

INTRODUCTION TO PLANTING AND GROWING CHESTNUTS



SITE SELECTION,
PREPARATION AND
PLANTING



SITE SELECTION



CONSIDERATIONS FOR SELECTING THE RIGHT SITE FOR AMERICAN CHESTNUT

Site Selection



- Type of site selected could be:

- Field →
- Forested –
 - ✦ Recent clear-cut
 - ✦ Shelter wood
 - ✦ Regeneration
 - ✦ Other
- Highly disturbed site –
 - ✦ Mine reclamation



Site Selection



Field

- Good access to light
- No clearing necessary
- Turf and other vegetation to manage
- Lack of beneficial mycorrhizae likely

Forested

- Light availability and site preparation necessary dependent on level of clearing
- Often little understory vegetation to manage
- Beneficial mycorrhizae present

Soils



- Soils appropriate to chestnut are:
 - Well-drained
 - ✦ Drainage
 - ✦ Saturated hydraulic conductivity
 - Slightly acidic
 - ✦ Soil pH of 4.5-5.5



<http://en.wikipedia.org/wiki/File:Blueberries-Littleisland.jpg>



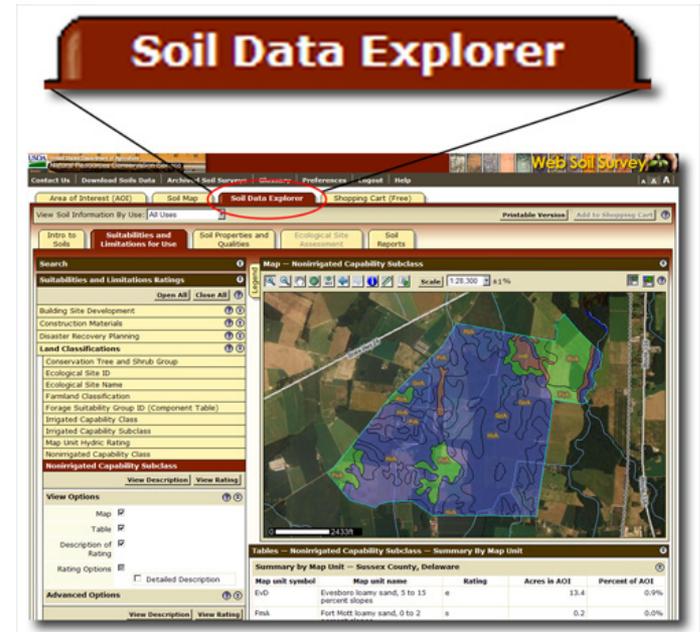
http://en.wikipedia.org/wiki/File:Kalmia_latifolia_species.jpg

Ericaceous plants, like mountain laurel and blueberries, are good indicators of acidic soils, though a soil sample is the best way to know for sure.

Soils



- A soil test is the best way to determine soil pH and learn more about the nutrient components
 - Most land-grant Universities offer soil testing for a minimal fee
 - Select blueberries or Christmas trees as the crop being grown, unless you know chestnut-specific recommendations are available
- Use NRCS's Web Soil Survey to look at the site in question
 - Explore many soil properties
 - ✦ Hydrology, changes in soil type, etc
 - Download results to keep on-file



Soil Data Explorer

The screenshot shows the NRCS Web Soil Survey interface. A red callout box highlights the 'Soil Data Explorer' tab. The main window displays a map of a field with various soil types color-coded. On the left, there are several panels for search, suitability ratings, and view options. At the bottom right, a table summarizes the data by map unit.

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Evd	Everetts loamy sand, 5 to 15 percent slopes	e	13.4	0.9%
Fmk	Fort Mott loamy sand, 0 to 2	e	0.2	0.0%

Soils



- Possible soil issues to look out for:

- Compaction

- ✦ Check land-use history
- ✦ Old log landings
- ✦ Previous construction

- Ledge/depth to bedrock

- ✦ Roots need room to grow
- ✦ Depth to bedrock:
4-6 feet minimum

- Fragipan

- ✦ Subsurface soil layer
- ✦ Restricts flow of water and
root penetration
- ✦ Bx or Btx in soil descriptions



Empty up-hill rows were planted over ledge.
Chestnuts sprouted but quickly died.

Soils



- Land-use history can be very important during site selection:
 - Compaction from pasture, old log landings or construction work
 - Nutrient levels – either high or low – from previous agricultural practice
 - On-site accidents or spills could leave behind toxins
- Best to know what happened in the past to identify any potential issues early on



Microclimate



- Microclimates are areas with climates differing from the surrounding area:
 - Warmer/colder
 - Wetter/drier
 - More/less prone to frost
- Can be large or small
- Look for:
 - Cold valleys
 - Large bodies of water
 - Topography

Local knowledge can help identify on-site microclimates



http://en.wikipedia.org/wiki/File:Frost_on_a_nettle,_Netherlands.jpg

SITE PREPARATION



PLANNING FOR PLANTING





Site Preparation

Begin planning for a planting at least one year in advance

It can take careful planning to prepare an orchard site



- Develop a timeline
 - Identify site preparations needed and target dates for completion
- Develop a budget
 - Research options and begin purchasing materials
- Work on time-consuming projects like:
 - Pricing/planning for deer fencing
 - Extensive clearing or pre-planting vegetation management
 - Experimental design or planting layout



Site Preparation

Vegetation management can be a big part of site preparation

Identify any invasive species early on - these will be the most difficult to remove and control

- Forest site prep:
 - Large existing vegetation to remove/manage
 - Clearing, stumping, rock removal
- Field site prep:
 - Herbaceous vegetation to remove/manage
 - Plowing, tilling, or other soil prep
 - Herbicide, black plastic, landscape fabric, mulch

Pre-planting row cover can help kill vegetation prior to planting.





Site Preparation

Soils should be a big consideration when selecting a site

A soil test is the best way to confirm that the soils on-site are appropriate for growing chestnut

- Your soil test results should include recommendations for your crop
- Follow site preparation and management recommendations, some of which are best done 6-12 months before planting
 - Soil amendments
 - ✦ Adjust the soil nutrition or pH to be most beneficial to growing chestnut
 - Fertilization plan
 - ✦ Use the on-site soil nutrition to develop an appropriate fertilization plan

PLANTING



RECOMMENDATIONS FOR INSTALLING AND MANAGING YOUR CHESTNUT PLANTING

Soil Preparation



- There are many ways to prepare the soil for planting
- Soil preparation will depend on the site and equipment available
- Field sites:
 - Big equipment: plowing, disking or use of a soil auger/post hole auger
 - Hand equipment: hand digging, bulb planter, dibble bar
- Forested or rocky sites:
 - Big equipment may be more difficult to use
 - Hand equipment: hand digging, bulb planter, dibble bar



Planting Supplies

Shelters provide
important
protection against
wildlife



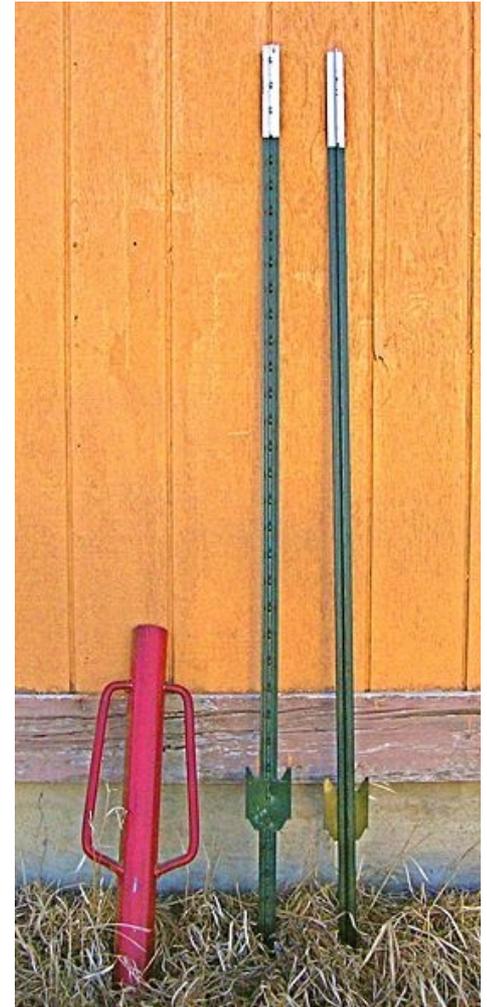
- Select shelters based on the expected wildlife pressure
 - The shorter the shelter, the better
 - Tall shelters prevent trees from forming reactionary wood
- Many options for 18-24” shelters
 - TREE PRO, Tubex, Blue-X[®]
 - Make your own – flashing, mesh, etc
- Sink shelters ~2” to protect the base of the trees
- Deer protection may best be provided by fencing
 - 8-feet – woven wire, electric, etc

Planting Supplies



- Stakes may be needed to secure shelters in place or mark the location of trees
- Wooden stakes are the easiest to find but do need to be replaced over time
- Options include:
 - Hardwood
 - Pine
 - Bamboo
 - Fiberglass
 - Metal or rebar

A post-pounder is a handy tool for installing stakes.



Planting Supplies



- Many vegetation management plans involve the use of some type of physical barrier
 - Often in addition to, or replacement of, herbicide
 - Can encourage rodents/voles – be mindful
- Landscape fabric
 - Woven fabric or plastic
 - Heavy-duty is best for long-term durability
 - Can be run down rows or around individual trees (competition mats)
- Mulch (if using)
 - Around individual trees is best
 - Most attractive to rodents/voles



Planting Supplies



Nuts

- Direct-seed nuts into weed-free germinating mix
- Plant with radicle down or sideways
- Plant no more than 1/2-1" deep



Seedlings

- No need for planting mix – nut has already germinated
- Include forest soil, compost or other amendments
- Plant at level of root collar, may remove nut shell

Planting Supplies



- A weed-free planting mix is often used
 - Reduces competition
 - Provides more balanced moisture
- Recommended planting mixes include:
 - 1/3 each peat, perlite and vermiculite
 - Scott's Miracle-Gro® Moisture Control® Potting Mix
 - Sun Gro® Metro-Mix® 560 SUN-COIR
- Including a small amount of forest soil may contribute beneficial mycorrhizae
 - Most important in field sites where beneficial mycorrhizae are less likely to be present



Planting Supplies



- Whether nuts or seedlings, make sure all sources are clearly labeled
- Nuts
 - Most common way to plant
 - Store somewhere cool until ready to put in the ground
- Seedlings – could be bare-root or potted
 - Bare-root seedlings require special care to make sure they do not dry out before planting



Remember: you can't plant much without the chestnuts!

Tracking the Planting



- It is important to randomize your chestnut planting
 - Often planting several sources of interest
 - Sources planted together may suffer from a local site issue or other geographically-oriented stressor
- Randomization also reduces site effect on performance
 - Genetic x Environment (G x E) interaction
 - Allows for a better snapshot of blight-resistance
 - Performance of an entire line not dependent on potential stress (or lack of stress) in one part of the planting



Tracking the Planting



- Chestnut plantings usually include several different crosses or species
 - Need a way to distinguish what goes where on the ground
 - Especially important with a large group of planters
- A color-coded layout works well
 - Plastic flags
 - Painted/colored stakes
- Can be done pre-planting or on planting day
 - If time to do prior to planting, this is a great prep task



http://www.forestry-suppliers.com/product_pages/View_Catalog_Page.asp?mi=1115&title=Plain+Vinyl+Stake+Wire+Flags#

Tracking the Planting



- Beyond mapping, there is a need to track the planting over time
 - Yearly mortality, growth, blight resistance, additional measures
- Work with Regional Science Coordinator to develop a format and set expectations for data collection
 - TreesDB in under development
 - ✦ Should be available “soon” to help track the trees in your planting





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MANAGING THE PLANTING



WHAT TO DO ONCE THE TREES ARE
IN THE GROUND

Management Recommendations



- Watering is important, especially during establishment
 - Should have a water source available, even if it is trucked in
 - Know your site:
 - ✦ Chestnut is fairly drought-tolerant but should be watered during dry periods
 - ✦ Seedlings will need more water while their root systems catch-up
- Fertilizing can enhance growth or provide lacking nutrients
 - Use an acid-loving fertilizer
 - Follow label instructions
 - The amount needed will go up as the tree grows
 - ✦ Water-soluble is good while trees are small
 - ✦ Granular is better as they get larger



Management Recommendations



- Weeds and other competing vegetation can be a big threat to chestnuts, especially during the first 3-5 years
- A 3' diameter vegetation-free zone around each tree is ideal
 - Herbicide – requires a couple applications/year
 - ✦ Be careful spraying – avoid spraying the trees
 - ✦ Follow all label instructions!
 - Landscape fabric or other mulches
 - ✦ May require maintenance over time to maintain effective control
 - ✦ Can provide cover for rodents – keep vegetation next to fabric or mulch short



Management Recommendations



- Protecting the base of the tree is important, especially while the trees are small
 - Shelters should be removed BEFORE they begin to girdle the tree
 - Good vegetation management will discourage rodent predators and make it easier for raptors to keep populations under control
- Deer browse can be a problem until the trees grow beyond browse height
 - Fencing is key on high-pressure sites
 - Tall shelters can also be used
 - Deterrents – examples: Plantskydd[®], Tree Guard[®] with Bitrex[™], Deer-Off![®]

