

Seed Orchard Overview and Site Requirements

The American Chestnut Foundation

The American chestnut, a species of formerly immense ecological and economic significance in the hardwood forests of the eastern United States, was virtually eliminated from our forest by the introduction of chestnut blight. The mission of The American Chestnut Foundation (TACF) is to restore the American chestnut tree to our eastern woodlands to benefit our environment, our wildlife and our society. The CT Chapter of The American Chestnut Foundation works toward the TACF mission, with a focus on conducting that mission locally. CT-TACF was officially established in 1995 and has worked primarily with TACF's breeding program for regional adaptability since 2005, incorporating over 20 different native American chestnuts into the breeding program and establishing several breeding orchards. The current breeding goals of CT-TACF include installing several seed orchards (Figure 1), where putatively blight-resistant Connecticut-bred chestnuts will be produced. CT-TACF is looking to identify partners that can assure long-term sites and support for these seed orchards.

What is a TACF Seed Orchard?

A TACF seed orchard represents one of the final generations of breeding in TACF's current breeding program. The orchard should be installed on a chestnut-appropriate site, which is also relatively accessible to workers and volunteers. A seed orchard is a long-term project and should be expected to remain on the site for 30-45 years.

The TACF breeding program requires each state chapter to produce at least 20 distinct breeding lines within a given source of blight-resistance. These lines are produced by crossing advanced trees from the TACF Meadowview Research Farms with wild American chestnuts native to Connecticut. The resulting offspring are planted, grown to an appropriate size, and challenged with chestnut blight. Trees that exhibit the most blight-resistance and American chestnut character are selected for further breeding and the resulting nuts are then planted in a seed orchard.

A seed orchard planting will be at least one acre, which consists of one block. Each block of seed orchard contains 20 plots, each one representing a different American chestnut parent from CT. Within each plot, 150 trees are planted on tight spacing (Figure 2). With 20 of these plots, at least 3,000 nuts will be planted in a block over the duration of the planting phase of the orchard. Once all the trees in a given plot are about five years old, they will be challenged with the blight fungus. The best tree in each plot will be selected for breeding within the seed orchard, all others will be removed. This means that of the 3,000 nuts planted in a block, only 20 trees will remain after challenging with the blight fungus and making breeding selections. This process will take at least 10 years and, once completed, the orchard will be used for nut production to facilitate forest testing and reintroduction.



Figure 1. Newly planted seed orchard in Maine.

Seed Orchard Site Requirements

The main considerations for a seed orchard site are that the site is 1) appropriate for growing American chestnut, 2) accessible for equipment needed to install and maintain the orchard, 3) secure for the expected duration of the planting and 4) has a committed orchard manager with a plan for succession or changes in management.

1. American Chestnut Site Conditions

- a. Well-drained, slightly acidic soil (pH 4.5 – 6)
- b. Full sun
- c. Turf or recently cleared forest site

2. Seed Orchard-specific Site Conditions

- a. Site should be at least 1-acre, larger sites could be considered as well
- b. Accessible by large equipment for plowing/soil prep, mowing and roguing (removing unselected trees); possibly by a bucket truck
- c. Accessible by orchard manager and other volunteers for planting and regular maintenance and upkeep
- d. Some way to get water on the site (creative solutions are welcome)
- e. Deer fencing will be required in most cases

3. Security of the Site

- a. A seed orchard is expected to be a 30-45-year project and the site needs to be secure and dedicated to that use for the duration of the planting's use
- b. A TACF Germplasm Agreement must be signed by the landowner
- c. A long-term agreement between TACF and the host will be developed that outlines the responsibilities of both parties. A lease agreement could also be considered.

4. Orchard Management

- a. The orchard manager is the point contact between TACF and the seed orchard site. It is expected that the orchard manager will:
 - i. Visit the site regularly and report any problems or issues as they arise
 - ii. Keep up with regular maintenance – vegetation control (mowing, weeding), fertilization, irrigation and yearly inventories
 - iii. Work closely with the TACF Staff and volunteers to plan planting, inoculation, selection and roguing activities
- b. It is expected that the orchard manager will change over the course of the project and a plan for passing down management responsibilities should be formulated

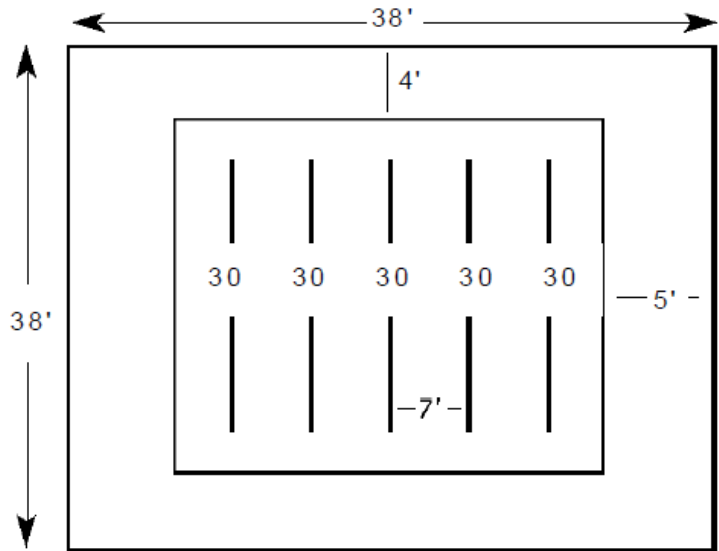


Figure 2. Here is the general layout for a seed orchard plot. A single seed orchard block will contain at least 20 of these, with the total planting filling about an acre. If space and resources allow, more than one block may be planted on a site, however one block is plenty for most cooperators.