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

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*

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Equipment Requirements

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

$9,000 to $13,000
8 to 20 tons
Banding of Compost

On Farm Composting

- 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
Heat Sterilized: 2.92g
Untreated: 0.97g
Manure Compost: 2.13g
Yard Compost: 2.04g

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 - Site F
Beta Glucosidase

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

Penn State Compost Guide
- [http://fpath.cas.psu.edu/compostguide.pdf](http://fpath.cas.psu.edu/compostguide.pdf)
