

Compost Maturity Test

Composts have several uses in both container and bareroot nurseries. They can serve as the organic component in growing media, and research has shown that compost-based media are suppressive to soilborne diseases. Bareroot nurseries can use organic composts as soil amendments to improve tilth, drainage and aeration. They also make ideal mulches for covering seed and protecting young emerging germinants, or for over-wintering older seedlings.

The composting process is explained in detail in the January, 1994 issue of FNN, but here's a quick review. Composting requires a mixture of organic wastes with particles ranging from 1 cm to 5 cm (0.4 to 2.0) in size and with a carbon-to-nitrogen (C:N) ratio between 25:1 to 35:1 (Figure 11). In the case of organics with a high C:N, like sawdust, fertilizer nitrogen is also required. The decomposer micro-organisms require water and oxygen to breakdown the organic matter and reproduce, and then give off heat and carbon dioxide as by-products of their respiration.

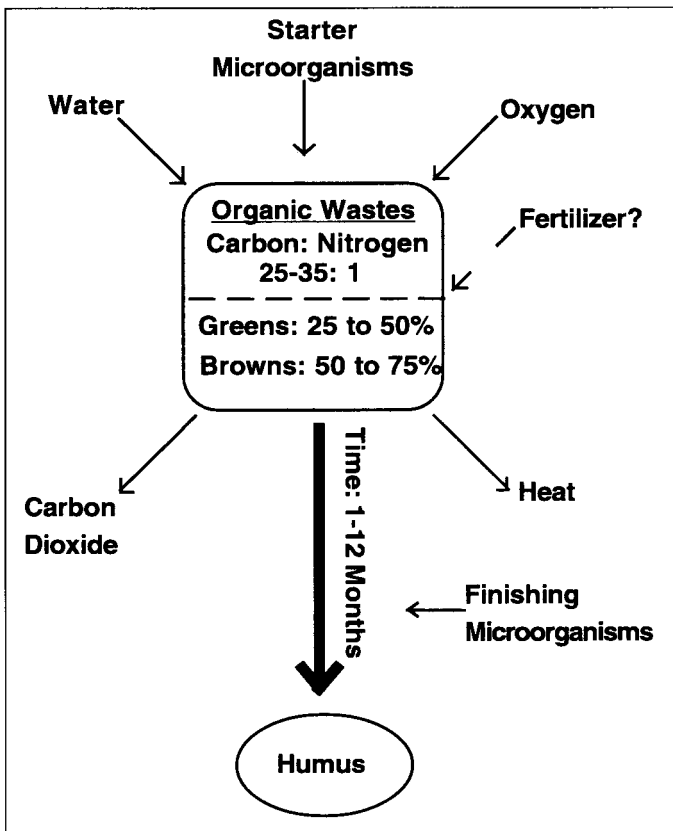


Figure 11. Although composting occurs naturally, nurseries can speed up and improve the quality of the humus by monitoring their compost piles

Up until now, the only way to check the progress of your compost pile was to measure the internal temperature. Recently, however, Woods End Research® has developed a series of field test kits which nursery managers can use to scientifically track the biological progress of their compost:

* The Compost Maturity Test is a colorimetric test that takes only 4 hours, and costs about \$14 per sample. The relative color is keyed to a numerical index from 1 to 8 (Table 6), which then describes the compost condition. Cost = \$84.00 (does 6 tests)

* The Compost Self-heating Test Kit evaluates the stability of the compost by measuring residual heating ability by monitoring the temperature in a special reusable flask. Cost = \$325.00

* The Compost Oxygen Probe is a kit containing a hand vacuum pump with a long probe for taking gas samples from within the compost pile. Cost = \$575.00

Woods End Research also performs other more complicated tests that require controlled laboratory facilities. Compost conditions, such as: decomposition rate, volatile organic acids, and phytotoxic compounds can be done on a fee basis. For more information, contact:

Jonathan W.Q. Collinson
 Woods End Research Laboratory
 Old Rome Road, Rt. 2, Box 1850
 Mt. Vernon, ME 04352 USA
 Tel: 207-293-2457
 Fax: 207-293-2488

Table 6. Relationship between organic compost condition and Solvita® Test Kit results

<u>Stage in Composing Process</u>	<u>Compost Maturity Test</u>	<u>Dewar Self Heating Test</u>	<u>Approximate Oxygen Use (mg/gVS/hr)</u>	<u>Approximate Carbon Dioxide Evolution Rate %C/day</u>
Fresh, raw compost. Extremely high rate of decomposition. High is volatile organic acids and so very odiferous	1 Yellow	I	1.60	2.75
Moderately fresh compost. Very high respiration rate, requiring frequent turning and aeration.	2 Orange-Yellow	II	1.40	2.25
Active compost. High respiration rate still requiring turning and aeration	3 Light Orange	III	1.25	2.00
Moderately active compost that is still decomposing	4 Orange	III	1.00	1.50
Moderately active compost, but past the active decomposition stage. Beginning to cure.	5 Reddish-Orange	IV	0.75	1.25
Moderately mature compost in curing phase, requiring less aeration and management.	6 Maroon	IV	0.50	0.75
Well-matured and aged compost that is well-cured. Ready for growing media and soil amendments.	7 Reddish-Purple	V	0.25	0.50
Highly matured compost that is well aged. Best for soil amendments.	8 Purple	V	0.00 to 0.10	0.00 to 0.25

New Disinfectant and Algicide

Naccosan concentrate has recently been registered by the US Environmental Protection Agency for use in container nurseries. While chemically similar to the other alkyl ammonium chlorides, this new product contains four different active ingredients and so is effective at much lower concentrations. As a disinfectant, Naccosan kills fungi, and bacteria on surfaces, tools, and equipment, but can also be used to control algae in evaporative cooling systems. Another attractive feature is that chelating agents chemically immobilize calcium carbonate, so Naccosan remains effective in hard water. To get more information contact:

Dexter Friede
Grow-More, Inc.
15600 New Centry Drive
Gardena, CA 90248 USA
Tel: 310-515-1700
Fax: 310-515-4937

New Root Control Containers

Root form is always a concern with container seedlings, so manufacturers continue to offer new features that will control spiraling, and produce a well-distributed, fibrous root system. Vertical ribs inside the cells were the first revolutionary design feature, and recently the inside of the cells were coated with copper compounds to promote chemical root pruning. Recently, this technology has been applied to polybags. Another new concept features slits in the sides of containers to stimulate lateral air pruning, and several manufacturers are now offering containers with side slits.

Spin Out® Polybags—As we discussed in the July 1995 issue of FNN, root deformation and spiraling are particularly bad in containers made of plastic sheeting. Polybags are one of the most widely-used containers in the world, and are especially popular in developing countries. The Griffith Corporation has just succeeded in developing a process that will treat the surface of polybags with Spin Out®, a copper hydroxide-based root control product which is already registered in several countries. Research trials are already underway with forest species, and results look promising, but the Griffith folks would like to try out the Spin Out® treated polybags with other species and in other cli-

mates. So, if you are interested in conducting an operational trial at your nursery, contact Mark Crawford:

Griffith Corporation
PO Box 1847
Valdosta, GA 31603-2571 USA
Tel: 912-249-5271
Fax: 912-244-5978

Side slit containers—Forcing seedlings to airprune their roots at the bottom of the container is a well accepted cultural practice. Now, several manufacturers are offering containers with vertical or horizontal slits in the sides to promote lateral air pruning. The concept is attractive, and several nurseries are now testing these containers. Several different types of side slit containers are now available:

Stuewe and Sons, Inc. offers **the Rigi-pot 25050** container from IPL, Inc. as well as two side slit containers from **Hiko**: the V-50SS and the V-150SS. Both are featured in their full color catalog, so call for a free copy:

Stuewe and Sons, Inc.
2290 SE Kiger Island Drive
Corvallis, OR 97333-9461 USA
Tel: 541-757-7798
Fax: 541-754-6617

The **Winstrip®** tray system features side slit cells interspersed with open vertical columns to further encourage air exchange. These hard plastic containers come in 4 models that feature a range of different cell volumes, depths, and densities. For more information, contact:

Sarah J. Lupfer
Winstrip, Inc.
PO Box 5095
Mills River, NC 28742 USA
Tel: 704-891-6226
Fax: 704-891-8581

RootMaker® Portable Container—These were developed from the research of Carl Whitcomb who pioneered work with side slit containers. Three sizes are available—the propagation size containers are arranged in a 4x4 configuration, the #1 square or round single pot, and the #3 round pot. For prices and more information, contact:

Carl Whitcomb
Lacebark, Inc.
PO Box 2383
Stillwater, OK 74076 USA
Tel: 405-377-3539
Fax: 405-377-0131

The **Lannen Plantek F** side slot tray (Figure 12) comes in 4 sizes of square cells ranging from 50 to 90 cm³ in volume. Plantek trays were developed in New Zealand, where they are proving a viable option for growing Eucalyptus and Radiata pines. To receive more information, contact:

Hakmet Ltd.
881 Harwood Blvd.
Dorion, PQ J7V 7J5
CANADA
Tel: 514/455-6101
Fax: 514/455-1890

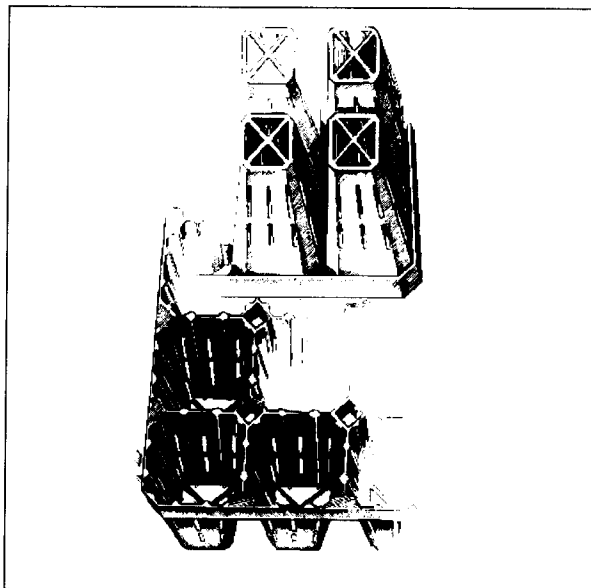


Figure 12. "Side slit" containers, such as this model from Lannen, are the newest type of containers which are specifically-designed to control root spiraling.