Vineyard Site Preparation in Maryland

Ben Beale
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St. Mary’s Extension Office
Some Slides Adapted From:
Mark Chien
Tony Wolfe
Joe Fiola

UM College Park • UM Eastern Shore
Steps to Vineyard Establishment

• Condition land for long term growth
• Eliminate or reduce pest-
  • Perennial weeds
  • Nematodes
• Adjust fertility level
  • Lime
  • Nutrients
• Prepare site for planting
• Vineyard layout
• Setting up the trellis system
• Training first year vines
From Here
Nematodes
Nematode Damage Symptoms
Sampling Procedure

• Sample when nematodes are active. Best time is in the fall. Do not sample once soil temperatures drop below 50F
• Take a sample the same way you would a soil sample. 15-10 cores at the 6-8 inch depth.
• Remember that nematodes are living. Treat them like you would want to be treated. No chills or sunburns please!
Nematode Assay Labs

• The Delaware Plant Diagnostic Clinic has agreed to accept Maryland Extension nematode samples.

  Plant Diagnostic Clinic
  151 Townsend Hall
  University of Delaware
  Newark, DE 19716-2170
  Phone: 302-831-1390
  E-mail - bobmul@udel.edu
  Fax: 302-831-0605
  Web site:
  http://ag.udel.edu/Extension/pdc/index.htm (for sample submission instructions and forms)

• The Virginia Tech Nematode Assay laboratory has agreed to accept Maryland Extension nematode samples:

  Nematode Assay Laboratory
  115 Price Hall
  Virginia Tech
  Blacksburg, VA 24061-0331
  Phone: (540)231-4650
  Fax: (540)231-7477
  Email: jon@vt.edu
  Web site:
  http://www.ppws.vt.edu/~clinic/nematode.php (for sample submission instructions and forms)
Soil Sampling Procedures

1. **Define the Management Units.**
   - A management area is an area that can and will be managed separately from any other.
   - Areas with differing soil types, past cropping histories, or production potentials should be managed separately.
   - Example: If one portion of the garden received compost last year, and another portion did not, test the two areas separately.
Soil Sampling Procedures for Nutrient Management

1. Define the management units. A management area is an area that can and will be managed separately from any other. If different field areas have different soil types, past cropping histories, or different production potentials, these areas should be sampled separately and managed separately (See Figure 1). If it is impossible for a farmer to manage different areas separately, they should be treated as one management unit.

2. Sample the management units. Each unit should be sampled separately. Follow these steps for each management unit.
   - Collect 15 to 20 samples in a clean plastic bucket.
   - Take samples from throughout the entire area of the unit.
   - Follow a sampling pattern similar to that in Figure 2.
   - Avoid sampling unusual areas such as windbreaks, old fence lines, wet areas or areas near lime rock roads.
   - Scrape away any surface residues.
   - Sample to the correct depth (See Figure 3).
     - 2 inches for monitoring pH on no till cropland and pasture
     - 8 inches for fertility samples on cropland and pasture
     - 12 inches for PSNT

3. Mix the sample. Thorough mixing is essential.
   - Sieve the samples through the sieve into a receiving box. If the sample is hard or strongly aggregated, use a mallet to help break up soil aggregates.
   - Transfer the soil to the ODJOB mixer. Roll the mixer at least 50 revolutions. Spread the sample out.
   - Return the soil to the receiving box. Spread the sample out.
Soil Sampling Procedures

- Collect 15 to 20 samples with a soil probe and place in a clean bucket or container.
- Take samples from throughout the entire area of the unit. (Figure 2).
- Avoid sampling unusual areas. (Windbreaks, fence lines, wet areas.)
- Scrape away any surface residues.
- Take samples at the proper 6 inch depth for established yards and gardens, and 8 inches for cropland fields.
Soil Sampling Procedures

3. Mix the sample.
   - Thorough mixing is essential.
   - If the sample is hard or strongly aggregated, break it up.
   - Transfer the soil to a bucket and mix it at least 50 times.
   - Spread the soil out, take 5 different scoops, totaling about 1 pint.
   - Place into soil sample bag, unless you need to..........

4. Dry the sample.
   - Spread the sample out in a warm place overnight to air dry it.
   - Newspaper or paper plate is fine.
   - Do not heat the soil.
Soil Sampling Procedures for Nutrient Management

5. **Label the sample bag and fill it with the soil.**

6. **Fill out the information sheet**
   - There are numerous labs that test soil for nutrients.
   - University of Maryland no longer tests soil.
   - Labs are capable of testing for Macro and Micronutrients. Be specific when selecting which nutrients you want to be tested.
<table>
<thead>
<tr>
<th><strong>Lab</strong></th>
<th><strong>Cost</strong></th>
<th><strong>Analyses</strong></th>
<th><strong>Comments</strong></th>
<th><strong>Degree P Saturation (DPS) or Al and Fe reported?</strong></th>
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</table>
| AgroLab, Inc.  
1009 Mattlind Way  
Milford, DE 19963  
Phone: 302-265-2734  
www.agrolab.us | $10.00  
Volume discounts available | **BSF**  
pH, buffer pH, OM, P, K, Ca, Mg, CEC, percent base saturation of cations, University of DE Phosphorus Saturation Ratio | See website for more analyses. | Yes. “University of D P Sat Ratio” is the same as DPS and is part of their standard soil test. |
| Brookside Laboratories, Inc.  
308 South Main Street  
New Knoxville, OH 45871  
Phone: 419-753-2448  
www.blinc.com | Price determined by consultant | **SOO1**  
pH, OM, Mehlich-3 P, Mn, Zn, B, Cu, Fe, Al, CEC, percent base saturation of cations, S, Bray II P | Brookside does not provide recs. Consultants develop the recs. Brookside prefers to receive samples from their consultants only. | Al and Fe are routinely reported for option SOO1.  
NuMan Pro 4.0 can calculate DPS from this information. |
| Pennsylvania Agricultural Analytical Services  
Penn State University  
University Park, PA 16802  
Phone: 814-863-0841  
www.aasl.psu.edu | $9.00  
$5.00  
$6.00 | **Standard Soil Test**  
pH, Mehlich lime requirement, P, K, Ca, Mg, Zn, Cu, S  
**OM**  
**Al & Fe** - required for high P soils to determine DPS for UM-PMT | See website for more analyses. | Al and Fe can be requested for an additional $6 per sample.  
NuMan Pro 4.0 can calculate DPS when soil test includes Mehlich-3 Fe & Al. |
| Spectrum Analytic, Inc.  
PO Box 639  
1087 Jamison Road NW  
Washington Court House, OH 43160  
Phone: 800-321-1562  
www.spectrumanalytic.com | $8.00  
$12.00 | **S1**  
pH, buffer pH, OM, P, K, Ca, Mg, CEC, percent base saturation of cations  
**S2**  
Basic package plus any 3 of the following - B, Cu, Fe, Mn, S, Zn | Dealer price is available to UME or other consultants. Soil info form would have to indicate “UME” under “company,” and the sample must be sent by the UME office. Report comes back to UME, not the grower. Checks from individual growers are OK. | Will report DPS for UM-PMT for no extra charge with S1 or S2 options. |
| University of Delaware Soil Testing Program  
152 Townsend Hall  
531 S. College Avenue  
Newark, DE 19717-1303  
Phone: 302-831-1392  
www.ag.udel.edu/dstp | $12.00 | **B1-Commercial Agriculture Soil**  
pH, lime requirement, OM, P, K, Ca, Mg, Mn, Zn, Cu, Fe, S, B, % P Saturation | | Percent P Saturation is the same as DPS and is included in B1 Routine Analysis |
# Soil Analysis Report

**Grower Code:**

**Received:** 4/4/2007  
**Processed:** 4/6/2007  
**Field ID:**

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<th>K</th>
<th>Mg</th>
<th>Ca</th>
<th>pH</th>
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## Soil Fertility Recommendations (lbs./Acre)

* = Maintenance Recommendation

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<thead>
<tr>
<th>Sample ID</th>
<th>Crop</th>
<th>Yield</th>
<th>Lime</th>
<th>Gypsum</th>
<th>N</th>
<th>P</th>
<th>K</th>
<th>Mg</th>
<th>S</th>
<th>B</th>
<th>Zn</th>
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<tr>
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Comments:

L=Low  M=Medium  A=Adequate  H=High  VH=Very High
<table>
<thead>
<tr>
<th>Tract No. / Farm Name</th>
<th>Field No.</th>
<th>Crops &amp; Note Numbers</th>
<th>Area</th>
<th>Yield Goal</th>
<th>Plant Nutrients Needed N-P2O5-K2O</th>
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<tbody>
<tr>
<td>Vineyard</td>
<td>Grape Example 2014 [*]</td>
<td>Grapes (all but Concord), pre-plant, loams, silt loams, and clay textures 7387</td>
<td>0.0 Acres</td>
<td>0.0</td>
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<table>
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<th>Nitrogen Credits</th>
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<td>Leg.</td>
<td>Man.</td>
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<td>0 #/A</td>
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<table>
<thead>
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<th>Fertilizer To Be Applied</th>
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<tbody>
<tr>
<td>brslc&amp;inc, pre-plant</td>
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</table>
Lime requirement (tons/acre) to effect a change in pH

<table>
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<tr>
<th>Soil pH</th>
<th>Sandy</th>
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<td>3.25</td>
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<tr>
<td>6.5</td>
<td>1.25</td>
<td>1.5</td>
<td>2.0</td>
</tr>
</tbody>
</table>
PREPARING THE FIELD

- Vines, Trees and Brush
- Rocks
- Old Fencing
- Old Cars and Refrigerators
- Vineyard Perimeter
- Burning Fields
Common Site Preparation Methods

1. Clean-till or cultivated surface

2. Planting through an established sod

3. Planting through existing crop residue

4. Bio-renovation program
Clean-till Cultivated Surface
- Useful for incorporating lime on low pH soils
- Useful for conditioning land with compaction, hard-pan or uneven terrain

- Subsoiling
- Plowing
- Discing
- Cultivating
- Springtooth Harrowing
- Dragging
Planting through an established sod

- Useful on sites with good fertility
- Enables planting with little soil disturbance
- The row strip is killed 3-4 weeks before planting with an herbicide such as Round-Up.
Planting through existing crop residue

- Useful on sites with good fertility
- The row strip is killed 3-4 weeks before planting with an herbicide such as Round-Up.
- Cover is planted after establishment
- Works well following a crop such as soybeans.
Basics of Pest Management

Bio-Renovation Program

- Increase organic matter
  - Nutrition
    - Nitrogen and nutrient holding capacity
  - Herbicide efficacy
- Reduction/elimination of residual herbicides
  - Adsorption of herbicides
- Reduction of plant pathogenic nematodes
  - Direct competition
  - Vector of virus diseases
- Control perennial weeds
Basics of Pest Management

Bio-Renovation Steps

Mid-April to Early-May - Plant SUDEX (sudan grass x sorghum hybrid)
Mid-late July - Mow down sudex
Mid-August - Mow and incorporate sudex
Late-August - Plant ‘Dwarf Essex’ rapeseed
Mid-Late April - Mow and immediately incorporate rapeseed crop
Early May - Plant ‘Dwarf Essex’ rapeseed
Mid-August - Mow and immediately incorporate rapeseed crop
September - Plant K31 Tall Fesque cover

Source: Dr. Paul Steiner, Extension Fruit Pathologist, University of Maryland
Vineyard Floor Management

Bio-Renovation Steps

Before mid-September – establish turf

- Hard fescue
  - More difficult and expensive to establish
  - Reduced mowing
  - Less intrusive and competitive

- Tall fescue – K31?
  - Easier and less expensive to establish
  - More mowing
  - Intrusive and competitive
  - Suppresses nematodes
    - Endophyte infested
Planting Preparation

• Field Layout
• Planting methods
  • Dug Hole
  • Mechanical Planting
• Trellis System
Field Layout
- Row Orientation
- Topography
- Row Length
- Row Spacing
- In-row plant spacing
Row Orientation

• The preferred row orientation is a 10 degree offset from the North/South orientation. The offset would be from northeast toward southwest direction. The N/S orientation maximizes sunlight interception on each side of the vine.

• Row orientation will also depend upon topography and erosion potential. A row layout perpendicular to the slope takes precedence over light interception.
Row Length and Spacing

• Longer rows are more efficient to spray and require less end post assemblies. Row length should be kept to a maximum of 600 feet without a break.

• Rows should be straight and allow 20-30 feet on each end (headlands) for turning equipment.

• Row Spacing will depend upon equipment, canopy height and intensity of land-use. Standard width in Maryland is 10 feet. Width’s less than 8 feet can lead to shading.
In- Row Vine Spacing

• In-row spacing varies from 2-10 feet.
• The “standard” is 6 feet between vines giving a population of 726 vines per acre (6x10 spacing).
• Wider in-row vine spacing may be warranted for very vigorous sites and vigorous variety/clone selections.
• Narrow in-row vine spacing (high-density planting) is best suited for intensively managed sites with lower vigor.
Layout and Marking the Field

• Hire a Professional Surveyor or Do It Yourself
• Transit, Distance Wheel and Marking Flags
• Marking Lines
• Popsicle Sticks
• A Good Eye
• A Over Hill, Over Dale
The Way to Straight Rows
Laser Planting means straight and evenly spaced rows.
Seeding Tall Fescue
Trellis Construction

• Use Only Highest Quality Materials Available
• Wire Source – packed and wound under tension
• Posts – Line and End: deep enough, tall enough, pound in, do not auger in
• Right Equipment for Installation
• Install before or after plants? Irrigation? Drain tile?
• Wire Positions
• End Assemblies
Figure 11-22  Screw Anchor Deadman Assembly

(Guyot Training, 9 ft. Line Posts)
Standard Vertical Shoot Positioning
Look for Good Examples and COPY THEM!
Like Cape May Vineyards in southern New Jersey
Not all stakes are created equal
Bellview Vineyards

Cape May Vineyards
End Assemblies – nothing fancy but very strong.
Irrigation

- Benefits
- Water
- Power
- Cost
- Type of System
- Problems
Drip Tape laid on the ground beside vines.
Orchard tubing drip tape attached to bottom trellis wire.
Guidelines of First Year Pruning

• Establish 2 primary shoots that will eventually form the trunks.
• Shoots should be as close to the graft union as possible.
• Select shoots on opposite sides and in line with the row if possible.
• Make sure old wood on branches is at least pencil thickness
Canopy Management Basics

Early Vine Training

- Straight up!
- Keep graft union above ground
- Keep off ground
- Tie to stake
- Trim off suckers and clusters
- Eliminate weed competition
Canopy Management Basics

Grow tubes
Canopy Management Basics

Grow Tubes

Benefits
• Animal damage
• Moisture
• Herbicide
• Growth rate
• Replaces stake
• Physical protection

Limitations
• Cost
• Growth rate
  • Trunk “twist”
• Promotes single trunk
• Diseases, insects
• Removal
• Winter damage
The use of milk cartons is a good, low cost alternative.

- It can disintegrate by the end of the season
- Larger space allows for less humidity/moisture
- >1 trunk
Questions?

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