

# The Old Ways Renewed: Compost, Vegetable Gardens, and PHA

## From Microorganism to Microorganism: MHG's Mission to Replace Petro-Plastic with Compostable Plastic Fuses Nicely with the Return of Local Food Systems

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By Laura Mauney

Up through the mid-20th century, maintaining backyard compost heaps and vegetable gardens were fairly common practices in the neighborhoods of America. The practices almost disappeared with the onset of fast food and easy-to-cook packaged food.

These days, however, as more and more communities adopt eco-friendly initiatives, composting has emerged once again as a popular practice along with its counterpart, locally grown food.

With that in mind, I invited an environmental leader in my community to tell the story of his mission to create a sustainable and renewable urban food system via a youth empowerment program. Turns out, the endeavor fits right in with MHG's mission to create a sustainable and renewable 100% compostable plastic.



Urban Vegetable gardens enriched by compost are becoming popular again in the U.S.

## Sustainable Composting Meets Renewable Food Sourcing

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In Tallahassee, Florida, about fifty miles south of MHG's headquarters in Bainbridge, Georgia, local entrepreneur Sundiata Ameh-El has taken urban gardening, education, and backyard composting to a new level.



Sundiata Ameh-El operates the grant funded iGrow urban farming program in tandem with Compost Community.

The former teacher, who earned a business degree from Florida A & M University in Tallahassee, runs the Dunn Street Community Youth Farm, a mentoring program for high schoolers also known as iGrow. (<http://igrow-whateveryoulike.weebly.com/>)

The program is funded by sales of produce and by grants from the [Tallahassee Food Network \(TFN\)](http://www.tallahasseefoodnetwork.org)

(<http://www.tallahasseefoodnetwork.org>), a group of farmers, farmer's market managers, chefs, educators, and local leaders who work to implement healthy food initiatives city-wide.

Ten to fifteen high school students participate in the iGrow program at any given time. Participants must apply and be accepted. Once enrolled, each student is offered a chance to earn a leadership position, which pays a small stipend.

The students learn all the core elements of successful entrepreneurship, including product creation, team building, strong work ethic, sales, and market analytics.

The iGrow garden is fed by compost the students help create at Sundiata's adjacent operation, aptly named [Compost Community](http://www.compostcommunity.org) (<http://www.compostcommunity.org>).

Sundiata describes iGrow and Compost Community as sustainable economic development programs designed to create jobs, change eating habits, provide entrepreneurship education, and reduce the community's carbon footprint.

Both iGrow and Compost Community are located in separate sections of open, urban acreage donated by a private citizen in Tallahassee. The land is adjacent to the City of Tallahassee Dent Street Common Garden, upon which local residents manage their own plots, and even keep bees.

Compost Community contracts with local restaurants and businesses, the City of Tallahassee, and private citizens to collect food scraps, untreated wood chips, shavings and sawdust, leaves, yard waste, and even granite dust from a local quarry. The waste is brought to the Dunn Street lot to recycle into an ongoing aerobic composting system. The final product – a nutrient rich humus – is used to feed the iGrow garden, or is donated back to the individuals who provided the original feedstock.

### **Aerobic Composting: Browns First – Then Greens – Then Browns**

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Sundiata defines [aerobic composting \(http://www.mhgbio.com/replacing-plastic-waste-stream-aerobic-anaerobic-decomposition-work/\)](http://www.mhgbio.com/replacing-plastic-waste-stream-aerobic-anaerobic-decomposition-work/) as the natural breakdown of organic matter to create fertilizer for food growth.

He explains that all aerobic compost must start with the correct balance of carbon based and nitrogen based organic matter, namely 25 parts carbon to 1 part nitrogen.

He describes the carbon component as “brown” waste, such as dried leaves and wood scraps, and the nitrogen component as “green” waste, such as vegetable scraps, eggshells, and coffee grounds.

To begin, the browns and greens are piled in layers of three, “like a sandwich,” he says, starting with a base layer of carbon-rich matter, with nitrogen rich matter laid on top, then topped by another layer of carbon rich material.

Once the starter pile is built, aerobic microorganisms move in to consume and digest the waste, breaking it down into more basic compounds and elements. The first type of microorganisms that get to work are mesophilic, because they thrive in the moderate temperatures (68° to 113° F) typical to a starter pile. The mesophiles feed on the carbon matter for energy as they digest the nitrogen matter.



Each pile shown in this photo represents one of the four stages involved in aerobic composting.



Sundiata Ameh-El uses a compost thermometer, designed like a meat thermometer but with a longer stem, to monitor temperatures of the active compost heaps at Compost Community.

As digestion intensifies, temperatures in the compost increase. Once temperatures surpass about 106° F, thermophilic organisms, which can survive higher levels of heat, take over the process. The ideal maximum temperature for an aerobic compost heap to succeed is 130° to 160° F. If the compost gets too hot, however, the bacteria will die, causing the process to fail.

Aerobic composting requires routine watering and turning to maintain proper oxygen levels, and promote heat.

To accomplish this, at Compost Community, separate piles in various stages of decomposition are rotated. On a regular basis, Sundiata and his volunteers shift heaps from one position to another around a circle, like musical chairs. When a pile is turned, odorless steam literally explodes out of it.

Sundiata cautions that a compost pile “can turn anaerobic if not tended to.” If piles are not aerated on a regular basis, anaerobic microorganisms, including pathogenic bacteria, can take over the digestion process. Aerobic bacteria will destroy such pathogens, however, so maintaining aeration is important for that reason, too.

During the final stage of the process, larger creatures move into the compost to finish the job. Says Sundiata, “You know that if you have red wigglers and earthworms in your compost pile you have some good stuff.”

The worms help keep the fresh soil aerated, and emit “castings” that contain nutrient-rich bacteria, and serve as natural pesticides for gardens.

Successful aerobic composting takes about three months to complete. Fifty lbs. of food waste generates about twenty-five lbs. of compost after water is removed and the material completely breaks down.

To date, Compost Community has diverted over 36,000 lbs. of waste from local landfills.

## **iGrow Whatever You Like**

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On the other side of the Dunn Street lot, vegetables such as Mizuna, Arugula, Rainbow Chard, Pak Choi, Collard Greens, Mustard Greens, Radicchio, Broccoli, Onions, Kale, Romaine Lettuce, Beets, Carrots and Radishes flourish in rows of long planter boxes.

Twice a week, the high school students enrolled in the iGrow program come together – often joined by college students from nearby Florida A & M and Florida State – to plant, weed, and harvest the large, urban vegetable garden.



Once harvested, the vegetables are sold to local restaurants, at the Frenchtown Heritage Farmer’s Market, and distributed via special events held on site at the Dunn Street garden, such as the monthly “Collards and Cornbread Gathering.”

In addition to handling the fundamental chores of managing a garden – weeding, watering, mulching, picking – the students are given basic training in management by offering up their own ideas, called “food dreams,” surveying and tracking work requirements, and weighing and recording harvests.

iGrow has harvested over 5000 lbs. of food in two years.

### **Stay Tuned...**

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Products made from MHG PHA – a carbon-based biopolymer – are aerobically biodegradable. In other words, trash bags, yogurt cups, packaging, and even glue made from PHA will disappear naturally and seamlessly in a landfill or compost heap – leaving no toxic trace – just like other organic waste.

With that in mind, MHG has committed to donating samples of compostable PHA products to Sundiata and his team. Over time, we will be documenting the aerobic breakdown of the products, and reporting back.

### **Does Your Company Manufacture Plastic Products?**

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*Please visit **MHGBio.com** (<http://www.mhgbio.com/>), to find out more about how biodegradable plastics from MHG can be adapted to a wide range of product manufacturing and packaging requirements.*