procedures used in the ongoing blight resistance-breeding project at the Meadowview Research Farms. To see firsthand the progress of this great undertaking should be most interesting.

13TH ANNUAL MEETING OF THE CCC

The meeting will be held on

SATURDAY, NOVEMBER 4th, 10:30 AM to 4:00 PM
at the

Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA) building

Highway # 19, about 1/2 km north of

Woodstock, Ontario

Guest Speaker

Dr. Sandra Anagnostakis

of the

Connecticut Experimental Station, New Haven, CT.

The focus of the meeting will be on "Growing Chestnuts and Handling Problems therein".

Interesting and informative displays are being arranged.

The business meeting and other important details will take place during the morning session.

CHESTNUT SITES in ONTARIO

In Ontario, existing chestnut sites, blighted or non-blighted, should not be destroyed. Some of them may contain valuable germplasm that may find a use in the breeding program. During the next 12 months the blight resistance breeding committee will be seeking out trees that may be used as female parents. Hopefully these trees will be readily accessible and their flowering branches reached with stepladders to carry out pollinations. If you have such a tree on your property, or know of a tree that might serve this need, please pass the information on to the CCC directorate.

A table was printed in the last CCC Newsletter (#22) listing many of the key characteristics of the *C. dentata* tree. Hybrids exist in Ontario that may not be of use to the committee at this time. By careful scrutiny of details true-to-type *C. dentata* may be identified.

CCC MEMBERSHIP RENEWAL an APPEAL for NEW MEMBERS

The membership in the CCC has reached a total of **189**. Thirty one new members have been added during the first six months of the current year. This is encouraging to our directorate.

Your suggestions and enquiries are appreciated. You might have some particular talent that you might offer to help our project on its way. Let us know.

If you haven't submitted your annual dues or made a financial contribution, please do so at your earliest convenience. Your membership status is shown beside your name on the address label on the mailing envelope in which you received this Newsletter. The two numbers following your name are the last two numbers of the year that you have paid up to and including Dec. 31 of that year.

For example: John Smith **99**
123 Chestnut Street
Ourtown, ON

Would mean that John is paid up until Dec. 31, 1999.
or

John Smith **00**
123 Chestnut Street
Ourtown, ON

Would mean that John is paid up until Dec. 31, 2000

The Canadian Chestnut Council

Membership Regular \$10.00 _____ , Contributing \$25.00 _____ .

Make cheque payable to; Canadian Chestnut Council, c/o R. Pamerter, RR# 1, Orangeville, ON., L9W 2Y8.

Name _____
Address _____

Do you know of any unrecorded chestnut trees? ____
If yes, please give location, size and condition.

Telephone _____

Other comments and suggestions re; aiding and promoting the Council's objectives. _____

