



## AquaVantage® Superabsorbant Technical Sheet

### ***A Smart New Way to Grow Crops***

*AquaVantage*, a new soil amendment from **Sunn Global Biologics LLC** (SGB), offers growers next-generation technology that delivers higher-quality crops with greater yields, more cost-effective input use, and more dependable plant germination and growth.

With its proprietary starch-based formulation, *AquaVantage* helps plants maximize water usage and creates a healthy microenvironment in the root zone that promotes vigorous plant growth and greater yields.

The core technology behind *AquaVantage* was developed by technology advisor William Doane, Ph.D., and his research group during his 32 years with the U.S. Department of Agriculture (USDA). Doane, an authority on starch polymer chemistry, and the USDA team are credited with key scientific breakthroughs, including several patents in superabsorbent technology.

### **Chemical Composition**

*AquaVantage* is based on natural cornstarch, making it an environmentally friendly, biodegradable, nontoxic and virtually odorless granule. To understand why *AquaVantage* succeeds in the field where synthetic petroleum-based polymers have failed, it is necessary to look at its chemical composition.

- **Starch-based.** *AquaVantage* is formed by hydrolyzed starch-polyacrylonile graft copolymers. *AquaVantage* copolymers are highly absorbent, but are water-insoluble. As a starch-based polymer, *AquaVantage* is made up of glucose molecules, which are linked together chemically to become a water-insoluble, net-like matrix in the form of a hydrogel that holds and releases water and nutrients. There are no active ingredients in the hydrogel.
- **Massive absorption.** The immense size and weight of its molecular structure are what set *AquaVantage* apart. These anionic units are able to absorb water until reaching maximum absorbency, swelling up to 500 times their original weight.
- **Controlled release.** The *AquaVantage* hydrogel slowly releases just the right amount of captured moisture to plant roots in response to capillary action (suction) of the root hairs. The hydrogel easily rehydrates and stores more water as moisture enters the soil. This process is repeated over and over again during the growing season before the hydrogel loses effectiveness.

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- **Potassium benefits.** *AquaVantage* contains potassium as its positive ion instead of sodium, which is used in other products, including synthetic polyacrylates and polyacrylamides. Plants benefit from the addition of potassium as a nutrient. Increased amounts of sodium in the soil can limit plant growth, especially in soils with high alkalinity levels.
- **Soil enhancement.** *AquaVantage* has high water-absorption and storage properties in a wide range of water qualities and soil types. Because it is starch-based, *AquaVantage* particles are an attractive food source for soil microorganisms. Over time, the microbes consume the hydrogel molecules, creating a richer soil environment than before *AquaVantage* was added.
- **No phytotoxicity.** *AquaVantage*, a natural, starch-based product, is biodegradable and does not harm plants or soil.

### **The difference between *AquaVantage* and diaper SAPs based on polyacrylates**

*AquaVantage* is totally different from other water-preservation products, including any of the synthetic polyacrylate and polyacrylamide formulations (e.g., PAMs) currently available. These synthetic polymers are superabsorbents made with petroleum-based formulations and typically use the active material found in disposable diapers. These synthetic polymers hold water tightly—a good thing for diapers, but not for plants that compete with the polymers for moisture, which explains why these formulations are less effective in growing plants.

*AquaVantage* is a natural, starch-based formulation. It is nontoxic, biodegradable, pH-neutral and safe for *all* plants. Many synthetic polymers typically contain significant amounts of sodium, petroleum derivatives and other fillers, which can be detrimental to food crops. *AquaVantage* was developed to hold **500 times its weight in water**, although a *AquaVantage* granule could be produced to hold as much as **5,000** times its weight. The *AquaVantage* particle has been developed to deliver the optimal balance of water and nutrients to benefit plants in agriculture. ***The most important factor is not total absorbency, but the ability of any superabsorbent to release the greatest amount of water as the plant needs it.***

In this vital area, *AquaVantage* is unmatched. Virtually all ***synthetic polyacrylates and polyacrylamides*** are formulated by large chemical manufacturers and are repackaged by distributors under such trade names as Terra-Sorb®, Soil Moist®, HydroSource®, Solid H2O, STOCKOSORB®, Tramsorb, Watersorb®, WaterSmart Crystals and WaterGel Spikes.

