WAITING FOR SPRING

American Chestnut Foundation Maryland Chapter Newsletter

Winter 2016

IN THIS ISSUE

Chapter President's Corner

By Dave Gill

I hope everyone fared well during our January blizzard. As can be seen in the masthead, our orchards didn't suffer much damage and are just waiting for spring to arrive. You will find in this newsletter that the Chapter has a very busy spring schedule that we hope you will be able to help us with. After a long winter there is great joy in getting outside and getting your hands dirty. Come join us and help plant the future. You won't regret it.

In prep for the spring activities, we will be kicking off the season with a Chapter meeting on **March 12th**. This should be a very interesting meeting with two special guest speakers. Details about the meeting can be found in this newsletter.

One of my goals this year is to improve the Chapter's communication with its membership. I can use your help in achieving this objective. Please let me know if there are topics you would like to see in the newsletter or if you have suggestions on how our notices to you could be improved.

Think spring, it will bring a smile to your face. See you at the **March 12th** meeting.

A Chinese Chestnut Thriving in the Canopy

By Bruce Levine

In the in the woods along Rock Creek, where it runs parallel to Jones Mill Road, a remarkable chestnut tree is growing. This unblighted tree grows straight, and free of branches for the first 65 feet. According to my Biltmore stick, it measures 85 feet tall, which is enough for it to compete in the canopy along with the neighboring oaks, tulip trees and black gums. In fact, it is so tall that I could not get a leaf or twig sample to examine what kind of chestnut it is, until I visited it after a thunderstorm a few summers ago and was able to pick some samples off the ground. Based on examination of its leaves, twigs, burs and nuts, it appears to be pure Chinese, but one whose growth habit is well-adapted to the forest. This tree seems an interesting candidate for future breeding, though getting access

to the flowers would be a challenge.

Fortunately, something is pollinating this tree. Most likely the pollen comes from a group of not particularly unusual Chinese chestnuts growing in the Audubon Society's Wood End Reserve, which is about 1.4 mile away as the crow flies on the other side of Rock Creek and Jones Mill Road. Two years ago, I grew 4 seedling from nuts I gathered from this Jones Mill Road tree, and I plan to start 30 more this spring, though I have no place to plant them. If anyone is interested in taking some of the seedlings, and keeping these interesting Chinese genes around for another generation, let me know at: (BruJonLev@yahoo.com).

Orchard Manager's Corner

By Ron Kuipers

Winter- Spring & Summer Field Work

Our Chapter has committed to a very ambitious work program this year. The timing of much of the work is tied to the planting season beginning in late March. Major early season projects include tree inoculations and culling and Ambrosia beetle control. As always, we need as many volunteers as possible to help get the job done. If you think you can help, contact me at m_rkuipers@yahoo.com and I can add you to our orchard volunteer email list. I will be posting to this list as tasks are coming up. Below are the target projects for each of our orchards.

Beltsville Agricultural Research Center (BARC)

- ✓ Finish installing 1,400' long deer fence.
- ✓ Prep for planting - finish installing stakes & tree shelters, make bulb planter holes, apply soil amendments & Roundup in rows.
- ✓ April 2 or 3 -plant 260 seeds, mulch all plantings.

WSSC Seed Orchard –

- ✓ Prep for planting - finish installing stakes & shelters, make holes, apply soil amendments in rows.
- ✓ First week of April - plant 2,300 seeds, mulch all plantings.

CMREC Seed Orchard

- ✓ Prep for planting - install stakes and shelters, make holes, apply soil amendments and Roundup in the rows.
- ✓ End of March-early April - plant 1,350 seeds, mulch all plantings.

IWL-Damascus and Hashawha

- ✓ Cut down and burn or chip all but 20-25 trees in each orchard. Host organizations have lead.

Fox Haven

- ✓ Remove final 200+ stumps.

Monocacy

- ✓ Finish tree culling and stump removal in original section
- ✓ May or June - inoculate all 150 trees in newest section

Black Hill

- ✓ Cull selected trees in demonstration section.
- ✓ May or June - inoculate the 15 B1 x B2 crosses.
- ✓ April - begin spraying for Ambrosia beetles.

Ft. Detrick

- ✓ Cull all non-B3F3 trees.
- ✓ April begin spraying for Ambrosia beetles.

Maryland State Highway Administration at Hampstead

- ✓ April - begin spraying for tent caterpillars and Ambrosia beetles.

IWL-Rockville

- ✓ Remove dead trees and branches.

IWL-Southern Maryland

- ✓ May or June - inoculate entire orchard to select for resistance.

WMREC

- ✓ Finish cleanup of dead trees and large weeds.
- ✓ May or June - inoculate entire orchard to select for resistance.

Spring Chapter Meeting

*When – **March 12, 2016***

*Time – **11 Am to 1 Pm***

*WHERE – **URBANA LIBRARY***
9020 AMELUNG ST
FREDERICK, MD 21704
The Anthony Natelli Community Room

Located on the Ground Level on the right across from the Library welcome desk, just inside the lower entrance from the large parking lot

*We are honored to have two special guest speakers at this meeting. Our first speaker will be **Lisa Thomson**, **President and CEO of The American Chestnut Foundation**. Lisa will be talking about the Foundation's long-term strategic plan for Restoration 1.0 seeds and the role that the Maryland chapter will play.*

*Our second guest will **be Dr. Harmony Dalgleish**, **Assistant Professor at the College of William & Mary**. Harmony will be presenting her current research on ecology critical to the American chestnut's reintroduction into the forests.*

These presentations are sure to be very interesting and informative. Be sure to mark your calendars so you don't miss this opportunity. If you know of non-members that would be interested in these topics, let them know they are more than welcome to attend the meeting. For those interested in growing chestnuts, we will have a limited number of seeds available at the meeting for attendees.

Below are brief biographies about our guests. Hope to see you at the meeting.

Lisa Thomson

President & CEO of The American Chestnut Foundation

Lisa came to The American Chestnut Foundation with over 30 years of experience working with non-profit conservation organizations. She specialized in the area of fund raising and served as a senior executive at The Nature Conservancy in the land management and philanthropy departments. She was also Vice President of Development at Rollins College and served as their Senior Major and Principal Gift Officer. Lisa earned her B.S. at Stetson University and M.S. at Florida State University. She and her husband Walt live in Asheville, North Carolina.

Harmony Dalgleish

Assistant Professor, College of William & Mary

Harmony received her Ph.D. from Kansas State University in 2007 and her B.A. from Grinnell College in 2000. She is a plant population ecologist with research interests in plant demography, the ecology of bud banks, and plant-animal interactions. Her current research examines biological interactions critical to American chestnut reintroduction and the potential consequences of successful establishment of a blight-resistant chestnut for the ecology and carbon dynamics of eastern US forests. Her teaching interests include population and community ecology, quantitative methods, mathematical population modeling, and environmental science.

Orchard Tour

By: Dave Gill

Most of the Chapter membership has not had an opportunity to visit the various chestnut orchards that the Chapter maintains. Starting with this newsletter, we will be introducing you to one of our orchards in every issue.

Maryland State Highway Administration (SHA) – Hampstead Orchard

- Orchard type – Backcross Breeding (Originally started as a demonstration orchard but converted to a backcross breeding orchard in 2011)
- Location – Route 30 bypass, Hampstead in Carroll County
- Size – Approximately 2 acres
- Resistance Type – Musick
- Total Trees – 375
- Steward – Jim Curtis

In 2010, SHA agreed to allow the Chapter to plant chestnut trees to help mitigate the environmental effect of the construction of the Route 30 bypass. Through their generous efforts, we have increased the area dedicated to our trees and have filled the allocated area. As a result of the joint efforts of our Orchard Steward, Jim Curtis, and SHA, the orchard is extremely well maintained and a model of what we hope to achieve for each of our orchards.

Jim Curtis checking Hampstead Orchard

Our orchards flourish when the Orchard Steward is totally dedicated to the project. Jim is one of those volunteers that make a difference. He has been a Chapter member since 2009. In addition to his orchard chores, Jim helps the Chapter by maintaining our web page and has been an active Board member for a number of years.

It takes a good deal of time to establish a breeding orchard, which involves a staggered planting schedule. We started planting this orchard in 2011 with final plantings completed in 2015. The backcross trees consist of BC_3 and F_1 trees. As with all breeding orchards, we also plant Chinese and American trees as controls to evaluate growth patterns and the results of our inoculations of the chestnut blight. Inoculations usually occur when the trees are five years old, so the first plantings will be tested in June 2016 and evaluated in November.

Each orchard brings challenges and the Hampstead orchard is no exception. The location has no water source, so Jim has carried many a five-gallon bucket to keep the new seedlings growing. Insects have wreaked havoc as well. Jim has dealt with outbreaks of Ambrosia Beetles and Tent Caterpillars.

Being an Orchard Steward can be very challenging, but also very rewarding as you see the outcome of your efforts. If you want to take on the role of Orchard Steward, please get in touch with Ron Kuipers at m_rkuipers@yahoo.com. If you are interested in helping Jim at the Hampstead orchard, please contact Jim at **curtisjim@comcast.net**

A Winter Nap

By: Dave Gill

Where do all those harvested seeds go?

Have you ever wondered what happens to the thousands of chestnut seeds that the Chapter members harvest each fall? We collect nuts either from our backcross breeding trees or pure American chestnut trees. The backcross nuts are generally destined for planting in the Chapter's orchards or are shared with organizations such as the American Chestnut Foundation, educational institutions, and independent researchers. The pure American nuts are put to a multitude of uses. We use some within our breeding orchards, raise some as seedlings to give to the public at Chapter presentations, and provide others to researchers.

Before we can use the seeds for spring plantings, dedicated chapter volunteers oversee the seeds' winter naps. In order for the chestnuts to properly sprout in the spring, they need to go through a cold hardening process that simulates a winter in the ground.

To get the nuts ready for their nap, they go through a 120-degrees bath for 20 minutes in order to kill off any weevil eggs and/or larvae that may have infiltrated the seeds. The next step is to take batches of 100 seeds and place them in freezer bags with lightly moist peat moss. This helps simulate the seeds lying in the ground over winter. The bags are labeled and small holes are put in the bags to allow air circulation so mold doesn't develop.

Naptime usually starts in early October by placing the chestnut bags in refrigerators and keeping the temperature at about 34 degrees. Each month our caretakers check the bags, looking for mold or anything unusual in the appearance of the seeds. The seeds need a minimum of 90 days in cold storage and we usually don't "wake" them until late March.

All this hard work pays off in spring when we see a sprout poking up from the ground. A lot of effort and care, but that is what the Chapter is all about. If you think you might be interested in housing some of next fall's harvest, contact Ron Kuipers at m_rkuipers@yahoo.com .

If you are interested in how to plant Chestnuts, Gary Carver has written an excellent instruction sheet for starting Chestnuts in pots or in the yard. You can find this guide at www.MDTACF.org under the heading "Chestnut Background"

Science Update

By: Gary Carver & Tom Scrivener

If It Were Perfect, They Wouldn't Call It Science!

The Science Committee co-chaired and staffed by Gary Carver and Tom Scrivener, has, for years, been learning what does not work and eliminating what we originally believed were promising approaches to good ideas. Here is a summary of some of our ongoing projects and the benefits we hope to achieve as we adapt our methodology.

Rooting Scionwood. Many of the large surviving native American chestnut trees in Maryland do not bloom or are not accessible for pollination. As a result, we are not able to use them to produce breeding lines. The goal of this project is to grow clones of these trees vegetatively and plant them in our orchards where they would be available for pollination. Over the years, we have tried almost all the available hormone and other rooting products in potting soil, soilless mixes, and liquid water using dormant branches, spring growth and late summer growth. Nothing worked. We cut a 2 mm girdling strip of bark around branches so that they would regrow across the cut (we got the idea from watching an insect on a branch), thereby creating a thickened area of callous tissue. We had surmised that callous tissue might promote root growth. Unfortunately, nothing we tried promoted any growth. We buried scions in sand for the winter, since we had heard that this promoted rooting. It didn't. We cut some tissue from the root crown of trees because this is where the buds that produce root sprouts are located. We could not get these to grow at all. The planned next step is air layering. This has the disadvantage that the branch must be left in place and monitored for several months, but it has worked in related tree species (such as oaks).

Treating Seeds to Deter Predation. Our goal is to treat seed chestnuts to make them unpalatable to predators (squirrels, deer, etc.) so as to avoid the need for stakes and tree tubes. This would make large plantings, such as on strip-mined land, much easier. At first we tried a combination of powdered Bitrex

("the most bitter substance known to man") and capsaicin (an active component of chili peppers). We dissolved these in ethyl alcohol using a fume hood according to manufacturers' instructions. We soaked the seeds in the alcohol solution for 15 to 20 minutes and planted them alongside untreated seeds as controls. All the planted seeds were dug up and eaten in the first night (by, we assume, raccoons). When applied at ten times the recommended concentration, we got the same result. Finally, and unscientifically, we poured the Bitrex and capsaicin powders in the hole on top of the planted seeds. Even using a dust mask and working upwind in a slight breeze, we tasted Bitrex for about a week. However, it did not deter the marauding creatures, who dug up the seeds and ate them each night. Since then, we have tried every rodent, deer, and small creature repellent, mostly by putting the granules or tablets right into the planting hole. None of them have had any efficacy in repelling hungry critters. The planned next step is to treat the seeds with a solution of castor bean seeds and stems prepared in a blender and dissolved in alcohol and water. We will mix the solution into latex, which will coat the seeds. (Coating seeds with chemicals added to latex is a technique used for yellow pine seeds that are dropped from aircraft when reforesting large areas.) We hope this substance will not kill the critters, because successful deterrence is a "teaching moment," not a lethal one.

Cruddy Bark and Biological Control of Blight. Most of the large surviving American chestnut trees in Maryland have dark, thickened bark that looks like one giant, gnarled canker all over their trunks. Above this area, the trees seem to be normal and even healthy in some cases. We now know that this "cruddy bark" contains a multitude of soil organisms (perhaps bacteria, fungi, and/or viruses) that seem to hold back the blight fungus and give trees time to grow callous tissue to protect their cambium layer.

We also now know from our experiments that soil from around cruddy bark trees can be applied as slurry to other cankered trees and can convert them, in about a year, to cruddy bark trees. This suggests a natural biological control method to protect chestnut trees against blight. It all began about ten years ago when we showed this phenomenon to two professors from West Virginia University who

study hypovirulence in the blight fungus. They expressed surprise and said they do not see such trees in West Virginia. In response to their interest, we sent them bark samples from many of the trees to study in their laboratory. The results were that about 10 % of the samples grew virulent blight fungus, another 10% grew hypovirulent blight fungus and the rest grew either nothing or an assortment of differently colored fungi. We repeated this experiment the following year on a larger scale with a senior high school student in the Global Ecology program at Poolesville High School. She additionally collected samples from virulent cankers on nearby trees. Every one of the virulent canker samples yielded virulent fungus. The samples from the cruddy bark trees yielded approximately the same results as our original experiment.

Several years ago, we hosted a professor and graduate student from Michigan State University (MSU) who were working on hypovirulence. They collected samples from the Maryland cruddy bark trees that we showed them. They, too, found that most of the samples grew other organisms and not chestnut blight fungus. They were able to identify some of the other organisms. One was a species of trichoderma, which is a fungus that has antifungal properties. We then bought a commercial trichoderma product that is intended for application to the soil as a root drench. We inoculated some cankers and sprayed others with it, hoping that the trichoderma in the product would be antagonistic to the blight fungus. We did not notice any effect and all of the cankers continued to grow. In the meantime, we actively lobbied The American Chestnut Foundation TACF Science Committee to fund research on cruddy bark proposed (at our suggestion) by the MSU group. This past year, the MSU researchers received a small grant from the TACF research program. We believe that this kind of research will result in a product that can be used to protect chestnut trees from dying from the blight.

Wood Quality Studies. When we took some of the wood from rogued B3 trees from one of our orchards and made coasters from it for the 25th TACF anniversary annual meeting in Chattanooga (2008), we noticed that the wood was darker, had more markings and "busyness," and was aesthetically not as clean and pretty as American chestnut wood. It was more like Chinese chestnut wood than American. We began to wonder whether the breeding program was creating trees with wood that is inferior to pure American chestnut wood. We began collecting wood from pure American, pure Chinese, F1 hybrids, and different generations of backcrossed trees that were rogued from our orchards. We also have sections of logs from B3F2 legacy trees that were rogued from Meadowview. We are planning to prepare samples from all the wood for comparison and analysis.

Other Chinese Hybrids. When we think of the "Chinese chestnut," we are thinking of the species *Castanea mollissima*, which is one of the three species of chestnut trees native to China. The other two species, rare in the United States, are *C. seguinii* and *C. henryi*. The so-called seguin chestnut is a small tree and the henryi is a forest-type chinquapin, in that it has only one nut in each bur (like chinquapins). Only *mollisima* is used in China and elsewhere as a chestnut orchard tree. It was bred for thousands of years to be a wide and low tree for easier harvesting of its large chestnuts (about 3 in each bur). We made crosses with the American chestnut and both of the other species, using pollen from specimens at the U.S. National Arboretum. Some of the crosses are planted in one of our chapter's orchards. Several of the American x *seguinii* crosses in pots developed basal cankers, so it appears that the hybrid is not reliably resistant to blight. We have seeds from one *seguinii* cross that bloomed for the second time this year (pictured in oval below). They came from open pollination by nearby Americans and are therefore B1s, i.e., 75% American. As yet, we have no plan to plant them.

Japanese Heritage Backcross Trees. We have obtained pollen from a selected B2 tree that has Japanese heritage, instead of Chinese heritage, as all TACF backcross trees have. The pollen comes from Sandy Anagnostakis who is a well-known researcher at the Connecticut Agricultural Experiment Station. It has recently been hypothesized that all chestnut species have the same resistance genes, but that they are expressed (or not expressed) differently by epigenetic differences. If that is true, it may be possible to turn on the resistance genes in American chestnut trees by some chemical or environmental process or treatment. Meanwhile, we have not made any decision as to what type of tree to use the pollen on, how many seeds to plant, or where.

We Need Your Help!

As the chapter develops seed orchards to help with future reforestation efforts, we need more help.

Volunteers are needed in a variety of areas within the chapter. Contact Ron Kuipers or Dave Gill at Mdtacf@acf.org if you can help. If you have the time and/or the talent we could use your help in these areas:

- **Orchard Work** – Whether planting, weeding, watering, harvesting, cutting down trees, building fences, or harvesting nuts, we will need large work parties this coming year. Most efforts will focus on the Washington Suburban Sanitary Commission orchard at Triadelphia Lake and the new orchards near Columbia and College Park.
- **Presentations** – Do you enjoy developing slide presentations, manning information booths at events, or speaking to small civic groups? We need your help!
- **Newsletter** – We need article writers, editors, and those with experience in building e-newsletters.
- **Grant Writers** – If you have experience writing grant request, we could use your skills.

Donations of either funds or services are always in short supply. In the past, the chapter has worked with a number of generous members and organizations to meet these needs. Through those efforts we have been able to expand our orchards and get closer to the restoring the American Chestnut. The coming year will be challenging with the establishment of two new orchards as well as the wrap-up of several other orchards. In particular we are looking for funds or services in the following areas:

- Fence materials
- Use of bucket trucks during pollination and harvest times
- Stump grinding equipment for clearing infected trees from the orchards
- Potting materials for starting seeds in the spring

If you can help in any of these areas or know someone who would be willing to lend a hand, please contact any of the chapter officers listed at the end of this newsletter.

MDTACF Calendar of Events 2016

Membership Meetings

- March 12, 2016 – 11AM – Spring Meeting
- October 1, 2016 – 11AM – Annual Meeting

Board Meetings

- March 12, 2016 – 10AM
- June 11, 2016 – 10AM
- September 10, 2016 – 10AM

Orchard Work

- February 2016 – Fence building at WMREC
- February 2016 – Fence building at Beltsville Orchard
- Last week of March and first two weeks of April 2016 – orchard plantings in Columbia, MD and Beltsville, MD

Information Booth Events

- **March 3, 2016** – Montgomery Parks Environmental Educators Open House – Brookside Gardens – 5:30 pm to 7:30pm
- **April 21, 2016** - Fort Detrick Earth Day Celebration – Fort Detrick – Building 1529 – 10 am to 2 pm.
- **April 30, 2016** - Montgomery County Greenfest – 7500 Maple Ave, Takoma Park
- **May 7, 2016** – Boonsboro Greenfest – Boonsboro, MD – 9 am to 5 pm

Chapter Board of Directors

President – Dave Gill

Vice President – Bruce Levine

Secretary – Barbara Knapp

Treasurer – Emilie Crown

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Stephen Peck
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Andrew Ralowicz
Tom Scrivener
Mark Vollaro
Dean Yap

Contact Us at
MDtacf@OUTLOOK.COM

Chapter Information

Stay up to date on Chapter activities by going to our WEB site – www.MDTACF.org

Membership Renewal

Renew your membership support for the American Chestnut Foundation

Please return to:

The American Chestnut Foundation

50 North Merrimom, Suite 115

Asheville, NC 28804

Additional gift to the MD Chapter: $ _____

To renew online visit: www.acf.org/join.php

Membership Levels:

Individual Membership -- $40.00 Receive all TACF publications and car decal

Organizational Membership -- $100.00

Name:_____

Address:_____

City: _____

State: _____

Zip: _____

Phone: _____

E-Mail: _____

Annual Sponsor Memberships

Includes Restoration Chestnuts 1.0

CHESTNUT ($300 and above) All membership benefits PLUS 4 Restoration 1.0 seeds

BRONZE LEAF ($500 and above) All membership benefits PLUS 6 Restoration 1.0 seeds

SILVER LEAF ($1,000 and above) All membership benefits PLUS 12 Restoration 1.0 seeds

Help the Maryland Chapter Grow in 2016

Please help us spread the word about our work to restore the American chestnut. We want to grow our membership in 2016 and you can help. If you know someone who may be interested in the restoration of the American chestnut, send them a personal invitation to consider joining. You might even consider purchasing a gift membership to help to get someone interested. Or invite them to our March Membership meeting so they can learn about our efforts. Help us grow the Chapter as strong as the American chestnut.