Why Vegetative Food Waste Does Not Belong in Landfills and Incinerators
Submitted by: Eve Spengler
Eve Spengler
Class of 2013: MA Patel College of Global Sustainability
MSc Entrepreneurship in Applied Technologies
PCGS Ambassador, ACG Cup Competitions and Fintech, USF Student Green Energy Fund Council helping secure 60+ Hydration Stations, Arbor Day Key-Note Speaker
• John Quinn, President of Chartered Institution of Wastes Management
• Speaking on the Circular Economy
The Natural Resources Defense Council

• “40% of the food in the USA which makes it to grocery markets and restaurants goes uneaten.”
Catch Up Florida!

Bay Mulch Inc. can help meet our 75% Recycling Goals

Over half the States in the USA have Vegetative Waste Diversion Bans and Mandates

Figure 1: Food comprises the largest percentage of disposed waste in the U.S.
Figure courtesy of U.S. EPA.

U.S. EPA Waste Composition

- Food waste, 21%
- Paper and Paperboard, 15%
- Plastics, 18%
- Yard Trimmings, 9%
- Metals, 9%
- Glass, 5%
- Wood, 8%
- Other, 4%
- Rubber, Leather and Textiles, 11%

Figure 3: The demand for organics diversion is driven primarily by state initiatives.
Food is NEVER Garbage

Food is a Recyclable & Recoverable Resource
Bio Natural Soil (BNS)

Bay Mulch Organics Recycling
Plant City, Florida
A Sustainable Business Supporting 38 Full Time Green Jobs at Living Wages
Maximum Productivity: Positive End USE

“the purest form of recycling imaginable is composting!” ~eve

80/20
BNS
Blueberry Mix
BAY MULCH Inc Organics Recycling

Circle of Life

- Food waste picked up or dropped off from supermarkets, restaurants, etc.
- Ground landscaping and land clearing debris is mixed with food waste.
- Bay Mulch Inc. processes materials into high-quality enriched compost called Bionatural Soil (BNS).
- BNS mixed with hardwood fines to produce soil additives that return materials to the earth.
- BNS potting soils used in Nurseries to aid growing landscape flowers, shrubs, and trees.
- Nurseries sell their plants for use in landscapes.
- High quality BNS used by the farmers/growers to aid production of their fruits and vegetables.
- The farmers/growers sell their produce back to the supermarket/restaurant.
Vegetative Food Waste Guidelines

**FOOD WASTE MATERIALS**

**Acceptable**
- All Fruits
- All Vegetables
- Bread, dough, bakery items
- Pasta and grains
- Coffee grounds and tea with filters

**Not Acceptable**
- Waxed cardboard boxes
- Raw meat products:
  - Beef
  - Poultry
  - Pork
  - Seafood
- Plastic bags, serve ware
- Utensils
- Twist ties
- Rubber bands
- Fats, oils, grease or consumable liquids
- Wood, metal, glass or other non-food items
Set Zero Waste Goals

Filled roll carts are placed outside by our customers on collection days
Food Waste Collection Services

• Bay Mulch Organics Recycling owns a fleet of specialized collection vehicles for the efficient handling of food waste

• We provide roll carts to our customers
Rear-mounted cart lift

System capable of lifting three carts at once
Composting

• Bay Mulch Inc was founded by Tom Kirkland 19 years ago.
• Bay Mulch Organics Recycling operates 42 acres in Plant City Florida, is a licensed and permitted facility in full compliance.
• With a proven method, Bay Mulch Organics Recycling utilizes Harvest Quest’s Catalyst inoculant and Modified Static Aerobic Pile (MSAP) composting methodology, and allows us to operate our facility without odors and nuisance vectors such as flies and scavenging birds.
• The finished compost is of the highest quality and is approved as an input by the USDA National Organic Program.
USDA NATIONAL ORGANIC PROGRAM ORGANIC INPUTS REGISTRY APPROVAL

Operation Name: Bay Mulch, Inc.
Certificate Address: USDA National Organic Program Approved Inputs Registry
Operation Address: Phys: 1603 S. Forbes Road, Plant City, FL 33566, Mail: P.O. Box 291496 Tampa, FL 33687
Effective Date: March 6, 2015
Registration Number: 03061523RIR

AmeriCert International, a USDA National Organic Program accredited certification body, has determined, after a review of the operation’s organic compliance plan and review of the operation’s policies, procedures, and practices, that the above listed operation has demonstrated that the products listed on the attached registration addendum comply with the United States Department of Agriculture National Organic Program Final Rule, the Organic Foods Production Act of 1990, and qualifies to represent its products as allowed for use in organic production when used in compliance with the restrictions (if any) listed on the registration addendum. This registration is valid for one year from the date of issuance unless revoked or suspended during the annual period. Questions about the continued and current validity of this registration should be directed to AmeriCert International.

Name and Title of AI Official Issuing Registration on Behalf of AmeriCert International: Jonathan Austin, Technical Director
Signature: [signature]
Date: March 6, 2015.

*PLEASE SEE REGISTRATION ADDENDUM FOR LIST OF APPROVED PRODUCTS* AND APPLICABLE RESTRICTIONS *BE SURE TO CHECK WITH YOUR CERTIFIER AND RECEIVE CERTIFIER APPROVAL* FOR ANY NEW INPUT INTENDED FOR USE ON A CERTIFIED ORGANIC PRODUCTION SITE
Food Not Suitable For Human Consumption is Perfect for Recycling and Composting into Soil
Figure 1. Contribution of different food categories to estimated domestically-acquired illnesses and deaths, 1998-2008

- Produce: 46% illnesses, 23% deaths
- Meat and Poultry: 22% illnesses, 29% deaths
- Dairy and Eggs: 20% illnesses, 15% deaths
- Fish and Shellfish: 6.1% illnesses, 6.4% deaths

*Chart does not show 5% of illnesses and 2% of deaths attributed to other commodities. In addition, 1% of illnesses and 25% of deaths were not attributed to commodities; these were caused by pathogens not in the outbreak database, mainly Toxoplasma and Vibrio vulnificus.

## Uncooked Produce
Can Be Dangerous and Carry Risks of Salmonella, Ecoli and other Illnesses

<table>
<thead>
<tr>
<th>Organism</th>
<th>Intestinal symptoms</th>
<th>Incubation</th>
<th>Major symptoms</th>
<th>Duration</th>
<th>Uncooked food or food contaminated by ill food handler after cooking, contaminated drinking water</th>
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</thead>
<tbody>
<tr>
<td>Cryptosporidium</td>
<td>Intestinal symptoms</td>
<td>2-10 days</td>
<td>Diarrhea, nausea, abdominal cramps, dehydration, fever, fatigue</td>
<td>May be vomiting and diarrhea over weeks to months</td>
<td>Various types of fresh produce (imported berries, lettuce, basil)</td>
</tr>
<tr>
<td>Cyclospora</td>
<td>Cyclosporiasis</td>
<td>1-4 weeks</td>
<td>Diarrhea, nausea, abdominal cramps, fever, fatigue</td>
<td>May be vomiting and diarrhea over weeks to months</td>
<td>Various types of fresh produce (imported berries, lettuce, basil)</td>
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<tr>
<td>E. coli (Escherichia coli)</td>
<td>E. coli infection</td>
<td>1-3 days</td>
<td>Watery diarrhea, abdominal cramps, fever</td>
<td>3-7 or more days</td>
<td>Water or food contaminated with human feces</td>
</tr>
<tr>
<td>E. coli O157:H7</td>
<td>Hemorrhagic colitis</td>
<td>1-3 days</td>
<td>Severe (often bloody) diarrhea, abdominal pain and vomiting, usually little fever is present, more common in children 4 years or younger</td>
<td>5-10 days</td>
<td>Undercooked beef especially hamburgers, unpasteurized milk and juice, raw fruits and vegetables (e.g., sprouts), and contaminated water</td>
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<tr>
<td>Hepatitis A</td>
<td>Hepatitis</td>
<td>2 weeks to 3 months</td>
<td>Diarrhea, fever, abdominal cramps, nausea, and abdominal pain</td>
<td>Variable</td>
<td>Raw produce, contaminated drinking water, uncooked foods and cooked foods that are not reheated after contact with an infected food handler, shellfish from contaminated waters</td>
</tr>
<tr>
<td>Listeria monocytogenes</td>
<td>Listeria</td>
<td>3-4 weeks</td>
<td>Fever, muscle aches, and nausea or diarrhea (pregnant women may have mild flu-like illness, and infection can lead to premature delivery or stillbirth). A weakened or immunocompromised patients may develop meningitis</td>
<td>Variable</td>
<td>Unpasteurized milk, soft cheeses, ready-to-eat deli meats</td>
</tr>
<tr>
<td>Noroviruses</td>
<td>Noroviruses</td>
<td>24-48 hrs</td>
<td>Nausea, vomiting, abdominal cramps, fever, headache, diarrhea (epidemics)</td>
<td>12-60 hrs</td>
<td>Raw produce, contaminated drinking water, uncooked foods and cooked foods that are not reheated after contact with an infected food handler, shellfish from contaminated waters</td>
</tr>
<tr>
<td>Salmonella</td>
<td>Salmonellosis</td>
<td>24-48 hrs</td>
<td>Diarrhea, fever, abdominal cramps, vomiting</td>
<td>4-7 days</td>
<td>Eggs, poultry, meat, unpasteurized milk or juice, cheese, contaminated raw fruits and vegetables</td>
</tr>
<tr>
<td>Shigella</td>
<td>Shigellosis or bacillary dysentery</td>
<td>2-7 days</td>
<td>Abdominal cramps, fever, and diarrhea, stools may contain blood and mucus</td>
<td>24-48 hrs</td>
<td>Raw produce, contaminated drinking water, uncooked foods and cooked foods that are not reheated after contact with an infected food handler</td>
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</tbody>
</table>

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**Foodborne Illness-Causing Organisms in the U.S.**

*WHAT YOU NEED TO KNOW*
The Center for Disease Control in Atlanta Warns Foodborne Pathogens Can be Lethal

Pathogens causing US foodborne illnesses, hospitalizations, and deaths, 2000–2008

<table>
<thead>
<tr>
<th>Pathogen Type</th>
<th>Pathogen</th>
<th>Estimated annual illnesses*</th>
<th>Estimated annual hospitalizations*</th>
<th>Estimated annual deaths*</th>
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<tr>
<td>Bacteria</td>
<td><em>Salmonella</em> spp., <em>Shigella</em> spp., <em>Escherichia coli</em>, <em>Vibrio cholerae</em>, <em>V. parahaemolyticus</em>, <em>V. vulnificus</em></td>
<td>52,000</td>
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Process Steps - Receiving

A three-sided receiving bunker is constructed from ground yard waste. The bunker has a base layer to provide absorption of any free liquids.

The food waste receiving area is located on a concrete pad, which provides an all-weather operating surface and easy to clean work space.
Receiving and mixing – Require investment in specialized equipment.
• The microbes within the Catalyst inoculant spread rapidly outward from the points of application initially populating the outer edges of the windrow just beneath the capping layer.

• This prolific microbial activity generates initial temperatures on the surface of the pile.

• The microbes then work their way towards the center of the windrow breaking the contents down from the outside in.

• This action increases the windrows natural chimney-effect, allowing sufficient air-flow into the pile.
The Capping Layer Provides:

• maintaining a minimum of 131 degrees inside the windrow is essential and carefully monitored.

• vector attraction reduction by creating a physical barrier between the contents of the pile and the outside air.

• an instant biofilter providing excellent odor mitigation.

• it insulates the pile allowing for high temperatures to be achieved all the way to the edges of the mixed contents.

• protects the contents of the pile from external influences, such as heavy rainfall or extreme cold.
Following a further 14 days of composting the windrow is turned a second time. Again, moisture is redistributed and at this stage the windrow will be entering the final phase of composting.

The properly controlled marriage between bacteria and compostable materials produces quality finished compost in 45 to 60 days.
Bay Mulch Organics Recycling
Bio-Natural Soil (BNS) and Custom Blends are Perfect for Growing Crops, Nursery Plants, Flowers, Shrubs, Trees & Restoring/Reclaiming Natural Areas
CATION EXCHANGE:
How Bio-Natural Soil (BNS) RESTORES ROOT SYSTEMS OF AT-RISK PLANTS TO RESILIENCY AND RECAPTURES WHOLISTIC HEALTH

Soil, clay and sand is negatively charged. Naturally derived nutrients sourced from recycled vegetative food material and woody debris are positively charged, including magnesium, potassium, nitrogen and carbon. Plants grown in BNS enjoy the following essential benefits:

- Need less water to grow.
- Restore soil to a natural balance.
- Grow more resilient plants with stronger root systems.
- Perfectly suited for Organic Farming.
- Not adversely affected by average (to above) rainfall.
- May require less fertilizers, pesticides, herbicides and chemical additives, depending on variety of plant species being grown, previous use of the land, and commitment to maintenance regime.
- Results commonly visible in 1 growing season.
- Provides financial ROI within one year, cycle or series of growing seasons, depending on the unique requirements of the plant species being grown.

Independent Study by the University of GA Extension, Sonon, Kissel and Saha 2014
So Why Incorporate Food Waste?

• Diverts vegetative waste away from landfills and incinerators;

• Reduces greenhouse gas emissions, and plants grown in this soil requires less water to grow;

• Diverted tons contribute to Florida mandated 75% recycling targets;

• Composting recycles organic matter and nutrients back to the soil;

• Redirects funds (tipping fees) to sustainable waste management practices;

• Speeds up the composting process by providing a more suitable Carbon to Nitrogen (C:N) ratio;

• Produces a higher value, more nutrient-rich compost product, without chemical run-off into the water stream.
Proposed Addition to City of Tampa Ordinance

ARTICLE VIII. - FRANCHISES FOR COMMERCIAL SOLID WASTE COLLECTION SERVICES

Sec. 26-400. - Title.

This article shall be known and may be cited as the "City of Tampa Ordinance for Commercial Solid Waste Collection Services and Franchises."

McKay Bay Complex means the city’s solid waste management facilities located near the intersection of Clark Street and 34th Street in the city. The McKay Bay Complex includes, but is not limited to, the McKay Bay Refuse-To-Energy Facility, a transfer station, a scale house, and associated structures and facilities.

McKay Bay Refuse-to-Energy Facility means the city’s municipal waste combustor, which is located in the McKay Bay Complex. The McKay Bay Refuse-to-Energy Facility burns solid waste to generate electricity.

Processable waste means any combustible solid waste that can be processed lawfully in the McKay Bay Refuse-to-Energy Facility, including but not limited to, garbage, rubbish, cardboard, paper products, plastics, and food containers.

Recovered materials means metal, paper, glass, plastic, textile, (ADD) VEGATATIVE FOOD WASTE; or rubber materials that have known recycling potential, can be feasibly recycled, and have been diverted or source separated or have been removed from the solid waste stream for sale, use, or reuse as raw materials, whether or not the materials require subsequent processing or separation from each other, but not does not include materials destined for any use that constitutes disposal. Recovered materials as defined herein are not solid waste.

Recycling means any process by which solid waste or materials that would otherwise become solid waste are collected, separated or processed and reused or returned to use in the form of raw materials or products.

Regulation means the requirements in this article and the requirements established by the director relating to the storage, collection, transportation, disposal, and recycling of solid waste.

Rubbish means an accumulation of discarded paper, trash, rags, cans, bottles, boxes, or other waste material resulting from normal housekeeping activities and operations in commercial establishments.

Sludge includes the accumulated solids, residues, and precipitates generated as a result of waste treatment or processing, including wastewater treatment, water supply treatment, or operation of an air pollution control facility, and mixed liquids or solids pumped from septic tanks, grease traps, privies, portable toilets, or similar waste disposal appurtenances. Sludge may be a solid, liquid, or semi-solid waste, but does not include the treated effluent from a wastewater treatment plant facility.
Waste to Energy (WTE) Incinerators: Burning Food Actually Waste More Energy than they Generate

To work efficiently a WTE Incinerator must have fuel with an average heat content of 5500 btu/pounds. Food scraps have a heat content of only 2600 btu/pound. Food actually dilutes the fuel of an incinerator. ~efc.org/wte-incinerator-wastes-energy
Inspiration for Green Living!!!
For More Information

Please Contact:

Eve Spengler, Managing Partner
BAY MULCH Inc. Organics Recycling
1603 S. Forbes Rd
Plant City, FL, 33566
Office: 813.465.1726
Mobile/Txt: 813.597.4896
www.baymulch.com
Advancing Universal Technology LLC

Promoting Sustainable Business

HONORING THE TRIPLE BOTTOM LINE
- Respecting People
- Protecting Our Planet
- Optimizing Profit