

American Chestnut Cooperators Foundation

2010 Newsletter

Forest Service Road 708, Newport, Virginia 24128

Dear Friends and Cooperating Growers:

Without a computer for six weeks, I may have lost many e-mails. Please resubmit your unanswered comments and questions with your Annual Report and chestnut request.

GRAFTING:

This year I sent no scion wood to cooperators. I was just too busy. The record snowfall closed forest roads and off-road paths, none of which are plowed; thus, most research plots could not be reached until March 11. This made it impossible to do planting and grafting preparations a little at a time, as usual, through the months of January and February. All that work was squeezed into two weeks. Of 50 grafts I made, 12 are growing, improving five different plots.

AIRPORT VIRTUAL TOUR:

Our most senior cooperators and grafters are familiar with this plot which we reclaimed in 2000, from a 1976 ACCF-Virginia Tech planting of Dietz chestnuts, like those in the original Lesesne plantation. But here we had only 15 rows of 10 each, on 10-foot centers, and Gary's tests, found no blight resistant chestnuts. So the plot was abandoned and soon overgrown in poison ivy, bittersweet, autumn olive, multiflora rose, Virginia creeper and blackberries.

In 1999 the Virginia Tech Grounds crew cut the first five rows near ground level, to make a wonderfully compact and level grafting plot, easily accessible off-road (except only in winter 2010, when two-foot drifts covered the trail through the hay fields.) Horticulture students helped us clear the vines and briars and spread wood chips in the other ten rows. The idea was to improve the first five rows by grafting blight resistant chestnuts, while leaving the other 10 rows to grow wild, as they do in forest clearings and edges, to demonstrate the difference, with blight resistant

American chestnuts growing beside American chestnuts that have no blight resistance.

Many trees had already been lost in the no-resistance rows, and those remaining were multi-stemmed, with many dead trunks of increasingly larger sizes. Continuous cycles of blight and death produces hypovirulence in the blight fungus. The combination of hypovirulence with the ever-increasing root systems permitted these chestnuts to make trunks up to eight inches in diameter before the blight killed them. They gave large annual nut crops which we sent out to nut grafters or as gifts to be eaten, for as long as we were able to gather this harvest. Not many years passed before all the invasive species had returned and once again, we abandoned these ten rows. It was too much work, at the bottom of a very long list. We let the animals have those chestnuts.

Meanwhile, the five managed rows became a great asset to our breeding program. Miles and Ruth, growing in the steeply sloping Martin American Chestnut Planting up on Salt Pond Mountain, first selections from our first generation of breeding, were making flowers high in the crown, out of reach. We grafted their scions alternately, in the first two rows, and about 10 grew very rapidly in the rich soil, in full sun. By 2002, using low branches we made second-generation intercrosses (planted in the Lesesne) and we have been sending their open-pollinated chestnuts all these years to our cooperators.

Each spring I used to hold grafting clinics here by appointment. We stopped this practice because each clinic took up a morning in prime grafting time and often it happened to fall on the finest day for grafting: no wind, high humidity, temperature between 55 and 60 F, overcast skies. On such a day, I would imagine that I could have made seven grafts, all of which might have succeeded. I could not dismiss that dream. (If you are determined to learn how to graft, you can do it by reading the instructions on our Web site and keeping scrupulous notes of your work, so that you are able to learn from most of your mistakes, as John Elkins, Ed Greenwell and I have done.)

You may better understand how I have become a stingy grafting cooperator, if you consider that each graft requires a minimum of one-half hour to make and has at best a 20% chance of success. (These figures are for whip-grafting in the field; I have come to consider other grafts to be a waste of my time.) Also, new grafts require weekly inspection, to be sure that the union is always covered with soil. Thus, in

ten years of grafting, we do not have a single uninterrupted row of five grafts in this plot (the elusive Bingo!). At the end of last summer, we had 23 grafts. Two grafts succeeded this spring, so now we have 16: blight below the exposed union killed one, and Ambrosia beetle had killed another before I noticed its telltale pinholes. Then we paid a tree service to cut away the remaining Miles and Ruth grafts (several were a foot in diameter) in late April, after I had discovered the plot was infested with gall wasp.

This is our first experience with gall wasp. We must thank Giorgio Maresi who had recently sent excellent pictures of the deformed leaves, curled up around pinkish galls. While checking my grafts, one of these leaves literally hit me in the eye. Instead of the planned hour, I spent half the day cutting infested leaves and stuffing them into plastic bags; we returned daily to the same work for two weeks. Galls in the tops of Miles and Ruth were out of reach, and since we are now selecting from the next generation in this breeding line, we decided to destroy those big grafts. (Miles and Ruth survive in two other plots.) However, this was just the tip of the infestation: it appears to have entered via the chestnuts abandoned in the adjacent overgrown ten rows. We cut paths to these chestnuts so the contractor could cut all of them. There were poison ivy and bittersweet vines up to three inches in diameter. We poisoned the chestnuts and vines.

The Airport plot is subject to extremely high gusts of wind. We must keep all grafts here staked for at least two years, while elsewhere, we usually remove the support stakes at the beginning of the second growing season. One week after the Miles and Ruth grafts had been removed, high winds flattened to the ground a 15-foot graft and left two larger, newly exposed grafts permanently listing to the east. The union on the downed graft was intact, so it lived several weeks before dying. What appeared at first to be the destruction of ten years work has yielded significant benefits. From now on the Airport plot is free from inferior pollen. The surviving grafts represent at least nine original sources of blight resistance, and possibly 10, because one graft is of a volunteer which may bring an additional source of blight resistance into the mix. Eleven of the grafts are original sources; three, including the volunteer, are first-generation intercrossovers; and two are second-generation intercrossovers with some of their parent trees present in duplicate in this plot. All were selected for blight resistance. Thus, future Airport harvests should produce a higher percentage of chestnuts inheriting blight resistance.

That is the smaller advance. The biggest deal we gleaned from careful observation. On one individual, represented by two grafts, a large 10-year-old and a three-year old, both surrounded by chestnuts infested with the gall wasp, we were unable to find any galls. On another unrelated chestnut, also represented by two grafts, we found just a few galls. This suggests, the first may be highly resistant to gall wasp, and the second, may also be resistant to this pest. It just so happens that we made the first intercross between these two individuals in 2002, and they may begin bearing nuts within a year or two. We shall send as many of these nuts as possible to southern growers, where gall wasp is most troublesome.

GALL WASPS

lay their eggs in the buds on the new growth of that year, the very same twigs from which we collect scion wood. (Since I collect most of our scion wood at the Airport, it is after all quite lucky that I sent none to cooperators this past winter.) The wasps lay eggs over a three week period. Spraying is not effective because it cannot penetrate the galls, but must hit the flying insects, which may hatch out over a period of a month or more. For the time being, our April infestation appears to be under control, but we must continue to be vigilant each spring, because Chinese chestnuts grow within a half-mile of the Airport.

CHESTNUT FLOWERING

usually begins when seedlings are seven to 10 years old; the lower number applies in very rich sites in full sun. The first year, often the chestnut makes only male catkins; the second year, it usually makes some female flowers also; and thereafter, if it has a pollinator, the tree may flower in abundance and produce regular nut crops. The female flowers usually show up about ten days after the catkins.

The pollinator is sometimes a problem, because American chestnuts bloom at various times. For instance, our earliest chestnut blooms a week before Chinese chestnuts, so that most years it can produce nuts only by controlled pollination, using pollen that was stored in the freezer from the previous year. This year we pollinated that chestnut on June 5. At the other end of the spectrum, our latest bloomer usually has no receptive female flowers till the second week in July, when all other male pollen has dropped; we pollinated it on July 10, using pollen collected on another chestnut in mid-June. Most American chestnuts bloom during the weeks in between these two extremes.

Blooming time may be altered by a freeze or heavy frost in late April or May. Chestnuts that have bloomed only once or twice, may make no flowers in such a year. While those regularly bearing chestnuts which usually bloom early or in the middle range of flowering time, may bloom as much as two weeks later than usual. In one forest plot, this Mays freeze hit a graft of our earliest chestnut, causing its catkins to be available for the first time when a much later chestnut graft came into bloom.

Variety in blooming time is expressed among the progeny of each chestnut, each generation. This characteristic favors survival by assisting regeneration. Very heavy rains falling when female flowers are receptive can prevent pollination, but because of the various flowering schedules, this is not likely to affect all the chestnuts in a stand.

GROWERS REPORTS:

As of October 13, 116 cooperators have reported **2,397** surviving all-American chestnuts. We shall add to these numbers your as reports come in. We have 636 chestnuts I planted in the Virginia research plots. A late freeze hit most of the newly emerging seedlings in two plots; all but a few of them recovered and put out new shoots. However, the setback in root development left them highly vulnerable to June drought, which killed half of this year's seedlings in the Lesesne before we were able to water. Drought conditions also lead to more vole attacks; thus, three more three-foot tall chestnuts are dead, their tap roots eaten. We water only the chestnuts which are not yet two feet tall. The water often must be carried uphill for a distance of 150 yards, reminding us that it is never a bad idea to limit annual planting to 10 chestnuts. On the bright side, abundant spring rains once again resulted in record growth on the larger trees in most plots. By early July, many had new growth exceeding six feet, and in those plots where the freeze did not hit, some new seedlings were already two feet tall.

OUTSTANDING COOPERATORS:

Thanks again to John Buschmann for supporting ACCF research and plot maintenance in the Lesesne.

Many thanks for harvest help from Lise & Harry Cooper, Carol Croy, Brian Hartnett, Vicky & Eli Lewis, Joe Norberg, and Albert Ward. If you wish to volunteer for the

2010 harvest, please e-mail me at allaccf@gmail.com and suggest a week day after September 15, when you may be able to help.

More thanks to Lise, Jenny, Lizzie & Harry Cooper, Vicky & Eli Lewis for helping install bat houses in those forest research plots which are within a half-mile of a water source. Bats eat thousands of insects per day. This is an experiment to see if they may help control ambrosia beetle, gypsy moth and/or gall wasp.

Yet more thanks, to Jenny & Lizzie Cooper at UNC Asheville & Raleigh, for giving up two days of their spring break to make protection cages and plant chestnuts.

We look forward to hearing from you and thank you for reporting.

Respectfully submitted,

Lucille Griffin, Executive Director

Other ACCF Directors

Gary Griffin, President, Professor Emeritus Plant Pathology, Virginia Tech

Ed Greenwell, Vice President & Director of Tennessee chestnut projects, Electrical Engineer, McEwen, TN

John Rush Elkins, Secretary, Professor Emeritus Chemistry, Concord College, WV

William Pilkington, Treasurer, Financial Advisor, Ghent, WV

Dave McCurdy, Director & Nursery Superintendent Emeritus, Raleigh, NC

Dedicated to the restoration of American chestnuts