Journal

OF THE AMERICAN CHESTNUT FOUNDATION

July 2010 | Issue 1 Vol.1

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THE AMERICAN CHESTNUT FOUNDATION®

The Mission of The American Chestnut Foundation

The mission of THE AMERICAN CHESTNUT FOUNDATION is to restore the American chestnut tree to its native range within the woodlands of the eastern United States, using a scientific research and breeding program developed by its founders. The American Chestnut Foundation is restoring a species - and in the process, creating a template for restoration of other tree and plant species.

We harvested our first potentially blight-resistant nuts in 2005, and the Foundation is beginning reforestation trials with potentially blight-resistant American-type trees. The return of the American chestnut to its former range in the Appalachian hardwood forest ecosystem is a major restoration project that requires a multi-faceted effort involving 6,000 members & volunteers, research, sustained funding and most important, a sense of the past and a hope for the future.

About Our Cover Photo: by Dr. Greg Weaver, TN

American chestnut wood fence - For many Americans, remnant fencing constructed from American chestnut is the only American chestnut wood they have ever seen.

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Journal
OF THE AMERICAN CHESTNUT FOUNDATION

Inside This Issue:

The Influence of
The American Chestnut
in Appalachian History and Culture

A New Era for TACF

by TACF Chairman, Glen Rea

This first issue of *The Journal of the American Chestnut Foundation* signifies a new era for the Foundation. Thanks to our members' hard work, persistence and funding, the Foundation has grown enough in breadth and depth to allow us to provide you a full-color magazine.

Our new publication is more than just another pretty magazine to display on your coffee table. It is a communications tool that will allow TACF to better educate and reach out to our membership as well as to new audiences.

Breeding a blight-resistant American chestnut and initiating on-the-ground restoration of the entire chestnut ecosystem are complex tasks. Our intent is to provide a communications platform to better share information about our breeding program and ongoing restoration efforts.

Our first feature article is written by Pennsylvania TACF member and professional forester Tracey Coulter. Tracey provides excellent insight into forest management techniques necessary to fully restore the American chestnut to its historic range. Although "clear cutting" has received a negative connotation over the years, today's forest management professionals use "clear cutting" and other harvesting techniques as forest management tools to achieve specific goals, including conservation. The days when hundreds of acres of forest were haphazardly cleared are gone. Today's practices are tightly controlled to meet specific forest management goals and objectives based on science.

Last year, TACF started to plant our first line of chestnuts that we hope will have the blight resistance and American growth characteristics we have been working toward for the last 27 years. We call these trees our "Restoration Chestnuts," and they represent the line of trees identified by Dr. Charles Burnham that should have similar levels of blight resistance as their original Chinese parents did. We will continue to test this first line of "Restoration Chestnuts" throughout the coming years.

Whether or not our current line of "Restoration Chestnuts" has the right stuff is not as important as the fact that TACF is making dramatic progress in our breeding program. Restoration of any species, and especially the American chestnut, is a long process that involves continued evaluation, testing and refinement. The process of restoration doesn't always have a near-term finish line, rather restoration works on a continuum. Setbacks are inevitable, but we are making progress.

Meadowview Research Farms are in full swing as the 2010 planting and pollinating season begins.

We hope you find this new publication enjoyable, educational and reliable as a tool to encourage your friends and family to join in our efforts. The ultimate restoration of the American chestnut will require 50 or more years of hard work, but as a team we will bring the "Mighty Giant" back to our forests.

Meadowview Research Farms Lab

Building Construction Nears Completion

The 3,000 square-foot Glenn C. Price Laboratory at Meadowview Research Farms.

Scientists at TACF's Meadowview Research Farms are continuing their work to restore the American chestnut in a new, state-of-the-art laboratory. Named after one of TACF's biggest supporters, the 3,000 square-foot Glenn C. Price Laboratory located at Price Farm was dedicated in April and is expected to be finished this summer. The conference room features an American chestnut conference table and coat rack as well as American chestnut wainscotting, all crafted and donated by members of the Foundation.

The real showcase is the 1,150 square-foot wet laboratory, and a small darkroom, which will support the research efforts of Dr. Fred Hebard and his staff.

The most significant new piece of equipment is the fume hood. The hood allows for the safe use of many chemicals previously unavailable in the current space. Scientists can safely prepare DNA samples and practice a full range of microscopy techniques. The microscopy work allows researchers to examine pollen germination, study the anatomy of blight cankers, and examine the microscopic characters of leaves for identification to name just a few of the techniques TACF's scientists will be able to use.

All of the offices will be heated via a passive solar heating system. For more information or to take a tour of the lab or Meadowview Research Farms, contact Dr. Fred Hebard.

Restoration Branch Events

TACF has added several new branches to its growing network of locally-based groups interested in restoring the American chestnut tree. Joining TACF's first Restoration Branch in Sewickley, Pa. are branches in Pequea, Pa, and Southwest Va. For more information on starting a branch in your area, contact Bryan Burhans at (828) 281-0047 or bryan@acf.org

Around the Range

Taking Our Message to the Masses

The American Chestnut Foundation has an amazing mission; the restoration of the American chestnut to its historic range. If you were to walk down the street in any town in the eastern U.S. and you randomly asked people if they had ever heard of The American Chestnut Foundation, what proportion of the people you talked to would know about our efforts? Likely, very few people would have any idea. However, if you asked the same individuals if they support bringing back the American chestnut, likely the consensus would be clear – the average person would love to see the American chestnut returned to our eastern forests.

Ironically, this is an exciting reality; very few people know who we are, but many are interested in supporting our efforts. I call this opportunity! Now imagine an event held at your local fire hall, gymnasium or even under a large tent erected at your local chestnut breeding orchard packed with 100 to 250 (or more) people from your local community. The crowd is excitedly socializing, eating some great food, and learning more about the American chestnut and our efforts to bring this species back.

The next day these new evangelists for the chestnut go to work and tell their colleagues about the exciting event they attended the previous evening and what they learned about the American chestnut. Even better, imagine that 10 of these participants volunteered to help out working in the local breeding orchard.

What I have described above is an exciting new program called TACF Branches. TACF Branches function as an arm of their respective TACF state chapter and promote the state's goals and objective in their local community. This new program allows TACF to take our message to the masses in a truly grass roots effort to recruit these new members to help us achieve our mission and strengthen our TACF state chapters.

People from all across the nation want to help us; many just haven't had the opportunity. Community based TACF Branches provide this opportunity. These Branches are simply groups of individuals within a local community that annually host an event, usually a dinner. The ticket cost to attend the event includes the price for a TACF membership. By including membership for each attendee, TACF has the opportunity to reach these new members through this magazine, *The Journal of The American Chestnut Foundation*. And by using the power of volunteers we can expand our reach to the local community.

TACF President and CEO Bryan Burhans

The local TACF Branches work with their respective state TACF chapter to complete projects to meet chapter priorities within the Branches' local community. For example, a Branch may work through the chapter to adopt a local breeding orchard and help recruit the members that attended their Branch event to help work in the orchard, or help raise funds necessary to support the orchard. The Branch may work with local school groups and other community organizations to educate the public about the American chestnut. In time, the Branch will assist the state chapter with plantings of blight-resistant chestnuts we call our Restoration Chestnuts.

Recently, I flew from Connecticut to Charlotte on a beautiful clear day. Even at 35,000 feet the air was clear and crisp. As I looked out the window I was reminded of the unfathomable amount of chestnut range that we will eventually need to fill. But for TACF to accomplish this historic feat we need to grow our volunteer network at the grassroots level. Local TACF Branches working in-step with their chapter will provide the infrastructure necessary for TACF to move forward with our mission.

If you are interested in starting a TACF Branch in your local community, please drop me an email (bryan@acf.org), or call me any time. We can work with you and your state chapter to make the event reality. All you need is the desire to see the American chestnut returned to our eastern forests.

What's in a Name?

The Real Story Behind the Naming of the American Chestnut

By William Lord

The chestnut is a lovely tree, rich in folklore and nostalgia, but when you read about the chestnut tree and see it identified as *Castanea dentata* does it annoy you? We want to bring the American chestnut back to our Appalachian forests, but the science surrounding our efforts can be a turnoff. Well, what do you think when you see *Castanea dentata* (Marshall) Borkh? A double turnoff? Maybe. But take a moment to reconsider. There is more human endeavor and drama represented in that name than you could imagine. The people who developed the "dry" science of taxonomy, the orderly classification of plants and animals, lived during the age of discovery from the 16th to the 20th centuries. They represented the scholarly part of exploration, seeking knowledge and order rather than gold.

Carolus Linnaeus (1707-1778) of Sweden is commonly regarded as the founding father of taxonomy, the object of which is to designate all present and fossil species with one universally-accepted scientific name. Essentially, he defined the binomial scientific naming system, one for each species and written in Latin. His two-volume *Species Plantarum* (1753) is the primary starting point of plant nomenclature. Plants closely related and resembling each other are grouped within the same genus. A plant that is descriptively unique within a genus is a species.

> It was an honor more precious than gold to make a first discovery. To identify a species or have a plant named for you achieved the ultimate acclaim

Carolus Linnaeus of Sweden (1707-1778) is commonly regarded as the founding father of taxonomy.

Throughout the centuries of exploration something akin to a fever motivated the wide ranging field botanists who faced down danger and exhaustion to find and name new species. Some of the more sedentary in the profession eagerly received and classified those new species. It was an honor more precious than gold to make a first discovery. To identify a species or have a plant named for you achieved the ultimate acclaim.

To whom are we indebted for the genus name of *Castanea*? This would be Philip Miller (1691-1771) a Scotsman and the chief gardener of the Chelsea Physic [Apothecary] Garden in London. He established an interchange and obtained plants from across the globe. He was a "gardener's gardener" and published an ongoing commentary, *The Gardener's Dictionary* containing the Methods of Cultivating and Improving the Kitchen Fruit and Flower Garden. The genus *Castanea* is first mentioned [since 1753] in the 4th edition in 1754 and the genus and three species are described in 1768 in the 8th edition. *Castanea* "...takes its name from Castana, a city of Thessaly [Greece], where this tree anciently grew in great plenty."

In *Species Plantarum*, Carolus Linnaeus of Sweden (1707-1778) combined the beech and the chestnut in one genus, *Fagus*. Within this genus he described three species, the European chestnut, *Fagus Castanea*, the chinquapin, *Fagus pumila*, and the European beech, *Fagus sylvatica*. Linnaeus' scientific name for the beech remains to this day. His scientific names for the European chestnut and the chinquapin were later changed by Miller.

Miller conformed to the Linnaeus format with reservations, as befitted his status as Britain's foremost botanist. He defined *Castanea* as a separate genus and he prevailed. "This genus of plants is ranged in the eighth section of Linnaeus's twenty-first class, intitled [sic: intentionally so written] *Monoecia Polyandria*, the plants of this section have male and female flowers, [*Monoecia*] and the male flowers have many stamina, [*polyandria*] but he has joined this genus to the *Fagus*, making these of one genus, so that he has entirely abolished the title. However, as the male flowers of the Chesnut [sic] are formed into long catkins, and those of the beech are globular, they may with propriety be kept separate; and this I choose to do, that it may be more intelligible to common readers." [*The Gardener's Dictionary*. 8th edition].

The American chestnut is not one of the three species in the genus *Castanea* described by Miller, probably because the American and the European chestnut were then considered to be one species. Evidence of this is given by Peter Kalm (1716-1779) who came to America on behalf of Linnaeus to study and collect American plants. Kalm authored a book, *Travels in North America*, covering his travels in Pennsylvania, New Jersey, New York and adjacent Canada from1748-1751. Kalm includes a list of trees, shrubs and vines in the Philadelphia area arranged according to abundance. The chestnut is number 24 out of 58 and is described as *Fagus castanea* on page 38. This is the same scientific name given for the European chestnut by Linnaeus in *Species Plantarum*.

Let's fast forward to the America of Humphrey Marshall (1722-1801) and the heady years emerging from Colonialism into independence. Humphrey, like his older cousin, John Bartram (1699-1771) was one of, "...the remarkable circle of Quaker botanists from Chester County, Pa., who helped shape American botanical practice during the 18th and early 19th centuries." [www.amphilsoc.org/library/exhibit s/nature/marshall.htm].

Humphrey was a successful entrepreneur raising and exporting plants of interest to parks

The American chestnut received its scientific name, not from an American author, but rather one from Germany.

and gardens around the world. He compiled a description of native trees and shrubs in his *Arbustrum Americanum*, 1785, full of "Useful knowledge" and dedicated to his friend, Benjamin Franklin. It contains the first published description of the American chestnut. He classified it as "*FAGUSS-CASTANEA dentata*," using terminology from Linnaeus, but with the addition of "*dentata*," indicating that he considered the American tree to be a variety of the European. This scientific name is now a botanical synonym, a term applied to all scientific names for species other than the one officially approved. The American chestnut, in common with most plants, has a number of synonyms.

Quoting Marshall's *Arbustrum Americanu*:

" The CHESNUT [sic] TREE

The Characters are nearly the same [as] of the Beech, except the Male flowers being disposed in cylindrical katkins. The Styles more in number and bristly. The Capsules much larger, round and set very thick with long prickly spines; containing from one to four or five, but generally two or three nuts, filled with sweet kernel.

"The Species of Chesnut, [sic] with us, are,

"1. *FAGUS-CASTANEA dentata*. American Chesnut [sic] Tree. This often becomes a large tree, growing to the height of sixty or eighty feet, and to four or five feet in diameter, sending out but few branches, garnished with long spear-shaped leaves, toothed or notched on their edges. The timber is used much for rails, splitting free and out-lasting most of our Oaks. The kernel of the nuts are dried and used by some as a substitute for Coffee. The wood is also burnt into coals for the use of blacksmiths, &c. but not much esteemed for common fuel."

Marshall also includes a brief description of the chinquapin as *FAGUS-CASTANEA pumila*.

The identity of the first person to publish a description of the American chestnut as *Castanea dentata* surprised me. This is Moritz Balthasar Borkhausen (1760-1808) a German forester naturalist. He was a prolific writer and in 1800 published a book on forestry, *Handbuch der Forstbotanik und Forsttechnologie*, including the first reference of the American chestnut as *Castanea dentata*. Marshall's *FAGUS-CASTANEA dentata* is given as the sole synonym.

Who would expect the author of our tree's scientific name to be from central Europe? No reference to an American chestnut is mentioned by Phillip Miller in 1751 or 1768. Nonetheless, the American chestnut was well-established in Germany by 1800, and Borkhausen considered it more suited to the northern German climate than the European chestnut.

Borkhausen's comments translated from the original German:

"This tree which reaches a height of 50-60 feet and an average thickness (circumference) from three to four feet, appears to differ little in its structure from the European chestnut tree; it is, however, healthy due to its tougher nature; for it grows in North America according to Warter, everywhere on the wooded hills and foothills of the Appalachian Mountains across the entire land. It is found upwards until the colder regions lying below the 41st degree latitude north, whose climate is equal to the climate of European lands lying below the 61st degree latitude, and also has a far tougher nature as our common chestnut tree, which come from warmer land and requires a protected and warm location. The bark of the trunk is ash colored and somewhat raised. The leaves are broad, lanceolate in form, pointed, sharply dentate, smooth and bright green. The blossoms

and fruit are similar to the European variety...

"For the northern regions of Germany, this tree is very much recommended and deserves preference over the preceding variety because it [is] uncommonly durable in the harshest situations. The fruits, which it yearly yields in large quantities, are somewhat smaller as the ones of the European variety; they are, however, more pleasantly sweet and will probably be enlarged and improved by cultivation. In America they are mostly eaten raw and in the wilderness, when ripe, provide an excellent food source for various animals and especially for American bears, which at this time are extraordinarily fat and delicious.

"The wood is similar to our chestnut, easy to split, very durable and is equally useful for all occasions [for carpentry and construction], firewood and wood for embers [Kohlhotz = charcoal]. All these advantages....together with its rapid growth and the little attention it demands...recommend the tree most emphatic ally not only to the German forester but also to the farmer. Its reproduction in large quantities can only be achieved with seeds"

Borkhausen's additional comments on the European chestnut:

"The fruits are prepared in the kitchen in various ways. Sometimes they are boiled and served with broths, ragouts and cabbage; other times they are used for stuffing in geese and ducks; other times they are roasted and enjoyed with or without lemon juice and sugar; one can also prepare a kind of chocolate, coffee, and also starch from them. Yearly in Italy, some of them are dried in the oven in order to be stored for the winter. They also can he used as a superb mast for pigs and other cattle. They are very dear to the deer.

"In autumn the seed of the chestnut is treated in the same way as the beech. With several varieties of differing quality having been cultivated, the best are propagated by grafting and budding.... the growing bud onto the trunk of the chestnut tree, grown from seed.

"The rapid growth of this valuable tree, its good wood, its usable fruit, and the little attention that it requires recommend its frequent cultivation."

It required a fever of sorts to keep me exploring the history of the American chestnut's name via libraries and the Internet to learn the identities of Miller, Marshall and Borkhausen. My course was much less arduous than that of the botanists of old, but I shared a kindred joy with them while investigating the ancient documents and their treasured words.

Note from the author: The translation of Borkhausen is by Kevin Bilicke, email: Kebst28@Pitt.edu

Bill Lord, a retired veterinarian, is a naturalist and author who spends much of his time in libraries, researching material with a focus on chestnuts.

The Influence of The American Chestnut in Appalachian History and Culture

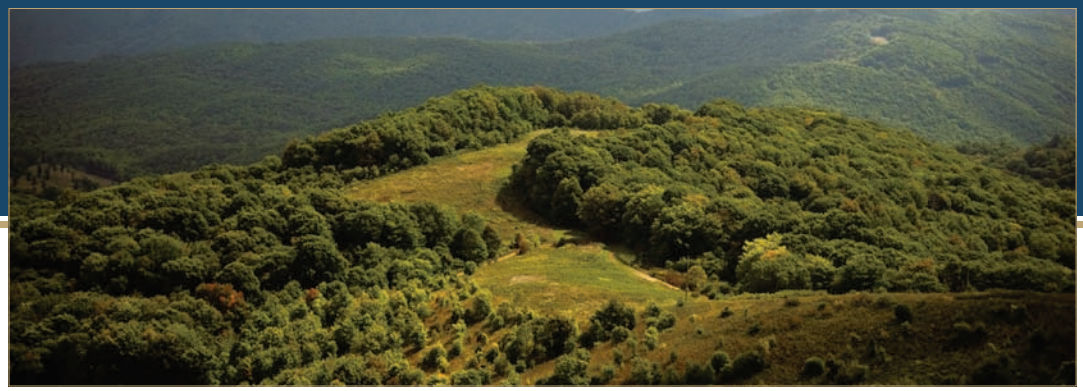
Editor's Note: *This paper, by Scott Osborne, was originally submitted for an independent study completed under Hank Shugart at the University of Virginia Graduate School during the spring semester of 2009. It is being reprinted with the author's permission as a two-part series to be concluded with Part Two in our September 2010 Issue.*

The history of Appalachia is deeply rooted in connections between humans and the landscape. From the ascendancy of the mountain chain to the demise of the grand forests, it is evident that humans have lived in accordance with these cycles. More specifically, the American chestnut tree provides a case study that mirrors the cultural proliferation and disintegration of Appalachia. By analyzing pioneer traditions, logging practices and the decimation by the blight, *Cryphonectria parasitica*, it becomes clear that the influence of the chestnut extends beyond utilitarian wood use.

Introduction

When the first pioneer-settlers were confronted with the great expanse of the American unknown they did not turn back and seek an easier way of life. They persisted, settled, and created a distinct, rich American culture. Their survival depended on using readily available resources found in the forest. Luckily, they stumbled into one of the most diverse mixed-deciduous habitats in the world. Game, wild edible plants and abundant timber provided the necessities for living. For products not naturally available, the settlers traded crafts or sold resources extracted from the forest at local markets. Generally, these people lived isolated lives in mountain communities relying on traditional subsistence practices and ingenuity.

It comes as no surprise that the most abundant resource had the most specified uses. Wood, manipulated to form everything from spoons to homes, was the main source of raw material for the settlers. The massive stand of uncut timber in the Southern Appalachians was termed "The Great Primeval Forest" by the first settlers.[1] This virgin woodland abounded with colossal trees covering large expanses of eastern Tennessee, western North Carolina, southwest Virginia, Georgia, eastern Kentucky, and West Virginia. This woodland region is



The significance of the American chestnut tree in Appalachian history is often overlooked and forgotten due to its swift disappearance in the early twentieth century

home to hundreds of tree and plant species that were each utilized to different ends. It is necessary to analyze the general uses of some of these species, however; in order to center this discussion and possibly impart a bit of nostalgia, the American chestnut (*Castanea dentata*) will be the primary tree and wood of interest.

The significance of the chestnut tree in Appalachian history is often overlooked and forgotten due to its swift disappearance in the early twentieth century. Additionally, the extreme specification of wood uses lessens the chestnut's impact on craft production and folk life subsistence practices. Unfortunately, chestnut wood was often relegated to fence posts, barn siding or railroad ties. Though these structures may have stood the test of time, they often do not contribute to our popular conception of Appalachia. We often see handicrafts of oak, hickory, walnut or poplar that have been preserved and appreciated for decades. These pieces of wooden history have created a connection to Appalachia that is continually recreated through firsthand contact with raw materials. A possible reason for chestnut's discrepancy is that it is un-relatable due to its present unavailability. If chestnut trees still made up 17-25 percent of the timber stock in the southern Appalachians, I believe that we would continually valorize them as "the perfect American tree." Regrettably, chestnut's woodland domination was cut short. The Asian blight, *Cryphonectria parasitica*, decimated more than 75 million acres of stately chestnuts in the early twentieth century. Their reign was curtailed and consequently the public's comprehension of this great American tree tapered for decades to come.

By providing a brief history of Appalachia's environment and people I will seek to reconstitute an interest in the utility and majesty of the American chestnut. This history will not only shed light on the ingenuity and downright perseverance of the Appalachian people, but it will also hopefully spark a concern for the preservation of cultural and environmental traditions into the future.

The Foundation

"Tracing the geologic history of the Appalachians is, as some geologists have pointed out, like reconstructing a hit and run car wreck."[2] Their creation was a mystery for decades until Alfred Wegener developed the theory of plate tectonics in the early twentieth century. The Appalachian Mountains are a series of accreted pieces of continental crust with distinct origins called terranes. The movement and collision of continental plates provides the mechanics for terrane fusion. The accretion of these terranes happened over a span of 500 million years from the Middle Cambrian to the Permian periods in the formation of the supercontinent, Pangaea.

A couple hundred million years later, during the Pleistocene, we see the continents arranged in their present locations and much of the world covered with extensive glaciers. The Wisconsin ice sheet extended from northern Canada southward in a narrow swath along the Appalachians though West Virginia, Virginia and the Smoky Mountains of Tennessee. Coniferous forests, predominantly filled with jack pine, spruce and fir, covered most of the middle and southern Appalachians. The ice sheet created tundra-like conditions that restricted much of the oak and hickory hardwoods to the deep south where it was slightly warmer. Between 14,000 and 10,000

American chestnut trees in the forest would often grow limbless for 50 feet or more, making the wood one of the most desirable for use by Appalachian families.

B.C., the Wisconsin ice sheet receded and redistributed tree species and plant life as we know it today.[4] "Islands of boreal forest crowning the higher Southern mountains" today are remnants of this once extensive glacial landscape.[5]

The Great Forest

The dark, thick forests of the Southern Appalachians would have been a daunting location to explore and settle. For many decades people of the Eastern colonial settlements did not venture into the great primeval forest, a land that was cloaked in mystery and fear. The mountains provided a westward boundary for the colonists that marked the end of civilization. Many did not dare to settle due to rough conditions and isolation from human development. Early pioneers that journeyed into the mountains encountered a great forest that was beyond their wildest dreams. "In 1770 George Washington was impressed by a sycamore along the Kanawha River measuring two inches short of forty feet in circumference." White oaks were commonly six feet through the middle. Yellow poplars grew to be over two hundred feet tall. The great abundance of chestnuts were tall and straight, commonly measuring four to ten feet in diameter. Although the diversity and scale of trees in the Southern Appalachians was astonishing, it was the grand structural complexity that attributed to its great diversity. The dense stands of old growth were part of a mosaic that was integral in the creation of a huge array of habitats and food for animal life. The diversity of wildlife was unmatched anywhere in eastern America. Deer, elk, bear, turkey, cougar, wolves and numerous other animals dominated the forest before shooting and pastoral practices drove them to secluded areas. Furthermore, the Great Forest supported "fifteen hundred species of flowering plants, including more kinds of trees than in all of northern Europe. Here are bewildering nuances of biodiversity, with mosses, fungi, spiders, salamanders, mussels, fish, birds, and people like none other on earth."[6]

The mountains of the southern Appalachians are the highest east of the Rockies. Mount Mitchell in North Carolina rises to 6,712 feet and is accompanied by 40 other peaks in the region over 5,000 feet. A United States Geological Survey expedition into the heart of the southern Appalachians by H.B. Ayres and W.W. Ashe in 1905 revealed the principal features of the mountains. They describe them as "seldom precipitous, and their profiles, instead of being angular and serrate, are rounded and softened by age."[7] The Appalachian Mountain chain has been steadily eroding for more than 300 million years creating a somewhat more in-

habitable landscape than was evident historically. The sheer age and undulating character of the Appalachians have made them a perfect landscape for the proliferation of an array of tree species unmatched anywhere in America and most of the world. Additionally, the diversity of drainage and relief patterns allows for certain trees to dominate particular microenvironments. For example, hemlocks in cool, wet ravines can grow to be seven feet in diameter. As one moves to higher, more xeric conditions, the hemlock is steadily replaced by red and white oak. In deep, moist and loamy hollows above 2,000 feet, chestnut reaches its greatest development. In the highest reaches, maple and pine are better adapted to the cooler temperatures than the southern hardwoods.

Editor's note: To be continued in the September 2010 issue of the Journal of the American Chestnut Foundation. In Part Two, the author discusses the people, the culture and the land-use practices of Appalachia.

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The Appalachian Regional Reforestation Initiative (ARRI)

As part of the reclamation process, the American chestnut, one of the fastest-growing native hardwoods in North America, is being planted with other high-value hardwood tree species on mined lands in the Appalachian coal fields. These plantings are part of the Appalachian Regional Reforestation Initiative (ARRI), which promotes restoring these coal-mined lands using high-value, native hardwood trees including the American chestnut. The American Chestnut Foundation and ARRI formed a partnership that will allow TACF to use ARRI's reclamation sites for establishing experimental plots and demonstration sites. Through a program called "Operation Springboard," ARRI and TACF scientists have teamed up with mine operators to evaluate planting protocols and techniques needed for when TACF's disease-resistant chestnuts will be available in mass quantities. They are also evaluating the potential for using reclaimed surface mines as "springboards" for re-establishing TACF's chestnuts into the Appalachian forest. For more information, please visit ARRI's question and answer page: http://arri.osmre.gov/AC/os-qna.htm

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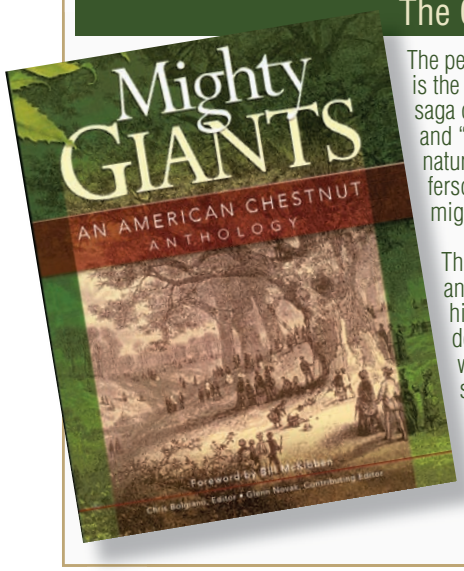
The Chestnut Anthology, at www.ACF.org, Makes A Great Gift



The perfect gift for the nature enthusiast in your life. *Mighty Giants: An American Chestnut Anthology* is the inspiring story of an American symbol and the struggle to save it from the brink of extinction, the saga of a unique and exceptional tree that supported a way of life, that fed and sheltered our ancestors, and "touched almost every phase of our existence." From Indians and early explorers, to colonists, naturalists, loggers, industrialists, and beyond, from presidents, poets, and artists, including Jefferson, Lincoln, Carter, Thoreau, Frost, Homer, Andrew Wyeth, and many more, the story of our once mighty, towering native chestnut tree is a lesson for our times.

The book tells, in images and words, the story of the once mighty monarch of the eastern forests and the scientists who engaged in the struggle against "one of the greatest natural disasters in the history of forest biology"—perhaps the deadliest plant blight ever encountered. It is the story of the dedicated few who refused who give up: the fearless plant explorer who tracked down the blight in war-torn China, the plant pathologists and geneticists who labored long and valiantly to understand the blight and find a way to thwart it. It is also a story of hope, of small but vital triumphs, as the secrets of the American chestnut and its deadly nemesis are gradually revealed.

Notable contributors to the book include former President Jimmy Carter, author Barbara Kingsolver, Nobel Peace Prize laureate Norman Borlaug and Bill McKibben, author of "The End of Nature." The 296-page full color book is available in hardback or paperback.

Hardback..... $49.50 Paperback..... $24.95

Phytophthora: Second Year Results on the Use of Phosphites

For Managing *Phytophthora* Root Rot in American Chestnut Seedlings

Steve Barilovits, III, TACF Carolinas, Charlotte, NC

During the growing season of 2009, I replicated the 2008 experiments on treating first-year American chestnut seedlings inoculated with *Phytophthora cinnamomi* (which causes a deadly root rot disease in American chestnuts) with several commercially available phosphite compounds. Those experiments are described in an article in the Spring 2009 edition of the Journal (Barilovits, 2009). In this year's experiment, I also compared the effectiveness of Subdue Maxx (mefenoxam, a phenylamide-class systemic fungicide manufactured by Syngenta™) with the phosphite compounds in controlling root rot disease. Phosphite treatments were also continued on the survivors of the 2008 experiments throughout 2009. The year-end cumulative mortality rates of the various treatment groups are summarized in the table below.

In these experiments, Agrifos and Prudent-44 treatments were much more effective than other treatments in the first year of seedling growth. Agrifos treatments show somewhat better effectiveness than Prudent-44 treatments by the end of the second year. These results continue to indicate that we might be able to use Phytophthora-infested land for production orchards in the future.

Dr. Charlotte Zampini, a professor of biology at Framingham State College in MD, and her student, Adam Wiskofske, have started a multi-year controlled study of the effectiveness of phosphites on controlling blight in American chestnut. Their work, conducted on American chestnuts growing on land owned by TACF Member Rufin van Bossuyt of the Massachusetts chapter, might help us grow wild American chestnuts to flowering stage, so that we can bring the genetics of those trees into our breeding program.

We look forward to hearing of their results.

Steve Barilovits III removes a chestnut seedling from the binder tube it was initially grown in at North Carolina State University. The seedlings were brought from NCSU to Chestnut Return for further research.

Dr. Joe James holds a chestnut seedling whose feeder roots have been destroyed by Phytophthora cinnamomi, or root rot, disease.

Carolinas Chapter President Doug Gillis and TACF Board Treasurer Steve Barilovits III place the seedling in a larger pot and fill it with potting soil.

	Untreated	Aliette	Agrifos	Prudent-44	Subdue-Maxx
2008 1 Year	0.979	0.806	0.286	0.281	N/A
2008 2 Year	1.000	0.919	0.317	0.400	N/A
2009 1 Year	1.000	0.696	0.242	0.312	0.423

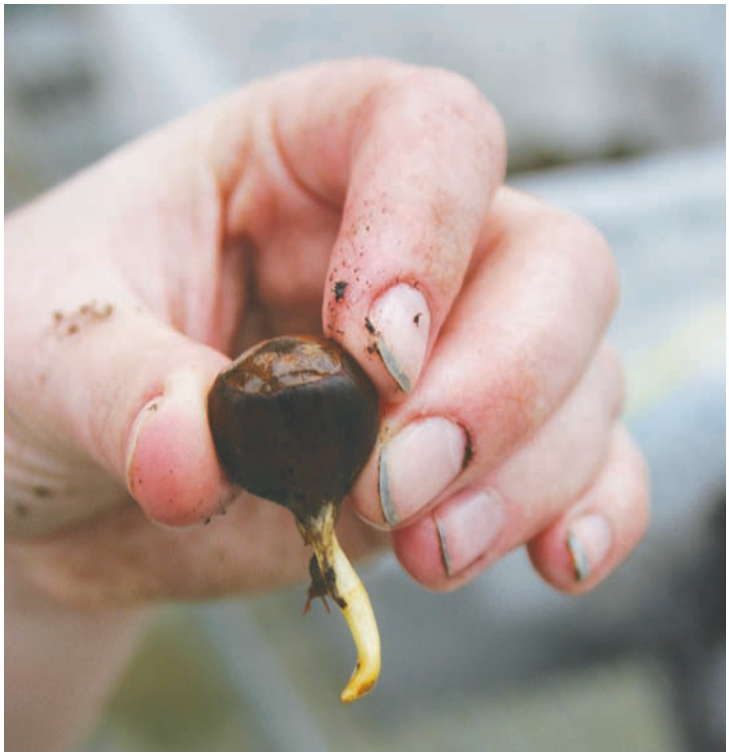
"One and Two Year Cumulative Mortality Rates from Phytophthora"

References Cited: Barilovits, S. (2009). First Year Results on the Use of Phosphite Compounds for Managing Phytophthora Root Rot in American Chestnut Seedlings. The Journal of the American Chestnut Foundation, Volume XXIII, No. 1 (Spring/Summer 2009), pp. 22-32.

Planting American Chestnuts in Pots

6 Tips for Successful Growing

By Kendra Gurney, NE TACF Regional Science Coordinator



Planting American chestnuts in pots can be a great way to start your trees. Try the following tips for a successful growing experience.

1 Schedule Some Cold Time

Like many nuts, American chestnuts need to go through extended cold exposure, as they would in nature. This process is called stratification, and it takes approximately 2-3 months for chestnuts to stratify properly. Nuts should remain in cold storage (think vegetable crisper) until at least January. In general, you want to start your chestnuts in pots about 2-3 months before your area is ready for spring planting.

2 Think Deep

American chestnut has a long tap root that needs plenty of room to grow so use a container that is much deeper than it is wide. If you would like to get a jump on spring and plant your tree outside once the weather is warm enough, a smaller pot is fine. If the tree may remain in the pot for most of the year, or longer, a larger pot is more appropriate. Also, consider your own habits. If you tend to water plants often a smaller pot will allow the planting mix to dry out more quickly after watering. If cacti and aloe are your kind of plants, a larger pot will hold sufficient water for a longer time. Looking for a reuse option? Quart-sized milk cartons make great chestnut pots; just make sure to poke some drainage holes in the bottom.

3 Don't Get Soiled

A soilless planting mix is best for providing good drainage and a weed-free germination environment for your chestnuts. Soilless planting mixes tend to include a lot of peat moss, which can be difficult to get wet. It is often easier to wet the planting mix in a larger container so you can work the water in by mixing (think kneading dough). Water will often bead up and runoff very dry peat moss, so pre-wetting your mix is helpful.

4 Shallow and Sideways = Success

Fill a pot with damp planting mix, tamp down and then poke a hole in the center with your finger or a hand spade. Often chestnuts will begin to sprout in cold storage so gently work the radicle (young root) into the hole until the nut is just below the soil surface. American chestnuts should be planted a half-inch to one-inch deep. Try not to break the radicle when you plant, and make sure you position the nut so that the pointed end, where the radicle comes out, is facing sideways (not up or down). Place your newly-potted nut in a warm, sunny location. It should sprout within a week or two.

5 Not Too Much, Not Too Little

Water your chestnut sparingly and allow the pot to dry out a little between waterings. If the planting mix stays too wet, the nut may rot before it sprouts. Once sprouted, the seedling will need more water so adjust as needed. And of course, keep an eye on the temperatures. Water needs increase as temperatures increase and the winter sun can be warmer than you might expect. American chestnuts should be fertilized with a formula for acid-loving plants, such as Miracle-Gro™ Nursery Select Miracid by Scotts™ or Holly-tone by Espoma.

As with caring for any living thing, vigilance is the key so check your seedling regularly. Most issues can be remedied if caught quickly.

6 Seeds, Like Pups, Need Weaning

Your seedling should be planted outside after the risk of frost. It will be much further along it its development than if it had sprouted naturally, however, remember the seedling is accustomed to the protected environment inside and needs to slowly acclimate to outside conditions. This process is called hardening-off and should take about a week or two. Transplanting can be stressful on a plant, so properly hardening-off your seedling will improve the odds for success. A final tip – remove the remnant nut from the base of the seedling. At this point the seedling has used all the nutrients it needs from the nut, but the nut can still be attractive to rodents and other wildlife.

These small Ray Leach "cone-tainers"™ are great for chestnuts that will be planted outside within a few months. However if you plan to keep your chestnut potted for longer look for a larger pot. The internet search term "tree pot" will help you find suppliers.

Planting Mix Selection

When choosing a planting mix, remember that American chestnuts do not like to be too wet. A simple mix of 1/3 each peat moss, perlite and vermiculite is a great high-drainage mix that many chestnut growers use. This mix does not hold too much moisture. However, if you forget to water your trees on a regular basis, look for a mix that holds a more moisture such as Miracle-Gro™ Moisture Control Potting Mix by Scotts™ or Sun Gro™ Metro-Mix 560 Coir.

Bringing the American Chestnut Back to Our Forest

By Tracey Coulter, TACF PA

Restoring the American chestnut to its native hardwood forests is not a single event, but a process that will take generations to complete. Along the way, a blight-resistant American chestnut will face the same challenges that today limit regeneration for many species in the eastern hardwood forests. Key among these challenges is competition with other plants, dispersal and wildlife predation. What we understand about these challenges, and how the chestnut grows in response to them, is vital to restoring this keystone species.

To date, most of TACF's breeding orchards have been situated on old pasture or other agricultural lands, so most of our material has been grown in a highly-managed system. In many cases, these trees were carefully nurtured, fertilized, watered, weeded and otherwise tended. To successfully restore the American chestnut, we need to allow nature to do much of the work. To expedite the process, we need to select sites that will best promote survival and natural dispersal of resistant seed. Let's start by talking about sunlight.

Light or Shade, or Somewhere in Between?

Once rooted, plants can't move to sites better situated for growth, so they must compete with surrounding vegetation for the things they need to successfully grow, survive and reproduce. These include space, water, nutrients and sunlight.

In a 1923 edition of *Pennsylvania Trees*, Joseph Illick noted: "Open grown (chestnut) trees have short trunks with deep, wide spreading crowns. Trees in closed stands (are) tall with little stem taper and few lateral branches." We often hear the classic American chestnut described as "tall, straight and clear," but that describes a forest-grown American chestnut whose shape was formed by competing vegetation.

Today, most wild American chestnuts are understory sprouts or saplings. While it is apparent these trees are somewhat shade tolerant and can survive under a forest canopy, they also respond positively to disturbances that create forest openings and expose the trees to sunlight. Many forest species have narrow tolerances to

light or shade, and this is especially true for seedling establishment. Fortunately, the chestnut's ability to tolerate diverse light conditions allows some flexibility in how the American chestnut might be restored to our forests.

Foresters employ a number of different timber harvesting systems to restore or regenerate hardwood forests. The systems they choose are largely dependent on the light requirements of the species they hope to regenerate. For species that are intolerant of shading by taller, more mature trees, even-age management is most commonly used. Even-age management results in a forest or stand that is, as the name suggests, largely the same age and with individual trees of similar size. Most of our eastern hardwood forests today are even-aged because of the widespread clearing for agriculture and timber that last occurred by the end of the 1800s.

Even-age forests are created using regeneration cuts that include clearcutting, seed tree and shelterwood. While most of us understand the term clearcut, seed tree and "shelterwood" may be unfamiliar concepts. Simply put, a seed tree harvest is a regeneration cut where some mature trees are left on the site to provide seed to regenerate the stand. On the other hand, a shelterwood gradually removes all the mature trees through a series of cuts. This technique provides a seed source for regeneration and protects the developing understory. All of these systems mimic large natural disturbances. Tree species that respond best to even-aged management include oaks, eastern white pine, black cherry, tulip, poplar and chestnut.

Uneven-aged forest management produces a forest or stand of diverse ages and sizes. This type of regeneration cut is generally employed to regenerate species that are more tolerant of shade than those regenerated through even-aged management. Sugar maple, American beech, black and yellow birch, eastern hemlock, basswood and pignut hickory benefit from uneven-aged management. Uneven-aged management mimics small natural disturbances by selecting individual or small groups of trees for harvest.

What History Tells Us About Growing Chestnuts

Chestnuts often dominated on dry, somewhat acidic sites on mountain ridges, but grew best on moist cove sites in the southern Appalachians. While the American chestnut was found along streams, it would not tolerate "wet feet," from flooding. Plus, the American chestnut was not likely to be found in the limestone valleys that parallel the Appalachian Mountains.

Conventional wisdom would tell us to plant American chestnuts where we find them now. After all, a site where the trees have been sprouting and re-sprouting for decades must be a good site to plant more. But folk wisdom, born of years of observation, also has developed around this forest icon which has been pushed out of its preferred habitats by the effects, direct and indirect, of blight. The rule of thumb I learned in forestry school was if you find chestnut oak, look for American chestnut. Sure enough, on a 90-mile bicycle ride through Pennsylvania's Laurel Highlands, I saw the familiar toothed leaves of the American chestnut shortly after I spied my first chestnut oak. Others look for different indicator species. Alex Day, PA-TACF President and retired PA Department of Conservation and Natural Resources

What is the Forest Stewardship Program?

The Forest Stewardship Program (FSP) is a voluntary program to help private forest landowners improve and maintain the ecological health of their land. All private forest landowners are welcome to enroll in the program, but ownership must include at least five acres of forestland to receive cost-shared funding. The U.S. Department of Agriculture Forest Service (USFS) has funded the FSP in all 50 states since 1990. To learn more about the Forest Stewardship Program visit http://www.fs.fed.us/spf/coop/programs/loa/fsp.shtml or contact your state forestry agency. Additional forest stewardship material, including a bulletin on regenerating hardwood forests is available online at http://rnrext.cas.psu.edu/FS/FSSeries.htm

Tracey Coulter

Late TACF President Bud Coulter surveying the Heisel stand in Walloon Lake Michigan. This large tree is a hundred-year-old, open-grown American chestnut originally planted by a Pennsylvania railroad man who relocated his family to northern Michigan in the early 1900s. It measures 76 inches at 4.5 feet. The surrounding forest grew around this tree and includes several American chestnuts of more than 40" in diameter.

forester looks for scarlet oak, another species adapted to dry sites, when he is looking for chestnut sites. One reason chestnut trees now are relegated to the high, dry, less-preferred sites is the competition factor. Blight is so pervasive that it has driven chestnuts out of the "nicer" areas where other species can out-compete them. Aggressive, fast-growing species such as tulip poplar and red maple can take over these mesic (moist) sites where chestnut would surely do well if they could withstand their fungal attacker.

Although the American chestnut is well adapted to growing on dry sites, if we are to rely on nature to provide optimum growing conditions, we would logically plant resistant chestnuts on better sites where moisture is sufficient to support untended seedling growth. If possible, we should select planting sites on moister east or north facing slopes where possible instead of drier southern or western slopes. With that in mind, consider locations suitable for northern red oak as restoration sites. Soil maps published through the Natural Resources Conservation Service (NRCS) are often available online and can offer valuable information about a site's ability to grow oaks. Where possible, a soil analysis tailored for optimum growth will help determine if a site is suitable to grow chestnuts.

A Question of Survival

Because the American chestnut is adapted to a broad range of light and moisture conditions, we can take advantage of these characteristics to plant the trees on a variety of sites. Once established, it may be desirable to remove surrounding vegetation to release the chestnuts or expose them to increased sunlight to enhance growth and seed production.

All of this will be a moot point unless the seedlings can grow to reach the canopy. One limiting factor is nearly universal throughout the range – the need to protect the young seedlings and saplings from wildlife. Although voles, raccoons and even bears cause substantial damage to newly established chestnuts, white-tailed deer remain the primary concern.. Where the cost of deer fencing is prohibitive, many growers employ a variety of shelters to protect their plantings. Some advocate five -foot plastic tubes, others prefer open cages. Another option is using metal cones to protect young trees from wildlife and to facilitate herbicide application. Planting unsheltered chestnuts in the interior of large clear cuts may offer some protection, because deer prefer forest edges where they are not as exposed to potential threats. Finally, volunteers should seek partnerships with conservancies, land management agencies and private landowners who own fenced land on good growing sites to establish restoration plantings.

Beginning Again

The discovery of the blight launched decades of chestnut research. Restoring the American chestnut to its historic range will require all that we have learned though these years, and then some. We are poised to learn even more from a living American chestnut, one not doomed to decline and unable to compete in eastern hardwood ecosystems. It is an unprecedented opportunity for academic and citizen scientists to observe and record the American chestnut's place in today's forests and to write a template for future generations of forest stewards.

Lois' Chestnut Hermits

by Lois Breault-Melican, MA TACF

The chestnut hermit recipe was an early attempt at altering a conventional recipe by substituting a portion of chestnut flour for regular flour. This is one of many that worked on the first try and is still a favorite. Now I regularly use chestnut flour in most recipes, from pie crusts and waffles to cookies, cakes, breads and gravies. The flour adds a certain toothiness or bite, and I can't help appreciating the nutritional value of chestnuts in all forms whenever I add them to a dish or recipe.

Lois' Chestnut Hermits have become a favorite at MA-TACF meetings. If you are not familiar with hermits, they are spice cookies made with raisins and are often cooked in a pan and cut into bars. Delicious! I adapted this recipe from one by Denise Paquette in *Here's What's Cooking at Paxton Center School* (1981, 1982).

Chestnut flour can be difficult to find. A great supplier is Empire Chestnut Company: 3276 Empire Rd SW, Carrollton, Ohio, 44615-9515 Phone/Fax: (330) 627-3181 www.empire-chestnut.com.

Lois Breault-Melican is a Massachusetts TACF director and co-manages the Moore State Park breeding orchard in Paxton, Mass., with her husband Denis Melican. Lois brought her love of the chestnut into the kitchen and has been experimenting with chestnuts as an ingredient for several years.

Lois' Chestnut Hermits

Ingredients:

- 1 ½ cups seedless raisins
- 1 stick butter or margarine, softened
- 1 ½ cup sugar
- 2 eggs
- 1 ½ cups flour
- ½ cup chestnut flour
- 1 tsp. cinnamon
- ½ tsp. nutmeg
- ½ tsp. cloves
- ½ tsp. salt
- 1 tsp. baking soda
- 1 cup walnuts
- 1 tsp. vanilla

Cooking Directions:

Simmer raisins in ½ cup water for 20 minutes.
Preheat oven to 350°F. Line a jelly roll pan with greased waxed paper.
Cream softened butter and sugar.
Mix in cooled raisin mixture from step 1.
Mix in eggs, the sifted dry ingredients and nuts.
Spread into a jelly roll pan lined with greased waxed paper.
Bake 20 - 25 minutes at 350°F.
Insert toothpick to make sure center is baked.
The toothpick should come out clean when done.

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