



The Science of Water Management by Microorganisms

Rarely does a dry land grower have just the right amount of water for plant and turf management; usually there is too little or too much water.

Some growers with irrigation systems are interested in reducing their irrigation usage.

The following information presents the science and the in the field experience with Quantum Growth's ability to manage and to produce water.

Too Little Water:

1. In stress and or drought conditions, photosynthetic bacteria in the Quantum Growth products can manufacture water. The cells can combine oxygen and hydrogen to make water at a rate of up to 0.74 grams of water per gram of substrate.
2. Plants and turf are dependent on beneficial soil fungi (Mycorrhizia) in order to grow. The fungi is like an underground sponge. The bacteria in Quantum Growth feed this sponge creating an underground water reservoir.
3. The bacteria in Quantum Growth are like small balloons, further increasing water storage at an estimated rate of 200,000 gallons per 2.47 acres of soil.
4. The bacteria can move water up or sideways in order to support a host plant. Without these soil bacteria the water will follow gravity and move below the plant's root system.
5. The bacteria in the Quantum Growth products create sugar, thus increasing sandy soil's ability to hold water molecules to it.

Dr. E. E. Lindstrom, University of Wisconsin "Photosynthetic bacteria are known to carry out the reaction; $2H_2 + CO_2 = (CH_2O) + H_2O$

Field Experience: Golf courses using Quantum Growth in their fertigation systems have reported on average a 30% reduction in water usage.

Too Much Water:

An in-the- field experience.

MB Webb Farms in Tifton, Georgia. Randall Webb planted 9 acres of squash at his home farm and 16 acres on a nearby plot. After several weeks Tift County received 22 inches of rain over a period of two weeks. The heavy spring rains were followed by drought conditions.

Webb reported the 9 acres that had been treated with Quantum Growth not only survived but were actually looking pretty good given the two extreme growing conditions. He cleared over \$ 2,000 per acre on the acres of zucchini that were treated. The key to our results wasn't that the yields were anything to brag about, but that we had a crop at all. My experience with the product was easy to sum up; "the acres that were not treated were a total loss and the treated acres produced zucchini".

Reason: The microorganisms in Quantum Growth release oxygen into the soil to keep it from becoming septic.

Dr. John Lindstrom, John's Bacteriology 102



The Use of Reclaimed Water and storm Water

Sewage treatment plants while efficient are unable to produce sterile water. Reclaimed water contains concentrated hormones, viral histones, and low levels of active bacteria that pass through the system.

Research has shown that reclaimed water can contribute approximately 40 lbs of nitrogen per acre per year. Users of reclaimed water would need to take this into account in their application of NPK.