Bridging the Gap between the Compost and Agricultural Industries

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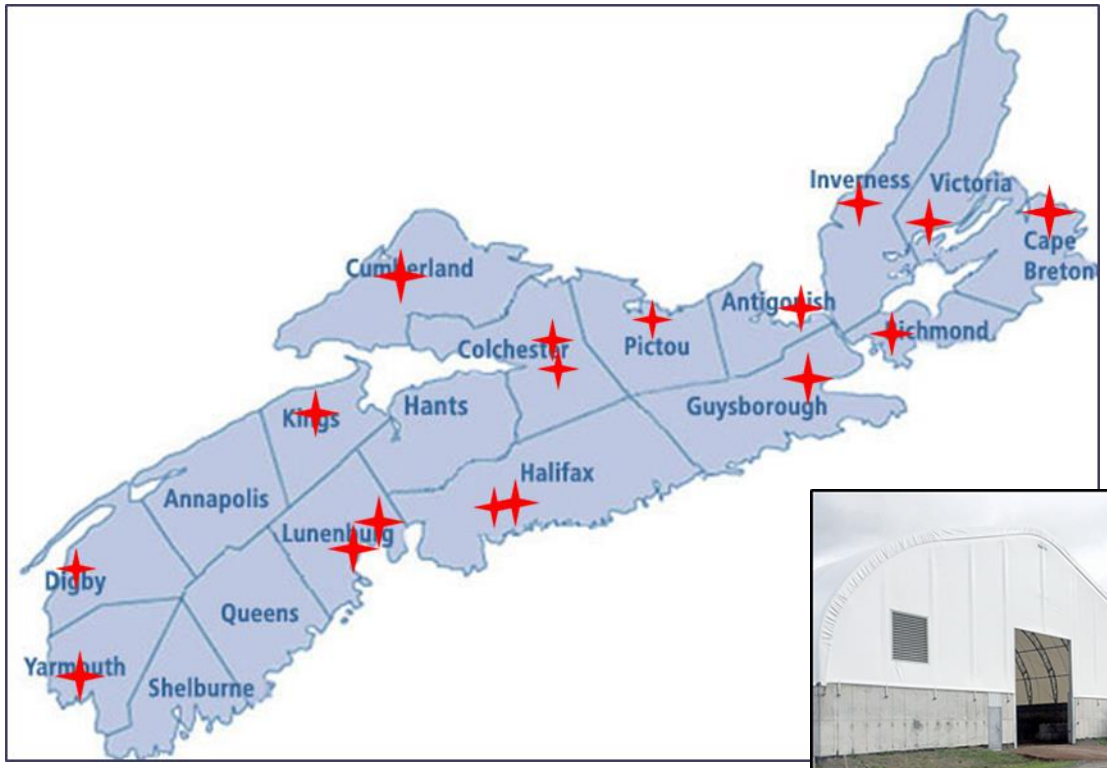
NS Compost Facility Locations

1995, NS Solid Waste-Resources Management Strategy

Divert 50% of waste materials from landfills into value-added products. 15/19 composting facilities receive SSO.



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Organic Amendments in Agriculture

Farmers recognize the need for amendments to improve soil health

1. **Improve soil condition – tilth, aeration, drainage, water holding capacity, reduces hard pan**
2. **Reduction in manure availability**
3. **Reduce reliance of fossil fuel fertilizers**
4. **Limited availability of phosphorus**
5. **Adds organic matter**
6. **Stimulates microbial activity for a healthy soil environment**
7. **Sustainable nutrients**

So why isn't compost in high demand?

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Low demand for compost in Ag Industry may be due to:

1. Perceived low fertilizer value
2. Potential contaminates
3. Product inconsistency
4. Equipment and labor costs

But is this true?

Project set out to answer this question

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Phase 1: 2017

Phase 1 was funded by DivertNS and NS Environment

Project Goals:

1. Review and evaluate Ag testing criteria

- **Compare labs and testing programs**
- **Evaluate pre-test results**
- **Reports to each facility**

2. Evaluate Ag requirements in different NS Regions

3. ID barriers, challenges and opportunities in each region

4. Workshops to bring Compost Facilities & Ag Community together – bridge the missing link

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Sampled 9 Municipal Compost Facilities

Samples were divided into 4 subsamples and sent to 2 labs

Analyzed as Compost & Manure

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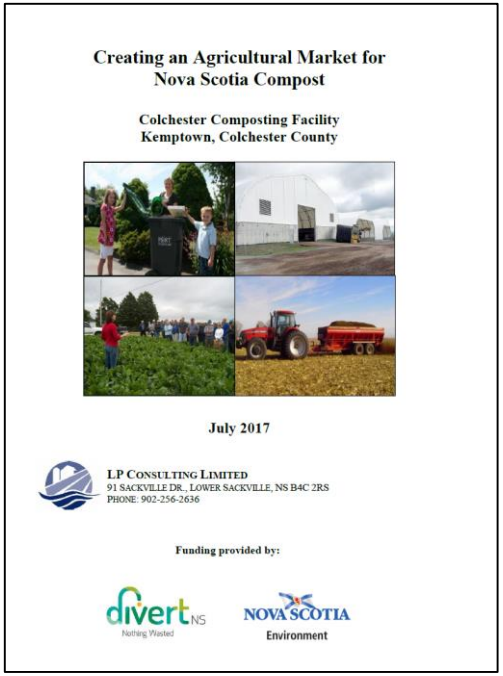
Municipal Reports

Know the Product & Market

1. Compost Regulatory Requirements
    - NS, CCME, CQA
2. Benefits of Compost to Ag
3. NS Ag Market Potential
4. Laboratory Testing
    - Historical Testing
    - Project Test Results – testing criteria, lab comparisons, value to Ag


Creating an Agricultural Market for Nova Scotia Compost

Colchester Composting Facility
Kemptown, Colchester County

July 2017

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Funding provided by:

divert NS
Nothing Wasted

Nova Scotia
Environment

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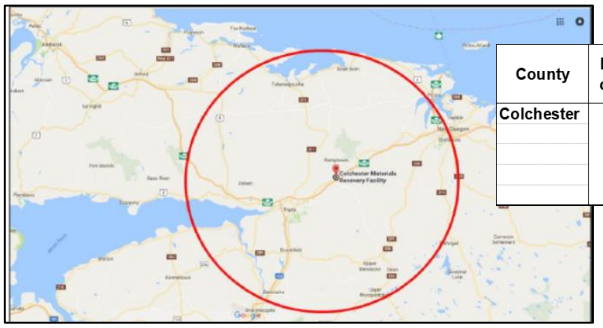
Municipal Reports

5. Agricultural Logistical Requirements - timing

6. Local Market Evaluation – Ag profile, types of farms & acres, soil health conditions, trucking costs



County	Number of farms	Total Farm Hectares	Average Farm Size (Ha)	Top 5 types	Number of Farms	Percent of County total	Other
Colchester	455	58,005	127.5	Fruit & Tree-nut	163	35.8	Veggie combo = 6 (1%)
				Hay	59	13.0	All grains = 6 (1%)
				Dairy	50	11.0	
				Beef	48	10.5	
				Horse & other equine	22	4.8	

Distance to Farm – Km's (one way)	Cost/tonne
30	$8.50
60	$9.50
100	$11.50
130	$16.00

Soil Health Conditions in the Region

County	Clay vs Sand	Parameter	OM	pH	P2O5 (kg/ha)	K2O (kg/ha)
Colchester	40 % clay/60% sand high risk	Average	5.3	5.9	506	284
		Median	4.5	5.9	237	211
Cumberland	Primarily Clay Low Risk	Average	4.3	5.9	497	287
		Median	4.0	6.1	284	209
Halifax	60% clay/40% sand Low risk	Average	4.3	6.1	834	329
		Median	4.0	6.2	509	249
Pictou	40% clay/60% sand high risk	Average	4.2	6.2	631	317
		Median	4.1	6.2	378	258
Ideal Soil Levels			<4.0	6.5-7.5	300-400	350-450

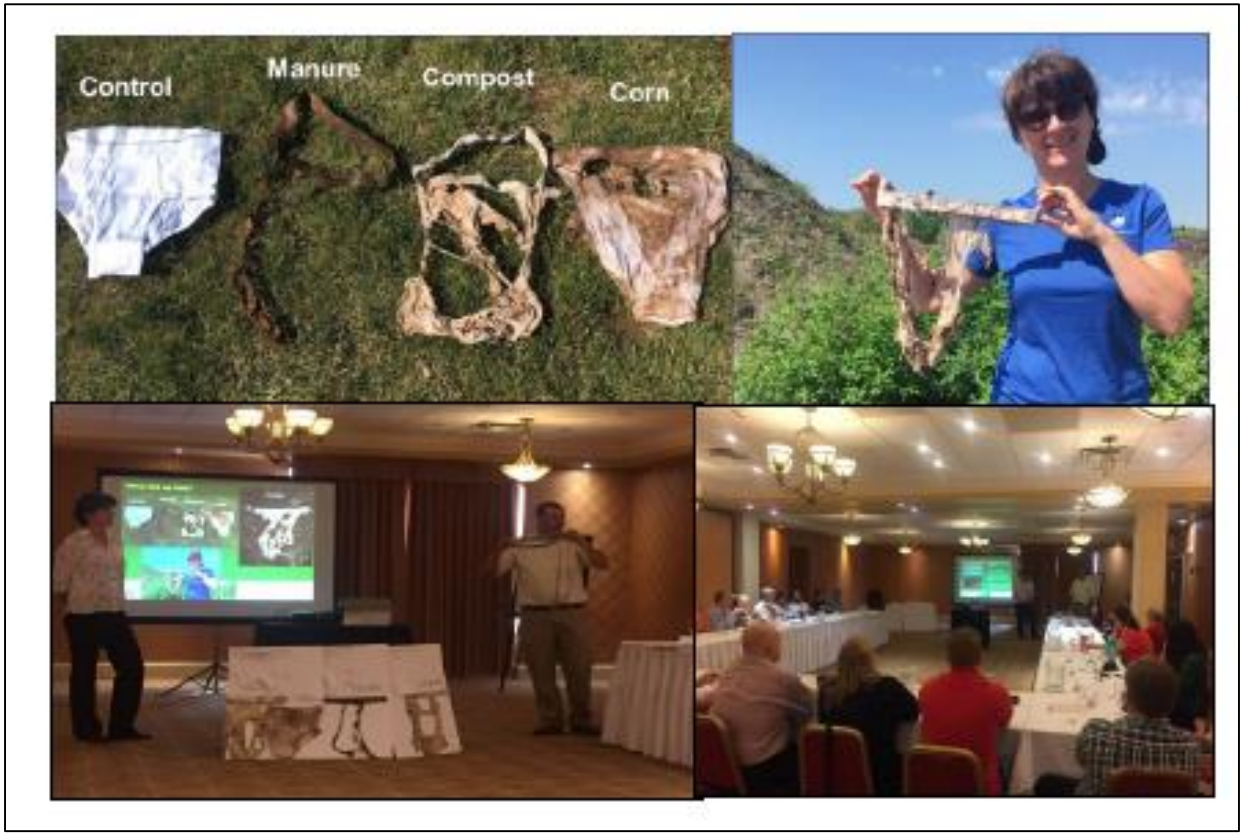
**2011 NSDA laboratory results complied by LP Consulting, 1513 samples*

7. Recommendations

Workshops

Workshops were held in 3 regions to bring together the compost and Ag industry to educate them on benefits of compost and discuss challenges and opportunities

- **Eastern (Antigonish), Central (Truro) and Western (Berwick) regions**



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Phase 1 Recommendations

Laboratory Analysis

1. **Facility operators should test their product as both a manure and a compost to ensure they have the proper information to market their product to agriculture.**

    - **Need to know your market – testing parameters**

Undervaluing fertility value in compost has been a significant deterrent to using compost in agriculture.

Sample ID	Compost Facility #5			
Sample Type	Compost		Manure	
Laboratory	NSDA	A&L	NSDA	A&L
Sample ID	1610612-004	32990	1610612-004	3588016
Date Received	19-Dec-16	22-Dec-16	19-Dec-16	22-Dec-16
Dry Matter (%)	51.4	50.5	51.3	51.2
Available OM %	Not Reported	29.0	Not Reported	Not Reported
Parameter	**"AS IS"**			
Nitrogen (%)	1.41	1.20	1.34	1.49
Ammonium-N %	Not Reported	Not Reported	0.01	0.01
Calcium (%)	2.42	0.31	2.21	Not Reported
Potassium (%)	0.37	0.17	0.33	0.44
K_2O (%)	0.45	0.21	0.40	0.53
Phosphorus (%)	0.38	0.05	0.37	0.38
P_2O_5 (%)	0.87	0.12	0.84	0.88
Magnesium (%)	0.25	0.04	0.24	Not Reported
Sodium (%)	0.22	0.09	0.22	0.29
Boron (ppm)	15.01	2.88	14.15	12.10
Copper (ppm)	34.72	1.67	37.34	61.00
Iron (ppm)	6257.48	143.93	5840.48	9764.30
Manganese (ppm)	390.97	34.85	380.80	369.00
Zinc (ppm)	125.52	23.89	133.27	149.00
Sulfur ppm	Not Reported	208.06	Not Reported	2239.90

Compost testing was as a media, not as an amendment

Different reporting units

Significant undervalue of compost if don't know which test to request for purpose & market.

		NSDA-Compost		A&L-Compost		NSDA-Manure		A&L Manure	
Nutrient	**Unit**		Value$		Value$		Value$		Value$
Nitrogen[1]	kg/tonne	2.64	$2.90	2.64	$2.90	2.42	$2.66	2.84	$3.12
Phosphorus (P_2O_5)	kg/tonne	9.97	$14.46	1.40	$2.03	10.57	$15.33	12.05	$17.47
Potassium (K_20)	kg/tonne	4.71	$4.47	2.66	$2.53	4.68	$4.45	8.93	$8.48
Calcium	kg/tonne	32.20	$72.45	3.00	$6.75	28.50	$64.13	Not reported	$0.00
Magnesium	%	0.49	$31.79	0.04	$2.73	0.39	$25.16	Not reported	$0.00
Boron	%	0.0017	$0.22	0.0003	$0.03	0.0013	$0.17	0.0015	$0.20
Zinc	%	0.0169	$0.76	0.0024	$0.11	0.0149	$0.67	0.0199	$0.89
Sulfur	%	Not reported	$0.00	0.0391	$0.35	Not reported	$0.00	0.3171	$2.85
Nutrient Value			**$127.05**		**$17.43**		**$112.55**		**$33.01**

[1] only includes 20% of nitrogen. 20% of compost nitrogen is available in year 1, while 100% of fertilizer nitrogen is available.

★ ***Organic matter and microbiology value is not included.***

Phase 1 Recommendations

Economics

2. The economic value of benefits other than nutrients need to be identified to increase demand in the agriculture market.

3. The cost of compost should provide a good economic return to the farmer.

Product

4. Assess the processing method for opportunities to reduce contamination levels.

5. Investigate the opportunity for a new classification that can provide an amendment product to the agricultural community.

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Phase 1 Recommendations

Education

6. Develop agricultural marketing strategies which are different than the traditional compost market program.

VS

Incentive Programs

7. Work with agriculture to develop a proposal to encourage government to invest in healthy soil incentive programs.

So now what?

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Phase 2

The results of Phase 1 and the success of the workshops clearly indicate that there is an opportunity & an enthusiasm for the compost and agricultural industry to work together.

5 Year Demonstration Research Program 2018-2022

Compost requires a longer-term demonstrable benefit payback when compared to traditional fertilizer and manure. It takes time for compost to work with the soil chemistry to show improvements in soil health.

3-4 Municipalities are providing compost for field scale demonstrations on 6 fields across Nova Scotia

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Phase 2

Control	NP 10 t/ac	Compost 10 t/ac	Compost 30 t/ac

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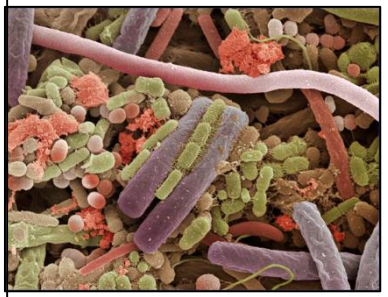
Phase 2

Data Collection

- Soil Sampling

- Microbial testing and underwear test


- Soil condition – soil compaction and soil tilth

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Phase 2

Data Collection

- **Yield and quality parameters**

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Phase 2

Outreach Program

- Municipal Facility Tours
- On-farm field days – demonstrate treatments, provide data, farm participant discussions
- Information factsheets

Provides opportunity for compost facilities and other members of the recycling community to interact

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Communication

Compost and Ag industry are not in communication with each other

More education on the value of compost as a local sustainable product that provides fertility and soil health benefits.

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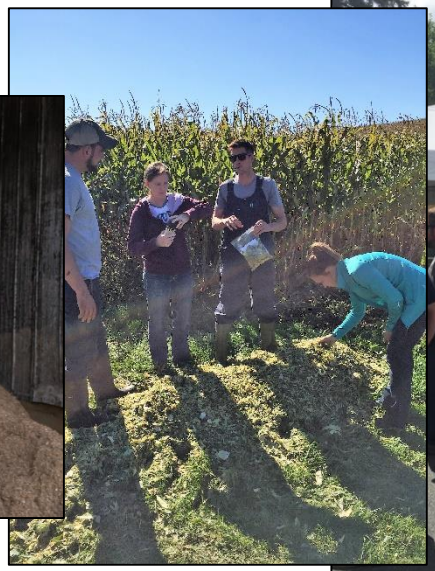
Why are other programs successful?

Seeing is Believing




Sustainable Agriculture Solutions
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