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A Composting Update:

The Way We Were, and Where We're Going

The US composting industry is viewed by many as the only valid means of recycling the hundreds of thousands of tons of organic residuals generated each year in our nation.

By Ron Alexander

The composting industry is now more than a quarter century old and steadily evolving. The composting industry, however, continues to display a great dichotomy—some composters operate on the basis that they are manufacturing a product, while others merely concentrate on generating tipping fees with little or no regard for producing a finished product of quality and consistency. This clearly continues to be an ongoing challenge for some, especially those composters who are investing in the production of high-quality products *and* those compost users who are looking for a reasonable level of quality and consistency.

Several challenges still exist despite the progress we have made. Probably the greatest challenges on the production side of the composting business are the lack of uniform regulation from state to state, the lack of federal legislation regarding the disposition of organic waste, and low tipping fees in some areas of the country that encourage the disposal of these valuable organic residuals rather than the recycling of them.

The United States composting industry's growth still has been very impressive despite all of these obstacles.

Interestingly, many of the feedstock-related arguments (e.g., biosolids and MSW issues) of the past have moved from a national focus down to a state and even local one in some instances. The argument over whether mixed solid waste can be composted is largely mute, since economics of disposal versus recycling has made it difficult to develop such facilities. The US Environmental Protection Agency (EPA) addressed most of the health and safety concerns regarding biosolids with its 40 CFR Part 503 regulations. National nu-

trient management issues recently have overshadowed concerns about the allowable levels of pollutants in compost products.

Probably one of the greatest infrastructure challenges that still exists in the composting industry is a fiscally unstable network of composting and recycling organizations at both state and national levels. Many of these important nonprofit organizations are struggling for their survival, and both need and deserve to be better supported by their respective industries. Without these types of organizations, it would be difficult to organize many of the necessary efforts we take for granted. Certainly the US composting industry could benefit greatly if it better supported their national industry trade and educational organization, the US Composting Council (USCC).

Areas in which the composting industry has made great strides are in the development of composting marketing and production tools and expanding compost use markets. These efforts have been largely accomplished through the USCC, its market development committee, and professional services contractors working with the USCC and some state composting associations. Another major area of interest to the composting industry has been the development of national compost standards, a very controversial and difficult task. Significant progress has been made in this area of national importance through the development of the Seal of Testing Assurance (STA) program.

Seal of Testing Assurance Program

Since its inception in 1990, members of the USCC have agreed that establishing compost quality standards was one of the leading issues of importance facing the industry. The USCC developed and kicked off

Key Elements of the Seal of Testing Assurance Program

1. Participants regularly sample and test their product

Testing frequency is based on the quantity of compost produced:

Compost Quantity	Frequency
1-6,250 tons	once per quarter
6,251-17,500 tons	once per 60 days
greater than 17,500 tons	once per month

Sample must test for pH, soluble salts, nutrients (N, P, K, Ca, Mg), moisture, organic matter, maturity (bioassay), stability (respirometry), particle size, pathogens (EPA 503), and trace metals (EPA 503)

2. Meet applicable state and/or federal regulations to ensure public health/safety and environmental protection
Applicable tests must be completed (e.g., pathogens, heavy metals, pesticides, inerts) and standards met
Participant's facility must be compliant with all applicable regulations
3. Testing will be completed at approved laboratories
Approved labs are required to use test method protocols from the *TMECC* manual
Approved labs are required to participate in the Compost Analysis Proficiency program (administered by Utah State University and managed by Bob Miller of Colorado State University)
4. Participants will offer "directions for product use" at point of sale (includes a list of product ingredients)
5. All participants will make test results available to inquiring customers (using the "Compost Technical Data Sheet," a uniform product label)
6. Participants have the right to use the STA program logo in their promotional activities
7. Participants will be included in all promotional activities of the program

the STA program in 2000 with help from an EPA grant. The program is seen by many as the first step toward the establishment of national compost standards. In its current form, however, the STA program is only a compost testing and information disclosure program that uses uniform testing and sampling protocols rather than a set of rigid analytical standards. The program uses test methods and sampling procedures outlined in the USCC's *Test Methods for the Evaluation of Composting and Compost (TMECC)*. *TMECC* is a technical manual of standardized test method protocols developed for use by analytical labs to uniformly test compost. It was developed through funds partially provided by the US Department of Agriculture.

The STA program currently has 60 composting facilities participating and more than 1.7 million yd.³ of compost under certification (see sidebar). The program allows compost buyers to more easily purchase the products they desire or require for a particular project. It also allows them to systematically compare compost products, facilitating an educated purchasing decision. Program participants use a uniform product label to allow for easy product comparisons. Educated purchasing decisions will help ensure successful utilization of compost "in the field." A factor that is perhaps even more important to the composting industry itself is that the STA program is encouraging a much needed and long overdue consistency or standardization in the composting industry—it requires consistency in product sampling, lab testing methodologies, and product labeling. Only through this type of industrywide consistency will the green industry (e.g., landscapers, nurserymen, farmers) become dependent upon the composting industry as a necessary and reliable supplier of products.

Why should composters participate in the STA program, and why should consumers demand it? Because it:

- **improves the image and value of compost**—as a manufactured product, produced under controlled conditions, both uniform and consistent;
- **improves field results**—provides compost users with the product quality and application information they need to use compost properly and with optimum results;
- **promotes customer-oriented composters**—assists composters who are rigorously testing their compost products and provides end-use information to customers to differentiate themselves from composters who do not;

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- **improves customer satisfaction**—assists compost customers and specifiers in making more informed purchasing decisions, which yield better results at lower costs;
- **reduces the chance of additional regulation**—reduces the trend of state/national organizations toward the creation of additional compost regulation, keeping operational and distribution costs down;
- **provides a competitive advantage over non-STA compost products**—STA compost will become the norm as more and more composters participate in the program. What product do you think a landscape architect, landscaper, or homeowner would specify or purchase given the choice?
- **becomes an internal quality-control program for composters**—allowing the composters to market their product, and end users to purchase that same product, with confidence;
- **standardizes laboratory test methods used to evaluate compost products**—allows composters, regulators, researchers, and compost buyers/specifiers to better compare products being produced throughout the country;
- **promotes the STA program's logo with end-user groups**—this will help add strength to the long-term program and provide participants with a competitive marketing advantage.

Yet even with all of the potential benefits to its participants (the composters), end users, and specifiers, as well as the long-term viability and growth of the composting industry, many composters resist such national efforts. Some composters do not believe the program is necessary, some believe that they don't need it, and others simply don't want to invest in program participation. As someone who has spent his entire professional career in the composting industry (almost 18 years), I see this as a huge mistake. The success of the STA program (the only national program of its type) goes far beyond the marketing success of any individual composter. It works toward the goal of bringing consistency to the composting industry, something end users have been concerned about ever since our industry became commercially viable. Without an understood and consistent basis to evaluate compost products, how can credible standards for compost even be considered? The obvious answer is that they can't! For additional information on becoming a STA program participant, log on to the USCC's Web site (www.compostingcouncil.org) or contact Al Rattie at 215/258-5259.

Efforts on Compost Specifications/Standards

Great interest continues to exist in the development of national compost specifications and standards. Landscape architects have been demanding specifications for years, and various public entities require them in order to utilize and purchase products.

EPA realized that the development of a model department of transportation (DOT) specification for compost was necessary to better promote the use of compost in state highway and other public applications and

to develop more continuity among existing state specifications. In 2000, The Composting Council Research and Education Foundation applied for and received a grant from EPA to promote compost use in state DOT applications and, as part of the project, develop a model DOT compost spec.

The model spec includes both boilerplate compost usage instructions (not shown in the table on page 36), as well as suggested numerical standards. The development of this industry-based standard was derived from field success and specifications that are

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DOT Compost Specification for General Landscape Applications (Soil Amending)

Parameters ^{1,6}	Reported as (units of measure)	General Range
pH ²	pH units	5.0–8.5
Soluble Salt Concentration ² (electrical conductivity)	dS/m (mmhos/cm)	Maximum 10
Moisture Content	%, wet weight basis	30–60
Organic Matter Content	%, dry weight basis	30–65
Particle Size	% passing a selected mesh size, dry weight basis	98% pass through 3/4-in. screen or smaller
Stability ³ Carbon dioxide Evolution rate	mg CO ₂ -C per gram OM per day	< 8
Maturity ³ (bioassay) Seed emergence Seedling vigor	%, relative to positive control %, relative to positive control	Minimum 80% Minimum 80%
Physical Contaminants (inerts)	%, dry weight basis	< 1
Chemical Contaminants ⁴	mg/kg (ppm)	Meet or exceed EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3 levels
Biological Contaminants ⁵ Select pathogens Fecal coliform bacteria Salmonella	MPN per gram per dry weight MPN per 4 grams per dry weight	Meet or exceed EPA Class A standard, 40 CFR § 503.32(a) levels

¹ Recommended test methodologies are provided in *Test Methods for the Examination of Composting and Compost*.

² It should be noted that the pH and soluble salt content of the amended soil mix is more relevant to the establishment and growth of a particular plant than is the pH or soluble salt content of a specific compost (soil conditioner) used to amend the soil. Each specific plant species requires a specific pH range. Each plant also has a salinity tolerance rating, and maximum tolerable quantities are known. Most ornamental plants and turf species can tolerate a soil/media soluble salt level of 2.5 dS/m and 4 dS/m, respectively. Seeds, young seedlings, and salt-sensitive species often prefer soluble salt levels at half the aforementioned levels. When specifying the establishment of any plant or turf species, it is important to understand their pH and soluble salt requirements and how they relate to existing soil conditions.

³ Stability/Maturity rating is an area of compost science that is still evolving, and as such, various other test methods could be considered. Also, never base compost-quality conclusions on the result of a single stability/maturity test.

⁴ EPA Class A standard, 40 CFR § 503.13, Tables 1 and 3 levels = arsenic 41 ppm, cadmium 39 ppm, copper 1,500 ppm, lead 300 ppm, mercury 17 ppm, molybdenum 75 ppm, nickel 420 ppm, selenium 100 ppm, zinc 2,800 ppm.

⁵ EPA Class A standard, 40 CFR § 503.32(a) levels = salmonella <3 MPN/4 grams of total solids or fecal coliform <1,000 MPN/gram of total solids.

⁶ Landscape architects and project (field) engineers may modify the allowable compost specification ranges based on specific field conditions and plant requirements.

known to be effective in the field. Additional information regarding the DOT project report, as well as the model spec, can be found on the USCC Web site.

Another national compost standards effort currently is underway, which has been sponsored by the Recycled Materials Re-

source Center at the University of New Hampshire. The three major objectives of the “Developing and Implementing National Erosion/Sediment Control Specifications for Composted Products” proposed project are to develop product and usage specifications for the use of compost products in erosion

and sediment control; gain approval of the specifications, as well as their placement in American Association of State Highway and Transportation Officials’s (AASHTO) *Standard Specifications for Transportation Materials and Methods of Sampling and Testing* manual; and promote the specifications throughout associated industries.

Development of these specifications is being completed by gathering and evaluating existing DOT and other compost/mulch erosion control specifications, as well as by obtaining past and current research and field demonstration data pertaining to the use of compost/mulch materials as both a soil blanket (mulch) and filter berm material. The specifications are going through intense industry review by the project’s National Advisory Board and AASHTO’s Subcommittee on Materials members. The project also will develop a formal information package pertaining to the use of compost/mulch in erosion and sediment control, which can be used by composters to better market their compost in this growing market segment. R. Alexander Associates Inc. is completing this project.

So, as you can see, efforts in the area of national compost standards and specifications finally are gaining some momentum. We now have a means by which to consistently characterize compost products (the STA program) and some new proposed national specifications in which to evaluate them against (of course, the specifications will no doubt be modified in each state where they are used). These tools will be invaluable to the composting industry, allowing it to expand compost markets, gain credibility within the green industry, and (we hope) increase product value. Now is the time for the composting industry to work together and embrace and rally around these types of projects and programs in order to raise itself to the next level. This means that individual composters, regulators, state composting organizations, and the USCC must work together wherever possible. The ability of our industry to focus and coordinate these types of important efforts will depend to a large extent on the initiative of individual composters and on the health of our national and state composting organizations. These organizations must be supported to ensure the success of our industry. **MSW**

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