

## Appendix 2-Advanced Bokashi Production

**B**okashi is the Japanese word for fermented plant matter. There are thousands of types of bokashi for you to make and explore. Once you learn the fundamentals of bokashi production you will find many creative ways to capture seemingly worthless organic materials and turn them into a powerhouse of nutrients and beneficial inoculants for plants and livestock.

Fertilizer production is a very complex procedure. However, with anaerobic composting, it is much simpler once you learn the basic steps. Whether you are going to use on farm or off farm inputs, you can learn to formulate and then calibrate what you are producing for

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accurate application. This will insure consistent yields. Bokashi (fermented plant matter) as a microbial fertilizer and worm multiplier works well in our Vermiculture also.

Effective microorganisms ferment rice bran, copra meal and carbonized rice hull, making it a powerful fertilizer rich in microbial activity. It inoculates the soil with beneficial microorganisms, adds organic matter and feeds earthworms, helping them to breed and populate depleted soils. We use a minimum of three substrates to give a diverse and balanced diet to the microbes. The copra meal is sometimes substituted with cow manure depending on availability. It is a flexible formula because the EM adapts to a wide range of ingredients. It's economical because it will replace chemical fertilizers and utilize waste materials that are inexpensive or free.

#### ALOHA “all around” Bokashi

People always ask for our secret mix, so here it is:

- 3 sacks Magaspang [D3] - about 100 Kilos
- 3 sacks Rice Hull Charcoal (Carbonized [D4]) ~100 Kilos
- 1 sack Copra Meal - 50 Kilos
- 200ml. EM and 200 ml. molasses diluted in 20 Liters water

Mix it just like cement on concrete floors; the bulk dry ingredients first, and then add EM solution. We ferment this mixture for two weeks in a sealed drum. Fills three 160-Liter containers.

There are cheaper formulas; some use only rice bran, but few can rival the performance of this three-ingredient recipe. Remember, the more diverse the ingredients, the more effective the fermentation and fertilizer will be in propagating the beneficial bacteria and fungi.

**Substitution List**

Review Chapter 10 on composting and C/N ratios. You can bokashi anything that will balance out to 30:1. A range from 20:1 to 40:1 is acceptable.

**Possible Substitutes relative to C/N Ratios**

1 <sup>st</sup> Choice	2 <sup>nd</sup> Choice	3 <sup>rd</sup> Choice	4 <sup>th</sup> Choice
Chopped straw	Wheat Straw	Rice Straw	Corn Husks
Fishmeal	Blood meal	Soy meal	
Cow Manure	Kitchen Waste		
Hog Manure	Chicken manure		
Bone meal	Eggshells		
Wheat mill cleanings	Wheat Bran	Rice Bran	
Saw Dust	Rice Hull		
Coffee bean sludge	Potato waste		
Sugar cane scrap	Pineapple waste	Baggasse	Molasses

**Strange Things We Have Fermented (From Drugman Drug House- a drug store on our island that donates their damaged goods)**

**Soured milk powder**-high in protein with sugars from lactose. We added rice bran, charcoal and sawdust with a little copra meal to bring up the nitrogen level.

**Stale biscuits**-carbohydrates with refined sugar. We mixed in our standard copra meal bokashi and added extra EME.

**Spoiled Soy Meal**- mixed with high carbon ingredients from the rice mill-rice bran (D3) and rice hull (D4) and charcoaled rice hull.

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**C.R.H.** Carbonized rice hull is put to good use in our classic bokashi recipe. It is a harboring agent for microorganisms and conditions the soil. It allows our radish and carrots to penetrate the clay soil we grow in.



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We have found that we get the best fermentation from bokashi made with 3 or more different ingredients. It is more conducive to the process. The more diverse the ingredients, the more stable and productive the fermentative by-products become. Biodiversity is an important aspect to stability; it will bring in richness and balance similar to natural systems like those found on the forest floor. We always use at least 2 carbon sources and sometimes as many as 3 nitrogen sources. This bio-diversity will be highly effective in the soil or as a compost facilitator. We use a 3-ingredient bokashi recipe for fermenting our kitchen waste. It is available to the community. There are people in this city growing healthy plants for food production or landscaping out of their garbage. Bokashi is simple to use and easy to make. Just keep the components diverse when you make it and you will see great results. The purpose of bokashi is two-fold; you are improving soil structure and nutrients within the soil as well as inoculating a high level of beneficial microorganisms into the soil. These are the workers that further dismantle the substrates that turn it into fertilizer for your plants.



**Radish and carrot can grow straight in clay soil if the soil is prepped with bokashi and carbonized rice hull. Heavy mulch makes them sweet.**



**Aerated Compost Tea (A.C.T.) Brewer-** Compost is constantly circulated in this brewer, preventing pockets of sediment and stagnation. The air stones are set in the bottom of the side chambers and the air brings water up the chamber. Then it is sucked down a swirling vortex in the center of the inverted water jug and re-circulates through the chambers again and again.