

Beneficial Soil and Plant Microbial Inoculants

Agricultural Application Rates

Application rates were determined based on US studies; application rates for geographies outside of the continental United States may vary substantially especially in dissimilar soil and weather conditions

VEGETABLES	RATE PER ACRE	RATE PER HECTARE	APPLICATION DIRECTIONS
ASPARAGUS	64 oz	4.7 L	At transplant or crop emergence
	64 oz	4.7 L	For mature plants, apply after cutting has stopped
BEAN (Butter, French, Green, Kidney, Lima, Navy)	64 oz	4.7 L	At planting
PEAS (Blackeye, Snap, Snow)	32 oz	2.3 L	As a foliar or through root zone irrigation every 14 to 21 days.
BROCCOLI	64 oz	4.7 L	At transplant or at crop emergence
BRUSSEL SPROUTS	32 oz	2.3 L	As a foliar or through root zone irrigation every 14 to 21 days.
CABBAGE			
CAULIFLOWER			
CARROT	64 oz	4.7 L	At planting or at crop emergence.
GARLIC	64 oz	4.7 L	As a foliar or through root zone irrigation every 30 days.
LEEK			
ONION			
RADISH			
SHALLOT			
CELERY	64 oz	4.7 L	At transplant or at crop emergence
	32 oz	2.3 L	14 days from last application
	32 oz	2.3 L	14 days from last application
CUCURBITS	64 oz	4.7 L	At transplant or at crop emergence.
CUCUMBER	32 oz	2.3 L	As a foliar or through root zone irrigation every 14 to 21 days.
CATALOPE			
MUSKMELON			
HONEYDEW MELON			
WATERMELON			
SQUASH			
PUMPKIN			
LETTUCE	64 oz	4.7 L	At transplant or at crop emergence.
	32 oz	2.3 L	As a foliar or through root zone irrigation every 14 to 21 days.
POTATOES (Red, Russet, Sweet, White, Yellow)	64 oz	4.7 L	At planting.
YAMS	32 oz	2.3 L	Every 14 to 21 days.
SEEDBEDS	64 oz	4.7 L	At planting or at emergence.
	32 oz	2.3 L	Add to irrigation water or as a topical spray every 14 to 21 days.

VEGETABLES (continued)	RATE PER ACRE	RATE PER HECTARE	APPLICATION DIRECTIONS
TOMATOES	64 oz	4.7 L	At transplant
PEPPERS	32 oz	2.3 L	At pre-bloom stage
	32 oz	2.3 L	At fruit set
If using root zone irrigation, use the following application cycle:			
	32 oz	2.3 L	At transplant
	32 oz	2.3 L	7-14 days from last application through irrigation
	32 oz	2.3 L	7-14 days from last application through irrigation
	32 oz	2.3 L	7-14 days from last application, apply as a foliar
			Repeat application cycle through harvest completion

FIELD CROPS	RATE PER ACRE	RATE PER HECTARE	APPLICATION DIRECTIONS
ALFALFA	64 gal	4.7 L	Broadcast at planting.
	32 oz	2.3 L	Broadcast after every cutting
CORN, irrigated (Field, Seed and Sweet)	32-64 oz	2.3 - 4.7 L	At planting; may be applied with starter fertilizer in furrow
	32-64 oz	2.3 - 4.7 L	With side dress
CORN, w/o irrigation (Field, Seed and Sweet)	32-64 oz	2.3 - 4.7 L	At planting; may be applied with starter fertilizer in furrow
	32-64 oz	2.3 - 4.7 L	With side dress
COTTON	32-64 oz	2.3 - 4.7 L	At planting; may be applied with starter fertilizer in furrow
	32-64 oz	2.3 - 4.7 L	With side dress
GRAINS (Wheat, oats, barley)	32-64 oz	2.3 - 4.7 L	At beginning of tillering (main shoot development; Zadoks stage 20/Feekes stage 2)
	32-64 oz	2.3 - 4.7 L	At beginning of booting (seed head development; Zadoks stage 40/Feekes stage 4-5)
PEANUTS	32-64 oz	2.3 - 4.7 L	At planting.
	32-64 oz	2.3 - 4.7 L	With 1st herbicide app. (check compatibility)
PINE SEEDLINGS	64 oz	4.7 L	At planting.
	64 oz	4.7 L	Subsequent applications at 30 day intervals.
RICE	2% solution		Pre-soak seeds for 24 hours
	1 gal	9.3 L	Within 7 days of transplant
SOD	1 gal	9.3 L	Broadcast at planting.
GRASSES grown for seed	64 oz	4.7 L	Broadcast after every cutting
SOY BEAN, irrigated	32-64 oz	2.3 - 4.7 L	At planting in furrow/emergence
	32-64 oz	2.3 - 4.7 L	At the start of bloom
	32-64 oz	2.3 - 4.7 L	At pod elongation
SOY BEAN, w/o irrigation	32-64 oz	2.3 - 4.7 L	At planting in furrow or w/ 1st herbicide spray (check compatibility)
	1 gal	9.3 L	21 days after planting.
SORGHUM	32-64 oz	2.3 - 4.7 L	At planting
	32-64 oz	2.3 - 4.7 L	At 4-6 leaf stage
SUGAR CANE	64 oz	4.7 L	At planting
	64 oz	4.7 L	Every 60 days during the growing season
SUNFLOWER	64 oz	4.7 L	At planting
	64 oz	4.7 L	At or just before floral head formation (R1)
TOBACCO	1 gal	9.3 L	At transplant or at crop emergence.
	32 oz	2.3 L	Every 14 to 21 days.

FRUIT	RATE PER ACRE	RATE PER HECTARE	APPLICATION DIRECTIONS
APPLE	1 gal	9.3 L	At new growth stage (tight cluster)
CHERRY	1 gal	9.3 L	Pre-bloom
PEAR	64 oz	4.7 L	At petal fall
	64 oz	4.7 L	At fruit set/young fruit
	64 oz	4.7 L	Every 14 days until harvest Note: Applications may be done as a foliar or root drench
APRICOTS	1 gal	9.3 L	Pre-bloom
NECTARINES	1 gal	9.3 L	14-21 days after petal fall
PEACHES	64 oz	4.7 L	30 days after last application
PLUMS	64 oz	4.7 L	30 days after last application
	64 oz	4.7 L	30 days before harvest Note: Applications may be done as a foliar or root drench
AVOCADOS	1 gal	9.3 L	14 days prior to bloom
	1 gal	9.3 L	14 days after petal fall
	64 oz	4.7 L	Early fruit development (prior to summer fruit drop)
	64 oz	4.7 L	30-45 days before harvest Note: Applications may be done as a foliar or root drench
BANANA	64 oz	4.7 L	Apply at transplant
PLANTAINS	32 oz	2.3 L	Apply every month as a foliar or root drench application
BERRIES (Black, Blue, Raspberry, Straw)	64 oz	4.7 L	At transplant
	32 oz	2.3 L	14 days prior to bloom
	32 oz	2.3 L	Every 7 days; for every three applications through irrigation make one application as a foliar. Continue through harvest.
CITRUS (fair to good condition)	1 gal	9.3 L	Pre-bloom or early bloom
	1 gal	9.3 L	Full bloom or 2/3 petal fall
	1 gal	9.3 L	With summer spray*
	1 gal	9.3 L	With fall spray*
	1 gal	9.3 L	6 to 8 weeks prior to harvest
CITRUS (poor condition)	1 gal	9.3 L	As a foliar* or through ground irrigation every 30 days
CITRUS new plantings/resets	2 oz per tree	145 ml per tree	At transplant with watering in solution * if spray includes any form of a pesticide, apply Quantum through injection into irrigation system
GRAPES	64 oz	4.7 L	As a foliar or through existing irrigation
	64 oz	4.7 L	30 days after initial application
	64 oz	4.7 L	30 days after last application
	64 oz	4.7 L	Additional treatment post harvest

HERBS	RATE PER ACRE	RATE PER HECTARE	APPLICATION DIRECTIONS	
BASIL	PARSLEY	64 oz	4.7 L	At planting/transplant
CHIVE	PEPPER	32 oz	2.3 L	Add to irrigation water or as a topical spray every 14 to 21 days.
CILANTRO	ROSEMARY			
CORIANDER	SAFFRON			
DILL	SAGE			
FENNEL	SAVORY			
MARJORAM	SWEET BAY			
NUTMEG	TARRAGON			

HORTICULTURE	CONCENTRATION	MIX PER SQ FT	MIX PER SQ M	APPLICATION DIRECTIONS
Plug Trays	2%	4 oz	1.3 L	Apply at seeding.
Seed Germination less than 2" deep	2%	6 oz	1.9 L	Apply within 3 to 5 days of germination
Seed Germination 2"-4" depth, 3"-4" pots	2%	8 oz	2.5 L	Apply 14 to 21 days after last application
Seed Germination >4" depth, 5" pots	2%	16 oz	5.1 L	
6" container or greater (up to 2 gals)	2%	32 oz	10.2 L	

TREE NUTS		RATE PER ACRE	RATE PER HECTARE	APPLICATION DIRECTIONS
ALMOND	PECAN	1 gal	9.3 L	14 days prior to bloom
CASHEW	PISTACHIO	1 gal	9.3 L	14 days after petal fall
CHESTNUT	WALNUT	64 oz	4.7 L	30 days after last application
COCONUT		64 oz	4.7 L	30 days after last application
HAZELNUT		64 oz	4.7 L	30 days before harvest
MACADAMIA				
Nursery transplants		2 oz per tree	145 ml per tree	At transplant with watering in solution

Soil Type	PRODUCT SELECTION	
high organics (≥ 5%)	Quantum-Light® (Quantum-Organic Light®)	<p>Irrigation Systems: Quantum Growth products may be applied through any type of irrigation system such as speed sprayer, boom sprayer, pivot irrigation, aerial spray, micro jet, etc.</p> <p>Chemical Application Timing: Allow 7-10 days after a pesticide (herbicide, fungicide, insecticide, nematicide, etc.) application before applying the Quantum Growth products.</p> <p>pH Tolerance: 7 to 8 is the optimal range for tank mix pH. The organisms will survive a pH from 5 to 9. Any substances outside of that range should be added just before application.</p> <p>Tank Mix Compatibility: It is preferable to apply the Quantum Growth products as a sole input in an application or in combination with low analysis fertilizers and/or other nutrient inputs. Tank mixes that include chemical components designed to kill biology, such as herbicides, fungicides, insecticides and nematicides, may result in loss of the vegetative strains of Quantum Growth bacteria that are responsible for carbon fixation, nitrogen fixation, denitrification and other important functions in the soil.</p> <p>Tank Mix Instructions: When tank mixing, add the Quantum Growth products last and apply within 0 to 12 hours. Ensure that the mix is sufficiently dilute before adding the Quantum Growth products. For example: 30 gallon mix tank; add 14-7-7 liquid fertilizer, micronutrient package and approximately 15 gallons of water; add Quantum-Light and remaining water.</p>
average to low organics	Quantum-Light and Quantum-VSC® (Quantum-Organic Light and Quantum-Organic VSC®)	
compacted, flood damaged or toxic	Quantum-Light and Quantum-VSC® (Quantum-Organic Light and Quantum-Organic VSC®) at twice published rates	
Due to the specialization of the Quantum-Total™, Quantum-12, Quantum-1® and Quantum-Revive® formulations, we request that you consult your Quantum Growth representative for use and application information.		
APPLICATION & TANK MIX GUIDELINES		
Watering Requirements: Quantum Growth products are designed to be mixed with whatever quantity of water is required to cover the desired acreage at the prescribed application rate. Use only non-chlorinated water.		