Organic Fungicides for Managing Downy Mildew in Cucurbits

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Following is a list of some biopesticides and other organic fungicides labeled for cucurbit downy mildew. There are several formulations of copper not included. Each product name is followed by active ingredient. Most products are labeled for managing other diseases which are included. Products listed with OMRI (Organic Materials Review Institute) are NOP compliant. Check state registration: each product may not be registered in all states. Also, always check with your certifier before purchasing any product. ‘No Ag Label’ indicates an agricultural label was not found for the product.

**Actinovate AG.** 0.0371% *Streptomyces lydicus* strain WYEC 108. Labeled for application to foliage for bacterial leaf spot and downy mildew, and to soil for damping-off, Fusarium wilt, Phytophthora blight, and Verticillium wilt. For best results with applications to foliage, label indicates to use a spreader-sticker. OMRI-listed. EPA Reg. No. 73314-1. Monsanto BioAg (formerly Natural Industries, Inc.).

**AVIV.** 0.08% *Bacillus subtilis* strain IAB/BS03. Labeled for Alternaria leaf spot, anthracnose, downy mildew, gummy stem blight, powdery mildew, Phytophthora blight and also as soil treatment for root pathogens (*Fusarium*, *Phytophthora*, *Pythium*, and *Rhizoctonia*) in cucurbits. Replaces Prevont. OMRI-listed. EPA Reg. No. 91473-1-86182. Seipasa S.A.


**Double Nickel 55 LC and WDG.** *Bacillus amyloliquefacinens* strain D747, 98.8% and 25%, respectively. Broadly labeled for foliar and soil-borne diseases, including downy mildew, gummy stem blight, powdery mildew, damping-off, crown and root rot, Monosporascus vine decline, and charcoal rot in cucurbits. OMRI-listed. EPA Reg No. 70051-107 and 108, respectively. Certis USA, LLC.

**ECOWORKS EC.** 70% cold pressed neem oil. Labeled generally for powdery mildew, downy mildew, leaf spot, botrytis, anthracnose, blight, etc. and also several insects and mites. OMRI-listed. EPA Reg. No. 89152-4. ECOSTADT Technologies LLC.

**GreenFurrow BacStop.** 2.0% thyme, 2.0% clove & clove oil, 1.5% cinnamon, 1.0% peppermint & peppermint oil, and 1.0% garlic oil. Broadly labeled primarily for bacterial diseases including bacterial leaf spot, bacterial wilt, bacterial fruit blotch, downy mildew, and powdery mildew in cucurbits. Recommended used with EF400 for these and some other diseases. Exempt from EPA registration. Mar Vista Resources.

**GreenFurrow EF400.** 8.2% clove, 8.1% rosemary, and 6.7% peppermint. Broadly labeled including downy mildew and powdery mildew in cucurbits. Exempt from EPA registration. Mar Vista Resources.

**KeyPlex 350 OR.** 0.063% yeast extract hydrolysate from *Saccharomyces cerevisiae*. Combination of defensive proteins (alpha-keto acids) and secondary and micronutrients. Elicits systemic acquired resistance in plants against fungal and bacterial pathogens. Labeled for general disease control in vegetables. EPA Reg. No. 73512-4. KeyPlex.

**LifeGard WG.** 40% *Bacillus mycoides* isolate J. Biological plant activator. Labeled for anthracnose, downy mildew, gummy stem blight, and powdery mildew. OMRI-listed. EPA Reg No. 70051-119. Certis USA, LLC. Federally registered Jan 2017; not registered in NYS yet.

**Organocide.** 5% sesame oil. Labeled broadly for several fungal diseases and insects. OMRI-listed. Exempt from EPA registration. No Ag Label. Organic Laboratories, Inc.

**OSO.** 5% polyoxin D zinc salt. Alternaria, anthracnose, downy mildew, gray mold, gummy stem blight, powdery mildew, and scab in cucurbits. OMRI-listed. EPA Reg No. 68173-4-70051. Certis USA, LLC.

**OxiDate.** 2. 27% hydrogen dioxide and 2% peroxycetic acid. Labeled for Alternaria, anthracnose, belly rot, downy mildew, Fusarium wilt, gummy stem blight, leaf spot, Phytophthora, powdery mildew, and root rots in cucurbits. OMRI-listed. EPA Reg. No. 70299-12. BioSafe Systems, LLC.


**Prevent.** Renamed AVIV.

**Procidic.** 3.5% citric acid. Labeled for damping-off, foliar diseases caused by fungal and bacterial pathogens, and post-harvest diseases. Previously marketed as Citrex. Procidic was reviewed and determined to be NOP compliant by Washington State Dept of Ag. Exempt from EPA registration. Greenspire Global, Inc.


**Serenade ASO.** 1.34% *Bacillus subtilis* strain QST 713. This bacterium colonizes roots when applied to soil and produces compounds that affect pathogens directly and triggers metabolic pathways to activate the plant’s natural defenses and modulate growth. Labeled for angular leaf spot, anthracnose, downy mildew, gummy stem blight, and powdery mildew in cucurbits. OMRI-listed. EPA Reg No. 84059-2. Marrone Bio Innovations, Inc.


**Serifel.** 9.9% *Bacillus amyloliquefacinens* strain MBI 600. Broadly labeled for foliar diseases, including anthracnose, Alternaria leaf spot, downy mildew, gummy stem blight, and powdery mildew in cucurbits. OMRI-listed. EPA Reg No. 71840-18. BASF Corporation.

**Sonata.** 1.38% *Bacillus pumilus* strain QST 2808. Labeled for downy mildew and powdery mildew. OMRI-listed. EPA Reg. No. 264-1153. Bayer CropScience (formerly AgraQuest).

**Sporan EC.** 16% rosemary oil, 10% clove oil, 10% thyme oil, 2% peppermint oil. Labeled for Alternaria leaf spot, downy mildew, and powdery mildew. OMRI-listed. Exempt from EPA registration. KeyPlex.

**Stargus.** 96.4% *Bacillus amyloliquefacinens* strain F727 cells and spent fermentation media. Labeled for downy mildew, Phytophthora blight, and root rot pathogens. OMRI-listed. EPA Reg. No. 084059-28. Marrone Bio Innovations, Inc.

**Thyme Guard.** 23% thyme oil extract. Labeled generally for diseases caused by all pathogen groups and also insect pests. Determined to be NOP compliant by Washington State Dept of Ag. Exempt from EPA registration. Agro Research International.
**Timorex Act.** 12.5% tea tree oil. Labeled for several diseases, including downy mildew, gummy stem blight, powdery mildew, and soil-borne diseases (damping-off, crown and root rot). OMRI-listed. EPA Reg. No. 86182-3-88783. Summit Agro USA, LLC.

**Timorex Gold.** 23.8% tea tree oil. Labeled generally for several diseases, including anthracnose, bacterial diseases, downy mildew, and powdery mildew in cucurbits. OMRI-listed. EPA Reg. No. 70051-2. Stockton USA, LLC.

**Trilogy.** 70% clarified hydrophobic extract of neem oil. Labeled generally for several insects and diseases, including *Alternaria*, anthracnose, downy mildew, leaf spot, and powdery mildew in cucurbits. OMRI-listed. EPA Reg. No. 70051-2. Certis USA, LLC.

**Zonix.** 8.5% rhamnolipid biosurfactant. Kills zoospories, which is one spore type produced by Oomycete pathogens which cause diseases such as late blight and downy mildews. OMRI-listed. EPA Reg. No. 72431-1. PropTera, LLC.

*Please Note:* The specific directions on fungicide labels must be adhered to -- they supersede these recommendations, if there is a conflict. If you are farming organically, before purchase make sure product is registered in your state and approved by your certifier. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended.

*Up-dated 6-16-20.*