American Chestnut Cooperators' Foundation

PLANTING INSTRUCTIONS

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PERMANENT SITE SELECTION

Please select and prepare your planting site ahead of time. Chestnuts prefer moderately acidic, sandy loam soil and require a well-drained location receiving six or more hours of direct sunlight per day. **Important elements to include in your site selection are:** *slope* (considering frost exposure and draining ability), *aspect* (considering sun and regular wind exposure), *soil* profile and depth, *resource* competition (considering grass, trees, etc. that are in close proximity), and *pollination* potential (considering ecosystem and distance from your other all-American chestnuts).

Slope: For maximum protection from frost, plant chestnuts on the high ground on sloping land. Planting on a slope will usually ensure adequate drainage. Avoid known frost pockets and wet spots. Probe the soil to be sure there are not mature tree roots or bedrock as obstacles for your young chestnut's taproot. You will need the ability to dig a 2'x2' hole.

Aspect: The aspect, or general direction your site on a slope faces, and the surrounding forest are the determining factors in the site's sun exposure. Chestnuts prefer full-sun, meaning six or more hours of direct sunlight per day. In our experience, the best sites receive full *morning* sun. Based on the aspect of your site, you can determine how much sun exposure per season your chestnuts will get.

Consider nearby trees and the shade they will cast on your plantings. If there are invasive, meaning non-native species, I recommend eliminating them without moral qualm. If there are native species that would shade your chestnuts, you might ask a certified arborist for advice on pruning a tree(s) without harming it in order to reduce its shading effect on your site. (You can find a certified arborist on the American Society of Consulting Arborists website: https://www.asca-consultants.org where you will see a "Find a Consulting Arborist" link at the top left of the home page.)

Removing surrounding large trees often removes a wind break (trees which have grown up, naturally adjusting their size and form to the wind exposure). This puts the line of trees behind them at risk for damage or complete uprooting by wind exposure they are not adapted to, having previously been protected by the first line of trees. If you feel the need to remove large trees near your site, consult a certified arborist, who should take windbreak and specific trees' species and form into account in order to ensure that your chestnuts do not become targets in the future.

Soil: Not everyone will have access to a site with all-American chestnuts' ideal soil type/profile. In the case that you do not, there are steps you can take to amend the soil, at least in the immediate area where you plan to plant. If you notice little vegetation in your selected site, or if it was previously farmland or a fruit tree orchard, there is a chance the soil is seriously deficient. In this case you can contact your local Extension Office for information on collecting and submitting soil samples for analysis. Test results will indicate what amendments and quantities are needed. If your soil does call for amendment, you will want to do this at least a year ahead of planting. (Most tree plantings do not react well to freshly amended soil. Time will allow introduced material to integrate with existing soil, which will be more tolerable.)

If you are dealing with a clay-heavy soil, mulching with a thick layer of high quality triple-milled hardwood mulch a year before digging your permanent planting holes will help aerate the clay, making it easier to dig and allowing for introduction of valuable microbes, fungus, and small organisms who will continue helping aerate and improve quality of your soil. In this case, you could make a nursery bed (see instructions below) rather than planting nuts directly in their permanent locations, allowing a year's time for the mulch to break down and begin conditioning the soil at the permanent sites.

Resources/Pollination: To give your chestnuts the advantage they need, you will want to eliminate resource competition. Competition for sun exposure is addressed above- but competition for *nutrients* and *water* also needs to be considered. Avoiding a monoculture (growth of only one species- in this case, chestnuts- within an area) can be equally important for pest control and to ensure that your chestnuts have adequate pollination potential by keeping a balanced ecosystem that will host a pollinator population.

To achieve elimination of water and nutrient competition, while maintaining a reasonably diverse ecosystem, I suggest identifying/assessing the ecotype where your site is, and use that to understand which plants might be appropriate for the site.

A good online resource to consult for this purpose is: https://forest-atlas.fs.fed.us/grow-forest-types.html
My favorite book source for this purpose (only relevant in the areas it covers) is: Wildflowers & Plant Communities of the Southern Appalachian Mountains & Piedmont by Timothy P. Spira

Looking into the qualities of native plants for your area will lead you to understand what may coexist with and even be beneficial to your chestnuts without outcompeting them. For example, many grass species and some weeds seed prolifically and/or may have aggressive growth habits that could quickly choke out a seedling or young chestnut, even if initially cleared from around the planting hole. (This type of vegetation could be eliminated by intensive weeding or smothering with landscape fabric and mulch.) On the other hand, some flowering trees and plants could attract pollinators and allow them to remain close to your chestnuts until their pollen is available.

You will still want to maintain adequate distance between companion plants and your chestnut plantings, especially to give the chestnuts room to grow in the future (healthy American chestnuts are capable of doubling their growth annually) and to give yourself space to move around them for monitoring and maintenance.

Distance between your chestnut plantings in a site is also important. Chestnuts have both male and female flowers on the same tree but are not self-fertile. At least two trees are necessary to make nuts. Plant your chestnuts at least 25 feet away from each other to avoid crowding and competing against each other, and no more than 50 feet apart to ensure efficient pollination. (Nut trees in general rely mostly on wind and honeybees for pollination.) The distance you choose depends on how much space you have to grow in, and your long term goals for the site.

PLANTING NUTS

Direct seeding (rather than starting in containers or indoors) results in the best first-year growth. Ideally, planting timing will mimic natural habits of the trees and squirrels' "plantings". Traditionally this timing falls in October, but please account for your area's climate and the fluctuating weather patterns we experience now due to climate change.

When you dig your hole, (if you are not already planting in sandy loam) replace (no more than) one third of the fill with compost and well-rotted manure, mixed *thoroughly* with the soil from the hole, fill the hole and mark with a stake near the middle. After the fill has settled, following rain, plant a chestnut on its side under one inch of fill. There are two appropriate methods for planting your ACCF chestnuts: creating a nursery bed to host multiple nuts during their first year, and transplanting them the following year OR direct-seeding each nut in its permanent site. **Select and prepare planting sites ahead of time.**

Nursery Preparation

A yard nursery bed is a good choice for safety of germinating nuts and seedlings. Keep in mind that nursery seedlings will be transplanted to their permanent sites the following year. Dig a broad shallow hole to a depth of one foot to make a circular bed 3.5' in diameter (chopping and mixing soil, if compacted). If you must plant in clay or other poorly drained soil, you may want to include a small amount of well-blended 50/50 mix of sand and peat moss near the top of the hole, and build up a small lightly tamped mound in which to press your chestnuts. This mound will allow for more adequate drainage in the first year of growth and let your seedling adjust to the less than ideal soil type over a longer period of time. Be sure to space

the chestnuts out, so that when it comes time to transplant, there is minimal root damage from tangling/separating.

The wire weld protection cage for a nursery will need to be 4' tall (at least) and 3'in diameter, centered over the prepared soil and staked in place. If you *know* there are moles, voles and other rodents in the area of your nursery, you may choose to make a short, 1' tall cage which you bury underground along the inside perimeter of your hole before you fill. I have had luck using Rabbit wire to protect my nursery beds, which has a smaller grid pattern than wire weld fencing, and will not allow underground tunnelers to dig through. (You will want to remove this when you transplant the following year so that it does not rust in the ground.)

Permanent Site Preparation

Permanent Site prep differs from nursery beds only in depth; prepared soil needs to be two feet deep. (Treat permanent site holes dug in clay soil as described above, making a small mound above ground level.) Press the chestnut into the prepared soil, one inch deep, (or deeper if you live in an area that experiences frost heaves) and pat the soil down on top of your nut.

TRANSPLANTS

Early spring is the time to transplant, before the last frost and before bud break.

Be very delicate with transplants. Keep in mind that while effective for our goals, transplanting is not a natural occurrence, so babying the transplants to ensure survival is *necessary*. Transplant on an overcast day to avoid sun exposure on the roots. Work quickly to avoid drying out the roots. You will want to dig a hole at the permanent site before removing the seedling from its nursery bed. Transplant *into* evenly moist soil. (If it is not already moist, lightly water your permanent site before digging the transplant hole.) Dig out a small hole, within your previously dug planting hole, that is equivalent to the underground space the transplant occupied in its nursery bed. Pay careful attention to depth.

Use clean hand tools to dig your seedlings out of their nursery bed. Use your tool to cut a hole around the seedling. Cut as far from the stem as possible, leaving equal distance between the cut and neighboring seedlings. Lift the transplant out very gently using your tool and steadying the seedling by holding its base with your fingers. Handle transplants near their base, just above the roots, to avoid damage to more delicate parts. To plant the seedling, hold its base just above ground level, roots suspended inside the hole, *not* touching it. (Once planted, the base of the exposed stem should be around one inch above the original ground surface.) Gently refill the hole, working from around all sides, using the soil you just dug out. Softly press the soil back down around the seedling to eliminate air pockets. Water the transplant immediately using about a gallon. Do this slowly and evenly around the transplant. Transplanted chestnuts need adequate water to survive. One gallon over a week should be enough. In dry spells, increase frequency of watering. Feel around your planting to check moisture and increase water amount if necessary.

CHESTNUT PROTECTION

Deer, turkeys, squirrels and many other woodland animals love to eat American chestnut seedlings, shoots on young trees and nuts. Deer nibble new growth through summer and eat stems in the winter. We advise 5' tall wire weld cages to protect the above ground growth at permanent sites. The cages may be 2-3' in diameter. Cages are invisible to a running deer, so decorate with flagging. Tall tree shelters are *not* a substitute for cages because they have insufficient space for leaves to spread, lead to spindly growth by blocking sunlight, and can act as incubators for the blight. If you have resilient rodent populations, an added defense might be attaching a 1' wire weld section, the same diameter as your cage, around the bottom of cages. Stagger the openings so that together the upright wire pieces achieve smaller holes. This can also be accomplished by attaching a 1' Rabbit wire section around the bottom of the cage. (If you add this extra protection, keep in mind that you will need to be able to detach one side of it to make an opening so that you can reach through the original cage for clearing debris or feeling soil for moisture.) **Mulching** protects young plants from extremes of heat, cold, drought, and weed competition. I prefer triple-milled hardwood mulch for its mix of larger pieces and fines which gives it the ability to break down more quickly,

mimicking the natural litter layer in a forest setting. *Do not mulch up to the trunk of your chestnut*, there should be a slow taper down to the soil going from the outside of the mulch coverage towards the trunk.

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