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Growing Yard Trimmings Facilities With Food Waste Composting

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FOOD WASTE COMPOSTING TAKES HOLD IN MISSOURI

RISING landfill tip fees and greater environmental awareness have spurred the creation of two thriving food waste composting facilities, Missouri Organic Recycling, Inc. in urban Kansas City and Black Oak Organics, LLC in less-populated Springfield, Missouri. "The economics of composting organics finally started working in this region, and the green mindset took hold," says Alan Chappell of Environmental Concepts and Design (EC&D), an organics recycling and composting consultancy firm in Brookline Station, Missouri that assists both companies.

Missouri Organic Recycling, Inc. (MOR) started out as a yard trimmings composting facility, processing grass and leaves from municipalities, residents and commercial sources. Dave Anderson, MOR's president, founded the family-owned company in 1992. His son Kevin is vice president of marketing and public relations; another son, Jason, is vice president of operations.

The Andersons wanted to expand by collecting and composting food waste and construction and demolition (C&D) debris. They received approval from the Missouri Department of Natural Resources (MODNR) to conduct a two-year pilot project with a local bagged salad preparation facility, Redi-Cut Foods in Kansas City. "The state was very

*A yard trimmings
composter and a
solid waste
management
company succeed
with commercial
ventures, aided
by grant funding
from state and
local agencies.*

Molly Farrell Tucker



interested in MOR doing a pilot," says Chappell. MOR named the pilot program FRED (Food Residual Environmental Diversion).

The pilot began in December 2001, with MOR composting the salad residuals at its five-acre Kansas City yard trimmings site, but the Andersons soon realized that the site wasn't large enough to accommodate food waste composting. While the pilot was underway, they decided to purchase a larger, 10-acre site on a 1,800-acre farm in Liberty, a suburb of Kansas City that was close to Redi-Cut Foods' facility.

MOR received a grant from MODNR to pay for a feasibility study to evaluate the economics of a significant expansion into food waste composting and to inventory sources of material. "The economics were right," says Chappell. "In the past 10 years, landfill tip fees in the Midwest had increased from \$15 to \$17/ton up to \$30 to \$40/ton."

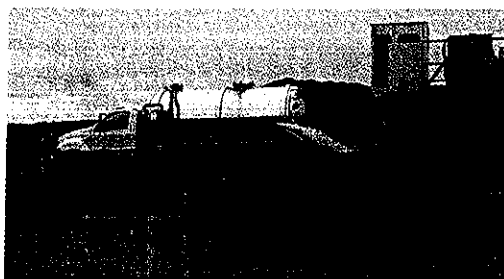
More than 30 different types of food waste generators in the area were identified, including universities, large office complexes, hospital and correctional facility cafeterias; poultry, beef, pork and fish processing plants; individual supermarkets and supermarket chains; and perishable and nonperishable food manufacturing sites. Some produced semisolids and liquids as well as solids.

The Mid-America Regional Council (MARC) Solid Waste District (a nonprofit association of city and county governments and the regional solid waste authority) gave MOR additional funds to do more detailed audits of 75 of these food waste generators. "We had proven that there were tons of businesses that had food waste that could be composted, so MARC funded the audits," says Chappell.

Having determined feedstocks were



Missouri Organic Recycling collects commercial and institutional food waste mixed with soiled paper and cardboard (above), and uses a 2,800-gallon tanker truck for collecting wastewater from food processing customers (above right).



Food processors save money by having their wastewater used for composting.

available, MOR decided to move ahead with expanding its yard trimmings composting operation to receive larger quantities of food waste. To process these materials, MOR had to obtain a construction permit from MODNR's Water Pollution Control Department and have the potential feedstocks approved by the Department of Solid Waste. MOR was the first company in Missouri to apply for these permits, and the agencies had no rules or regulations in place to guide them. "The state was hugely supportive of food waste composting, and the agencies were very responsive in helping us time both the permits and the grants to meet our needs," says Chappell.

Permits were received in November 2004 and MOR began receiving food waste in March 2005. The permits allow MOR to accept food production residuals as well as pre and postconsumer wastes. "MOR won't have to keep going back to the state to ask

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FOOD WASTE DIVERSION AT MISSOURI STATE UNIVERSITY

Tony Hein is director of food service operations for Sodexo at Missouri State University (MSU). Sodexo, which has food service operations at 1,000 universities, feeds 5,000 of the approximately 20,000 students at MSU. Black Oak Organics began collecting food residuals in late September 2008 from two of the three dining centers that Sodexo operates on the campus.

From January through May 2009, Black Oak Organics collected 170,000 pounds of food waste from the two MSU dining centers. In fall 2009, it will begin collecting from a third smaller cafeteria on the campus. Black Oak Organics provides

the containers and Sodexo purchases compostable liners, napkins, straws and cutlery. "We decided to use only sustainable products in the dining centers so we wouldn't have to rely on students to keep contamination out," Hein says.

One big advantage of the food waste diversion program, says Hein, is that they have been able to turn off the garbage disposals in the kitchens of the dining centers, which saves 42,000 gallons of water a week, plus the electricity costs of running the disposals. "We used to run two huge garbage disposals 13 hours a day, 7 days a week, and each disposal would use a gallon of water every 8 seconds."

that its permit be amended for a new type of food waste, because it allows for virtually any type of food production or restaurant food waste," says Chappell.

COLLECTION LOGISTICS

In 2005 MOR received a \$50,000 grant from MODNR's Environmental Improvement and Energy Resources Authority (EIARA) to purchase a 2,800-gallon capacity tanker truck to collect wastewater from MOR's food processing customers. "Food processors save money by having their wastewater used for composting, because they pay a lower tip fee to MOR than they would to a landfill, and they don't have to pay a wastewater facility to treat the water," explains Chappell.

To collect commercial and institutional food residuals, designated containers (some lined with compostable bags) are placed in cafeterias or other selected areas. In addition to food, MOR accepts virtually all types of paper, including wax-coated labels, waxy wet-strength cardboard boxes, colored paper and milk cartons. "These types of paper are a pretty high percentage of what comes out of grocery stores, and fiber recyclers won't accept them," he adds.

MOR provides initial and ongoing training and education to its customers through EC&D. "In some instances, we train the department heads, who in turn train their employees," says Chappell. "In other instances we train both the department heads and staff. It's whatever the client prefers." Retraining is done as necessary. "This is very important to the success of any program because without complete buy-in from all of the staff, contamination will be a problem," says Anderson. Drivers monitor loads for contamination.

Customers can use their own container to collect food waste, or MOR will provide 22-gallon Slim Line containers for its restaurant customers, and 33-gallon Brut containers for its grocery store customers. Some customers purchase compostable liners from MOR for the containers to keep them clean, contain odors and facilitate emptying them. "Smaller containers reduce the weight, so they can be moved around more easily," says Chappell. "We also promote the idea of using a different color for food waste, because it makes the containers more defined."

When full, the 22- and 33-gallon containers are brought outside and emptied into larger units. "We let each facility decide how they stage the waste, but we prefer that they use 96-gallon cans or 2-, 3- or 4-cubic yard containers outside," says Anderson. "It is the responsibility of the customer to clean the cans, but for a fee, we will swap dirty cans for clean ones as often as they like."

Organics are collected three times a week. Collection vehicles include rear loader trucks (one purchased with assistance from MARC) and roll offs with special hydraulic pickup apparatus. "We had to weld and modify the trucks to contain the liquid," says Chappell. "We would use front loaders but those are more expensive when initially building routes." Currently, MOR collects from 65 food waste generator customers in the Kansas City area (within a 50-mile radius of the composting facility), including 20 grocery stores that are part of four chains: Whole Foods Market, Hen House, Price Chopper and Cosentino's.

PROCESSING AND MARKETS

Food and paper waste is mixed with lawn, garden and tree trimmings collected from the Kansas City area, and from commercial customers and individuals who drop off green waste. "We are constantly changing the recipe and our management practices to handle the increased amounts of food waste we are receiving," says Anderson.

MOR was able to use equipment it already owned to process the food waste stream. Machinery includes a Hogzilla grinder, Frontier turner and a star screen. It also had semitrailers with walking floors and dump trucks to deliver the compost, mulch and other products.

The composting process currently takes about 14 weeks, says Anderson, "but we would like to reduce that to 10 weeks to increase our capacity without expanding the size of the facility." MOR would then be able to do five cycles of composting a year, which will reduce the cost/ton for processing.

Anderson says that 3,100 tons of food residuals were processed at MOR's facility in 2005, 3,694 tons in 2006, 6,701 tons in 2007 and 15,159 tons in 2008. He projects that 25,000 tons of food waste will be processed in 2009, as well as 75,000 cubic yards of green waste. MOR makes and sells its own brand of Nature Wise compost, as

well as topsoil and mulch. The mulch is made from brush and C&D waste.

MOR continues to offer free waste audits, conducted by EC&D, to determine if potential customers are good candidates for the program. The audit evaluates how much a food waste generator can save by participating in FRED. "If the customer is using compactors, it will reduce the customer's solid waste bill by up to 50 percent, between fewer compactor pulls and a reduction in utility costs to operate the compactor," says Chappell. "FRED also eliminates problems for customers who store food waste outside in dumpsters during hot summer months. The last things that customers want to worry about are odors, leachate and vectors in their parking lots."

The Hyatt Regency Crown Center hotel in Kansas City signed on with MOR in April 2009 to recycle its pre and postconsumer food waste, contaminated paper and cardboard, waxed cardboard, and other organics such as floral waste. Andrea Ashmore, Purchasing Director at the Hyatt, says there have been several benefits of using the service. "First is the knowledge that our organic waste is no longer directed to a landfill," she says. "Second there is the cosmetic and cost benefit of reducing the smell and pests associated with housing a large dumpster with decaying organics. Third is being able to show our guests and groups that we share their environmental concerns. Fourth, there is a tangible savings by reducing the weight of our waste haul."

Ashmore says that there were a few challenges in starting the program at the Hyatt. "There is an initial investment, not only in equipment but also in training and monitoring," she says. "Fortunately, the members of our hotel Green Team have done an excellent job in creating tools to train, monitor, and record our progress. Though we did experience some growing pains, they were brief and allowed our teammates a better understanding of the process. Everyone here at the Hyatt has 'bought in' and our compliance with the new program is excellent."

BLACK OAK ORGANICS, LLC

In 2004, Craig Post, then a solid waste hauler, transfer station operator and landfill developer in southwest Springfield, Missouri, began questioning the traditional model of landfilling food waste. "Decomposition of food, wood, plant matter and other organic wastes creates methane and leachate, which are two environmental problems that plague landfills," says Post. "I knew that I could convert these materials into a usable compost product that could be sold to landscapers and nurseries."

Post approached Chappell about the possibility of establishing an organics composting operation in Southwest Missouri, an area with a smaller population (350,000) and proportionally less commercial food production than the Kansas City metropolitan area.

EC&D conducted a feasibility study to assess requirements for siting, constructing and operating the compost facility, and identify potential sources of food and C&D waste. The study also evaluated the cost of composting versus landfilling and examined the markets for end products. The findings encouraged Post to proceed with his new company, Black Oak Organics.

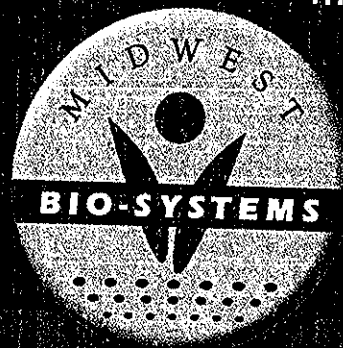
In January 2005, the Missouri Department of Natural Resources approved a pilot project to compost food residuals, yard waste and wood chips on a two-acre site in Verona, Missouri. "Unfortunately, it rained from February through July so we were not

Black Oak collects from food waste generators three times a week, within a 50-mile radius of the composting facility.

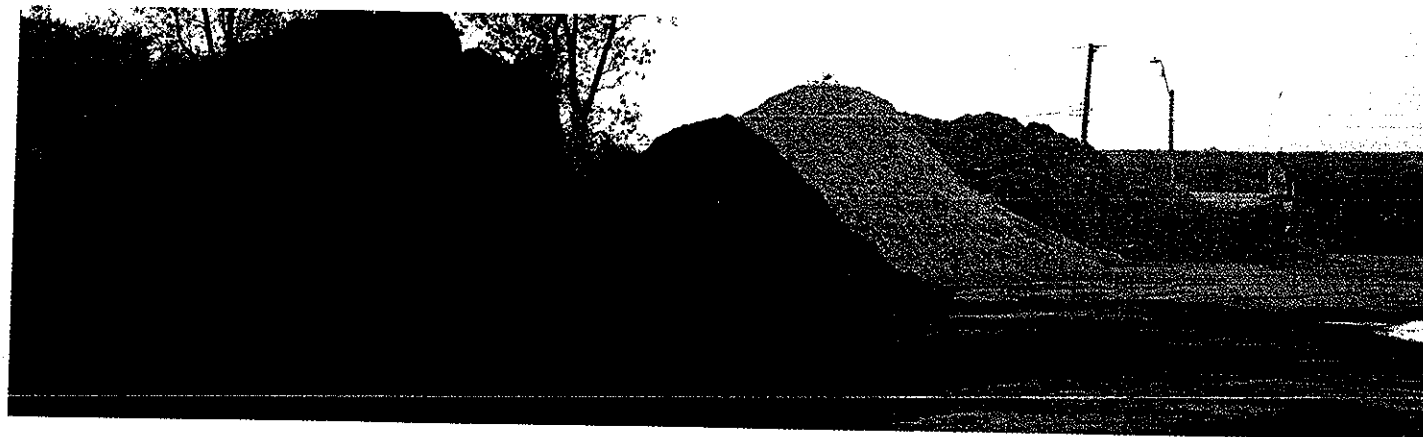
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Missouri Organic Recycling colorizes mulch made from brush and C&D waste.

able to begin construction for the pilot until August, and didn't begin accepting food waste until the winter of 2005," says Chappell. Black Oak started selling finished compost in spring 2006.

"By May 2006, we realized that two acres weren't enough," says Post. "We had to go back to MODNR and worked out water and site permits for a much larger facility, much sooner than we had originally planned." The company was permitted by the state in May 2008 to build the compost facility on a 17-acre site in Verona, where the two-acre pilot was located. To start the flow of food waste, EC&D first approached Post's existing clients from his hauling business. "Most were persuaded by the opportunity to support the environment with a cost-neutral change," says Chappell. Black Oak started out with 25 food waste customers and 12 wood waste customers.

Post sold his solid waste hauling and transfer station businesses in 2006 in order to focus solely on Black Oak Organics. It purchased a front end loader and delivery truck, and secured three grants to purchase processing equipment, including a KW windrow turner, a SCREEN USA star screen, and a Morbark horizontal grinder.

Black Oak initially contracted with private haulers to do the collection. It then leased a collection vehicle and, more recently, received a \$22,595 grant from Missouri Solid Waste Management District to purchase its own collection truck. "We may end up also keeping the leased vehicle because we are at a growth point where we need a second truck," says Chappell. He adds that composting facilities need to control the collection and delivery services they provide to ensure they meet the customers' needs. "When you are trying to create a new market, the service feature is huge."

Like MOR, Black Oak collects from food waste generators three times a week, within a 50-mile radius of the composting facility. The food waste, waste paper and cardboard are stored at the generators' sites in the same containers used by MOR. Black Oak assists customers in marketing their new "green" attributes. "If they don't have a marketing department, we help them come up with a marketing plan or meet with their staff to develop a trademarked

logo, signage in grocery stores, or table tents in restaurants," says Chappell.

The company now has about 65 customers, including 17 Price Cutter grocery stores, Drury University, Missouri State University (see sidebar), Applebee's restaurants and commercial food producers. "Black Oak Organics contracts to haul cafeteria wastes from Missouri State University and Drury University at the same rate that the universities would have paid to landfill the wastes," notes Chappell.

Black Oak processes 550 to 600 cubic yards (137 to 150 tons) of organics per week, including food residuals, old lumber, drywall, pallets, cardboard, soiled paper, wax board, root balls and large trees. About 30 percent is food waste.

It takes about 36,000 to 40,000 gallons of water to make a finished batch of 250 to 300 cubic yards of compost, over 10 weeks. "We designed the pilot project and the 17-acre facility to have a storm water retention pond that we can pump water from onto the compost," says Chappell. "If we have a feedstock from a food processor that is 50 percent water, that helps cut our water use costs." Like MOR, Black Oak has its own tanker truck to collect liquids.

The company had \$400,000 in gross revenues in 2007, over \$500,000 in 2008, and Post expects another 30 percent increase in 2009. Compost is the company's major product. "Tip fees at our facility cover the cost of processing the organics and profits come from bulk sales of finished compost, mulches and soil blends," Post explains. Black Oak is also producing and selling erosion control materials for construction sites, and has a growing customer base of organic food growers.

In April 2009, the City of Springfield adopted a policy that requires all newly constructed buildings to meet the Silver LEED Certification standard established by the U.S. Green Building Council. Builders can earn certification points by recycling their construction wastes and returning them to the building site in a useful form. Black Oak Organics collects organic materials like scrap wood products and in turn sells mulch and compost for landscaping the new project. "It's hard for us to keep up with the demand," says Post. ■