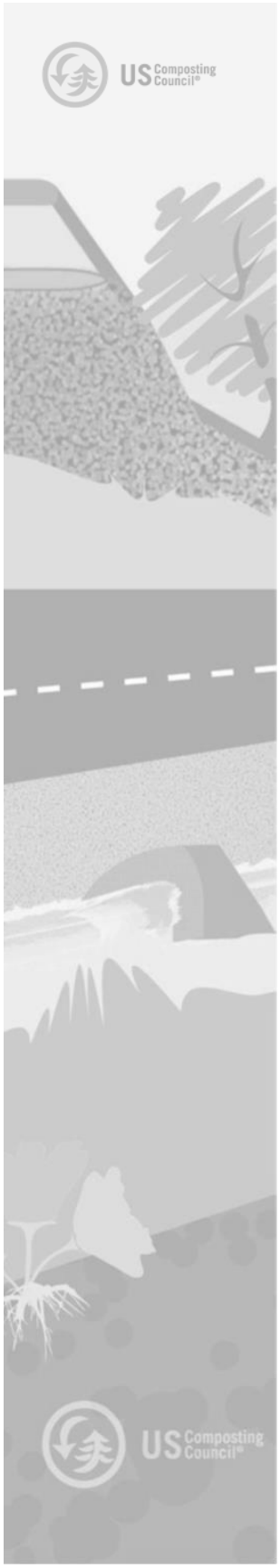
COMPOST
THE SUSTAINABLE SOLUTION
SOIL WATER PLANTS

# EROSION & SEDIMENT CONTROL

ESC



"When the well's dry, we know the worth of water", B. Franklin

**The soil removed by erosion contains up to three times more nutrients than the soil that is left behind. About 60% of lost soil is deposited each year in streams and rivers, blocking waterways with sediment or polluting them with nutrients, pesticides and other contaminants.[1] According to a national water quality assessment, 35% of U.S. streams are classified as polluted and approximately 75% of the U.S. population lives within a few miles of a polluted water body.[2] Adding compost to improve local soils, both as a soil amendment and as an erosion control surface application (compost blankets, berms and encapsulated compost or 'socks') helps capture sediment and prevent erosion.**

**The Iowa Department of Natural Resources and the Iowa Department of Transportation commissioned a 3-year study by Iowa State University researchers.[3] Key findings of this project address five main areas:**

Runoff Quantity http://www.eng.iastate.edu/compost/results.runoff.html

- Run-off from compost blanket treated areas during a 30 minute high intensity rain storm was reduced by 99.2% compared to runoff from areas treated with topsoil, and 0.5% or less of that from compacted subsoil.
- Due to the water absorbing capacity of the compost, initiation of runoff from compost-treated areas was significantly delayed.
- While compacted subsoil and topsoil typically began producing runoff within 5 to 8 minutes after rainfall began, areas treated with any of the three types of compost took, on average, 30 – 60 minutes to begin producing runoff.
- The reductions in quantity and frequency of runoff provided by compost treatments were similar under both un-vegetated and vegetated conditions. These results show that compost blankets can provide storm water runoff control (and erosion control) on construction sites before vegetative cover can be established.

Erosion Control http://www.eng.iastate.edu/compost/results.erosion.html

- On both bare and vegetated slopes, the highest interrill erosion (solids loss caused by raindrop impact and subsequent transport within a thin "sheet" of runoff) from areas treated with compost berms and blankets during the first 30 minutes of intense rainfall was 0.02% (or less) of the erosion from slopes receiving conventional treatments, i.e. seed & straw, hydro-seed, etc.
- One of the most important potential benefits of blanket compost treatments is that they provide significant erosion protection under un-vegetated conditions.
- Since rill erosion will not occur until rills are initiated by interrill erosion, compost-treated areas, which are highly resistant to interrill erosion, are expected to suffer relatively little rill erosion as long as they are protected from concentrated runoff discharged from adjoining areas.

Chemical Pollutants in Runoff http://www.eng.iastate.edu/compost/results.chemical.html

- Runoff from vegetated test plots contained lower total masses of soluble phosphorus and potassium than was found in the runoff from un-vegetated plots. Again, the total mass of pollutants was much lower in runoff from test plots treated with compost than from conventionally-treated test plots.
- As was the case for the soluble pollutants, the total mass of adsorbed pollutants carried by eroded particles in runoff caused by a 30-minute high intensity storm was significantly lower for compost-treated areas than for test plots treated conventionally.

Roadside Vegetation http://www.eng.iastate.edu/compost/results.vegetation.html

- All compost-treated areas produced as much planted cover-crop growth (differences were not statistically significant) as conventionally-prepared roadside consisting of compacted subsoil or subsoil capped with 6 inches of imported topsoil.
- Equally important, the combined dry mass of weeds harvested from test plots at the ends of two growing seasons showed that compost-treated plots produced significantly less (36% or less) weed growth than conventionally-prepared embankments.


**COMPOST BLANKETS:** Apply ½" to 2" for areas that will be immediately vegetated, or 1" to 4" for un-vegetated areas. Application rate depends on annual rainfall/flow arte and rainfall erosivity index. [5]


**COMPOST FILTER BERMS:** Berm dimensions **vary from 1'x2" to 2'x4'.** Application rate depends on annual rainfall/flow rate and rainfall erosivity index. [5]


**COMPOST FILTER SOCKS:** Compost filled filter socks can either be made on site or delivered to the jobsite. In general, 12" diameter filter socks can replace 24" high silt fences, and 18" diameter filter socks will replace 36" high silt fencing. [5]

**Compost is MORE effective than traditional SESC techniques and is typically LESS costly!**

**Currently 40 state's DOTs and/or environmental protection agencies and the American Association of State Highway and Transportation Officials (AASHTO) specify that compost be used for soil erosion and sediment control on highway projects. AASHTO has established compost specification for blankets, berms and filter 'socks'. All AASHTO specifications require US Composting Council Seal of Testing Assurance certified lab testing[4].**

## AASHTO[5] SPECIFICATIONS

**AASHTO has established compost specifications for the following compost properties: pH, soluble salts, moisture, organic matter, particle size, stability (carbon dioxide evolution) and physical contaminants. An abbreviated version of the AASHTO speculations and application rates and practices [6] for compost uses identified above can be found on the US Composting Council website at: http://compostingcouncil.org/admin/wp-content/plugins/wp-pdfupload/pdf/32/AASHTO-Specifications.pdf.**

**Cited References**

[1] David Pimentel, et al., "Environmental and Economic Costs of Soil Erosion and Conservation Benefits," *Science,* February 24, 1995, pp. 1118-1120.

[2] US Environmental Protection Agency. 2007. Total Maximum Daily Loads National Section 303(d) List Fact Sheet. US Environmental Protection Agency. http://iaspub.epa.gov/waters/national_rept.control Accessed on 2-22-2008.

[3] Agriculture and Biosystems Engineering, Iowa State University http://www.eng.iastate.edu/compost/index.html

[4] US Composting Council http://compostingcouncil.org/seal-of-testing-assurance/

[5] AASHTO http://www.transportation.org/Pages/default.aspx

[6] Standard Specifications for Compost for Erosion/Sediment Control, R. Alexander, Inc. 2003

**Other Useful References**

The Soil and Water Connection, US Composting Council, 2013 http://compostingcouncil.org/publications/

*This booklet is a great source of information and contains 67 references to technical articles and papers on the innovative uses of compost to conserve and help filter the nation's water supply.*

The US Composting Council supports and strongly recommends regular compost testing to insure product quality and safety. The Seal of Testing Assurance Program (STA) is the ONLY nationally recognized compost testing program. Read more about it at: http://compostingcouncil.org/seal-of-testing-assurance/

Please visit www.compostsolution.org for many more references on the use of compost for increasing soil organic matter and water conservation.

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