

Source Separation

Cultivating a Culture of Stewardship

Tom Gilbert

Black Dirt Farm LLC



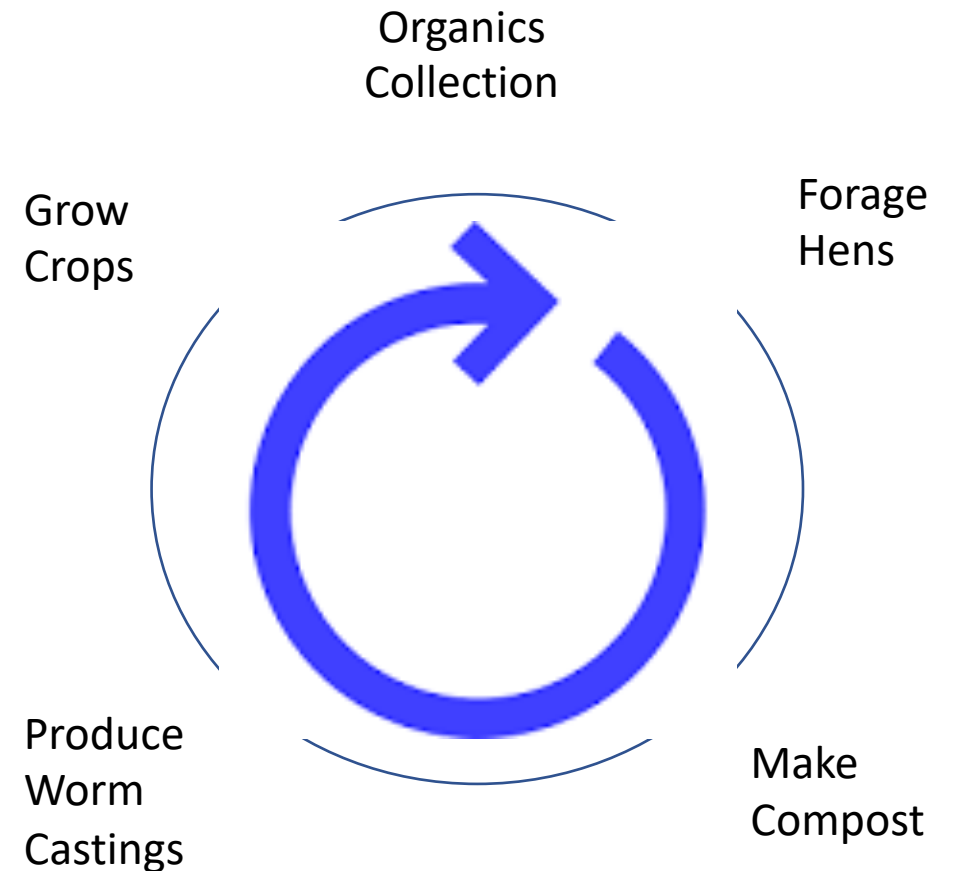
Black Dirt Farm

- Stannard Mountain, Stannard VT at 1700', Zone 3, Lamoille River Watershed
- Unceded land of the Nulhagen Band of the Abenaki Tribe
- Last hundred years – Winchester Family
- Part of the Hardwick Area Foodshed
- Designed to follow the carbon cycle and utilize eco-mimicry
- 9th season, 7 employees (5-5.5 FTE)
- We do nothing perfectly and we have plenty of growth ahead of us, but we try to do a good job. We've learned some things and are unafraid to learn more.
- Stridently aspirational

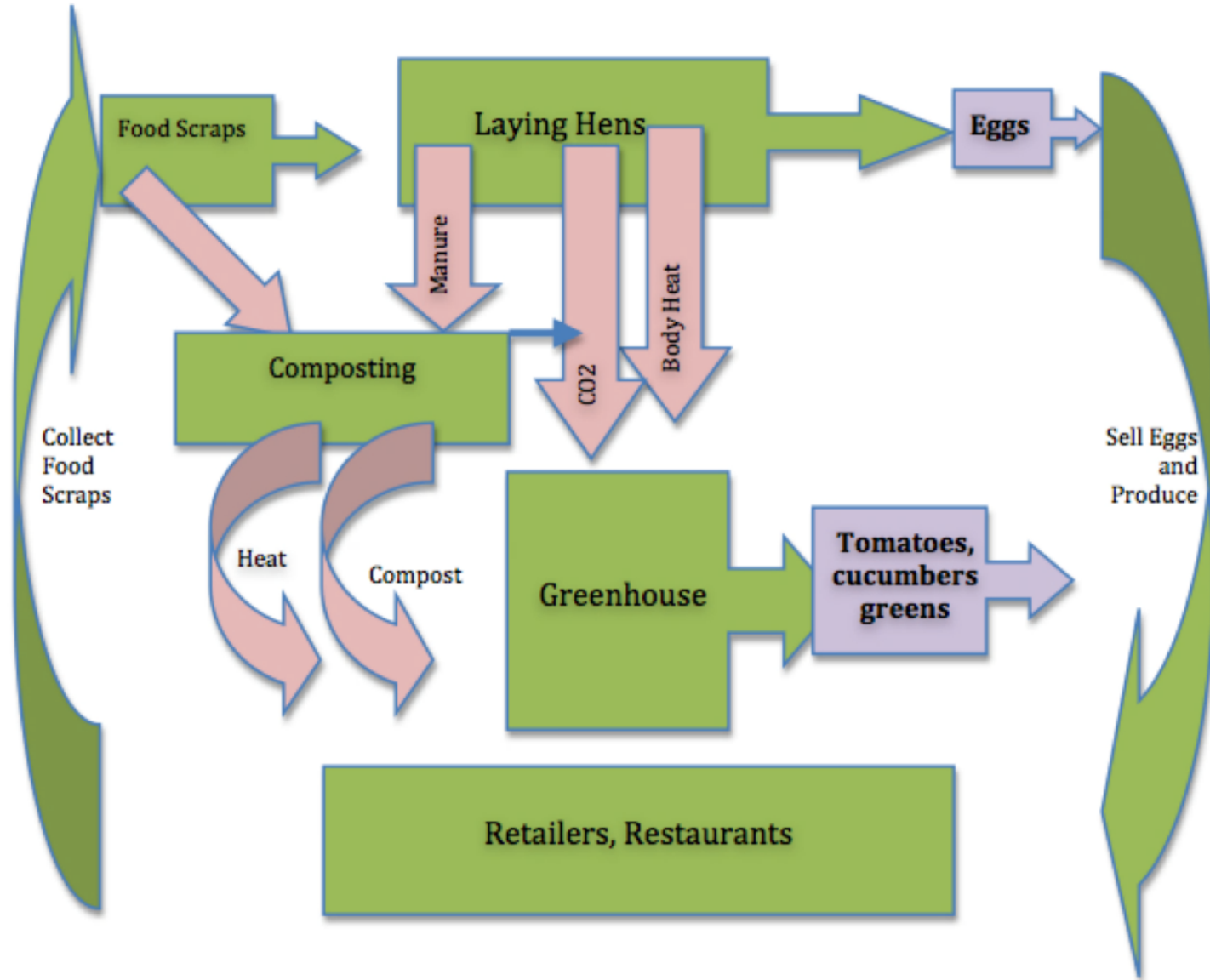
Black Dirt Farm Enterprises

Pursuing an Economy of scope Rather than Scale

- **Organics collection** (off farm)
 - 100 +/- businesses and institutions within 35 mile radius
 - 25-30 tons per week/ 2,600,000 pounds per year
- **Laying Hens**
 - 1200-2000 hens seasonally
 - Hens forage on compost and pasture
 - Sell retail and whole (VT, NH, MA)
 - Stewing Hens wholesale and retail (VT, MA)
- **Compost**
 - 850 CY/ yr
 - Use on farm
 - Bulk and bagged retail, wholesale (VT, NH, MA)
- **Worm Castings**
 - Use on Farm
 - Retail and wholesale (VT, NH, MA)
- **Crops**
 - Hay, loose leaf greens, tomatoes, mixed crops
 - Wholesale (greater Hardwick area) and retail



Food Scraps in the Farm System





Source Separation of Food scraps in diverse settings



Compost Foraging

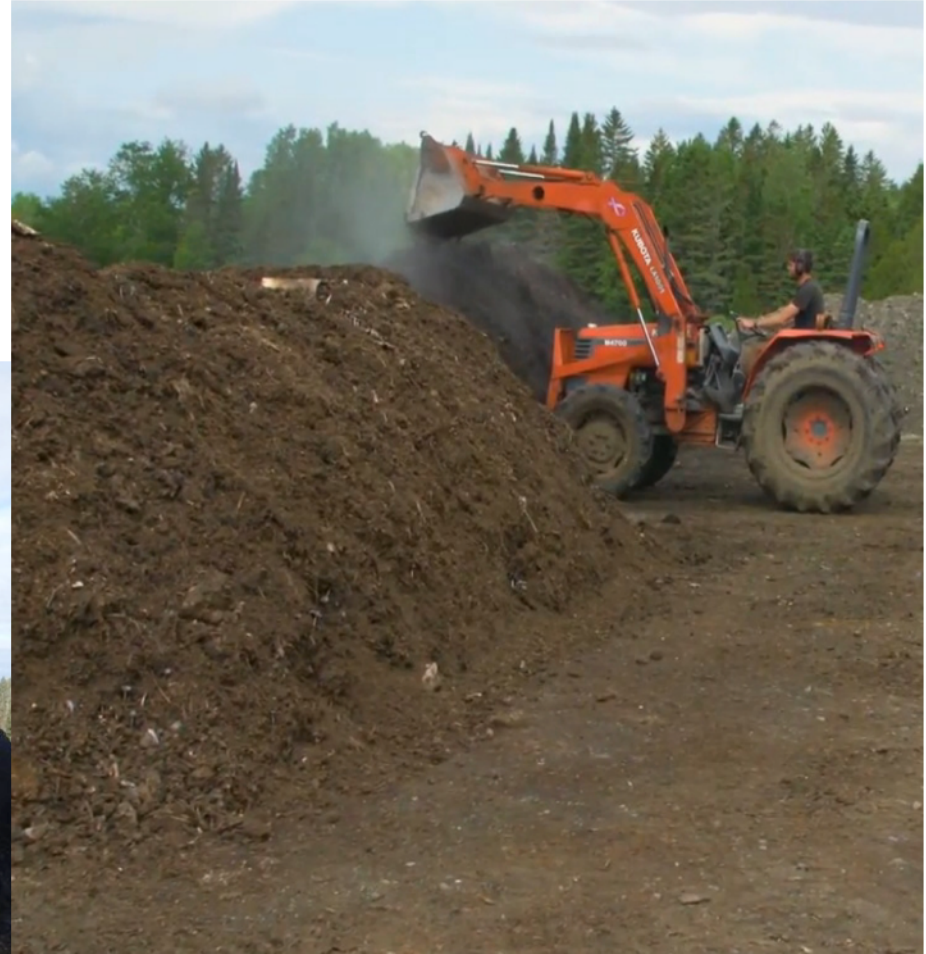






Making Compost

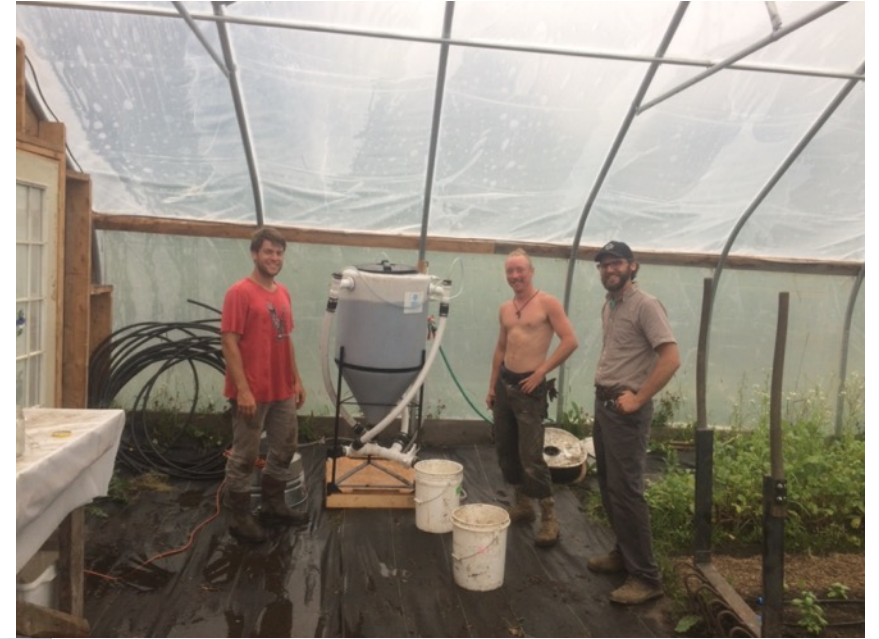




Producing Castings







**Compost
Heat
Recovery/
Pile Aeration**

**Compost
Tea**

Growing Crops



Framing Statement

- The Earth, and the biophysics of its systems, define the rules, we must live within them
- We do not have the right to displace other species or undermine the integrity of Earth systems
- Design human society around ecological principles
- Social equity is an important aspect of ecological integrity. All species live within a social contract that is mutually inclusive and beneficial. Human society should reflect this.
- Acceptance of our circumstances is required to attune actions, but does not equate to complacency
- Social values, personal accountability and transparent systems are critical
- Precautionary Principle – do no harm
- Participation & Power - We are beholden to act on what we know

Source Separation - It's the Law

Sec. 1. 10 V.S.A. § 6602

§ 6602. DEFINITIONS

- (31) **“Food residual” means source separated and uncontaminated material** that is derived from processing or discarding of food and that is recyclable, in a manner consistent with section 6605k of this title. Food residual may include pre consumer and postconsumer food scraps. **“Food residual” does not mean meat and meat-related products when the food residuals are composted by a resident on site.**
- (32) **“Source separated” or “source separation” means the separation of compostable and recyclable materials from noncompostable, nonrecyclable materials at the point of generation.**

Why Does Source Separation Matter?

- Pathways for Contamination
 - Micro plastics
 - PFAS
 - Heavy Metals
 - Other toxins/ pollutants
- Soil and resource stewardship
 - Principle of Return
 - Precautionary Principle
- Social Innovation vs Mechanical Innovation
- Public participation & psychological proximity – building a culture of stewardship
 - Building community capital and ecological literacy

“knowledge increased, but like the circumference of an expanding circle, ignorance grew as well.”

— David W. Orr,
Earth in Mind: On Education,
Environment, and the Human Prospect

Contaminated Compost



Composting is a hot (140-170F), low pH, wet, agitated process, conditions that can cause leaching and fragmentation.



Photo Credit: Peninsula Compost;
CalRecovery

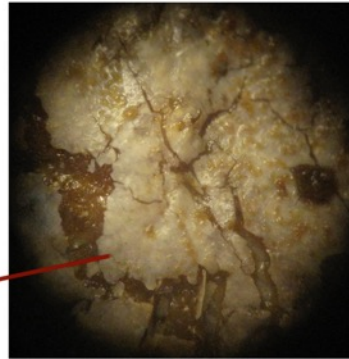
30x digital microscopy of peeling and fragmenting process

Microscopic Images After 5 Weeks of Biodegradation



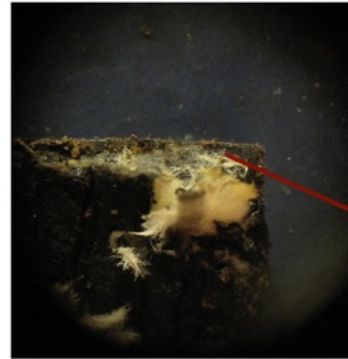
Food Boats/Clay

Natural clay material disintegrating normally.



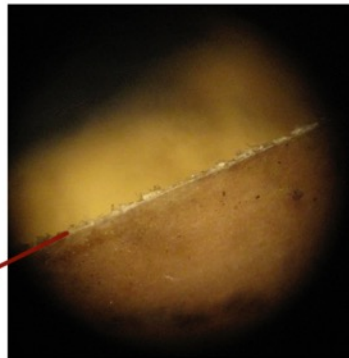
Stouffer's Tray/PET

Inside paper layer (now soft & pulpy) against black coated, intact plastic layer (no degradation).



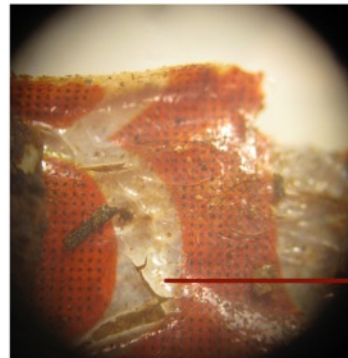
Minute Maid/LDPE & Nylon

Some delamination. Sharp, intact plastic edge. No visible signs of degradation.



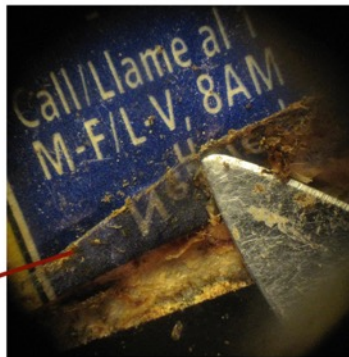
Stouffer's Box/LDPE

Plastic layer cracking and peeling away from ink layer. No obvious degradation.



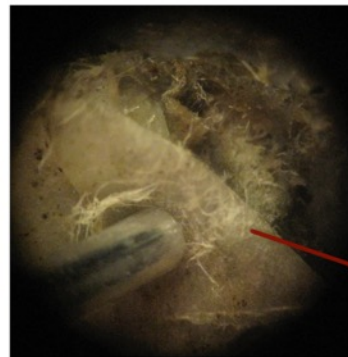
Nesquik/LDPE

Intact plastic layer (no degradation) being peeled back from inside paper layer (soft & pulpy).



Tropicana/LDPE Blend

Intact plastic layer being peeled away from paper layer (now soft & pulpy).



Slide Source:
EcoCycle & Woods
End Labs

Household Food Scrap Collection

- 20% of a carton is PE
- Many programs accept cartons with food scraps
- Each half gallon carton (pictured) has ~15g of pure PE
- 15g of PE in ~1.5kg food scraps per carton = a potential 0.01% of PE in compost



Slide Source: EcoCycle & Woods End Labs

Collection for Depackaging



Mechanical Innovation

Never packaged materials for depackaging



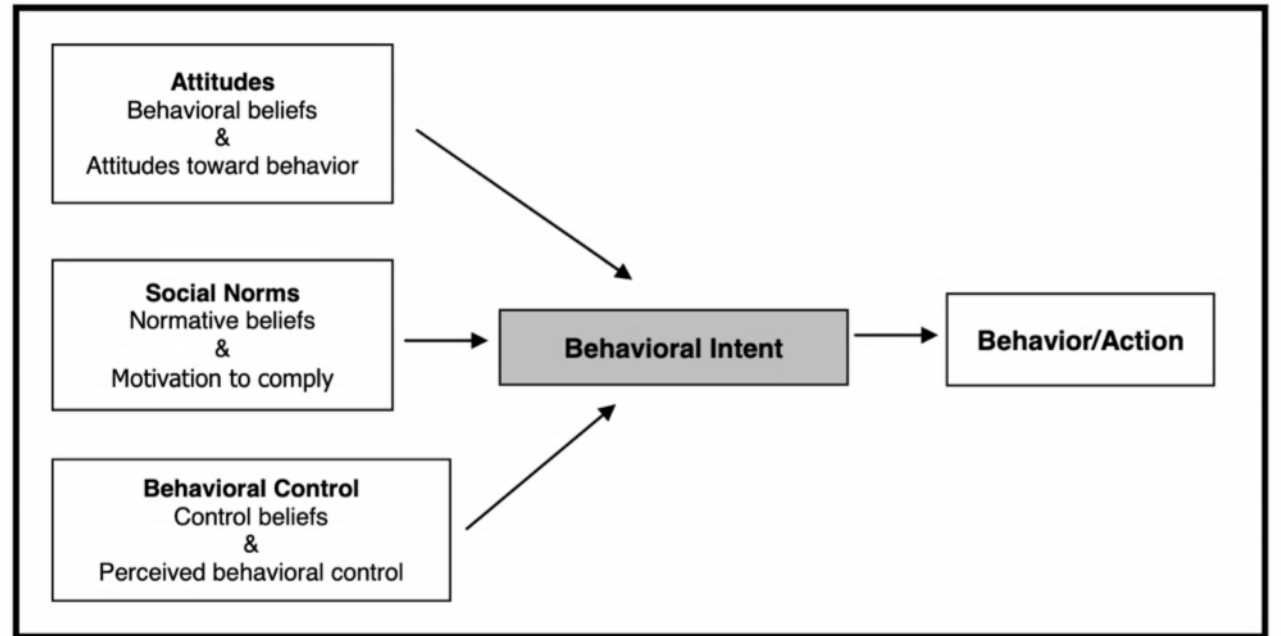
So How do we Achieve Source Separation? Social Innovation

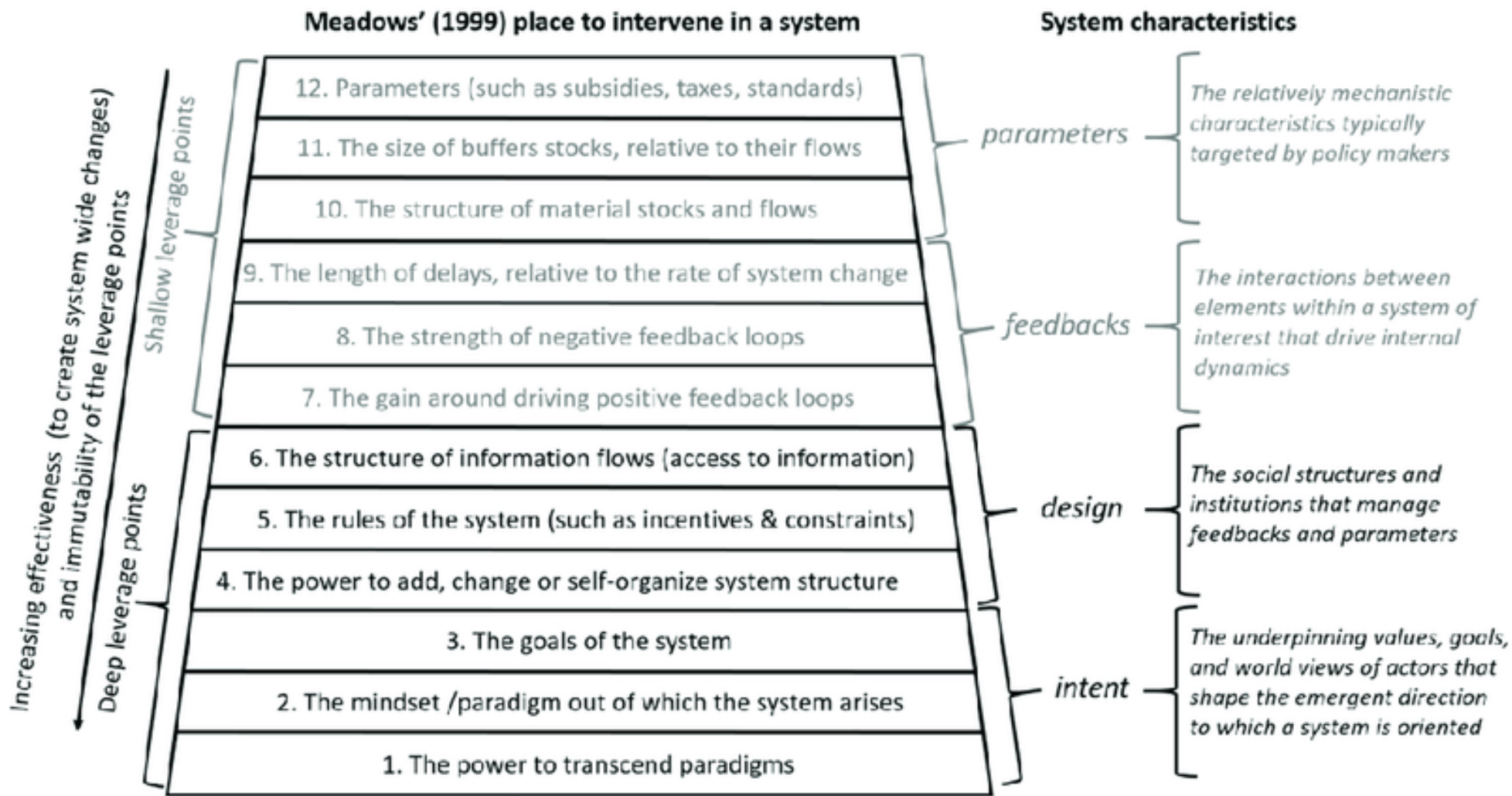


Behavior Change

- Source separation requires behavior change
- Changing behaviors can be hard and requires learning, but most importantly, you have to intend to change
- Learning to change is important – it's a sign of well-being
- Behavior change is rarely motivated by information alone – beliefs matter
- Requires and offers optimism and possibility
- Intrinsic Motivation, Accountability and Sense of Personal Power

Figure 2. Theory of planned behavior (Ajzen & Fishbein, 2005)





The four system characteristics represent a nested hierarchy of, tightly interacting, realms of leverage within which interventions in a given system of interest may be made. Deeper system characteristics constrain the types of interventions possible at shallower realms of leverage

Source: Kirst & Lang; Journal of Sustainability "Perspectives on Comprehensive Sustainability-Orientation in Municipalities: Structuring Existing Approaches"

NEWS + OPINION ▶ TRUE 802

MAY 31, 2017

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+ send a letter to the editor

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By SASHA GOLDSTEIN



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Core Approach

- Belief: people want to do good, they want existential relevance, they want to feel connected to others and the world, and they want to be respected
- SSO is an optimistic, solution-based approach
- Relational
 - Relationship w/ BDF – our farm, our birds, our operators, our products
 - Relationship to ‘system’/ community – personal context & belief (connect to what matters)
 - Build off existing relationships w/in community to model behavior & jumpstart new norms
- Community of Individuals
 - Group outcome emerges from individual choices
- Explicit, clear, diversely redundant
- Inviting and fun
- Collaborative – orient as peers and partners
- On-going/ Iterative
- Relationship fosters long term partnerships - flexibility, motivation, and resilience
- Personal accountability is a skill that builds on itself



Fostering Source Separation at FSGs

Program Set-Up

- Constant messaging from start to finish – shamelessly forward and unapologetic
 - SSO is the program
 - Reference in promotional materials, initial contact, first visit and maintained through on-going communications
 - Positive – you can be the solution. Create a group norm and invite others in
 - Making the System Transparent and Contextualized for all participants
- Contract – structurally reinforces messaging
- Remove unnecessary opportunities for confusion and mistakes
 - Layout, preventable trash/ single use, ease of operation
- Training – redundant messaging in multiple forms
 - General presentation – recognized leadership legitimizes, we engage and contextualize
 - Specific small-group trainings
 - In-person presentation
 - Video
 - Model the behavior in training, even if informally
- Behavior modeling within existing culture; ID champions with strong social capital
- Real time monitoring at sorting station

Program Maintenance

- Positive Reinforcement
- Pre and post tip screening
 - Collection Equipment design
 - Operator Ethos/ buy in – picking
- Feedback
- Documentation – photos and follow up
- Tote Rejection
- Retraining, fines and other corrections
- Relationship Maintenance
 - Mail Chimp and Social Media
 - Invoices
 - End of Year Posters



SSO from the Inside Out; Building a Farm Culture



Rule of Thumb – stewardship in every moment - when you see plastic, pick it.



Source Separation is how we present and talk about our program from start to finish

Black Dirt Farm

Compost Collection Services

Black Dirt Farm offers professional food scrap collection services to area businesses and institutions. Our clients capture food scraps and collect them in the 48 gallon totes we provide. Each week the totes are emptied and thoroughly pressure washed with hot water. We bring the food scraps back to our farm in Stannard where they are used as feed for our laying hens and then turned into nutrient-rich compost. We accept all food scrap materials and a limited number of paper products.

We Provide

- Rugged, 48-gallon totes with good lids and wheels (*as many as you need at no additional cost*)
- Employee training & instructional signage
- Resource recovery & pollution prevention statistics in every invoice
- Sawdust to cap & seal the tote against odors and pests (*option*)

Rates

At \$20.00/per tote our rates are competitive with trash costs. Most businesses are able to renegotiate their trash fee to see a corresponding reduction in costs through composting. Pricing is also available by the ton.

Contact Us

802-533-7033

393 Stannard Mountain Rd.
Greensboro Bend, VT 05842

www.blackdirtfarm.com
info@blackdirtfarm.com



Acceptable Materials For Compost

meat, bones, dairy, fruit, vegetables, bread, nuts, eggs, shells, seafood, oils, soups, sauces, brewery mash, coffee grounds; AND a select number of paper and fiber-based products such as coffee filters, paper towels, napkins, disposable serveware and cardboard egg cartons.

Contracts

- Use specific, precise language about expectations
- Build in redundancy – have content requiring SSO and banning contaminants
- Name FSGs as collaborators in achieving separation, including making employee and student time available for training, as well as including source separation training in their new hire training
- Clearly lay out thresholds, ‘fines’, and tote rejection for contamination
- Establish a point person for source separation communications
- FSG responsible for contamination, including dealing with rejected totes

Trainings – beyond information transfer

- Key to effective programs
- Best opportunity for relationship building
- You must believe in the people you are training
- Most people have a hard time believing in the things they can't see or haven't experienced. This is, in part, why behavior change is hard. Help them SEE!
- Bring visual and tactile references
- Appeal to the things that matter to them; connect the dots; help establish what matters.
- Get personal! I and Thou.
- Get motivated, get activated! This is change work we have the power to do! We need change makers at every touch.

“... the more students work at storing (information) deposits entrusted to them, the less they develop the critical consciousness which would result from their intervention in the world as transformers of that world [...] they accept the passive role imposed on them.”

Paulo Freire,
Pedagogy of the Oppressed

Pro Tip: Don't just train managers. Involve employees in developing their sorting areas



Signage and Labeling

ACCEPTABLE ITEMS FOR
COMPOST

⊗ YES
All food scraps can be composted:

- Meat & bones
- Milk, cheese & other dairy
- Fruits, vegetables & peels
- Soups & sauces
- Dressings & condiments
- Flour, bread & pastas
- Nuts & shells
- Seafood and shells
- Coffee grounds
- Oils & fats
- Eggs & egg shells
- Spices

Additionally, the following items can be composted:

- 100% fiber paper towels & napkins
- Egg cartons & Coffee filters
- 100% fiber based, compostable plates, bowls, or portion cups
- Bamboo and sugarcane

⊗ NO
These items cannot be composted:

- Metal
- Plastic, including biodegradable plastics and other PLA products
- Styrofoam
- Hazardous wastes
- Paper products with plastic liners
- Milk, or orange juice cartons
- Sugar packets
- Grease or food items contaminated with cleaning agents
- Compostable bags, utensils, cups
- Store-bought flowers
- PLU stickers

802.533.7033
BlackDirtFarm.com



Pro Tip: Don't include plastic lined products, such as milk cartons, on your list of acceptable materials. Use very explicit words and phrasing.

Easy to Use Sorting Areas



Photo Credit: NY Times

Pro Tip: Make sure flow is intuitive and easy for participants. Order: trash, recycling, compost. Provide a surface for them to place tray or plates on.

Set the standard!

Want clean material? Offer clean services!

Clean, professional services for your customers help establish a sense of mutualism and benefit.

Efficient, user-friendly systems for your crew make their job easier and create pride



Black Dirt Farm

PERFECT ✓ **USELESS** ✗

CAP COMPOST TOTES WITH SAWDUST

Cover contents of the compost tote with a 2" blanket of sawdust DAILY to prevent odors & pests. This is particularly important for totes containing meat & seafood. Cap FULL totes with a 4" layer of sawdust.

BLACK DIRT FARM 802.533.7033 | INFO@BLACKDIRTFARM.COM



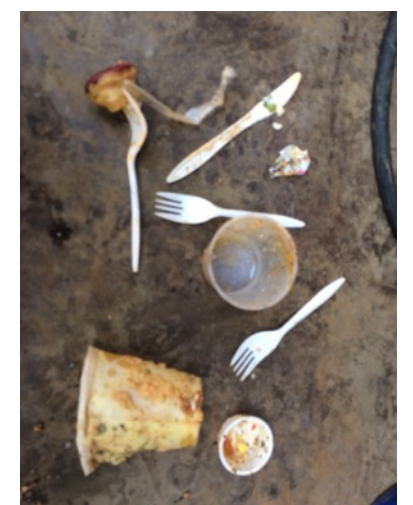
Load Screening

materials must be visible to operator



Pro Tip: Look before and after. Set yourself up to easily pick.

Picking & Documenting Contamination



To get this.....



We pick this



We pick roughly 2-4 gallons of trash out of food scraps per day (two 3.5-5 ton loads), or 1 gal/1600 gal food scraps – about 0.0009%.

Residential Drop Offs

- Have a presence. Table at start-up and every so often.
- Gather as many participants contact info as possible for follow up
- Send Welcome email w/ video and printable Yes/No poster. Consider fridge magnets.
- Social media posts
- Connect to community through various pathways. For us this includes our egg cartons.



Black Dirt Farm
Published by Instagram · March 21 · Instagram

Yikes! Look at all those bags! 🚫

Please do not put ANY plastic bags in our drop off totes. Even if they say biodegradable.

Why not? Well, because they're contamination just like a soda can, PLU stickers, rubber bands, plastic wrap, etc.

Even the Bio-bags? YES!
Just because it says biodegradable doesn't mean it actually is. One of the reasons we don't accept them because more often than not, this type of bio-products doesn't break down as readily as promised. Secondly, our compost is certified for use on organic farms and bioplastics interfere with our ability to be certified.

We take contamination so seriously because we bring your food scraps back to Black Dirt Farm and put them to work.

First we blend in carbon materials like woodchips and manure. Our laying hen then forage the mixture and add their own fertility. Next the materials are moved out to our compost pad and made into piles which are turned and monitored until they become high quality compost. A portion of the compost is taken to the Worm Shed where a couple of hundred thousand Red Wiggler worms turn it into High Potency Worm Castings.

Finally, after all that work, the compost and casting—both approved for use on organic farms—are used by home gardeners and local farmers to grow delicious and nutritious food right here in our community.

Thank you for helping us keep BDF totes free of contamination! [See less](#)



Black Dirt Farm
Published by John Huw Lodge · October 15, 2015 · Vermont

We have agreements with all of our generator to separate trash and other "non Compostables". We sometimes need to do some of the work for them. This ensure a clean feed for the hens and also a clean end product in our compost.

— at Black Dirt Farm.

Edit

Like Comment Share

Comment as Black Di...

Tote Rejection

OH NO!

THESE FOOD SCRAPS ARE
CONTAMINATED
WITH TRASH!



We've left this compost tote behind because the contents have been compromised by trash. Please clean out the tote before your next pick up, by removing the contaminating items or dumping the contents in the trash.



QUESTIONS?

Contact us at (802) 533-7033
info@blackdirtfarm.com



It HAS to MATTER! Celebrate your Successes!

Black Dirt Farm
393 Stannard Mtn Rd
Greensboro Bend, VT 05842
(802) 533-7033



To
St Johnsburry Academy



Date 05/03/22
Invoice 11073
Terms Net 30

Decription	Quantity	Unit Price	Service Date	Total
Number of 48-Gallon compost totes collected	19	20.00	4/6/22	380.00
Number of 48-Gallon compost totes collected	13	20.00	4/12/22	260.00
Number of 48-Gallon compost totes collected	14	20.00	4/19/22	280.00
Number of 48-Gallon compost totes collected	11	20.00	14/26/22	220.00

This month your team diverted 12,312 pounds of food scraps from the landfill, mitigating greenhouse gas emissions equivalent to not burning 547 gallons of gasoline!

Total \$1,140.00

Please make all checks payable to 'Black Dirt Farm'.
For inquiries about your bill, please contact Jarrett Belmont at 802-533-7033.

YOU ROT! Thanks for your business!

St. Johnsburry Academy Composts its Food Scraps!



In 2021, in partnership with Black Dirt Farm,
St. Johnsburry Academy has:

Diverted
152,928
lbs of food scraps
from the landfill

Mitigated Greenhouse
Gases equivalent to
not burning
6,796.8
gallons of gasoline

Captured enough
Nitrogen to fertilize
11.47
acres of mixed
vegetable crops

Together, we have retained these resources in our community, strengthening the local economy and contributing to a regenerative local food system.



Picking Piles

We pick during monitoring, and before and after every turn

We pick roughly 24 gallons of trash/ month on the site, or 2 gal/ pile. This is roughly 1 gal/ 2,000 gal compost or 0.0005%

Pro Tip: Pick Less, often. Do not fragment plastics



Photo: 7Days



Post-process Removal



We pick roughly 0.5-2 gal/ 15 CY (3000 gal) screened compost, or roughly 0.0005%. We do have some contaminants make their way passed us, esp PLU stickers

Pro Tip:
'Overs' provide a good feedback loop

Relationship Maintenance



- Keep in touch
- Know people's names
- Seek out opportunities to say thank you
- Anticipate needs
- Collaborative Frame: 'WE'
- Product givebacks

Opportunities to Improve

BDF

- Internal metrics tracking
- More sharing of lessons learned between FSGs
- Better web-based FSG resources
- Updated training tools
- More fun propoganda

FSGs

- Improved new hire/ new student training
- Internal workplace culture
- Reduce opportunities for contamination, reduce waste
- PLU removal
- Recognize & leverage organizational & educational opportunity

Districts/ State

- Promote, support & enforce SSO
- Set an ambitious vision
- Provide educational/ training support for schools
- More resources for haulers
- Protect the SSO market
- Apply precautionary principle
- Product Standards
- If allowing depack, apply to most necessary materials until standards are developed
- Manage the message – don't let depack confuse and undo years of work
- See stewardship capacity as social capital – invest in it!