

BIOLOGICAL CONTROL and BOTANICAL AGENTS – PLANT DISEASES

Products listed alphabetically:

Product	Biocontrol Agent	Target Pathogen /Disease	Crop	Formulation	Application Method	Manufacturer/Distributor
Actigard	acibenzolar-S-methyl	Many	Tobacco, tomato, lettuce, spinach	Water dispersible granule.	drench	Syngenta Crop Protection P.O. Box 18300, Greensboro, NC 27419 USA. Phone: 1-800-334-9481 www.syngentacropprotection-us.com/
Actinovate*	<i>Streptomyces lydicus</i>	soilborne disease	greenhouse and nursery crops, turf	water-dispersible granule	drench	Manufacturer/Distributor: Natural Industries, Inc. 6223 Theall Rd., Houston, TX 77066 USA. Phone: 888-261-4731, FAX: 281-580-4163. www.naturalindustries.com/index.html
AF36	<i>Aspergillus flavus</i> AF36	<i>Aspergillus flavus</i> strains that produce aflatoxin	cotton	sterilized wheat seeds colonized by <i>A. flavus</i>	aerial or ground equipment	Arizona Cotton Research and Protection Council, 3721 East Wier Ave., Phoenix, AZ 85040 USA
Afla-guard	<i>Aspergillus flavus</i> NRRL 21882	Strains of the fungus <i>A. flavus</i> that produces aflatoxin	Peanut	granules containing 0.01% <i>A. flavus</i> NRRL 21882	applied to soil at 1 gram ai/acre once per year, 40-80 days after the peanuts are planted	Circle One Global, Inc. One Arthur Street, PO Box 28, Shellman, GA 39886-0028. Phone: 229-768-2538
All Natural 3-in-1 Garden Insect Spray	Rosemary oil, clove oil, cottonseed oil	Powdery mildew, rusts, leaf spots, bacterial spot and speck, anthracnose, fire blight, greasy spot, scab, brown rot, leaf curl, bunch rot, early late blight and many others.	Fruits, Vegetables & Ornamentals	liquid	spray	
AtEze	<i>Pseudomonas chlororaphis</i> 63-28	wilt diseases as well as stem and root rots	ornamentals and vegetables grown in greenhouses		drenching	Turf Science Laboratories, Inc., 2121 Hoover Ave., National City, CA 91950 USA.
AQ10 Biofungicide	<i>Ampelomyces quisqualis</i> isolate M-10	powdery mildew	apples, cucurbits, grapes, ornamentals, strawberries, and tomatoes	water-dispersible granule	spray	Ecogen, Inc., 2005 Cabot Blvd. West, Langhorne, PA 19074; Phone: 1-215-757-1590; FAX: 1-215-752-2461

Ballad	<i>Bacillus pumilus</i> QST2808	Asian soybean rust	soybeans	liquid	spray	AgraQuest, Inc., 1530 Drew Avenue, Davis, CA 95616 USA. Phone: 1-530-750-0150, Fax: 1-530-750-0153, www.agraquest.com
Binab T Wettable Powder Biorational Fungicide	<i>Trichoderma harzianum</i> ATCC 20476 and <i>Trichoderma polysporum</i> ATCC 20475	fungi that infect tree wounds	ornamental, shade, and forest trees	powder	as a slurry to the wound	BINAB Bio-Innovation EFTR AB, Florettgatan 5, SE-254 67 Helsingborg, Sweden. Phone: 46-42-16-37-04, Fax: 46-42-16-24-97, www.alqonet.se/~binab/index2.html
Bio-save 10LP, 110	<i>Pseudomonas syringae</i>	<i>Botrytis cinerea</i> , <i>Penicillium</i> spp., <i>Mucor pyroformis</i> , <i>Geotrichum candidum</i>	pome fruit, citrus, cherries, and potatoes	lyophilized product, frozen cell concentrated pellets	pellets added to water to produce liquid suspension, postharvest application to fruit as drench, dip or spray	JET Harvest Solutions, PO Box 915139, Longwood, FL 32791 USA. Phone: 1-877-866-5773, www.jetharvest.com
BlightBan A506	<i>Pseudomonas fluorescens</i> A506	Frost damage, <i>Erwinia amylovora</i> , and russet-inducing bacteria	almond, apple, apricot, blueberry, cherry, peach, pear, potato, strawberry, tomato	wettable powder	bloom time spray of the flower and fruit	NuFarm Inc., 1-708-754-3330, www.nufarm.com
Companion	<i>Bacillus subtilis</i> GB03, other <i>B. subtilis</i> , <i>B. licheniformis</i> , <i>B. megaterium</i>	<i>Rhizoctonia</i> , <i>Pythium</i> , <i>Fusarium</i> , and <i>Phytophthora</i>	Greenhouse and nursery	liquid	drench at time of seeding and transplanting or as a spray for turf	Growth Products, Ltd., PO Box 1252, Westmoreland Ave., White Plains, NY 10602 USA. Phone: 1-800-648-7626, Fax: 914-428-2780, Internet: www.growthproducts.com
Contans WG, Intercept WG	<i>Coniothyrium minitans</i> strain CON/M/91-08	<i>Sclerotinia sclerotiorum</i> and <i>S. minor</i>	many	water dispersible granule	spray	Sylvan Bioproducts, Inc., 333 Main Street, PO Box 249, Saxonburg, PA 16056-0249 USA. Phone: 1-724-352-7520, www.sylvanbio.com
Concern Copper Soap	Copper with fatty acids	Downy mildew, leaf and fruit spots, blights and rusts	Flowers, fruits and vegetables indoor and outdoor	liquid	spray	Woodstream Corporation 69 North Locust Street Lititz, PA 17543
DiTera	fermentation product of killed <i>Myrothecium verrucaria</i> (killed)	Parasitic nematodes	cole crops, grape, ornamentals, turf, trees	powder and liquid suspension from fermentation	to soil and incorporated by various methods	Valent Biosciences, Inc., 1333 N. California Boulevard #600, Walnut Creek, CA 94596, USA. Phone: 800-6-VALENT. www.valent.com

EcoGuard	<i>Bacillus licheniformis</i> SB3086	Dollar spot, low and moderate disease pressure	turf	liquid spore concentrate	standard spray equipment	Novozymes A/S, Krogshoejvej 36, 2880 Bagsvaerd, Denmark. Phone: 45-88-24-99-99, Fax: 45-88-24-99-98; or Novozymes Biologicals, Inc., 5400 Corporate Circle, Salem, VA, 24153. www.novozymes.com/ecoguard
Frostban A	<i>Pseudomonas fluorescens</i> strains A506 and 1629RS, <i>Pseudomonas syringae</i> 742RS	frost-forming bacteria	certain fruits, almond, potato, and tomato crops		two to four spray applications early in growing season	Frost Technology Corporation, 1333 Burr Ridge Parkway, Suite 125A, Burr Ridge, IL 60527 USA.
Frostban B	<i>Pseudomonas fluorescens</i> A506	frost-forming bacteria	certain fruits, almond, potato, and tomato crops		two to four spray applications early in growing season	Frost Technology Corporation, 1333 Burr Ridge Parkway, Suite 125A, Burr Ridge, IL 60527 USA.
Frostban C	<i>Pseudomonas syringae</i> 742RS	frost-forming bacteria	certain fruits, almond, potato, and tomato crops		two to four spray applications early in growing season	Frost Technology Corporation, 1333 Burr Ridge Parkway, Suite 125A, Burr Ridge, IL 60527 USA.
Frostban D	<i>Pseudomonas fluorescens</i> 1629RS	frost-forming bacteria	certain fruits, almond, potato, and tomato crops		two to four spray applications early in growing season	Frost Technology Corporation, 1333 Burr Ridge Parkway, Suite 125A, Burr Ridge, IL 60527 USA.
Fungastop	Mint oil, Citric Acid, Glycerol, Citrus Pulp (strained), Fish Oil (edible), Vitamin C (ascorbic acid) and water.	<i>Alternaria</i> , <i>Aspergillus</i> , <i>Botrytis</i> , <i>Bremia</i> , <i>Erysiphe</i> , <i>Microsphaera</i> , <i>Pseudoperonospora</i> , <i>Phytophthora</i> , <i>Sclerotinia</i> , Fusarium Patch, Fairy Ring, Take-all Patch	Turf and ornamentals	liquid	spray	Soil Technologies 2103 185th St., Fairfield, IA 52556 USA 800-221-7645/ www.soiltechcorp.com/

Galltrol	<i>Agrobacterium radiobacter</i> Strain 84	crown gall disease caused by <i>Agrobacterium tumefaciens</i>	fruit, nut, and ornamental nursery stock	petri plates with pure culture grown on agar	bacterial mass from one plate transferred to one gallon of non-chlorinated water; suspension applied to seeds, seedlings, cuttings, roots, stems, and as soil drench	AgBioChem, Inc., 3 Fleetwood Ct., Orinda, CA 94563, USA. Phone: 1-925-254-0789 or 10795 Byrne Avenue, Red Bluff, CA, 90860 USA. Phone: 1-530-527-8028, www.crowngall.com
GB34 Biological Fungicide	<i>Bacillus pumilus</i> GB34	fungal pests <i>Rhizoctonia</i> and <i>Fusarium</i>	soybean seeds		slurry applied to seeds using specified mechanical seed-treating equipment	Gustafson LLC, 1400 Preston Road, Suite 400, Plano, TX 75093, USA. Phone: 972-985-5617, Fax: 972-985-1696, www.gustafson.com
GC-3	Garlic oil	Powdery mildew, rust, downy mildew	Ornamental indoor and outside	liquid	spray	JH BIOTECH, INC. 4951 Olivas Park Drive, Ventura, CA 93003 Phone: (805) 650-8933 www.jhbiotech.com/
GreenCure	Potassium bicarbonate and surfactants	Powdery mildew and other fungi	Flowers, trees, houseplants, fruits, vegetables and turf	powder	spray	H & I Agritech, Inc. 95 Brown Road, Box 1030 Product Name Ithaca, NY 14850
Green Releaf	<i>Bacillus licheniformis</i> SB3086	many fungal species especially those causing leaf spot and blight diseases	ornamental turf, lawns, golf courses, ornamental plants, conifers and tree seedlings in outdoor, greenhouse, and nursery sites		diluted in water and sprayed on leaves or applied to soil	Novozymes A/S, Krogshoejvej 36, 2880 Bagsvaerd, Denmark. Phone: 45-88-24-99-99, Fax: 45-88-24-99-98; or Novozymes Biologicals, Inc., 111 Kesler Mill Rd., Salem, VA 24153, USA; www.novozymes.com
HiStick N/T	<i>Bacillus subtilis</i> MBI600 (rhizobia also in formulation)	<i>Fusarium spp.</i> , <i>Rhizoctonia spp.</i> , <i>Aspergillus</i>	soybean, alfalfa, dry/snap beans, peanuts		slurry, damp and dry inoculation of seed	Becker Underwood, 801 Dayton Ave., PO BOX 667, Ames, IA 50010. Phone: 515-232-5907, FAX: 515-232-5961, www.beckerunderwood.com
Kodiak (several formulations)	<i>Bacillus subtilis</i> GB03	<i>Rhizoctonia solani</i> , <i>Fusarium spp.</i> , <i>Alternaria spp.</i> , and <i>Aspergillus</i> spp. that attack roots	cotton, legumes	dry powder; usually applied with chemical fungicides	added to a slurry mix for seed treatment; hopper box treatment	Gustafson, Inc., 1400 Preston Rd, Suite 400, Plano, TX 75093 USA. Phone 1-800-248-6907 or 1-972-985-8877; Fax: 1-972-985-1696, www.gustafson.com
MeloCon WG	<i>Paecilomyces lilacinus</i> strain 251	Plant parasitic nematodes	many	water dispersible granule	spray, drench, drip irrigation	WF Stoneman Company LLC. PO Box 465, McFarland, WI 53558-0465. billstoneman@charter.net

Mepplus	<i>Bacillus cereus</i> BP01	Uniform plant height, decrease in vegetative growth, larger cotton bolls	cotton plants		aerial and ground spraying	Micro-Flo Company LLC, 530 Oak Court Drive, Memphis, TN, 38117 USA. Phone: 1-800-451-8461, Fax: 901-432-5100, www.microflocompany.com
Messenger	<i>Erwinia amylovora</i> HrpN harpin protein.	Many	field, ornamental, and vegetable crops	powder	drench or spray.	EDEN Bioscience Corporation, 3830 Monte Villa Parkway, Suite 100, Bothell, WA 98021-7266 USA. Phone: 888-879-2420 or 425-806-7300, Fax: 425-806-7400, www.edenbio.com
Mycostop	<i>Streptomyces griseoviridis</i> strain K61	<i>Fusarium spp.</i> , <i>Alternaria brassicola</i> , <i>Phomopsis spp.</i> , <i>Botrytis spp.</i> , <i>Pythium spp.</i> , and <i>Phytophthora spp.</i> that cause seed, root, and stem rot, and wilt disease	field, ornamental, and vegetable crops	powder	drench, spray or through irrigation system	AgBio Inc., 9915 Raleigh St., Westminster, CO 80031 USA. Phone: 877-268-2020, Fax: 303-469-9598, www.agbio-inc.com
Nogall	<i>Agrobacterium radiobacter</i> K1026	<i>Agrobacterium tumefaciens</i>	fruit and nut trees, caneberrries, roses, and other ornamental nursery stock	pure culture in pre-sterilized, neutralized, finely divided peat	culture diluted in nonchlorinated water then used as for seed, root, or cutting dips or sprays	New BioProducts, Inc., 4272 NW Pintail Place, Corvallis, OR 97330 USA. Phone: 541-752-2045; Fax: 541-754-3968, www.newbioproducts.com
Primastop	<i>Gliocladium catenulatum</i> strain J1446	soilborne pathogens that cause seed, root, and stem rot, and wilt disease	ornamental, vegetable, and tree crops	powder	drench, spray or through irrigation system	AgBio Development Inc., 9915 Raleigh St., Westminster, CO 80031; Phone 877-268-2020, 303-469-9221; FAX 303-469-9598. www.agbio-inc.com
RootShield/PlantShield	<i>Trichoderma harzianum</i> Rifai strain KRL-AG2 (T-22)	<i>Pythium spp.</i> , <i>Rhizoctonia solani</i> , <i>Fusarium spp.</i>	trees, shrubs, transplants, all ornamentals, cabbage, tomato, cucumber	granules or wettable powder	granules mixed with soil or potting medium; powder mixed with water and added as a soil drench	Bioworks, Inc., 345 Woodcliff Dr., First Floor, Fairport, NY 14450 USA. Phone: 1-800-877-9443 or 585-641-0581, Fax: 1-800-903-2377 or 585-641-0584, www.bioworksbiocontrol.com
Serenade / Rhapsody/ Serenade Garden	<i>Bacillus subtilis</i> QWT713	powdery mildew, downy mildew, Cercospora leaf spot, early blight, late blight, brown rot, fire blight, and others	cucurbits, grapes, hops, vegetables, peanuts, pome fruits, stone fruits, and others	wettable powder	spray	AgraQuest, Inc., 1530 Drew Avenue, Davis, CA 95616 USA. Phone: 1-530-750-0150, Fax: 1-530-750-0153, www.agraquest.com
Soap-Shield	Copper octanoate	Powdery mildew, downy mildew, leaf and fruit spots, rusts, fruit rots	Fruits, flowers, vegetables, ornamentals	Flowable concentrate	spray	Gardens alive! inc 5100 Schenley place Lawrenceburg, IN 47025 Company Number: 056872

Sonata	<i>Bacillus pumilus</i>	powdery mildew, downy mildew, <i>Cercospora</i> leaf spot, early blight, late blight, brown rot, fire blight, and others	cucurbits, grapes, hops, vegetables, peanuts, pome fruits, stone fruits, and others	wettable powder	spray	AgraQuest, Inc., 1530 Drew Avenue, Davis, CA 95616 USA. Phone: 1-530-750-0150, Fax: 1-530-750-0153, www.agraquest.com
SoilGard	<i>Gliocladium virens</i> GL-21	damping-off and root rot pathogens especially <i>Rhizoctonia solani</i> and <i>Pythium</i> spp.	ornamental and food crop plants grown in greenhouses, nurseries, homes, and interiorscapes	granules	granules are incorporated in soil or soilless growing media prior to seeding	Certis USA LLC, 9145 Guilford Road, Suite 175, Columbia, MD 21046 USA. Phone: 1-301-604-7340 or 1-800-847-5620, Fax: 1 301-604-7015, www.certisusa.com
Spot-Less Biofungicide	<i>Pseudomonas aureofaciens</i> Tx-1	dollar spot, anthracnose, <i>Pythium</i> , pink snow mold	turfgrass		added directly to sprinkler system	Turf Science Laboratories, Inc., 2121 Hoover Ave., National City, CA 91950 USA.
Stylet-oil, Sunspray Ultra-fine	Mineral oil	Powdery mildew, rust, black spot, <i>Cercospora</i> , <i>Botrytis</i> , <i>Alternaria</i> leaf spot, gummy stem blight, viruses (vector control)	Fruit trees, vegetables, small fruits, turf, roses	oil	spray	JMS Flower Farms, Inc, 4423 5 th Place SW, Vero Beach, FL 32968 www.stylet-oil.com
Subtilex	<i>Bacillus subtilis</i> MBI600	<i>Fusarium</i> spp., <i>Rhizoctonia</i> spp., and <i>Pythium</i> spp. that cause seed and root rots	field, ornamental, and vegetable crops	powder	drench, spray or through irrigation system	Becker Underwood, 801 Dayton Ave., PO BOX 667, Ames, IA 50010. Phone: 515-232-5907, FAX: 515-232-5961, www.beckerunderwood.com
Taegro, Tae-Technical	<i>Bacillus subtilis</i> var. <i>amyloliquefaciens</i> FZB24	<i>Rhizoctonia</i> and <i>Fusarium</i>	Only in greenhouses and other indoor sites on shade and forest tree seedlings, ornamentals, and shrubs. Not permitted for use on food crops.	granules	suspend in water and either drench or dip plants	Earth Biosciences Inc., 106 Somerset Ave., Fairfield, CT 06824, USA.
TerraCyte	Sodium carbonate peroxyhydrate and other	Moss, slime molds, algae, Brown Patch, Dollar Spot, Snow Mold, <i>Pythium</i> , Liverwort	Lawns, Ornamental Shrubs, Flowerbeds and Walkways. Indoor outdoor	granular	Dry spreader	BioSafe Systems LLC 22 Meadow Street East Hartford, CT 06108

Triogy	Neem oil	Alternaria, Anthracnose, Early blight, Leaf blight, Botrytis, Greasy spot, Leaf spot, Post bloom fruit drop, Powdery mildew, Molds, Scabs, Rusts, Shothole	vegetables, fruits, nuts, melons, outdoor ornamental plants and agronomic crops	liquid	spray	Certis USA LLC, 9145 Guilford Road, Suite 175, Columbia, MD 21046 USA. Phone: 1-301-604-7340 or 1-800-847-5620, Fax: 1 301-604-7015, www.certisusa.com
YieldShield	<i>Bacillus pumillus</i> GB34.	Soilborne fungal pathogens causing root diseases	soybean	dry powder	added to a slurry mix for seed treatment; hopper box treatment.	Gustafson, Inc., 1400 Preston Rd, Plano TX 75093 USA; Phone 1-800-248-6907 or 1-972-985-8877; FAX 1-972-985-1696. www.gustafson.com
ZeroTol	Hydrogen peroxide and other	Algae - Anthracnose - Brown Patch - Black Spot - Botrytis - Copper Spot - Dollar Spot - Downy Mildew - Fairy Ring - Fusarium - Leaf Spot - Pink Snow Mold - <i>Pseudomonas</i> - <i>Pythium</i> - <i>Phytophthora</i> - Powdery Mildew - <i>Rhizoctonia</i> - Rust - Scab - Slime Molds - Smut - Summer Patch - <i>Thielaviopsis</i> - Wilts & Blights - and other plant pathogenic fungal and bacterial spores	Bedding plants, Flowering plants, Roses, Poinsettia, Ornamentals, Nursery stock, Trees, Turf, Cut flowers, Bulbs, Cuttings, Seedlings and Seeds	liquid	Spray or drench	BioSafe Systems LLC 22 Meadow Street East Hartford, CT 16108
Endomycorrhizae to increase plant nutrition and help protect against disease: Glomus sp.(VAM fungus): Bioscientific (Mycorise) • BioOrganic • Green Releaf(BioReleaf) • Mikro-Tek • Plant Health Care (Mycor) • Biological Crop • Natural Fertilizer • Philom (TagTeam) • Rincon-Vitova • AgBio • Roots • Mycorrhizal Applications						
Ectomycorrhizae (forest nurseries, urban trees): Pisolithus tinctorius: Rincon-Vitova • Plant Health Care (Mycortrees) • Plant Revolution • AgBio • Mycorrhizal Applications Pisolithus, Rhizopogon mixtures: Roots • Plant Health Care						
Microbial Soil Amendments: New Era Farm Service (composted soil amendments) • Jade Mountain (composting toilet) • Northeast Organics (Turf Cocktail to stimulate microbials in soil) • Lane • Agro Dist						
Beneficial microorganisms that attack turf pathogens: Gardener's Supply (Green Magic) • Green Releaf (BioReleaf) • Peaceful Valley (Restore) • Wilbur-Ellis (BioTrek) • Bioworks (Turfmate) • Eco-Soil (BioJect) • Soil Technologies (BacPack) • Natural Fertilizer • Plant Health Care (Compete)						
Disease-suppressive container mixes or compost: BioComp • Earthgro (Scotts) • Sun-Gro • Southern • Louisiana Pacific • O.M. Scotts (Hyponex) • Paygro						

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