

# Tree Care Guidelines for Antinanco Earth Arts School American Chestnut Planting Sites

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Cultures + Generations + Hearts + Connected

Bring Back the American Chestnut Tree Project  
Antinanco  
[www.antinanco.org](http://www.antinanco.org)  
Fall 2020

## **PURPOSE**

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**Species:** American Chestnut Tree (*C. dentata*)

**IUCN Species Status:** Critically Endangered

**Primary Geographic Area Where the Project Takes Place:** New Jersey, Pennsylvania

Our goal is to achieve lasting preservation of the American Chestnut Tree (*C. dentata*), native to the North American forest ecosystem and to ensure that as many trees that have full or partial resistance to the blight make it to maturity. We focus on restoring blight-resistant American Chestnut species by planting two groups of trees: (a) American chestnut hybrids that are a very close genetic match to the original *C. dentata* species; and (b) pure American *C. dentata* from mature parents that survived the blight and are producing chestnut seeds. Along with planting the American Chestnut trees, we also plant companion plants to promote the trees' optimal health and growth. We track and compare health and growth of the two groups, the impact of the companion plants and other biological factors, and share data with all stakeholders and conservation community at large. The trees can provide useful genetics for future generations as well as food for the ecosystems (including humans).

## **APPLICABILITY**

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These guidelines provide the information necessary for site managers to make decisions about, and carry out work for, the care and management of their American Chestnut Trees.

Arboricultural standards and guidelines that are normally applicable to the tree care activities should be followed. If there are conflicts between arboricultural standards and these guidelines, the site manager working with the trained professional affiliated with Antinanco monitoring American Chestnut Trees protection should exercise professional judgment in determining the appropriate course of action, documenting any recommendations, decisions and actions taken, and results observed.

Because the trees and companion plants are living organisms, there is inherently a significant degree of uncertainty in tree care work. It is possible that certain guidelines and best practices discussed in this document cannot be successfully applied in all situations. Also, as the tree care industry implements these guidelines more broadly, there may be revisions that improve the best practices. Departures from these guidelines should be made only with careful consideration of the reasons for deviating from the best practices contained therein, and with rationale to support such deviations.

These guidelines are not intended to address every situation that may arise. Site managers shall be responsible for all decisions and work done and not done on their trees and landscaping, and the timing of such decisions and work.

## **INTRODUCTION**

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The American Chestnut is native to the North American forest ecosystem and is, tragically, on the brink of extinction. The loss of the American Chestnut tree is often cited as one of the worst ecological disasters in the United States. In the first half of the 20th century, 1 out of 4 trees across the 180 million acre range of eastern forests were killed because of an accidentally introduced pathogen: the Chestnut

blight (*Cryphonectria parasitica*). The damage came to the total of 4 billion trees. American Chestnut trees were once 20% of the Appalachian forest, in some areas they were 1/3 of all trees. Although chestnut trees still exist in our forests today, they rarely have an opportunity to reproduce and mostly exist as understory sprouts. The American Chestnut has ceased to evolve as a species. It used to rank as the most important wildlife plant in the eastern United States. Reports of chestnuts four inches deep on the forest floor were not uncommon in many parts of the Appalachian Mountains. Squirrels, wild turkey, white-tailed deer, black bear, raccoon, and grouse depended on these chestnuts as a major food source. Several unique insect species also relied upon chestnut trees as their principal food source. Paul Opler, formerly of the US Fish and Wildlife Service, has estimated that at least seven native moths became extinct in the southern Appalachians as a result of the chestnut blight.

## **MAINTENANCE – SHORT TERM**

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Short term maintenance considerations include fertilization, soil testing for PH, watering, pruning, deer and pest control and weed control.

### 1. Fertilization

There are several considerations that go into selecting the proper regime for the trees and applying fertilizing products to help maintain the planting. Fertilizers provide an added boost in the trees' early years, but are not necessary for the trees' survival. Antinanco believes that it would be best long-term for the trees to rely on the companion plants and environment for sequestration of needed nutrients and nitrogen. When fertilizers are to be used, Antinanco prefers to utilize organic fertilizers only based on the following standards:

- Pay attention to all labels. Work with Antinanco project leader to establish an effective fertilization regimen. Antinanco will assist in the purpose of materials. Products such as fish emulsion fertilizers and granular slow-release organic products by Espoma such as Tree Tone meet Antinanco organic fertilizer standards.
- Fertilizers should not be applied in early Spring only.
- Fertilizers should be spread evenly around the drip-zone of the trees, or an 18" circle if the tree has not branched yet.

### 2. Soil Testing

American Chestnut tree thrives in slightly acidic soil (between 4.5 and 5.6 Ph). Ph should be tested and adjusted every year (if needed) until the desired level is reached. The adjustments can be done via applying Sulphur-containing fertilizers such as Espoma's Holy Tone. Once the optimal level is reached, the test can be performed every other year.

### 3. Watering

Watering will be required only if there is prolonged dry weather during the first Spring and Summer after planting. American Chestnut trees quickly develop a very deep taproot and should not need to be watered. The trees planted in November of 2019 already had a one-foot taproot which will be growing even more during the winter. Regular inspections by Antinanco will be performed during the first spring and summer to address any watering needs.

#### 4. Pruning

Appropriate pruning protocols will keep American Chestnut Trees healthier, create a more attractive appearance and increase nut production. Of highest priority is to remove any branches that might cause the tree problems in the future. This includes broken branches, branches affected by blight, and branches with too narrow a crotch angle. The following standards should be used:

- American Chestnut tree pruning should typically take place when the trees are dormant. Dry late summer or winter is the best time to reduce possibility of infection.
- However, pruning back a broken or diseased branch can be done at other times to optimize the tree's health so long as the weather is dry. That said, pruning should NEVER happen in springtime and early summer when blight is most active (releasing spores). Even a diseased branch should not be pruned then because spores can go right into the wound into the healthy wood that was just exposed.
- It is critical to wait for dry weather to start cutting back the tree. Trimming a chestnut tree while it is raining or about to rain is never recommended. It provides disease an easy way to enter the tree.
- Use clean sharp secateurs to reduce possibility of infection.
- Ensure tree is growing straight up through protective tube. Occasionally they may fall out the slit and become exposed to deer browse. The central leader system is to be used. It is the most popular for trimming a chestnut tree. In this system, all leaders but the strongest are removed to encourage tree height.
- When pruning, trim off side branches from the main leader on each tree until it reaches a height taller than the tube. Cut flush to trunk without damaging branch collar.
- Do not remove more than 1/3 of the chestnut tree in any one year.
- Pruning can be less frequent when trees reach their tube height. The objective behind training and pruning young trees will help to develop a strong tree framework, prevent many serious problems before they develop, and support but production.
- Ensure name tag is visible at each tree or that name is legible on the tree tube.
- Cut back (coppice) any companion trees/shrubs that have grown to block light from the Chestnuts. Cut back to the group any existing saplings or shrubs that are encroaching on the Chestnuts.

#### 5. Deer and Pest Control

In Pennsylvania and New Jersey, the most common setback in chestnut growing is browse by deer. Antinanco uses tall plastic tree tubes in combination with wire rodent guards and supportive staking, as they render superior protection for deer and other mammalian predators. The tubes also act as mini-greenhouses around the trees, promoting faster growth. We inspect the protective tree tubes regularly for damage and to make sure they stay straight. As the trees grow, they may need to be tucked back into their tubes at times.

## 6. Weed Control

Antinanco believes that planting American Chestnut Trees along with native beneficial nitrogen-fixing and nutrient-accumulating plants contributes greatly to the trees' health and growth as well as to the local biodiversity. Antinanco follows the following weeding standards:

- Manual weeding of competing or invasive plants or grasses within 3 feet of base of trees. This zone may be expanded as the trees grow. Take care not to remove or harm companion plants (see Appendix A for the list of species we have planted to familiarize).
- Periodic mulching
- Application of organic herbicide (only if necessary) of vinegar and neem oil.

## **MAINTENANCE – LONG TERM**

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Long term maintenance considerations include pathogen and blight control, deer protection and replanting

### 1. Pathogens and Blight Control

This Project exists because of the attack on the American Chestnut Tree by the Chestnut Blight Fungus. Antinanco expects that the planting sites will eventually be attacked by natural infections of the blight. Other pathogen attacks (such as *Phytophthora cinnamomi*) may be possible although to date, none have been reported in New Jersey and Pennsylvania. That said, as with insect attacks, vigilance is to sudden changes in survival or health of the trees is expected during all inspection visits.

With respect to addressing the blight occurrence, the following standards are to be followed:

- If there are any signs of blight, remove any dead branches to the nearest branch collar.
- Remove blighted branches by cutting back to the nearest uninfected branch collar. This is preferred during late summer or winter. The Chestnut Blight is most active in the summer and in moist weather.
- If blight affects the trunk of any tree, a decision must be made whether to apply a "mud-pack" dressing which may prolong the lifespan of a tree, cut, or remove the tree. The decision will depend on severity of infection and hardiness of the tree.

### 2. Deer and Pest Control

Once the trees have matured and grown several feet above the level of the tree tubes, the tubes and wire rodent guards will be removed and replaced with 3-4 foot tall cylinders of chicken wire garden fencing to deter deer from rubbing the bark with antlers.

### 3. Replanting

Our overall goal is to ensure that as many trees that have partial or full resistance to the blight make it to maturity. However, any trees that do not survive will be replanted, unless the decision is made to leave the space for adjacent trees if necessary.

## DATA COLLECTION –

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Of great importance is ongoing monitoring of the trees and research of new methods to address the blight. We are already seeing signs of the blight infection in six trees that we planted in 2018. With 107 trees planted in the last two years, it is only inevitable that more trees will develop signs of infection. Further monitoring of the trees' performance, especially those infected by the blight, will help the trees and the conservation community to answer many important questions and allow us to provide better care for the trees in the future through improving their health and survival rate.

Data to be Recorded Quarterly:

1. Tree height, rounded to nearest inch
2. Presence of disease or pests causing harm to the tree. Evidence of any damage caused by animals
  - Species need to be identified and recorded. If unknown, a picture should be sent along with the observation details to the Project Coordinator.
  - Approximate percentage of that plant that is affected
  - If Chestnut Blight is observed, note the number of cankers on the tree and if the tree is actively healing around the edges, as well as if it is on branch or main stem. Branches with blight should be removed immediately.
3. Plant and fungal species growing in the immediate vicinity of the Chestnuts
  - Herbaceous annuals and perennials: including weeds, native plants, and any companions planted with the tree. This should include any plants growing next to the trunk and under the drip line.
  - Trees present in the surrounding area that may affect the Chestnuts' soil with dropped leaves or mycorrhizal fungi.
  - Any fruiting bodies of fungi that may emerge in the vicinity of the trees.
  - Species need to be identified and recorded. If unknown, a picture should be sent along with observation details to the Project Coordinator.
  - The data may be redundant after initial observations, so only add to the list as new plants/fungi are identified.

## **PROJECT CONTACTS**

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**MAINTENANCE SCHEDULE**

<b><u>PROCEDURE</u></b>	<b><u>SCHEDULE DATE</u></b>	<b><u>DATE COMPLETE</u></b>	<b><u>BY WHOM</u></b>
<u>Soil Testing, Site Maintenance, Planting, Installing Deer and Rodent Protections, Tagging, Fertilizing</u>	<u>November 2019</u>	<u>November 2019</u>	<u>Entire Team, Volunteers, Students</u>
<u>Measuring, Checking Protections</u>	<u>January/February 2020</u>		
<u>Measuring, adjusting tubes, fertilizing</u>	<u>March 2020</u>	<u>March 23, 2020</u>	<u>Olga Sher, Olga Chechina, Mariya Chechina, YAnnick Neveux</u>
<u>Measuring, weeding, removing blight-affected branches, doubling shelters for 7 trees at mt. olive to experiment with providing expanded shelter space to avoid sun leaf damage, adding soil, adjusting shelters, removing 7 trees to the nursery for rehab</u>	<u>July 2020</u>	<u>July 5, 2020</u>	<u>Entire Team, Volunteers, Students</u>
	<u>July 2020</u>		
	<u>September 2020</u>		
	<u>December 2020</u>		



## Appendix A Companion Plants Added to Planting Sites:

### Herbaceous Perennials:

**Lobelia siphilitica**  
(Great Blue Lobelia)



**Lespedeza virginica**  
(Slender Bush Clover)



**Baptisia australis**  
(Wild Blue/False Blue Indigo)



**Dalea purpurea**  
(Purple Prairie Clover)



**Desmodium canadense**  
(Showy Ticktrefoil)



**Desmodium glabellum**  
(Tall Ticktrefoil)



**Rudbeckia hirta**  
(Black-Eyed Susan)



**Monarda didyma**  
(Scarlet Beebalm)



**Agastache foeniculum**  
(Anise hyssop)



**Senna hebecarpa**  
(Wild Senna)



## Trees/Shrubs:

*Cercis canadensis*  
(Redbud)



*Gleditsia triacanthos*  
(Honey Locust)



*Robinia pseudoacacia*  
(Black Locust)



## Beneficial soil bacteria added to plantings (from Holly Tone):

- *Bacillus licheniformis*
- *Bacillus megaterium*
- *Bacillus pumilus*