Seed Orchard Management Prescription

Site: [SAMPLE SITE]
CT Chapter of The American Chestnut Foundation and [PARTNER]

Overview

A seed orchard is filled in over time, as seed from the necessary breeding lines becomes available. It is therefore difficult to predict exactly how many seed will be planted each year, as this depends on a variety of factors. As such, this management prescription addresses activities in relation to where trees are in the process of seed orchard establishment, rather than outlining specific dates or expectations. Annual meetings between CT-TACF and [PARTNER] should be held in winter or early spring and will help to review the status of the project and also provide a mechanism for planning the upcoming year's activities.

Basic Management Strategies

Vegetation management: mowing, hand-weeding and herbicide; cover cropping on tilled but unplanted orchard sections
Varmint protection: 16-18" plastic shelters (also help shield against herbicide drift), 8' deer fence
Fertilization: slow-release (Osmocote-Plus) for years 1 and 2; granular (10-10-10) for year 3 and beyond
Water: fire truck (or other large tank truck) to come on-site if needed
Labeling: write tree numbers on shelters with a paint marker (Sharpie will not last), write number on tree with timber crayon once large enough, maintain labeled grade stakes at corner of each plot (a plot is a planting of an individual line w/in each unit)

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Management Activities

Year 0: Pre-Planting

Fall:

- Determine area to be planted the following spring, based on available harvest (consult with CT-TACF).
- Till the area to be planted.

Winter:

- Order all planting supplies (shelters, stakes, etc).

Year 1: Year of Planting

- Till planting area, or otherwise prepare for planting in consultation with CT-TACF.
- Plant into freshly prepared rows. Planting should be done in collaboration with CT-TACF.
- Protect each seed/seedling with a plastic shelter sunk 2-4" into the soil. This helps protect against voles and also helps to protect seedlings from herbicide drift.
- Vegetation control: Weeds will be the most aggressive the first year after tilling.

    - Herbicide as often as needed to keep a 3' wide swath, centered on the row of trees, free of vegetation. Herbicide should be applied on a calm day and in accordance to all instructions on the label. A pre-emergent could also be used early in the season.
    - Hand-weed within the tubes at least twice over the course of the season. Monthly hand-weeding of tubes may be helpful during the first growing season.
    - Mowing should be done between rows according to a pre-arranged schedule frequency. Some managers prefer a monthly frequency, others may cut in early season and allow the growth of native vegetation throughout the season to provide habitat to encourage nesting birds and other animals.
- Water: Water is most important during the first growing season. The decision about when to water will depend on several factors - the amount of rainfall, drainage of the soil, ambient air temperature, etc. As with any new planting, if there is not a good soaking rain every week or two, you should check on the trees and determine if watering is needed. As you gain a better understanding of the site and how chestnut grows on it, this decision will be easier to make.
- Fertilization: slow-release, such as Osmocote-Plus, applied to root-zone (should be applied at rate recommended on packaging, based on caliper of trees)
- End of first growing season:
    - Herbicide and hand-weed one last time.
    - Make sure all shelters are sunk into the ground. This should be done before the ground freezes and/or before the first snow fall.
    - Re-label all tree shelters with paint marker (NOT Sharpie), check condition and re-label corner stakes for each plot.

Year 2 – 5+: Second growing season – season before inoculation

- Beginning of the season make sure all shelters are still in place and sunk into the soil
- Vegetation control: As the trees grow, they will begin to shade out competing vegetation.
    - Herbicide as often as needed to keep a 3' wide swath, centered on the row of trees, free of vegetation, likely once early in the summer and again towards the end of the growing season. Herbicide should be applied on a calm day and in accordance to all instructions on the label. A pre-emergent could also be used early in the season.
    - Hand-weed within the tubes at least twice over the course of the season, making sure one time is towards the end of the growing season.
    - Mowing should be done between rows at least once/month.
- Water: The trees should become better established over time. When conditions call for watering, start with the youngest trees. If 2nd or 3rd year trees are showing signs of drought stress they could be watered as well, but this should not often be necessary.
- Fertilization: slow-release (Osmocote-Plus) for year 2; granular (10-10-10) for year 3 and beyond.
- End of the season: Make sure all shelters are sunk into the ground. Re-label all tree shelters with paint marker (NOT Sharpie), OR (if trees are large enough) label tree trunks with timber crayon. Check condition (replace as needed) and re-label corner stakes for each plot.

Year of Inoculation (**Year 5 is an estimate, but inoculation depends on the size of the trees**)

This is similar to Year 2 and beyond, except that water becomes more important. Inoculation is stressful and therefore it is important to make sure inoculated trees are not drought-stressed. If conditions have been dry, irrigation is recommended. Tree shelters will also need to be removed prior to inoculation.

Inoculation Process

Inoculating chestnut trees with chestnut blight fungus is a way to directly test their resistance. The standard practice is to challenge trees with both a highly-virulent and a moderately-virulent strain of the fungus. Because the spacing in a seed orchard is very tight, causing stress for the trees, staggered inoculations may be conducted. This would mean that the moderate strain would be used the first year and the stronger strain would follow a year or two later (if necessary). Whether staggered or not, the timing of inoculation and selection activities follow the same seasonal cycle. Inoculation will be conducted in collaboration with and under the guidance of CT-TACF.

- Trees are inoculated with chestnut blight fungus in June, once trees are fully leafed-out.
- Inoculated trees are rated once in the fall (usually November) and an initial cull list may be created.
- Inoculated trees are rated again in June (one full year after inoculation).
- Selections are made and all other trees are removed. According to permitting for this process, removed trees must be burned.

Year after Inoculation

This is similar to Year 2 and beyond, except that once selections are made most trees will need to be removed (rogued). According to permitting for this process, removed trees must be burned. If staggered inoculations are employed, the culling process will also be staggered.

Year after Selection

Selected trees should continue to receive vegetation management (as needed) and fertilization (10-10-10). CT-TACF will coordinate all breeding/harvesting activities for selected trees.