



## ACTIVATED EM•1

### YOU CAN MAKE MORE EM AND APPLY MORE EM FOR MANY PURPOSES!

The term "EM" is an acronym for "Effective Microorganisms." EM•1 is a multipurpose microbial product. As EM•1 is comprised of several living microorganisms, these microorganisms propagate themselves if suitable feed and conditions are provided. Therefore, you can activate and increase the population of EM•1 by yourself. This demonstrates how EM•1 is a very economical product.

In EM•1 applications, increasing the density of beneficial microbial populations in each environment, such as in soil, water, and organic matter, is the key to achieving good results with EM•1 applications. Therefore, EM TECHNOLOGY NETWORK (EMTN) recommends you to frequently apply EM•1 by utilizing Activated EM•1. This brochure shows how to make Activated EM•1 for use in your home, farm, and/or business.

EMTN would also like to inform you that it is perfectly fine to use EM•1 as is (not activated) at all of the same recommended rates of application. The preparation of Activated EM•1 is purely for economical reasons, not efficacy.

## HOW TO MAKE ACTIVATED EM•1 (AEM)

### MATERIALS:

To prepare 20 parts of Activated EM•1(AEM) from 1 part of EM•1 you will need:

- An airtight plastic bottle or container or large tank \*
- Sugar Cane Molasses (blackstrap) – 5% of the total volume\*\*
- EM•1 – 5% of the total volume
- Water \*\*\*

*\*Please wash container thoroughly. Please do not use a glass bottle or container to avoid rupturing the container caused by gas production during the fermentation process. From about the second day on, gas may form as a result of the fermentation process. Loosen the cap and release the gas as needed. Try to use activated EM•1 within 7 days after the pH drops below 3.8.*

*\*\*Do not use molasses containing preservatives. Also, some molasses may be contaminated with undesirable microbes (i.e., mold growing on the surface). In this case you can boil the molasses before use. Use blackstrap molasses due to its high mineral content, which makes it good for activating EM•1. But if you use other sugar sources such as white sugar, please add a mineral source such as a natural sea salt (0.05 - 0.1% of total volume).*

*\*\*\* Rain water, well water, tap water and commercially distilled water can be used. The cleanest possible water is highly recommended. When using tap water, first dissolve the molasses in it in order to lessen the harmful effects of chlorine. Water quality is an important factor to prepare quality Activated EM•1.*

Tools to help the preparation process:

- A funnel
- A measuring cup and spoon
- pH paper to check the pH level



## PREPARATION



### CASE-1: MAKING ACTIVATED EM•1 IN A 1 LITER PLASTIC BOTTLE

1. Add water to fill 80% of the plastic bottle
2. Then add 50ml (1.7oz) of molasses and 50ml (1.7oz) of EM•1 in the bottle
3. Shake the bottle to dissolve the molasses. Top off with water.
4. Cap the bottle tightly and keep in a warm place.

### CASE-2 MAKING ACTIVATED EM•1 IN A 5 GALLON PLASTIC CONTAINER

1. Add water to fill 50% of the plastic container
2. Then add 1 liter (32 oz) of molasses and 1 liter (32 oz) of EM•1 in the bottle\*
3. Shake the container to dissolve the molasses and top off the container with warm water.
4. Cap the container tightly and keep in a warm place

*\*Dissolve the molasses with warm or hot water before adding it to the container. This makes the preparation easier.*

### CASE-3 MAKING ACTIVATED EM•1 IN A 1,000 LITER (264 GAL.) TANK

1. Add water to fill 50% of the tanks
2. Then add 50 liters (13 gallons) of molasses and 50 liters (13 gallons) of EM•1 to the tank\*
3. Add water again to fill up the tank, eliminating excess airspace.
4. Cap the tank tightly and keep in a warm place

*\* Dissolve the molasses with warm or hot water before adding it to the tank. This makes the preparation easier.*

#### NOTE:

##### • EM likes warm conditions.

A suitable temperature for fermentation (propagation) of EM•1 is from 30°C to 40°C (from 86°F to 104°F). In the winter, and other times when the temperature is low, after making the Activated EM•1 (dissolving the molasses in hot water), place the EM next to a radiator, space heater, or other warm device, or even wrap it in a blanket or an insulator, in order to promote EM fermentation.

##### • When is Activated EM•1 ready to use?

Activated EM•1 is ready to use, 4 - 7 days after preparing it, when the pH of Activated EM•1 drops below 4.0 (ideally it has a pH between 3 - 3.5), and when it has a sweet-sour smell and has changed color from black to reddish brown. However, please note that there will be some variation in the results of the fermentation of Activated EM•1 due to factors such as; the quality of the water and molasses, the amount of EM•1 and molasses, and temperature differences (water during mixing, room temperature).

#### USE:

Ideally, it is best to use Activated EM•1 within a week after Activated EM•1 is ready (after the pH is below 4.0). The effective microorganisms in Activated EM•1 are very active and powerful during this period. You can use Activated EM•1 for up to one month after it is ready. However, the microbial effects of Activated EM•1 are not as great as when it is "young".

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## STORAGE

Activated EM•1 should be kept in an expandable air-tight container to keep it anaerobic. Store Activated EM-1 at room temperature 20°C to 30°C (from 68°F to 86°F). Refrigeration is not necessary.

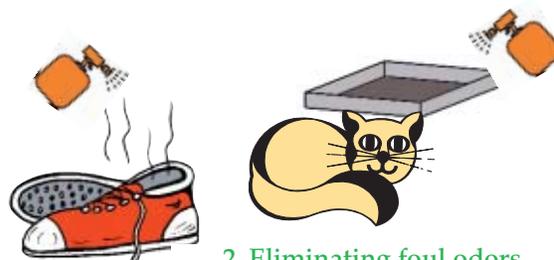
In containers that are not totally airtight, a white layer of yeast bacteria may form on the surface. Since this may lead to putrefaction, remove the layer as needed and transfer to a container that can be closed tightly.

If stored Activated EM•1 has a foul smell or the pH rises above 4.0, the solution could be contaminated with undesirable microbes and should be discarded. It is fine to pour this material on a long-term compost pile.

### MANY USES FOR ACTIVATED EM•1: FROM DOMESTIC USE TO CLEANING UP THE ENVIRONMENT



1. Improving soil quality for healthy plants.



2. Eliminating foul odors.



3. Keeping your drain clean.



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### EM•1 CAN BENEFIT AGRICULTURE, CLEAN THE ENVIRONMENT, AND IMPROVE OUR LIFE

- EM•1 eliminates odors so, it can be used for cleaning in the home.
- Dilute EM•1 or Activated EM•1 with water (1:500 dilution) then use it for cleaning.
- A half cup in the washing machine can help clean the clothes.
- The EM•1 in the water draining into your pipes will work on cleaning the sewer lines.
- A half cup in a vaporizer will remove odors in the home (cigarettes, wet dog smell, food).
- Clean the bathroom with it too. Have spray bottle handy and spray into the sink, shower, and toilet after each use. (1:500 dilution).



### AGRICULTURAL APPLICATIONS OF EM•1

One of the main uses of EM•1 in agriculture is soil improvement by applying large amounts of Activated EM•1. Large amounts of Activated EM•1 can be prepared by utilizing a large tank. By applying large quantities of Activated EM•1 to the soil from the land preparation stage, the soil will have a strong microbial anti-oxidation condition. This will result in higher quality crops. Recently in Japan an EM•1 activation unit (see photograph) has been developed to produce large amounts of high quality Activated EM•1 with a low labor cost.



Commercial EM•1 activation unit for producing large amounts of Activated EM•1

### GRASSROOTS MOVEMENTS TO CLEAN UP RIVERS AND OCEANS USING ACTIVATED EM•1

In recent years the water pollution of rivers, oceans, and lakes from sewage and agrochemicals has become a major problem. In order to restore a clean environment, grassroots citizen movements have come about all over Japan to apply EM technology to cleaning the environment. These projects are setting up tanks to make Activated EM•1 near rivers and the ocean and are applying Activated EM•1 continuously to clean up sludge along shorelines to improve the local ecosystem and to improve the water quality. In Japan these EM environmental activities have been widely reported in newspapers and magazines. Also the results of these activities were presented at the 3rd World Water Forum, March, 2003 in Japan.



A series of connected 1 ton tanks being used for Activated EM•1

#### NOTE:

Secondary Activated EM•1 cannot be made by using Activated EM•1, because the definition of "EM" is defined as the co-existence and coupling of the 3 beneficial microorganism groups, lactic acid bacteria, phototrophic bacteria, and yeast in a solution. The balance of lactic acid bacteria, phototrophic bacteria and yeast is an important factor for the EM product. Therefore, if you make secondary Activated EM•1 from Activated EM•1, it is no longer EM•1 as it is unbalanced and un-coupled lactic acid bacteria, phototrophic bacteria and yeast. This is true even if the solution's pH drops below 3.5. Calling it an Activated low acid bacterial solution is more accurate. But, it cannot be called "EM•1" or "Activated EM•1".

We have made EM technology related books and magazines in Japanese, English, Spanish, German, Chinese and Korean including the EM Food Waste Recycling Kit available. Please visit [www.emtechnologynetwork.org](http://www.emtechnologynetwork.org) and see our EMTN Library Shop. We also would like to invite you to our [EM online forum](#) to exchange EM information and experiences with EM.

**EM TECHNOLOGY NETWORK** Non Profit Organization

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REMEMBER -  
THIS IS  
YOUR  
NETWORK.

LET'S MAKE  
THE MOST  
OF IT!