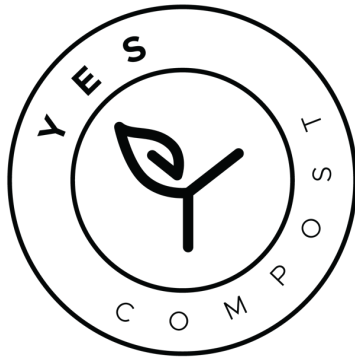


Karl Johnson

Owner / Operator



- Belgrade, Montana
- Established 2018
- 8-10 tons foodscrap / week
- 30 yards compost / month
- 1 Acre facility
- Turned Windrows
- Vermicomposting



WARNING: This presentation is just a description of facility expansions / transitions, and a bunch of opinions about lessons learned. Skin your own cat

**Using Goals and Limitations to
inform facility design and avoid debt**

- You are what you measure
- Process and equipment
- *Nightmares Come True!!*
- Utilize Partnerships
- Investing time vs. Spending time



Y E S
C O M P O S T



Goals:

1. Create High Quality Products
2. Provide High Quality Service
3. Maximize Landfill Diversion

Limitations:



- Don't own Land
- No Power at Site
- Limited Access to Water
- Cold Winter Temps
- Semi-dispersed Service Area
- Inexperienced Customers
- High Labor Costs



Result:

- Bucket Turned Windrows
- Vermicomposting
- Provide Collection Service
- Include Bin Washing

But First . . .

You Are what you Measure:

Inputs / Recipe

Date	12/9	12/11	12/12	12/13	12/14	12/15	12/16	12/19	12/21	12/22	12/23	12/24	12/26
Foodwaste:													
5 gal													
17120 15 gal	38	9	5	3	33	13	1				1	12	
23 gal	5	8	3	5	5						6	5	
32 gal	7	6	2	4	6	2	2	1					
48 gal	3	8	7	7	4	5	2	7	1	1		4	
64 gal	21		6	5	10	13	9	14	14			12	
96 gal													
Carbon:													
Large Chips													
9594 Bark Chips	4	14	5	4	16							25	4
Medium Chips		4											
Composted Chips													
Dust		2			2								
Hay													2
Water:													
gray													
fresh													

Outputs – Biology and Chemistry

Metric	Value	Target	Notes
F&B Ratio	0.31	0.22	The F&B ratio is a measure of soil health. A ratio of 0.22 is considered good. A ratio of 0.31 indicates a higher level of soil health.
Organic Matter	10%	10%	Good. Organic matter is a key indicator of soil health. A ratio of 10% is considered good.
Moisture	10%	10%	Good. Moisture is a key indicator of soil health. A ratio of 10% is considered good.
Acid Phosphorus	1.1	1.1	There is no minimum requirement for acid phosphorus. A ratio of 1.1 is considered good.
Phosphorus	10.00	10.00	Good. The number of phosphorus is a key indicator of soil health. A ratio of 10.00 is considered good.
Phosphorus	10.00	10.00	Good. The number of phosphorus is a key indicator of soil health. A ratio of 10.00 is considered good.
Phosphorus	10.00	10.00	Good. The number of phosphorus is a key indicator of soil health. A ratio of 10.00 is considered good.

Process Consistency
 =
Product Consistency
 =
Repeat Customers



- Accounting Software
- Cash Flow Spreadsheets
- Time is money – use a stopwatch, literally
- As owner, value your own time (or at least track it) - eventually you'll have to pay someone to do it
- Labor cost vs. wage - 1.5 X – insurance, taxes
- Price Services in order to afford expansion

Composting:

Goals:

- Maximize diversion

Limitations:

- Don't own Land
- No Power at Site
- Limited Access to Water



First "windrow"



7 months of material



1 ton / week



8-10 tons / week – active yard

Vermicomposting:

Goals:

- Create High Quality Products

Limitations:

- Cold Winter Temps
- High Labor Costs



“worm bunker”



Labor + Space



Heat and rent \$\$



???

- Outdoor
- Lower cost (rent + labor)
- Mimic natural environment
- Use Thermophilic heat for winter



Nightmare scenario!

Learn, then grow



Collection:

Goals:

- Maximize diversion
- Provide High Quality Service

Limitations:

- Semi-dispersed Service Area
- Cold Winter Temps



**Less trips =
Less fuel + labor**



**“Bucket Exchange”
Kiosks**



Process and Equipment:

Goals:

- Maximize diversion

Limitations:

- High Labor Costs



< 200 lbs/week



- Buy used, no leaks!
- Windrow "flipping"



???

- Loader?
- ASP?
- Grants!!

Bin / Bucket Washing:

Goals:

- Provide High Quality Service

Limitations:

- Limited Access to Water (at compost yard)
- Cold Winter Temps

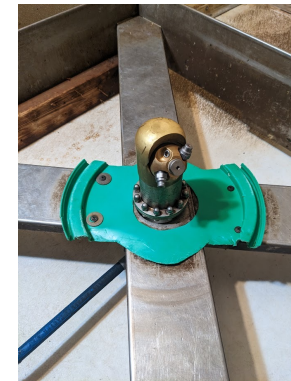
“washhouse” / “wormhouse”



30 buckets / hour



100 buckets / hour



Get Creative!

Goals:

- Create High Quality Products

Limitations:

- Limited Access to Water



- \$5000 (new)
- \$1200 down, balance financed through manufacturer over 12 months



- Graywater!!
- \$500 trailer (new)
- Used tank
- \$200 harbor freight 2" pump



- Landlord's tank and trailer
- Fire Safety for property
- \$500 Honda 2" pump

Partnerships – Mutual Benefits



- All customers are Partners
- Co-branding / advertising
- Sustainability initiatives
- Municipalities – it'll happen eventually
 - Lower cost service
 - Diversion, lower quality products



Investing time vs. Spending time – Decrease Contamination through education



GREENWASHING:

The process of conveying a false impression or providing misleading information about how a company's products are environmentally sound. Greenwashing is considered an unsubstantiated claim to deceive consumers into believing that a company's products are environmentally friendly.
-Investopedia

GREENWASHING TERMINOLOGY:

- "ECO Friendly"
- "Natural"
- "Renewable"
- "degradable" and "biodegradable"
- Colored Green

CERTIFIED COMPOSTABLE TERMINOLOGY:

- BPI Certified Compostable in "Industrial" or "commercial" facility
- ASTM D6400 certification
- The Word "Compostable"
- #7 PLA



Customer
Feedback -
Pictures



Make removal
part of the
process, don't
just rely on
screening

In other words:

- Stay curious and be willing to change
- *Kaizen* – continuous evaluation and improvement
- Use Data to inform decisions
- Know before you grow
- Don't take yourself too seriously, you're only saving the world, right!!??



Thank you!

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