

## Efficacy of Organic Fungicides for Vegetable Diseases

Fungicides listed by crop grouping and disease, then by product. Effective products in bold. Almost all results are from Plant Disease Management Reports (PDMR). References to studies include state and year of study. All field studies with weekly spray schedule except where noted.

CTE = Conventional treatment effective.

### HERBS - Basil

#### Downy mildew (my reports not included)

2 GH expts. **Actinovate** (12 oz/A) **effective** in both. Regalia SC (1% v/v), **Companion** (32 fl oz/A), and **Sonata** (4 qt/A) **effective** in one. Serenade (3 lb/A) ineffective. Prophyt (4 pt/A) was much more effective. Prophyt (2 pt/A) + Quadris (9 fl oz/A) was excellent. 3 experimentals also examined. FL, 2010, PDMR 6:V059.

**Actinovate** 12 oz/A + Induce **moderately effective** (FL, 2007, PDMR 2:V068). \*

**Actinovate** 10 oz/A + ThermX70 **slightly effective** at 1 of 2 sites. Preventive schedule. (CT, 2011, PDMR 6:V073). \*

Actinovate 10 oz/A + ThermX70 ineffective, 2 sites. Preventive schedule. Also ineffective applied in alternation with OxiDate (CT, 2012, PDMR 7:V045). \*

Actinovate 12 oz/A ineffective. Preventive. Conventional fungicides also ineffective. (NY, 2010, PDMR 5:V098).

Companion 1 gal/A ineffective. Preventive. Conventional fungicides also ineffective. (NY, 2010, PDMR 5:V098).

Companion 1 gal/A ineffective. Preventive. Conventional fungicides also ineffective. (NY, 2011, PDMR 6:V099).

**MilStop** 2.5 lb/A **moderately effective**, 2 sites. Preventive schedule. (CT, 2011, PDMR 6:V073). \*

MilStop 2.5 lb/A ineffective, 2 sites. Preventive schedule. (CT, 2012, PDMR 7:V045). \*

Nordox 75WG 14oz/A ineffective (IL, 2011, PDMR 6:V131). \*

Nordox 75WG 8 oz/A + TriTek 2% (v:v) ineffective (IL, 2011, PDMR 6:V131). \*

Organocide 2 fl oz/100 gal ineffective. Preventive. Conventional fungicides also ineffective. (NY, 2010, PDMR 5:V098).

**OxiDate** 0.6 and 1.2 gal/A (rate increased after symptoms seen) + Yucca Ag-Aide **moderately effective**. 2 sites. Preventive schedule. (CT, 2011, PDMR 6:V073). \*

**OxiDate** 0.6 gal/A + Yucca Ag-Aide **slightly effective** at 1 of 2 sites. Preventive schedule. (CT, 2012, PDMR 7:V045). \*

OxiDate 128 fl oz/100 gal ineffective. Preventive. Conventional fungicides also ineffective. (NY, 2010, PDMR 5:V098).

**Regalia** 1% **moderately effective**, slightly more effective applied with Sonata 4 qt/A, but neither were sufficiently effective to yield marketable stems (6-in stem tips with no symptoms). Control not improved by applying Regalia with Kocide 3000 2 lb/A (FL, 2010, PDMR 5:V155).

Regalia 1% ineffective. Preventive. Conventional fungicides also ineffective. (NY, 2010, PDMR 5:V098).

Serenade 2 qt/A + Induce 90 ineffective (IL, 2011, PDMR 6:V131). \*

Serenade 2 qt/A + Regalia 1% (v:v) ineffective (IL, 2011, PDMR 6:V131). \*

**Serenade Max** WP 4 lb/A + Biotune **moderately effective** (FL, 2007, PDMR 2:V068). \*

**Serenade MAX** 2 lb/A + ThermX70 **slightly effective** at 1 of 2 sites. Preventive schedule. (CT, 2011, PDMR 6:V073). \*

**Sonata** ASO 4 pt/A + Biotune **moderately effective** (FL, 2007, PDMR 2:V068). \*

Sonata 2 qt/A + Induce 90 ineffective (IL, 2011, PDMR 6:V131). \*

Sonata AG 3 qt/A + BioLink ineffective. Preventive. Conventional fungicides also ineffective. (NY, 2010, PDMR 5:V098).

Sporatec AG 1 qt/A + BioLink ineffective. Preventive. Conventional fungicides also ineffective. (NY, 2010, PDMR 5:V098).

Timorex Gold 0.75% ineffective. Preventive. Conventional fungicides also ineffective. (NY, 2010, PDMR 5:V098).

**Trilogy** 77 fl oz/A **slightly effective** at 1 of 2 sites. Preventive schedule. (CT, 2011, PDMR 6:V073). \*

\* In CT trials, symptoms were confirmed during third week of treatments in 2011, second in 2012. Mean ratings for basil receiving best treatment (MilStop) were 1.6 and 2.0 versus 2.4 for non-treated basil at both sites. The rating scale used was based on percent leaf area with sporulation: 1 = <10%, 2 = 10-50%, and 3 = >50%.

\* In IL trial, all organic treatments tested were ineffective; conventional treatments were all very effective (9 provided complete control).

\* In FL trial in 2007 some conventional treatments provided effective control.

## Asparagus

### Beet

#### Cercospora leaf spot

**Actinovate** 12 oz/A **effective**, preventive schedule (NY, 2014, PDMR 9:V007). \*

**Serenade Optimum** 1 lb/A **effective**, preventive (NY, 2014, PDMR 9:V007). \*

**Copper**. Cueva 1 gal/A **effective**, preventive (NY, 2014, PDMR 9:V007). \*

\* all organic treatments equally effective; less disease on untreated resistant varieties. Serenade + Cueva not better than either alone. (NY, 2014, PDMR 9:V007)

### **Brassica (cruciferous) crops** (broccoli, cabbage, cauliflower, kale, kohlrabi, etc.)

#### Alternaria leaf spot

**Actinovate** 12 oz/A **effective** (NY, 2010, PDMR 5:V116).

Actinovate 12 oz/A ineffective tested on collards. CTE (MA, 2013, PDMR 8:V223).

Actinovate 6 oz/50 gal ineffective (NY, 2013; see below). \*

**Double Nickel** 55 LC 6 qt/A **effective** tested on collards, as effective as conventional fungicide (MA, 2013, PDMR 8:V223).

**Double Nickel** 3 lb/A **effective** after 2 applications in second trial and 1 wk after the one application made in first trial. (NY, 2012, PDMR 7:V054; NY, 2012, PDMR 7:V032)

EF 400 64 oz/100 gal ineffective. Cauliflower. (NY, 2013; see below). \*

**Regalia** 3 pt/A **effective** 1 wk after the one application made. (NY, 2012, PDMR 7:V032)

Regalia 3 pt/50 gal ineffective (NY, 2013; see below). \*

Serenade Max 3 lb/A ineffective (NY, 2013; see below). \*

Serenade Optimum 20 oz/A ineffective tested on collards. CTE (MA, 2013, PDMR 8:V223).

Sonata ASO 4 qt/A ineffective tested on collards. CTE (MA, 2013, PDMR 8:V223).

Sonata 4 qt/A ineffective (NY, 2013; see below). \*

Sporatec 3 pt/A ineffective (NY, 2013; see below). \*

\* NY, 2013: products applied 7X weekly at 40 gpa starting 2 days before inoculation, none effective, copper also ineffective (PDMR 8:V260)

### **Black rot**

Actinovate 12 oz/A ineffective tested on collards. CTE (MA, 2013, PDMR 8:V223).

**Double Nickel** 55 LC 6 qt/A **effective** tested on collards, as effective as copper (MA, 2013, PDMR 8:V223).

Serenade Optimum 20 oz/A ineffective tested on collards. CTE (MA, 2013, PDMR 8:V223).

Sonata ASO 4 qt/A ineffective tested on collards. CTE (MA, 2013, PDMR 8:V223).

Regalia 3 pt/50 gal applied at 40 gpa ineffective applied alone in both experiments and didn't improve control achieved with Kocide 3000 in 2012 (NY, 2011, PDMR 6:V106; NY, 2012, PDMR 7:V060).

### **Bulb Crops** (onion, garlic, shallots)

### **Corn**

#### **Common rust**

**Serenade** 32 fl oz/A **effective** (MI, 2009, PDMR 5:FC002)

#### **Grey leaf spot**

**Serenade** 32 fl oz/A **effective** (MI, 2009, PDMR 5:FC002)

### **Corn, Sweet**

### **Cucurbit crops** (cucumber, melon, pumpkin, squash, watermelon, etc.)

#### **Anthracnose - Watermelon**

Actinovate 6 oz/A ineffective, preventive schedule, assessed 3 wks after last spray, CTE (OK, 2006, 1:V036).

**OxiDate** 1% **effective** but not enough to increase yield compared to nontreated (IN, 2010, PDMR 5:V022).

Regalia 1gal/A ineffective (SC, 2013, PDMR 8:V218).

Serenade Optimum 20 oz/A ineffective (SC, 2013, PDMR 8:V218).

### **Bacterial spot - Pumpkin**

**Actinovate** 12 oz/A **effective** for controlling disease on leaves in both experiments and on fruit in 2013 (IL, 2012)(IL, 2013, PDMR 8:V).

**Serenade** 6 qt/A **effective** for controlling disease on leaves and fruit (IL, 2012)(IL, 2013, PDMR 8:V).

**Regalia** 1 qt/A **effective** for controlling disease on leaves and fruit; most effective treatment for protecting fruit in 2012 (IL, 2012)(IL, 2013, PDMR 8:V).

**Sonata** 4 qt/A **effective** for controlling disease on leaves and fruit (IL, 2012)(IL, 2013, PDMR 8:V).

### **Downy mildew - Cucumber**

**Actinovate** 12 oz/50 gal applied at 40 gpa alone or tank mixed with Regalia 3 pt **effective** but authors concluded not sufficient control. Control similar to copper (3 products tested). (NY, 2015, PDMR 10:V015).

Actinovate 6 oz/A applied at 60 gpa ineffective. CTE. (FL, 2015, PDMR 10:V065).

**Actinovate** 6 oz/50 gal **effective**; copper numerically better but not significantly; preventive schedule used (NY, 2013, PDMR 8:V227).

**Actinovate** 12 oz/A + Biolink **somewhat effective**, same as copper; preventive schedule (NY, 2008, PDMR 3:V116).

**Actinovate** 12 oz/A **moderately effective**, copper slightly better; symptoms present at first application (NY, 2009, PDMR 4:V123).

Actinovate 12 oz/A applied in alternation with copper (Champ) less effective than Champ weekly (MD, 2013, PDMR 8:V210).

**Double Nickel** LC 1.25 lb/A applied at 40 gpa **effective** but authors concluded not sufficient control. Control similar to copper (3 products tested). (NY, 2015, PDMR 10:V015).

**Neem oil** 1 fl oz/gal **somewhat effective**; copper more effective (OH, 2013, PDMR 8:V177).

Organocide 1 oz/gal applied with low rate copper (NuCop HB 1 lb/A) at 75 gpa effective, same as copper at high rate (1 lb/A); symptoms present at first application (NY, 2009, PDMR 4:V123).

OxiDate 1% weekly schedule ineffective. CTE. (NC, 2015, PDMR 10:V086).

**OxiDate** 1% weekly schedule **effective**, copper numerically better but not significantly (OH, 2013, PDMR 8:V177).

**OxiDate** 128 oz/A **effective** only when applied with Yucca Ag Aide; preventive schedule used; copper more effective (NY, 2012, PDMR 7:V049).

**OxiDate** 128 oz/A **effective**, no benefit to using Yucca Ag Aide; copper numerically better, not significantly; preventive schedule (NY, 2013, PDMR 8:V227).

OxiDate 128 oz/A ineffective applied with Yucca Ag Aide; preventive schedule used; copper effective (NY, 2011, PDMR 6:V103).

OxiDate 4 pt/A ineffective applied every 4-6 days; 5% infection when started sprays; conventional fungicides effective (MI, 2009, PDMR 4:V057).

OxiDate 3 pt/A applied in alternation with copper (Champ) less effective than Champ weekly (MD, 2013, PDMR 8:V210).

**Regalia** 3 pt/50 gal applied at 40 gpa **alone or tank mixed with Actinovate 12 oz effective** but authors concluded not sufficient control. Control similar to copper (3 products tested). (NY, 2015, PDMR 10:V015).

**Regalia** 0.5% **limited efficacy**, copper better; symptoms present at first application (NY, 2009, PDMR 4:V123).

Regalia 1% ineffective; copper effective (OH, 2013, PDMR 8:V177).

Regalia 3 pt/50 gal applied at 40 gpa ineffective; copper effective; preventive schedule used (NY, 2013, PDMR 8:V227).

Regalia 1 qt/A applied in alternation with copper (Champ) less effective than Champ weekly (MD, 2013, PDMR 8:V210).

**Serenade Max** 3 lb/A **limited efficacy**, copper better; symptoms present at first application (NY, 2009, PDMR 4:V123).

Serenade Max 2 lb/A ineffective; copper effective (OH, 2013, PDMR 8:V177).

Serenade Max 3 lb/A ineffective; copper effective (NY, 2011, PDMR 6:V103).

Serenade 3 lb/A ineffective applied every 4-6 days; 5% infection when started sprays; conventional fungicides effective (MI, 2009, PDMR 4:V057).

Serenade Soil 2 qt/A applied in alternation with copper (Champ) as effective as Champ weekly (MD, 2013, PDMR 8:V210).

**Sonata** 2 qt/A + BioTune **somewhat effective**; Bravo more effective (GA, 2006, PDMR 1:V166).

Sonata 2 qt/A ineffective in 2 experiments; CTE (SC, 2007, PDMR 2:V024).

**Sonata** 3 qt/A **somewhat effective**; numerically more severe DM with Manzate (GA, 2010, PDMR 5:V169)

**Sonata** 4 qt/A **effective**; preventive schedule used; numerically better but not significantly (NY, 2011, PDMR 6:V103).

**Sonata** 4 qt/A **moderately effective**, copper slightly better; symptoms present at first application (NY, 2009, PDMR 4:V123).

Sonata 4 qt/A ineffective; copper effective (NY, 2012, PDMR 7:V049).

**Sporatec** AG 2 pt/A applied with Biolink 2 fl oz/gal was **effective**, as effective as copper; symptoms present at first application (NY, 2009, PDMR 4:V123).

**Sporatec** 2 pt/A **somewhat effective**, other biopesticides more effective; preventive schedule (NY, 2008, PDMR 3:V116).

Sporatec 3 pt/A ineffective; preventive schedule used; copper effective (NY, 2011, PDMR 6:V103).

**Taegro** 3.5 oz/A **somewhat effective**, same as copper; preventive schedule (NY, 2008, PDMR 3:V116).

**Taegro** 3.5 oz/100 gal applied at 75 gpa **somewhat effective**, copper better; symptoms present at first application (NY, 2009, PDMR 4:V123).

**Zonix** 38 fl oz/50 gal applied at 40 gpa **effective** but authors concluded not sufficient control. Control similar to copper (3 products tested). (NY, 2015, PDMR 10:V015).

NY, 2010 trial. Downy mildew started to develop late, severity remained low. Preventive schedule. None of the 9 organic treatments including copper were effective; conventional fungicide program effective (PDMR 5:V100).

**Downy mildew - Cantaloupe**

Actinovate 12 oz/A applied in alternation with copper (Champ) as effective as Champ weekly (MD, 2013, PDMR 8:V210).

OxiDate 3 pt/A applied in alternation with copper (Champ) as effective as Champ weekly (MD, 2013, PDMR 8:V210).

Regalia 1 qt/A applied in alternation with copper (Champ) as effective as Champ weekly (MD, 2013, PDMR 8:V210).

Serenade Soil 2 qt/A applied in alternation with copper (Champ) as effective as Champ weekly (MD, 2013, PDMR 8:V210).

**Downy mildew - Summer Squash**

Double Nickel 1 qt/A tested in 2 programs with Oso and Cueva. Control achieved with Oso applied weekly, not when alternated with Double Nickel suggesting later ineffective (SC, 2013, PDMR 8:V219).

**Downy mildew - Butternut Squash**

Regalia 1 qt/A applied in alternation with copper (Champ) as effective as Champ weekly (MD, 2013, PDMR 8:V211).

Serenade Soil 2 qt/A applied in alternation with copper (Champ) as effective as Champ weekly (MD, 2013, PDMR 8:V211).

**Downy mildew - Hubbard Squash**

Regalia 1 qt/A applied in alternation with copper (Champ) ineffective; Champ weekly effective (MD, 2013, PDMR 8:V211).

Serenade Soil 2 qt/A applied in alternation with copper (Champ) ineffective; Champ weekly effective (MD, 2013, PDMR 8:V211).

**Downy mildew - Pumpkin**

Regalia 1 qt/A applied in alternation with copper (Champ) as effective as Champ weekly, which was moderately effective (MD, 2013, PDMR 8:V211).

Serenade Soil 2 qt/A applied in alternation with copper (Champ) as effective as Champ weekly, which was moderately effective (MD, 2013, PDMR 8:V211).

**Fusarium Wilt - Watermelon**

Serenade Soil 2 or 4 qt/100 gal ineffective applied as soil drench at transplanting and also when followed by 2 qt/A foliar spray (GA, 2011, PDMR 6:V138).

**Gummy Stem Blight - Watermelon**

Regalia 2 qt/A ineffective, preventive schedule (5 applications before symptoms seen), CTE (GA, 2009, PDMR 4:V146).

Regalia 2 qt/A ineffective, preventive schedule (3 applications before symptoms seen), CTE (GA, 2009, PDMR 4:V152).

**Powdery mildew - Cantaloupe**

**Actinovate** 3 oz/A **very effective** at 5/13 assessment, not 5/28; preventive schedule (FL, 2009, PDMR 4:V103).

**Actinovate** 6 oz/A **moderately effective** (AZ, 2006, PDMR 1:V073).

**Actinovate** 6 oz/A **somewhat effective** (AZ, 2012, PDMR 7:V107).

**Actinovate** 6 oz/A **very limited efficacy** (AZ, 2013, PDMR 8:V197).

**Actinovate** (rate not specified) **very limited efficacy**, other organic products more effective (AZ, 2015, PDMR 10:V010).

Actinovate 3 oz/A ineffective (FL, 2010, PDMR 5:V062).

Actinovate 12 oz/A applied in alternation with copper (Champ) as effective as Champ weekly (MD, 2013, PDMR 8:V210).

**Companion** 32 fl oz/A **effective** both rating dates; preventive schedule (FL, 2009, PDMR 4:V103).

**Companion** 1 qt/A **effective** on 5/21, not 6/4 (FL, 2010, PDMR 5:V062).

**Kaligreen** 4.1 lb/A **moderately effective** (AZ, 2006, PDMR 1:V073).

Kaligreen 5 lb/A among least effective treatments (AZ, 2012, PDMR 7:V107).

**Microthiol Disperss** (sulfur) 8 lb/A **very effective** both leaf surfaces (AZ, 2006, PDMR 1:V073). 10 lb/A no symptoms (AZ, 2012, PDMR 7:V107; AZ, 2013, PDMR 8:V197).

OxiDate 3 pt/A applied in alternation with copper (Champ) more effective than Champ weekly (MD, 2013, PDMR 8:V210).

**Regalia** 5% **moderately effective** (GA, 2009, PDMR 4:V145).

Regalia 1% very effective at 5/13 assessment, not 5/28; preventive schedule (FL, 2009, PDMR 4:V103).

Regalia 1% effective at 5/21 assessment, not 6/4 (FL, 2010, PDMR 5:V062).

Regalia 4 qt/A among least effective treatments (AZ, 2012, PDMR 7:V107).

Regalia 1 qt/A applied in alternation with copper (Champ) more effective than Champ weekly (MD, 2013, PDMR 8:V210).

**Serenade Max** 2 lb/A **moderately effective** (AZ, 2006, PDMR 1:V073).

Serenade applied in alternation with copper (Champ) more effective than Champ weekly (MD, 2013, PDMR 8:V210).

**Sonata** 4 qt/A **moderately effective** (AZ, 2006, PDMR 1:V073).

**Sonata** 4 qt/A **somewhat effective**, other organic products better, Taegro best currently registered product, Timorex Gold better (AZ, 2015, PDMR 10:V010).

Sonata 4 qt/A ineffective (AZ, 2013, PDMR 8:V197).

**Taegro** 5.2 oz/A **effective** (AZ, 2013, PDMR 8:V197).

**Timorex Gold** 20.3 fl oz/A **effective**, best organic product, not approved yet for organic production in US (AZ, 2015, PDMR 10:V010).

#### **Powdery mildew – Acorn Squash**

**M-Pede** 2% **effective** until last assessment, copper (Nordox) more effective (KY, 2013, PDMR 8:V203).

Regalia 5L 2 and 4 qt/A ineffective, preventive schedule. Only organic trts. CTE (VA, 2012, PDMR 7:V038).

#### **Powdery mildew – Butternut Squash**

**MilStop** 3 lb/A **moderately effective**, IPM schedule. (NY, 2009, PDMR 4:V024).

**Organocide** 2 fl oz/gal **moderately effective**, IPM schedule. (NY, 2009, PDMR 4:V024).

Serenade Max 2 lb/A + Biotune 1 pt/100 gal ineffective, preventive schedule. CTE (GA, 2006, PDMR 1:V164).

**Sonata AS** 2 qt/A + Biotune 1 pt/100 gal **somewhat effective** but not signif dif from Serenade Max (other organic trt that was ineffective), preventive schedule. CTE (GA, 2006, PDMR 1:V164).

#### **Powdery mildew – Scallop Squash**

Serenade Max 12 fl oz/A ineffective, preventive schedule. Only organic trt. CTE (FL, 2015, PDMR 10:V062).

#### **Powdery mildew – Summer Squash**

**Actinovate** 12.0 oz/A **effective** at first assessment (FL, 2010, PDMR 4:V112).

Actinovate 12.0 oz/A ineffective, preventive schedule (GA, 2008, PDMR 3:V149).

**Companion** 1 qt/A **effective** at first assessment (FL, 2010, PDMR 4:V112).

**Companion** 3 qt/A **somewhat effective**, preventive schedule (GA, 2008, PDMR 3:V149).

OxiDate 2 1% ineffective, applied with Yucca Ag Aide, treatment started 3 days after first symptoms seen. CTE (GA, 2013, PDMR 8:V272).

**Regalia** 0.5% **moderately effective**, preventive schedule (VA, 2010, PDMR 5:V128).

**Regalia** 2 qt/A **somewhat effective**, preventive schedule. Only organic trt. CTE (FL, 2015, PDMR 10:V055).

Regalia 1% effective at first assessment (FL, 2010, PDMR 4:V112).

Regalia 5L 2 and 4 qt/A ineffective, preventive schedule. Only organic trts. CTE (VA, 2012, PDMR 7:V039).

Regalia 2 qt/A ineffective, preventive schedule (GA, 2009, PDMR 4:V141).

**Sonata** 2 qt/A + Biotune **effective** (GA, 2006, PDMR 1:V165).

Sonata 2 qt/A + Biotune effective at first assessment (GA, 2007, PDMR 2:V174).

Sporan 3 pt/A ineffective, preventive schedule (GA, 2008, PDMR 3:V149).

#### **Powdery mildew - Pumpkin**

JMS Stylet-oil 5 qt/100 gal ineffective, CTE (WI, 2015, PDMR 10:V070).

**Microthiol Disperss** 4 lb/A **somewhat effective**, CTE (WI, 2015, PDMR 10:V070).

**Microthiol Disperss** 5 lb/A **effective** (TN, 2014, PDMR 10:V027).

MilStop 3 lb/A ineffective, IPM schedule. (NY, 2007, PDMR 2:V141).

**Organocide** 2 fl oz/gal **moderately effective**, IPM schedule. (NY, 2007, PDMR 2:V141).

Organocide 1.5% ineffective, Microthiol Disperss effective (TN, 2014, PDMR 10:V027).



Potassium bicarbonate 5 lb/A ineffective, Microthiol Disperss effective (TN, 2014, PDMR 10:V027).  
Regalia 1 qt/A applied in alternation with copper (Champ) more effective than Champ weekly, which was moderately effective (MD, 2013, PDMR 8:V211).  
Serenade Soil 2 qt/A applied in alternation with copper (Champ) as effective as Champ weekly, which was moderately effective (MD, 2013, PDMR 8:V211).  
Kocide effective (TN, 2014, PDMR 10:V027).  
Kocide ineffective (WI, 2015, PDMR 10:V070).

### **Powdery mildew - Zucchini**

**MilStop** 2.5 lb/A **very effective**, best in 2 trials, see below (NY, 2011, PDMR 6:V104; NY, 2012, PDMR 7:V051).  
**M-Pede** 2% **very effective**, see below (NY, 2011, PDMR 6:V104).  
**OxiDate** 128 oz/A **moderately effective** applied with Yucca Ag Aide (both trials) or without (in 2012), see below (NY, 2011, PDMR 6:V104; NY, 2012, PDMR 7:V051).  
**Sonata** 4 qt/A **very effective**, see below (NY, 2011, PDMR 6:V104).  
**Serenade Max** 3 lb/A **moderately effective**, see below (NY, 2011, PDMR 6:V104).  
**Sporatec** 3 pt/A **moderately effective**, see below (NY, 2011, PDMR 6:V104). NY, 2011 and 2012. Applications started after first symptoms found.

### **Lettuce**

**Drop** (caused by *Sclerotinia minor* and *S. sclerotiorum*)  
**Actinovate** 12.0 oz/A **effective** against both pathogens applied twice as soil spray. Inoculated plots. (AZ, 2013, PDMR 8:V198).  
BioTam 4.0 lb/A ineffective. (AZ, 2013, PDMR 8:V198).  
**Contans WG** 4.0 lb/A **very effective** against both pathogens, better for both than conventional fungicides tested. Applied once as soil spray at thinning, incorporated. Control not improved by re-applying 18 days later. Inoculated plots. (AZ, 2011, PDMR 6:V077).  
**Contans WG** 4.0 lb/A **very effective** against *S. sclerotiorum*, not *S. minor*. Similar results applied 1 or 2 times as soil spray. (AZ, 2013, PDMR 8:V198).  
Contans applied with Soilgard (AZ, 2011) or Serenade Soil (AZ, 2013) did not improve control.  
**Soilgard 12G** 4.0 lb/A **effective**. Control of *S. sclerotiorum* better with 2 applications but not significantly; control same for *S. minor*. Inoculated plots. (AZ, 2011, PDMR 6:V077).  
**Soilgard 12G** 4.0 lb/A **effective** especially for *S. sclerotiorum*. Inoculated plots. (AZ, 2013, PDMR 8:V198).  
**Serenade Soil** 4.0 qt/A **limited efficacy** for only *S. sclerotiorum*. Inoculated plots. (AZ, 2013, PDMR 8:V198).

**Leafy vegetables other than lettuce + spinach** (celery, parsley, radicchio, etc.)

## **Legumes** (succulent and dried beans and peas)

### **Damping-off (pea)**

Actinovate STP was ineffective (emergence not increased). (WA, 2011, PDMR 6:ST012).

Heads Up Plant Protectant ineffective. (WA, 2011, PDMR 6:ST012).

Mycoseed Treat was ineffective. (WA, 2011, PDMR 6:ST012).

Mycostop Mix was ineffective. (WA, 2011, PDMR 6:ST012).

Serenade Soil drench was ineffective. (WA, 2011, PDMR 6:ST012).

Soilgard 12G drench was ineffective. (WA, 2011, PDMR 6:ST012).

T-22 HC was ineffective. (WA, 2011, PDMR 6:ST012).

Actinovate seed treatment was ineffective. Several unregistered organic materials tested also; only copper increased emergence (WA, 2007, PDMR 2:V153).

Serenade ASO seed treatment was ineffective. Several unregistered organic materials tested also; only copper increased emergence (WA, 2007, PDMR 2:V153).

### **White mold (snap bean)**

**Double Nickel** 55 WG 1 qt/A as **effective** as 4 of 6 conventional fungicides tested. All applied twice before the first and third inoculations with ascospores (NY, 2015, PDMR 10:V004).

EF400 + BacStop applied alone twice or once in alternation with copper. None effective but neither were the 9 conventional fungicide treatments or copper alone (WI, 2015, PDMR 10:V032).

## **Pepper. Fruiting vegetables** (pepper, tomato, eggplant, tomatillo, okra, etc.)

### **Bacterial leaf spot**

OxiDate 1% ineffective on greenhouse transplants. Preventive, twice weekly schedule; sprayed twice before inoculating center plants in tray. Copper effective. (GA, 2007, PDMR 2:V160).

Regalia 3 pt/A ineffective. 4-day schedule; then 7-day. Copper effective. (GA, 2009, PDMR 4:V151).

Regalia 4 pt/A ineffective. Preventive, one spray before inoculating. CTE. (NC, 2011, PDMR 6:V091).

Serenade 1 lb/A ineffective on greenhouse transplants. Preventive, twice weekly schedule; sprayed twice before inoculating center plants in tray. Copper effective. (GA, 2007, PDMR 2:V160).

**Serenade Max** 1 lb/A **effective** for controlling foliar symptoms, but only based on AUDPC, did not reduce % fruit affected. Preventive schedule; sprayed once before inoculating. Copper effective. (FL, 2010, PDMR 6:V038).

Serenade Max 1.5 lb/A ineffective applied alone or with Biotune (NC, 2007, PDMR 2:V003).

### **Phytophthora blight**

**Actinovate** 12.0 oz/A **limited efficacy** but copper and conventional fungicides not better (NY, 2012, PDMR 7:V017).

## **Potato.**

### Early blight

**Actinovate** 9 oz/A preventive schedule **effective**; limited disease (ID, 2010, PDMR 5:V075).

EF 400 12 fl oz/A ineffective (WI, 2013, PDMR 8:V246).

**M-Pede** 2% preventive schedule **effective**; limited disease (ID, 2010, PDMR 5:V075).

**Regalia Max** 1 pt/A **somewhat effective**. CTE (PA, 2009, PDMR 4:V077).

Regalia Max 20SC 1 pt/A ineffective (MI, 2009, PDMR 4:V089).

**Serenade Max** 3 lb/A preventive schedule **effective**; limited disease (ID, 2010, PDMR 5:V075).

### Late blight

**Regalia Max** 20SC 1 pt/A **effective** for foliar symptoms, not tuber blight; limited residual activity as ineffective 16 d after last application when conventional fungicides still effective (MI, 2009, PDMR 4:V089).

## **Spinach.**

### Anthracnose

Oxidate 1 gal/A ineffective applied weekly starting before symptoms; incidence and defoliation ratings significantly higher than untreated control; also occurred with an ineffective conventional fungicide. CTE for some (OK, 2007, PDMR 2:V055).

### Damping off (*Pythium* spp primarily, *Fusarium* also detected)

Kodiak Concentrate Biological Fungicide applied as a seed treatment was ineffective based on final emergence rating; product has since been discontinued (WA, 2007, PDMR 2:V133).

**Micro 108 Seed Inoculant** applied to seed + Actinovate AG applied as a soil drench was the most **effective** treatment (WA, 2007, PDMR 2:V133).

Mycostop Mix applied as a seed treatment was ineffective. Micro 108 + Actinovate was effective (WA, 2007, PDMR 2:V133).

SoilGard 12G applied as a soil drench was ineffective based on final emergence rating. Micro 108 + Actinovate was effective (WA, 2007, PDMR 2:V133).

T-22 Planter Box applied as a seed treatment was ineffective. Micro 108 + Actinovate was effective (WA, 2007, PDMR 2:V133).

Yield Shield applied as a seed treatment was ineffective. Micro 108 + Actinovate was effective (WA, 2007, PDMR 2:V133).

### Downy mildew

**Actinovate** AG 12 oz/A **effective**, Taegro better, see that entry for more information. Actinovate + Taegro same as Actinovate alone (CA, 2015, PDMR 10:V016).

Oxidate 1 gal/A ineffective applied weekly starting when incidence was <1%. CTE (OK, 2007, PDMR 2:V056).

**Taegro** 5.2 oz/A **effective**, better than other organic trts, but none “reduced downy mildew to an acceptable level for fresh market standards”; disease pressure relatively high. (CA, 2015, PDMR 10:V016).

Cueva 2% effective, Taegro better, see that entry for more information. Cueva applied with Actinovate or Taegro slightly but not signif better than Cueva alone (CA, 2015, PDMR 10:V016).

## **Tomato. Fruiting vegetables** (pepper, tomato, eggplant, tomatillo, okra, etc.)

### **Anthracnose**

All products tested were ineffective in an evaluation with very high disease pressure: Regalia MAXX, experimental products, std (Kocide + Manzate) (OH, 2011, PDMR 6:V061).

Serenade Max 1 lb/A + Kocide 1 lb + Biotune ineffective. CTE (Manzate + Kocide) (OH, 2006, PDMR 1: V005).

### **Bacterial canker**. Greenhouse.

Cease + MilStop ineffective. Conventional treatment (Tanos + Kocide) also ineffective. (MS, 2012, PDMR 7:V056)

### **Bacterial canker**. Processing tomato.

Serenade Max 1 lb/A + Kocide 1 lb + Biotune ineffective. CTE (Manzate + Kocide) (OH, 2006, PDMR 1: V005).

### **Bacterial spot**

All products tested were ineffective in an evaluation with very high disease pressure: Regalia MAXX, experimental products, std (Kocide + Manzate) (OH, 2011, PDMR 6:V061).

Actinovate moderately effective in GH (FL, 2013).

### **Early blight**

Serenade Max 1 lb/A ineffective (IN, 2008, PDMR 3:V135).

OxiDate 128 oz/A applied with Yucca Ag Aide ineffective; Nordox also (NY, 2011, PDMR 6:V105).

Serenade Max 3 lb/A ineffective; Nordox also (NY, 2011, PDMR 6:V105).

Sonata 4 qt/A ineffective; Nordox also (NY, 2011, PDMR 6:V105).

**Sporatec AG 3 pt/A effective** (others not) (NY, 2011, PDMR 6:V105).

### **Late blight**

### **Septoria leaf spot**

**Actinovate moderately effective** (NY, 2008, PDMR 3:V127; My expt).

Actinovate ineffective (NY, 2009, PDMR 4:V115; My expt).

**Companion moderately effective** (NY, 2008, PDMR 3:V127; My expt).

Companion ineffective (NY, 2009, PDMR 4:V115; My expt).

**Organocide moderately effective** (NY, 2008, PDMR 3:V127; My expt).

Organocide ineffective (NY, 2009, PDMR 4:V115; My expt).

**Regalia moderately effective** (NY, 2008, PDMR 3:V127; My expt).

Regalia ineffective (NY, 2009, PDMR 4:V115; My expt).

Sporatec ineffective (NY, 2008, PDMR 3:V127 and NY, 2009, PDMR 4:V115).

Taegro ineffective (NY, 2009, PDMR 4:V115; My expt).