

## Bio-Enriched Soil Technologies (BEST)

**R**esearchers at the University of South Florida have developed a method to enhance food and energy crops using an innovative composition of natural materials.

The enrichment of soil with functionalized natural materials is a promising means for enhancing or restoring the ability of soil to retain and provide nutrients and water. Hence, increasing the bioavailability of those essential plant growth components to subsistence and commercial crops will greatly improve food production, reduce waste, prevent over-fertilization, evaluate energy requirements, and effectively dispense water. Several variables may impact crop production including draught, climate, unbalanced chemical properties, and a lack of soil based nutrients. With the many ways to utilize food and energy crops, and the constant increase in the human population, it is imperative that an effective and dependable way to produce these items be developed.

USF researchers have designed a bio-enriched soil technology (BEST) to enhance food and energy crop productivity in a variety of climates and soil types. The main component of BEST is cactus mucilage, recovered from the part of cacti responsible for storing and transporting water and nutrients through the plant's capillaries. This component can enhance and restore the soil's ability to retain and provide nutrients and water to the plant. These enhancements will greatly improve energy and food crops. If a water supply is scarce, BEST will be able to attract, store, and transport water and nutrient molecules to the plant in a controlled way. If the water or nutrient resources are excessive, BEST will be able to release the excess and supply only what is needed. Hence, BEST soil can function in capricious climates, allowing these plants to grow in a plethora of environments.

### ADVANTAGES:

- **Attracts, stores and transports water and nutrient molecules**
- **Allows plants to grow in radical climates**
- **More energy created from biofuels**
- **Improved food production**

### *A Food and Energy Crop Enhancement*

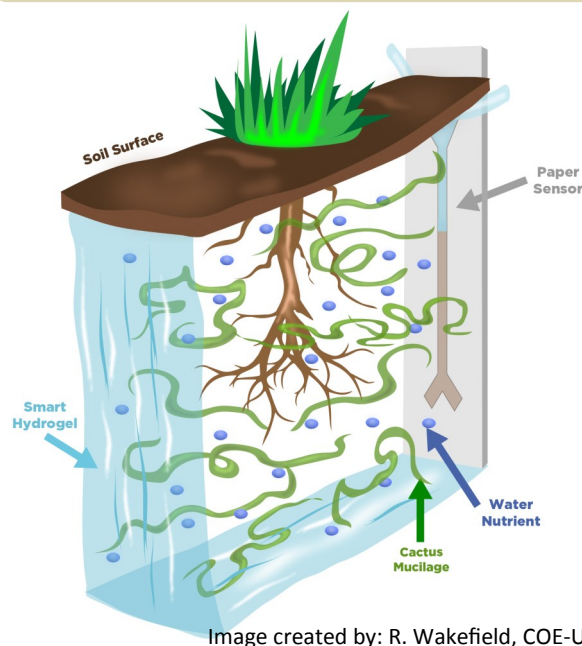


Image created by: R. Wakefield, COE-USF

### *Visual Representation of the Bio-Rich Soil Technology*

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