



## Compost Utilization

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## Compost Effects on Soil Properties (Shiralipour et al.)

Parameter	Rate (T/Ac)	Effect
Organic matter	18-146	Inc 6-163%
Water holding capacity	7-146	Inc 5-143%
Cation exchange capacity	57-228	Inc 31-94%
Bulk density	20-146	Dec 4-71%
pH	20-146	Inc 0.8-1.4
Nutrients	18-446	Inc 0-500%

### Compost combats environmental stress

- Disease suppression
- Salt and drought tolerance
- Plant growth regulators

### Uses of Compost

1. Soil amendment
2. Potting mix
3. Lawn establishment/renovation
4. Mulch

### Landscape soil characteristics that would benefit from compost:

- Compacted
- Acidic
- Low organic matter
- Low nutrient content

Acid sulfate soil near I-295  
in Mechanicsville, VA

Soil amended with  
fertilizer and seeded.

### Marginal Land Reclamation

Site after 3 years.

Soil amended with compost  
and lime and seeded.

## Utilization of Hard Rock Mining By-Products for Marketable Topsoil

W. Lee Daniels, Greg Evanylo and  
R.S. Li  
Dept. of Crop & Soil Environmental  
Sciences

Greene Quarry granite gneiss saprolites in cut



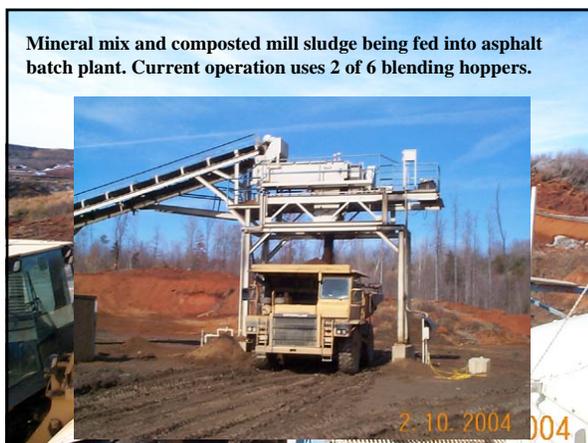
Mineral fines from air classifier used to blend with saprolites



Composted papermill sludge used as organic amendment.



Mineral mix and composted mill sludge being fed into asphalt batch plant. Current operation uses 2 of 6 blending hoppers.



- Luck Stone has one labeled manufactured topsoil and a second product under final development.
- They marketed over 50,000 yards last year, and *good topsoil sells for \$10 to \$25 per yard.*



## Potting Media




Fig 1. Left: lettuce growing in unamended soil.  
Right: lettuce growing in 50% compost.

## Turf Topdressing

Compost can replace topsoil, peat, and wood fines mix in conjunction with aeration and reseedling.




Apply 1/2 inch and rake.

Inexpensive source of nutrients and organic matter.

Promotes seed germination and improves soil properties.

## Orchard and Vineyard Mulch

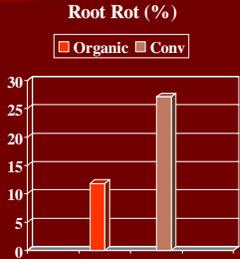


- Application rate: 2-3 inches thick
- Benefits
  - Moisture
  - Nutrients
  - Disease suppression
  - Plant growth regulator

## Results of Compost Use on Grape Studies

- Pinamonti and Sicher (2001): Compost Utilization in Horticultural Cropping Systems
- 17 studies
  - Reduced soil erosion, water runoff, and need for chemical weed control
  - Increased soil organic matter, vine growth, fruit yield and quality (sugar and acid)
  - Improved soil properties, vine nutrient status, fruit color

## Compost Use in CA Vineyards (Granett, U. of CA, Davis)



Category	Root Rot (%)
Organic	~12
Conv	~28

- Studied 6 organic and 7 conventional farms
- Higher populations of Fusarium antagonists (i.e., Pseudomonas, Trichoderma) in compost-amended soil
- Further evidence for disease suppression

## Erosion Control

Apply compost at rate of 270-540 cu yds/acre (2-4 inch layer).

Apply compost 3 ft over the top of slope to prevent rill formation.







## Compost Berms

Silt fence replacement

## Compost as Alternative Amendment

- Topsoil
- Pine bark
- Peat
- Potting soil
- Animal manure
- Biosolids
- Playground sand

## Compost vs. Other Media

Parameter	Compost	Manure	Peat	Topsoil
Nutrients	M-H	H	vL	L-M
Sol Salts	M-H	M-H	vL	L
pH	M	M-H	L-vL	L-M
BD	M	H	L	H
WHC	M	L-M	H-vH	L
OM	M-H	M-H	H-vH	L

## Compost Use Estimator

Thickness	Cu yd/1000 ft <sup>2</sup>	Cu yd/Ac
½ inch	1.5	67
1 inch	3.0	134
2 inch	6.0	269
3 inch	9.0	402

## Composting References

- On-Farm Composting Handbook. 1992. Natural Resource, Agricultural, and Engineering Service. NRAES-54. [www.nraes.org](http://www.nraes.org).
- Compost Utilization in Horticultural Cropping Systems. 2001. Stoffella and Kahn (eds.). Lewis Publishers
- Field Guide to Compost Use. 1996. U.S. Composting Council. [www.compostingcouncil.org](http://www.compostingcouncil.org).