

# Activated EM

(activating microbes in EM-1 for the soil and other uses)

Activated EM (or Activated EM-1) is simply an economic way of using EM-1 (also, "EM-1 Microbial Inoculant"). There are several species of microbes in EM-1 (see separate sheet, "Microbes in EM-1", [goodmicrobes.org/files/Microbes%20in%20EM1.pdf](http://goodmicrobes.org/files/Microbes%20in%20EM1.pdf)) that are in a stable balance which allows the liquid of live microbes to have a 1 year shelf-life (6 months after opening). When mixed with a feed, such as molasses, and water, the microbes activate (from a dormant state) and quickly expand in population. So, from 1 bottle, you can make 20 bottles. However, because they've been activated, they soon dissipate in numbers as the food runs out and should be used within 45 days. Therefore, make only as much as you will use and repeat the process every month or so.

## How to Make Activated EM

### Preparations

- **Water** - preferably warm tap water.
- **Implements** - bowl or bucket to mix in, measuring cup, PETE plastic bottle(s) or glass bottle(s) with airlock, and (optional) a funnel.
- **Ingredients** - see list below.

### Ingredients [example quantities below for making 1 quart, 32 fl oz (0.95 L)]

- **EM-1 Microbial Inoculant** (a liquid containing a combination of naturally existing microbes found in foods, soil, and water.)  
[5%, 1.6 fl oz or 5 tablespoons]
- **blackstrap molasses** (blackstrap, unsulfured sugarcane molasses; or high mineral content sugar material — if using some other sugar source, add a teaspoon of sea salt for mineral content.)  
[5%, 1.6 fl oz or 5 tablespoons]
- **water** (optional: heated to 100-120°F to make it easier to dissolve the molasses; otherwise, simply dissolve with a clean hand)  
[to fill the remainder of the bottle--have at least 1 quart of water readied]

### Optional ingredients (may add one or more of the following depending on purpose)

**sea salt** [1 teaspoon] — adds minerals; helps in cleaning and deodorizing.

**liquid mineral extract** [a few drops to a dribble] — helpful for longer stable activated EM.

**lemon** [1 whole lemon, juice squeezed and the peel sliced and also added] — for cleaning, antiviral and anti-pathogenic properties; adds lemon scent.

*Other materials may also be added, something that is known for their property, and the fermentation can then incorporate or enhance that property.*

### For Making Enough To Fill Any Volume Size Bottle

1. Determine the **volume size** of your bottle (either from it's label or use a measuring cup).  
[Examples: volume = 32 fl oz (1 quart); volume = 128 fl oz (1 gallon)]
2. **Divide** the volume size **by 20** to determine the 5% amount for that volume.  
[Examples: 32 fl oz ÷ 20 = 1.6 fl oz; 128 fl oz ÷ 20 = 6.4 fl oz]

## How To Mix

To mix right in the bottle, fill the bottle only about 1/4 full with water; add first the molasses [1.6 fl oz] and swirl the bottle to get the molasses to fully dissolve; add the same amount of the EM-1 [1.6 fl oz]; fill the rest of the bottle with water.

-or-

1. Using a bowl or bucket that holds at least 1.5 quarts or more, mix in the EM-1 and molasses; make sure to dissolve all of the molasses (if by hand, rub inside the bowl or bucket until it's all gone, i.e., you don't feel the thick molasses on the bottom anymore).
2. Pour the mixture into a quart (or liter) size PETE bottle, that is, a soda bottle which can handle any gas pressure buildup. A funnel would be helpful to pour into the bottle.
3. Let ferment for about 2 weeks. Store out of direct sunlight.  
*Optionally, you can use a pH meter or pH paper; when the pH is 3.7 or below, it is ready.*

**Daily check** for gas build-up; release by very slightly opening cap; do so over a sink.

When ready, apply as suggested below, and use within 45 days. Store out of sunlight. Keep airtight and at room temperature.

## **Applications of Activated EM**

*The oz/gallon refers to fluid ounce of Activated EM per 1 gallon of water.*

1. Use 1 fl oz/gallon for watering your garden and houseplants.  
You can apply with every watering or at least once a week.
2. Use 0.5 fl oz/gallon for foliar feeding (spraying to the plant leaves),  
or about 1 teaspoon/quart of water. Spray every other week or once a month.
3. For your regular laundry, use half the amount of your laundry detergent and the other half with Activated EM.
4. Use up to 10 fl oz/gallon for tough stains, especially on grime, greasy or oily stains or buildup, including ovens, oven hoods, drains, etc. For best results, let soak for several minutes to half hour.
5. Use 2 fl oz/gallon (2-3 teaspoons/quart) for odor problems, including urine, as well as for general cleaning (floors, windows, etc.). Use a spray bottle where useful.

The peak period within which Activated EM is most active is 15 to 30 days. Most of the microbes may still be viable within 45 days and most likely not beyond 60 days. It may last well past 60 days and may still be useful for such purposes as odor control. If it begins to smell bad, pour down drains (may help clean the drain and pipes).

Reference. EM Research Organization (EMRO) [emro.co.jp](http://emro.co.jp) (English version: [emrojapan.com](http://emrojapan.com)), TeraGanix ([teraganix.com](http://teraganix.com))

EM-1 is OMRI Listed (Organic Materials Review Institute), [omri.org](http://omri.org), and can be used by certified organic operations.