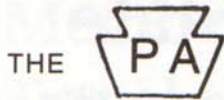


Chestnut Tree



CHAPTER OF THE AMERICAN CHESTNUT FOUNDATION



VOLUME 1 No. 3

July 1995



(Photo courtesy of Jack Hubley/Lancaster Sunday News)

President Ann Leffel works the Ort Tree in York County as the chapter got into some serious pollinating — in Pennsylvania and at the Virginia research farm. This newsletter has extensive coverage on this new phase of the chapter's work.

Breeding Program Underway

In June a chapter member's fancy quickly turns from planting to breeding. June is the pollinating season — the most important time of the year for those bent on the restoration of the American Chestnut Tree.

That's what this newsletter is all about — birds and bee stuff, and backcrossing, and pollinating, and breeding. Chapter members are learning what it takes to build our way back to a blight-free tree. And it ain't easy. It's tricky business. Time-consuming. Hardwork. The flavor of what it's all about is in this editon of the Chestnut Tree.

We suggest turning to page 7 and start with backcrossing, an article by Bob Leffel. It will really get you into what the program is all about. Bob writes about backcrossing in a way that the layman can understand it.

Then come back to page 3 and read Ann Leffel's account of their trip down to the research farm in Virginia where she and four other members participated in pollinating the young trees. It was valuable training working under Dr. Fred Hebard, and with more than 300 trees in the ground, the chapter in a

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Chapter Meets In Northeast On August 19

The Pennsylvania Chapter of the ACF will meet Saturday, Aug. 19, 10:30 A.M. at the farm of Jim Schuettrumpf, Quakake, Schuylkill County.

(A map showing how to get there is printed at the end of this story.)

Dr. Joseph R. Newhouse will be a featured speaker. A research associate and part time faculty member at California University (PA), Dr. Newhouse will present an update on current research on new classes of viruses that weaken the blight's affect on Chestnut Trees. Dr. Newhouse earned his PhD at the University of West Virginia.

Other speakers will be Vice President Pat Chamberlain and Director Bob Leffel. They will lead discussion groups and demonstrations, present guidelines on identifying American Chestnut Trees, and demonstrate mudpacking of blight cankers. A question and answer session will follow.

Lunch at 12:30 P.M. will be provided by the Little Schuylkill Conservation Club.

After adjourning, if time allows, there can be an outing to a Chestnut area such as Bears Head Mountain.

The area coordinator for the meeting is Eugene J. Dougherty. (*See the registration form.*) Gene needs to hear from you by Aug. 11. If you don't receive this newsletter in time, and you plan to attend, Please call.

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Spreading The Word

Good Publicity

A newspaper feature on the Pennsylvania Chapter ACF in the Lancaster Sunday News resulted in over 35 phone calls from people reporting locations of large flowering Chestnut Trees. These samples being mailed in are being identified to determine if they are Chinese, Japanese, American or other types. The American can be used in the breeding program.

Speaks to Growers

Chandis Klinger, chapter board member, was a featured speaker at the 39th annual Pa. Nut Growers picnic at Thompsettown, near the Juniata River. Chandis presented the history and progress of the ACF tree restoration projects. The crowd of 50 or so were very inquisitive about the tree and the program.

Inquirer Next

In August the ACF and PA Chapter will be featured in the Philadelphia Inquirer by reporter Virginia Wiegand. Ms Wiegand travels the state to report on areas of special interest in the state.

Leffels to Speak

Questions come to the York County Extension office about Chestnut Trees. Ann and Bob Leffel will speak to about 60 master gardeners at their annual recognition barbeque. Bob and Ann will give an overview of ACF Pennsylvania Chapter and provide educational materials. The gardeners volunteered their time to cover phone inquiries. Our material will provide them with correct answers.

More Publicity

People are interested in hearing about a program that will lead to a solution to a long term problem. Many long term problems never get solved. More presentations and publicity are needed in the state to build support and financial resources for the chapter work.

ACF, Chapter will Meet Foresters at Penn State

A cooperative effort toward the restoration of the American Chestnut Tree will be held at Penn State Friday morning, Sept. 8. Representatives of the Pennsylvania Bureau of Forestry, the American Chestnut Foundation and Pennsylvania Chapter of the ACF will attend.

Ann and Bob Leffel, officers of the state chapter requested the meeting of Dr. James Finley, assistant professor/cooperative extension PSU School of Forest Resources. Subject matter will include forestry, tree genetics and breeding, forest pathology, ecology

and entomology, wildlife and forestry extension and education. James Grace and Thomas Hall of the state forestry bureau have been invited to attend.

Attending from the Foundation will be Executive Director John Herrington, Dr. Fred Hebard and Director Bill Lord. Jan Doudt, ecologist and chapter member, also will attend.

According to President Leffel, the group will explore a cooperative grant proposal to Heinz endowment in the area of environment.

The Chapter Needs You

The home office, meaning Ann and Bob Leffel, needs help. For example, they need suggestions for hosts and meeting places. There are large groups of chapter members in the Pittsburgh area, Lancaster/Manheim area and Philadelphia area. Someone out there must be willing to coordinate a meeting and secure a meeting place in these locations. An effort is being made to hold activities all over the state.

Here are some other needs:

- Membership chairperson to track new members and renewals and to send welcome packets to new members.

- A carousel slide projector (approx. \$400) for educational presentations.

- Portable folding display table (approx. \$40)

- Two 10-14" orchard ladders for breeding program

While we're at it, let's give thanks for the support we are getting. We acknowledge receiving:

- Printing costs of newsletter
- Approximately \$500 in donations since March.

- Slides for educational programs (approx. \$85.00)

- Resource library materials from several sources.

Yes, I want to help bring back the American Chestnut Trees to our forests. Enclosed is my check to support the effort:

Regular membership \$40.00

Student membership \$15.00

I do not wish to become a member at the present time, but wish to support the new Pennsylvania Chapter with a contribution in the amount of \$_____.

Please make checks payable to:

**Pennsylvania Chapter
American Chestnut Foundation**
Audrey Chamberlain, Treasurer
R.D. 2, Box 119
Edinboro, PA 16412

Name: _____

Phone No. _____

Address _____

City _____

State _____ Zip _____

Visit to Chestnut Research Farm

Members Travel to Virginia

Introduction to Pollinating

by Ann Leffel

Five members made the trek to the Wagner ACF Research Farm at Meadowview, VA on Sunday, June 11 — Tom Pugel, Rosina Coltellaro, Bill Peifer and Ann and Bob Leffel. Bill Lord from Pittsburgh, who was ill, was unable to go. The group stayed at Henry Emory College, just 3 or 4 miles from the farm. Three nights lodging in a dormitory, 3 meals a day including a box lunch for Monday and Tuesday and Wednesday breakfast — all you could possibly eat — all for \$58 per person. How's that for economical. The food was good; the hospitality, southern; and the campus, beautiful. The college is a liberal arts school established in 1836.

Fred resides on the farm in a small old farmhouse with his wife Dale and children Paige and Kendra. Dale, also a PhD pathologist now works as a nurse about 50 miles from home. Fred is a very mild, unassuming man with a dry sense of humor. He immediately put the volunteers at ease and also to work. He demonstrated how to protect the female from undesirable airborne pollen and the blocking of fertilization by the trees' own impotent male pollen. This was accomplished by removing the male catkins on the branch and securing a waxed bag over the female bur to await the time of female receptivity (about 12 days hence).

It didn't take the group long to catch on. Juggling bags, paper clips, and shears; climbing the ladders, locating the female burs . . . not too difficult as long as you remembered not to lean over



These snapshots give you a pretty good idea what it's like pollinating American Chestnut Trees. Chapter members helped Dr. Fred Hebard at the research farm in Virginia in June where there are 6,000 trees in various stages of backcross being grown toward the restoration of the Chestnut Tree to the American forest.

too far so that paper clips fell out of pockets. The really difficult part of the job was counting the number of bags placed on a single tree. Seems with three people counting, surely two of them would come up with the same count! !

Monday lunch was eaten early because of rain. Fred showed us his modest lab and office. With magnifying glass and microscope we studied the leaf hairs which distinguished Chinese from American chestnuts. We surveyed his mostly old planting equipment in the barn. Dealing with old equipment doesn't seem to deter or even challenge Fred; it's just a necessary part of the job. Then back to bagging when the rain stopped.

Tuesday, more of the same, but there was also a tour of the

farm. American, Chinese, exotic species, F, BC, BC2, and yes, BC3 generations all growing on the 20 acre Wagner Farm. It was exciting to see the 5th generation young trees knowing that the sixth generation will produce the desired goal, a blight resistant, 99% American Chestnut nut. Fred instructed the group on ways to identify each species.

Tuesday evening after dinner we met at Fred's to meet his lively family and to talk chestnuts and the future. It is a marvel how much Fred Hebard has accomplished with so little. This dedicated man is the backbone of the ACF backcross breeding program and deserving of much more support. The recent gift of an 80+ acre farm brings with it not only greater

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Who's Who in Chestnuts . . .

Dr. Frederick V. Hebard, director of research, Wagner and Price ACF Research Farms, Meadowview, VA.

Coincidence or providence? Fred Hebard was born in the Chestnut Hills area of Philadelphia in 1948. He earned a BS in biological sciences at Columbia University; a MS in botany at University of Michigan, Ann Arbor; and a PhD in plant pathology at Virginia Polytechnic Institute and State University, Blacksburg, VA in 1982. His PhD dissertation was on the biology of virulent and hypovirulent chestnut blight.

After working for USDA in Prosser, WA and the Department of Plant Pathology at University of Kentucky, Fred joined the staff of the American Chestnut Foundation in 1988 and became the superintendent of the Research Farm at Meadowview. He initiated the back cross breeding program there in 1989. So in some ways Fred has been into chestnuts since birth. For more information on Fred and his work see the article on Meadowview.

* * *

Dr. Joseph R. Newhouse, is a research associate and part time faculty member at California University in California, PA. He will be a speaker at the August 19 chapter meeting in Schuylkill County. He lives in Belle Vernon southeast of Pittsburgh. He attended school at St. Vincent's College in Latrobe, PA, earned his MS at California University and his PhD at University of West Virginia. His work at West Virginia was about new classes of viruses of fungi, and of hypovirulence in chestnut blight. He will give an update on current research on the class of viruses which weakens the blight effect on Chestnut Trees.

* * *

Jim Schuettrumpf, Quakake, PA was a Penn Stater in wildlife technology. He is providing a meet-

ing place on his farm for the August chapter meeting. Jim is an interested member of ACF and also actively involved in the Little Schuylkill Conservation Club which does trout habitat work. The club is involved in reclaiming water for trout that has been damaged by acid runoff from mines. A wetlands project is underway. Stands of American Chestnuts abound on Bear Mountain in Delano township and Jim has some American Chestnut Trees on his property. His farm is located in Schuylkill County roughly 10 miles south of Hazleton and surrounded by state game lands and state forests.

* * *

He came bearing gifts — pressed American Chestnut leaves, walking sticks made from hickory and chestnut, maps showing areas where flowering chestnuts grow, and a list of sayings. **Harold Floyd** from Manheim has been watching the woods for Chestnut Trees for 20 years. By his observations he concludes that the sprouts are living longer and growing larger now than they were 20 years ago. He has an eye trained to spot Chestnut Trees, and travels Dauphine, Lebanon, Lancaster and Schuylkill County looking for and observing Chestnut Trees. One of his sayings: "Each day

is a gift from God. That's why it's called the present!"

Visit to Chestnut

(Continued from Page 3)

opportunity, but greater need for operating funds and more manpower. When asked about the number of volunteers helping each summer, Fred answered, "About four or five. You all really skewed the distribution by bringing five in one week!"

Members, state chapters can assist more than ever by volunteering their services during pollinating and nut gathering seasons and by upping membership level and contributions.

There is much work to be done even as we approach the historic and momentous occasion of the first resistant nuts. Many breeding lines must be developed throughout the American Chestnut range to achieve the populations of resistant trees required for reforestation. The Pennsylvania Chapter is a very important part of the process as we develop our state's breeding program. We are dedicated to the restoration of the majestic American Chestnut Tree!

Area Coordinators Needed

This box is part of the chapter getting itself organized. Right now area coordinators are needed. Too many can't travel to Roaring Spring for Chestnut meetings, so we're breaking the state into counties. There is a need for contact members to handle one, two and three county areas.

These people have access to information; they can get your questions answers; and it will be much easier to make personal contact.

Rosina Coltellaro — 215-625-2482 — Phila., Delaware and Montgomery
 Eugene Dougherty — 717-467-2303 — Schuylkill, Luzerne, Carbon, Monroe
 Chandis Klinger — 727-837-0457 — Snyder
 Pat Chamberlain — 814-756-3197 — Erie, Crawford, Warren
 Dan Heacock — 717-957-2733 — Perry and Dauphin
 Bill Lord — 412-793-0255 — Allegheny
 Tom Pugel — 610-346-6198 — Bucks
 Ann and Bob Leffel — 717-927-9557 — York and Cumberland
 Herb Gedmark — 717-774-7313 — York
 Rod Clapper — 814-842-3307 — Bedford
 Doris Goldman — 717-762-0755 — Franklin

June Is Month for Pollinating

Breeding Replaces Planting

The Chapter's breeding program is on it's way.

Members were introduced to what breeding is all about when they gathered around what is now called the Ort Tree, located in York County. Up until June, emphasis had been on planting. Good reports have come in from two major plantings, but with pollinating coming in June, everyone's attention turned to breeding.

The following is from President Ann Leffel's field report:

"The male catkins were at 50% bloom — That is the green catkins began to exert stamens and turn white or creamy yellow. The female burs were about pea size with the styles protruding 3-5 mm. The proper time to bag the female flowers (burs) to exclude random airborne pollen from fertilizing or blocking fertilization from selected pollen had arrived.

Much of the bloom on the 40-45' tree was in the top 20'. Using a 10' old stepladder we were able to reach at risk to life and limb some of the flowering branches. One hundred two branch tips containing 1-17 female burs each were bagged with glycine (waxed) bags.

"All male catkins and leaves and the male part of the bisexual catkins were removed the length of the bag, the bag was placed over the flowers and secured to the branch. Male catkins were collected and Fed Exed to Fred Hebard at the Wagner ACF Research Farm in Meadowview, VA for the ACF research program.

"Now to wait about 12 days until females have reached peak receptivity. PA Chapter members put into practice the skills learned



Photo courtesy of Jack Hubley/Lancaster Sunday News

The Ort Tree in York County where chapter members visited and pollinated this surviving American Chestnut. It's speculated that the many trunks are from stump sprouts from the main trunk. With the death of the oldest Chestnut up in Cameron County, this tree could be in line for the oldest title.

from Fred Hebard on the visit to Meadowview Farm."

* * *

Pollination day for the above was July 1. It had been raining before members arrived at the Ort Tree. The humidity was high and the tree was wet. President Leffel reported:

"Fred Hebard FedExed pollen from a BC2 (second backcross) tree at Meadowview from the hybrid ClapperX American line, a tree selected for its partial resistance to blight and its American characteristics. This selected male parent and the "Ort" female parent will produce BC3 progeny (the 5th generation of the 6 required to obtain blight resis-

tance) if fertilization is successful.

"By 9:00 A.M. the tree was dry. It was checked for female receptivity. The female styles had turned yellow and spread out across the top of the flowers. Anthers from the bisexual catkins had not yet emerged. The male catkins were in full bloom. All the signs were right to proceed with pollinating.

It was an exciting day for the Ort family. Three generations were on hand. Jim Ort provided a ladder. Son, David took off work in order to bring his daughter Joy, an aspiring high school science student, to participate. Joy was enthusiastic about the opportunity to apply her genetics

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Focus is Back on Old American Chestnut Trees

The focus is back on the biggest American Chestnut Tree. There is great public interest in old trees, and the bigger those old trees are the better. And because of the scarcity of the American Chestnut, blighted or unblighted, an old Chestnut Tree gets even more attention.

Pennsylvania's oldest Chestnut Tree is dead. The Cameron County tree died in the summer of '94.

The tree was cut this winter and sold to an individual to be put to good use according to Frederick Linging, forester and Robert W. Martin, Jr., Forest District #13 manager. The Bureau of Forestry letter indicates that it does not appear that the tree died from blight. Cankers were not apparent. The area in which the old champion was growing was defoliated several years in a row by the gypsy moth. The foresters consider stress from this environmental change may have contributed to the tree's death.

Inquiry has been made of the Pennsylvania Forestry Association and the "Big Trees" chairman as to the location and size of the successor to the old champion and as to the largest living tree in the U.S.

The Pennsylvania Chapter is interested in flowering old surviving American Chestnut Trees for the backcross breeding program. The "Walbridge" Erie County tree and the "Ort" York County trees are used both as mother trees and for pollen.

Keep looking for old survivors and flowering Americans which are accessible by truck and ladder. The chapter is adding them to the data base for future use. Location forms are available from Chapter headquarters. Verification will be done by Pat Chamberlain, vice president. Just enclose a few leaves and twigs with your form.

Hunt is on for Biggest American Chestnut Tree

The hunt is on for the biggest surviving American Chestnut Tree.

The former champion is dead. That's the one in Cameron County and listed by the Big Tree Committee of the Pennsylvania Forestry Association. Chairman Maurice Hobaugh reported the tree died the summer of 1994.

The Pennsylvania Chapter of the American Chestnut Foundation will join in the search for a new champion. The chapter has a lot to gain. Old surviving, flowering Americans are put to use in the chapter's breeding program.

The program involves transferring the genes for Chestnut blight resistance from the Chinese Chestnut tree to the American and to recapture all of the timber qualities of the American through the backcross method of breeding. It is a proven method which requires six generations of crosses. The fifth generation

of nuts is in the ground at ACF Meadowview Farm in Virginia. In about 4 or 5 years (we're hoping by year 2000) they should produce the first fully resistant 99% American Chestnuts.

Pennsylvania chapter plans to use the surviving American Chestnut trees as mother trees. The pollen and nuts will also be used in the controlled breeding program. This will help increase the geographic and genetic diversity needed for a successful program.

So the hunt is on for the largest surviving American Chestnut Trees. Contact:

PA Chapter ACF
P.O. Box 7
Brogue, PA 17309

Note: Chinese Chestnut leaves are glossy or waxy on top, have broader base at stem end than American which are sharply tapered on stem end and tip and have matte or dull finish on top of leaf.

June is Month

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studies in a direct manner to a practical project. She quickly learned the pollinating technique — remove the glycine bag, gently transfer male pollen from the catkin to the female stigmas and resecure the bag to the branch. Every tenth bag was left unpollinated as a control check on the procedure.

The events of the morning were well recorded on video and by still photographs by the Ort family and by Jack Hubley of WGAL-TV.

Acknowledgements — Many thanks to the Ort family, Tucker Hill for use of ladder; Jack Hubley, Tina and Jade Hubley, Eugene Witmyer, Don Nunemacher and Bill Peifer for their assistance.

* * *

Pollinating complete, four

chapter members headed for Reineman Wildlife Sanctuary to fertilize the orchards. The trees in the '88 planting are growing well. Four trees produced male catkins this year. Hopefully female flowers will appear next year. Of the 161 nuts planted this spring, about 140 were up and growing. Fertilization and weeding were completed after thundershowers in the afternoon abated.

PA Chapter - ACF
will be featured on

Jack Hubley's
"Call of the Outdoors"

Channel 8 - WGAL
Lancaster

Sunday, Aug 20, 1995
12:30 P.M.

Backcrossing

The Why and How of It

by Bob Leffel

(Chapter Director and Retired Biologist)

Efforts to breed timber-type, blight-resistant chestnuts during the first half of this century failed — and hope for restoration of the American Chestnut was abandoned.

In 1936 Dr. Charles Burnham (Geneticist, University of Minnesota) and associates published a 51-page review of past approaches and the corrected approach to attain the timber-type, blight-resistant chestnut — the backcross method of breeding. What is the backcross method of breeding?

Backcross breeding is a system of breeding in which reoccurring crosses are made to one of the parents of a hybrid, accompanied by selection for a specific, simply inherited character from the other parent of the hybrid. The potential of backcrossing in plants was not realized until small-grain breeders began to use the method in the 1920's to incorporate disease resistances into disease susceptible by otherwise highly desired wheat and barley varieties.

For the backcross method of breeding to succeed, three requirements must be met:

1. A satisfactory parent (the recurring or "recurrent" parent) with a fault correctable by a simple inherited character available in another variety or species (the donor parent) exists.

2. The simply inherited "correction" can be retained through generations of backcrossing.

3. Adequate generations of backcrossing are conducted to recover the recurrent parent improved with the simply inherited character from the donor parent.

The American and Chinese

chestnuts are the recurrent and donor parents respectively of the American Chestnut Foundation's backcross breeding program. In this program, American and Chinese chestnuts are hybridized and the progeny backcrossed to the American chestnut. These first backcross progeny, which include both partially resistant and susceptible trees, are inoculated with the chestnut blight fungus and the susceptible trees discarded. Those partially resistant trees most like the American chestnut are backcrossed again to the American chestnut, creating the same situation — partially resistant and susceptible progeny.

Again, inoculate, select as previously, and backcross to the American chestnut. By now we have obtained the third backcross generation of the program, containing partially resistant and susceptible progeny. But by now, the morphological and timber features of the trees are those of the American chestnut, because the backcrosses to the American chestnut have diluted the contribution of the Chinese Chestnut except for the genes for resistance to chestnut blight. And the experimental data indicates that resistance to chestnut blight is controlled by two genes with incomplete dominance.

Now, back to the third backcross progeny containing partially resistant and susceptible progeny. Inoculate and select the partially resistant progeny. These third backcross generation, partially resistant progeny, must now be inter-crossed among themselves, producing a generation of susceptible, partially resistant, and resistant progeny. Again,

inoculate, and select only the resistant progeny. Inter-crosses among these resistant progeny will produce the seed of the timber-type Chestnut Trees with the blight resistance of the Chinese Chestnut

Skeptics of success in breeding blight-resistant, timber-type chestnuts consider the American Chestnut and dinosaurs extinct and lost forever. But, unlike the dinosaurs, the American Chestnut still lives as subdued, blight susceptible shrubs in the forests of its former range in the eastern United States. All we need from this existing geneplasm are the flowers of the American Chestnut, to serve as the recurrent parent in the backcrossing program. No, the American Chestnut is not extinct, and it can be restored as a blight-resistant tree because blight resistance is available in a cross-compatible species of Chestnut and is simply inherited.

Yes, the American Chestnut, like the buffalo can come back to the range!

Breeding Program

(Continued from Page 1)

few years will have its work cut out in preparing the trees for the lengthy backcrossing program.

On page 5 is another story — the one that launched the chapter's breeding program. Members worked on what they call the Ort Tree, a 100-year-old or so tree in York County. The fascinating thing here was they took pollen from here and shipped it for use at the Virginia research farm, and Dr. Hebard reciprocated and his pollen was used on the Ort Tree. Everyone is hopeful that successful fertilizations will advance the breeding programs here and at the research farm.

The York County venture has gained the chapter wide publicity. Jack Hubley, outdoors editor of the Lancaster Sunday News, turned out a nice spread of pictures and story that appeared July 9 in the newspaper.

Chapter Meets

(Continued from Page 1)

If you are staying over, the Pine's Motel is on Route 309, only 2 miles from the meeting place. The phone: 717-668-0100.

Registration Form
PA Chapter Meeting (ACF)
August 19, 10:30 A.M.

Name _____

Address _____

Phone No. _____

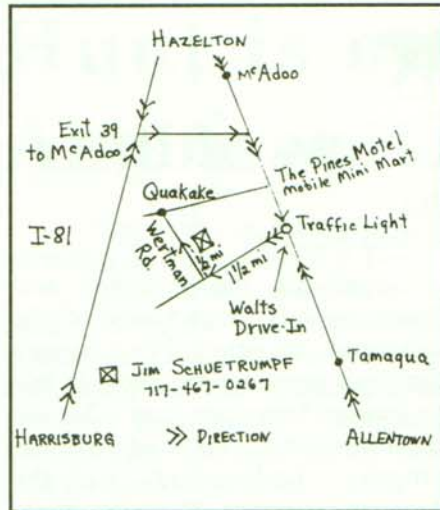
Number attending _____

Please return registration by August 11

to:

Eugene J. Dougherty
34 Walnut Street
P.O. Box 89
Delano, PA 18220

After Aug. 11, call 717-467-2303.



New Cookbook

ACF member Jane Huntwork has released her "The Majestic American Chestnut, a History and Cookbook," a paperback of favorite chestnut foods from native American, Colonial, 19th and 20th Century memos. The cost is \$10, and Ms Huntwork will donate \$3 of each sale to the American Chestnut Foundation.

Lancaster TV Will Feature Old Chestnut

Jack Hubley, of WGAL-TV Channel 8, Lancaster, joined chapter members at the Ort Tree in York County to record the pollination of that tree. The program will air on Sunday afternoon August 20 at 12:30

Jack also wrote an extensive article with pictures in the Lancaster Sunday News on July 9, 1995. The article resulted in 10 telephone calls the first day reporting locations of trees which may be American Chestnut trees of interest to the organization. Newsletters and tree location forms were sent to all callers.

You can help restore the Chestnut Trees to our Pennsylvania Forests by becoming a member of the ACF or by giving a financial contribution to the chapter. (See membership form on page 2)

Pennsylvania Society for the American Chestnut Foundation
P.O. Box 7
Brogue, PA 17309

Nonprofit Organization
U.S. Postage Paid
Claysburg, PA 16625
Permit No. 45

Working to restore the American Chestnut



- Lumber Tree
- Ecological Link
- Abundant Food for Wildlife
- Forest in good health & balance