METHODS AND MARKETS

GEORGIA BUILDS POULTRY LITTER COMPOSTING INFRASTRUCTURE

GEORGIA leads the nation in poultry production, processing nearly 1.5 billion birds a year. A majority of the poultry operations are concentrated in north Georgia. With over 1.5 million tons of poultry litter produced on an annual basis, some of the resulting issues facing the poultry production industry include: Reduced land area on farms to apply increasing amounts of litter; Increasing buffer areas to state waters; Nutrient management plans that are based on phosphorous indexes; and Land applying poultry litter to clay soils that already have high phosphorous levels.

To some producers, this excess litter can pose an economic and environmental hazard. For others, it has become a value-added opportunity. While much research has been put into reducing the nutrient levels of fresh litter including alum amendments and changing feed supplements, composting the litter not only stabilizes the nutrients and helps move the material off the farm but also provides a source of income.

Following are descriptions of poultry litter composters who illustrate how value-added opportunities can be achieved.

APPALACHIAN ORGANICS

J.A. Whidby was a poultry producer for 25 years before he retired from ConAgra to become a poultry litter composter in 1991. A grant from the Georgia Environmental Protection Division and the Georgia Forestry Commission to the Limestone Valley RC&D for $163,000 helped Appalachian Organics purchase a Compost-A-Matic in-vessel turner, sprinkler system, screener and also covered some construction costs. The University of Georgia and Auburn University provided technical assistance with experimental feedstocks including: hatchery waste, biosolids from poultry processors, peanut hulls, straw, leaves, limestone fines, poultry litter, municipal biosolids and biodegradable packaging material.

After many trials, Whidby decided to stick to poultry litter and sawdust, determining that marketing it as certified organic would best fit his operation and market demand. He receives the litter from a third party poultry house cleaning company which only charges freight costs at approximately $8/ton. A full compost batch averages 168 tons of poultry litter, collected from houses in a 30-mile radius.

The in-vessel system and adjacent curing area were retrofitted into old poultry houses. The processing area is three-feet deep and covers the whole floor of the poultry house, 240 ft. long and 20 ft. wide. Whidby maintains temperatures of 125° to 140°F for at least ten days and composts for an average of three months. Piles are turned everyday for the first ten days and then turned based on oxygen and temperature levels, never falling below two percent oxygen. The fresh litter is typically received at 20 percent moisture which requires frequent watering (approximately 5,000 gallons/batch) in the initial stages while maintaining a 42 percent moisture content to minimize odor and clumping.

Whidby monitors moisture samples with an old microwave, but smiles and says, “the squeeze test works just as well”. After three months, the material is loaded into a hopper, screened at 3/8 inch, and conveyed to the curing poultry house — never exposed to the outdoors. Here the piles cure in 100-foot windrows under forced aeration for one to six months depending on current demand.

Appalachian Organics is registered with the Georgia Department of Agriculture and markets to mostly local and organic farmers and landscapers at $3 for a 50 lb bag, $30 for a small pickup load, or $60/ton. “I could make more money selling it by the cubic yard because the moisture content is low, but the...
fols I sell to are pleased with the product and so am I," adds Whidby. The finished nutrient analysis is about a 3-3-3 NPK and has a 20 percent moisture content. In 1995, Whidby helped set up a roadside demonstration for highway plantings, slope stabilization and erosion control with the Georgia Department of Transportation. The compost and seeded slopes were compared to fertilized ones for a year and a half. The fertilized slopes showed faster growth for the first six months. However, after that, the compost amended slopes greatly surpassed the fertilized slopes in ground cover and plant vigor.

SARGENT NUTRIENTS, INC

In 1971, soon after Jerald Sargent started his layer operation of 90,000 hens he found there was a value-added product opportunity in selling the hen manure. By 1976, he formed Sargent Nutrients, Inc. by cleaning poultry houses and selling the fresh manure as fertilizer and cattle feed supplement. By 1981 Sargent had built two methane digesters for hen manure with some technical assistance from Auburn University. In 1983, Sargent Nutrients, Inc. purchased its first windrow turner and began composting layer manure for the first time. When quality suffered because demand outstripped production, Sargent began to diversify his services. With the help of the Chesatee Chattahoochee RC&D, Sargent Nutrients, Inc. received an EPA 503c grant in 1991, to expand Sargent's on-farm composting operation. Initially he experimented with a variety of feedstocks including: Wrigley Gum processing residuals, egg shells, gypsum wallboard, broiler litter, wax corrugated cardboard from poultry processing, soybean meal, cornmeal and cotton seed from Cargill.

In 1991, Sargent also formed Georgia Natural, the composting arm of Sargent Nutrients, Inc. and realized he needed a cooperative network of poultry litter composters to handle growing market demands and maintain quality standards. While Georgia Natural compost production peaked in 1996 and 1997, Sargent concentrated on helping new operations get started. More recently, Sargent began Compost Management Solutions, a consulting and marketing firm that helps composters with site design, permitting, nutrient management and finding market outlets. He also provided consulting to the Georgia Department of Corrections in starting compost operations at Jackson and Reidsville state prisons.

Currently, Sargent is a partner in a layer manure, broiler litter and wood waste composting windrow operation in Chestnut, Georgia, his original operation. He is a consultant to three independent poultry litter in-vessel operations in Clarksville and Gainesville, Georgia and Clemson, South Carolina. He provides technical assistance to Booker Farms in Lula, Georgia in composting broiler litter, hen manure and horse manure. Sargent markets his product mainly to landscapers but also to homeowners and horticulturalists. "I experimented with bags early on, and prefer to sell my compost in bulk," says Sargent who gets $30/cubic yard for unscreened compost and $35 for 3/8" screened material.

POULTRY GOLD

Located in Gainesville, Georgia — the poultry capital of the world — John Roberts owns and operates Poultry Gold composting facility. Roberts got into composting in 1996 while working as a timber dealer when he recognized the amount of green waste that was available. He soon linked up with a friend who had a layer operation and contacted the local RC&D who was promoting such ventures and happened to have a windrow turner that was not being used.

Five years later, Poultry Gold handles roughly 3,400 cubic yards/yr of hen manure and 8,500 cubic yards/yr of wood chips.

At one facility, poultry litter and sawdust are fed into a rotating bin that includes a hopper and conveyor (top inset), then allowed to "finish" in windrows before being marketed (left).
Roberts services four layer houses and contracts out the grinding of the green waste at $4/cubic yard. He uses a 600 ft. long by 300 ft. wide pad to process the material in windrows. Feedstocks are routinely analyzed for moisture and C:N ratios to ensure optimal recipes are used for each batch. Windrows are agitated using a windrow turner, based on maintaining temperatures at 131° to 160°F for the first month and 120° to 160°F for a second month. Moisture content is monitored using a squeeze test except for the finished product. Each finished batch is sent to a lab and analyzed for moisture, nutrients, pH and soluble salts. Final composts consistently average 25 to 30 percent moisture, 1-1-1 NPK, 7.2 pH and 3.5-4.0 mmhos for soluble salts.

Poultry Gold has been experimenting with different sizes of wood chips in response to customer requests for less woody material, in addition to experimenting with horse manure as a feedstock in hopes of servicing some of the area horse parks. Roberts' process follows guidelines set by the USDA National Organic Standards for composting as he is pursuing organic certification for his product. "Most compost buyers, especially the bagged market, can identify certified organic since it has become a popular mainstream term," explains Roberts. Poultry Gold's main market outlets are 40 lbs. bags and bulk sales to garden centers and landscapers. Roberts receives $2.70/bag delivered and $2.40/bag picked up at his facility. Bulk prices include $35/cubic yard delivered and $30/cubic yard picked up.

GROMOR ORGANICS, INC.

Peter Germishuizen manages Gromor Organics, Inc., near Tifton, Georgia. He came to Tifton after successful forestry consulting and compost ventures in South Africa, Chile and Mexico. Together with two farming partners, he assisted in the formation of Gromor in February 2000. Germishuizen is the compost partner with three local mixed vegetable farmers who actively cultivate over 1,500 acres using compost as a soil amendment.

Gromor currently mixes 20,000 to 29,000 tons/yr of ground municipal yard trimmings, cotton gin trash, peanut hay and finished compost as the carbon source and nearly 4,400 tons/yr of poultry litter and culled vegetables as the nitrogen source. The poultry litter accounts for 80 percent of the nitrogen material throughout the year. Windrows are turned almost daily for the first two weeks, thereafter on demand depending on temperature, moisture and carbon dioxide levels.

Germishuizen is a meticulous compost operator whose broad experience has helped him in conducting experiments with various aspects of the windrow process. He has experimented with different components, such as engineered wood products, as well as various microbial inoculants and compost starters. Germishuizen has been working with the vegetable farmers and the University of Georgia in assessing the potential of compost in the field and in vegetable transplants. In the future they hope to investigate the water conservation potential, disease suppression and methyl bromide

COMPOSTING MANURE FOR VALUE-ADDED PRODUCTS

A NEW REPORT, compiled by the editors of BioCycle, provides significant data on how composted manure fulfills soil needs for microbial vitality as well as nutrient management. The report, Composting Manure for Value-Added Products, describes the new driving forces to turn manure from a disposal headache into a productive resource. Many systems are now available to economically process raw manure into quality end-products that save money on crop fertilizers. Another chapter explores the application of anaerobic digestion systems to produce energy and organic fertilizer.

Options for composting run the full gamut of windrow techniques, and extend into agitated bays, in-barn systems, hoop structures, high-rise buildings and in-vessel methods. Material handling techniques are equally versatile — with many options to dewater, utilize carbon sources, aerate, screen and apply. The report also shows that anaerobic digestion makes "dollar sense" at more and more manure generating facilities.

A special section — Economics of On-Farm Manure Composting — features case studies which analyze costs and revenues, as well as the synergies between composting and other farm activities. Observe BioCycle editors: The farm provides an outlet for excess compost, and the compost operation provides an outlet for excess farm residues. Composting is compatible with agricultural technologies and practices.

Other sections of the report cover: Speciality markets — nurseries, landscapers, erosion control as well as compost use for increasing farm yields and suppressing disease; Materials blending methods that lower costs for manure management; and Picking the right system that serves a farm's special needs.

To order a copy of Composting Manure for Value-Added Products, send $39 to BioCycle, 419 State Avenue, Emmaus, PA 18049. Phone (610) 967-4135, ext. 21; Fax 610-967-1345; E-mail: biocycle@jgpress.com. Multiple copy discounts are available.
Five demonstration sites using poultry litter compost are being set up in the Metro Atlanta region by the University of Georgia.

substitution capabilities in utilizing high quality compost. Preliminary findings suggest vegetable growers may reduce water requirements by approximately 30 percent when applying seven to ten tons/acre of compost every 18 months.

Most of the compost produced by Gromor Organics is sold back to the partners on a cost plus per ton basis. Bulk selling price is $40/ton. Potential bagging markets, however, are also actively being explored.

TRI-STATE NUTRITION
Led by Michael Sayers in Hazelhurst, Georgia, Tri-State Nutrition specializes in raising broilers, and marketing aged poultry litter. Tri-State Nutrition has 20 poultry houses and processes approximately 20,000 tons of litter per year.

Sayers cleans his houses and “deep stacks” his poultry litter in 20 to 25 foot high static piles under a shelter. He allows the piles to heat for one to six months depending on demand. The poultry litter goes through an initial heat to reduce odor and help stabilize the litter but does not go through the full compost process. Tri-State Nutrition has established a niche market with turf growers and golf courses who want an organic soil amendment that is high in nutrient content and has a fine particle size and very little odor. “I can’t let it process for too long or I will reduce the nutrients in the material which would take me out of the market I am in. They already want to know if I can get the nutrient content higher but keep everything else the same,” explains Sayers. Once the poultry litter is taken out of the static piles, it is run through a shredder/mixer to reduce the particle size, fluff and homogenize the mix. The shredder/mixer conveyor belt empties into a ten-ton capacity spreader truck used for application on turf farms and golf courses. Tri-State charges $50/ton to spread the aged poultry litter.

EXPANDING THE MARKET
Through a series of grants awarded to the University of Georgia to find innovative uses for poultry litter, the Department of Biological and Agricultural Engineering will be working with poultry litter composters to expand their market potential. The goal is to increase throughput volume and sustain the growth of this important industry. Using poultry litter compost for erosion control and storm water management will be the focus of the research and demonstration projects. Research will include two phases: initial lab characterizations and erodibility analysis followed by field test plot studies that measure erosion, storm runoff quantity and water quality.

Five demonstration sites using poultry litter compost in addition to other composts and mulch will be set up in four Metro Atlanta counties. Sites will focus on commercial, residential and county construction projects that work closely with county building inspectors. Cooperators and cosponsors on the project include: U.S. Poultry and Egg, Animal Waste Management Center at North Carolina State University, Cobb County, Rockdale County, Gwinnett County, Bobo Grinding, Wood Tech Mulch, MetroMulch Blowing Services, National Soil Erosion Laboratory-USDA and Erth Products, Inc. The poultry litter composters profiled above are participating in the research and demonstration projects. All receive technical assistance from the University of Georgia.

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