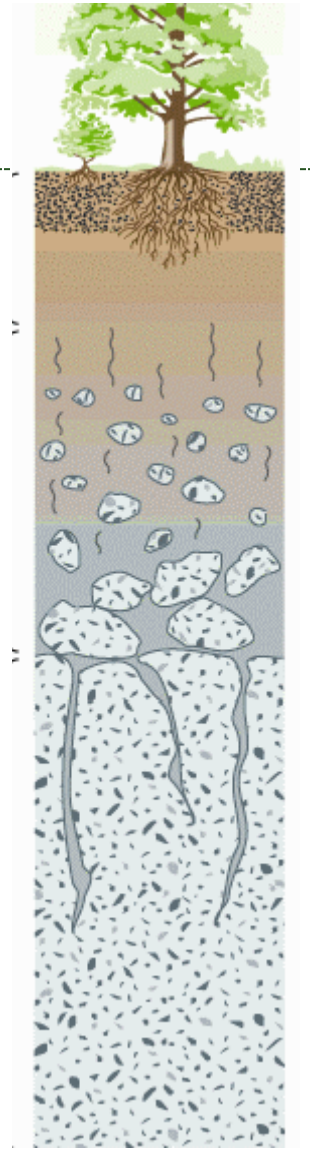
Site Selection



- The #1 Most Important Step in Planting Anything
- Soils a major component
  - Physical Characteristics
    - Drainage
    - Texture
    - Saturated Hydraulic Conductivity
    - Permeability
    - Swales
  - Chemical Composition
    - Nutrition
    - Get a soil test

Soils

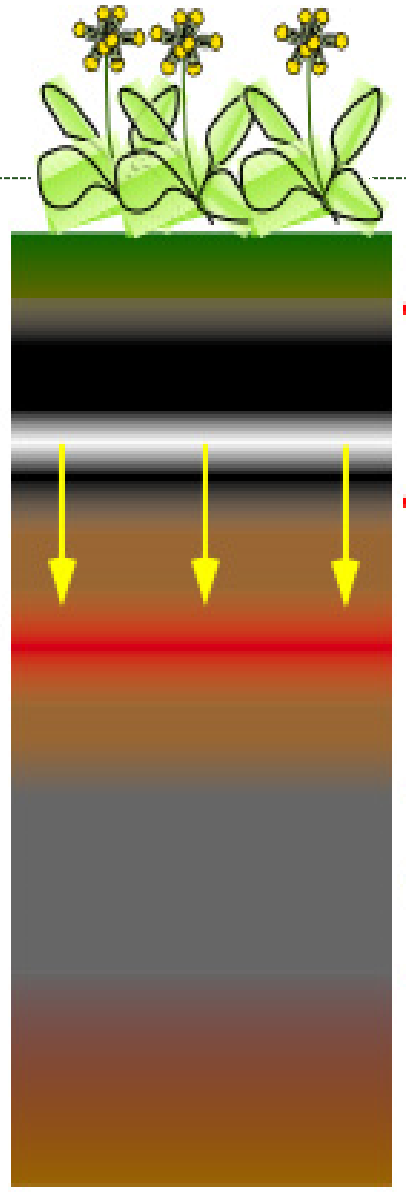
http://en.wikipedia.org/wiki/File:Kalmia_latifolia_species.jpg

- Soils appropriate to chestnut are:
  - Well-drained
    - Drainage
    - High saturated hydraulic conductivity
      - Perc test
  - Slightly acidic
    - Soil pH of 4.5-6.5 ::: Preferred 5.5

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

Horizons



O Horizon

- O = Organic Layer

A Horizon

- A = Mineral Particles

B Horizon

- B = Mineral particles + material from A horizon. More clay

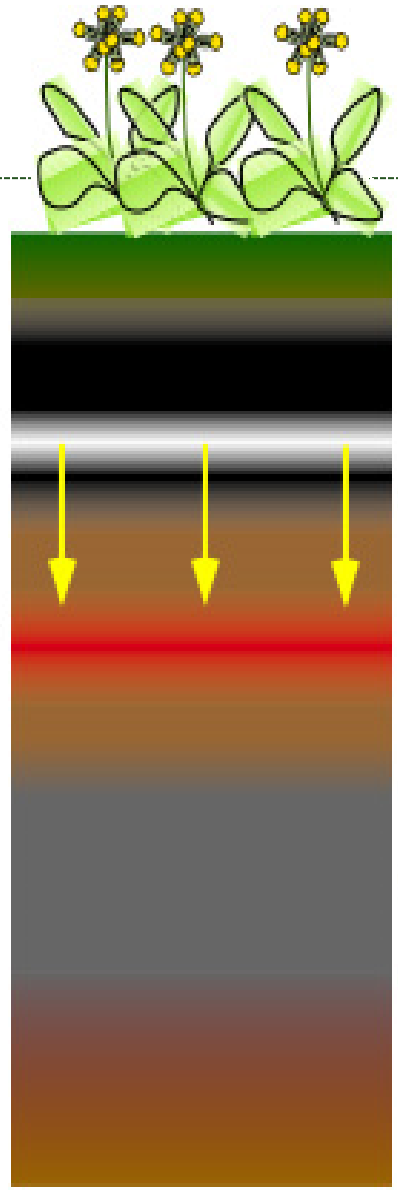
C Horizon

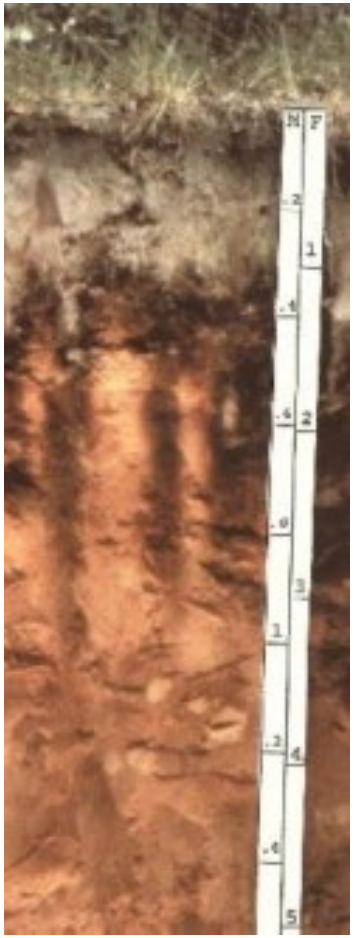
- C = Weathered parent material

R Horizon

- R = Parent material; unweather bedrock.

Horizons


O Horizon
A Horizon
Eluviation Layer
Illuviation Layer
B Horizon
C Horizon
R Horizon

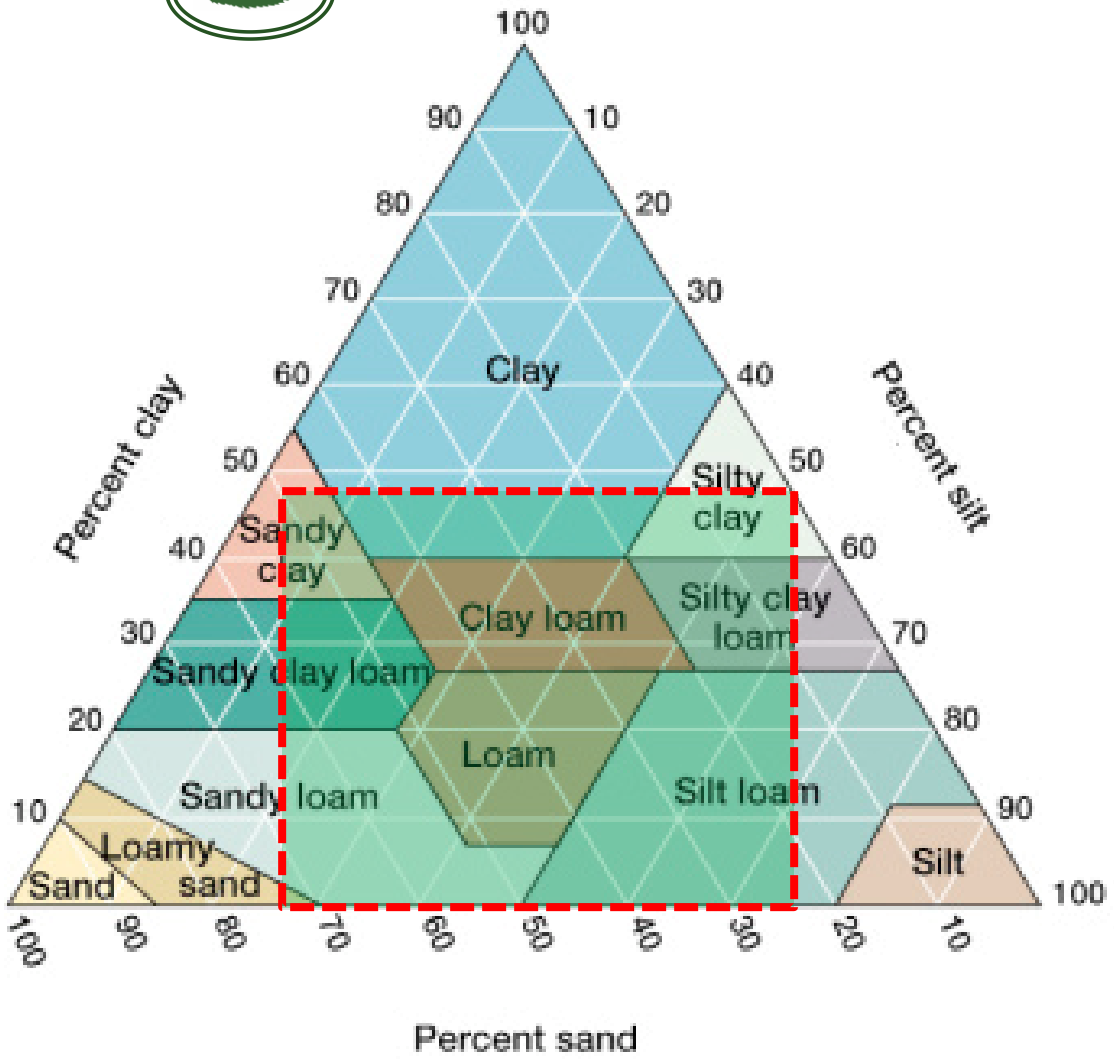


What Factors to Look For?

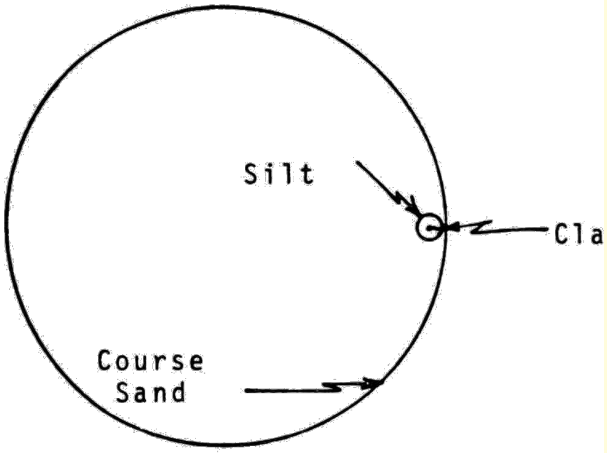
1. Particle Size
   - Ability to hold water
     - Drainage
     - Saturated Hydraulic Conductivity (KSat / Permeability)
2. Depth to Impermeable Layer
   - Fragipan, Bedrock, Water Table, Compaction
3. Nutrient Availability
   - N:P:K
4. Ability to hold nutrients
   - Cation Exchange Capacity

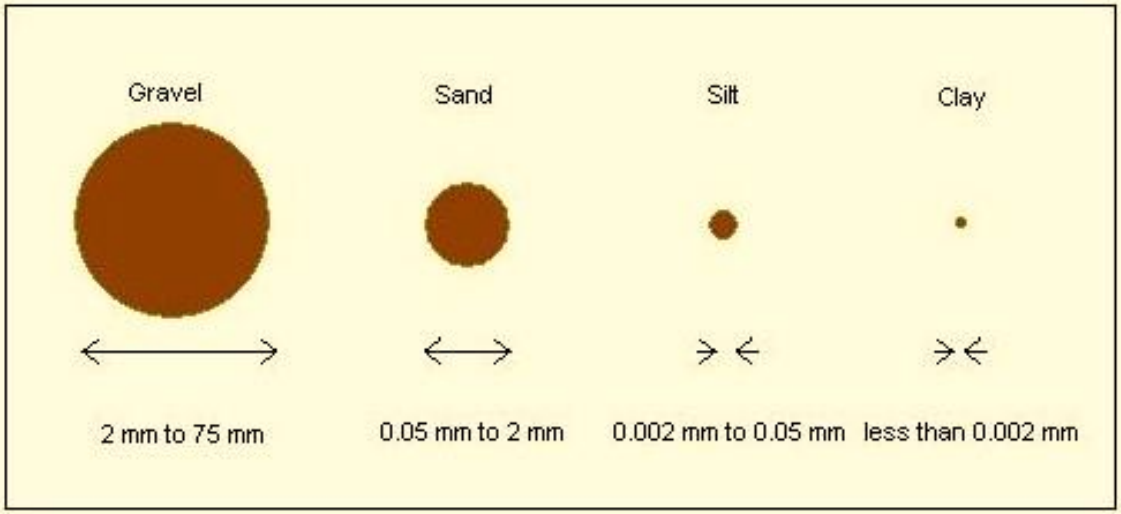
Physical Soil Characteristics

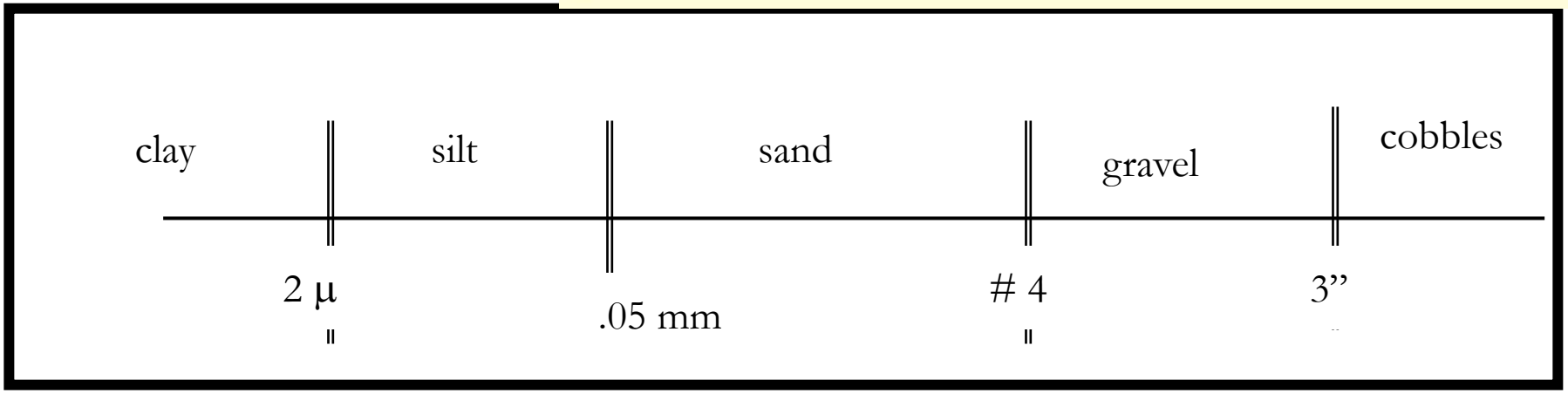
- TEXTURE
- Particle Size
  - CLAY : SILT : SAND
- Sweet spot:
  - 25% - 75% Sand



Soil Particle Size







Particle Size Activity

- http://globe.gov/sda/tg/soil/ParticleSize.pdf

What is Affected by Texture?

- Porosity – a measure of void space
- Drainage – roughly indicates the degree, frequency, and duration of wetness
- Saturated Hydraulic Conductivity (Ksat) (aka permeability)
  – the ability of water to flow through a soil
    http://techalive.mtu.edu/meec/module06/Percolation.html
  – perc test

- Ribbon Test

Place ball of soil between thumb and forefinger, gently pushing the soil between with the thumb, squeezing it upward into a ribbon. Form a ribbon of uniform thickness and width. Allow ribbon to emerge and extend over the forefinger, breaking from its own weight.
Does the soil form a ribbon?

No → **Loamy Sand**

Yes

What kind of ribbon does it form?

Moisten a pinch of soil in palm and rub with forefinger		Forms a weak ribbon less than 1" before breaking	Forms a ribbon 1-2" before breaking	Forms a ribbon 2" or longer before breaking
		LOAM	**CLAY LOAM**	**CLAY**
Does it feel very gritty?	Yes	**Sandy Loam**	**Sandy Clay Loam**	**Sandy Clay**
Does it feel equally gritty and smooth?	Yes	**Loam**	**Clay Loam**	**Clay**
Does it feel very smooth?	Yes	**Silt Loam**	**Silty Clay Loam**	**Silty Clay**

http://virtual.yosemite.cc.ca.us/agens/instruction/pollard/nr/resources/Lab%204%20Soil%20Texture.doc

Depth to Impermeable Layer

- 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.

Web Soil Survey

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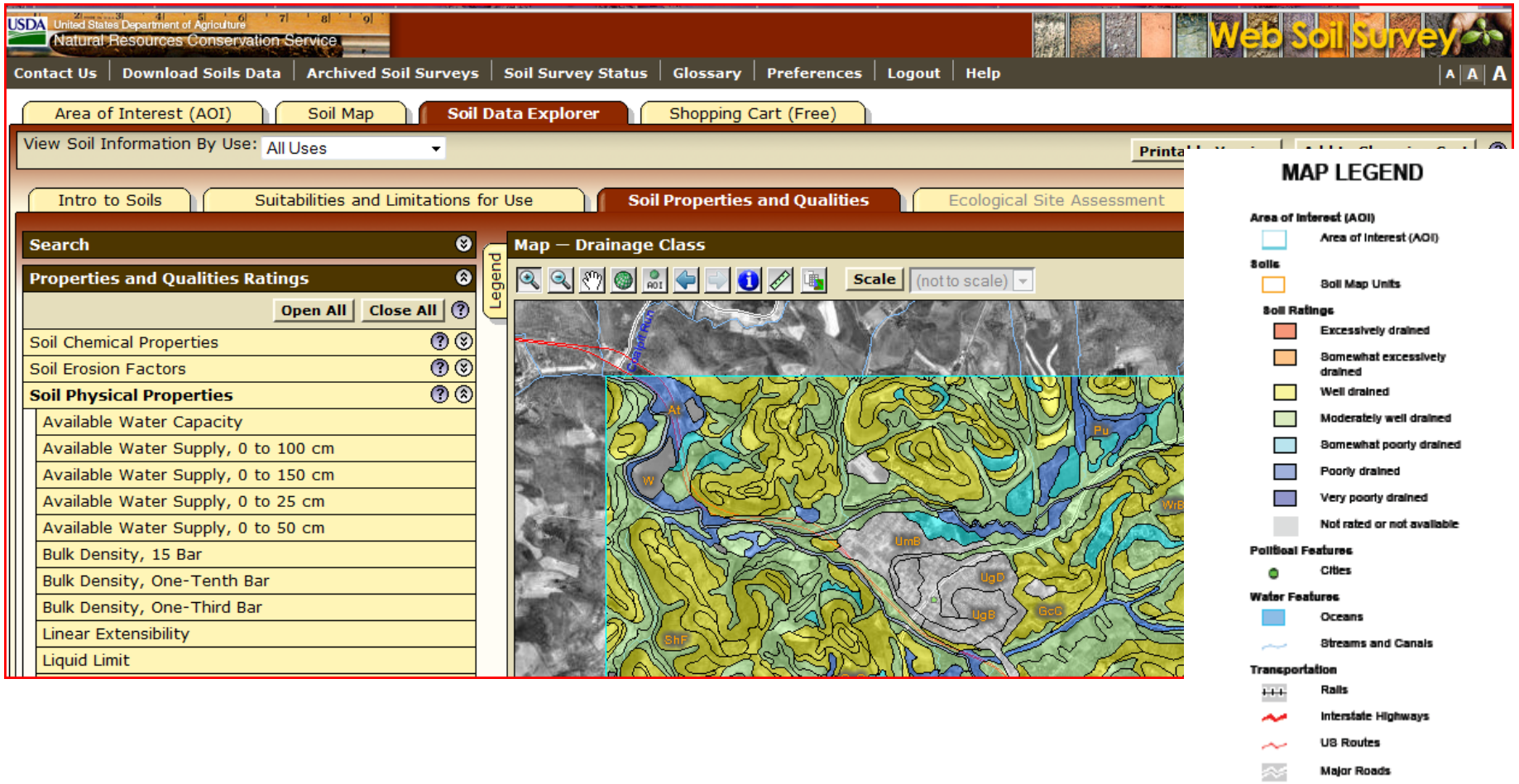


Web Soil Survey

- Area of Interest (AOI)
- Find soil type
  - Enter into Official Soil Description Website

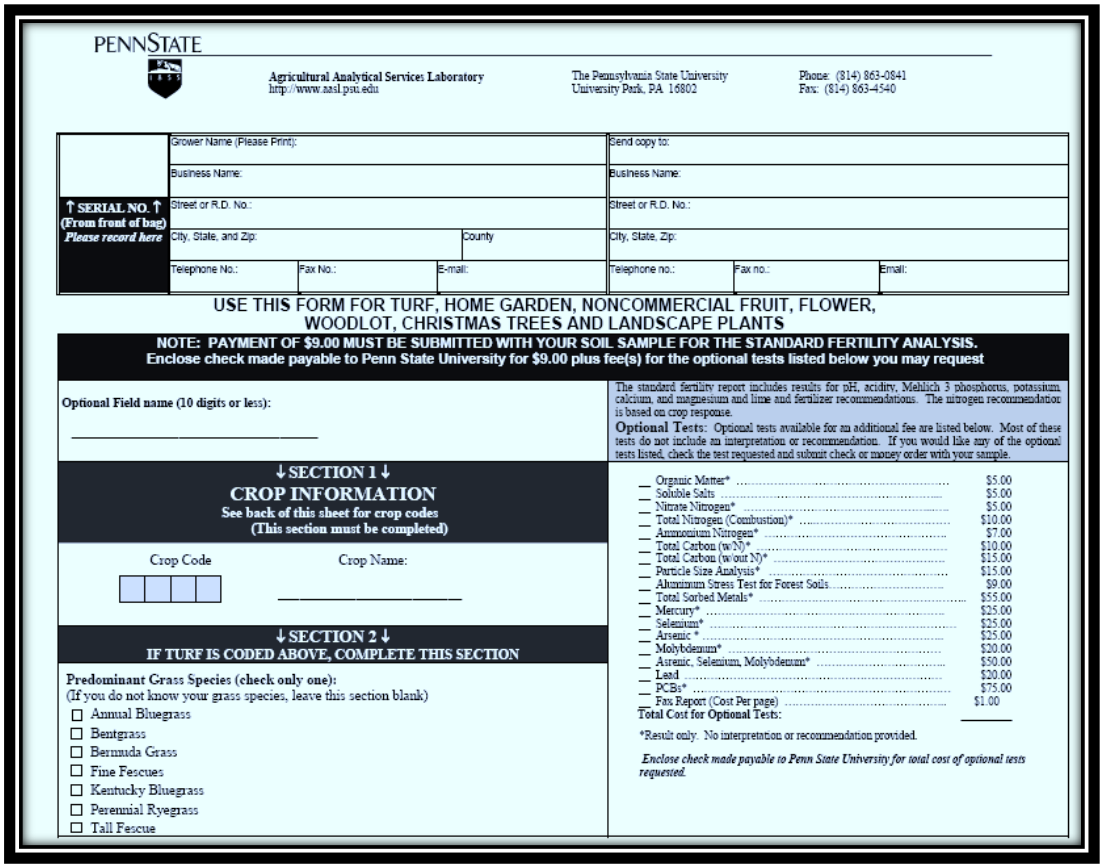
1. Soil Physical Properties
   1. KSat / Permeability
   2. % Sand, % Clay, % Silt
2. Soil Qualities and Features
   1. Drainage Class vs. Hydrologic Soil Group
   2. Depth of Impermeable (Restrictive) Layer
3. Water Features: Depth to Water Table

- Let's go to Web Soil Survey
  - Scotia: 40.79363079535323, -77.9277742934946
  - Gamelands 176: 40.83638841239644, -77.87970248163255
  - Zoar Valley (William W. White): 42.45104122422605, -78.87693655833554

Soil Testing

THE AMERICAN CHESTNUT FOUNDATION®

- Soil test kits from Penn State ($9/kit)



PENNSTATE

Agricultural Analytical Services Laboratory
http://www.aasl.psu.edu

The Pennsylvania State University
University Park, PA 16802

Phone: (814) 863-0841
Fax: (814) 863-4540

↑ SERIAL NO. ↑ (From front of bag) *Please record here*	Grower Name (Please Print):	Send copy to:
	Business Name:	Business Name:
	Street or R.D. No.:	Street or R.D. No.:
	City, State, and Zip: / County	City, State, Zip:
	Telephone No.: / Fax No.: / E-mail:	Telephone no.: / Fax no.: / Email:

USE THIS FORM FOR TURF, HOME GARDEN, NONCOMMERCIAL FRUIT, FLOWER, WOODLOT, CHRISTMAS TREES AND LANDSCAPE PLANTS

NOTE: PAYMENT OF $9.00 MUST BE SUBMITTED WITH YOUR SOIL SAMPLE FOR THE STANDARD FERTILITY ANALYSIS.
Enclose check made payable to Penn State University for $9.00 plus fee(s) for the optional tests listed below you may request

Optional Field name (10 digits or less):

_____

The standard fertility report includes results for pH, acidity, Mehlich 3 phosphorus, potassium, calcium, and magnesium and lime and fertilizer recommendations. The nitrogen recommendation is based on crop response.

Optional Tests: Optional tests available for an additional fee are listed below. Most of these tests do not include an interpretation or recommendation. If you would like any of the optional tests listed, check the test requested and submit check or money order with your sample.

↓SECTION 1↓
CROP INFORMATION
See back of this sheet for crop codes
(This section must be completed)

Crop Code ☐☐☐☐ Crop Name: _____

↓SECTION 2↓
IF TURF IS CODED ABOVE, COMPLETE THIS SECTION

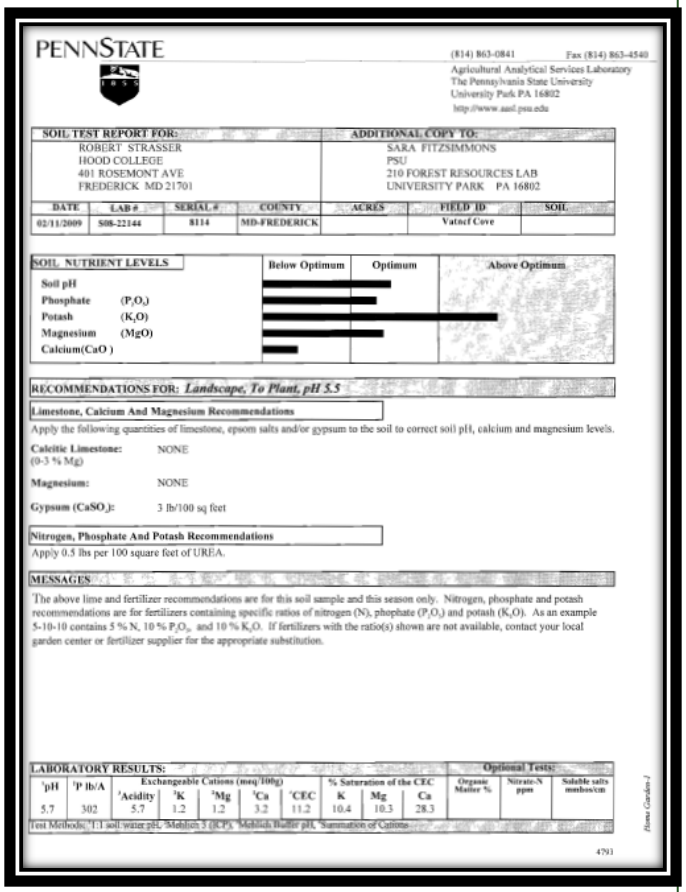
Predominant Grass Species (check only one):
(If you do not know your grass species, leave this section blank)

- ☐ Annual Bluegrass
- ☐ Bentgrass
- ☐ Bermuda Grass
- ☐ Fine Fescues
- ☐ Kentucky Bluegrass
- ☐ Perennial Ryegrass
- ☐ Tall Fescue

__ Organic Matter*	$5.00
__ Soluble Salts	$5.00
__ Nitrate Nitrogen*	$5.00
__ Total Nitrogen (Combustion)*	$10.00
__ Ammonium Nitrogen*	$7.00
__ Total Carbon (w/N)*	$10.00
__ Total Carbon (w/out N)*	$15.00
__ Particle Size Analysis*	$15.00
__ Aluminum Stress Test for Forest Soils	$9.00
__ Total Sorbed Metals*	$55.00
__ Mercury*	$25.00
__ Selenium*	$25.00
__ Arsenic *	$25.00
__ Molybdenum*	$20.00
__ Arsenic, Selenium, Molybdenum*	$50.00
__ Lead	$20.00
__ PCBs*	$75.00
__ Fax Report (Cost Per page)	$1.00
Total Cost for Optional Tests:	_____

*Result only. No interpretation or recommendation provided.

Enclose check made payable to Penn State University for total cost of optional tests requested.



PENNSTATE

(814) 863-0841 Fax (814) 863-4540
Agricultural Analytical Services Laboratory
The Pennsylvania State University
University Park PA 16802
http://www.aasl.psu.edu

SOIL TEST REPORT FOR:	ADDITIONAL COPY TO:
ROBERT STRASSER HOOD COLLEGE 401 ROSEMONT AVE FREDERICK MD 21701	SARA FITZSIMMONS PSU 210 FOREST RESOURCES LAB UNIVERSITY PARK PA 16802

DATE	LAB #	SERIAL #	COUNTY	ACRES	FIELD ID	SOIL
02/11/2009	S08-22144	8114	MD-FREDERICK		Vatsef Cove	

SOIL NUTRIENT LEVELS

		Below Optimum	Optimum	Above Optimum
Soil pH				
Phosphate	(P_2O_5)			
Potash	(K_2O)			
Magnesium	(MgO)			
Calcium	(CaO)			

RECOMMENDATIONS FOR: *Landscape, To Plant, pH 5.5*

Limestone, Calcium And Magnesium Recommendations

Apply the following quantities of limestone, epsom salts and/or gypsum to the soil to correct soil pH, calcium and magnesium levels.

Calcitic Limestone: NONE
(0-3 % Mg)

Magnesium: NONE

Gypsum ($CaSO_4$): 3 lb/100 sq feet

Nitrogen, Phosphate And Potash Recommendations

Apply 0.5 lbs per 100 square feet of UREA.

MESSAGES

The above lime and fertilizer recommendations are for this soil sample and this season only. Nitrogen, phosphate and potash recommendations are for fertilizers containing specific ratios of nitrogen (N), phosphate (P_2O_5) and potash (K_2O). As an example 5-10-10 contains 5 % N, 10 % P_2O_5, and 10 % K_2O. If fertilizers with the ratio(s) shown are not available, contact your local garden center or fertilizer supplier for the appropriate substitution.

LABORATORY RESULTS:

		Exchangeable Cations (meq/100g)					% Saturation of the CEC			Optional Tests:		
pH	P lb/A	Acidity	K	Mg	Ca	CEC	K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
5.7	302	5.7	1.2	1.2	3.2	11.2	10.4	10.3	28.3			

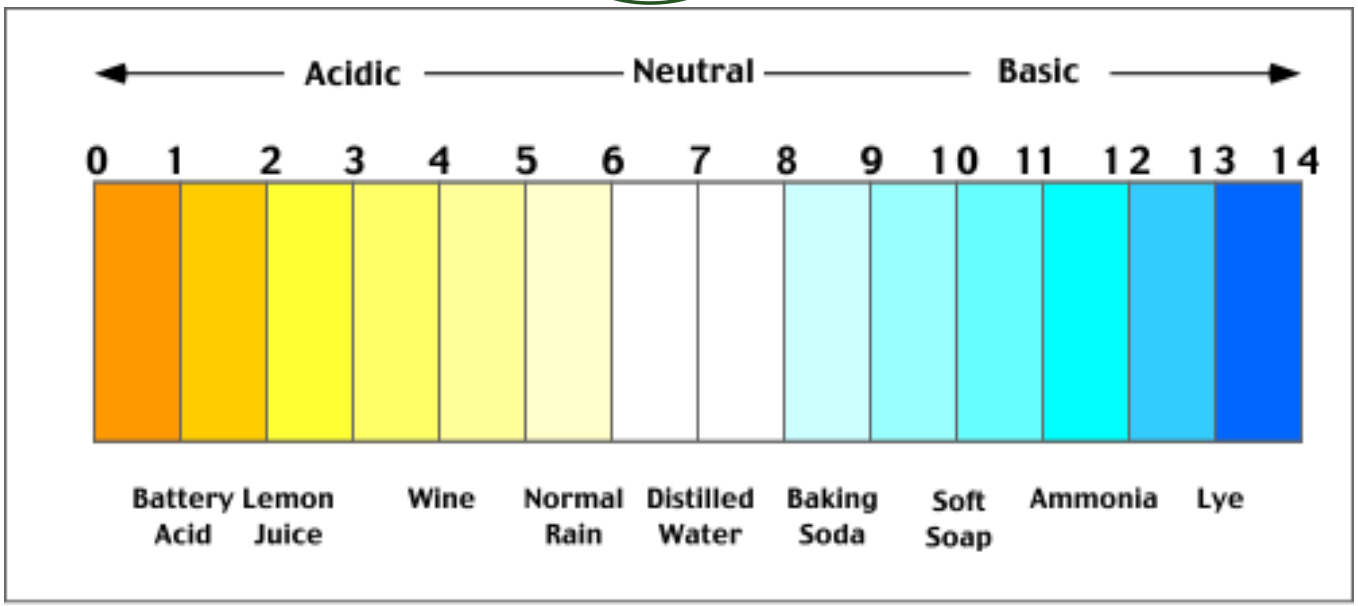
Test Methods: *1:1 soil water pH, Mehlich 3 (ICP), Mehlich Buffer pH, Summation of Cations*

4793

Photo courtesy Katy McCune

Sara Fitzsimmons

Soil pH



- How to increase?
  - Lime
- How to decrease?
  - Sulfur

Soil Test!

N : P : K

- N : P : K
  - N = Nitrogen
    - Important for vegetative growth
  - P = Phosphorous
    - Important for root growth and flower development
  - K = Potassium
    - Important for flower and fruit development as well as in assisting in disease resistance.

Chestnut Response to Nitrogen Input

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Cation Exchange Capacity (CEC)

- the capacity of a soil for ion exchange of cations between the soil and the soil solution
- Clay and other organic matter (OM) are negatively charged
  - Will loosely attract cations – positively charged ions
  - Measuring CEC provides an indication of soil fertility
- Increase clay/OM : increase CEC
  - Sandy or low clay soils = low fertility?
  - What do chestnuts like?

Cation Exchange Capacity (CEC)

- Ca : Mg : K
  - Ca: 1 – 5%
  - Mg: 10 – 15%
  - K: 60 – 80%

- Will be given in % Saturation
  - If don't add up to 100, the rest is hydrogen.
  - Decrease hydrogen, increase usable nutrients

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SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
Soil pH				
Phosphate	(P_2O_5)			
Potash	(K_2O)			
Magnesium	(MgO)			
Calcium	(CaO)			

RECOMMENDATIONS FOR: *Landscape, To Plant, pH 5.5*

Limestone, Calcium And Magnesium Recommendations

Apply the following quantities of limestone, epsom salts and/or gypsum to the soil to correct soil pH, calcium and magnesium levels.

Calcitic Limestone: NONE
(0-3 % Mg)

Magnesium: NONE

Gypsum ($CaSO_4$): NONE

Nitrogen, Phosphate And Potash Recommendations

Apply 1.5 lbs per 100 square feet of 5-10-5 and 1.0 lbs per 100 square feet of 0-46-0.

MESSAGES

The above lime and fertilizer recommendations are for this soil sample and this season only. Nitrogen, phosphate and potash recommendations are for fertilizers containing specific ratios of nitrogen (N), phophate (P_2O_5) and potash (K_2O). As an example 5-10-10 contains 5 % N, 10 % P_2O_5, and 10 % K_2O. If fertilizers with the ratio(s) shown are not available, contact your local garden center or fertilizer supplier for the appropriate substitution.

pH is high. Use sulfur (see Table on back of report) to lower pH to optimum level of 5.5

LABORATORY RESULTS:

[1]pH	[2]P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Optional Tests:		
		[3]Acidity	[3]K	[3]Mg	[3]Ca	[4]CEC	K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
7.0	48	0.0	0.4	1.9	7.4	9.8	4.5	19.8	75.7			

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), Mehlich Buffer pH, [3]Summation of Cations

7376

Home Gardens-1

SOIL NUTRIENT LEVELS		Below Optimum	Optimum	Above Optimum
Soil pH				
Phosphate	(P_2O_5)			
Potash	(K_2O)			
Magnesium	(MgO)			
Calcium(CaO)				

RECOMMENDATIONS FOR: *Landscape, To Plant, pH 5.5*

Limestone, Calcium And Magnesium Recommendations

Apply the following quantities of limestone, epsom salts and/or gypsum to the soil to correct soil pH, calcium and magnesium levels.

Calcitic Limestone: NONE
(0-3 % Mg)

Magnesium: NONE

Gypsum ($CaSO_4$): 3 lb/100 sq feet

Nitrogen, Phosphate And Potash Recommendations

Apply 0.5 lbs per 100 square feet of UREA.

MESSAGES

The above lime and fertilizer recommendations are for this soil sample and this season only. Nitrogen, phosphate and potash recommendations are for fertilizers containing specific ratios of nitrogen (N), phophate (P_2O_5) and potash (K_2O). As an example 5-10-10 contains 5 % N, 10 % P_2O_5, and 10 % K_2O. If fertilizers with the ratio(s) shown are not available, contact your local garden center or fertilizer supplier for the appropriate substitution.

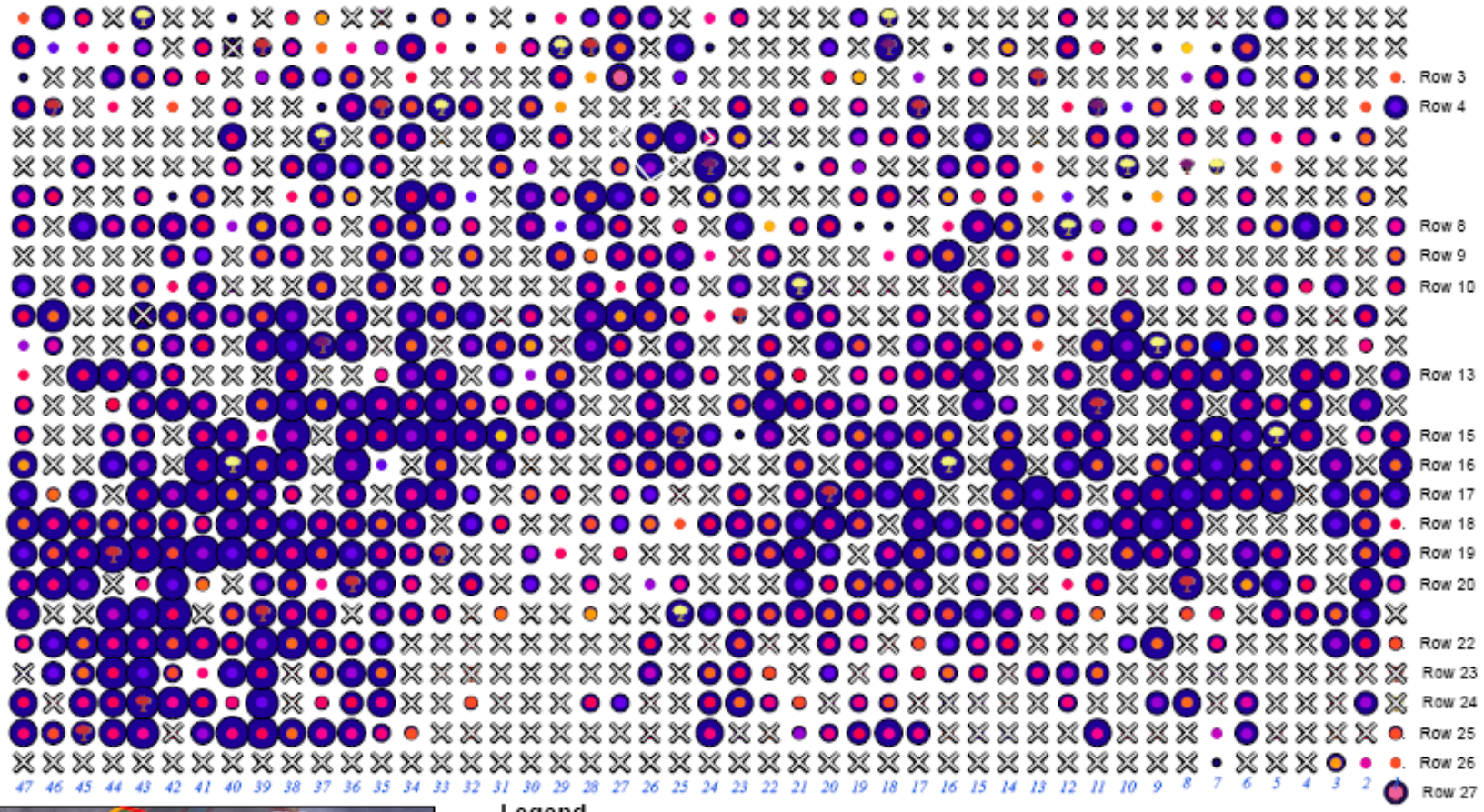
LABORATORY RESULTS:

[1]pH	[1]P lb/A	Exchangeable Cations (meq/100g)					% Saturation of the CEC			Optional Tests:		
		[2]Acidity	[3]K	[3]Mg	[3]Ca	[4]CEC	K	Mg	Ca	Organic Matter %	Nitrate-N ppm	Soluble salts mmhos/cm
5.7	302	5.7	1.2	1.2	3.2	11.2	10.4	10.3	28.3			

Test Methods: [1]1:1 soil:water pH, [2]Mehlich 3 (ICP), [3]Mehlich Buffer pH, [4]Summation of Cations

Home Garden-1

Kuhns Clapper BC3 Orchard Map



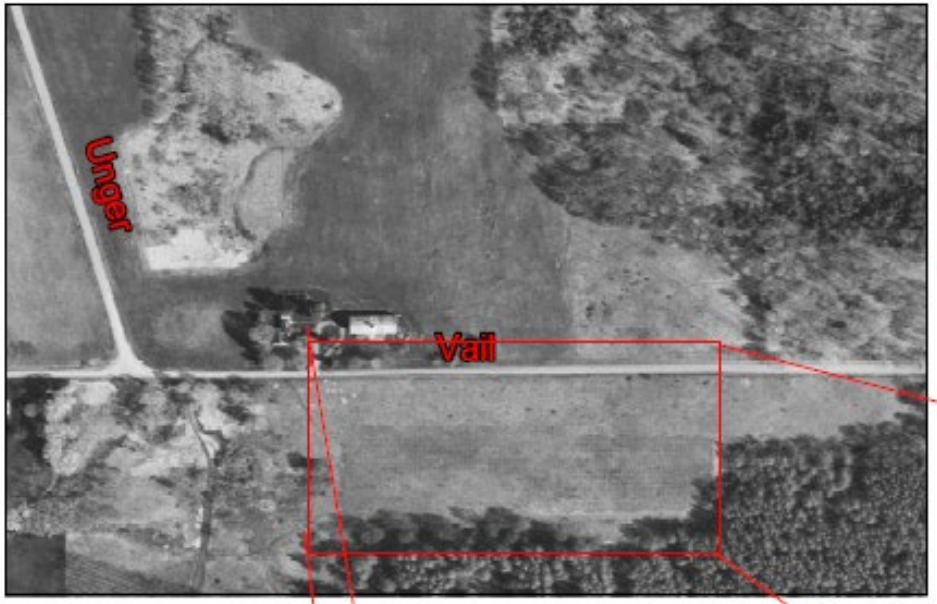
Legend

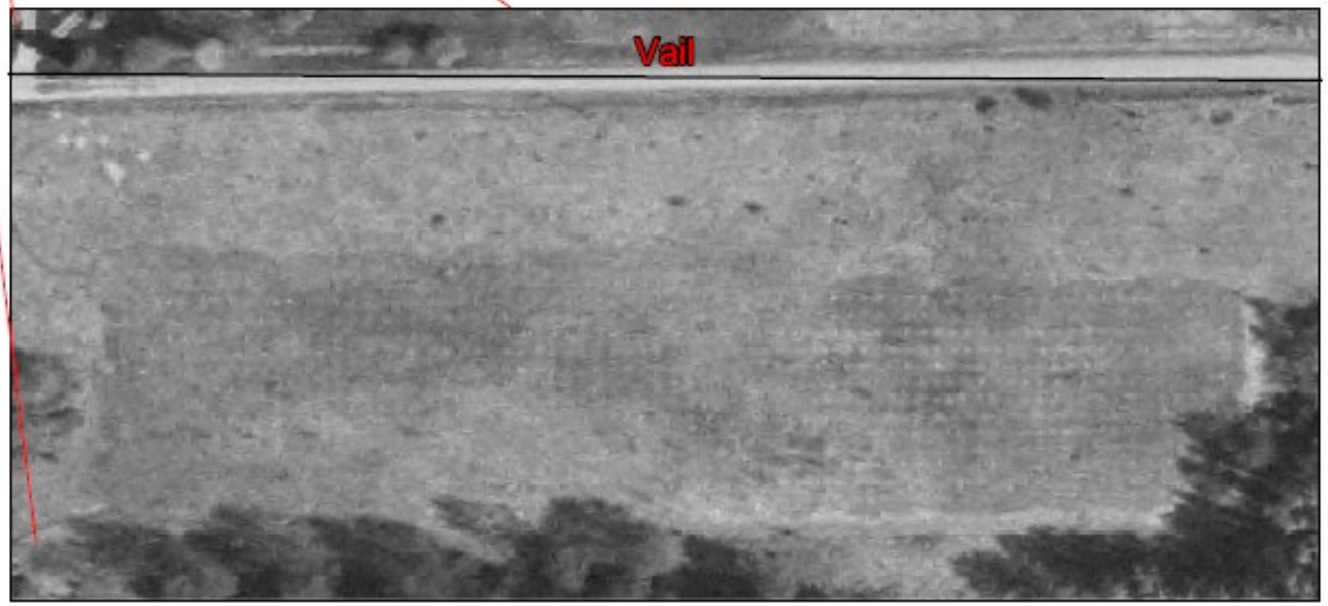
06_HT

- 0.00 - 2.50
- 2.51 - 5.00
- 5.01 - 7.50
- 7.51 - 10.00
- 10.01 - 12.50
- 12.51 - 15.00
- 15.01 - 17.50

Kuhns BC3 Orchard
Planted 2000; As Seedlings; No Replants
Soil Type: Andover
Inoculated 6/23/2006

Aerial Photographs of William W. White Plantation Zoar Valley, NY



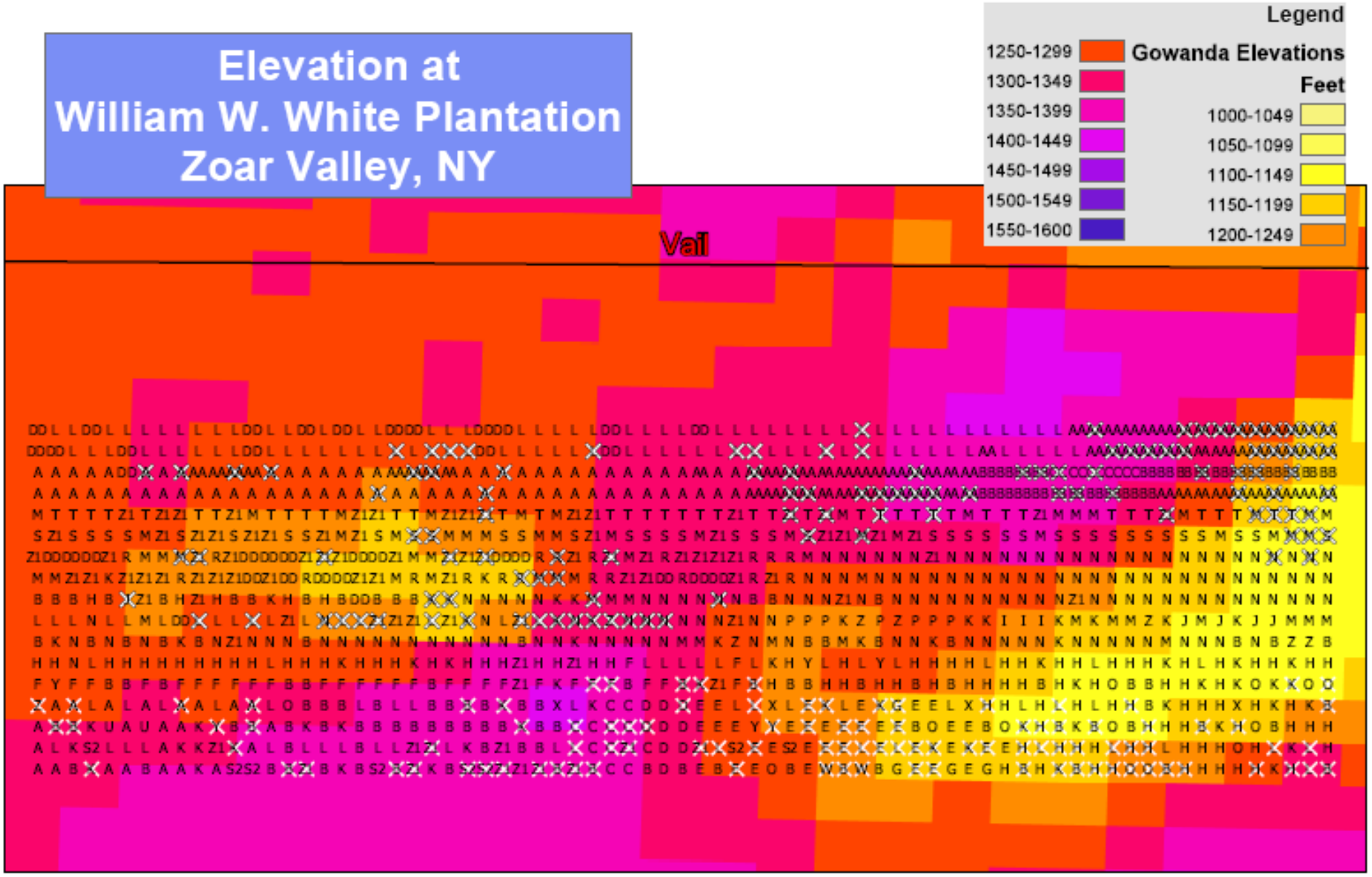


AP I. Aerial photos of William
'. White Plantation taken in
)02 after 11 years of
anting chestnuts at the site.
ıe positions where chestnuts
ave been planted
ay be seen in the closeup.

N
W E
S

10/24/04, SFF

Elevation at William W. White Plantation Zoar Valley, NY

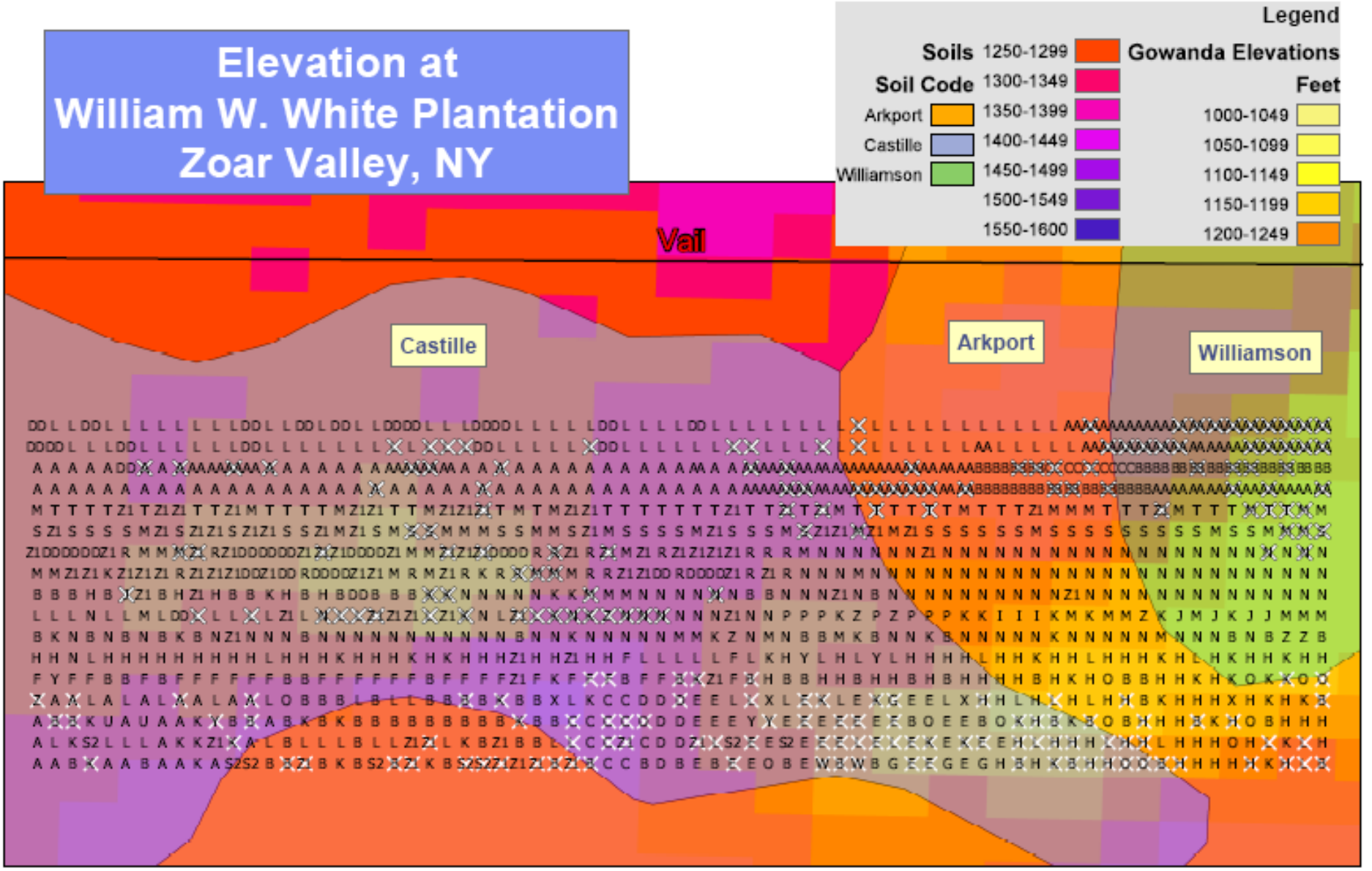


MAP II. Elevation, in feet, of William W. White Plantation in Zoar Valley, NY. Of particular particular interest is the low lying area in the middle left of the planting (indicated by yellow and orange). Within this are appears to be a wet area where growth is low and extensive replanting has occured. Tree locations are identified by tree type code which relates back to mother tree (Those values may be found in Table 5). Dead positions as of September 2004 are symbolized by a white "X".

N
W E
S

10/24/04, SFF

Elevation at William W. White Plantation Zoar Valley, NY

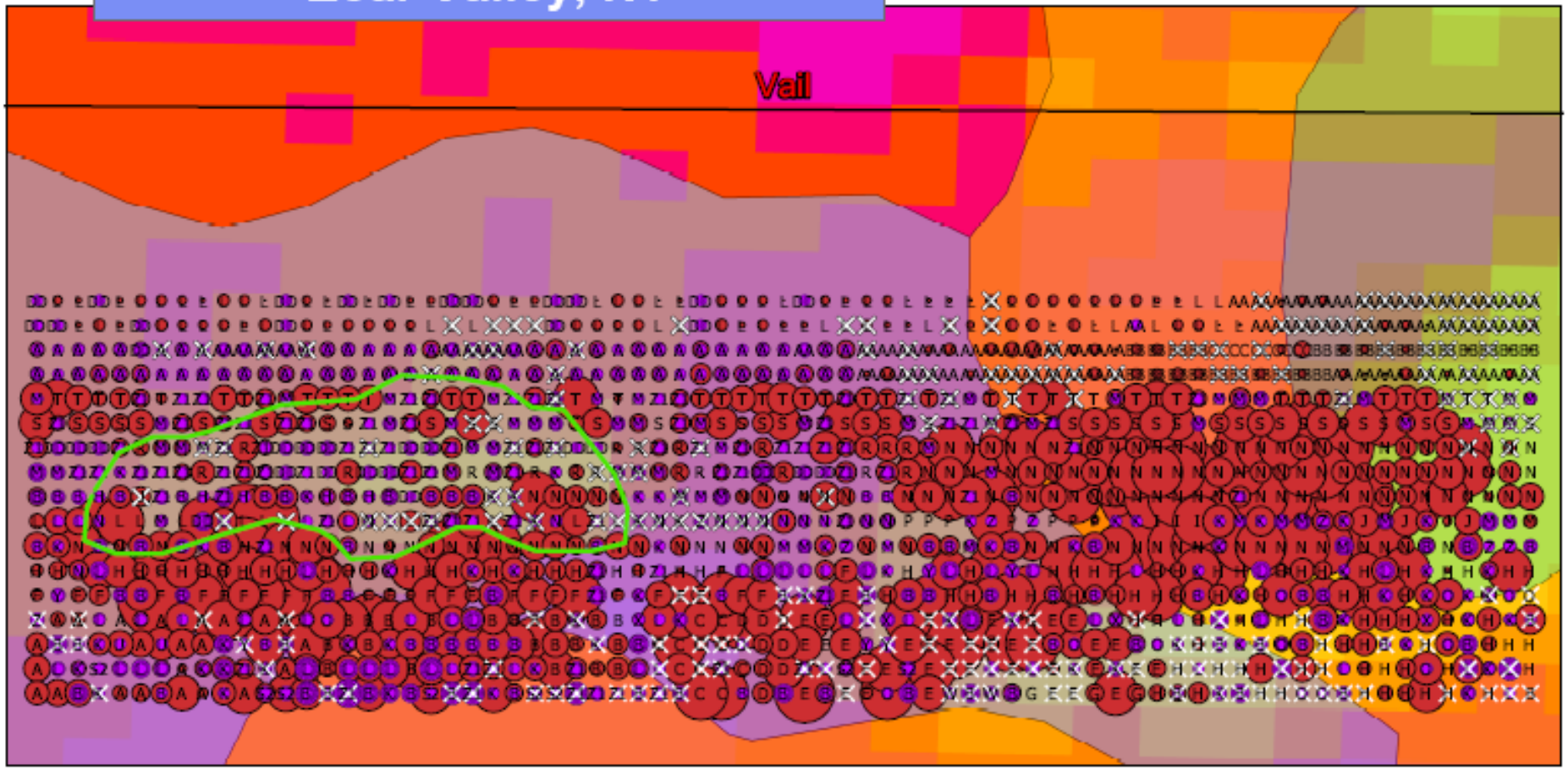


MAP III. Soils and Elevation of William W. White Plantation, Zoar Valley, NY. There are three different soil types found at the chestnt orchard, Arkport, Castille, and Williamson.

N
W E
S

10/24/04, SFF

Replacements and "Wetland" of William W. White Plantation Zoar Valley, NY



MAP IV. Location of "wetland" is in green, positioned by some observation at site, soil type, and elevation. Replaced positions are symbolized by graduated purple circles -- the larger the circle, the more times that position has been placed. The maximum amount of times a position has been replaced at this orchard is five. Heights are shown by graduated red circles -- the larger the circle, the taller the tree

10/24/04, SFF

Zoar / WWW GCO, NY

THE AMERICAN CHESTNUT FOUNDATION®

References

- Chestnut Growers Website
  - https://ecosystems.psu.edu/research/chestnut
- Penn State Soil Analysis
  - https://agsci.psu.edu/aasl/soil-testing
- Fertilizing Woody Ornamentals, Kuhns 1987
  - Will be posted on Chestnut Chat Site
- NRCS Web Soil Survey
  - http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm
- Official Soil Series Descriptions (OSD)
  - https://soilseries.sc.egov.usda.gov/osdname.aspx

Site Preparation

Planning For Planting

THE AMERICAN CHESTNUT FOUNDATION®

Site Selection

THE AMERICAN CHESTNUT FOUNDATION®

Field

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

Forested

- Light availability dependent on level of clearing
- Often little understory vegetation to manage
- Beneficial mycorrhizae present
- Interaction with forest

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.

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Planting

Recommendations for Installing and Managing Your Chestnut Planting

THE AMERICAN CHESTNUT FOUNDATION®

Soil Preparation

- Field sites:
  - Big equipment: plowing, disking or use of a soil auger/post hole digger
  - 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

- Sterile, weed-free planting mix
  - Reduces competition
  - Provides more balanced moisture
- Recommended planting mixes
  - Well-drained, acidic
  - 1/3 each peat, perlite and vermiculite
  - 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

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

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

http://en.wikipedia.org/wiki/File:Tpost1.jpg

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

- 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

- 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#

- Map
  - Mo
  - Mu
- Map
  - Pre
    - pla
      - V
  - Pos
    - enc
      - M

Wigwam Brook Orchard
John Baker and Tom Traver
Row 1 starts in the South-East corner, along the beaver dam/wetland

N

Blue Bird Box

Position	Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	Row 9	Row 10	Row 11	Row 12	Row 13	Position
38	CT-WL087 x HE367 BC4	VCE x OP Ch Chinese	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding								38
37	VT-CC006 x op Am American Seeding (888)	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	VCE x OP Ch Chinese	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding							Blue Bird Box	37
36	CT-WL087 x HE367 BC4	CT-WA088 x HE155 BC4	Hu97-13 x Palmyra F1	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								36
35	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4								35
34	CT-WL087 x HE367 BC4 (888)	Hu97-13 x Palmyra F1	VCE x OP Ch Chinese	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4							Blue Bird Box	34
33	VCE x OP Ch Chinese	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding	Hu97-13 x Palmyra F1	CT-WL087 x HE367 BC4								33
32	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								32
31	CT-WA088 x HE155 BC4	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								31
30	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4								30
29	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WA088 x HE155 BC4	Hu97-13 x Palmyra F1	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								29
28	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								28
27	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4								27
26	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	Hu97-13 x Palmyra F1	CT-WL087 x HE367 BC4	VCE x OP Ch Chinese	CT-WL087 x HE367 BC4								26
25	VT-CC006 x op Am American Seeding	VCE x OP Ch Chinese	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								25
24	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding								24
23	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	Hu97-13 x Palmyra F1	CT-WL087 x HE367 BC4								23
22	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								22
21	VCE x OP Ch Chinese	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4	VCE x OP Ch Chinese	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								21
20	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WA088 x HE155 BC4	VT-CC006 x op Am American Seeding								20
19	CT-WL087 x HE367 BC4	Hu97-13 x Palmyra F1	VCE x OP Ch Chinese	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4								19
18	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								18
17	VT-CC006 x op Am American Seeding (888)	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	Hu97-13 x Palmyra F1	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4							Blue Bird Box	17
16	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4								16
15	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								15
14	CT-WL087 x HE367 BC4 (888)	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4	VCE x OP Ch Chinese	Hu97-13 x Palmyra F1							Blue Bird Box	14
13	CT-WL087 x HE367 BC4	VCE x OP Ch Chinese	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								13
12	Hu97-13 x Palmyra F1	CT-WL087 x HE367 BC4	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								12
11	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding								11
10	CT-WL087 x HE367 BC4	Hu97-13 x Palmyra F1	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								10
9	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding	Hu97-13 x Palmyra F1	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4	VCE x OP Ch Chinese								9
8	VCE x OP Ch Chinese	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4								8
7	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								7
6	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	VCE x OP Ch Chinese	Hu97-13 x Palmyra F1								6
5	Hu97-13 x Palmyra F1	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	Hu97-13 x Palmyra F1	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4								5
4	CT-WL087 x HE367 BC4	VCE x OP Ch Chinese	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								4
3	VT-CC006 x op Am American Seeding	CT-WA088 x HE155 BC4	VT-CC006 x op Am American Seeding	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4								3
2	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	VCE x OP Ch Chinese	Hu97-13 x Palmyra F1	VT-CC006 x op Am American Seeding								2
1	VT-CC006 x op Am American Seeding	Hu97-13 x Palmyra F1	CT-WA088 x HE155 BC4	CT-WL087 x HE367 BC4	CT-WL087 x HE367 BC4	CT-WA088 x HE155 BC4								1
Position	Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	Row 9	Row 10	Row 11	Row 12	Row 13	Position

N

Beaver Dam/Wetland Area

THE AMERICAN CHESTNUT FOUNDATION®

Tracking the Planting

- Beyond mapping, there is a need to track the planting over time
  - Yearly mortality, growth, performance, additional measures

- Work with Regional Science Coordinator to develop a format and set expectations
  - Install and track in dentataBase

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!®

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

Questions?

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