~~An~~ Quick Introduction to Soils and Compost

Using Compost to Improve Stormwater Management and Erosion Control On Roadsides Roundtable

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Introduction to Soils

- Soil quality is key to plant survival
- There are many factors that can effect soil quality. One that we are focusing on today is:
  - Organic matter content (OM)
- Soils can be degraded due to:
  - Erosion
  - Overuse/nutrient depletion
  - Disturbance
- The less degraded the soil, the more productive it can be

Organic Matter Content

- Organic matter is the fraction of the soil derived from plants, animals, and microorganisms
  - Raw plant residues or microorganisms
  - Active OM
  - Stable OM (humus)
- Functions of OM:
  - Stores nutrients
  - Promotes good soil structure
  - Maintains tilth
  - Minimizes erosion
- 'Ideal' soils contain about 5% organic matter

Organic Matter Content of Soil

- Organic matter content can effect:
  - Cation exchange capacity
  - pH
  - Soil bulk density
  - Water holding capacity
  - Plant diseases/pathogens
  - Susceptibility of soils to erosion
- Building soil OM with compost can help improve these soil characteristics which can lead to improved plant growth

What is Compost?

- Compost is aerobically decomposed organic materials
- Organic materials can be:
  - Yard wastes
  - Food wastes
  - Animal manure/Agricultural wastes
  - Biosolids
- The composting process uses time and temperature to:
  - Degrade the organic materials create a product indistinguishable from the original
  - Kill pathogens and weed seeds
  - Make the OM in the final product more stable than it originally was

Benefits of Compost in Stormwater BMPs

- Compost retains a large volume of water
  - Prevents or reduces rill erosion
  - Reduces runoff volume
  - Promotes establishment of vegetation
- Compost improves downstream water quality by retaining/adsorbing pollutants
  - Heavy metals, nitrogen, phosphorus, oil and grease, fuels, herbicides, and pesticides
  - Nutrients and pollutants are decomposed by naturally occurring microorganisms

Benefits of Compost in Stormwater BMPs, cont.

- Compost improves soil structure and nutrient content
  - Reduces need for chemical fertilizers, pesticides, and herbicides
- Compost-based BMPs remove as much or more sediment and pollutants from stormwater as traditional perimeter controls, such as silt fence
  - Allow a larger volume of clear water to pass through

Compost Quality

- Use sanitized, mature compost with no identifiable feedstock constituents or odors
- Must meet all local, state, and federal quality requirements
- U.S. Composting Council certifies compost products
  - Seal of Testing Assurance program
  - Products certified under program have a standard product label for comparison of products
- Some composts contain metals and/or nutrient concentrations that are higher than topsoil; these do not result in higher stormwater concentrations

Compost Quality, cont.

- American Association of State Highway Transportation Officers (AASHTO) standards
  - Quality and particle size specifications for compost to be used in compost blankets, compost filter berms, and vegetated compost filter socks
- Quality and particle size specifications for unvegetated compost filter socks provided in EPA fact sheet
- Many State Departments of Transportation (DOT) also have specifications for compost quality and particle size used in BMPs