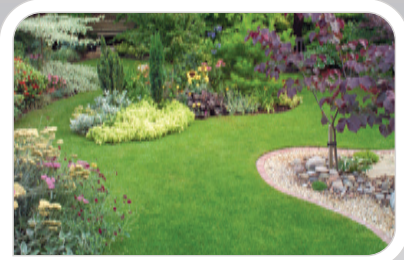


# USER GUIDE



AquaVantage® soil amendment keeps moisture where it's needed near plant roots to get crops, plants and turf off to a fast start and thriving all season long.

# Production Agriculture



APPLICATION	PRODUCT	RATE	METHOD
<b>Anti-crustant</b>	AV 16-30 or AV 8-15	3-5 lbs per acre	Apply AquaVantage by banding into the top layer of soil directly over seed row before press wheel in direct seeded crops to help prevent soil crusting.
<b>Beans</b> (all types)	AV 16-30 or AV 8-15	4-6 lbs per acre	Apply AquaVantage in furrow with seed at planting. Apply AquaVantage by shanking 2-4" offset from the seed and 4-6" deep.
<b>Caneberries</b>	AV 16-30 or AV 8-15	0.25-0.5 tsp (0.5-1 g) per plant	Apply AquaVantage evenly in the planting hole or mix in soil while back-filling planting hole.
<b>Christmas Trees &amp; Forestry Seedling Beds</b>	AV 16-30 or AV 8-15	0.5-1 tbsp (3.5-7g) per tree 1-2 lbs per 1,000 sq ft	- Apply AquaVantage AV 16-30 or AV 8-15 evenly in the planting hole, or mix in soil while back filling new plantings or resets. - Apply AquaVantage AV 16-30 or AV 8-15 by broadcasting and incorporating into bed prior to planting or seeding.
	AV 40-80	6 Tbsp (42 g) per 5 gal water*	- Apply AV 40-80 AquaVantage as a root dip to transplants, to aid in stand establishment, early root development and growth vigor.
<b>Citrus Trees</b> (resets or transplants)	AV 40-80	1-2 Tbsp (7-14 g) per plant	- Apply AV 40-80 evenly in the planting hole, or mix in soil while back-filling new seedlings or resets.
	AV 16-30	1 lb per 100-400 gal water	- Apply AV 16-30 to transplant water at min rate: 1 lb in 100-400 Gal. of water. - Apply in the root zone before transplanting. Prehydrate AquaVantage by slowly adding the product to water with agitation. Do not use on systems with screens or filters.
<b>Corn</b>	AV 16-30 or AV 8-15	4-6 lbs per acre	Apply AquaVantage in furrow at planting or sidedress 3-5" below the soil surface post plant.
<b>Grapes</b>	AV 16-30 or AV 8-15	0.5-1 tsp (1-2 g) per plant 7-10 lbs per acre	- Apply AquaVantage evenly in planting hole or mix in soil while back filling hole. - Apply AquaVantage to established plantings by shanking as deep as possible (optimum 6") 1-2 ft inside drip row.
<b>Grasses &amp; Legumes</b> (clover, alfalfa, pastures, etc)	AV 16-30	3-4 lbs per acre	Apply AquaVantage by mixing or blending with seed and/or applying in furrow at planting to improve stand establishment and germination.
<b>Leafy Vegetables</b> (lettuce, spinach, bok choy, etc)	AV 16-30	3-5 lbs per acre	- Apply AquaVantage in furrow with seed at planting for improved germination & establishment.
		6-10 lbs per acre	- Apply AquaVantage by incorporating product into root zone during bed formation or by shanking in the bed between bed rows, 4-6" deep at time of bed shaping.
<b>Melons, Squash, Cucumber</b> (transplanted & seeded)	AV 16-30	7-10 lbs per acre	- Apply AV 16-30, 1-3 weeks after transplant by sidedressing 4-6" offset from plants and 4-6" deep (or) Apply AV 16-30 by shanking, or banding in during bed formation. For best results AquaVantage should be 4-6" below the soil surface in the root area.
	AV 40-80	6 Tbsp (42 g) per 5 gal water*	- Apply AV 40-80 as a root dip to transplants to aid in stand establishment, root development and growth vigor.
<b>All Vegetables: Pepper, Tomatoes, Eggplant, etc</b> (transplanted & seeded)	AV 16-30	1 lb per 100-400 gal water	- Apply AV 16-30 to transplant water at min. rate of 1 lb in 100-400 Gal of water. - Apply in root zone before transplanting. Prehydrate AquaVantage by slowly adding to water with agitation. Do not use on systems with screens or filters.
	AV 16-30	1 lb per 100-400 gal water	- Apply in root zone before transplanting. Prehydrate AquaVantage by slowly adding to water with agitation. Do not use on systems with screens or filters.
<b>Onions</b>	AV 16-30	4-8 lbs per acre	Due to variability in row (onion) spacing, bed configuration and irrigation practices, please consult SGB or local PCA/extension agent for best use guidelines for your area.
<b>Potatoes</b>	AV 16-30	7-10 lbs per acre	Apply AquaVantage AV 16-30 in furrow around seed pieces at planting.
<b>Small Grains</b> (wheat, barley, oats)	AV 16-30	1.5-2 lbs per acre	Apply AquaVantage AV 16-30 by mixing or blending with seed or fertilizer and applying in furrow at planting.
<b>Strawberries</b>	AV 16-30	7-10 lbs per acre	- Apply AquaVantage AV 16-30 by shanking or banding in the row at bed formation. For best results AquaVantage should be 4-6" below the soil surface in the root area.
	AV 40-80	6 Tbsp (42 g) per 5 gal water*	- Apply AquaVantage AV 40-80 as a root dip to transplants, to aid in stand establishment, early root development and growth vigor.
<b>Sugar Beets</b>	AV 16-30	3-5 lbs per acre	Apply AquaVantage in furrow with seed at planting.
<b>Tree Fruit and Nuts</b>	AV 16-30	1-2 Tbsp (7-14 g) per tree 7-10 lbs per acre	- Apply AquaVantage AV 16-30 evenly in the planting hole, or mix in soil while back-filling new plantings or resets. Apply AquaVantage to established trees by shanking 4-10" below soil surface near drip line.
	AV 40-80	6 Tbsp (42 g) per 5 gal water*	- Apply AquaVantage AV 40-80 as a root dip to transplants, to aid in stand establishment, early root development and growth vigor.

AquaVantage can be applied using Gandy or Microband applicators. After application AquaVantage must be removed from any equipment or sealed from exposure to moisture, rain, dew, or excess humidity. On crops or for uses not listed in this guide, or where the user has no previous experience with AquaVantage, it should be used on a trial basis to determine effectiveness and rate. \*Root Dip thickness may be adjusted by adding more water or more AV 30-60 as desired.

# Nursery • Ornamentals

APPLICATION	PRODUCT	RATE	METHOD		
<b>Bare Root Planting</b>	AV 40-80	6 Tbsp (42 g) per 5 gallons of water	Vigorously agitate and slowly add product to water. Allow product to fully hydrate. Dip plant root structure into hydrogel solution, then lift and allow excess to drain.		
<b>Plant Beds &amp; Landscape</b>	AV 40-80	1-1.5 lbs per 1,000 sq ft (4-6 cups)	Broadcast or band and incorporate into planting bed root zone prior to planting.		
<b>Vegetable Transplant</b>	AV 40-80	1 lb per 100-400 gallons of transplant water	Apply AquaVantage to transplant water at a minimum rate of 1 lb in 100-400 gallons of water. Apply in the root zone before transplanting. Prehydrate AquaVantage by slowly adding to water with agitation. Do not use in systems with screens or filters.		
<b>Potting Containers</b> (Trade Sizes) 4" - 6"	<b>AV 40-80</b>	<b>Low Rate</b>	<b>Normal Rate</b>	<b>High Rate</b>	Mix half throughout planting hole and amend backfill with remaining half.  Use higher rates for media high in bark with low water holding capacity.  Use lower rates for high peat mixes or mixes with high water holding capacity.
#1 Pot (1 gallon) #2 Pot (2 gallon) #3 Pot (3 gallon) #5 Pot (5 gallon) #7 Pot (7 gallon) #10 Pot (10 gallon) #15 Pot (15 gallon) #20 Pot (20 gallon) #25 Pot (25 gallon) #30 Pot (30 gallon) #65 Pot (65 gallon)		0.1 tsp 0.33 tsp 1 tsp 1.5 tsp 1.75 tsp 2.5 tsp 1.5 Tbsp 2 Tbsp 2.75 Tbsp 3.67 Tbsp 0.33 cup 0.67 cup	0.25 tsp 0.75 tsp 2 tsp 1 Tbsp 1.25 Tbsp 1.75 Tbsp 3.0 Tbsp 4.25 Tbsp 5.75 Tbsp 7 Tbsp 0.5 cup 1.25 cup	0.5 tsp 1.25 tsp 1 Tbsp 1.5 Tbsp 2 Tbsp 2.67 Tbsp 4.67 Tbsp 6.33 Tbsp 8.67 Tbsp 11 Tbsp 13.5 Tbsp 2 cup	
*Pot size subject to manufacturers specifications					
<b>Soil Mix, Potting Soil, Planting in Containers</b>	AV 40-80	0.5-1.5 lbs (2 to 6.25 cups) per cubic yard 1.5-4 Tbsp per cubic foot (10-28g), or 0.3-0.9g per liter of container size	Completely mix AquaVantage and dry soil before planting or filling containers. Add AquaVantage gradually to soil mix and water well after planting. For large individual containers layer the AquaVantage into the pot as you fill the container.		
<b>Transplant Ball &amp; Burlap</b>	AV 40-80	See rates listed in Turf, Golf, Sports Field and Landscaping section on reverse.	See method listed in Turf, Golf, Sports Field and Landscaping section on reverse.		

*Do not use for tissue culture or on unrooted cuttings  
\*Root Dip thickness may be adjusted by adding more water or more AV 40-80 as desired.*



# Turf • Golf • Sport Field • Landscaping



APPLICATION	PRODUCT	RATE	METHOD																																																				
<b>Existing turf</b>	AV 40-80	1-2 lbs per 1,000 sq ft (4-8 cups)	Cut grass as short as possible, then aerate turf. Spread AquaVantage over area, rake or drag into aeration holes as much as possible, then irrigate. Excess AquaVantage will on surface and will subside naturally.																																																				
<b>Mechanical injection with Dryject™ or similar equipment</b>	AV 40-80	1-2 lbs per 1,000 sq ft (4-8 cups)	Specific method subject to manufacturer's recommendation. AquaVantage may be mixed with dry sand, nutrients or substrates.																																																				
<b>Planting Beds &amp; Landscape</b>	AV 40-80	1-1.5 lbs per 1,000 sq ft (4-6 cups)	Broadcast and incorporate into top 2-4" of soil or root zone.																																																				
<b>Seeding grasses</b>	AV 40-80	1-2 lbs per 1,000 sq ft (4-8 cups)	Broadcast AquaVantage evenly with the seed onto dry soil area. Incorporate seed and AquaVantage into the top 1/2" of prepared turf area and water.																																																				
<b>Sod Installation</b>	AV 40-80	1-2 lbs per 1,000 sq ft (4-8 cups)	Spread AquaVantage evenly on soil surface before laying sod, roll sodded area, then water.																																																				
<b>Transplant Ball &amp; Burlap (Root Ball Sizes)</b> <b>12 inch diameter</b> <b>15 inch</b> <b>18 inch</b> <b>24 inch</b> <b>30 inch</b> <b>36 inch</b> <b>48 inch</b>	AV 40-80	0.75-1.5 Tbsp (5-10 g) 1.5-3 Tbsp (10-21 g) 2.5-5 Tbsp (18-35 g) 6-12 Tbsp (42-84 g) 0.75-1.5 Cup (84-168 g) 1.25-2.5 Cup (140-280 g) 3-6 cup (336-672 g)	Mix half throughout planting hole and amend backfill with remaining half.  Use higher rates for sandy soils with low water holding capacity or plants requiring more water.  Use lower rates for clay soils or plants requiring less water.																																																				
<b>Transplanting Containers (Trade Sizes) 4" - 6"</b> #1 Pot (1 gallon) #2 Pot (2 gallon) #3 Pot (3 gallon) #5 Pot (5 gallon) #7 Pot (7 gallon) #10 Pot (10 gallon) #15 Pot (15 gallon) #20 Pot (20 gallon) #25 Pot (25 gallon) #30 Pot (30 gallon) #65 Pot (65 gallon)  *Pot size subject to manufacturers specifications	AV 40-80	<table border="1"> <thead> <tr> <th></th> <th><u>Low Rate</u></th> <th><u>Normal Rate</u></th> <th><u>High Rate</u></th> </tr> </thead> <tbody> <tr> <td>#1 Pot (1 gallon)</td> <td>0.25 tsp</td> <td>0.33 tsp</td> <td>0.75 tsp</td> </tr> <tr> <td>#2 Pot (2 gallon)</td> <td>0.5 tsp</td> <td>0.75 tsp</td> <td>0.5 Tbsp</td> </tr> <tr> <td>#3 Pot (3 gallon)</td> <td>1 tsp</td> <td>0.67 Tbsp</td> <td>1 Tbsp</td> </tr> <tr> <td>#5 Pot (5 gallon)</td> <td>1.5 tsp</td> <td>1 Tbsp</td> <td>1.25 Tbsp</td> </tr> <tr> <td>#7 Pot (7 gallon)</td> <td>0.75 Tbsp</td> <td>1.5 Tbsp</td> <td>2 Tbsp</td> </tr> <tr> <td>#10 Pot (10 gallon)</td> <td>1 Tbsp</td> <td>2 Tbsp</td> <td>3 Tbsp</td> </tr> <tr> <td>#15 Pot (15 gallon)</td> <td>2 Tbsp</td> <td>3.5 Tbsp</td> <td>0.33 cup</td> </tr> <tr> <td>#20 Pot (20 gallon)</td> <td>2.75 Tbsp</td> <td>0.33 cup</td> <td>0.5 cup</td> </tr> <tr> <td>#25 Pot (25 gallon)</td> <td>3.33 Tbsp</td> <td>7 Tbsp</td> <td>10 Tbsp</td> </tr> <tr> <td>#30 Pot (30 gallon)</td> <td>0.25 cup</td> <td>0.5 cup</td> <td>0.75 cup</td> </tr> <tr> <td>#65 Pot (65 gallon)</td> <td>0.33 cup</td> <td>0.67 cup</td> <td>1 cup</td> </tr> <tr> <td></td> <td>0.75 cup</td> <td>1.5 cup</td> <td>2.25 cup</td> </tr> </tbody> </table>		<u>Low Rate</u>	<u>Normal Rate</u>	<u>High Rate</u>	#1 Pot (1 gallon)	0.25 tsp	0.33 tsp	0.75 tsp	#2 Pot (2 gallon)	0.5 tsp	0.75 tsp	0.5 Tbsp	#3 Pot (3 gallon)	1 tsp	0.67 Tbsp	1 Tbsp	#5 Pot (5 gallon)	1.5 tsp	1 Tbsp	1.25 Tbsp	#7 Pot (7 gallon)	0.75 Tbsp	1.5 Tbsp	2 Tbsp	#10 Pot (10 gallon)	1 Tbsp	2 Tbsp	3 Tbsp	#15 Pot (15 gallon)	2 Tbsp	3.5 Tbsp	0.33 cup	#20 Pot (20 gallon)	2.75 Tbsp	0.33 cup	0.5 cup	#25 Pot (25 gallon)	3.33 Tbsp	7 Tbsp	10 Tbsp	#30 Pot (30 gallon)	0.25 cup	0.5 cup	0.75 cup	#65 Pot (65 gallon)	0.33 cup	0.67 cup	1 cup		0.75 cup	1.5 cup	2.25 cup	Mix half throughout planting hole and amend backfill with remaining half.  Use higher rates for sandy soils with low water holding capacity or plants requiring more water.  Use lower rates for clay soils or plants requiring less water. <ul style="list-style-type: none"> <li>• Use normal rates for most plant species</li> <li>• Low rates can be used for plants requiring less water, or receiving frequent watering</li> <li>• Higher rates can be used for plants that require more water or a longer period between irrigation intervals</li> </ul>
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# Soil Types

## OBJECTIVE

Performance study in varying soil classifications.

## SAMPLE VOLUMES USED

**Soil:** 500 ml

**Water:** 750 ml

**AquaVantage:** .5 grams

## TEST SAMPLES

Sample	Type	% Sand	% Silt	% Clay	Control weight (g)	w/AquaVantage weight (g)
1	Sand	100	0	0	761.35	768.9
2	Silt Loam	37	40	24	615.1	626.35
3	Clay Loam	30	48	22	407.25	400.55

## WATER HOLDING CAPACITY

Type	Test	Water passing (ml)	Water retained (ml)	% retained	% increase
Sand	control	425	325	43.3	-
	w/AquaVantage	150	600	80.0	85.0
Silt Loam	control	275	475	63.3	-
	w/AquaVantage	100	650	86.7	37.0
Clay Loam	control	352	398	53.1	-
	w/AquaVantage	200	550	73.3	38.0



Soil testing performed by

**Logan Labs, LLC**

Russells Point, Ohio

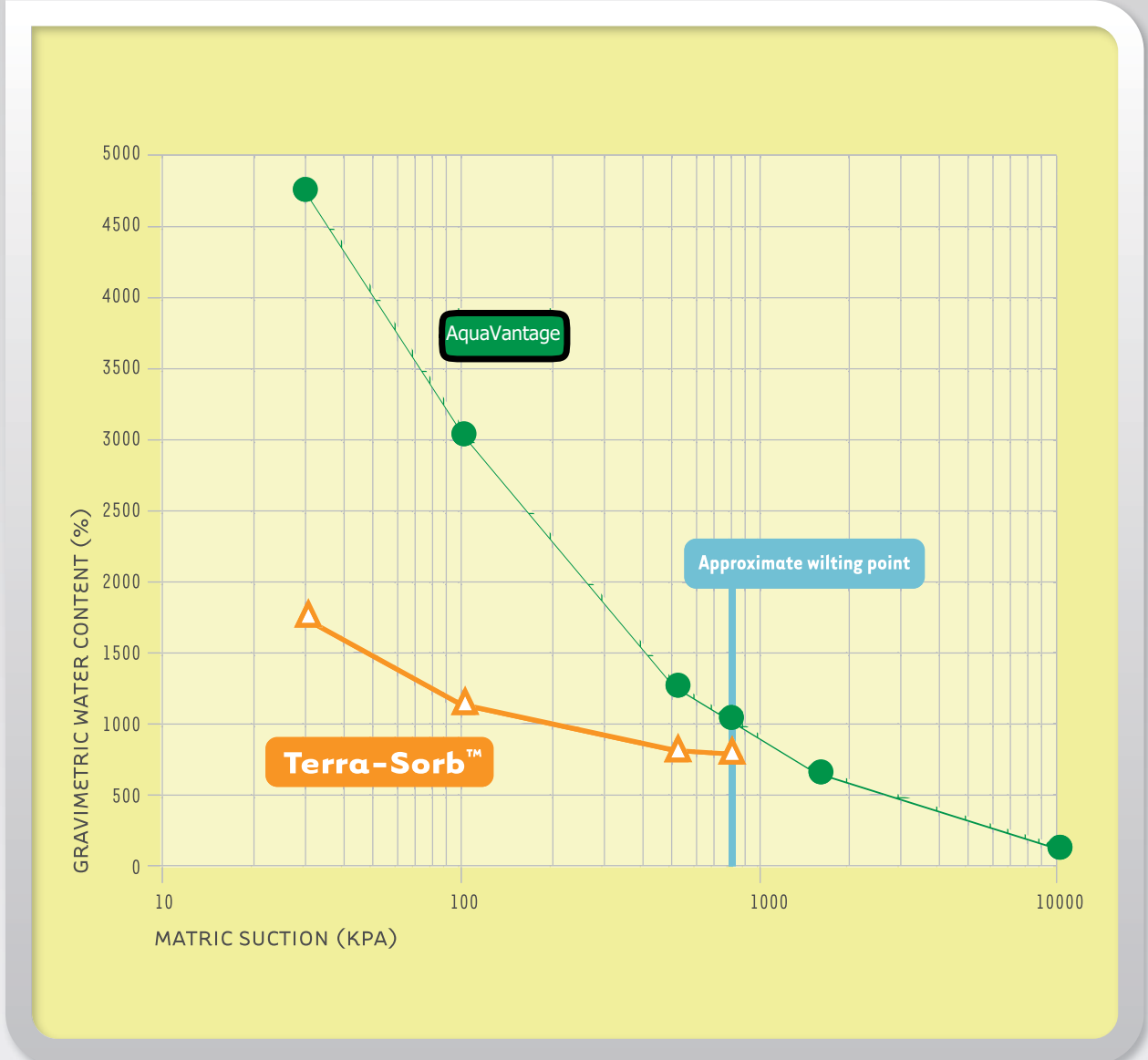
January 12, 2006

**PAMS = polyacrylamide polymers**  
**AquaVantage = Starch Based Polymers**



# AquaVantage® vs PAMs

Absorbent-Water Characteristic Curve Over 21 Days



AquaVantage is a natural, biodegradable starch-based formulation. AquaVantage demonstrates greater water absorption potential and the ability to freely release water under suction pressure by plant roots versus Terra-Sorb, a leading polyacrylamide synthetic polymer (PAM).



Consulting Laboratory:  
**Geotechnical Consulting  
 and Testing Systems**  
 Tempe, Arizona