AMBASSADOR COLLEGE

Agriculture Department

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BACTERIA--HOW THEY HELP PLANTS GROW

Bacteria are a minute form of life that live in the soil. They, along with millions of other living organisms such as fungi, algae, and protozoa, make up the life in the soil.

Each particle of soil under our feet is a little world of its own. Over each particle's surface is a thin film of water, teaming with many types of microbes. Bacteria are one of the smallest forms of these micro-organisms. They are so small and complex that science still has a great deal to learn about them.

Although little is known about their anatomy, much is known about their effect on all living things. Bacteria fall into several major classes with hundreds of varieties in each class. The ones with which we are concerned fall into three major groups which are: cellulose bacteria, nitrogen-fixing bacteria, and scripto bacteria.

The job of cellulose bacteria is to decompose the plant remains which litter the soil. They turn stems, leaves, roots, and virtually all vegetable matter into humus, decomposing or decaying organic material. As the cellulose bacteria decompose the plant matter, they liberate nitrogen and minerals, thus enriching the soil.

Nitrogen-fixing bacteria live throughout the upper layers of the soil. They fix nitrogen from the air and various plant and animal residues in the soil.

Scripto bacteria are disease fighting. They produce antibiotics to combat fungus diseases, nematodes, root rot, and insects.

These three basic types of bacteria are included in the package you may request. They are very important in unlocking the minerals and nutrients already in the soil. A soil may be high in various elements; however, without life, without soil bacteria, a limited amount and number of the elements can be utilized by the plants. Basic soil bacteria will help you have a balanced soil that will supply your crops with proper nutrients and fight off disease and insects.

The Care and Use of Bacteria

Instructions upon receiving one pound of bacteria material:

1. Add material to one gallon of water.
2. Add one pint (or about 3/4 lb.) of non-debittered Brewer's yeast.
3. Add one-half pint (one lb.) of sugar or molasses (this feeds the bacteria and causes it to multiply).

Care

1. Let mixture set about four days at 70° Fahrenheit. It reproduces most rapidly at 70°, but will not die at another temperature.
2. After four days add this to 50 gallons of water. (Use a wooden or cement container.)
3. Also add five pounds non-debittered Brewer's yeast and five pounds of sugar or molasses.
4. Let mixture set until bubbles begin rising. After 30 hours or longer (can be up to 7 days) depending upon the temperature, it is ready for application. The bacteria should be refed in three weeks if not used. You can save a gallon if you wish to begin a new batch. Also, you can make larger quantities at one time. The above is simply a feeding guide.

Application

Bacteria may be used in fields at the rate of 20 to 30 gallons per acre with a regular sprayer (garden rates - ½ gallon per square yard). It is helpful to then disc it in. On pasture land apply when soil is wet or apply more gallons of water to the mixture per acre. It may also be applied by letting it drip into irrigation water as it is being applied in the field.

Water varies in different areas in regard to acid and alkaline content. The bacteria will die in highly acid conditions. We have found diatomaceous earth acts as a buffer to help control the pH or acid balance. If you have trouble keeping your culture alive, we would recommend that you add one-half pound of diatomaceous earth to 10 gallons of water.

The bacteria can also be used on gardens, shrubbery, flowers, and lawn--applied with a sprinkling can or small hand sprayer. Be sure your sprayer is clean and free of insecticides. If in doubt about it being clean, baking soda and warm water solution is very effective and will clean the sprayer. Agitate this solution in your sprayer about 15 minutes. Then drain out completely and the sprayer is ready for use.

To help cover the cost of starter bacteria, you may contribute $1.50 per package. Soil bacteria represents only one facet in maintaining a balanced and living soil, but it is one of the basics for right agriculture.

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