

AIM Environmental Group

Aerobic Organic Recycling

A Relevant and Growing Technology



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AIM Environmental Group

- Located in Stoney Creek, Ontario Canada
- Provides Environmental contracting and waste management services in Organics Processing and Management, Soil and Groundwater Remediation, Demolition and Abatement
- Specializes in organic material processing facility design, operation and management with contracts for AIM CCF Hamilton (City of Hamilton) and Wellington Organix (City of Guelph)



Relevancy of Organic Recycling

- Operational Costs – recycling v.s. landfill
- Sustainable Practices – cyclic v.s. cradle to grave
- Environmental Responsibility – resource v.s. waste
- Environmental Accountability – GHG reduction



AIM CCF Hamilton Inc.

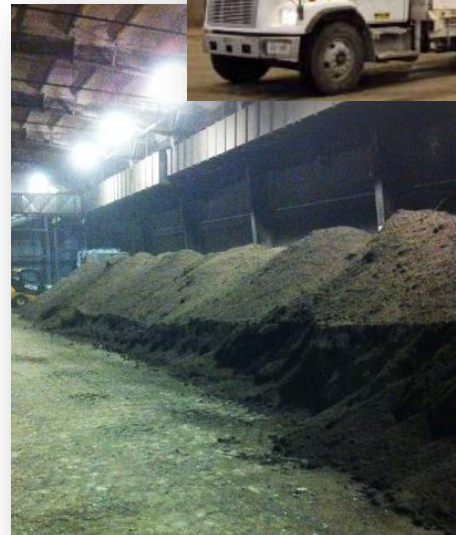
- City of Hamilton Facility receiving municipal green bin SSO from three municipalities with total annual tonnage of 70,000 metric tonnes
- 75/25 split between SSO and L&Y
- Closed in-vessel tunnel technology with 3 week in-vessel processing
- Static Pile curing for 14– 21 days





Wellington Organix Inc.

- City of Guelph Facility receiving SSO from two municipalities with total annual tonnage of 30,000 metric tonnes
- 100 % municipal green bin SSO
- Closed in-vessel technology with 3 week in-vessel processing
- Indoor windrow turning and curing for 21 – 28 days





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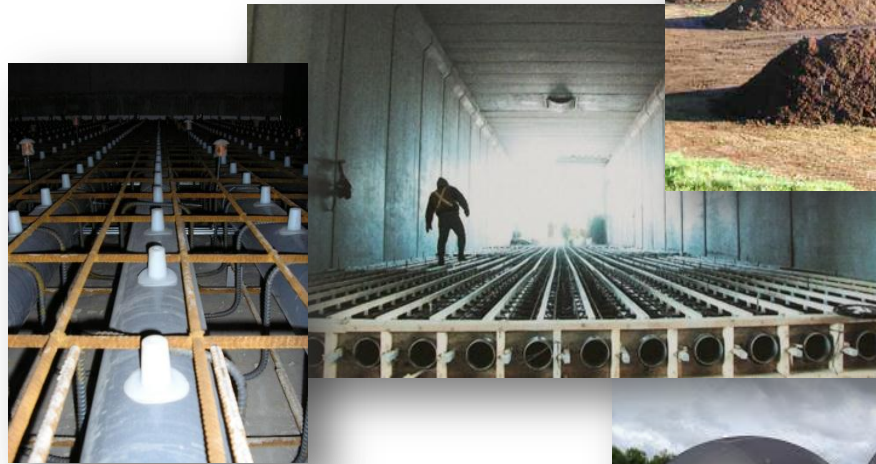
Types of Organic Feedstock

- Leaf and Yard (Green Waste)
- Green Bin (Municipal Source Separated Organics)
- Ag Products such as manures and bedding
- IC&I Organics
- Bio-solids



Types of Organic Processing

- Outdoor Windrow Composting
- In-vessel Aerobic Composting



- Anaerobic Digestion
- High Solid Anaerobic Digestion





Organic Recycling Technology Applications

Feed stock will determine the Optimum Design

- Green Bin → In-vessel Aerobic and/or Anaerobic
- MSW Pretreatment → In-vessel Aerobic
- Bio-solids → In-vessel Aerobic Composting
- IC&I Organics → In-vessel Aerobic and/or Anaerobic Digestion
- Leaf and Yard → Aerobic Outdoor
- Ag Products → Anaerobic and Aerobic Indoor & Outdoor





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Historical Challenges of Organic Processing

- Odour
- Biological



- Contaminants in Feedstock
 - Quality of End Residuals
 - Market for End Product



New Challenges Faced - 2012

Compost Quality Standards

Changes in New Compost Quality Standards include:

- New Categories of Compost: AA, A, B
- Curing: maintained at 40% moisture for 21 days
- Contaminant Requirements: Sharps & Foreign Matter
- Maturity and Respiration Testing Methods
- Permitting of Site



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Odour Control Management

Operational Considerations

Biobed Technology:

- Organic Media
- Synthetic /biorem Media

• Scrubber Technology:

- Acid
- Biological





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Agricultural Markets

Benefits of Compost in Agriculture

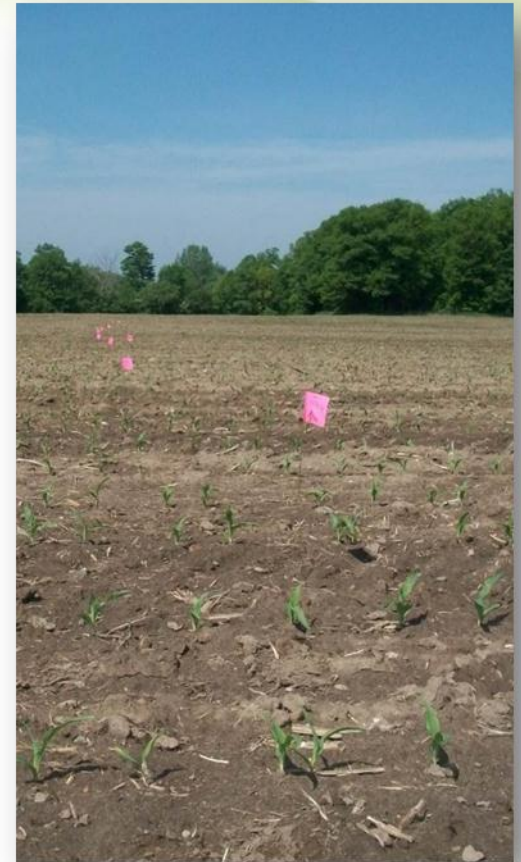
- Increased Nutrient Value = Increased Yields and Quality
- Improved Water Retention and Conditioning of Soil
 - Increased Plant Health



AIM Compost Field Trials

AIM Field Compost Trials (2013 – 2016):

- Comparison of three different municipal composts, alone and in combination with fertilizers in terms of nutrient value, crop yields and plant health
- Two test locations in Southern Ontario – River Bend Acres (Bright) and Arlington Farms (Jarvis)
- Challenges with field trial:
Compost Application and equipment
Weather





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Value of Compost: Total Commercial Fertilizer Equivalence

Compost Agri-Value per tonne (total)								
Producer Location	Nitrogen	Phosphorus (P ₂ O ₅)	Potassium (K ₂ O)	Magnesium	Sulfur	Calcium	Other	Total Commercial Fertilizer Equivalent Value (Including Macro and Micro nutrients)
Hamilton Compost	\$ 33.61	\$ 15.48	\$ 13.02	\$ 18.10	\$ 7.73	\$ 46.08	\$ 5.33	\$ 139.35
Guelph Compost	\$ 27.70	\$ 18.84	\$ 11.18	\$ 33.35	\$ 21.53	\$ 58.46	\$ 2.60	\$ 173.66
Other Compost	\$ 22.33	\$ 11.44	\$ 7.70	\$ 11.43	\$ 4.86	\$ 50.45	\$ 1.72	\$ 109.93

Total Commercial Fertilizer Equivalent value is based on:

- Macro and Micro nutrients
- Present Value Fertilizer August 2013

Only a portion will be available in the season of application. Additional compost value includes Organic matter content and the beneficial probiotic biological activity.

Digestate v.s. Compost

Digestate:

- 80% of nitrogen in food-based digestate is readily available, with 60% available to crops in the first year
- Fast release of nitrogen results in an increased risk of nutrient management

Compost:

- Source of organic nitrogen (slow release), and crop available phosphorus, potassium and organic matter

	Nitrogen (N)(kg/t)		Phosphate (P ₂ O ₅) (kg/t)		Potash (K ₂ O) (kg/t)	
	Total	Readily Available	Total	Crop Available	Total	Crop Available
Whole Digestate	5.0 <i>(3.5 - 6.0)</i>	4.0 (80%)	0.5 <i>(0.25 - 1.5)</i>	0.25	2.0 <i>(1.5 - 2.5)</i>	1.6
Green Compost ⁺	7.5	<0.2 (<2%)	3.0	1.5	5.5	4.4
Green/Food Compost ⁺	11	0.6 (5%)	3.8	1.9	8.0	6.4

⁺ Source Defra "Fertiliser Manual (RB209)"

Benefits of Compost

- Amount of diverted Municipal Greenbin waste per year is equal to the amount of manure produced by 26,500 dairy cattle (close to 10% of cattle in Ontario).
- Compost contributes over 55, 000 tonnes of organic matter and over \$5.25 million/year in crop fertilizer equivalency.





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Thank You!

QUESTIONS?

