



FROM THE GROUND UP

Compost News for Landscape and Agricultural Professionals

Sponsored by the City of San Jose • May 2001

Commercial Food Waste Composting Underway at Z-Best Restaurant Discards Will Be Processed into Soil Amendments

Thanks to a new pilot program at the Z-Best Composting Facility, there's a good chance that any food scraps you leave on your plate in San Jose restaurants will be processed into compost! Z-Best started composting food waste from restaurants in February using the Compost Technologies Inc. (CTI) system with an Ag-Bag (www.ag-bag.com) bagger. The program, in start-up phase right now, is processing 80 tons of restaurant residuals per week. Z-Best's permit will allow for ramping up the operation to 350 tons of commercial food waste per day over the next few years.

Material collected from San Jose restaurants is taken to the Charles Street transfer station, where recyclables and large non-biodegradable objects are removed, reducing the tonnage by about nine percent. It is then loaded onto transfer trucks for the trip to the Z-Best Facility in Gilroy.

The first step at the composting facility is to run the material through the Zehr grinder. It is then mixed with an equal volume of finely screened yard trimmings and loaded into a truck mounted mixer. The material then goes to the bagging machine, which packs it into eight-mil laminated plastic composting bags that are ten feet in diameter and 200 feet long. Two aeration pipes run the length of each bag. They are connected to a timer-controlled air blower that maintains aerobic conditions. Optimum temperature and moisture conditions are maintained by managing the blower operating time and venting the water vapor during the composting process. Venting is accomplished by cutting openings in the bag to decrease moisture in the mixture, and closing the openings when the mix gets too dry.

Each bag holds about 200 tons of feedstock. After the feedstock has composted 10 to 14 weeks the bag is cut open. Depending on the level of decomposition, the compost may be managed in open windrows prior to screening and curing. Z-Best uses loaders to turn compost at the facility, which also produces yard trimmings compost products.



Greg Ryan, General Manager of Z-Best Products in Gilroy, with the conveyor, bagging machine and composting bag used to process material collected from restaurants.

The finished compost is put through a 1/4 inch screen to remove non-biodegradable material and particles that have not completely decomposed. It will be cured for a minimum of 12 weeks, in accordance with Z-Best manufacturing protocol. Carbon to nitrogen ratio of the product will be determined and it will be analyzed for major and minor nutrients. It will also be tested for levels of heavy metal elements and pathogens, in accordance with state guidelines.

Z-Best's food waste composting pilot is funded in part by a City of San Jose grant. According to Michele Young, City of San Jose, food scraps account for 30-50% of the waste at restaurants and grocery stores. "Food waste composting is a new challenge, but the benefits are worth working towards," she says. "Programs like this are a win-win—they cut waste to the landfills and they create high quality compost that can be used to improve local soils."

For a complete description of the project and the CTI system, call the Clearinghouse at (831) 427-3452 or check the website at www.urbancompost.org.

Compost for Oyster Mushroom Production

Principal Investigator: Maria de la Fuente, Farm Advisor, UCCE Santa Clara County

This project evaluates the efficacy of three yard trimmings substrate formulas for production of oyster mushrooms. The objectives of the project include developing alternative uses for municipal yard trimmings products and providing an alternative specialty crop for area growers.

Treatments include:

Substrate formulas

- BFI compost
- BFI compost + Amycel Spawn Mate (fertilizer)
- BFI composted wood-overs + compost (3:1 ratio)

Production techniques

- Commercial pasteurization
- Solarization

Commercial varieties

- *Pleurotus pulmonarius* Amycel 3014
- *Pleurotus ostreatus* Amycel 3015

Data collection

Flush intervals, number of breaks or flushes, yield per flush, size and weight of fruiting bodies, color, grade, yield per experimental unit, total yield and biological efficiency.

Preliminary findings for the project were presented at a December 2000 Field Day at UC Bay Area Research and Extension Center (BAREC). To date, the most successful treatment has been *P. pulmonarius* grown on pasteurized BFI compost without Spawn Mate, which represents savings for the grower. Under this treatment, average yield per bag after three flushes was 380 grams.

Several local mushroom growers attended the field day, which featured sampling of some fabulous dishes made with oyster mushrooms. The research project will continue through 2001. For more details check our website at www.urbancompost.org.

Pajaro Valley Compost Partnership

Dr. Marc Buchanan, Buchanan Associates, spoke about the results of his soil and crop studies at a February meeting of



Maria de la Fuente, UCCE Farm Advisor, UCCE Santa Clara County, with local mushroom growers at a December 2000 UC Bay Area Research and Extension Center Field Day.

Community Alliance with Family Farmers. Project work, which began in the Fall of 1999, includes field sites in the Gilroy, San Juan Bautista and Watsonville areas. Fields are of four soil types: coarse sandy loam, fine sandy loam, sandy clay loam, and loam.

Buchanan explained the “Maturity Index,” recently introduced by the California Compost Quality Council (CCQC). To earn a mature rating, compost must have a carbon to nitrogen ration less than or equal to 25, pass a test demonstrating level of carbon dioxide release or oxygen demand, and a test measuring presence of potentially plant-toxic compounds. More information on the Maturity Index is available from CCQC at (530) 265-4560 or www.ccqc.org. Buchanan believes the Maturity Index may be a useful tool to assess compost quality, particularly when supplemented by some key compost chemical and physical parameters. When immature composts are added to the soil they can continue to decompose, negatively affecting plant growth by reducing oxygen, water infiltration and/or available nitrogen.

See Compost Partnership, page 4

Compost and Mulch Product Suppliers

BFI Organics, (408) 945-2844
Zanker Road Resource Management, (408) 263-2384
Z-Best Composting Facility, (408) 846-1574

City of San Jose Organics Diversion Programs

Michele Young, (408) 277-3780, Michele.Young@ci.sj.ca.us

From the Ground Up Clearinghouse and Newsletter

Karin Grobe, (831) 427-3452, karingrobe@earthlink.net

From the Ground Up is funded and administered by the City of San Jose Environmental Services Department. The purpose of From the Ground Up is to disseminate information on production and use of compost, compost tea and mulch to landscape, agricultural and horticultural professionals. Information submissions and inquiries should be directed to Karin Grobe, Outreach Coordinator and Newsletter Editor, (831) 427-3452, karingrobe@earthlink.net or to Michele Young, City of San Jose Environmental Services, michele.young@ci.sj.ca.us.

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Use of Grasscycling to Improve Turf Quality

Ali Harivandi, UCCE Environmental Horticulture Advisor, discussed his research on grasscycling at the January 2001 Northern California Turf and Landscape Council Expo. The study focused on the effect of grasscycled clippings on weed invasion, turf quality and thatch accumulation. It also measured nitrogen removed using a non-recycling (bag) mower.

Grass clippings are high in nitrogen and average total nitrogen removed with clippings was 3 lbs/1000 square feet/year. Although a clear benefit of grasscycling is nitrogen return to the turf stand, not all the nitrogen returned from grasscycling becomes available to plants. A recycling mower should be able to reduce nitrogen application approximately 25% from levels required when a bag mower is used. Grass clippings are 2/3 water and they contain 4 percent nitrogen, 0.5 percent phosphorus and 2 percent potassium.

Although thatch accumulation was slightly higher when a grasscycling mower was used, differences in thatch depth were too small to concern a turf manager. Bermuda grass, Kentucky bluegrass and kikuyu grass produce more thatch than most other turfgrasses, and require regular dethatching whether the site is grasscycled or not. Thatch also has some benefits: a half-inch layer of thatch provides insulation to roots, reduces soil water evaporation, cushions playing surfaces, and may prevent soil compaction.

Harivandi pointed out that while grasscycling reduces mowing time and disposal costs, it is not appropriate when the grass is too wet or too tall. Options such as composting and mulching are viable alternatives to grasscycling in these cases. Dried turfgrass clippings applied as a mulch aid in weed control and prevent moisture loss in ornamental planting beds. While a three to four inch layer of mulch is necessary to reduce weed infestations, adding too much mulch prevents oxygen movement into the soil. Mulches should be kept away from tree trunks in order to avoid the moist conditions that would allow for infestation by tree bark disease causing organisms. Mulching with Bermuda grass clippings should be avoided due to its invasiveness, as should mulching with clippings receiving recent or regular herbicide applications. Turfgrass clippings are an excellent addition to a compost pile. They contain high levels of nitrogen, and should be layered or mixed with high carbon materials like leaves, dried plants and weeds.

The research is detailed in a UCCE Bulletin, California Turfgrass Culture, "Grasscycling in California." Practical information on grasscycling is included in "Reusing



Ali Harivandi, UCCE Environmental Horticulture Advisor, checks his hard fescue turf grass field plots at a Fall 2000 UC Bay Area Research and Extension Center Field Day.

Turfgrass Clippings to Improve Turfgrass Health and Performance in Central and Northern California," by Janet Hartin and Ali Harivandi, UCCE. If you would like a copy of either document contact the Clearinhouse at (831) 427-3452.

Compost as a Top Dressing for Turfgrass

Michelle Le Strange, UCCE Farm Advisor, Tulare County, presented her research on use of compost as a top dressing for Bermuda turfgrass at the January 2001 Northern California Turf and Landscape Council Exposition.

A yard trimmings/biosolids compost was applied at various rates and its effect on turf performance was compared to that of conventional fertilizer. The 1/4 inch application, which was repeated four times per year, garnered the highest quality rating. Some reduction in crabgrass occurred because the light, frequent topdressing nourished the turf regularly and gave it a competitive advantage over the crabgrass. This treatment failed to reduce the annual bluegrass populations during the winter months, however. There was no significant difference in thatch layer development between any of the treatments.

Compost applications of 1/4, 1/2, and 1-inch depths applied to turf in late fall resulted in an improvement of turf color throughout the year and delayed the onset of dormancy. However, 1-inch applied at one time creates a very low quality turf until the organic matter filters into the soil profile. Overall, consistently higher quality turfgrass ratings and lower weed populations of crabgrass were observed when 1/4 inch compost topdressings were applied four times throughout the year (October, April, June, and August). However, a high clipping yield was also observed

See *Turfgrass Topdressing*, page 4

From the Ground Up Clearinghouse

The purpose of the From the Ground Up Clearinghouse is to collect and disseminate information on production and use of compost, compost tea and mulch. Information is mailed to callers in response to requests for no charge. Newsletters and research reports are also available online at www.urbancompost.org.

We can gather information specific to your needs on request. Contact Karin Grobe at (831) 427-3452 or email karingrobe@earthlink.net with requests.

Documents Available from the Clearinghouse

"Increasing Government Purchase of Compost Products," Michele Young and Karin Grobe. A turfgrass comeback at a soccer field gives momentum to policies designed to boost compost purchases by city agencies. Reprinted from *BioCycle*, December 2000.

New Publications from the Waste Board

The California Integrated Waste Management Board will supply the following publications free of cost. Call (916) 341-6300 to request copies of the following publications, or download from the website, <http://www.ciwmb.ca.gov/Publications/>.

- Composting Reduces Growers' Concerns About Pathogens, Publication #442-00-014.
- Compost Microbiology and the Soil Food Web, Publication #442-00-013.
- Persistence and Activity of Pesticides in Composting, Publication #442-00-015.

Compost Partnership

Continued from page 2

Buchanan summarized some important chemical and physical differences between chicken manure-yard trimmings compost and yard trimmings composts. The differences may influence their impact on soil nitrogen and crop productivity. His findings included the following:

- Composts produced with chicken manure and yard trimmings appear to provide more available nitrogen than yard trimmings composts.
- Immature and very mature composts may reduce inorganic soil nitrogen and decrease production in conventionally farmed soils.
- High ammonia-nitrogen levels of immature manure-based composts can reduce seed germination and crop productivity.
- Mature composts can provide agronomically significant nitrogen if application is correctly timed.
- Placement and timing of compost applications directly affect crop response.
- Stabilized yard trimmings mulch may provide weed control benefits in establishing vineyards.

A summary of the project objectives and findings to date is available by calling the Clearinghouse at (831) 427-3452, or at our website, www.urbancompost.org.

Soil Biology Primer

The Soil Biology Primer is an introduction to the living component of soil and how it contributes to agricultural productivity, and air and water quality. The Primer includes units describing the soil food web and its relationship to soil health, and units about bacteria, fungi, protozoa, nematodes, arthropods and earthworms. Authors include Elaine Ingham, Andrew Moldenke and Clive Edwards. Published by USDA Natural Resources Conservation Service.

The on-line version is available at www.statlab.iastate.edu/survey/SQI/SoilBiologyPrimer/index.htm. Order printed version by calling 1-800-THE-SOIL. The cost is \$6 per copy plus shipping and handling.

Field Guide to On-Farm Composting

This is a companion to the On-Farm Composting Handbook and is meant to assist in day-to-day compost system management. Topics discussed in the book include: operations and equipment; raw materials and recipe making; process control and evaluation; site considerations, environmental management, and safety; composting livestock and poultry mortalities; and compost utilization on the farm. 128 pages, 1999. Publication number NRAES-114, available from Natural Resources, Agriculture and Engineering Service, phone 607-255-7654, www.nraes.org/.

Turf Grass Topdressing

Continued from page 3

with this treatment. It may be better to apply 1/4 inch only two or three times a year. This reduction in frequency would reduce costs, decrease clipping yield and likely still provide the same positive effect on weeds and quality. Compost applications of 1/8, 1/4, or 1/2-inch on an annual basis are better than none and provide a small increase in quality and color over the control but are insufficient to improve turf performance to a truly higher standard.

Le Strange found that in terms of application and material costs, compost is significantly more expensive per pound of nitrogen than synthetic fertilizers and is comparable in cost with steer manure. Application costs for compost are based on tonnage rather than the amount of area to be treated so cost of application becomes quite significant as rates of topdressing increase. However, due to significant reduction in weed populations, the savings in herbicide applications may more than compensate for the increase cost of applying compost. Complete report on the project is available at www.urbancompost.org or by calling the Clearinghouse at (831) 427-3452.