

Activated EM

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

Activated EM (or Activated EM-1) is 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) 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/stable state) and expand in population. So, from 1 bottle of EM-1, you can make 20 bottles of Activated EM; both EM-1 and Activated EM can be used in the same way (see Uses on page 2). However, because they've been activated, they dissipate in numbers (2 months) as the food runs out and should be used within 2-3 months. Therefore, make only as much as you will use and repeat the process every 1-2 month(s).

How to Make Activated EM

Preparations

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

Ingredients [example quantities below for making 2 liters (68 fl oz) using a 2-Liter seltzer bottle]

- **EM-1 Microbial Inoculant** (a liquid containing a combination of naturally existing microbes found in foods, soil, and water.)
[5%, 3.5 fl oz or 7 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%, 3.5 fl oz or 7 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 2 liters 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 (e.g., apple cider vinegar at 5%).

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 = 1 quart (32 fl oz); 1 gallon (128 fl oz); or 2 liters (68 fl oz)]
2. **Divide** the volume size **by 20** to determine the 5% amount for that volume (or multiply by 0.05).
[Examples: 32 fl oz ÷ 20 = 1.6 fl oz; 128 fl oz ÷ 20 = 6.4 fl oz; 68 fl oz ÷ 20 = 3.4, and round the #s]

How To Mix

To mix right in the bottle, fill the bottle only about 1/4 full with water; add first the molasses [3.5 fl oz] and swirl the bottle to get the molasses to fully dissolve; add the same amount of the EM-1 [3.5 fl oz]; fill the rest of the bottle with water.

-or-

1. Using a bowl or bucket that holds at least the same volume of water or more as your bottle, mix in the molasses and EM-1; 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, slick molasses on the bottom anymore).
2. Pour the mixture into a PETE bottle (i.e., soda or seltzer water bottle), that is, the bottle's design/shape can handle the 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 (CO₂) build-up; release by very slightly opening cap; do so over a sink or plate.

When ready, use as suggested below, and use within 2-3 months. Store out of sunlight. Keep airtight and at room temperature.

Uses of Activated EM (AEM)

The fl 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, or 2-3 times a month.
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 AEM. If adding other ingredients when making AEM (e.g., lemon, sea salt), can use all AEM.
4. Use 2 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 before wiping clean. If does not go away first wipes, then apply & wipe every day until gone.
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 45 days. For the simple AEM recipe (i.e., no other ingredients), most of the microbes may still be viable within 60 days and most likely not beyond 90 days. It may last well past 90 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 (English version: emrojapan.com), TeraGanix (teraganix.com)

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