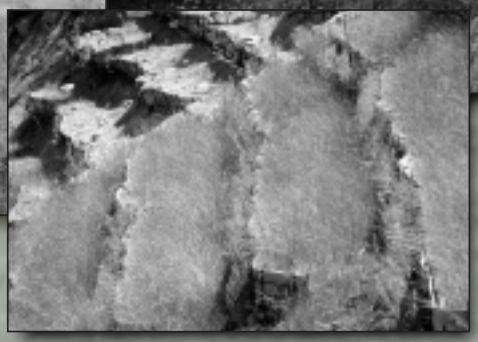
Compost Use On State Highway Applications



COMPOST USE ON STATE HIGHWAY APPLICATIONS

Project Background

Thanks to funding provided by a United States Environmental Protection Agency (USEPA) cooperative agreement (number X82826301), The Composting Council Research and Education Foundation (CCREF), in conjunction with the United States Composting Council (USCC) has completed the enclosed document in order to promote compost use on state and local 'roadside' applications. Aside from helping to assure healthy plant growth and reduced plant loss, the use of compost in roadside applications, can also reduce the production of greenhouse gases. This is accomplished in two ways. First, by promoting the use of composting as an alternative waste management strategy to landfilling and lagooning of organic by-products, known sources of methane production, and secondly, through the use of compost itself. The use of compost has demonstrated the ability to sequester carbon within the soil. For additional information on USEPA programs, go to their website at www.epa.gov.

Though this grant, the CCREF has completed various data collection efforts, in order to develop a tool that may allow State Departments of Transportation (DOT), as well as other roadside management organizations, specify the use of compost with greater ease and confidence. Further, this information package will assist these organizations to better locate potential suppliers of compost, foster communications between related highways organizations and allow compost use with greater success.

Overall Objectives

1. Assist States in incorporating the use of compost in landscape/building specifications in building, construction, highway seeding, planting, erosion control and other applicable projects.
2. Educate State and local DOT's about the various methods of compost utilization, as well as its many economic, agronomic, and environmental benefits.
3. Broaden the definition of *compost* in the list of landscape products recognized by the transportation industry to include a wider range of organic feedstocks.

Acknowledgements

The CCREF and the USCC would like to thank the USEPA for providing the funding necessary for completing this project. We would also like to acknowledge the assistance provided by the USEPA's, Office of Solid Waste, and project manager, Jean Schwab, for assistance through out the project. Also, the project could not have been completed without the assistance provided by the various State Departments of Transportations, as well as some of their contractors.

Project Management

CCREF/USCC
1924 N. Second Street
Harrisburg, PA 17102
717-238-9759
717-238-9985 fax
www.compostingcouncil.org

Contractor:
R. Alexander Associates, Inc.
1212 Eastham Drive
Apex, NC 27502
919-367-8350
919-367-8351 fax
alexassoc@earthlink.net

TABLE OF CONTENTS

1.0 INTRODUCTION

This document has been developed to assist those individuals and organizations involved in the maintenance and management of roadsides and highways. It is understood that the proper and sustainable management of 'roadsides' relies on professionals that possess varying and specific skill sets. Today, with greater emphasis being placed on environmental sustainability, as well as reducing the environmental impacts of roadways, the growth of compost utilization in landscape, erosion/sediment control and other environmental applications is imminent. Through the development and distribution of this document, the United States Environmental Protection Agency (USEPA) and the United States Composting Council (USCC) hopes to provide the 'transportation' industry, which encompasses roads and highways staff, policy makers, product specifiers, project designers and engineers, environmental officers, landscapers, and other interested parties, with the tools necessary to use composted products to meet their specific project requirements.

Although composted products are manufactured from 'recycled' materials, and many agencies are promoting the use of recycled products, its usage has actually grown because of its functionality and cost effectiveness. Compost is often less expensive than other soil amendments. With this said, it should be understood that the use of compost in specific applications may actually increase the construction costs on certain projects. However, the maintenance costs related to that same project, would be reduced. For example, experience and research has proven that by using compost in roadside planting projects, an acceptable vegetative stand can be developed much faster, and the survival rate of landscape plants in improved. So, although the initial cost of installation may have been greater, long-term costs are no doubt lower. Therefore, in some cases, the life cycle cost (analysis) of project must be considered. In cases like these, it is important that both DOT design/construction and maintenance staff be in communication, and understand the longer-term benefits of using compost on the project. Besides, in many cases, innovative applications for compost simply out perform standard practices and products used today.

What is Compost?[1]

Compost is the product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth. Compost bears little physical resemblance to the raw material from which it originated. Compost is an organic matter resource that has the unique ability to improve the chemical, physical, and biological characteristics of soils or growing media. It contains plant nutrients but is typically not characterized as a fertilizer.

How is Compost Produced?[2]

Compost is produced through the activity of aerobic (oxygen-requiring) microorganisms. These microbes require oxygen, moisture, and food in order to grow and multiply. When these resources are maintained at optimal levels, the natural decomposition process is greatly accelerated. The microbes generate heat, water vapor, and carbon dioxide as they transform raw materials into a stable soil conditioner. Active composting is typically characterized by a high-temperature phase that sanitizes the product and allows a high rate of decomposition, followed by a lower-temperature phase that allows the product to stabilize while still decomposing at a lower rate. Compost can be produced from many feedstocks.

2.0 WHY USE COMPOST?

Compost is an extremely versatile product, possessing a variety of innate benefits. Today, these benefits are better understood, and measurable. Compost has the unique ability to improve the properties of soils physically (structurally), chemically (nutritionally), and biologically. But aside from its technical benefits, the simple fact is that both research and field experience have documented that vegetation and other plants established with compost grow healthier and faster, and are able to better persist in harsh conditions. Although many equate the benefit of compost use to lush green growth, caused by the plant-available nitrogen, the real benefits of using compost are long-term and related to its content of living-organic matter. [3]