

## **BOKASHI**

### **From Text to Operational**

#### OUR FUTURE

The Great Pacific Garbage Patch was discovered in the 1970's. The continued dumping in the oceans has now resulted in several large islands estimated in sizes between Texas and the Soviet Union. Our solid waste landfill problems also continue to grow. Many cities are being forced to ship their waste out of state due to lack of room and smell (NY City exports to NJ, VA, PA, & upstate NY)(Seattle WA exports to OR, and ID with plans for NM). It is estimated that 30% is reusable or recyclable and 35% of the solid waste is organic. Now, it is up to us to implement some changes (**R**efuse, **R**euse, **R**ecycle.) Experts continue researching ways to solve the solid waste issues, which include composting. Dr. Teruo Higa's discovery of efficient microorganisms (EM) make kitchen composting affordable, practical, and beneficial.

#### AFFORDABLE

Initial Expenses	DIY BOKASHI BUCKET	SCD
Bokashi Composting book	\$14.71	\$14.71
Two (2) 5 gal. buckets [\$3.98 each]	\$7.96	
Gamma Lid for 5 gal. bucket	\$7.25	
1/2" brass boiler drain 1/4 turn	\$8.90	
Evaporative cooler brass drain	\$5.68	
SCD All Season Bokashi 2.2 lbs.	\$12.50	(included in kit)
SCD All Season Indoor Composter Kit		\$43.95
Miscellaneous (pen, gasket, screen, ?)	?	?
Time & Labor	?	
	\$57.00	\$58.66

EM (effective microorganisms) MIX	DIY	SCD
SCD All Season Bokashi 2.2 lbs.		\$12.50
Wheat bran 50 lbs.	\$15.09	
TeraGanix EM-1 (32 oz.)	\$34.99	
Plantation Organic Black Strap Molasses (15 oz.)	\$11.49	
Mixing container		
large space bag (vacuum)		
	\$61.57	\$12.50

## BENEFICIAL

The benefits of kitchen composting (digestion) include: 1) can compost most kitchen organics 2) no smell, bugs or insects 3) by product - fertilizer 4) Doesn't go to landfill!

## PRACTICAL

No larger than a kitchen garbage can. Can accept most kitchen leftovers.

## Construction

The top bucket requires drain holes in the bottom for the liquids released in the digestion process. The holes need to be big enough to ensure adequate drainage and small enough to prevent digested debris from plugging the drain valve. About eighteen (18), evenly spaced, 1/4" holes should work well.

A small screen (re-useable), cut to fit the inside bucket floor, will also aid in preventing the drain valve from plugging.

A snap on lid keeps the main container air tight but taking it off to add waste can be frustrating. I recommend a Gamma lid that screws on & off easily and also make the container air tight.

It is recommended that an additional inner air seal be placed on top of the waste to reduce air re-entering the anaerobic (without oxygen) process. A plastic bag will do. I used a clay plant pot base/tray that just fits the inside of the bucket, it is heavy enough to compress the air out of the waste.

The bottom bucket needs a drain. The build up of liquids into the top bucket may spoil the digestion process - resulting in a bad & stinky batch! Some people do not install a valve (fear of leaking). Their solutions are: put shredded paper in the top bucket to absorb the liquids or separate the two buckets & pour off the liquids. Separating the buckets seem impractical because it introduces air to the anaerobic system, it is messy, and the bucket weight increases with each use. A drain can be installed by drilling a 1" hole in the side and inserting a valve. Caution: The valve needs to be high enough to ensure the spigot nozzle doesn't touch the counter and low enough so it doesn't interfere with the top bucket.

## WASTE

Since the system is anaerobic digestion and not composting you can add most table scrapes, followed by an EM (effective microorganisms). Dr. Higa published his EM findings in 1982 and since then others have come up with their own EM's.

The **General Guidelines** suggest to **only add fresh** kitchen waste. About 2" of waste followed by 2 tablespoons of EM (about 1 heaping tablespoon per cup) sprinkled on top, seal, repeat, until bucket is full. **Don't** exceed 3 inches because the EM won't be able to effectively penetrate the waste to do its job.

**Don't** add spoiled or rotten. The bad bacteria may overpower the EM resulting in a bad batch.

**Don't** add plastics, oil, grease, wood, yard & lawn trimming.

**Avoid** liquids (the fruits & vegetables secrete enough) because they can ruin your batch.

**Avoid** paper because it would be a barrier for the EM and possible cause pooling of liquids. Some people add shredded paper to the bottom of their bucket to absorb the liquids while they are away.

After the last fill, allow 2 or more weeks (undisturbed anaerobic conditions) before integrating with plant roots.

Some terms appear vague, such as "add a handful", "sprinkle about" 2 to 3 tablespoons. This is necessary because not all EM's are the same. You would add more EM to proteins (meat, fish, eggs, cheese) and less to

finely chopped carbohydrates. When you add to your next batch, your observations (smell) will let you know if you need to add more or less. If you notice the start of an unpleasant odor you could try saving it by add additional EM.

Handful = about 1/3 to 1/2 cup  
= about 2 to 3 ounces

### Effective Microorganisms (EM)

Should you make your own or buy one of the commercial mixes?  
SCD Probiotics sells a 2.2 pound bag for for about \$12.50. A small family might take 2 weeks to fill a bucket and use about 1/3 of a bag of EM per bucket. [\$2.08 / week]

I am made my own, using the recipe from Bokashi Composting - Adam Footer page 54. I found it easy to make a small batch. Excluding buying a trash can to store the bran (discourages mice) and a mixing container (larger volume), I am estimating my cost for EM to be about \$2.71 for 2.2 pounds. [\$0.45 / week]

### USES

#### Soil additive

In a container: add 1/3 potting soil, then 1/3 waste, mix and then cover with 1/3 potting soil. Cover with plastic (anaerobic) and wait at least two weeks - more is OK. Additive/soil is ready to plant.

#### Bury it

Dig hole (away from young roots) about 12 inches deep (possibly along a tree line), then bury and forget. If animals are a concern, bury deeper or put something over it to prevent digging. If you want to plant something over fresh hole, wait two weeks to prevent burning new roots.

#### Bokashi liquid waste

- Bucket should be drained daily. NO MORE than 3 DAYS
- Mixing preferably done outdoors.

- 1 tablespoon to 2 or 3 ounces per gallon of water can be sprayed on soil as additive. Not suggested for foliar application. Must be used within one day.
- Flush down toilet (bacteria is good for sewer lines and septic tanks)
- Compost activator (can be used as mother culture one more time - more regeneration results in diluted ineffective microorganisms).

## SUMMARY

Although making my own DIY Bucket was fun and educational, I believe the commercial buckets to be more cost appropriate and with choice of colors to be better suited for the kitchen/utility room cosmetic appearance.

## YOUR CHOICE

We have passively disregarded our environment too long. It's time to make a commitment. After reviewing several composting methods, Bokashi Composting seems to be easiest to use, reasonably affordable, practical, and beneficial.

## **REFERENCES**

### **<https://en.wikipedia.org/wiki/Compost#Bokashi>**

- Bokashi is a method that uses a mix of microorganisms to cover food scraps or wilted plants to decrease smell, reduce the risk of attracting pests and increase the speed of decomposition.
- It derives from the practice of Japanese farmers centuries ago of covering food scraps with rich, local soil that contained the microorganisms that would ferment the material.
- The first stage of bokashi preserves the ingredients in a lactic acid fermentation. The acid is a natural disinfectant, used as such in household cleaning products, so that what enters the second (digestion) stage is essentially free of microbial pathogens.
- The term "anaerobic composting" is still used in the United States but should rather be replaced with anaerobic digestion. It is not a composting process.

### **BOKASHI COMPOSTING SCRAPS TO SOIL IN WEEKS**

copyright 2014 by Adam Footer [Third printing January 2018]

New Society Publishers ISBN: 978-0-86571-752-7

### **Waste-to-Energy (WTE) Options and Solid Waste Export Considerations**

King County, September 28, 2017 (Sec 3.2)