Compost Use in the Vineyard

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Today's Talk

- Reasons to use or not use compost
- Define compost and various types
- Compost quality factors
- Determining rates and cost of application
- Methods and equipment needs
- Application timing
- Best uses of compost in Virginia Vineyards

Suggested Uses for Compost

- Add nutrients to soil (yes)
- Add organic matter (OM) to soil (yes)
- Increase soil microbial activity (maybe)
- Suppress weeds? (not really)
- Control disease? (not consistent)
- Foliar spray/drip – compost tea (nutrients)
- What about improving soil structure?

Will compost benefit your vineyard?

- IF:
- Grapevines have high vigor, canopy already divided, high OM (>5%)
- Petiole analysis shows sufficient N, and only one or two limiting nutrients
- ……then probably not.
- IF:
- Petiole analyses show need for N and other macro-nutrients
- Areas in vineyard show low vigor, drought stress, leaf yellowing
- Areas in vineyard have compacted soil
- ……then most likely yes.

What is compost?

Compost is:

- Well - decomposed, stable OM & nutrients
- Produced in pile or windrow over many months (6-10mo)
- Sustained temp of 130-140°F for at least 1 week

Compost is not:

- Raw manure or animal bedding
- Fresh or aged grape pomace
- Mulch, woodchips, straw, sawdust etc.

Types of Compost

1. Manure Blend:
   - ✓ Straw 60%
   - ✓ Cow Manure 39%
   - ✓ Gypsum 1%
   - ➢ High N,P,K
   - ➢ High microbial activ.

2. Municipal-Yard:
   - ✓ Leaves 60%
   - ✓ Yard brush 20%
   - ✓ Grass clips 20%
   - ➢ High Ca

Types of Compost

1. Grape Pomace:
   - ✓ Pomace 50%
   - ✓ Manure 24%
   - ✓ Straw 25%
   - ✓ Lime 1%
   - ➢ High K (stems)

2. Custom Blend:
   - ✓ Leaves 20%
   - ✓ Pomace 40%
   - ✓ Grass Clips 20%
   - ✓ Turkey Litter 15%
   - ✓ Wood Shavings 5%

Compost Nutrient Considerations

- Nitrogen (N) is greatest factor limiting application rate
  - 30% of total N available to vines
    - 15% in year 1 and additional 15% over years 4-5
  - Manure compost – greater N
- Potassium (K) – most available in year 1
    - 85 – 100% in year 1
  - Mg competition
  - An issue in VA?
- Soluble Salts (Na) may also limit application rates

Compost Quality

- Odor should be neutral to earthy (no stink)
- Uniformly decomposed
- Viable weed seeds?
- Suggested minimum analyses:
  - Carbon:Nitrogen ratio (C:N)
  - Macro, Micro-nutrients
    - N,P,K,Mg,B
  - Soluble Salts (Na+)
  - pH

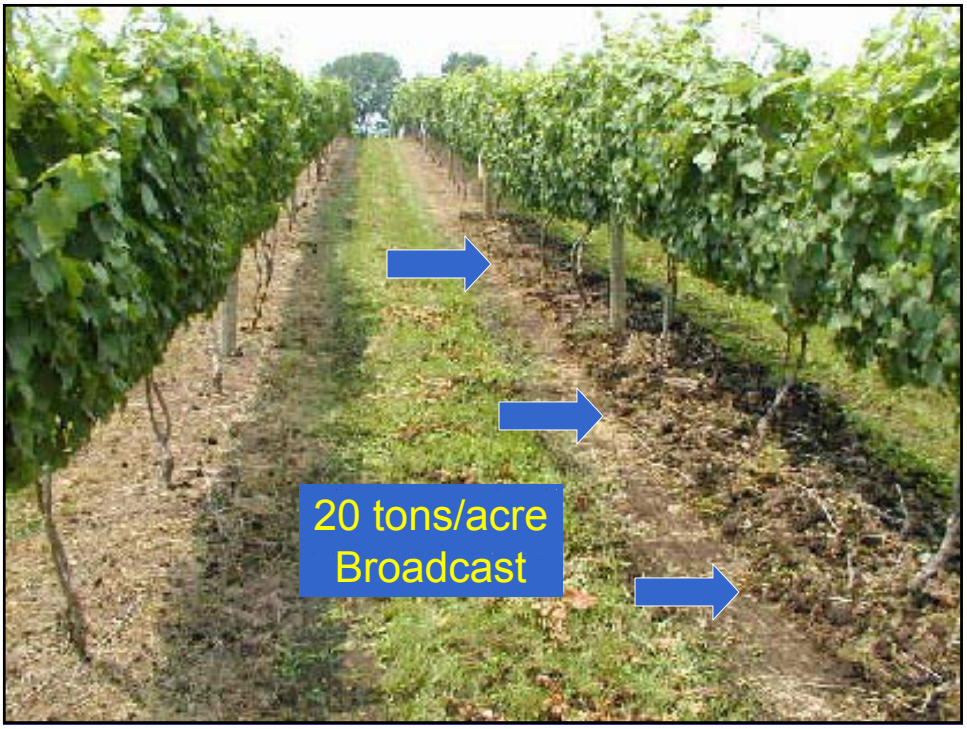
Compost Application Rates

- Required Information:
  - Soil and petiole analyses
  - Compost analysis
  - Visual observation
- Records of compost applied in last 5 years
- Looks may be deceiving….application rates may appear insignificant on soil surface.

Surface Applied Compost

7 tons/acre
Broadcast

20 tons/acre
Broadcast



$ Cost Considerations $

- Compost: $30 - $60/ton*
- Transport: $35 - $200 for each 10 ton load
- Cost for 7 ton/A on 5 acres = 35 tons
  - Lowest case scenario = $1,190
  - Highest case scenario = $2,900
  - Application cost: ?
- Objective: Find closest source with qualities desired

*Estimates for Northern Virginia – based on means of five producers

Equipment Requirements

$9,000 to $13,000

8 to 20 tons

- Millcreek mulch spreader (band)
- Manure spreader (broadcast)
- Hand/shovel application (small blocks)

Banding of Compost

- Custom blending possible
- Utilize on farm wastes
- Additional equipment requirements

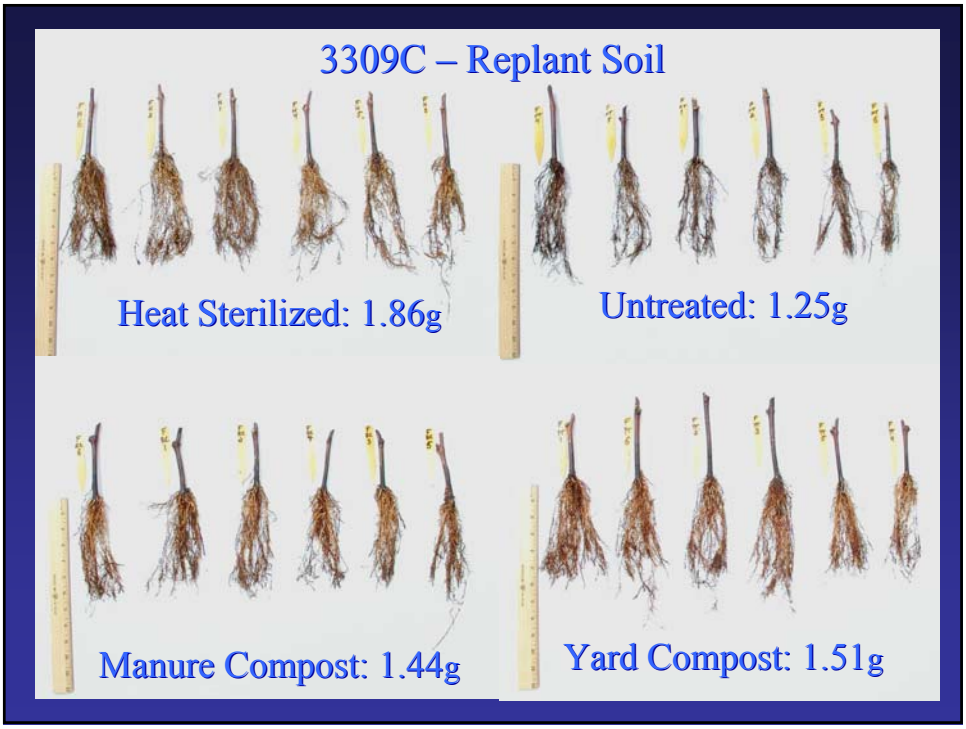
When to Apply Compost

- Best
  - Fall: after harvest before ground freezes
- Acceptable
  - Spring: before bud break until pea-size berry
- Unacceptable
  - Summer: bunch closure until harvest
    - Problems with winter acclimation

Vineyard Replant Situations

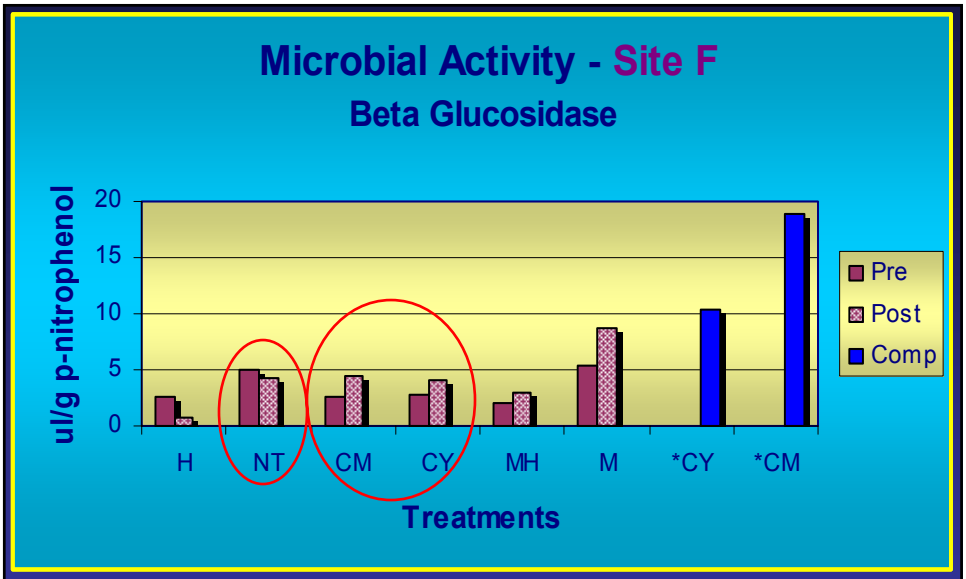
- Compost added to replant soils for pre-plant soil conditioning
- Compost may indirectly improve soil structure by improving aggregate formation (Cass & McGrath, 2004)
- Incorporate compost when adding lime and/or broadcast before planting


Vidal – Replant Soil
Heat Sterilized: 2.92g
Untreated: 0.97g
Manure Compost: 2.13g
Yard Compost: 2.04g


3309C – Replant Soil
Heat Sterilized: 1.86g
Untreated: 1.25g
Manure Compost: 1.44g
Yard Compost: 1.51g

Does compost increase soil microbial activity?

- Additive effect expected
- Results are not always immediate
- Temporary decrease might be observed



Microbial activity of replant soils and compost. Pre = before compost added: Post = after compost added and incubated for 10 days: Comp = compost alone: H = heat sterilized soil: NT = non-treated soil: CM = composted manure: CY = composted yard waste: HM = heated meadow soil (no grapes): M = meadow soil.

Best Use of Compost in VA

- Use for N fertilization, best when other macronutrients are also needed
  - Banded, surface application
- Improve OM content and nutrient buffering of mineralized soils or excavated sites
  - Broadcast, surface application
- Improving soil structure and aggregate stability in highly compacted soils
  - Broadcast, incorporation
- Soil conditioning for replant vineyard sites
  - Broadcast, incorporation or surface application

Additional Resources

ATTRA

- http://attra.ncat.org/attra-pub/farmcompost.html

Penn State Compost Guide

- http://fpath.cas.psu.edu/compostguide.pdf

Cass A., McGrath, M.C. 2004. Compost benefits and quality for viticultural soils. Pages 135-143 in: Proceedings of the Soil Environment and Vine Mineral Nutrition Symposium. Christensen, P.L., Smart, D.R. eds. ASEV Publications, Davis, CA.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