



Bokashi Fermentation: Practice & Application to Urban Composting Operations

September 2023

WHO WE ARE



Who We Are



We are community composters working to build a zero-waste world.
We keep food waste out of landfills and use it to improve soil health and support resilient, and equitable food systems.





EPIC RENEWAL

**We do the dirty work,
you do good.**

Composting Services



Home



Business



Events



**Zero Waste
Consulting**



**Software for
Composters**

BOKASHI FERMENTATION



We're working to shape a new future for composting,
one that provides a local solution, tailored to an
urban environment.

To do that, we use bokashi fermentation.



Bokashi $\neq$ Compost



Bokashi is a fermentation process, which allows food scraps to be turned into a ready-to-go soil amendment within about 10 days.



Traditional Composting

(Aerobic)



Bokashi

(Anaerobic Fermentation)



Aerobic Composting

(Aerobic)

Requires Outdoor Space

Limited Input Options
(Depending on scale)

Regular maintenance



Bokashi Composting

(Anaerobic Fermentation)

Indoor Processing

Requires Less Space

More Input Options

Faster Turnaround

Less Labor

No Pests or Smell



HOW IT WORKS





- **Lactic acid bacteria** : *Lactobacillus casei*
- **Photosynthetic Bacteria**: *Rhodospseudomonas palustris*
- **Yeast**: *Saccharomyces cerevisiae*
- **Others**: beneficial microorganisms that exist naturally in the environment may thrive in the mixture.

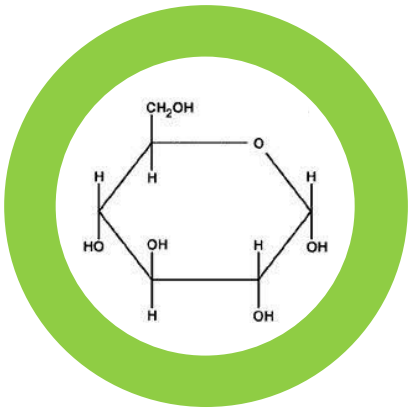


Chemical Process: Bokashi Fermentation



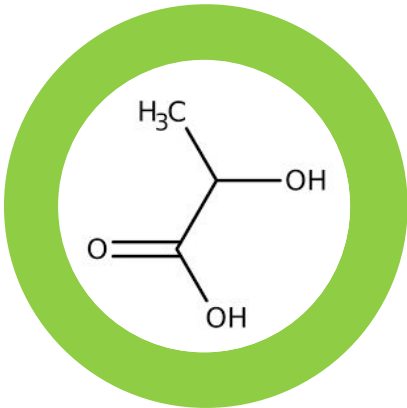
Bokashi

+



Carbohydrate

➤



Lactic Acid



MAKING THE BRAN & TOOLS



Making Bokashi Bran



EM1

+



Sugar

+



Water

+



Substrate

Making Bokashi Bran



Making a Fermenter

*Drill holes in top bucket
for leachate to drip
through*

Fermenter:

- 2 5-gallon buckets
- 1 airtight lid
- 1 spigot

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Note: while this is a good setup for home composters who need to regularly drain leachate, we utilize our leachate when building our aerobic composting piles, and therefore no longer use spigots on our own fermenter setups, but drain by separating the two buckets and collecting leachate in a larger container.



*Add spigot for
drainage to bottom
bucket.*

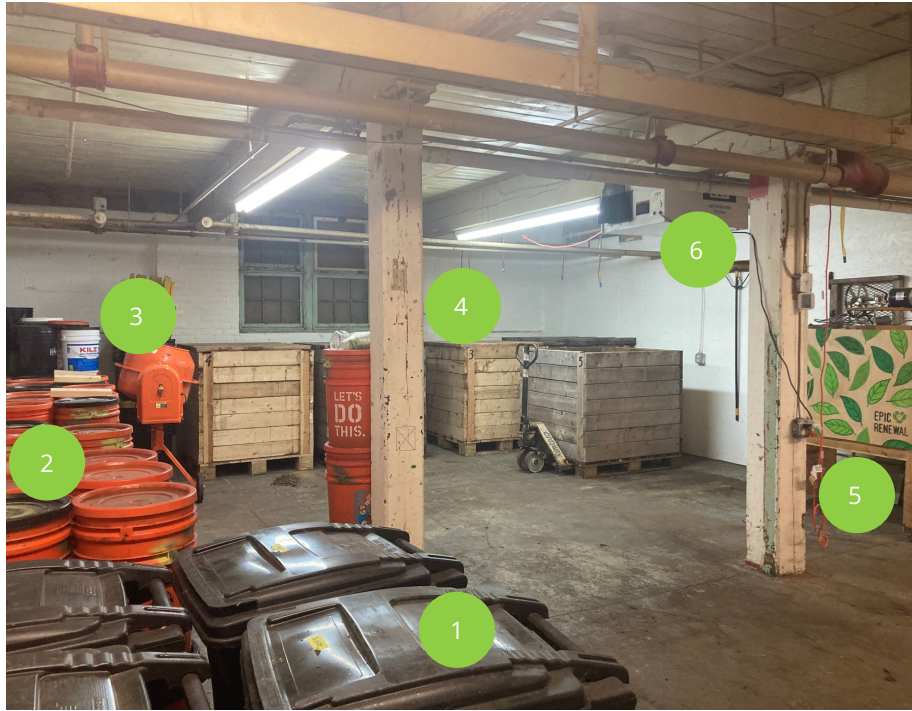




EPIC'S COMPOSTING PROCESS



Our Studio Layout (we do everything indoors)



- 1) Feedstocks
- 2) Fermentation Containers (Loaded by pallet)
- 3) Cement Mixer (For premixing before loading hotboxes)



- 4) Hotboxes (Have hardware fabric base, built on pallets for easy moving)
- 5) Sifter
- 6) Air filter for particles



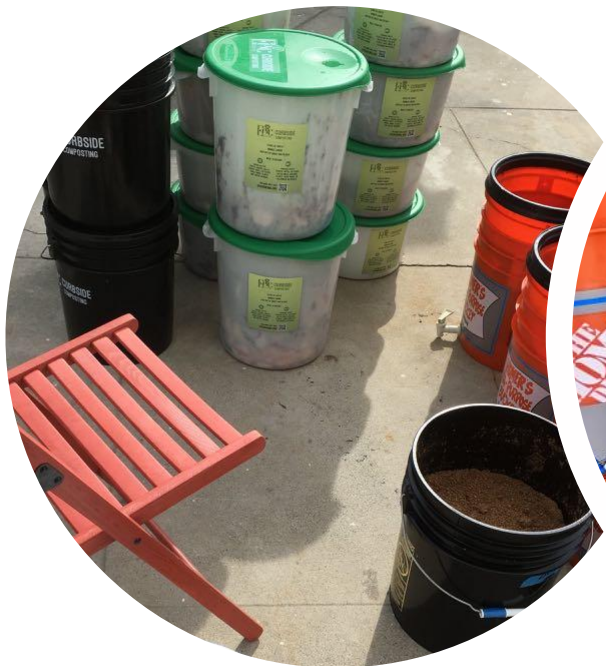
Our Process



Step 1 -
Fermentation



Step 1 - Fermentation



Step 2 • Alternatives



Vokashi has their clients add bran throughout the week, and collects filled, fermenting buckets. They trench by loading large holes in the earth with layers of fermented material, soil, and sawdust.



Some folks create a 'soil factory' by mixing their fermented material with healthy soil in a large container, and giving it an occasional stir. Slow but effective!



JACCC sometimes employs a similar process to ours, mixing the fermented material into other aerobic composting processes as a feedstock.



Step 2 - Mixing



We use a cement mixer to blend our fermented material with a carbon mix of ovals from past cycles, clean wood chips, and leaves.



We add a wood chip biofilter to the top and bottom (~10"), and load the mixed material in between to fill our hot box. We add our leachate from the fermentation process to our mix to prevent overdrying.



Our hotbox sits for 4-8 weeks depending on our staff bandwidth before sifting. We will often reach 131° or higher within 2 days.



Step 3 - Hot Composting



We have also a



We add a wood chip biofilter to the top and bottom (~10"), and load the mixed material in between to fill our hot box. We add our leachate from the fermentation process to our mix to prevent overdrying.



Our hot box temperature is often reaching 131° or higher within 2 days, depending on our staff bandwidth and sifting. We will



Step 4 - Sifting & Finished Product



We sift using a $\frac{1}{4}$ " screen and our motorized sifter.



Bokashi composting is perfectly suited to an urban environment, or anywhere with limited green space.

A huge perk that's especially useful in urban spaces is that since everything stays contained, vertical space becomes a whole new resource.



Japanese American
Cultural & Community
Center

Hiro's Bokashi Workshop



Thanks!



Epic Renewal | Urban Composting



epicrenewal.org



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