



# More Food, Using Less Resources

## A SUSTAINABLE TECHNOLOGY REPORT

### Introducing AquaVantage® – A New Tool for Your Sustainable Food Supply Chain

Corporate sustainability has emerged as a vital part of a company's brand position. It's not only appealing to customers—it's also smart fiscal policy.

Industry leaders everywhere are pro-actively driving programs to ensure their sustainable efforts are far-reaching and transparent, following the truism that "you're only as green as your supply chain." With such authentic efforts, corporations can legitimately boost their sustainable scorecards and avoid criticisms of 'greenwashing.'

And here's where AquaVantage-branded superabsorbents can play a critical role in your company's supply chain efforts, with innovative and renewable technologies that represent measurable, high-impact sustainable practices and messaging.

#### What is AquaVantage®?

AquaVantage is a remarkable, latest technology soil amendment that helps improve quality and yield for all types of plants, using less water while increasing the efficiency of other crop inputs.

This new technology builds on basic cornstarch to create a 'hydrogel' that holds and releases water – over and over again, similar to a sponge below the soil – for use by plants and food crops on an as-needed basis.

Each small granule holds 500 times its weight in water, nearly all of which is made available to the plant in the right quantities in response to plant root suction. By creating an "on-demand" moisture and nutrient reservoir, AquaVantage not only reduces the level of water and nutrient inputs required, but also reduces plant stress which results in greater yields and a heartier, higher quality of crops.

The core of the AquaVantage technology was developed by leading researchers at the U.S. Department of Agriculture and is well-proven through worldwide agricultural production. AquaVantage works for a full season, then biodegrades harmlessly in the soil and can be reapplied every time a new crop is planted.

#### How AquaVantage® Improves Sustainability

The sustainability benefits of AquaVantage's technology encompass several key sustainability areas:

- **Water Conservation**
- **Nutrient Management and Conservation**
- **Reduced Environmental Impact in Food Production**
- **Increased Yields and Improved Food Quality**



#### AquaVantage® is 'Green'

*AquaVantage is a biodegradable soil additive that improves quality and yield for all types of plants.*

## Water, Nutrients and Conservation

Water is the most essential life-sustaining substance on earth, and the only commodity that has absolutely no substitute at any price.

While the global supply of water has remained fixed, population growth and competing demands mean that two-thirds of the global population will experience water stress by 2025. According to the International Water Management Institute, future farmers will need 17% more water than the world now has available.

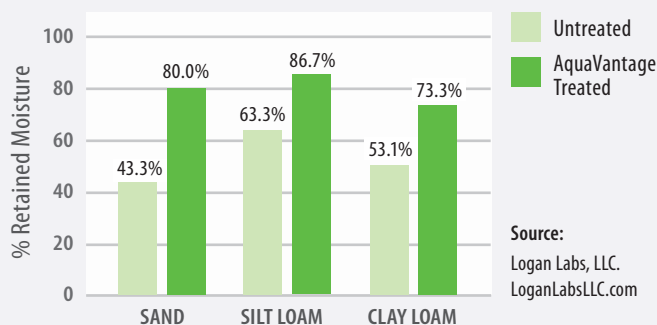
AquaVantage is an effective water management tool that increases irrigation and rain efficiency. Basically, AquaVantage ‘traps’ available moisture that would otherwise evaporate or leach down through the soil, creating a reservoir that readily serves moisture to plant root systems as needed.

AquaVantage has proven to provide a sustainable advantage in food production by:

- **Reducing water wastage through increased intervals between irrigation cycles.**
- **Improving plant performance under drought conditions and water restriction mandates.**
- **Opening up new acreage that would otherwise be marginal.**
- **Providing further efficiency even with the most sophisticated water-management systems, such as drip irrigation.**

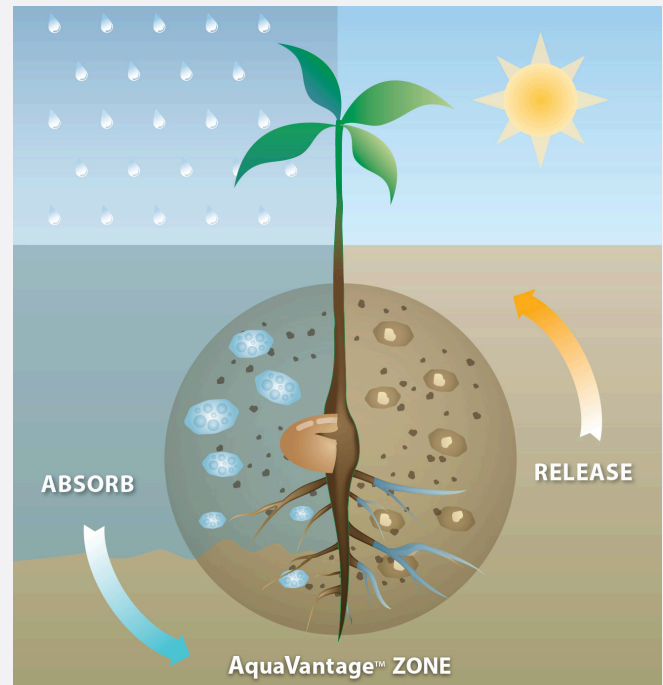
### Water Holding Capacity

*AquaVantage® increases moisture efficiency and availability across all soil types. This reduces plant stress, creating higher quality and yields.*



### AquaVantage® Benefits Cycle

*AquaVantage particles absorb water up to 500x their original weight, forming hydrogels that slowly release precise amount of encapsulated moisture and nutrients as needed by plants. The hydrogels easily rehydrate as moisture enters the soil, repeating this process over and over again for a year or more.*



### Nutrient Management and Conservation

The price of fertilizer has skyrocketed, increasing more than 300% in less than a year in response to petroleum costs. In addition to high costs, the scarcity of fertilizer means many growers cannot obtain fertilizer at any price. Purdue University predicts further, substantial increases.

AquaVantage not only manages moisture in the root zone; it also traps water-soluble nutrients and reduces leaching of fertilizer nutrients down through the soil. With AquaVantage’s water-soluble nutrient holding capacity, nutrient efficiency is increased and applications can be reduced. Scientific trials repeatedly show higher levels of important nutrients present in plant tissue, and thus a reduction in the amount of nutrients lost through leaching in the soil.

AquaVantage’s sustainability with nutrients has further environmental benefits, such as the reduction in phosphorous and nitrogen leaching which have generated bans in many communities. With increased nutrient efficiency, growers receive more return to offset the constantly increasing costs of fertilizer, while reducing waste and generating more predictable outcomes.



## Food Production and Food Quality

### Reduced Environmental Impact in Food Production

Agricultural inputs and active agents, including herbicides, pesticides, and fungicides, have long enjoyed remarkable success in increasing worldwide food supply. However, there are often environmental trade-offs.

AquaVantage® is made using common, renewable cornstarch, although most any starch can be used for this unique technology. AquaVantage biodegrades in the soil after approximately one year, turning into a simple food cereal which increases microbial activity in the soil. AquaVantage reduces the need for environmental compromises common with other agricultural inputs.

### Increased Yields and Improved Food Quality

Much of the worldwide acreage for food production is shrinking against population sprawl and competition for precious natural resources. Success will be defined as producing more while reducing the impact on resources. And this fits exactly the AquaVantage promise of more responsible growing.

With a steady reservoir of water and nutrients, plants are less susceptible to stress. The plant can focus its photosynthesis energies, for example, on producing greater fruit instead of shutting down as a means of survivability.

“Nitrogen and phosphate leachate  
reduced by 14% - 20%.”

**UF** UNIVERSITY of  
**FLORIDA**

“Extended wilting 1 to 3 days with  
50% less water.”



In potatoes, an average increase of...\*

**3.6**

TONS/ACRE

**3.6x**

THE ROI



*Potatoes, like any vegetable or crop, are typically larger and higher in quality and weight when grown with AquaVantage®*

Using AquaVantage, crop yields typically increase anywhere from 8% to 15% among technically advanced growers; even higher yields are possible in less developed regions. Overall taste and physical appearance can be improved, with the example of increased brix (sugar) in tomatoes. Quite simply, food grown with AquaVantage typically tastes and looks better.

In addition to directly contributing to increased revenues and profits, higher yields also translate into more efficient use of all of the inputs that factor into crop production – including not just water and fertilizer, but labor and energy inputs as well. Processing costs are also reduced, owing to greater consistency and quality in crops. When transplanting crops, AquaVantage has been demonstrated to reduce plant mortality losses by upwards of 50%.

By promoting a more robust crop, AquaVantage contributes to crop consistency and improved plant health. These in turn increase production efficiencies, reduce waste, maximize the benefits and make for more efficient chemical inputs, and generate more predictable outcomes.

## Leveraging the Impact of AquaVantage®

Companies in your supply chain should bear in mind several stakeholder groups when evaluating and messaging around sustainability initiatives.

### Your Customers

Customers are increasingly aware of the impact their purchase decisions make on a sustainable environment. In the US, millions of Americans are members of environmental organizations focused on sustainability in their state, city, or neighborhood and spread their opinions through orchestrated messaging and personal blogs. The AquaVantage® corporate brand and website provide the validation that consumers are demanding to support sustainability claims.

### Food Supply Chain

Supply chains have become transparent, whether as part of a corporate sustainability initiative or investigative efforts by consumers, the media or direct competitors. AquaVantage® provides a quantifiable impact and credibility that carries directly to a corporation's sustainability scorecard.

### Employees and Potential Employees

Your company's commitment to sustainability is an increasingly important factor in retaining and recruiting employees. By providing concrete evidence of your own actions and initiatives to your staff and recruiting targets, your company can ensure that you are satisfying their desire to work for a company that "walks the talk." With AquaVantage, your employees can know they are making a contribution towards greater food availability with reduced environmental impact.

### Nonprofits and Non-Governmental Organizations (NGOs)

Political and community activist organizations often target industries – and, in some cases, individual companies – singling them out as the "villain" in the fight to improve corporate sustainability. AquaVantage in your supply chain demonstrates immediate actions and results, rather than vague plans, creating a more positive message.



Strive to create a more **balanced scorecard** for all your stakeholders.

### Financial Analysts

Although financial analysts increasingly recognize the intangible impact that sustainability efforts can have on your company's brand and "goodwill," such generosity only goes so far. But like many sustainability improvements, AquaVantage's technologies promote bottom-line improvements, with financial benefits due to more efficient management of water and nutrients, more efficient processing practices, and ultimately higher yields of higher-quality food.

"Green business has shifted from **a movement to a market.** But there is much, much more to do."

– Joel Makower, *State of Green Business. 2008*



## Get to Know Us

This document is intended to provide general guidelines and to spark ideas for how you can include your adoption of AquaVantage superabsorbents and soil amendment technology as part of your sustainability story.

If you would like help in identifying, articulating and quantifying AquaVantage's sustainability benefits for your company, please contact [info@SunnGlobal.com](mailto:info@SunnGlobal.com) or call **+1-717-298-0856** or fax **+1-610-200-6406**.