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**The mission of Iowa's LTAP:** To foster a safe, efficient, environmentally sound transportation system by improving skills and knowledge of local transportation providers through training, technical assistance, and technology transfer, thus improving the quality of life for Iowans.

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ISU Research Park  
2901 S. Loop Drive, Suite 3100  
Ames, Iowa 50010-8632  
Telephone: 515-294-8103  
Fax: 515-294-0467  
[www.ctre.iastate.edu/](http://www.ctre.iastate.edu/)

**Stephen J. Andrie**  
Director of CTRE  
[andrie@iastate.edu](mailto:andrie@iastate.edu)

**Duane Smith**  
Director of Iowa LTAP  
[desmith@iastate.edu](mailto:desmith@iastate.edu)

**Marcia Brink**  
Editor  
[mbrink@iastate.edu](mailto:mbrink@iastate.edu)

**Tom McDonald**  
Safety Circuit Rider  
[tmcdonal@iastate.edu](mailto:tmcdonal@iastate.edu)

**Lori Wildeman**  
Program Coordinator  
[lwild@iastate.edu](mailto:lwild@iastate.edu)

Mark Anderson-Wilk  
Michele Regenold  
Brett Hansen

Contributing Writers

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## Benefits of recycled materials for erosion control

RESEARCHERS across the country, including in Iowa and Missouri, have been studying the capability of recycled materials to stabilize new ditch and bridge embankments following road construction.

Successful materials such as compost and reprocessed plastic are now making their way into state and regional design specifications, including the Statewide Urban Design and Specifications Manuals being drafted for Iowa.

### Compost

Numerous studies have shown that composted waste materials can make effective slope stabilization materials. One such study was conducted by an Iowa State University research team led by Thomas Glanville, professor of agricultural and biosystems engineering.

The Iowa State researchers collected data on compost's effectiveness as a slope stabilizer, its ability to grow vegetation, and its impact on runoff quantity and quality. The team used compost collected from three of Iowa's 50 to 60 composting sites—biosolids from Davenport, yard waste from Des Moines, and bioindustrial waste from Cedar Rapids.

Compost was applied as 5- and 10-cm deep blankets on highway foreslopes along I-35 in central Iowa and then subjected to simulated rainstorms to observe runoff and erosion.

The research team found that compost is an effective roadside stabilizing material in four ways:

1. Compost absorbs and slows runoff, thereby significantly reducing erosion. In fact, some of the compost tested produced so little runoff that it was necessary to increase rainfall intensities to approximately 100 mm/hour to initiate runoff in less than an hour.
2. Unlike soils that normally need vegetation to provide erosion protection, the composts reduced erosion immediately after application. The researchers point out that this is important for many reasons; for instance, "compost applications on projects completed too late in the year to establish vegetation could provide immediate runoff and erosion control that would help prevent damage that may otherwise occur before the next growing season."
3. Growth of the cover crop on the compost-treated test plots was equal to that on untreated soils during the first summer of testing. During the

second summer, unusually dry weather prevented cover crop growth. During both summers, however, weed growth was significantly lower on the compost-treated plots.

4. Although the biosolids compost contained significantly higher initial concentrations of nitrogen and eight heavy metals than the construction soils at the test site, runoff from the biosolids compost contained significantly lower total quantities of these materials than the construction soils due to the greatly reduced runoff and erosion from the compost.

Using compost as a slope stabilizer is also environmentally friendly because it reduces the amount of waste going to landfills.

A 1988 law passed by the Iowa legislature banned certain types of organic materials from landfills. The ban stimulated construction of many composting facilities throughout the state, resulting in significant compost production. This study was funded in part to help identify new markets for composted organic materials.

### Recycled plastic

Recycled plastic has also been shown to have effective slope stabilization properties. Researchers at the University of Missouri-Columbia are currently evaluating stabilization applications of recycled plastic pins (RPPs) made of pressure-molded recycled polyethylene, sawdust, and other byproducts and commonly known as "plastic lumber."

Field testing in Missouri has shown that stabilization using RPPs is a "feasible and economically competitive alternative to other potential stabilization methods." RPPs are particularly promising in their ability to stabilize shallow landslides.

### For more information

For information about the compost study, which was funded by the Iowa DOT and Iowa Department of Natural Resources, contact Dr. Thomas Glanville, Iowa State University, 515-294-0463, [tglanvil@iastate.edu](mailto:tglanvil@iastate.edu), or see the project website, [www.eng.iastate.edu/compost/](http://www.eng.iastate.edu/compost/).

For information about the RPP study, which was funded by the Missouri Department of Transportation, contact Keith McGowan, 573-751-4641, [mcgowk@mail.modot.state.mo.us](mailto:mcgowk@mail.modot.state.mo.us); a report on the project (RDT 00-007) is available, [www.modot.state.mo.us/rdt/Publications.htm](http://www.modot.state.mo.us/rdt/Publications.htm). •

