

Appendix 1

Compost Education Presentations, Workshops & Demonstrations



Barrie Cogburn at the compost booth used at conferences such as the 2001 AGC Annual Trade Fair



...with a level of compost...
...Two weeks later, within vegetation covered...
...The following week, a three-inch rainfall event was...
...successfully filtered, sediment was retained, and erosion was...
...As an additional benefit, the compost filter berm is easily...
...rehabilitated by mowing operations after construction is...
...complete, eliminating waste and disposal costs.

BEFORE

US 281, North of Lampasas, Texas
(ripping the compost filter berm)

AFTER

US 281, North of Lampasas, Texas
(growth after 2 weeks and 3" rainfall)

Prepared by the Texas Department of Transportation
and the Texas Natural Resource Conservation Commission
and financed through a grant from the
U.S. Environmental Protection Agency

For more information, please contact:
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(512) 416-2986 • barriecogburn@txdot.gov
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(512) 231-6779 • smccoy@tnrc.texas.gov

To learn more about how you can incorporate
compost into your projects, go to:
www.tdot.state.tx.us/gov

Printed on 100% Recycled Paper

The proven material
for establishing quick
vegetation with lower
costs, less water,
less maintenance, and
fewer headaches.

Encouraging Growth

Establishing vegetation is critical to preventing erosion. But poor timing coupled with harsh climates makes establishing vegetation difficult. Typical used on many highway construction projects lack the organic matter needed to establish and sustain vegetation growth. Adding organic matter in the form of compost, creates an environment that retains moisture and encourages the establishment of vegetation. Adequate vegetation establishment prevents erosion, which in the long run protects the integrity of the roadway. Simply put, the Texas Department of Transportation (TxDOT) saves time and money.

Proven Performance

Using Interstate 20 in Big Spring as a test site – which had been plagued with erosion problems since 1968 – TxDOT found that applying compost is the key to slope stabilization. In such an arid climate, establishing sufficient vegetation was an elusive goal. Through the years, several attempts had been made with traditional erosion-control tools. These products protected the slope temporarily but did little to change the poor-quality soil. TxDOT applied erosion-control compost, a blend of compost and wood chips, to a portion of the severely eroded slope. Within eight weeks of the application, the resulting vegetation proved the success of compost. Considering the maintenance costs involved in each of the previous attempts, the cost savings became quite clear.



IH 20, Big Spring, Texas
(loading slope erosion)



IH 20, Big Spring, Texas
(resulting vegetation after just 8 weeks)

Using Interstate 20 in Big Spring as a test site – which has been plagued with erosion problems since 1968 – TxDOT found that applying compost is the key to slope stabilization.

Solution

With the successful use of compost and compost filter berms on highway construction and maintenance projects, TxDOT has approved two statewide specifications:

- "Furnishing & Placing Compost"
- "Multi/Compost Filter Berm for Erosion & Sedimentation Control"

Successful

Encouraged by a partner... Conservation Commission... Protection Agency (E...
...ion of compost to...
...construction and...
...sure. TNRC's...
...achieve its goal...
...preventing large...
...landfill or for...
...TNRC, and...
...ingested Boreas and Leno River...
...made from dairy manure, water quality is improved and...
...avoid erosion by achieving vegetation establishment quickly.

Scott McCoy gives a PowerPoint presentation during a compost workshop.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Robert Wilson, P.E.
Design Division Director
125 East 11th Street
Austin, TX 78701

Dear Mr. Wilson,

I recently had the pleasure of meeting Ms. Barrie Cogburn at the National BioCycle in St. Paul, MN. Before this event, I had heard that TxDOT had an innovative road control method, but I had no idea just how successful it was until then. Her present concert with Scott McCoy (TNRCC), demonstrated to various international, federal, local governments and industry the innovative and successful advances the Texas Department of Transportation has made in their highway construction and maintenance programs.

I was very impressed by both the accomplishments of the State of Texas and quality presentation of your state's two representatives - Barrie Cogburn and Scott McCoy. I would like to offer my assistance in showcasing TxDOT's outstanding achievements by incorporating your program into a selection of "success stories" we are compiling on the beneficial use of compost in roadside landscaping. I also serve on the Steering Committee for the University of Hampshire's Recycled Materials Resource Center (RMRC). Ms. Cogburn has been invited to Washington, D.C. this November by the RMRC to present your program to a national and international audience of transportation and environmental professionals. This is the first time such a conference has been held. Presentations on your program and its success will be a highlight of the event. A partnership with the Federal Highway Administration follows.

Both the achievements of your program and the excellent presentation you truly sets your operation apart from others in the United States. Your success has been emulated nationwide.

I hope to see Ms. Cogburn in Washington, D.C. this fall to show the rest of the nation and the international community the benefits of your imagination, cooperation, and support as has been done in other states.

Sincerely,

Jean M. Schwab
US EPA (5306W)
1200 Penn. Ave., N.W.
Washington, DC 20460
(703) 308-8669

cc: Barrie Cogburn

Internet Address
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FW MEM cc: Wes H... ENV



MEMORANDUM

January 11, 2001

TO: Abilene, Austin, Brownwood, Fort Worth, Dallas, Waco, and Wichita Falls District Engineers

FROM: Lawrence J. Zatopek
General Services Division

SUBJECT: Implementation of the TxDOT Compost Incentive Program

We have been notified by the Texas Natural Resource Conservation Commission (TNRCC) that we now have an opportunity to take advantage of an Environmental Protection Agency (EPA) grant that I wrote to you about on August 30, 2000. The grant will allow for a \$5 per cubic yard reimbursement to TxDOT when we use manure compost from the Bosque/Leon watershed. The ultimate goal of the program is for TxDOT to use 200,000 cubic yards of compost from this watershed during the next three years.

Initial forecasts submitted by your district and the other six districts, TxDOT will exceed this goal by the end of the grant. This will make a total of \$1 million available to reimburse the seven districts in the Bosque/Leon watershed only. Compost from any source can be used in the program and to be partially reimbursed by TNRCC. We will need to document our use of compost whenever feasible so that we can achieve our goal. That will ensure that compost supplied on a job meets this state forces, blanket purchases are a tool that we

credit for compost used. Attached are the reimbursement the districts. Also included are the designated contact person from your Construction and Maintenance case contact Rebecca Davio at 512/416-



MEMORANDUM

DATE: Sept. 18, 2000

TO: All Area Engineers
All Maintenance Supervisors
Consultant Contract Management Office
John Bohuslav, P.E., Director of Maintenance
Craig Clark, P.E., Director of Construction
Julia Brown, P.E., Director of Trans. Planning & Dev.

FROM: John P. Kelly, P.E.
District Engineer

SUBJECT: Re-vegetation/Compost Usage & Drill Seeding

As we struggle to make it through another drought, it becomes more need to review our "best management practices" and seek the most rapid vegetation establishment possible using a minimum amount of water. Although we can't change the amount or frequency of rain, we prepare our projects for vegetation establishment.

The topsoil that is normally accepted and used on our projects is pit and is very low in organic matter. Even true "topsoil" in our area is usually deficient in organic matter. Water holding capacity is low and the soil is not really conducive to seeding germination and growth. The benefits of adding compost to re-vegetation projects have been seen across the state through demonstrations between TxDOT, the Texas Natural Resource Conservation Commission (TNRCC) and local compost suppliers (in our District demonstration). Organic matter from compost in the soil increases activity, increases water penetration and increases the water holding capacity of the soil. This increase of organic matter greatly enhances establishment of a healthy, permanent grass cover and the quicker release of the contract

Originating Office: DM
San Antonio District



MEMORANDUM

TO: All Area Engineers
All Maintenance Supervisors
Brian Crawford, P.E.
Paul Hoelscher, P.E.
Blair Haynie, P.E.

FROM: William L. Haigh
District Engineer

SUBJECT: Re-vegetation/Compost Usage & Drill Seeding

The Texas Department of Transportation (TxDOT) has been awarded a grant from the Resource Conservation Commission (TNRCC) to take advantage of an Environmental Protection Agency (EPA) grant that I wrote to you about on August 30, 2000. The grant will allow for a \$5 per cubic yard reimbursement to TxDOT when we use manure compost from the Bosque/Leon watershed. The ultimate goal of the program is for TxDOT to use 200,000 cubic yards of this material in the next three fiscal years.

As you are aware, the topsoil that is normally accepted and used on our projects is typically mined from a pit and is very low in organic matter. Even true "topsoil" in our area is usually deficient in organic matter. Water holding capacity is low and the soil is not really conducive to seeding germination and growth. Adding compost to the topsoil will greatly improve our re-vegetation efforts. Any projects requiring topsoil should use Compost Manufactured Topsoil (CMT)(Item 1027, Furnishing and Placing Compost). A rate of 25% compost / 75% topsoil should be used at a depth of 4" minimum.

All projects requiring seeding for revegetation should use compost on those areas to be seeded. Drill seeding should be specified on all areas 3:1 or flatter and Broadcast seeding on all other slopes. A 2-3" layer of Erosion Control Compost (ECC)(Item 1027) should be applied to all areas requiring seeding. I also strongly encourage the use of General Use Compost (GUC)(Item 1027) around trees, shrubs, and on turf areas in lieu of fertilizers and mulch. Normally a 3.4" layer for beds and a 1/2" layer for turf areas will be adequate.

The use of compost on our projects will greatly enhance establishment of vegetation. Further, this partnership with TNRCC and EPA will be beneficial to all parties involved and the Abilene District will realize a direct financial benefit from all compost material that is removed from the affected watershed. If you have questions regarding the use of the compost specification, please contact Pete Krause at (915) 676-6827.



MEMORANDUM

October 18, 2000

TO: Staff and Area/Project Engineers

FROM: Jay Nelson

SUBJECT: Establishment of Vegetation/Use of Compost

It has become apparent that we need to review our best management practices to search for new and better ways to insure the establishment of vegetation on the rights-of-way as quickly as possible while utilizing a minimal amount of water. Recently, we have been faced with drought-like conditions that hamper our efforts even further. We must improve the way we prepare our projects for vegetation establishment.

The topsoil that we normally accept and use on our projects is typically mined from a pit and is very low in organic matter. Even true "topsoil" in our area is usually deficient in organic matter. Water holding capacity is low and the soil is not really conducive to seeding germination and growth. Organic matter from compost in the soil increases the microbial activity, increases water penetration and increases the water holding capacity of the soil. The increase of organic matter greatly enhances establishment of vegetation.

The attached *Guideline for Enhancing Establishment of Vegetation on Highway Rights-of-Way* outlines eight steps to help achieve our goal throughout the Dallas District, and confirms our decision to require the use of compost amended topsoil in Dallas County. These eight ideas will be incorporated into the design and construction of our projects during the coming months. There will more than likely be increased construction costs, but the higher costs incurred up front will be recovered through a more rapid establishment of a healthy, permanent grass cover, quicker release of the contractor from the project, and ultimately lower maintenance costs.

All current and future construction and maintenance work requiring re-vegetation by seeding or sodding in the Dallas County area shall use compost manufactured topsoil (CMT). This will apply to areas that disturb more than one acre of soil. The use of compost is also encouraged elsewhere in the district where soil conditions are less than desirable.

We must find new ways to increase vegetation establishment and conserve water resources. The Fort Worth District uses CMT on every project. The Waco District has committed to using CMT on the entire IH35 expansion project. The San Antonio District now requires the use of CMT in Bexar County. Hopefully, we will begin to see some much-needed improvement in our efforts to establish vegetation within the Dallas District.

If you have questions regarding the use of Special Specification 1027--000, *Furnishing and Placing Compost*, please contact Patrick Haigh, (214) 320-6205.

Attachment
cc: Haigh



NAVIGATE THE TxDOT WEBSITE AND MAKE THE "COMPOST CONNECTION"

To find more information about the compost specifications, visit this site to see the actual specifications, pictures of compost demonstrations, and current bid prices:
www.dot.state.tx.us/compost

To find what upcoming TxDOT projects specify compost:
www.dot.state.tx.us/insdotdot/orgchart/cmd/cserve/notice/cpost1
(What follows is a listing on every project on that month's letting, the highlighted words, "Item Descriptions" to see if Item 1027 or are specified for that project.)

To find which contractor was the low bidder on a particular project:
www.dot.state.tx.us/insdotdot/orgchart/cmd/cserve/results/aw
(Click on the contractor name in blue for addresses and phone numbers.)

If you are a supplier and want to be included in the Highway Dope Book and Directory (this handy book lists contractor contacts as well as material suppliers) contact:

Mr. Joe McGlothlin
Whitley & Siddons
Box 2125

COMPOST FACT SHEET

How can Special Specification Item 1027 "Furnishing & Placing Compost" help to establish vegetation and control erosion?
Because compost actually changes the texture of the soil, poor quality topsoils can be amended with compost to increase chances for seed germination and continued establishment. Quick and dense vegetation will significantly reduce the chance for erosion.

Why is the use of compost good for the environment?
Compost is made from organic matter that would be otherwise landfilled. By returning this useful resource to the environment, TxDOT can achieve better vegetation establishment while at the same time help to divert organic matter from the waste stream.

What do the references to the "40 CFR Part 503" mean?
These are regulations put forth by the EPA designed to encourage the beneficial use and reuse of biosolids while protecting public health and the environment for all disposal practices.

Why are...

Subchapter B Part 3 important?
The Code defines acceptable industrial non-hazardous waste products that add industrial byproducts (power plant ash, fly ash, gypsum, etc.) to TxDOT. These wastes are clearly prohibited by TNRCC.

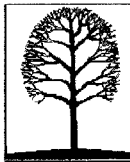
Class B Biosolids?
Class B biosolids are those that have reduced pathogens below levels for any agricultural uses, including those that have been treated to reduce pathogens to Class A. Class B products are not allowed for public access.

Why do we need to know what they mean?
The specification lists several parameters. Each parameter has a specific meaning.

Why are carbon-based materials in the soil?
Higher carbon content may be necessary for certain applications.

TxDOT - Design Division - Landscape Design Section - Furnish and Place Compost <http://www.dot.state.tx.us/insdotdot/orgchart/cmd/cserve/landscape/compost/topsoil.htm>

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Landscape Design

AUSTIN CONTACTS

DISTRICT CONTACTS

PROGRAMS

COMMENTS

Concrete Pavers

Color/Texture in Concrete

Form Liners

Modular Block Wall

Landscape Planting

Compost

The use of Compost in Highway Construction



The use of compost on roadway construction projects is simply an additional erosion control tool. As topsoil sources have become depleted over the years, we have observed that the most

basic part of revegetation, a 4" topsoil seedbed, is actually soil with little or no organic material to sustain plant growth. This has led, on many projects, to severe erosion. If erosion occurs while the project is still under contract, the contractor must reapply topsoil, seed, fertilizer, and mulch/and or erosion control blankets. In many cases, barricades are left standing until the contractor achieves sufficient grass growth (per SW3P Requirements). If erosion results on existing highway sections, maintenance is left to deal with the resulting problem. Since compost costs are comparable to topsoil, we believe that by adding organic matter in the form of compost, poor soils can be amended, revegetation can occur, erosion is avoided and TxDOT saves time and money.

TxDOT can benefit greatly by helping to increase the awareness and acceptance of compost for use on highway right-of-way. By promoting the use of compost, TxDOT can realize the following:

- an effective erosion control solution
- a savings of construction expenditures due to quicker vegetation establishment
- a savings of future maintenance expenditures due to erosion avoidance
- the opportunity for our agency to be seen as a partner in the statewide waste reduction effort.

We hope the information provided here will open up additional design options for your projects. This site will be updated periodically to keep it as current as possible. Should you decide to include Special Specifications 1027 or 1034 in your roadway design, please feel free to contact the [Landscape Design Section](#) for assistance and the most up to date information.

Compost Information on the TxDOT Website



requesting rapid alongside highways has economic benefit. The Big Spring...

roughly 81 to 83% from last. In the Bosque wood District, the same maintenance...

TxDOT Special Specification Item 1027, "Furnishing and Placing Compost..."

The use of compost along roadways in Texas has been demonstrated in 14 of the 25 TxDOT districts, often with remarkable...

to ensure runoff, landscape and pond treatment projects have been used. All the...

TEXAS MAKES INROADS WITH HIGHWAY USE OF COMPOST

MOTIVATED BY MANURE

LOCATED 60 miles southwest of the Dallas-Ft. Worth metropolitan area, the bustling town of Stephenville, Texas, population 14,694, has 47,822 dairy cows...

Success vegetating a slope that hadn't been green since the highway was built in 1968 has led to broader use of compost by TxDOT...

The Big Spring site had been unsuccessfully revegetated with conventional treatment, and had six-inch grass...



In a demonstration near Dallas, the part of the site treated with compost maintained over 90 percent of its water-holding capacity...

At the demonstration in the Bosquewood District in January, the maintenance engineer expressed a willingness to pay more for the application of compost...

Here for Ben "Dirt" (Dirt) statements in 1994 indicate that he had been able to do so in a variety of...

The area was in a "break" as he used compost. A small amount of compost...

In May, 1999, the two agencies held a demonstration in the West Texas town of Big Spring. TxDOT had tried five times...

Scott McCoy and Barrie Coghlan

The Big Spring site had been unsuccessfully revegetated with conventional treatment...

had been discussed as an alternative in land watershed potential composters who had been reluctant due to their apprehension...

Compost grant to benefit area dairy producers

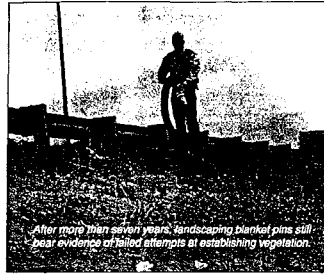
Dairy producers will be reaping the benefits from a recent three-year grant program proposal that will utilize composted manure from impaired watersheds...



TEXAS DAIRY REVIEW
"The Texas Dairyman's Number One Choice In Newspapers"
Dedicated To Serving and Preserving The Texas Dairy Industry



Article in Texas Contractor April 16, 2001



After more than seven years, landscaping plantings still bear evidence of failed attempts at establishing vegetation.



Barrie Cogburn (left) and Scott McCoy have conducted workshops in compost applications in over half of Texas' 25 TxDOT districts.

impacting the amount of direct land application in watershed areas, began leading to contamination of area creeks and rivers that ultimately flowed into lakes that provide drinking water for some of Texas' major cities. A number of Texas rivers have experienced water quality problems due to runoff of manure

impacting the amount of direct land application in watershed areas, began leading to contamination of area creeks and rivers that ultimately flowed into lakes that provide drinking water for some of Texas' major cities. A number of Texas rivers have experienced water quality problems due to runoff of manure

ing algae and reduce a river's ability to sustain aquatic life. Known as a dairy area in Texas, Tarrant County on the Bosque River watershed is home to approximately 67,660 dairy cattle. Local farmers who purchased manure from area dairies for direct application in a restricted 10-acre

With the advent of Senate Bill 1, the omnibus water bill enacted into law in 1997, the Texas Natural Resource Conservation Commission (TNRCC) became involved with exploring cost-effective options of managing these growing mountains of manure. The idea of composting the manure held use. Composting would increase use of transport beyond the immediate area as well as reduce contamination concerns, as the composting

Two Ideas Destined to Find Each Other

by Liz Kraja
with excerpts from papers written by Barrie Cogburn and Scott McCoy

Demand

In recent years, highway contractors and TxDOT have had increasing difficulty in establishing grass along right-of-ways.

"If we can't get grass growing along highway construction ROWS, there is an extra expense for the contractor, and time delay opening the new roads," explained Barrie Cogburn, landscape architect for TxDOT's Design Division. "If grass doesn't ever grow, then it becomes a maintenance problem for TxDOT."

TxDOT researchers examining the situation learned that much of the topsoil now being used had been dug from pits and was not topsoil at all, according to Cogburn. They also learned from suppliers that commercial quantities of marketable topsoil had been depleted in Texas. Farmers have known for years that, even in fertile areas, soil found only a matter of inches below the surface has no organic matter, and so is not fertile.



Demonstration of Erosion Control Compost application in Odessa on an overpass along Hwy 80. A mixture of compost, cotton burs and wood chips was blown-on to a depth of 1 inch by TEX-mulch specialists Joe Hardac and Greg Hatch.

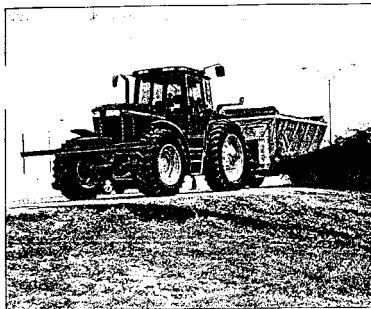
The result is that grass seeds planted in infertile soil dies or washes away before they can germinate, resulting

in severe erosion on many projects. Contractors are then required to reapply topsoil, seed, fertilizer, and mulch and/or erosion control blankets and cannot leave the project until sufficient grass growth occurs (SW3P Requirements). The state currently withholds 5 percent of the payment for highway projects until vegetation is established on 70 percent of the disturbed area. Using compost to accelerate the establishment of vegetation is a real incentive.

Supply

Texas dairies and meat producers have been searching for years for a solution to the growing quantities of manure being produced by their feedlots, dairies, and poultry farms. The solution thus far had been to sell the manure to area farmers for direct land application and for years it was a "green" solution.

Two challenges have surfaced: supply has exceeded demand, but more



Another method of application was demonstrated with the use of a side-slinger. A mixture of Blue Grama "Hatchia" (Houtoukoua gracilis "Hatchia"), Sand 1 Oregan was applied along in compost without the mulch mixture. The slinger applied it

process by nature destroys any pathogens harmful to humans.

The Light Turned On

"Drought-related issues were brought to the forefront by SB 1," said the TNRCC's Scott McCoy, "and we thought that compost, which retains soil moisture, would help conserve water when applied to highway right-of-ways." The TNRCC approached TxDOT with a proposal to work jointly to demonstrate the application of compost along roadsides to the public, potential contractors, and other interested parties.

"We believe that by adding organic matter in the form of compost, poor soils can be amended, revegetation can occur, erosion is avoided and TxDOT saves time and money," said Cogburn.

Encouraged by a Texas Transportation Institute Research Report, "The Use of Compost and Shredded Brush on Rights of Way for Erosion Control," TxDOT formed an informal committee to research the subject. However, for TxDOT to fully implement composting procedures, a set of specifications were required. Starting with this innovative use for an old concept, Cogburn teamed with TNRCC Program Specialist Scott McCoy.

"The TNRCC has been an important partner in the development of this

specification," said Cogburn. The agency strives to find materials, they have given of their time to educate construction industry on compost." TNRCC and coordinated a series of explaining, and demonstration workshops throughout the state. Contractors, area representatives, TxDOT and the agricultural

Initial Successes

In May 1999, the two a demonstration in the town of Big Spring, TX. unsuccessfully five time vegetation on a steep, se overpass. The site was c 1968 in a low rainfall. been barren except for t tumbleweed for nearly 2 post made from feedlot r burs and yard trimmings were applied at a depth Wood chips, which red tial water and wind e compost and topsoil, y with the compost at a parts compost to one part wood chips. By mid-June, thick grass was growing on soil that had laid barren since highway construction in 1968.

Compost is being applied to the soil surface as a top dressing as well as

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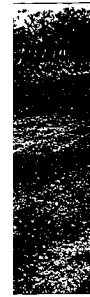
The success of the Texas demonstration projects has led to the development of a statewide TxDOT Special Specification Item 1027, "Furnishing and Placing Compost," and Item 1034, "Mulch/Compost Filter Berm for Ero-



LARGEST MOBILE MULCHERS IN TEXAS
Fleet of Rubber Tired & Crawler Mounted Grinders

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Smooth Park - Like Finish
FAST, COST EFFECTIVE

CESA Contractors, Inc. San Antonio, TX
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silt, allowing water to seep through. They require no cleanup of staked or silencing. Maintenance mowers have no problem dispersing the berms during routine mowing. Mulchers are no materials to handling equipment.

noxious weeds, pathogen and vector attraction. Composting is a natural microbial process, taking place in an aerobic environment. The required (or average) time and temperature composting requirements are 15 days at 132 degrees with five turnings. Raw manure will not be allowed. The contractor must have certifying, documentation from the compost and must provide lab analysis.

"Your nose will be a good judge," commented Cogburn. "Compost has an earthy aroma not at all like the original product."

Item 1027 specifications identify three classes of composted treatments:

1. Compost Manufactured Topsoil (CMT) will be the class most used by contractors for amending, poor quality soil. A mixture of 25-percent compost and 75-percent topsoil is recommended at this time. It can be either Blended on Site (BOS), 3 inches of topsoil and 1 inch of compost or by the specs, or it can be Pre-Blended (PB) in the specified proportions.

2. Erosion Control Compost (ECC) will effect substantial savings as a treatment on slopes. Used in a 50/50 mix of compost and wood chips, it will provide an alternative to wood fiber blankets except in high flow areas.

3. General Use Compost (GUC) placed in 100-percent strength will

Item 1034 "Mulch/Compost Filter Berm for Erosion and Sedimentation Control" promises to be an excellent option as a filter berm. Once installed, both Filter Berm Mulch and Filter Berm Compost hold their shape in all but high flow areas, trapping silt but allowing water to seep through. They require no cleanup of staked or silencing. Maintenance mowers have no problem dispersing the berms during routine mowing. Mulchers are no materials to handling equipment.