

Using Compost for a Safer Environment

[Home](#)

[Project Background & Objectives](#)

[Study Procedures](#)

[Project Results](#)

- [Runoff Quantity](#)
- [Erosion Control](#)
- [Chemical Pollutants in Runoff](#)
- [Roadside Vegetation](#)
- [Uses and Application Methods](#)

[Project Sponsors](#)

[Research Publications](#)

[Compost Suppliers](#)

[More About Compost & Erosion](#)

[Contact the Researchers](#)

Project Results – Vegetation

Growing a vegetative cover crop is one of the most common and effective ways to reducing erosion on new roadway embankments. Vegetative cover reduces the erosive effects of raindrop impact on bare soil, and it establishes a dense network of roots that helps to hold soil in place during storm runoff.

In some cases, however, the compacted subsoil used to construct roadway embankments does not promote good plant growth. For many years, adding a sufficiently thick blanket of imported topsoil has been the most typical solution to this problem. More recently, highway designers also have attempted to improve the organic matter and structure of deficient subsoils by amending them with appropriate types of compost. These can be applied as blankets, or by tilling them into the surface of the compacted subsoil.

As noted in the section on "Study Procedures" compost applications tested in this project were applied as blankets (not tilled into underlying soil). Blanket applications were selected so that measurements of erosion and runoff would directly reflect the performance of the individual composts rather than the performance of an uncontrolled mixture of compost and subsoil. Furthermore, since blanket applications take less time and equipment to apply, their performance is of interest to roadway designers and managers of other types of construction sites who are looking for ways to minimize the costs of erosion control.

A key question regarding blanket applications of compost, however, concerns the ability of relatively coarse-textured and mulch-like yard-waste composts to provide a suitable seed-bed for good cover crop emergence and growth. Elevated metal concentrations, particularly in bio-solids composts, also occasionally raise concerns since some metals are potentially toxic to plants (note that none of the composts evaluated in this study contained metal concentrations above those permitted by USEPA rules for "high quality" bio-solids).

- As shown in table 1, all compost-treated areas produced as much planted cover-crop growth (differences were not statistically significant) as



- Compost-treated areas produced as much planted cover-crop growth as conventionally-prepared roadside areas.
- Compost-treated plots produced significantly less weed growth than conventionally-prepared embankments.

conventionally-prepared roadside consisting of compacted subsoil or subsoil capped with 6 inches of imported topsoil. (Note that the compacted subsoil at the research site was of a quality and that would NOT normally have been amended with topsoil or compost treatments.)

Table 1. Two-season production of planted species.

Treatment	Mean Mass of Planted Species* (g/m ²)
Compacted subsoil	353.97 ^{a**}
Topsoil	293.66 ^a
Bio-solids	229.61 ^a
Yard waste	338.90 ^a
Bio-industrial	366.44 ^a

*Planted species included oats, rye, timothy, & clover.

**Means with different letter designations and cell color are significantly different (p<0.05).

Highest Lowest

- Equally important, the combined dry mass of weeds harvested from test plots at the ends of two growing seasons showed (table 2) that compost-treated plots produced significantly less (36% or less) weed growth than conventionally-prepared embankments.

Table 2. Two-season production of weed species.

Treatment	Mean Weed Mass (g/m ²)
Compacted subsoil	353.14 ^b
Topsoil	260.45 ^b
Bio-solids	33.90 ^a
Yard waste	74.62 ^a
Bio-industrial	93.70 ^a

* Means with different letter designations and cell color are significantly different (p<0.05).

Highest Lowest

- Reasons for reduced weed production on composted areas are believed to be two-fold. Since composting processes often produce internal temperatures in excess of 140 degrees Fahrenheit, the number of viable weed seeds in compost is generally lower than in many soils. Further, blanket applications of compost presented a barrier to the emergence and

growth of native weed seeds present in the subsoil beneath the compost blankets.

- There were no significant differences in cover-crop growth or weed growth between areas treated with 2 inches of compost, and those that received the 4-inch treatments.

COLLEGE OF AGRICULTURE
COLLEGE OF ENGINEERING