

# Introducing an Innovative Solution to Restore Soil Structure & Nourish Plants



**Converting Vegetative Food  
Waste into Nutrient-Rich  
USDA Certified Organic Soil**  
Eve Spengler, BAY MULCH Inc.  
Organics Recycling Division

# BAY MULCH Inc. Organics Recycling Division 42 Acres in Plant City, FL



**BAY MULCH Inc**  
**ORGANICS RECYCLING DIVISION**  
**URNS THIS...**



# Into THIS: Bio Natural Soil (BNS)

We transform Vegetative Food Waste into SOIL:

- ✓ High-Quality
- ✓ Low Cost
- ✓ Nutrient Rich
- ✓ pH Balanced
- ✓ Peat Free
- ✓ Bark Free
- ✓ Earth-Friendly
- ✓ Chemical Free
- ✓ Pesticide Free
- ✓ Fertilizer Free
- ✓ FL Certified
- Free of Harmful Nematodes
- ✓ USDA Certified Organic



# A Proven Leader in Composting and Recycling

- Bay Mulch Inc. was founded by Tom Kirkland 19 years ago, primarily as a land clearing and mulch operation, with our first facility of 17 acres in Pasco Co.
- The Organics Recycling Division began 18 months ago, with a 42 acre fully permitted and licensed facility operating in Hillsborough County.
- We add value to food waste by creating nutrient-rich custom blends of soil.
- A critical ingredient is our Catalyst inoculant and Modified Static Aerobic Pile (MSAP) composting method, which allows operations WITHOUT odors and with no nuisance vectors such as flies and scavenging birds.
- Our finished compost is of the highest quality USDA Certified Organic, Florida State Certified free of harmful nematodes & full of beneficial bacteria and fungi.



**“40% of the food in the USA which makes it to grocery markets and restaurants goes uneaten.”**



**The Natural Resources Defense Council, 2015**

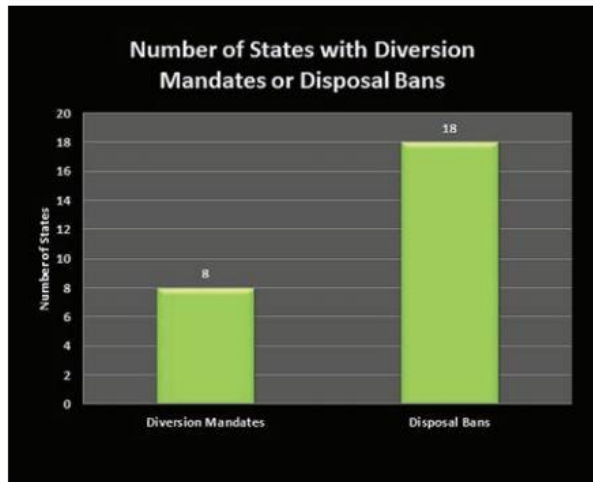


# Food is **NEVER** Garbage

Food is a Recyclable  
& Recoverable Resource

# Catch Up Florida!

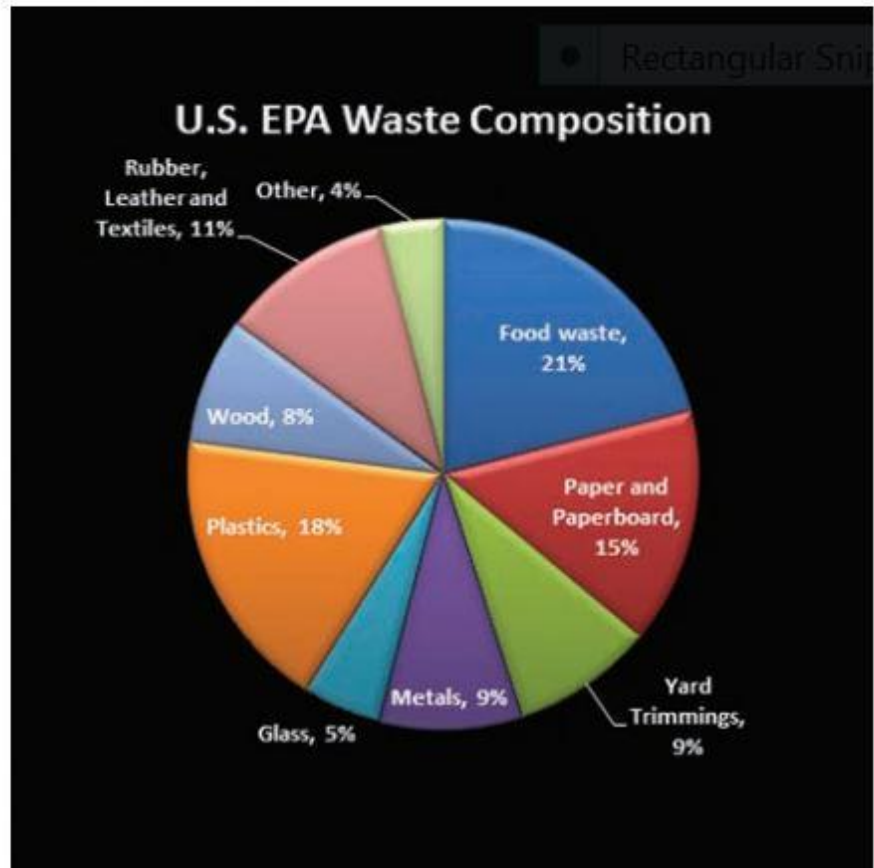
**Bay Mulch Inc. can help meet our 75% Recycling Goals**  
**Over Half the States in the USA have Vegetative Waste Diversion Bans and Mandates**



**Figure 3:**  
The demand for organics diversion is driven primarily by state initiatives.

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

Figure courtesy of U.S. EPA.





# Eve Spengler, BA, MA, MS

**USF Class of 2013: MA Patel College of Global Sustainability  
MSc Entrepreneurship in Applied Technologies USF Tampa**

**PCGS Ambassador, ACG Cup Competitions and Fintech, USF Student Green Energy  
Fund Council helping secure 60+ Hydration Stations, Arbor Day Key-Note Speaker,  
Board Member at Tampa Bay Network to End Hunger (TBNEH)**



# INVENTING the FUTURE of SOLID WASTE MANAGEMENT

# SWANA'S WASTECON®

Featuring the Best in Solid Waste

AUGUST 24- 27, 2015



- With John Quinn, President of Chartered Institution of Wastes Management, Based in Dublin, IRE
- Speaking on the Circular Economy

# Addition to City of Tampa Ordinance:

On December 17, 2015, Eve spoke to City Council and they voted unanimously “Yes” in favor of this change, but the Ordinance is now being blocked by the Tampa Solid Waste Department, which wants to send all food to the incinerator at MacKay Bay, instead of recycle it!

## 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.

~~Processible~~ 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.

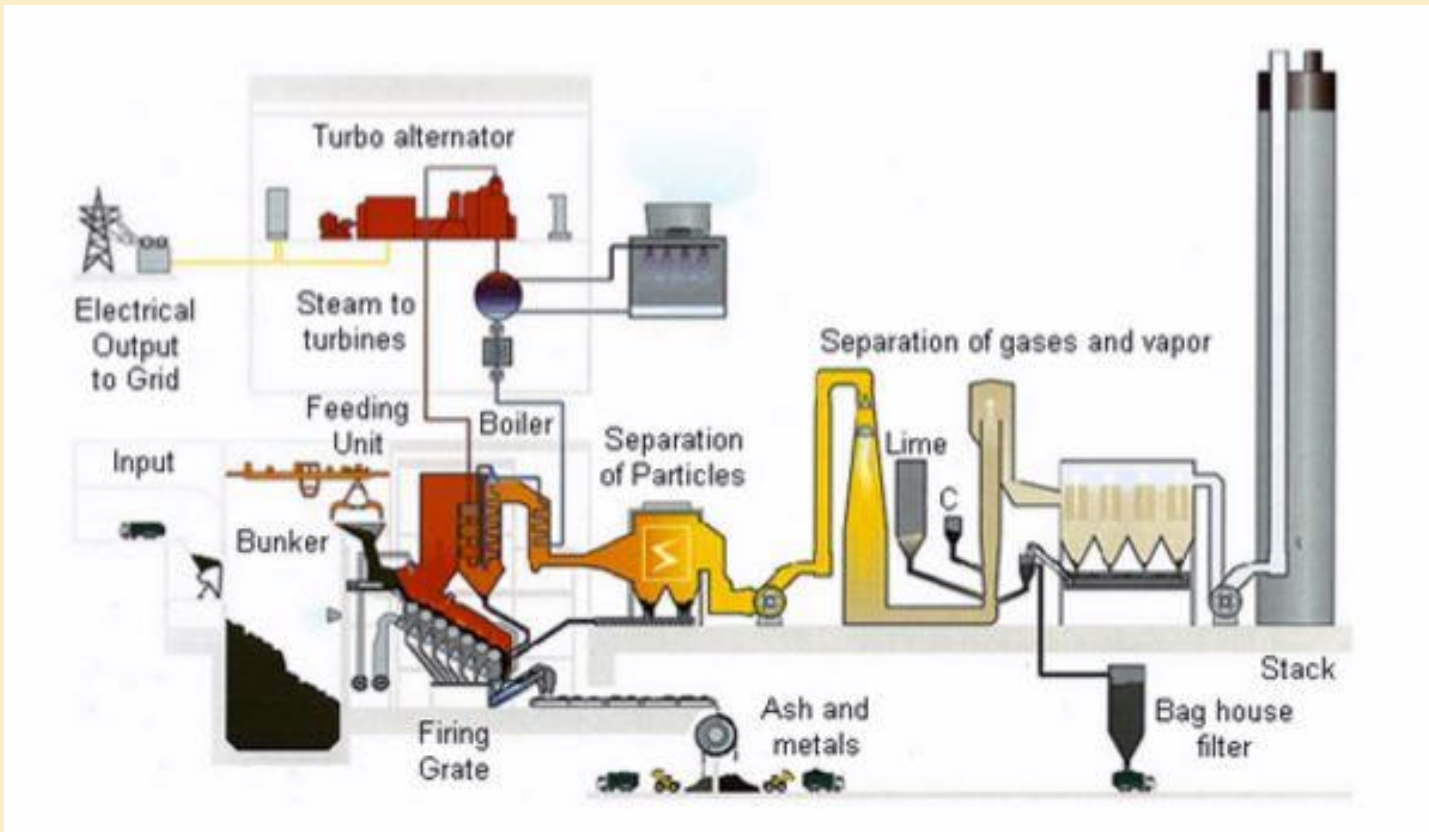
Recycling means any process by which solid waste or materials that would otherwise become solid waste are collected, separated or processed and reused or returned to use in the form of raw materials or products.

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 Wastes More Energy than it Generates



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

# Bay Mulch Inc. Organics Recycling Division

## Food Waste Collection Services

- Bay Mulch Inc. purchased a fleet of specialized water-proof collection vehicles for the efficient handling of food waste.
- We provide 65 gallon rolling totes to our customers at no charge.



## Rear-mounted cart lift

System capable of lifting three carts at once



**Creating an organic composting operation required a major investment in the latest technology, team-training & finest equipment for pick-up, mixing, grinding, wind-row formation, turning and delivery.**



# We Partner with Local Businesses to Set & Meet Zero Waste Goals



**Filled roll carts are placed outside by  
our customers on collection days**



**BAY MULCH Inc Organics Recycling Division in ACTION!**



## Composting Means: Positive End USE

*“The purest form of recycling imaginable is composting. Uneaten blueberries can be transformed into soil and used by local farmers to grow fresh new blueberries!” ~eve*



**80/20 BNS  
Blueberry  
Mix**

## Custom Blended Nutrient-Rich Soils: Restorative!

*Another ideal product for nurseries and landscapers is our 50/50 Potting Soil made of 50% Bio-Natural Soil (BNS) and 50% Finely Screened Recycled Wood Dust (95% Oak, 5% Pine).*



**50/50  
Potting Soil**

# BAY MULCH Inc.

**We are a Sustainable Local Business Supporting 38 Full Time Green Jobs at Living Wages**



# Unused food, not suitable or unsafe for human consumption is perfect for recycling into BNS organic soil



Eve Presenting at University of South Florida in 2015

# BNS 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



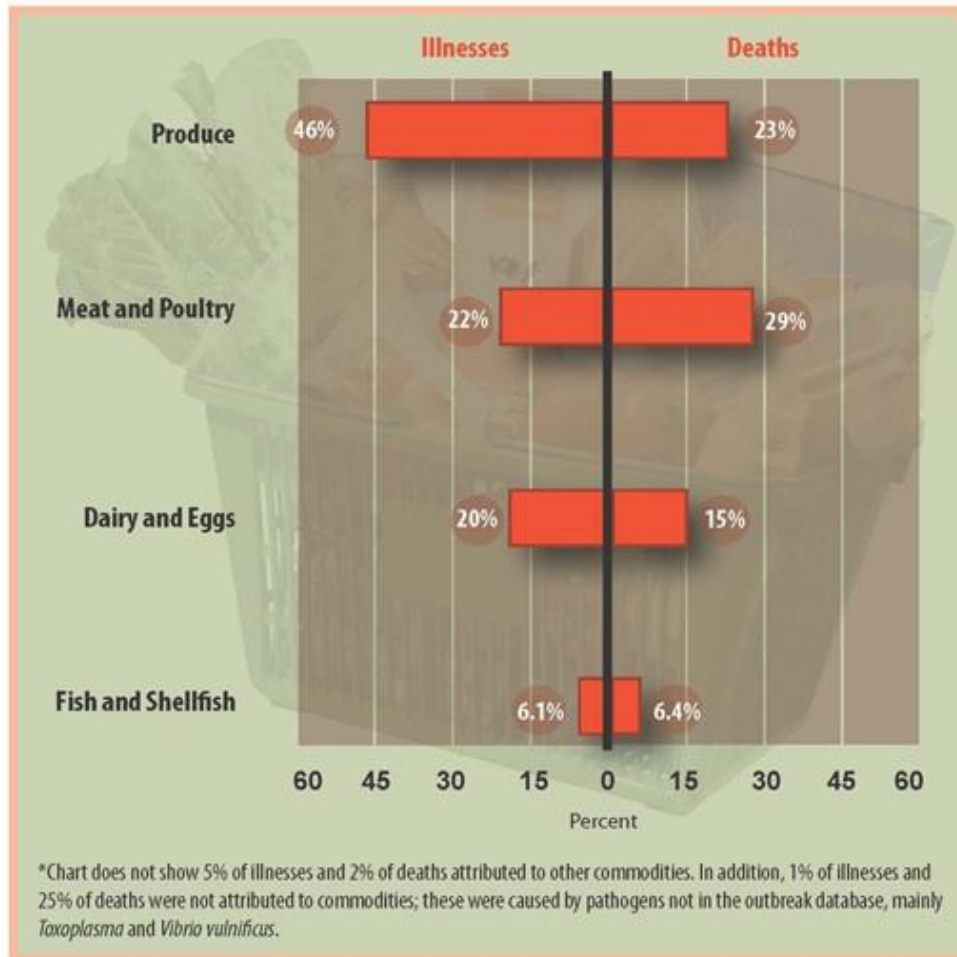
### Not Acceptable

- 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



# Keep Food Safety in Mind

Figure 1. Contribution of different food categories to estimated domestically-acquired illnesses and deaths, 1998-2008\*



\*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, E.coli and other Foodborne Pathogens

<i>Cryptosporidium</i>	Intestinal cryptosporidiosis	2-10 days	Diarrhea (usually watery), stomach cramps, upset stomach, slight fever	May be remitting and relapsing over weeks to months	Uncooked food or food contaminated by an ill food handler after cooking, contaminated drinking water
<i>Cyclospora cayatanensis</i>	Cyclosporiasis	1-14 days, usually at least 1 week	Diarrhea (usually watery), loss of appetite, substantial loss of weight, stomach cramps, nausea, vomiting, fatigue	May be remitting and relapsing over weeks to months	Various types of fresh produce (imported berries, lettuce, basil)
<i>E. coli (Escherichia coli) producing toxin</i>	<i>E. coli</i> infection (common cause of "traveler's diarrhea")	1-3 days	Watery diarrhea, abdominal cramps, some vomiting	3-7 or more days	Water or food contaminated with human feces
<i>E. coli O157:H7</i>	Hemorrhagic colitis or <i>E. coli</i> O157:H7 infection	1-8 days	Severe (often bloody) diarrhea, abdominal pain and vomiting. Usually, little or no fever is present. More common in children 4 years or younger. Can lead to kidney failure	5-10 days	Undercooked beef (especially hamburger), unpasteurized milk and juice, raw fruits and vegetables (e.g. sprouts), and contaminated water
Hepatitis A	Hepatitis	28 days average (15-50 days)	Diarrhea, dark urine, jaundice, and flu-like symptoms, i.e., fever, headache, nausea, and abdominal pain	Variable, 2 weeks-3 months	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
<i>Listeria monocytogenes</i>	Listeriosis	9-48 hrs for gastro-intestinal symptoms, 2-6 weeks for invasive disease	Fever, muscle aches, and nausea or diarrhea. Pregnant women may have mild flu-like illness, and infection can lead to premature delivery or stillbirth. The elderly or immunocompromised patients may develop bacteremia or meningitis	Variable	Unpasteurized milk, soft cheeses made with unpasteurized milk, ready-to-eat deli meats
Noroviruses	Variouly called viral gastroenteritis, winter diarrhea, acute non-bacterial gastroenteritis, food poisoning, and food infection	12-48 hrs	Nausea, vomiting, abdominal cramping, diarrhea, fever, headache. Diarrhea is more prevalent in adults, vomiting more common in children	12-60 hrs	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
<i>Salmonella</i>	Salmonellosis	6-48 hours	Diarrhea, fever, abdominal cramps, vomiting	4-7 days	Eggs, poultry, meat, unpasteurized milk or juice, cheese, contaminated raw fruits and vegetables
<i>Shigella</i>	Shigellosis or Bacillary dysentery	4-7 days	Abdominal cramps, fever, and diarrhea. Stools may contain blood and mucus	24-48 hrs	Raw produce, contaminated drinking water, uncooked foods and cooked foods that are not reheated after contact with an infected food handler



Foodborne Illness-Causing Organisms in the U.S.

WHAT YOU NEED TO KNOW



# BAY MULCH Inc: Organics Recycling Division Eliminates All Risk of Foodborne Pathogens



**Bio-Natural Soil Made With Food Waste Retains Essential Nutrients. Harmful Nematodes and Bad Bacteria are Eliminated. Beneficial Bacteria, Fungi and Microbes Proliferate and Grow. A Bionic Soil is Created Containing Properties that Can Restore the Earth to Full Natural Health.**



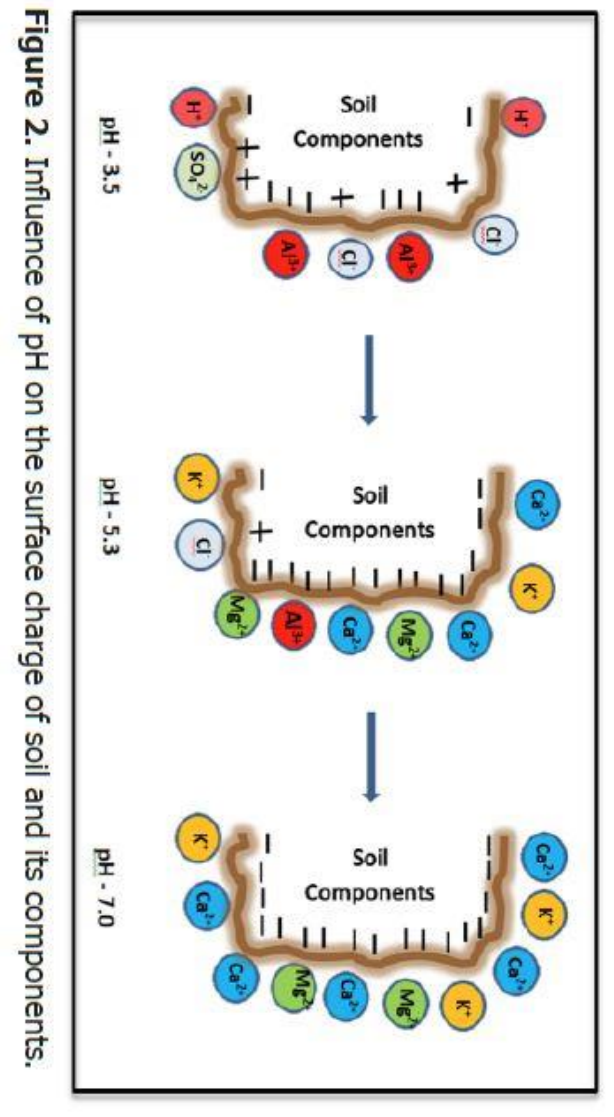
# CATION EXCHANGE:

## How Bio-Natural Soil (BNS) RESTORES ROOT SYSTEMS OF AT-RISK PLANTS TO RESILIANCY 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, calcium, 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 only 1 growing season.
- ✓ Provides financial ROI within one year, cycle or season, depending on the unique requirements of the plant species being grown. (ie strawberries vs. tomatoes)



Independent Study by the University of GA Extension, Sonon, Kissel and Saha 2014

# A Budding Partnership with Amalie Arena

- ✓ Collecting Waste
- ✓ Supplying Soil
- ✓ Promoting Sustainability



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.



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Lab # 2433384		Report of Analysis		Report Number: 15-233-4112
Account: 34447	THOMAS KIRKLAND BAY MULCH INC PO BOX 291496 TAMPA FL 33687	 Robert Ferris Account Manager 402-829-9871		
Date Sampled: Date Received: Sample ID:	2015-08-14 BNS	NUTRIENT ANALYSIS		
		Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
<b>NUTRIENTS</b>				
<b>Nitrogen</b>				
Total Nitrogen	%	0.65	1.54	13.0
Organic Nitrogen	%	0.65	1.54	13.0
Ammonium Nitrogen	%	< 0.001	—	—
Nitrate Nitrogen	%	< 0.01	—	—
<b>Major and Secondary Nutrients</b>				
Phosphorus	%	0.11	0.26	2.2
Phosphorus as P2O5	%	0.25	0.59	5.0
Potassium	%	0.08	0.19	1.6
Potassium as K2O	%	< 0.1	—	—
Sulfur	%	0.07	0.17	1.4
Calcium	%	0.88	2.09	17.6
Magnesium	%	0.09	0.21	1.8
Sodium	%	0.010	0.024	0.2
<b>Micronutrients</b>				
Zinc	ppm	28.7	68	—
Iron	ppm	401	950	0.8
Manganese	ppm	45.1	107	—
Copper	ppm	< 20	—	—
Boron	ppm	< 20	—	—
<b>OTHER PROPERTIES</b>				
Moisture	%	57.80		
Total Solids	%	42.20		844.0
Organic Matter	%	24.00	56.87	480.0
Ash	%	18.00	42.65	360.0
C:N Ratio		18 : 1		
Total Carbon	%	11.90	28.20	
Chloride	%	< 0.01	—	—
pH		7.0		
Conductivity 1:5 (Soluble Salts)	mS/cm	0.19		

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Lab # 2433385		Report of Analysis		Report Number: 15-233-4114
Account: 34447	THOMAS KIRKLAND BAY MULCH INC PO BOX 291496 TAMPA FL 33687	 Robert Ferris Account Manager 402-829-9871		
Date Sampled: Date Received: Sample ID:	2015-08-14 50/50	NUTRIENT ANALYSIS		
		Analysis (as rec'd)	Analysis (dry weight)	Total content, lbs per ton (as rec'd)
<b>NUTRIENTS</b>				
<b>Nitrogen</b>				
Total Nitrogen	%	0.44	0.98	8.8
Organic Nitrogen	%	0.44	0.98	8.8
Ammonium Nitrogen	%	< 0.001	—	—
Nitrate Nitrogen	%	< 0.01	—	—
<b>Major and Secondary Nutrients</b>				
Phosphorus	%	0.07	0.16	1.4
Phosphorus as P2O5	%	0.16	0.36	3.2
Potassium	%	0.18	0.40	3.6
Potassium as K2O	%	0.22	0.49	4.4
Sulfur	%	< 0.05	—	—
Calcium	%	0.63	1.41	12.6
Magnesium	%	0.07	0.16	1.4
Sodium	%	0.020	0.045	0.4
<b>Micronutrients</b>				
Zinc	ppm	< 20	—	—
Iron	ppm	261	584	0.5
Manganese	ppm	28.2	63	—
Copper	ppm	< 20	—	—
Boron	ppm	< 20	—	—
<b>OTHER PROPERTIES</b>				
Moisture	%	55.30		
Total Solids	%	44.70		894.0
Organic Matter	%	30.40	68.01	608.0
Ash	%	14.40	32.21	288.0
C:N Ratio		35 : 1		
Total Carbon	%	15.50	34.68	
Chloride	%	< 0.01	—	—
pH		6.8		
Conductivity 1:5 (Soluble Salts)	mS/cm	0.77		

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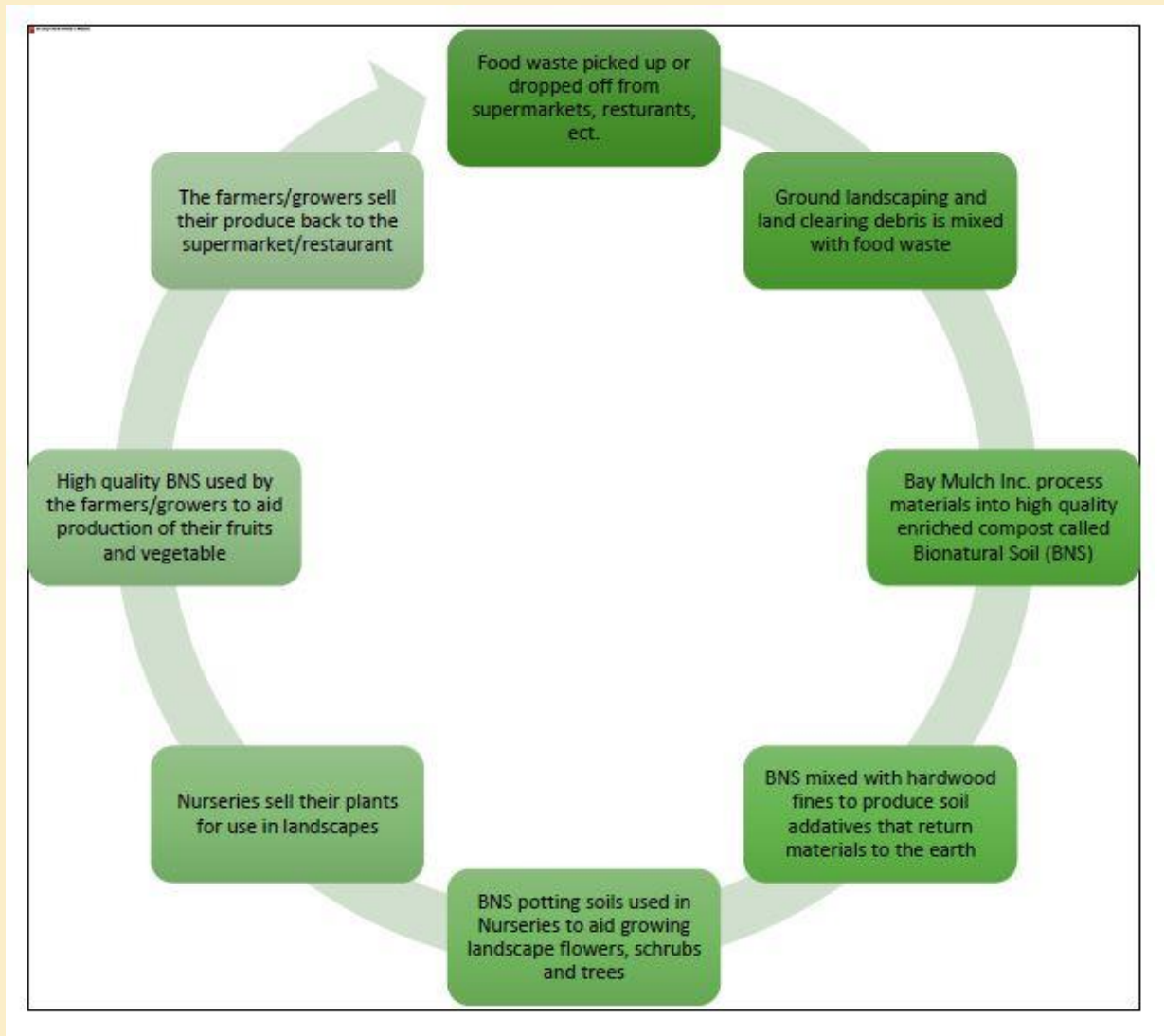
## **So Why Incorporate Food Waste?**

- **Diverts vegetative waste away from landfills and incinerators;**
  - **Reduces greenhouse gas emissions co2 and methane;**
  - **Plants grown in Bio-Natural Soil require 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 business 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.**
-



# BAY MULCH Inc Organics Recycling

## *Circle of Life*



# Inspiration for Green Living!!!

Creating a framework for local sustainable communities which respect and protect a natural and healthy food lifecycle.





# For More Information



## Please Contact:

Eve Spengler

**BAY MULCH Inc.**

**Organics Recycling Division**

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