

Dead or Alive

By Rich Gellert

Are you killing your beneficial organisms by using the wrong water?

Compost teas, bio-extract solutions, and microbial inoculants; there are many ways to describe them and many more varieties are possible. If the perfect biologically active elixir is what you and your plants are seeking, you absolutely must start with the purest of water. No matter if you have constructed your own brewer, purchased a brewing kit, or are using store bought brews, pure water plays a critical role in final product's effectiveness.

Sources of Water

There are many possible sources of water for your garden. The quality of this water will determine the health of your plants and the outcome of your harvests.

Many people don't realize that chlorine is a biocide that will kill any living biological agents present, either in your soil or in your bio-solutions and fertilizers. Most chlorinated water is from city or municipal sources, as few people on well or spring sources have chlorinex in their water. Still, there are plenty of other problems that well or spring water users may have, which can also affect living micro-biology.

Water high in certain minerals, especially sulfur, iron and salts, can have negative effects on beneficial organisms. The contaminants in the water can interfere with the life cycles of microbes and suppress their numbers to where you hardly see their true benefits in your garden. High salts levels increase EC levels (a measure of the ppm). If the EC in the soil rises too high,

the rate of nutrient absorption decreases. This absorption reflects the osmotic pressure capabilities in your plants. High salts levels reduce the osmotic pressure in the growing environment, essentially causing root lock. Bio-extract solutions rich in beneficial microbes consume salts and help balance the osmotic pressure. Using purified water will have a dramatic influence in the health of these important microbes and, ultimately, the success of your harvests.

Brews and Extracts

Those brewing their own blend of microbial rich solutions and teas must start with use pure water. In fact, all leading manufacturers of such products require pure water to brew with for optimal results.

John Perrino, from Vermicrop Organics, said he relies on water purified through a reverse osmosis system.

“RO water has everything to do with the outcome of your fresh brewed microbial rich solution,” Perrino said. “Without any impurities present, a brew or extract has an ability to multiply the microbial community evenly. Most do-it-yourself brews or extracts have a source of beneficial microbes and food to feed these different microbes in the community ... With RO water you are able to eliminate any foreign elements or food sources that may be present in your water and any inhibitory elements such as chlorine and chloramines.”

This and other similar elixirs stimulate your garden to give extraordinary results, including: protecting against pathogens, increasing fertilizer uptake, decreasing transplant shock, giving larger yields, increasing roots and micro-roots, promoting crop uniformity, improving oxygen availability, pushing salts below the root web, raising brix levels, and providing immediate microbial activity to the root zone.

“Untreated water has many compounds a reverse osmosis system can potentially remove,” according to David Sime, leading research biologist for Cutting Edge Solutions. “To keep it as simple as possible: heavy metals in toxic concentrations may have great impacts on: 1) microbial community structure 2) microbial biomass, and 3) organismal (microbial) activities. A reduction in soil microbial structure and biomass limits decomposition of organic matter. Limits in

decomposition change particle sizes in soil and soil adjuvants, especially in an aqueous environment.”

Biomass and bacterial community structure is significantly affected by particle size. Smaller size fractions host higher diversities of microbes than larger size fractions.

Large particles in the tea solution tend to favor less diversity, as larger surface areas make it easier for certain protozoa to consume vast quantities of bacteria. The large particles will be present when decomposition cannot proceed properly due to poor community structure and biomass.

Reverse osmosis filtering removes the majority of contaminants that effectively reduce the microbiological community in both structure and biomass. Both microbial structure and biomass are directly correlated to community dynamics. Fungi initially utilize the larger particle sizes for energy, in turn breaking down these soil/mineral complexes into smaller particles that the protozoa and bacteria can utilize.

In the absence of RO-treated water, compounds that normally appear as simple contaminants (minerals) or in small amounts are important (trace elements) but in heavy concentrations all are detrimental to the chemistry that occurs between the fungi, protozoa and bacteria.

Compost teas are a veritable universe of microscopic life, and the water they live in supports or detracts the complex community structure and interactions.

Foliar Sprays and Pure Water

Foliar spraying is a popular way to deliver nutrients, pesticides and fungicides to your plant's leaves. Using pure water as the base for these spray formulas is of the utmost importance to their effectiveness.

Surfactants, also known as tensides, are wetting agents that lower the surface tension of a liquid, allowing it to spread more easily. There are many types of surfactants available to the horticulture industry and they are an essential component of an effective foliar spray.

When using surfactants you need to consider many factors to increase the effectiveness of your products. Are you using a fungicide that needs to spread around the leaf surface or has systemic qualities? Are

you trying to increase the entry of nutrients into the leaf? Todd Mason of Botanic Oasis cautioned against trying to do both because the way the nutrition foliar spray and the fungicide work could fight against each other.

“Surfactants are designed to improve the dispersing, absorbing, spreading, or sticking of the spray mixture,” Mason explained. “Plant leaves have a net negative charge,” he continued. “Surfactants can be classed into ionic or non-ionic forms. Ionic surfactants have a negative charge so it is easy to understand that two negatives opposing each other will cause a “spreading “ effect around the leaf surface and actually reduce the absorption effect. This type of surfactant would aid in the ‘contact’ ability of a fungicide to come in contact with a disease to help control it. Non-ionic surfactants work best to move nutrients into the leaf. Non-ionic surfactants do not have a charge and therefore do not compete with the net negative charge of the leaf.”

Got Pure Water?

We are in the midst of the bio-revolution and an incredible number of biologically active inputs are available. If you are not using pure water with these ingredients you might as well be throwing your money and time away because you are essentially rendering them useless.

There are several different types of water purifying filters available. Most specialty indoor garden centers carry a variety of these water filters to fit your needs. Depending on the quality of your untreated water and its source, you can find a particular filter to help you obtain the purest water possible. 🍃

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References:

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