THE Journal OF THE AMERICAN CHESTNUT FOUNDATION

March/April 2011 | Issue 2 Vol.25

Songbird Response to Reforestation of Mined Land

Seedling Establishment on Reclaimed Coal Mines

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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 and volunteers, research, sustained funding and most important, a sense of the past and a hope for the future.

About Our Cover Photo:

An article about the origins of the name *Castanea sativa*, better known as the European chestnut, is featured on page 20. Our cover photo was taken in Tuscany, Italy and shows both the shape and beauty of the European chestnut.

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TACF Locations & Staff

TACF National Office
160 Zillicoa Street, Suite D
Asheville, NC 28801
(828) 281-0047
Bryan Burhans, President and CEO
Judy Antaramian, Administrative Assistant
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Meadowview Research Farms
9010 Hawthorne Dr
Meadowview, VA 24361-3349
(276) 944-4631
Dr. Fred Hebard, Chief Scientist, David Bevins, Research Technician, Robert Caudell, Technician, Danny Honaker, Farmer; George Sykes, Farmer

New England Regional Office
USFS Northern Research Station
705 Spear Street
South Burlington, VT 05403
(802) 999-8706
Kendra Gurney, New England Regional Science Coordinator

Mid-Atlantic Regional Office
Virginia Dept. of Forestry
900 Natural Resources Dr.
Charlottesville, VA 22903
(434) 906-9312
Katy McCune,
Regional Science Coordinator

Northern Regional Office
School of Forest Resources
206 Forest Resources Lab
University Park, PA 16802
(814) 863-7192
Sara Fitzsimmons, Northern Appalachian Regional Science Coordinator
Mark Banker, Director of Development

Southern Regional Office
Department of Biology & Environmental Services
615 McCallie Ave, Holt Hall 215, Chattanooga, TN 37403
William White, Southern Appalachian Regional Science Coordinator

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Journal
OF THE AMERICAN CHESTNUT FOUNDATION

Inside This Issue:

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One Million and Seven

by TACF Chairman Glen Rea

The American Chestnut Foundation (TACF) is at a critical juncture in our history. First, we have worked our way through the original breeding plan outlined by Dr. Charles Burnham and we have started production of our first line of potentially blight-resistant chestnuts at our research farm in Meadowview, Virginia. In addition, our New York chapter is now testing its first line of potentially blight-resistant chestnuts using biotechnology methods. Second, there are recent scientific advancements that have opened new doors of opportunity to help us better refine our blight-resistant chestnuts. And finally, we need to start planning how we will actually reintroduce this tree into our forests.

TACF's mission is concise: the restoration of the American chestnut to our eastern forests. To accomplish this goal, we not only have to develop a tree resistant to the blight, we also have to reintroduce this tree back into our forests and these trees must successfully compete with other hardwoods. Although it seems very simple, in reality, reintroducing the chestnut into our forests will present tremendous challenges to TACF and our members. Reintroducing the American chestnut requires far more than simply planting chestnuts in the forest. Our larger challenge is to establish viable populations with appropriate amounts of resistance and American growth characteristics and monitor these trees over many decades.

To position the organization and to take advantage of the opportunities that lay before us, we have launched the most aggressive and far reaching campaign in the organization's history: The Restoration Campaign. This campaign is designed to position the organization over the next three years to plant and evaluate over ONE MILLION potentially blight-resistant chestnut trees by the year 2017! But to plant, monitor and evaluate these trees, TACF will have to undergo growth at unprecedented levels.

TACF must grow dramatically to allow us to achieve this short-term goal. This fact is clear. Our Restoration Campaign is built on three critical principles:

1) Put in place the necessary infrastructure needed to grow our state chapters. The production of locally adapted, blight-resistant chestnuts by our state chapters is the foundation of our program. However, our chapters must have more tools available to them to attract active volunteers and members to help at the local level. TACF's greatest asset is our volunteers; we need more of them.

TACF Chairman Glen Rea

2) Use the best available science to better refine our programs to develop blight-resistant trees, implement an aggressive program to develop trees resistant to root rot caused by *Phytophthora cinnamomi*, and continue our research on hypoviruses to develop protocols that will assist our tree's survival.

3) Develop a comprehensive restoration plan that establishes a road map for the organization that clearly defines and communicates our approach.

4) Educate our youth. Most of us don't remember the American chestnut as it once was. And we continually lose people who have first-hand knowledge and memories of the chestnut. We must educate our youth about the history and importance of the American chestnut. TACF has a 75-year or more mission; we must educate our youth today.

This is an exciting time for TACF and a challenging one as well. The success of this campaign over the next three years is essential if we are to truly achieve the mission set out by our founders 27 years ago; the restoration of the American chestnut.

Share our story with your friends and family and ask them to join TACF.

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News From TACF

Mark Banker, TACF's new Director of Development

New Faces at TACF

The American Chestnut Foundation recently hired Mark Banker as its new Director of Development. Mark has more than 20 years in the conservation industry and brings a wealth of experience to this position. He will be based at TACF's Northern Appalachian Regional Offices at Penn State University with Sara Fitzimmons, TACF's regional science coordinator supervisor and with Sue Oram, administrative assistant for the Pennsylvania state chapter.

William White, TACF's Southern Appalachian Regional Science Coordinator has moved his office to Chattanooga, TN. He will be located at the University of Tennessee, Department of Biology and Environmental Services.

The American Chestnut Foundation and the National Park Service team up to bring back a national icon

Select National Park Service landscapes may once again be filled with a true icon—the American chestnut tree. Under a recently signed agreement between NPS and The American Chestnut Foundation (TACF), the two organizations will work together to restore the American chestnut to forest ecosystems within the native range of the tree.

"We are excited to work with TACF to bring American chestnut trees back to the eastern United States," said National Park Service Director Jonathan Jarvis. "We are already working to sustain and recover populations of threatened and endangered species in national parks, and we look forward to sharing ideas, experiences, and practices with another organization involved in restoring species."

NPS lands will serve as sites for planting chestnuts, large demonstration plantings which will include both pure American trees and hybrids, habitat conservation projects including maintenance of genetically pure, native American chestnut sprouts, and collection of native chestnut pollen to further expand the genetic base of TACF's plant material. Finally, NPS lands will serve as a delivery point for educational information about American chestnut.

"The NPS system offers a unique opportunity to not only restore the American chestnut, but also share the story about this remarkable tree with millions of people," said TACF President & CEO Bryan Burhans.

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News From TACF

The Living Legacy Tree
Following through with our commitment

Many members of The American Chestnut Foundation (TACF) have recognized loved ones through generous gifts to our foundation. We then include this list of honorees in our bi-monthly magazine. Whether the gift was to remember the passing of a loved one, or to honor a marriage or birth; these gifts represent a touching legacy.

As a way to better honor these individuals, and to honor the wishes of the individuals that fund these honors and memorials, TACF has selected one of our 200 Legacy Trees to perpetually recognize your loved ones. This tree is growing in our Legacy Tree orchard in southwestern Virginia. Each year, TACF will use potentially blight-resistant seed from this tree and plant them in public venues to honor those recognized or memorialized by you, through TACF.

When a tree is planted, TACF will notify the donors of the planting location and date of planting. Through this program, we hope to eventually plant hundreds if not thousands of trees to honor the individuals who have been recognized or memorialized.

There is no minimum pledge for a gift. To honor or remember your loved one, simply make a donation to TACF (tax deductible) and specify the individual you would like to honor.

Living Legacy Tree Submission Form

Your name:_____
Address:_____ City:_____State:_____Zip:____
Email address:_____

Gift Recipient:
☐In Honor of
☐In Memory of

Recipient Name:_____
If the person is living, please provide their address:
Address:_____
City:_____ State:_____ Zip:_____
Reason for the gift:_____

In Memory of and In Honor of Our TACF Members

In Memory of

D'Arcy Brent
Rosemary Connelly
Anne Kuchel
Mark & Courtney Roberts
Central VA Chapter of Military Officers Association of America
Peter and Gloria Beddow

Dr. Ed Rall
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George and Donna Lohr
David Vaughn

Please consider making a gift in honor of or in memory of a loved one. Gifts may be directed to TACF, 160 Zillicoa Street, Suite D, Asheville, NC 28801

In Honor of

Craig Morse Moffat
Patricia Gans

Joseph P. Reardon
Black River Audubon Society

Nancy Kyle
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Tim and Marie Taylor
Garden Discovery Tours, Inc.

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Keith Gooch

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Reforesting Abandoned Mine Lands

by Bryan Burhans, CEO

TACF President and CEO Bryan Burhans

When life gives you lemons, make lemonade.

This issue of The Journal of the American Chestnut Foundation features an exciting partner for TACF, The Appalachian Regional Reforestation Initiative (ARRI). ARRI represents the collaboration of university scientists, land managers, state and federal agencies and conservation organizations all working to establish healthy forests on abandoned mine lands.

I distinctly recall several research projects I had the opportunity to work on early during my career that examined the impact of mine land reclamation techniques on wildlife. Many of the sites I worked on in Pennsylvania and Ohio had soils that were compacted during the reclamation process and then planted with tall fescue, *Sericea lespedeza* and aggressive grasses and legumes and other introduced plant species that provide little or no value for wildlife. Because the soils on these sites were compacted as part of the reclamation process, a historically accepted practice, these sites would not support the establishment of trees. From the perspective of wildlife habitat and natural succession, these sites fell far below their potential.

Technically, abandoned mine lands (AML) are sites that were mined before the late 1970s prior to the enactment of the federal law – The Surface Mining Control and Reclamation Act (SMCRA, PL 95-87). However, lands reclaimed after the Act that were not reclaimed using environmentally friendly techniques are often considered AML sites by the general public as well. Today, the majority of AML sites are owned by private landowners like you and I and are usually not owned by the mining companies.

Although many of these lands were initially "reclaimed" according to the established federal and state standards, AML sites often fall short in their ability to function as a healthy forest and support a diversity of wildlife. Unfortunately, there is a lot of acreage spread across our region that is considered AML.

A challenge that faces private landowners that own AML sites, as well as conservationists, is how to deal with the up to 1 million acres (estimated) of AML sites that are located throughout the eastern United States. This dilemma represents a significant opportunity for conservation and the creation of healthy forests.

ARRI is currently working with the mining industry to use the 5-step Forest Reclamation Approach (FRA) on current reclamation projects. The implementation of the FRA results in a reclaimed mine site that promotes a healthy and productive forest that will enhance timber production, provide wildlife habitat, protect the soil and promote water conservation.

In partnership with ARRI and many of our university partners, TACF has conducted extensive research on the methods needed to successfully grow American chestnut on previously mined sites. The results of this research clearly demonstrate the American chestnut grows exceptionally well on these sites if the reclamation process uses the FRA and proper tree planting procedures are followed.

Within the next decade, TACF will produce millions of potentially blight-resistant chestnut seeds, which we call our Restoration Chestnuts, for testing and evaluation. We will continue to work with TACF members, private forest landowners, land trusts, and state and federal agencies to help us with early testing and planting. As seed production increases and our state seed orchards come online, the opportunity to use the potentially blight-resistant American chestnut to leverage and move forward land conservation efforts on AML sites will be dramatic, not only for the American chestnut, but also our wildlife, our environment and our society.

Our partnership with ARRI is making some great lemonade.

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Methods Promoting Ectomycorrhizal Interactions on Establishing American Chestnut Seedlings During Coal Mine Land Reclamation

Jenise M. Bauman[1], Carolyn H. Keiffer, Brian C. McCarthy, and Shiv Hiremath

Abstract

The objective of this research was to evaluate planting protocols that may aid in seedling establishment on reclaimed coal mines in central Ohio by encouraging root colonization from ectomycorrhizal (ECM) fungi. Two field studies used American chestnut (*Castanea dentata*) and blight resistant hybrid chestnut *(C.dentata x C. mollissima*) to evaluate: 1) the effects of mechanical soil treatments on native ectomycorrhizal (ECM) fungi, and 2) the persistence and movement of introduced ECM inoculum.

The first study sampled roots from seedlings planted in either plots that were cross-ripped, plowed and disked, or a combination of both treatments. Plant height and basal diameter were recorded and related to ECM colonization. The presence of native ECM was sequenced to determine fungal species identity. In the second study, 1 year-old chestnut seedlings previously inoculated with one of five different species of ECM fungi (*Hebeloma crustuliniforme, Laccaria bicolor, Amanita rubescens, Suillus luteus, and Scleroderma cepa*) were planted. A combination of BLAST searches and phylogenetic analyses were used to identify ECM fungi to confirm the persistence of the inoculating strain. To test the ability of the fungal inoculum to colonize incoming seedlings, chestnuts planted as seeds 30 cm from the inoculated seedling were also sampled.

In Study 1, mechanical soil treatments resulted in seedlings with significantly more ECM root tips and species richness when compared to the control plots (p = 0.0001 and 0.01, respectively). There were significant interactions between soil treatments and native ECM infection when comparing seedling height (P = 0.008) and basal diameter (p = 0.03). Chestnut seedlings found naturally colonized by ECM fungi had the greatest shoot production in the mechanically treated plots when compared to their non-ECM counterparts. Employing methods of surface conditioning that alleviate soil compaction while encouraging native ECM colonization aid in chestnut establishment on reclaimed mines. In Study 2, after one year in the field, the ECM inoculum did not persist. However, the presence of ECM inoculum at planting greatly contributed to the survival of hybrid chestnut seedlings (p < 0.0001). More importantly, our inoculum did not impede natural colonization by native ECM fungi. Chestnuts that formed ECM with indigenous species resulted in increased growth rates (p = 0.0005). Synthesizing the results of both studies reveal that proper planting methods significantly contributes to the beneficial symbiosis of this natural mutualism and aids in chestnut establishment in reclaimed mine sites in central Ohio.

Ectomycorrhizal sheath (45x) of a Scleroderma species colonizing *Castanea dentata* sampled from Tri-Valley Wildlife Management Area in Muskingum County, Ohio. Photo courtesy of Jenise Bauman.

1 Jenise M. Bauman, Research Associate, Carolyn H. Keiffer, Professor, Department of Botany, Miami University, Oxford, OH 45042; Brian C. McCarthy, Professor, Department of Environmental and Plant Biology, Ohio University, Athens, OH 45701, Shiv Hiremath, Research Biologist, U.S. Forest Service, Northern Research Station, Delaware, OH 43015

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The Jockey Hollow Experiment

Factors Affecting Performance of Artificially Regenerated American Chestnuts on Reclaimed Mine Sites

Paper was presented at the 2010 National Meeting of the American Society of Mining and Reclamation, Pittsburgh, PA. Bridging Reclamation, Science and the Community June 5-11, 2010. R.I. Barnhisel (Ed.) Published by ASMR, 3134 Montavesta Rd., Lexington, KY 40502

Brian C. McCarthy, Professor, Keith E. Gilland, Research Associate, Department of Environmental and Plant Biology, Ohio University, Athens, OH 45701; Jenise M. Bauman, Research Associate, Carolyn H. Keiffer, Professor, Department of Botany, Miami University, Oxford, OH 45042

Jenise Bauman and Bruce Willis planting at Jockey Hollow Wildlife Management Area in March 2008. Courtesy of Keith Gilland.

Abstract

The use of Surface Mining Control and Reclamation (SMCRA) approved practices for mined land reclamation has resulted in arrested succession throughout many areas of central Appalachia. The combination of heavily compacted soils and the addition of aggressive, often non-native grass and forbs creates and environment characterized by high soil-bulk density and aggressive ground-layer competition. This results in a situation where trees are unable to recruit and thus many lands are unable to return to original forest cover through natural processes of succession.

Using the basic principles of the Forestry Reclamation Approach (FRA), we report on two experiments conducted in Ohio; one designed to remediate a 30-year arrested succession and the other designed to encourage immediate reforestation at the time of reclamation. We conducted these experiments using American chestnut (*Castanea dentata*) to explore the potential for using these sites as part of the national restoration plan under development by The American Chestnut Foundation.

The first experiment utilized deep soil ripping and a combination of plowing and disking treatments. After three years, the results are clear. Simply planting chestnut into untreated existing habitat is ineffective. Some type of surface treatment to reduce soil bulk density and competition is necessary for seedling establishment. The more significant the disturbance, the better the survival and growth of chestnut.

The second experiment utilized loose end-dumping at the time of reclamation. Various methods of chestnut deployment and planting were evaluated including direct seeding and bare-root seedlings. Plantings were done with and without protection from predators in different microsites. While survival of seedlings was greater than seeds, the most noticeable enhancement to survival was the addition of a tree shelter, which nearly doubled the survival rate. In summary, American chestnut appears to thrive on mine land reclamation sites – this may prove to be a useful focal point for restoration of the species while aiding in the reforestation of old and new reclamation sites.

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Songbird Response to Reforestation of Mined Land with Hardwood Trees

Jeremy Mizel, WV Fish & Wildlife Research Unit and Petra B. Wood, USGS Fish & Wildlife Research Unit.

Abstract

In the two decades following passage of the Surface Mining Control and Reclamation Act (SMCRA, 1977), surface mines generally were reclaimed to grassland habitat or were planted with black locust (*Robinia pseudo-acacia*), Virginia pine (*Pinus virginiana*), eastern white pine (*P. strobes*), and autumn olive (*Elaeagnus umbellate*). In traditional post-SMCRA reclamation, unweathered materials contribute heavily to the growth medium; mine soils are severely compacted from immoderate grading, and aggressive groundcovers are seeded to prevent soil erosion. Although locust and pine are adapted for growth in this environment, most native hardwoods have poor survival and growth, thus tree species diversity that is characteristic of native deciduous forests is typically absent. Recently, the Appalachian Regional Reforestation Initiative has promoted use of reclamation techniques that enhance survival and growth of native hardwood trees. Surface mines reclaimed to hardwood forest are potentially vast sources of breeding habitat for early successional bird species, many of which are experiencing long-term declines.

We initiated a study to quantify diversity, abundance, and nesting success of early successional birds on mountaintop mines reclaimed with a reduced grading approach and planted to hardwoods and pine 8-14 years ago. We examine variation in bird communities across a site gradient ranging from uncompacted minesoils planted with an array of hardwood species to compacted minesoils planted primarily to pine and locust and representative of the traditional reclamation environment. Investigation into this relationship could provide insight into the bird species assemblages that future reforestation efforts might yield. Other studies have found scrubland species to be common on some mineland habitats, but it is not known if nesting success is high enough to sustain populations. Previous studies found that Cerulean Warblers (*Dendroica cerulea*) had reduced abundance and territory density in proximity to large-scale mine edges and in landscapes with reduced amounts of mature forest. Reforestation of mined land that is adjacent to forest may mitigate edge effects for forest interior songbirds through the creation of a more transitional forest-mine edge. Productive and diverse forests that have been established on reclaimed minelands may also contribute to reducing fragmentation and compensating for habitat loss within the surface mining landscape.

The Cerulean Warbler may find enhanced breeding habitat as former mine lands are reclaimed.

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Mighty Giants to the Rescue

By Lisa Metheny

Regardless of the debate over the need for coal, the processes in which is it removed from the earth is a hot-button topic for many. Obviously, coal mining does leave a mark on the land. How much of a mark and can that mark be minimized are questions that only time can answer.

The good news is with today's high-tech science, improved mining regulations, mandatory reclamation programs, and dedicated conservation organizations, many of the mine sites have been completely reclaimed or are in the reclamation process. So instead of leaving abandoned, unsightly, dangerous mine sites, which were common only a few decades ago, new efforts are underway to reclaim these lands.

What exactly is reclamation? Reclamation is the process of returning the land to a condition better than it was prior to mining. The process sounds simple but requires a great deal of planning as well as a significant financial investment. Today all mines must file a reclamation plan long before the first truckload of dirt is moved and typically the reclamation process continues during and long after the last piece of heavy equipment is hauled off to the next site. According to Patrick Angel, Ph.D. and Senior Forester for the U.S. Department of the Interior, Office of Surface Mining Reclamation and Environment, "during the mining process, wildlife species typically leave the area and find refuge in the surrounding undisturbed forest. Once mining is finished and the reclamation has been completed, a diversity of wildlife species can return to use the sites for food and shelter depending on the composition of the vegetation used to reclaim the mine site. Restoring the forests with a reclamation methodology called the "Forestry Reclamation Approach" has been found to be the best post-mining land use for wildlife enhancement."

Conservation organizations such as The American Chestnut Foundation (TACF) have also stepped up to the plate and added their energy and expertise to help in the reclamation process. Take, for example, the heavily mined mountaintop Appalachian region, an area with a heritage rich in coal as well as the forestry industry. In this area, the Appalachian Regional Reforestation Initiative (ARRI) and TACF have actively become involved in reclaiming this region by planting mixed hardwood tree species including the American chestnut tree on active and abandoned mine sites. According to Angel, "ARRI goals are to plant more high-value hardwood trees on reclaimed coal mined lands, increase the survival rates and growth rates of planted trees, and to expedite the establishment of forest habitat through natural succession. We are planting many species of native hardwoods and understory shrubs to accomplish these goals, including potentially disease-resistant American chestnuts."

Although the reclamation process involves a variety of species of hardwoods, grasses and legumes, the American chestnut tree certainly has garnered much attention recently, primarily because American chestnut trees thrive in mine soils and because they grow very fast and the nuts produced by the chestnut trees are great food source for wildlife. Many mine operators are pleased with the success they have seen from the American chestnut tree. Additionally, much of this region is also the native range for the American chestnut tree; therefore it only makes sense to try restoring both the land and the precious American chestnut tree

The dibble bar is an essential tool for planting American chestnut seedlings on abandoned coal mine lands. Courtesy of ARRI.

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Before and After. Patrick Angel surveys three-year-old chestnut trees at a former coal mine site in Kentucky. The same area is shown at left, before reclamation plantings were fully established. Photos courtesy of ARRI.

to its native area.

Landowners are trying to squeeze every possible penny out of land these days and reclaimed mine land is no exception. Reforestation has become increasingly popular as landowners consider future commercial timber as a possible revenue stream and are now planting a variety of hardwoods for future timber. Unlike some hardwoods which may only offer one source of revenue, the mature American chestnut tree may produce two cash crops, nuts and timber. Additionally, the demand for hardwood products is also growing thanks to a resurgence in industries that use wood as their main material such as flooring, cabinetry, furniture and pallets companies.

Reclaimed mining lands which have successfully reestablished native wildlife species also bring value to a region in terms of conservation benefits and economic benefits. Consider for a moment that a successful reforested area can house hundreds of species of animals, birds, insects and vegetation to create a healthy and balanced ecosystem.

The economic impacts which typically follow such successful reforestation projects are many. Take hunting for example, regardless of which side of the hunting debate you are on, few can argue ethical hunters make enormous contributions to help promote healthy wildlife and protect valuable habitat. Even non-game species such as the bald eagle have benefited from money generated from hunters. According to the U.S. Fish and Wildlife Service, the Pittman Robertson Act of 1937 applies taxes to every item a hunter or angler purchases from the guns and ammo, to boots and bait. This fund generates on average over $150 million annually. That revenue is then pumped back into wildlife, habitat, restoration, watershed improvement and a host of other critical projects.

It is difficult to measure in terms of dollars how a piece of reclaimed mine with huntable resources such as deer, turkey, upland and small game can have on a local economy. When forest thrives wildlife thrives, and when wildlife thrives hunters and anglers and other outdoor enthusiasts will pour money back into the area.

The benefits of a healthy forest ecosystem are numerous but possibly one of the greatest benefits that often gets overlooked is a healthy supply of water. Balanced forest ecosystems serve as one giant filtration system for precious underground aquifers. Water is the single most important natural resource man has, and healthy hardwood forests play a vital role in keeping this resource safe.

By reclaiming the land and planting nature's Might Giant, the American chestnut tree, and other hardwood species, the potential for future hardwood products, clean water, and recreational uses are endless. We look forward to the day when we can return the American chestnut tree as the mighty giant in woodlands across America to the help restore, rebuild and reclaim the land for future generations to enjoy.

Lisa Metheny is an award-winning outdoor writer, photographer, seminar speaker and outdoor skills instructor. Metheny has over 250 articles published; conducts seminars on a woman's participation in the outdoors, archery and hunting topics and holds several instructor certifications.

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Sowing the Seeds in Small Town USA

by Tom Fitzsimmons

Tom Fitzsimmons, father of TACF Regional Science Coordinator Supervisor Sara Fitzsimmons. Courtesy of Sara Fitzsimmons.

In the small, scenic railroad town of Hinton, West Virginia, Alisha and Mike Segars have joined thousands of Americans in the quest to return the once magnificent American chestnut to our forests.

By naming their recently opened coffee house/bed and breakfast "Chestnut Revival," they hope to encourage others to become more actively involved in bringing back the American chestnut tree.

Mike and Alisha have both earned wildlife degrees from West Virginia University. They understand the important role that the American chestnut tree played in the lives of people and animals, especially in rural Appalachia.

"The younger generation doesn't realize how important chestnut trees were to our culture, lives and to the animals of farms and forest," Alisha said. "Knowledge used to be passed down fact-to-face on a daily basis from one generation to the next. We listened and learned from parents, uncles, aunts, and grandparents whom we knew, loved, and respected," she continued. "I am concerned that this isn't happening as much as it used to and the younger generation is not aware of the work that The American Chestnut Foundation is doing to overcome the damage done by the Asian fungus that kills American chestnut trees. They don't realize that their volunteer work and financial assistance are essential for research such as backcross breeding between American and Chinese chestnut trees."

Mike added that "putting information into the hands of this younger generation is essential. A coffee house provides an excellent place for informal dialogue to occur, which hopefully will result in active involvement in returning healthy American chestnut trees to our forest."

In every community there are some who rise to great heights. The John Henry legend of man vs. machine came from a C&O railroad tunnel at Talcott in Summers County, just down the road from Hinton. In more modern history, Hinton has been the home of a retired chairman for Goldman Sachs, two inductees into the Country Music Hall of Fame, an Assistant Chief of Staff for President Bill Clinton, and the Vice-President of Massey Energy (a supporter of chestnut restoration), just to name a few.

Those people made significant contributions, in a variety of ways, to our world. Hundreds of other people in every community have given their time, talent, effort and/or resources to make the world of ours a better place to live. For 35 years as a high school and community mental health counselor, I have tried to sow a lot of seeds. Some took longer to grow than did others. Alisha and Mike Segars are in their own way sowing seeds. Hopefully, these will grow and each in their own way contribute to the return of one of America's great lost resources – the American chestnut tree.

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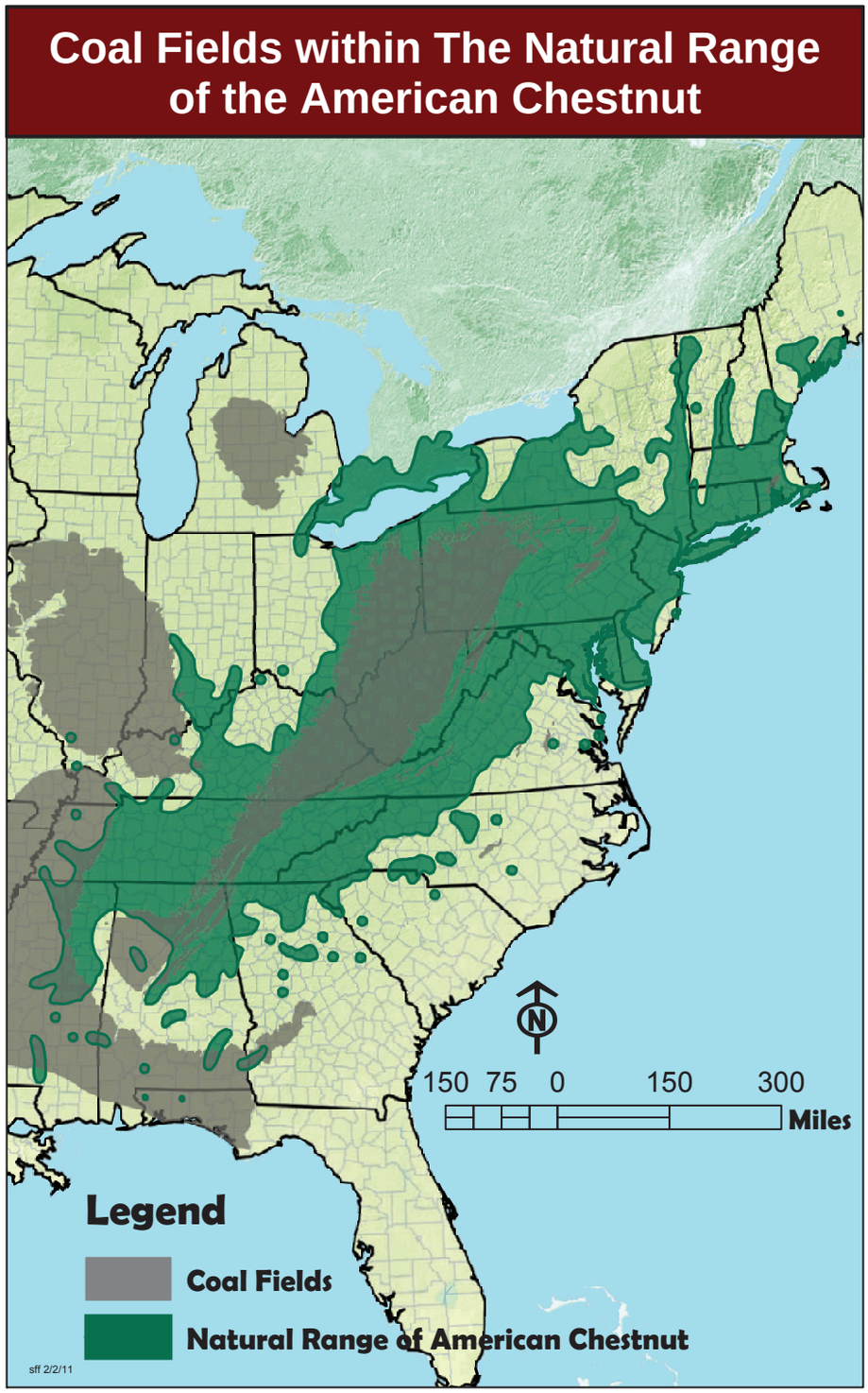

Courtesy of Sara Fitzsimmons, TACF

TACF's partnership with ARRI has become an important effort to plant both pure American chestnuts and our potentially blight-resistant Restoration Chestnuts on tracts of land impacted by coal mining. The natural range of the American chestnut tree encompasses much of the coal fields of the Appalachian Mountain region. With such overlap, using the fast-growing chestnut tree to reforest abandoned coal mine lands will result in a healthier forest ecosystem and the restoration of many wildlife habitats.

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What is the ARRI?

By Patrick Angel, Vic Davis, Jim Burger, Don Graves and Carl Zipper

Younger generations can help turn abandoned coal mine lands into healthy, vibrant forests by planting fast-growing hardwoods like the American chestnut. Pictured here is a group of high schoolers from Wyoming County, WV. They joined West Virginia state forestry officials and representatives from the Appalachian Regional Reforestation Initiative and TACF to plant 6,600 one-year-old hardwood seedlings, including chestnut, across nine acres of reclaimed property last year. Courtesy of ARRI.

The Appalachian Regional Reforestation Initiative (ARRI) is a cooperative effort by the states of the Appalachian region with the Office of Surface Mining to encourage restoration of high quality forests on reclaimed coal mines in the eastern US. ARRI's goals are to communicate and encourage mine reforestation practices that:

- Plant more high-value hardwood trees, like the American chestnut, on reclaimed coal mined lands
- Increase the survival rates and growth rated of planted trees
- Expedite the establishment of forest habitat through natural succession

The Surface Mining Control and Reclamation Act (SMCRA) improved the surface mine landforms by increasing stability, improving water quality, and enhancing human safety in the Appalachian region. However, SMCRA's implementation has not been accompanied by widespread replacement of forests disturbed by mining. Many mined lands were restored as grasslands but are not currently used for hay or pasture by their owners. Native forests will eventually be restored on such areas by natural succession, but this process is slow and centuries may be required.

Following SMCRA's implementation, regulators focused primarily on the overall landscape structure at the expense of restoring forest land capability. This approach was caused by a desire to solve the problems such as severe erosion, sedimentation, landslides, and mass instability caused by pre-SMCRA surface mining. As a result, excessive mine soil compaction was common on surface mines, and aggressive

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Abandoned coal mine land across the Appalachian region that has been reclaimed may someday be filled with American chestnuts like these three-year-old trees at the Jockey Hollow site. Courtesy of ARRI.

ground covers were generally planted. Furthermore, both regulators and mine operators were challenged by the technical complexities of implementing SMCRA in the years following its passage. As a result, reforestation took a back seat. Lastly, some early efforts by mine operators to reforest under SMCRA proved problematic, in part because these efforts were conducted without the benefit of scientific knowledge that is available today; as a result, mine operators and regulators came to believe that post-mining land uses such as hay and pasture land were easier and cheaper to achieve than forests. These factors and others contributed to a significant loss of forests due to mining across Appalachia. The current reforestation initiative is an effort to increase knowledge and change attitudes about planting high-value, native hardwood trees such as the American chestnut on surface mines.

Forests have been the traditional land use and support an established industry throughout the eastern coalfields; in recent years, resurgence in the hardwood timber and forest

products industry has occurred throughout the region. Furniture, flooring, and paneling are made from many fine hardwood species, including American chestnut. Forests provide many benefits such as wildlife habitat, watershed control, carbon sequestration, and recreation. Owners of mined lands, who were once content to have their land reclaimed to grassland and shrubland, are becoming more interested in reforestation with commercially-valuable hardwoods.

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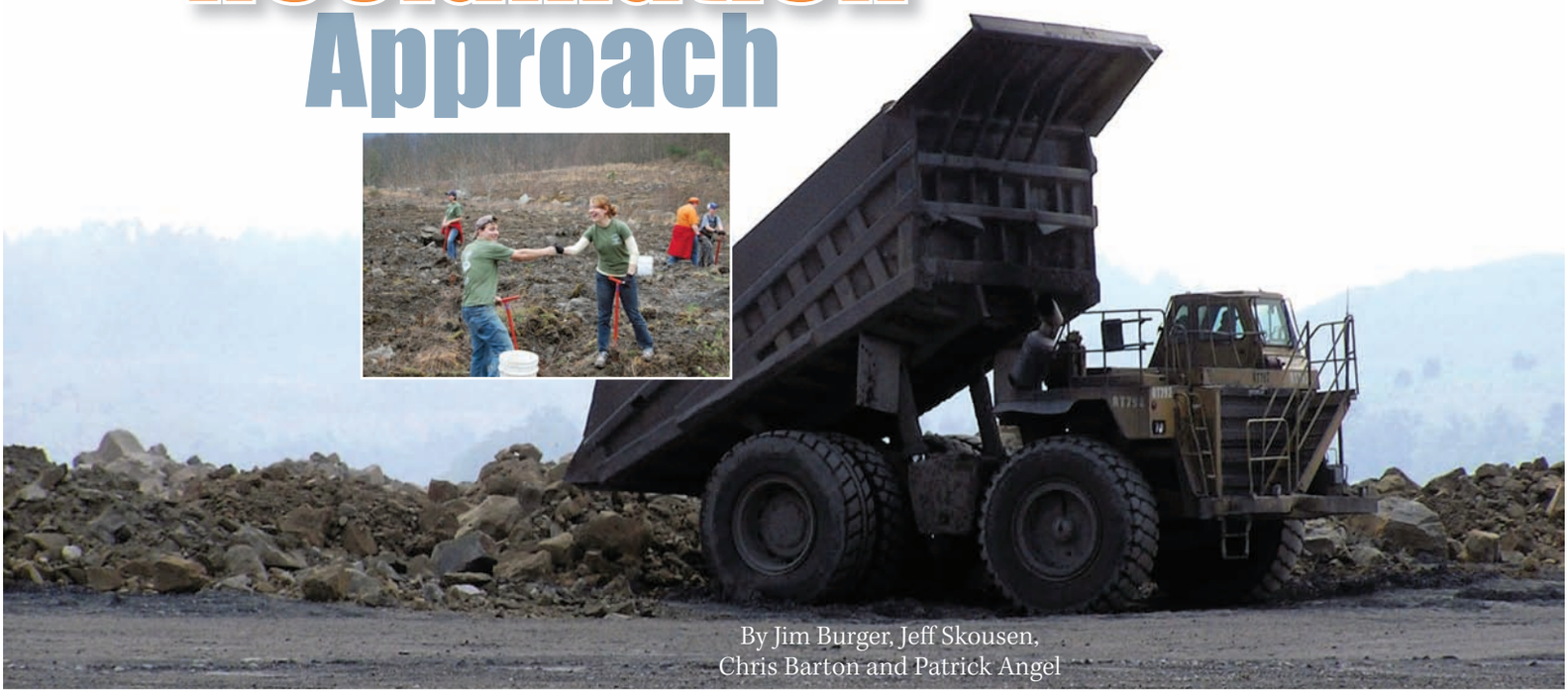
The Forestry Reclamation Approach



By Jim Burger, Jeff Skousen,
Chris Barton and Patrick Angel

Dumping commercial forestry growth medium to begin the eventual reforestation of lands formerly used for coal mining. Courtesy of ARRI.

The Appalachian Regional Reforestation Initiative (ARRI) advocates a diverse, mixed planting of native hardwoods on reclaimed mined land. One of the species that stands above the rest is the American chestnut. This amazing tree grows and produces nuts very fast on mine soils that are loosely graded. In general, the American chestnut actually prefers the dry, well-drained, rocky, non-compacted growth medium that mining operations can create with the Forestry Reclamation Approach (FRA).

When talk turns to reclaiming abandoned mine lands, ARRI embraces the idea that the project is about planting trees and not about creating more disturbances on the land.

FRA is a method for reclaiming coal-mined land to forest under the Surface Mining Control and Reclamation Act (SMCRA). The FRA is based on knowledge gained from both scientific research and experience. The FRA can achieve cost-effective regulatory compliance for coal operators while creating productive forests that generate value for their owners and provide watershed protection, wildlife habitat, and other environmental services.

The FRA is considered by state mining agencies and the US Office of Surface Mining to be an appropriate and desirable method for reclaiming coal-mined land to support forested land uses under SMCRA. The FRA is also supported by members of the ARRI's Science Team, which is drawn from universities in nine states, and by other groups and agencies.

The FRA is designed to restore forest land capability. When all five steps of FRA are followed, forest land productivity can be restored. Furthermore, the FRA accelerates the natural process of forest development by creating conditions similar to those of natural soils where native forests thrive. By limiting compaction during reclamation, dirt becomes deep and loose, similar to the best forest soils. Temporary erosion-control ground covers are selected to allow native herbaceous and woody plants to seed-in, emerge, and grow.

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The ground cover species are meant to be sparse and slow growing in the months after seeding, after which they will transition to a more diverse species mix that will control erosion and will be self-sustaining as required by SMCRA. Over the longer term, the herbaceous ground cover will yield to native forest through the process of natural succession which refers to the refers to more or less predictable and orderly changes in the composition or structure of an ecological community such as a forest.

Natural succession is further accelerated by planting heavy-seeded species such as those in the chestnut-oak family. Seeds from species in the chestnut-oak family are not dispersed from the native forest easily by wind and wildlife. Planting these heavy-seeded species puts them on site right away, allowing them to emerge with other species that can seed in on their own. When good soil is established, late successional plants will thrive, especially when native soil is used or mixed with the suitable overburden materials. When native forest soils are used as part of the growth medium, native vegetation establishment will be accelerated. This is due to vegetation that sprouts from those seeds of forest understory and tree species that remain viable. Overall, such reclamation practices create a diverse and valuable forest of native plants that produces wood products and habitat for wildlife.

"TACF has been a great supporter and partner in advocating proper surface mine reforestation. We're taking and mixing American chestnut with oak, maple, cherry, poplar and other hardwoods on these mined lands and we're seeing tremendous results," says Patrick Angel who works for the Office of Surface Mining. Angel also says that when he and other members of ARRI mention planting American chestnut to landowners, the faces of these landowners light up when they realize that they are part of a region-wide ecological restoration effort.

"I foresee a time when disease-resistant American chestnuts will emerge as the superior reclamation species for stabilizing mine sites, producing timber and wood fiber, enhancing wildlife potential, and playing a major role in restoring the ecosystem services provided by healthy, productive forests."

Create a suitable rooting medium for good tree growth that is no less than four feet deep and comprised of topsoil, weathered sandstone and/or the best available material.

Loosely grade the topsoil or topsoil substitute established in step one to create a non-compacted growth medium.

Use ground covers that are compatible with growing trees.

Plant two types of trees—early successional species for wildlife and soil stability, and commercially valuable crop trees.

Use proper tree planting technique

Mother Nature despises a void in the ecosystem. Where such a void exists, such as the one created by an abandoned mined land, she will find a way to fill it. Natural succession is the process by which these barren lands become thriving ecosystems once again.

First, wind-borne plant species find their way to the land as early succession plantings.

Second, mid-succession plants, including such species as pokeberry arrive.

Finally, late-succession species such as the American chestnut assert themselves since most late-succession species will become the dominant species in the natural succession process.

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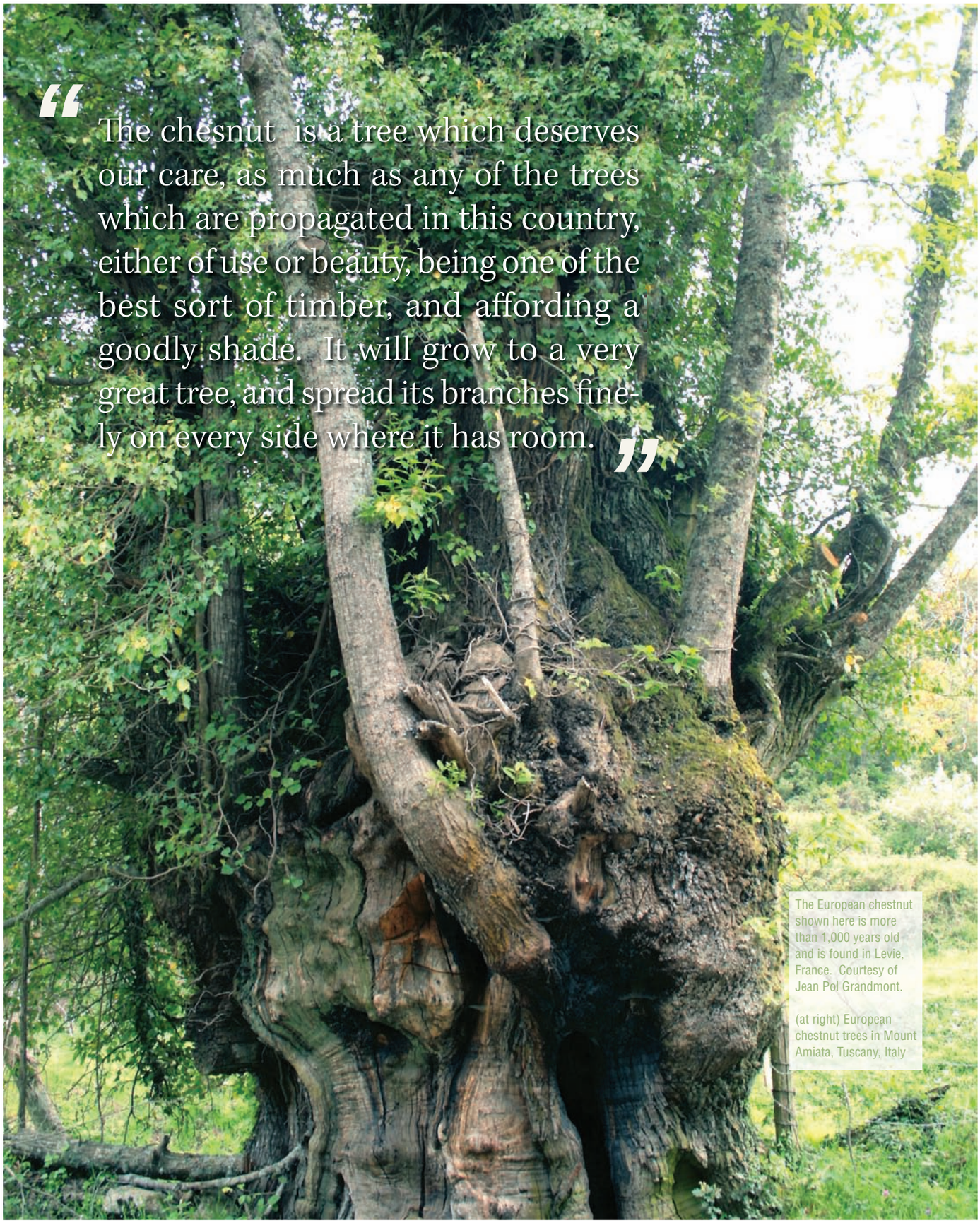

The European chestnut shown here is more than 1,000 years old and is found in Levie, France. Courtesy of Jean Pol Grandmont.

(at right) European chestnut trees in Mount Amiata, Tuscany, Italy

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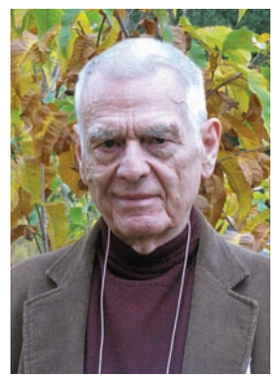
Phillip Miller (1697-1777) & *Castanea Sativa*

Behind the scientific naming of the European Chestnut

By William Lord

Phillip Miller's (1691-1771) association with the European chestnut was rich and life-long. His description of *Castanea sativa* in his 1768 edition of the *Gardener's Dictionary* preceded that of all other contemporary European botanists and so his epithet sativa is recognized over the *C. vulgaris* (1785), and the *C. vesca* (1788). *Sativa* is interpreted from botanical Latin as, "not wild, planted, cultivated, sown," [Ibid. p 135]. This may be a refinement of Miller who defines "*sativa*" as "manured." In Miller's words, "These trees require no manure other than their own leaves, which should be suffered to rot upon the ground…." Miller also writes: "The chesnut is a tree which deserves our care, as much as any of the trees which are propagated in this country, either of use or beauty, being one of the best sort of timber, and affording a goodly shade. It will grow to a very great tree, and spread its branches finely on every side where it has room. The leaves are large, of a lucid green, and continue late in the autumn; nor are they so liable to be eaten by insects, as are those of the Oak, which of late years have frequently happened to the latter, and has rendered them very unsightly a great part of summer, which I have never observed to be the case with the Chesnut, which renders them more valuable for parks and plantations for ornament and there is no better food for deer, and many other animals, that their nuts, which most of them prefer to acorns, but yet, there should not be many of these trees planted too near the habitation; because, when they are in flower, they emit a very disagreeable odor, which is very offensive to most people."



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.

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Photo of European chestnut trees taken by Massachusetts member Brad Smith on a recent trip to the Lazio region of Italy. Courtesy of Brad Smith

Miller noted that the European chestnut was formerly more abundant than at present, and described methods for its cultivation, for timber and for nuts. It "was formerly in greater plenty amongst us than at present, as may be proved by the old buildings in London, which were for the most part of this timber." And in a description of London, written by Fitz-Stephen, during King Henry the Second's time (1153-89), he speaks of...

"a very noble forest, which grew on the north part of it...and there are now some remains of old decayed Chesnuts, in the woods.....not far distant from London....which plainly proves, that this tree is not so great a stranger to our climate, as many people believe, and maybe cultivated in England, to afford an equal profit with any of the other sorts of larger timber-trees, since the wood of this tree is equal I value to the best Oak, and for many purposes, far exceeding it, as particularly for making vessels for all kinds of liquor, it having a property (when seasoned thoroughly) of maintaining it s bulk constantly, and is not subject to shrink or swell, as other timber is too apt to do; and I am certainly informed, that all the large casks (and) tuns, for their wines in Italy are made of this timber, and it is for that, and many more purposes, in greater esteem among the Italians, than any timber whatever.

It is also very valuable for pipes to convey water underground, as enduring longer than the Elm, or any other wood. In Italy it is planted for coppice wood , and is very much cultivated in stools, {sprouts] to make stakes for their Vines; which being stuck into the ground, will endure seven years, which is longer than any other stakes will do, by half the time. The usefulness of the timber, together with the beauty of the tree, renders it as well worth propagating as any tree whatever."

Before planting seed Miller recommended, "...it would be proper to put them into water, to try their goodness, which is known by their ponderosity; those of them that swim upon the surface of the water should be rejected as good for nothing, but such as sink to the bottom, you may be sure are good."

Miller gave detailed instructions for growing a plantation of chestnut, producing a variety of wood products as the trees grew and were thinned. When growing trees primarily for nut production "....(The seed) should be taken from such trees as produce the largest and sweetest nuts, which are commonly found on trees that spread the most.....", compared to trees with tall, vertical growth. "....in many countries, where the trees are cultivated for their fruit, the people graft the largest and fairest fruit, upon the stocks of Chesnut raised from the nut; and these grafted trees are by the French called Maronnier, but they are unfit for timber."

In his folksy, informative article on chestnut, Miller describes no American species other than the chinquapin. This is probably because when Miller wrote about the genus *Castanea* in 1768, the American chestnut and the European chestnut were considered t o be the same species.

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Chestnut Sage Herb Stuffing

Chestnut Sage Herb Stuffing

Nutrition Facts Serving Size: 1 Heaping Spoonful of Stuffing

Calories	361 (7% protein, 67% carbohydrates, 25% fat)
Total Fat	19g (Saturated fat 3.8g)
Cholesterol	43mg

Ingredients: herb stuffing, unsalted butter, hot Italian sausage, onion, celery, sage, chestnuts, parsley, sea salt, black pepper, chicken broth.

Ingredients:

- 1 package herb stuffing
- 3/4 stick unsalted butter, melted
- 10 oz. hot Italian ground sausage meat
- 2 cups onion, diced
- 1 1/2 cups celery stalk, diced
- 1/4 cup (packed) fresh sage leaves, roughly chopped
- 1 cup jarred chestnuts, peeled and coarsely crumbled
- 1/3 cup flat leaf parsley, roughly chopped
- 1/2 tsp sea salt (optional)
- 1/2 tsp freshly ground black pepper
- 1 1/2 cups prepared chicken broth

▶Preheat oven to 350º F.

▶Butter an 11x7x2 glass baking dish.

▶Heat 1 tablespoon of the butter in a large skillet over a medium high heat. Add the onions, celery and sage, cover and cook until tender, about 6 minutes.

▶Stir in the ground sausage and breaking it up with a wooden spoon, continue to cook until all the meat has browned and is crumbled in appearance, about 10 minutes.

▶Transfer sausage mixture to a bowl, stir in the chestnuts, parsley, iodized sea salt and pepper. Stir in herb stuffing mix with low sodium chicken broth; add a little more broth if stuffing is too dry. Stir in remaining butter.

▶Transfer stuffing to prepared baking dish and cover with buttered foil. Bake for 40 minutes. Uncover and bake a further 20 minutes or until top is crispy and golden.

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