

GUIDANCE FOR USE

WHAT'S BEHIND A COMPOST LABEL OR SEAL?

As part of a project to improve knowledge about purchases, the Cornell Waste Management Institute examined guidelines, label requirements and quality seals for commercial composts.

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MANY home gardeners, commercial growers and landscape managers who are interested in using composts don't have enough experience to help them choose the right one that will best meet their needs. For example, when topdressing turf, fine texture may be critical; but for potting mix, maturity and low conductivity may be more important. Many consumers are also not familiar with the meaning of such compost parameters as soluble salts or C:N ratio.

To help inform compost consumers, some organizations have developed guidelines, specifications or seals that match certain compost characteristics to particular end uses. These guidelines may be presented as a range of values for particular parameters that are suggested as desirable for composts to be used in a particular application. Consumers would then compare the test results for a particular compost with those recommendations.

An alternative approach is for the entity overseeing the guideline or seal program to examine analytic data on the compost or compost-based product and compare the results to their guidelines. They would then provide recommendations about appropriate end uses. In such a scenario, the consumer is not required to make use of the test data directly.

As part of a New York State (NYS) project partially funded by the NYS Energy Research and Development Authority (NYSERDA), the Cornell Waste Management Institute (CWMI) examined the compost guidelines, label requirements, specifications for use and seal of quality or certificate programs available to consumers. Those generated by an individual compost producer were not included since they might be influenced by the attributes of their own compost. For U.S. guidelines, we identified only a few sources, which are:

USEPA and state environmental agen-

cies: The environmental regulatory agencies at the federal and state levels have adopted rules pertaining to certain composts. These rules pertain to environmental protection and do not generally address constituents or parameters that may be important to compost users but that do not have environmental implication. Composts that include sewage sludges are covered by these rules. At the federal level and in most states (including NYS), agricultural and yard waste composts are not subject to such standards. Therefore these standards are not included in the discussion and analysis that follow. However, the guidelines for heavy metals adopted by the U. S. Composting Council (USCC) are identical to the US EPA sludge standards.

Mulch and Soil Council: (formerly the National Bark and Soil Producers Association) The MSC mission is to "define quality products and promote an open marketplace for producers of horticultural mulches, consumer soils and commercial growing media." They have identified pH and soluble salt ranges for compost, topsoil and other products. Their guidelines are available at: <http://www.nbspa.org/consumer/soilnomenclature.html>.

Natural Resource, Agriculture, and Engineering Service: NRAES is an interdisciplinary, issue oriented program sponsored by Cooperative Extension of fourteen member land grant universities. Their "On-Farm Composting Handbook" includes guidelines that address an array of physical and chemical parameters for compost used in agriculture (Northeast Regional Agricultural Engineering Service, 1992).

Rodale Organic Gardening Compost Quality Seal: This program is a partnership between Rodale Organic Gardening and Woods End Research Laboratory (WERL), Inc. Under this program, compost producers submit samples to WERL where it is tested for key nutrients and trace elements, pH, C:N ratio, heavy metals, soluble

salts, plant response and pathogens. Where the product is not compost, but a soil amendment blend such as potting mix, samples submitted are the final product and not the compost inputs. Based on results, tested material is then classified for best use as seed starter, container mix, garden compost, topsoil blend, mulch or fertilizer. Information on the program is available at: <http://www.organicgardening.com/compostseal>.

U.S. Composting Council (USCC): This not for profit organization published a USCC Field Guide to Compost Use which contains guidelines for different uses (US Composting Council, 1996). They have also developed guidelines for use in the landscape industry. These guidelines address an array of physical and chemical parameters. With few exceptions, the recommended values are identical for all compost end uses. USCC also created and administers the Seal of Testing Assurance (STA) program. Participating compost producers can display the seal if they submit samples to an STA certified laboratory for analysis of selected physical and chemical parameters and meet standards for nine metals equivalent to those required by US EPA for sewage sludges used as a soil amendment. There is no classification of composts for different uses. There is a fee for this program. Information is available at: <http://tmecc.org/sta/index.html>.

State Departments of Transportation: A number of states have established specifications for compost used in transportation (DOT) projects. These specifications are used by DOTs as requirements for composts used in DOT projects. Since these differ from state to state, for this article we considered the NYS DOT specifications.

Some of these guidelines apply only to one or two end uses (DOT and NRAES, for example), while others apply to a wider array of compost applications. The guidelines also differ in the number of physical and chemical parameters that they address. The MSC guidelines specify only pH and soluble salts, while density, moisture content, organic matter, pH, soluble salts, maturity, particle size, foreign matter and metals are included in others. Only the Rodale guidelines address plant response measurements.

An examination of the USCC guidelines shows that although they mention end uses from potting mix to erosion control, the recommended values are identical for almost all of the identified end uses. The fact that the guidelines are essentially the same for all uses indicates that they may not be refined enough to provide the kind of guid-

Guidelines can cover a range of values suggested as desirable for composts to be used in a particular application.

Figure 1. Sample of a possible standardized information label for composts

Feedstock: Dairy cow manure, wood chips, sawdust, leaf and yard waste					
Date of Analysis: 06/24/03; 3 samples taken					
General	Unit	s1	s2	s3	Ave
Maturity	<i>solvita</i>	6	6	7	6.3
Organic Matter	%	34.1	31.2	29.6	31.6
Weed Seeds	#/Liter	4	12	7	7.7
Density	lb/ft ³	44.5	37.9	41.0	41.1
Solids	%	23	31	28	27.3
C:N Ratio	X:1	16	21	19	18.7
pH	<i>pH</i>	7.91	8.01	7.84	7.92
Conductivity	<i>mmhos</i>	2.8	5.2	4.1	4.0
Nutrients					
Total Nitrogen (N)	%	1.3	1.6	1.5	1.5
Total Phosphorus (P)	%	0.4	0.1	0.3	0.27
Total Potassium (K)	%	0.7	0.9	1.1	0.9
Total Calcium (Ca)	%	4.07	3.12	3.98	3.72
Total Magnesium (Mg)	%	0.71	0.52	0.64	0.62
Metals					
Copper	<i>ppm</i>	31.6	64.8	45.2	47.2
Iron	<i>ppm</i>	9603.1	5684.5	7874.9	7720.8
Zinc	<i>ppm</i>	125.8	182.9	98.4	135.7
Arsenic	<i>ppm</i>	5.6	1.1	2.5	3.1
Cadmium	<i>ppm</i>	3.1	0.9	2.2	2.1
Plant Response					
<i>L. sativum</i> germination	%	98.5	99.4	101.3	99.7
<i>L. sativum</i> weight	%	52.0	69.3	45.1	55.5

ance that users need. Recognizing that these guidelines were developed some years ago and that knowledge about end user needs has developed, the USCC is considering revising the guidelines.

WHAT DO CONSUMERS WANT?

In a previous survey of the compost attributes of greatest interest to compost users, we found that weed seeds were the biggest concern. Weed seed content is not a standard parameter for which composts are routinely monitored and none of the guideline programs specify maximum weed seed content. The USCC Landscape guidance calls for composts that are "weed free;" however, no numeric value (number of weed seeds/volume of compost) are specified. Pathogens were also a user concern, and ex-

cept for regulations pertaining to composts produced from sewage sludges, pathogens are not included in most guidelines.

Of greatest interest to users is plant response. Two methods used to directly measure plant response are germination tests and measures of plant biomass. Again, these are not routine parameters measured in compost tests, nor are they included in most guidelines.

TESTING COMPOSTS

Determining compost quality is not easy. Composts often exhibit some heterogeneity. In a recent project, CWMI had several replicate composite samples of 25 different manure-based composts analyzed at WERL for an array of parameters. For a number of parameters like Total Kjeldahl Nitrogen, the replicates were similar; however, for other parameters, notably organic matter, even samples taken on the same day each of which was a composite of 16 grab samples taken from throughout a single compost pile, showed significant differences. This heterogeneity did not decrease with increased turning or with the use of dedicated

turning machines. Heterogeneity presents a challenge for sampling and characterization of composts.

Another challenge is interpreting analytic results since procedures used by laboratories may differ. The development by the USCC of recommended methods for many tests is helpful.

WHERE TO FROM HERE?

To encourage greater use of composts, there is a need to develop more use-specific guidelines for composts. CWMI is engaged in a project to try to develop guidance for compost use in vineyards, turf maintenance and landscape remediation. With support from the New York State Energy Research and

Development Authority (NYSERDA), the Cornell University Agricultural Experiment Station, the NYS College of Agriculture and Life Sciences and Cornell Cooperative Extension, we are working with Cornell faculty and staff and with local cooperators to test the impact of compost additions on soil quality and on plant response. The sites include several vineyards, athletic fields, home lawns and one construction-compacted soil on the Cornell campus. As part of the project, we will be working with representatives of the relevant industries to assess their knowledge about compost use and their needs. This includes grape growers, turf managers and landscape architects. We hope to develop improved guidance regarding compost use specific to the needs of those industries and to provide outreach to both users and compost producers.

INCOMPATIBILITY WITH STATE FERTILIZER REGULATIONS

To compare composts to guideline values, consumers need to be able to obtain data on the composts. Development of a standardized information label, resembling the nutrition label for foods, might be a helpful approach. Figure 1 shows how a sample label might look. However, one confounding issue in looking at the potential for a compost label program or even for individual compost producers to provide information to customers is a conflict with fertilizer rules. Most states regulate fertilizer under rules closely patterned on a model law put forward by the Association of American Plant Food Control Officials (AAPFCO). Under these rules, materials manufacturers making certain claims about their products in relation to plant nutrients fall under rules for fertilizers. Thus providing information regarding nitrogen, phosphorus, potassium, calcium, magnesium, copper, iron or zinc content, or even making a statement such as "helps plant growth" would require that that product be registered as a fertilizer.

Unfortunately, the fertilizer law was developed prior to the emergence of compost as a significant product in the market place. The fertilizer rules are established to provide consumer protection to ensure that they are getting what they pay for. Any nutrient content information provided by a manufacturer must be the minimum guaranteed concentration. On a weight basis, the product must meet or exceed the stated percent concentration of the nutrient. The rules also specify the use of certain testing procedures and limit the information about other attributes that the manufacturer may provide to consumers. The current rules are not appropriate for composts which are a very different product.

There are many aspects of the fertilizer rules that are a misfit for composts. Composts, unlike most fertilizers, are applied as a soil amendment used to increase organic matter and establish beneficial microbial populations. Compost is not a formulated

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product, so it is variable. The nutrient content may vary from batch to batch and from sample to sample. Fertilizer is used in pounds, compost in tons, so a per ton fee is not equitable. The rules also require labeling by product weight. Composts, unlike most fertilizers, are not dry products and the weight of compost will change. One commercial compost producer who is registered as a fertilizer reports overfilling bags by at least ten percent so that loss of weight due to loss of moisture will not result in fines. Fertilizer rules prohibit labels from including critical information for composts such as organic matter content. To protect consumers, fertilizer laws require that any nutrient claims represent a guaranteed minimum nutrient content. However, composts exported from a farm that falls into the Confined Animal Feeding Operation (CAFO) rules are required to notify users of the average nutrient content. A farmer cannot simultaneously obey both. Finally, specified test methods for fertilizers are not applicable to composts.

For several years, the USCC has been working unsuccessfully with AAPFCO to develop a model law for composts. More recently, the effort has switched to trying to amend the model soil amendment law to make it appropriate for inclusion of composts. However, at this time there is no model legislation proposed or agreed upon. In NYS, the fertilizer law exempts certain materials including "unmanipulated animal and vegetable manure." The NYS Department of Agriculture and Markets has not included composts produced from manure and vegetable in that defined exemption. To address this problem for composters, a bill to exempt compost derived from animal and vegetative constituents from the definition of a commercial fertilizer passed the NYS Assembly and Senate in June, 2003 and at the time of writing this article, it is awaiting the signature of the Governor.

Providing information to compost users in the form of both analytic data and guidelines for compost use remains an important goal. There are few existing programs that can meet that need and there is inconsistency among those programs in regard to recommendations concerning compost quality for different end uses. Because compost is a relatively new product, efforts are needed to work with compost end markets to identify compost traits and application practices necessary to meet their needs. At the same time, compost producers need to continue to work towards developing a consistent product and to test their composts periodically to determine the quality. Development of a consistent, easy-to-read label would help consumers compare products and select those meeting their needs. ■

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