

## 4. Hands On- EM Extended

**I**t's time for some hands on farming. This step makes inoculation affordable to the masses. We will grow some microbes. We call this EM Extended. We will make a concoction that used to take me 27 man-hours to make and weeks to watch and monitor while propagating. I had to grow each organism individually. It was labor intensive, as well as expensive. Let me explain.

The Korean Natural Farming (KNF) System is a highly effective inoculation method. We learned to gather and propagate our own microbes. We successfully applied these principles to our crops at Aloha House and saw good results. This is part of a bigger movement called I.M., which stands for Indigenous Microorganisms. It has an influence in organics; however, the extreme form of this movement is to culture only the microbes from your own farm, without bringing in any of the *evil* foreign microbes from non-indigenous regions. I find this an unbalanced approach.

The problem with the above theory is two fold. First, microbes are not indigenous, not in the same sense that we would apply the word to plants and wildlife. The spores and colonies of most varieties of microbes will inhabit any area that favors their growth. They are very difficult to contain. The beneficial ones don't need to be

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contained. They will only improve your soil and co-exist with the other beneficials and guide the neutrals to better use.



We are learning the hard way that eradicated diseases like small pox or polio are coming back. Most microbes are universal, often found in the smallest amounts throughout the world. Even on the surface of your skin can be found e-coli, hepatitis and typhoid at parts per billion. Nature brings balance and will control by keeping the unproductive species minimized, not eradicated. Even undesirable organisms produce beneficial aspects to a system at optimized minimal levels. Everything in creation has an optimum level. So beneficial microbes may prosper better in some climates and microclimates, but we don't need to fear which ones are indigenous. What we want are the ones that will build up the soil and protect our plants.

The second concern with the IM movement extremes is that you don't have large quantities of all the beneficials that you need to succeed economically in your system. They just are not there. That's why we are inoculating, to bring in all the species we need, not just exploit some that we can find on our project.

So that being said, let's just open up a bottle of dormant EM type microbial concoction and propagate them one (1) generation. We can't keep repeating this procedure because we will lose the balance in the population and we will not benefit from our efforts. You will need to buy one bottle of EM1 (you will use 45 ml.), 45 ml. molasses, 1 liter of non-chlorinated water and an empty 1 liter plastic bottle (P.E.T. bottles work well).

#### **E.M.E. MATERIALS / INGREDIENTS LIST**

- 45 ml. EM1, 45 ml. molasses
- 1 liter of non-chlorinated water
- 1 liter empty plastic bottle (P.E.T. bottles work good)
- Permanent marker
- 1 Tablespoon- 1T (15 ml.)

Buy your TABLE SPOON (T) from the kitchen store. It can't be the ordinary dining spoon from your dinner table. This is not accurate, nor is it standardized. Women who cook know this, but you guys need to get the right stuff, OK? We always teach our students to calibrate a 1-liter bottle; you can do it with 45ml. (3T=45 ml.) of water and mark the level. Then we pour out the water and add molasses directly into the bottle. Don't measure the molasses into spoons or pour through a funnel, as it is very sticky and will make a mess of things. Always use molasses because it has the best nutrients for your microbes.



**We trained 50 students from Western Palawan University, in Aborlan, to make their own EM culture.**

Then dilute the molasses by adding about half the water and gently shaking. Take care not to aggravate the solution; avoid creating foam.

Next add 45 ml. EM1 and the rest of the water. Fill to the shoulder of the bottle, allow some head space for fermentation to take place. Then label the cap with a permanent marker. Write EME and include the day and month. Let the gas out every morning and in one week you have a huge quantity of EM for the price of 45 ml. Remember: don't extend the EME, it will not remain true to the mother culture.

If you end up having older EME on hand, that's O.K.; don't throw it out! The anti-oxidant value increases over time and helps in odor control. You can use older batches for minimizing foul smells

from waste problems. It is excellent in shredded materials; feed it to the compost. The flexibility of the system prevents you from ever making a mistake that cannot be remediated through a natural process.



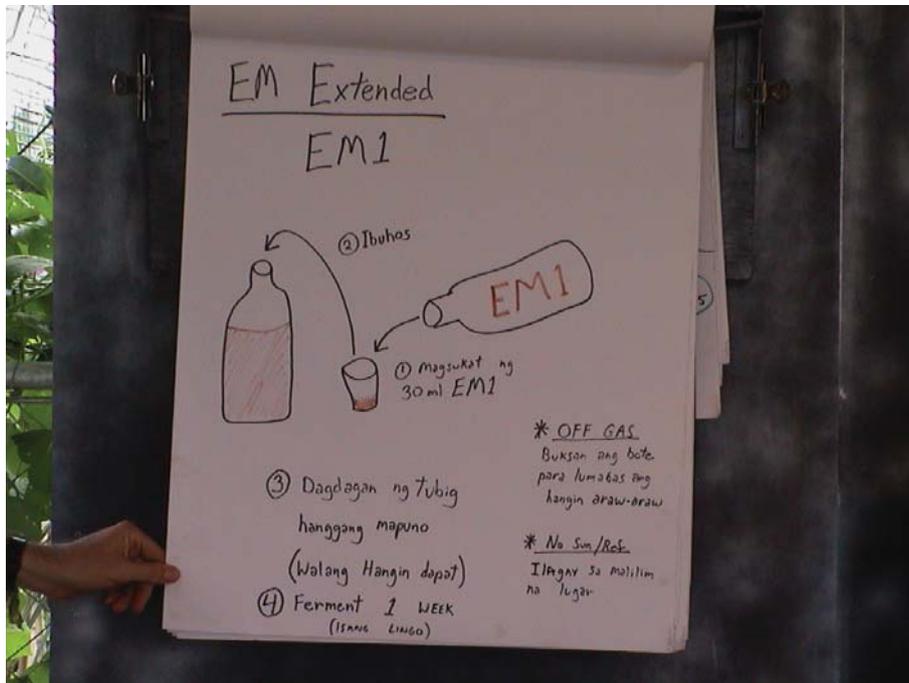
**Shredders increase the surface area of organic matter and allow microorganisms to feed efficiently. Microbes need food, moisture and air for aerobic composting. A shredder will accelerate the aerobic composting process.**

That's one of the comforting aspects of EM technology; a solution in one area often leads to solutions in other areas. You don't have to worry about creating some kind of Frankenstein; the risk is virtually zero on health and environment. It is even approved by O.M.R.I., the Organic Materials Review Institute. They provide certifiers, growers, manufacturers and suppliers an independent review of products intended for use in certified organic production, handling, and processing.



**Molasses is food for the EM family. The lactic acid bacteria, such as Lactobacillus, consumes the sugars and causes the EM to go dormant, granting a stable shelf life.**

Be sure to make what you need in advance, but don't over stock. For maximum microbial activity you should use it up in the coming months. The shelf life is variable with the extension time depending on ingredient quality, water source, ambient temperature and elevation. In the tropics the whole process is easy to oversee. Over all, it's a low maintenance operation. We just keep a stock ready, on hand for use. Our pattern of use is very predictable now.



Our training is hands on, including a mixing session where you learn to extend the EM1 one generation, lowering the cost of inoculation for the small farmer.

It is worth noting, however, that without a properly organized approach, you can waste a lot of time. You need to be disciplined when implementing these principles. My goal is that by the end of this book, you will have some useful information and motivation to go about successfully transforming your agricultural endeavors, or at least, assimilating a few of the principles and technologies as presented here in this volume.

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Microbial applications are safe for humans to make. Pets, livestock or aquariums will benefit from the effects of EM.



Science is fun - These students are enjoying the EM experience. Measuring your own water, molasses and EM-1 for mixing, blending and fermenting brings down your costs. It's an inexpensive solution for your farm or livestock unit.



Students get to examine bokashi as an alternative fertilizer.



My son Archie joins a student and me in a foray of mad science. Mixing EM1 is safe for children as well as for older farmers.

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**Spraying with a mixture of beneficial microorganisms is effective if it is a rich culture of different symbiotic species.**