



OMRI Products - Insecticide and Fungicide Options for 2017

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Not all of the products mentioned in this bulletin are registered in all states. Some pesticides are restricted use in some states or regions and not others. Contact GGSPRO if there is a question about a specific product

Products were included in this list if they are OMRI listed. OMRI listed products may be used on operations that are certified organic under the USDA National Organic Program. The OMRI Products List© <http://www.omri.org/omri-lists> is the most complete directory of products for organic production or processing. The list includes over 2,300 products.

Not all of the products mentioned in this bulletin are registered in all states

This guide includes only excerpts from the actual labels and does not replace the need to read the entire pesticide label before making any applications. The labels include complete listings of approved crops. Information in this bulletin is believed to be correct but it is the responsibility of the applicator to read and follow all label directions!!! Labels do change without notice. Pesticides other than those listed may be safe, legal and effective.

Many pesticide labels now contain resistance management instructions. They are legal requirements and are essential for helping to preserve the effectiveness of the chemistry. Please contact the Griffin Technical Department for help with pesticide rotations.







Mode of Action Groups

In order to help growers make effective and responsible pesticide choices, Griffin references Mode of Action designations (MOA) for insecticides and fungicides. The codes are established by the Insecticide Resistance Action Committee (IRAC; <http://www.irac-online.org/>) and the Fungicide Resistance Action Committee (FRAC; <http://www.frac.info/home>). Pesticides with the same MOA group number share the same mode of action and therefore should not be used in rotation with each other. Griffin's GGSPRO Technical Services department is available to help you integrate this information into your pesticide decision making process.

GGSPro Bee Safety Codes

GGSPro has assigned Bee Safety Codes per information EPA information presented on the product labels. Bee Safety Codes are intended to provide a quick and easy reference to guide grower in initial decision-making and do not replace to read the label application details and restrictions with respect to bees and other pollinators. Please note that some application methods (ex. granular) and some product classes (ex. fungicides, surfactants) do not currently require inclusion of bee hazard information on the label. Therefore, the lack of a Bee Safety Code should not be considered an indication of complete lack of risk. The GGSPro team is available to discuss specific concerns.

Table 1. Key to GGSPro Bee Safety Codes

<p>Toxicity Key</p> <p>Highly Toxic EPA describes as very highly toxic, highly toxic or very toxic to bees.</p>  <p>Toxic EPA describes as toxic to bees.</p>  <p>Low Toxicity EPA describes as a potential pathogen or with low toxicity to bees.</p>  <p>Special Case Special use notes per label; contact GGSPro for more information.</p> 	<p>Exposure Key (adapted from the North American Pollinator Protection Campaign)</p> <ol style="list-style-type: none"> 1 Toxicity risk through direct exposure only - avoid treatment when <i>bees are actively visiting or actively foraging</i> in the treatment area. <i>Actively visiting the treatment area refers to bees you see on the plants and pertains to products that do not show residual effect. Bees are protected when bees are absent during treatment.</i> 2 Toxicity risk through residual exposure only - avoid treatment when <i>bees are visiting</i> the treatment area. <i>Visiting the treatment area refers to bees that may visit the plants after treatment. Bees are protected when bees are absent from the area following treatment. Avoid use of these products when crops and/or weeds are in bloom.</i> 3 Toxicity risk through both direct exposure and residual exposure - avoid treatment when <i>bees are visiting</i> the treatment area. <i>Visiting the treatment area refers to bees that may visit the plants after treatment. Bees are protected when bees are absent from the treatment area both during and following treatment. Avoid use of these products when crops and/or weeds are in bloom.</i> <p>Bee Code Examples and Appropriate Grower Actions:</p> <p> Do not apply this product to plants when bees are present or if bees may come into contact with associated flowers in the landscape in the following weeks. For example, do not apply this product to budded or flowering plants in a greenhouse if they will be sold for outdoor use in the subsequent weeks. The duration of residual exposure risk varies by product and cannot be generalized by MOA; contact GGSPro for guidance on the duration of residual risk.</p> <p> Do not apply this product to plants when bees are present. This product may be safely applied in a greenhouse or late in the day outdoors (after bee foraging has ceased) to budded or flowering plants that will be sold for outdoor use the next day.</p>
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All recommendations for insecticides are foliar sprays except as noted. Most foliar sprays listed will perform better with an OMRI listed surfactant such as Organic Ag Aide, active ingredient: yucca schidigera or Nu-Film P. Both are non-ionic, organic wetting agent to increase coverage and reduce visible residue. Organic Ag Aide rate is 4-16 oz per 100 gals or ¼-1 tsp per gal. Nu-film-P rate is ¼ tsp per gal or 4 oz per 100 gals rate. Some product labels state that surfactants should not be added.

Insecticides and Miticides

Aphids

AzaGuard- (EPA Reg. # 70299-17)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 1/2-1 tsp per gal or 8-16 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. Good plant safety. For aphids, best control is achieved when tank mixed with M-Pede at a rate of 1 oz per gal or 100 oz per 100 gal. 0 day PHI. 4 hr REI. MOA UN. OMRI Listed.

Azatin O- (EPA Reg. # 70051-9-59807)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 2/3 tsp per gal or 10.66 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. For aphids, best control is achieved when tank mixed with M-Pede at a rate of 1 oz per gal or 100 oz per 100 gal. Labeled for edible crops. No residue and safe on most blooms. 4 hr REI. 0 day PHI. MOA UN. OMRI listed.

BioCeres WP- (EPA Reg. # 89600-2) 

Active Ingredient: *Beauveria bassiana* strain ANT-03

Naturally occurring bioinsecticide used on ornamental, herb and vegetable crops in greenhouses and outdoor production. Foliar spray rates: 1 tsp-1 Tbls per gal or 15-25 oz per 100 gal. More effective when tank mixed with AzaGuard, Azatin O, Molt-X, or horticultural oil. Do not tank mix with fungicides within 4 days of application. 4 hr REI. 0 PHI. OMRI listed. Not registered in ME, NH, VT, MA, RI as of 10.16.

Grandevo PTO- (EPA Reg. # 84059-17-87865) 

Active Ingredient: *Chromobacterium subtsugae* Strain PRAA4-1T

Biological insecticide for use on certain edible crops. Naturally occurring bacteria. Foliar spray rate at 2.5 tsp-2.5 Tbls per gal or 1-3 lb per 100 gal. Make three applications one week apart. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Molt-X- (EPA Reg. # 68539-11)


Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. Label for vegetables. Foliar spray rates: 1/2-1 tsp per gal or 8-16 fl oz per 100 gal. Labeled for edible crops. Good plant safety. For aphids, best control is achieved when tank mixed with M-Pede at a rate of 1 oz per gal or 100 oz per 100 gal. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

M-Pede- (EPA Reg. # 10163-324)

Active Ingredient: Potassium salts of fatty acids

Foliar spray at 1.0 fl oz per gal or 100 oz per 100 gal. Tank mix M-Pede with a neem based IGR such as Azatin O, AzaGuard or Molt-X for best results. Do not tank mix with surfactants. Labeled for vegetables and some herbs. Burns some tender growth and most open blooms. Trial for phytotoxicity before large-scale use. 0 day PHI. 12 hr REI. MOA UN. OMRI listed.

Preferal- (EPA Reg. # 70051-19-67690) 

Active Ingredient: *Isaria fumosoroseus* Apopka Strain 97

Naturally occurring fungus for use on herbs, spices, vegetables, and many other food crops including bearing and nonbearing fruit trees and grape vines. Foliar spray rates: 1½ Tbls per gal or 28 oz per 100 gal. Most effective when relative humidity is 80% or higher for 8-10 hours. May be drenched for root aphids at the same rates. Drench volumes based on pot size on the label. 4 hr REI. MOA UN. OMRI listed.

Pyganic 5.0 Specialty- (EPA Reg. # 1021-1772) 

Active Ingredient: Pyrethrin

Foliar spray applied at 1-2 tsp per gal or 16-32 oz per 100 gal. Labeled for many vegetables and herbs. Test small numbers of plants before large scale use. 0 day PHI. 12 hr REI. MOA 3A. OMRI listed.

Beetles

Azatin O- (EPA Reg. # 70051-9-59807)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 2/3 tsp per gal or 10.66 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. For aphids, best control is achieved when tank mixed with M-Pede at a rate of 1 oz per gal or 100 oz per 100 gal. Labeled for edible crops. No residue and safe on most blooms. 4 hr REI. 0 day PHI. MOA UN. OMRI listed.

BioCeres WP- (EPA Reg. # 89600-2) 


Active Ingredient: *Beauveria bassiana* strain ANT-03

Naturally occurring bioinsecticide used on ornamental, herb and vegetable crops in greenhouses and outdoor production. Foliar spray rates: 1 tsp-1 Tbls per gal or 15-25 oz per 100 gal. More effective when tank mixed with AzaGuard, Azatin O, Molt-X, or horticultural oil. Do not tank mix with fungicides within 4 days of application. 4 hr REI. 0 PHI. OMRI listed. Not registered in ME, NH, VT, MA, RI as of 10.16.

Entrust 22.5- (EPA Reg. # 62719-291) 

Active Ingredient: Spinosad

Apply 1 tsp per 6 gal, 3 oz per 100 gal as a foliar spray. Short residual control. No visible residue or bloom safety concerns. Labeled for ornamentals in greenhouses and outdoors and certain outdoor edible crops. PHI varies by crop; see label. 4 hr REI. MOA 5. OMRI listed.

Grandevo PTO- (EPA Reg. # 84059-17-87865) 

Active Ingredient: *Chromobacterium subtsugae* Strain PRAA4-1T

Biological insecticide for use on certain edible crops. Naturally occurring bacteria. Foliar spray rate at 2.5 tsp-2.5 Tbls per gal or 1-3 lb per 100 gal. Make three applications one week apart. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Molt-X- (EPA Reg. # 68539-11)


Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. Label for vegetables. Foliar spray rates: 1/2-1 tsp per gal or 8-16 fl oz per 100 gal. Labeled for edible crops. Good plant safety.

M-Pede- (EPA Reg. # 10163-324)


Active Ingredient: Potassium salts of fatty acids

Foliar spray at 1.0 fl oz per gal or 100 oz per 100 gal. Tank mix M-Pede with a neem based IGR such as Azatin O, AzaGuard or Molt-X for best results. Do not tank mix with surfactants. Labeled for vegetables and some herbs. Burns some tender growth and most open blooms. Trial for phytotoxicity before large-scale use. 0 day PHI. 12 hr REI. MOA UN. OMRI listed.

Preferal- (EPA Reg. # 70051-19-67690) 

Active Ingredient: *Isaria fumosoroseus* Apopka Strain 97

Naturally occurring fungus for use on herbs, spices, vegetables, and many other food crops including bearing and nonbearing fruit trees and grape vines. Foliar spray rates: 1½ Tbls per gal or 28 oz per 100 gal. Most effective when relative humidity is 80% or higher for 8-10 hours. 4 hr REI. MOA UN. OMRI listed.

Pyganic 5.0 Specialty- (EPA Reg. # 1021-1772) 

Active Ingredient: Pyrethrin

Foliar spray applied at 1-2 tsp per gal or 16-32 oz per 100 gal. Labeled for many vegetables and herbs. Test small numbers of plants before large scale use. 0 day PHI. 12 hr REI. MOA 3A. OMRI listed.

Broad and Cyclamen Mites-

SuffOil-X- (EPA Reg. # 48813-1-68539)

Active Ingredient: Horticultural oil

1.25 fl oz per gal or 1 gal per 100 gal as a foliar spray. Full coverage is essential, acts as a suffocant. Apply when rapid drying will occur and when air temperatures are below 85° F to avoid phytotoxicity. Labeled for many vegetables. Leaves a shiny residue behind and burns some open blooms. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Caterpillars

BioCeres WP- (EPA Reg. # 89600-2) 

Active Ingredient: *Beauveria bassiana* strain ANT-03

Naturally occurring bioinsecticide used on ornamental, herb and vegetable crops in greenhouses and outdoor production. Foliar spray rates: 1 tsp-1 Tbls per gal or 15-25 oz per 100 gal. More effective when tank mixed with AzaGuard, Azatin O, Molt-X, or horticultural oil. Do not tank mix with fungicides within 4 days of application. 4 hr REI. 0 PHI. OMRI listed. Not registered in ME, NH, VT, MA, RI as of 10.16.

DiPel Pro DF- (EPA Reg. # 73049-39)


Active Ingredient: *Bacillus thuringiensis kurstaki*

Naturally occurring bacteria. 2 tsp per gal or 1 lb per 100 gal as a foliar spray. Works best on immature caterpillars. Slight residue, safe on open blooms. Many edible crops are on the label. 0 day PHI. 4 hr REI. MOA 11A. OMRI listed.

Entrust 22.5- (EPA Reg. # 62719-291) 

Active Ingredient: Spinosad

Apply 1 tsp per 6 gal, 3 oz per 100 gal as a foliar spray. Short residual control. No visible residue or bloom safety concerns. Labeled for ornamentals in greenhouses and outdoors and certain outdoor edible crops. PHI varies by crop; see label. 4 hr REI. MOA 5. OMRI listed.

Grandevo PTO- (EPA Reg. # 84059-17-87865) 

Active Ingredient: *Chromobacterium subsugae* Strain PRAA4-1T

Biological insecticide for use on certain edible crops. Naturally occurring bacteria. Foliar spray rate at 2.5 tsp-2.5 Tbls per gal or 1-3 lb per 100 gal. Make three applications one week apart. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Preferal- (EPA Reg. # 70051-19-67690) 

Active Ingredient: *Isaria fumosoroseus* Apopka Strain 97

Naturally occurring fungus for use on herbs, spices, vegetables, and many other food crops including bearing and nonbearing fruit trees and grape vines. Foliar spray rates: 1½ Tbls per gal or 28 oz per 100 gal. Most effective when relative humidity is 80% or higher for 8-10 hours. 4 hr REI. MOA UN. OMRI listed.

Pyganic 5.0 Specialty- (EPA Reg. # 1021-1772) 

Active Ingredient: Pyrethrin

Foliar spray applied at 1-2 tsp per gal or 16-32 oz per 100 gal. Labeled for many vegetables and herbs. Test small numbers of plants before large scale use. 0 day PHI. 12 hr REI. MOA 3A. OMRI listed.

Fungus Gnats and Shoreflies-

AzaGuard- (EPA Reg. # 70299-17)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. Soil drench rates: 2/3 tsp-1 tsp per gal or 10-16 fl oz per 100 gal. Insect growth regulator activity. No visible residue and safe on most open blooms. Herbs and vegetables on the label. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Azatin O - (EPA Reg. # 70051-9-59807)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. Soil drench rates: 1/2-1 tsp per gal or 8-16 fl oz per 100 gal. No visible residue and safe on most open blooms. Herbs and vegetables on the label. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Gnatrol WDG- (EPA Reg. # 73049-56)

Active Ingredient: *Bacillus thuringiensis israelensis*

Drench soil to control larvae by applying 26 oz per 100 gal to wet only the top 1-1.5 inch of soil. Can be used on certain vegetables. Three applications at 7 day intervals are needed for heavy infestations. Treat crops and under benches. Does not control shorefly larvae. 0 day PHI. 4 hr REI. MOA 11A. OMRI listed.

Molt-X- (EPA Reg. # 68539-11)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. Drench rate: 1/2 tsp per gal or 8 fl oz per 100 gal. Labeled for edible crops. Excellent plant safety. For heavy infestations or dense foliage use the maximum rates. For tank mixing use the lowest rates. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Sentry-

Active Ingredient: Steinernema feltiae

Does not control shorefly larvae. Beneficial nematode applied to the soil as a spray or drench to control the larval stage. Repeat applications at 14-21 day intervals. 25 million per 800 sq ft, 35 million per 1,100 sq ft or 50 million per 1600 sq ft. Can be used on all crops including vegetables and herbs. 0 hr REI. OMRI listed.

Leafminers

Blotch (*Amauromyza maculosa*) and Serpentine (*Chrysanthemum leafminer*; *Liriomyza trifolii*)

The Chrysanthemum leafminer is resistant to many pesticides. Consult with GGSPRO for help in designing a control program.

Adult stage

Entrust 22.5- (EPA Reg. # 62719-291) 

Active Ingredient: Spinosad

Apply 1 tsp per 6 gal, 3 oz per 100 gal as a foliar spray. Short residual control. No visible residue or bloom safety concerns. Labeled for ornamentals in greenhouses and outdoors and certain outdoor edible crops. PHI varies by crop; see label. 4 hr REI. MOA 5. OMRI listed.

Preferal- (EPA Reg. # 70051-19-67690) 

Active Ingredient: *Isaria fumosoroseus* Apopka Strain 97

Naturally occurring fungus for use on herbs, spices, vegetables, and many other food crops including bearing and nonbearing fruit trees and grape vines. Foliar spray rates: 1 ½ Tbls per gal or 28 oz per 100 gal. Most effective when relative humidity is 80% or higher for 8-10 hours. 4 hr REI. MOA UN. OMRI listed.

Larval stage

AzaGuard- (EPA Reg. # 70299-17)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 1/2-1 tsp per gal or 8-16 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. Excellent plant safety. For heavy infestations or dense foliage use the maximum rates. For tank mixing use the lowest rates. 0 day PHI. 4 hr REI. MOA UN. OMRI Listed.

Azatin O- (EPA Reg. # 70051-9-59807)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 2/3 tsp per gal or 10.66 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. No residue and safe on most blooms. 4 hr REI. 0 day PHI. MOA UN. OMRI listed.

Molt-X- (EPA Reg. # 68539-11)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. Foliar spray rates: 1/2-1 tsp per gal or 8-16 fl oz per 100 gal. Labeled for edible crops. Excellent plant safety. For heavy infestations or dense foliage use the maximum rates. For tank mixing use the lowest rates. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Spider Mites- (see also Broad and Cyclamen Mites)

Preferal- (EPA Reg. # 70051-19-67690)



Active Ingredient: *Isaria fumosoroseus* Apopka Strain 97

Naturally occurring fungus for use on herbs, spices, vegetables, and many other food crops including bearing and nonbearing fruit trees and grape vines. Foliar spray rates: 1 ½ Tbls per gal or 28 oz per 100 gal. Most effective when relative humidity is 80% or higher for 8-10 hours. 4 hr REI. MOA UN. OMRI listed.

SuffOil-X- (EPA Reg. # 48813-1-68539)

Active Ingredient: Horticultural oil

1.25 fl oz per gal or 1 gal per 100 gal as a foliar spray. Full coverage is essential, acts as a suffocant. Apply when rapid drying will occur and when air temperatures are below 85° F to avoid phytotoxicity. Labeled for many vegetables. Leaves a shiny residue behind and burns some open blooms. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Scale and Mealybugs

AzaGuard- (EPA Reg. # 70299-17)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 1/2-1 tsp per gal or 8-16 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. Excellent plant safety. For heavy infestations or dense foliage use the maximum rates. For tank mixing use the lowest rates. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Azatin O- (EPA Reg. # 70051-9-59807)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 2/3 tsp per gal or 10.66 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. No residue and safe on most blooms. 4 hr REI. 0 day PHI. MOA UN. OMRI listed.

Molt-X- (EPA Reg. # 68539-11)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. Foliar spray rates: 1/2-1 tsp per gal or 8-16 fl oz per 100 gal. Labeled for edible crops. Excellent plant safety. For heavy infestations or dense foliage use the maximum rates. For tank mixing use the lowest rates. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

M-Pede- (EPA Reg. # 10163-324)

Active Ingredient: Potassium salts of fatty acids

Foliar spray at 1.0 fl oz per gal or 100 oz per 100 gal. Tank mix M-Pede with a neem based IGR such as Azatin O, AzaGuard or Molt-X for best results. Do not tank mix with surfactants. Labeled for vegetables and certain herbs. Burns some tender growth and most open blooms. Trial for phytotoxicity before large-scale use. 0 day PHI. 12 hr REI. MOA UN. OMRI listed.

Preferal- (EPA Reg. # 70051-19-67690) 

Active Ingredient: *Isaria fumosoroseus* Apopka Strain 97

Naturally occurring fungus for use on herbs, spices, vegetables, and many other food crops including bearing and nonbearing fruit trees and grape vines. Foliar spray rates: 1 ½ Tbls per gal or 28 oz per 100 gal. Most effective when relative humidity is 80% or higher for 8-10 hours. Drench volumes for root mealybugs is based on pot size on the label. 4 hr REI. MOA UN. OMRI listed.

SuffOil-X- (EPA Reg. # 48813-1-68539)

Active Ingredient: Horticultural oil

1.25 fl oz per gal or 1 gal per 100 gal as a foliar spray. Full coverage is essential, acts as a suffocant. Apply when rapid drying will occur and when air temperatures are below 85° F to avoid phytotoxicity. Labeled for many vegetables. Leaves a shiny residue behind and burns some open blooms. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Thrips

AzaGuard- (EPA Reg. # 70299-17)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 1/2-1 tsp per gal or 8-16 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. Excellent plant safety. For heavy infestations or dense foliage use the maximum rates. For tank mixing use the lowest rates. 0 day PHI. 4 hr REI. MOA UN. OMRI Listed.

Azatin O- (EPA Reg. # 70051-9-59807)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 2/3 tsp per gal or 10.66 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. No residue and safe on most blooms. 4 hr REI. 0 day PHI. MOA UN. OMRI listed.

BioCeres WP- (EPA Reg. # 89600-2) 


Active Ingredient: *Beauveria bassiana* strain ANT-03

Naturally occurring bioinsecticide used on ornamental, herb and vegetable crops in greenhouses and outdoor production. Foliar spray rates: 1 tsp-1 Tbls per gal or 15-25 oz per 100 gal. More effective when tank mixed with AzaGuard, Azatin O, Molt-X, or horticultural oil. Do not tank mix with fungicides within 4 days of application. 4 hr REI. 0 PHI. OMRI listed. Not registered in ME, NH, VT, MA, RI as of 10.16.

Entrust 22.5- (EPA Reg. # 62719-291) 

Active Ingredient: Spinosad

Apply 1 tsp per 6 gal, 3 oz per 100 gal as a foliar spray. Short residual control. No visible residue or bloom safety concerns. Labeled for ornamentals in greenhouses and outdoors and certain outdoor edible crops. PHI varies by crop; see label. 4 hr REI. MOA 5. OMRI listed.

Grandevo PTO- (EPA Reg. # 84059-17-87865) 

Active Ingredient: *Chromobacterium subtsugae* Strain PRAA4-1T

Biological insecticide for use on certain edible crops. Naturally occurring bacteria. Foliar spray rate at 1 2/3 Tbls–3 1/3 Tbls per gal or 2-4 lb per 100 gal. Make three applications one week apart. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Molt-X- (EPA Reg. # 68539-11)


Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. Foliar spray rates: 1/2-1 tsp per gal or 8-16 fl oz per 100 gal. Labeled for edible crops. Excellent plant safety. For heavy infestations or dense foliage use the maximum rates. For tank mixing use the lowest rates. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

M-Pede- (EPA Reg. # 10163-324)

Active Ingredient: Potassium salts of fatty acids

Foliar spray at 1.0 fl oz per gal or 100 oz per 100 gal. Tank mix M-Pede with a neem based IGR such as Azatin O, AzaGuard or Molt-X for best results. Do not tank mix with surfactants. Labeled for vegetables and certain herbs. Burns some tender growth and most open blooms. Trial for phytotoxicity before large-scale use. 0 day PHI. 12 hr REI. MOA UN. OMRI listed.

Preferal- (EPA Reg. # 70051-19-67690) 

Active Ingredient: *Isaria fumosoroseus* Apopka Strain 97

Naturally occurring fungus for use on herbs, spices, vegetables, and many other food crops including bearing and nonbearing fruit trees and grape vines. Foliar spray rates: 1½ Tbls per gal or 28 oz per 100 gal. Most effective when relative humidity is 80% or higher for 8-10 hours. May be drenched for thrips pupae at the same rates. Drench volumes based on pot size on the label. 4 hr REI. MOA UN. OMRI listed.

Pyganic 5.0 Specialty- (EPA Reg. # 1021-1772) 

Active Ingredient: Pyrethrin

Foliar spray applied at 1-2 tsp per gal or 16-32 oz per 100 gal. Labeled for many vegetables and herbs. Test small numbers of plants before large scale use. 0 day PHI. 12 hr REI. MOA 3A. OMRI listed.

Sentry-

Active Ingredient: *Steinernema feltiae*

Beneficial nematode applied to the soil as a spray or drench to control the thrips pupal stage. Repeat applications at 14-21 day intervals. 25 million per 800 sq ft, 35 million per 1,100 sq ft or 50 million per 1600 sq ft. Can be used on all crops including vegetables and herbs. 0 hr REI. OMRI listed.

SuffOil-X- (EPA Reg. # 48813-1-68539)

Active Ingredient: Horticultural oil

1.25 fl oz per gal or 1 gal per 100 gal as a foliar spray. Full coverage is essential, acts as a suffocant. Apply when rapid drying will occur and when air temperatures are below 85° F to avoid phytotoxicity. Labeled for many vegetables. Leaves a shiny residue behind and burns some open blooms. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Whiteflies-

AzaGuard- (EPA Reg. # 70299-17)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 1/2-1 tsp per gal or 8-16 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. Excellent plant safety. For heavy infestations or dense foliage use the maximum rates. For tank mixing use the lowest rates. 0 day PHI. 4 hr REI. MOA UN. OMRI Listed.

Azatin O- (EPA Reg. # 70051-9-59807)

Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. 2/3 tsp per gal or 10.66 fl oz per 100 gal applied as a foliar spray. Labeled for edible crops. No residue and safe on most blooms. 4 hr REI. 0 day PHI. MOA UN. OMRI listed.

BioCeres WP- (EPA Reg. # 89600-2) 

Active Ingredient: *Beauveria bassiana* strain ANT-03

Naturally occurring bioinsecticide used on ornamental, herb and vegetable crops in greenhouses and outdoor production. Foliar spray rates: 1 tsp-1 Tbls per gal or 15-25 oz per 100 gal. More effective when tank mixed with AzaGuard, Azatin O, Molt-X, or horticultural oil. Do not tank mix with fungicides within 4 days of application. 4 hr REI. 0 PHI. OMRI listed. Not registered in ME, NH, VT, MA, RI as of 10.16.

Grandevo PTO- (EPA Reg. # 84059-17-87865) 

Active Ingredient: *Chromobacterium subtsugae* Strain PRAA4-1T

Biological insecticide for use on certain edible crops. Naturally occurring bacteria. Foliar spray rate at 2.5 tsp-2.5 Tbls per gal or 1-3 lb per 100 gal. Make three applications one week apart. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Molt-X- (EPA Reg. # 68539-11)


Active Ingredient: Azadirachtin

Botanical (neem) insect growth regulator. Foliar spray rates: 1/2-1 tsp per gal or 8-16 fl oz per 100 gal. Labeled for edible crops. Excellent plant safety. For heavy infestations or dense foliage use the maximum rates. For tank mixing use the lowest rates. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

M-Pede- (EPA Reg. # 10163-324)


Active Ingredient: Potassium salts of fatty acids

Foliar spray at 1.0 fl oz per gal or 100 oz per 100 gal. Tank mix M-Pede with a neem based IGR such as Azatin O, AzaGuard or Molt-X for best results. Do not tank mix with surfactants. Labeled for vegetables and some herbs. Burns some tender growth and most open blooms. Trial for phytotoxicity before large-scale use. 0 day PHI. 12 hr REI. MOA UN. OMRI listed.

Preferal- (EPA Reg. # 70051-19-67690) 

Active Ingredient: *Isaria fumosoroseus* Apopka Strain 97

Naturally occurring fungus for use on herbs, spices, vegetables, and many other food crops including bearing and nonbearing fruit trees and grape vines. Foliar spray rates: 1½ Tbls per gal or 28 oz per 100 gal. Most effective when relative humidity is 80% or higher for 8-10 hours. 4 hr REI. MOA UN. OMRI listed.

Pyganic 5.0 Specialty- (EPA Reg. # 1021-1772) 

Active Ingredient: Pyrethrin

Foliar spray applied at 1-2 tsp per gal or 16-32 oz per 100 gal. Labeled for many vegetables and herbs. Test small numbers of plants before large scale use. 0 day PHI. 12 hr REI. MOA 3A. OMRI listed.

SuffOil-X- (EPA Reg. # 48813-1-68539)

Active Ingredient: Horticultural oil

1.25 fl oz per gal or 1 gal per 100 gal as a foliar spray. Full coverage is essential, acts as a suffocant. Apply when rapid drying will occur and when air temperatures are below 85° F to avoid phytotoxicity. Labeled for many vegetables. Leaves a shiny residue behind and burns some open blooms. 0 day PHI. 4 hr REI. MOA UN. OMRI listed.

Fungicides and Bactericides

Bacterial Diseases

Bacterial pathogens are spread by movement of water and can become systemic in plants. They can be brought into the greenhouse on cuttings and/or seed. Cultural controls play an important part in keeping bacteria at bay. Start clean by purchasing certified disease free stock. Disinfect tools after use. Attempt to keep splashing water to a minimum. Avoid handling and pruning plants when wet, wash hands after handling disease plants, and promptly remove diseased plants from growing areas.

Camelot O- (EPA Reg. # 67702-2-67690)

Active Ingredient: Copper Octanoate

Foliar spray rate 0.5 fl oz per gal or 50 fl oz per 100 gal. Repeat sprays every 7-10 days. Leaves some visible residue and burns most open blooms. Do not allow this product to come in contact with aluminum sprayer or irrigation parts. Labeled for several edible crops. More effective when tank mixed with Cease. 4 hr REI. 0 day PHI. MOA M1. OMRI listed.

Cease- (EPA Reg. # 264-1155-68539)

Active Ingredient: *Bacillus subtilis* QST 713 strain

Biofungicide foliar spray applied at 1.25-2.5 fl oz per gal or 1-2 gal per 100 gal. Naturally occurring bacteria. Preventative control effective for about 7 days. Good plant safety including open blooms and no visible residue. Tank mixable with most common pesticides. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

Nordox 75 WG- (EPA Reg. #4 8142-4)

Active Ingredient: Cuprous Oxide

Labeled for certain edible crops in greenhouse and outdoor crops. Foliar spray applied as 1/3 tsp per gal or 10.66 oz per 100. Do not tank mix with Aliette or any phosphonate fungicides such as Agri-phos, Alude, or Fosphite. 0 day PHI. 12 hr REI. MOA M1. OMRI listed.

Regalia PTO- (EPA Reg. # 84059-3-87865)

Active Ingredient: *Reynoutria sachalinensis*

Foliar spray rates: 2-4 tsp per gal or 32-64 fl oz per 100 gal. Good plant safety. A botanical fungicide that stimulates plants natural defenses. Labeled for use in greenhouses and nurseries. 0 day PHI. 4 hr REI. MOA P5. OMRI listed.

Triathlon BA- (EPA Reg. # 58044-3-59807)

Active Ingredient: *Bacillus amyloliquefaciens* strain D747

Biofungicide foliar spray applied at 2 tsp-2 Tbls per gal or 16-96 oz per 100 gal. Naturally occurring bacteria. Good plant safety including open blooms and no visible residue. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

Botrytis-

All recommendations are for foliar sprays except as noted. Most foliar sprays listed will perform better with a surfactant such as CapSil added at 1/2 tsp per gal (8 oz per 100 gal), to increase coverage and reduce visible residue. Some product labels state that surfactants should not be added.

Camelot O- (EPA Reg. # 67702-2-67690)

Active Ingredient: Copper Octanoate

Foliar spray rate 0.5 fl oz per gal or 50 fl oz per 100 gal. Repeat sprays every 7-10 days. Leaves some visible residue and burns most open blooms. Do not allow this product to come in contact with aluminum sprayer or irrigation parts. Labeled for several edible crops. More effective when tank mixed with Cease. 4 hr REI. 0 day PHI. MOA M1. OMRI listed.

Cease- (EPA Reg. # 264-1155-68539)

Active Ingredient: *Bacillus subtilis* QST 713 strain

Biofungicide foliar spray applied at 1.25 fl oz per gal or 1 gal per 100 gal. Naturally occurring bacteria. Preventative control effective for about 7 days. Good plant safety including open blooms and no visible residue. Tank mixable with most common pesticides. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

MiiStop- (EPA Reg. # 70870-1-68539)

Active Ingredient: Potassium bicarbonate

1 Tbls per gal or 40 oz per 100 gal as a foliar spray. Fast acting product that is labeled for many vegetable crops. Formulated with a surfactant so do not add another. Leaves some residue. Best tank mixed with Cease. 0 day PHI. 1 hr REI. MOA NC. OMRI listed.

Nordox 75 WG- (EPA Reg. # 48142-4)

Active Ingredient: Cuprous Oxide

Labeled for certain edible crops in greenhouse and outdoor crops. Foliar spray applied as 1/3 tsp per gal or 10.66 oz per 100. Do not tank mix with Aliette or any phosphonate fungicides such as Agri-phos, Alude, or Fosphite. 0 day PHI. 12 hr REI. MOA M1. OMRI listed.

Regalia PTO- (EPA Reg. # 84059-3-87865)

Active Ingredient: *Reynoutria sachalinensis*

Foliar spray rates: 2-4 tsp per gal or 32-64 fl oz per 100 gal. Good plant safety. A botanical fungicide that stimulates plants natural defenses. Labeled for use in greenhouses and nurseries. 0 day PHI. 4 hr REI. MOA P5. OMRI listed.

Triathlon BA- (EPA Reg. # 58044-3-59807)

Active Ingredient: *Bacillus amyloliquefaciens* strain D747

Biofungicide foliar spray applied at 2 tsp-2 Tbls per gal or 16-96 oz per 100 gal. Naturally occurring bacteria. Good plant safety including open blooms and no visible residue. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

Zero-Tol 2.0- (EPA Reg. # 70299-12) 

Active Ingredient: Hydrogen dioxide and Peracetic acid

0.5 fl oz per gal or 50 fl oz per 100 gal spray on young tender plants and 1.25 fl oz per gal or 128 fl oz per 100 gal spray on established plants. No visible residue and safe on most open blooms. Contact control with no residual. Labeled for many edible crops. 0 day PHI. 1 hr REI. MOA NC. OMRI listed.

Downy Mildew-

This is a very difficult disease to control. Consult the Griffin GGSPRO Technical Services department for cultural practices, treatment intervals and rotation strategies.

Cease- (EPA Reg. # 264-1155-68539)

Active Ingredient: *Bacillus subtilis* QST 713 strain

Biofungicide foliar spray applied at 1.25 fl oz per gal or 1 gal per 100 gal. Naturally occurring bacteria. Preventative control effective for about 7 days. Good plant safety including open blooms and no visible residue. Most effective when tank mixed with MilStop. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

MilStop- (EPA Reg. # 70870-1-68539)

Active Ingredient: Potassium bicarbonate

1 Tbls per gal or 40 oz per 100 gal as a foliar spray. Fast acting product that is labeled for many vegetable crops. Formulated with a surfactant so do not add another. Exempt from food tolerances. Leaves some residue. Best tank mixed with Cease. 0 day PHI. 1 hr REI. MOA NC. OMRI listed.

Nordox 75 WG- (EPA Reg. # 48142-4)

Active Ingredient: Cuprous Oxide

Labeled for certain edible crops in greenhouse and outdoor crops. Foliar spray applied as 1/3 tsp per gal or 10.66 oz per 100. Do not tank mix with Aliette or any phosphonate fungicides such as Alude, Agri-phos or Fosphite. 0 day PHI. 12 hr REI. MOA M1. OMRI listed.

Regalia PTO- (EPA Reg. # 84059-3-87865)

Active Ingredient: *Reynoutria sachalinensis*

Foliar spray rates: 2-4 tsp per gal or 32-64 fl oz per 100 gal. Good plant safety. A botanical fungicide that stimulates plants natural defenses. Labeled for use in greenhouses and nurseries. 0 day PHI. 4 hr REI. MOA P5. OMRI listed.

Triathlon BA- (EPA Reg. # 58044-3-59807)

Active Ingredient: *Bacillus amyloliquefaciens* strain D747

Biofungicide foliar spray applied at 2 tsp-2 Tbls per gal or 16-96 oz per 100 gal. Naturally occurring bacteria. Good plant safety including open blooms and no visible residue. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

Fungal Leaf Spots

The most common pathogens that cause leaf spots and blights are *Alternaria*, *Botrytis* (see *Botrytis* section), *Anthracnose/Colletotrichum*, *Cercospora*, *Phyllosticta*, *Septoria* and Rust (see rust section). Controlling leaf spots can be challenging because symptoms can vary from plant to plant. Signs of a pathogen may not be visible without a hand lens or microscopic examination. It is recommended that you always acquire a lab test from your state diagnostic lab or university to confirm that there is a pathogen associated with the leaf spots or blight. Many abiotic conditions can cause similar spotting. Cultural practices that will help reduce infection include: minimizing leaf wetness and reducing humidity, improving air circulation, and removing diseased leaf debris.

Camelot O- (EPA Reg. # 67702-2-67690)

Active Ingredient: Copper Octanoate

Foliar spray rate 0.5 fl oz per gal or 50 fl oz per 100 gal. Repeat sprays every 7 to 10 days. Leaves some visible residue and burns most open blooms. Do not allow this product to come in contact with aluminum sprayer or irrigation parts. Labeled for several edible crops. 4 hr REI. 0 day PHI. MOA M1. OMRI listed.

Cease- (EPA Reg. # 264-1155-68539)

Active Ingredient: *Bacillus subtilis* QST 713 strain

Biofungicide foliar spray applied at 1.25 fl oz per gal or 1 gal per 100 gal. Naturally occurring bacteria. Preventative control effective for about 7 days. Good plant safety including open blooms and no visible residue. Tank mixable with most common pesticides. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

MilStop- (EPA Reg. # 70870-1-68539)

Active Ingredient: Potassium bicarbonate

1 Tbls per gal or 40 oz per 100 gal as a foliar spray. Fast acting product that is labeled for many vegetable crops. Formulated with a surfactant so do not add another. Exempt from food tolerances. Leaves some residue. Best tank mixed with Cease. 0 day PHI. 1 hr REI. MOA NC. OMRI listed.

Nordox 75 WG- (EPA Reg. # 48142-4)

Active Ingredient: Cuprous Oxide

Labeled for certain edible crops in greenhouse and outdoor crops. Foliar spray applied as 1/3 tsp per gal or 10.66 oz per 100. Do not tank mix with Aliette or any phosphonate fungicides such as Alude, Agri-phos or Fosphite. 0 day PHI. 12 hr REI. MOA M1. OMRI listed.

Regalia PTO- (EPA Reg. # 84059-3-87865)

Active Ingredient: *Reynoutria sachalinensis*

Foliar spray rates: 2-4 tsp per gal or 32-64 fl oz per 100 gal. Good plant safety. A botanical fungicide that stimulates plants natural defenses. Labeled for use in greenhouses and nurseries. 0 day PHI. 4 hr REI. MOA P5. OMRI listed.

Triathlon BA- (EPA Reg. # 58044-3-59807)

Active Ingredient: *Bacillus amyloliquefaciens* strain D747

Biofungicide foliar spray applied at 2 tsp-2 Tbls per gal or 16-96 oz per 100 gal. Naturally occurring bacteria. Good plant safety including open blooms and no visible residue. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

Zero-Tol 2.0- (EPA Reg. # 70299-12) 

Active Ingredient: Hydrogen dioxide and Peracetic acid

0.5 fl oz per gal or 50 fl oz per 100 gal spray on young tender plants and 1.25 fl oz per gal or 128 fl oz per 100 gal spray on established plants. No visible residue and safe on most open blooms. Contact control with no residual. Labeled for many edible crops. 0 day PHI. 1 hr REI. MOA NC. OMRI listed.

Fusarium-

Actinovate SP- (EPA Reg. # 73314-1)

Active Ingredient: *Streptomyces lydicus*

Drench at 1/2 tsp per gal or 6 oz per 100 gal. Protectant only, apply as early in the crop cycle as possible. Typically only one application per growing season is needed. Long term crops should be retreated with a half-rate application midway through the crop. 1 hr REI. 0 hr REI if no contact with drenched surfaces. MOA NC. OMRI listed.

Cease- (EPA Reg. # 264-1155-68539)

Active Ingredient: *Bacillus subtilis* QST 713 strain

Biofungicide soil drench at 1.25-2.5 fl oz per gal or 1-2 gal per 100 gal. Naturally occurring bacteria. Labeled for certain edible crops. Re-application interval 21-28 days. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

RootShield G- (EPA Reg. # 68539-3)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22

Incorporation rate: 1.5 lb per cu yd of soil mix. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled for many edible crops in greenhouses and nurseries. 0 hr REI. MOA NC. OMRI listed.

RootShield WP- (EPA Reg. # 68539-7)

Active Ingredient: *Trichoderma harzianum* Rifai strain KRL-AG2

Drench rate: 2 Tbls per 5 gal or 5 oz per 100 gal applied as early in the crop cycle as possible. Naturally occurring fungus that grows along with the roots to protect them. Labeled for vegetables and herbs. Typically only one application per growing season is needed. Long term crops should be retreated with a half-rate application midway through the crop. 0 hr REI. MOA NC. OMRI listed.

RootShield Plus G- (EPA Reg. # 68539-10)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22 and *Trichoderma virens* strain G-41

Incorporation rate: 2-3.0 lb per cu yd of soil mix. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled for many edible crops in greenhouses and nurseries. 0 hr REI. MOA NC. OMRI listed.

RootShield Plus WP- (EPA Reg. # 68539-9)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22 and *Trichoderma virens* strain G-41

Drench rates: 1.5-2 Tbls per 5 gal or 5-8 oz per 100 gal. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled for many edible crops in greenhouses and nurseries. Approved for hydroponic applications. Long term crops should be retreated with a half-rate application midway through the crop. 4 hr REI. MOA NC. OMRI listed.

Powdery Mildew-

Camelot O- (EPA Reg. # 67702-2-67690)

Active Ingredient: Copper Octanoate

Foliar spray rate 0.5 fl oz per gal or 50 fl oz per 100 gal. Repeat sprays every 7-10 days. Leaves some visible residue and burns most open blooms. Do not allow this product to come in contact with aluminum sprayer or irrigation parts. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA M1. OMRI listed.

Actinovate SP- (EPA Reg. # 73314-1)

Active Ingredient: *Streptomyces lydicus*

1 tsp per gal or 12 oz per 100 gal as a foliar spray. Has shown protectant and erradicant properties. Leaves some visible residue, safe on open blooms. 1 hr REI. MOA NC. OMRI listed.

Cease- (EPA Reg. # 264-1155-68539)

Active Ingredient: *Bacillus subtilis* QST 713 strain

Biofungicide foliar spray applied at 1.25 fl oz per gal or 1 gal per 100 gal. Naturally occurring bacteria. Preventative control effective for about 7 days. Good plant safety including open blooms and no visible residue. Tank mixable with most common pesticides. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

MiiStop- (EPA Reg. # 70870-1-68539)

Active Ingredient: Potassium bicarbonate

1TbIs per gal or 40 oz per 100 gal as a foliar spray. Fast acting product that is labeled for many vegetable crops. Formulated with a surfactant so do not add another. Leaves some residue but has good plant safety. 0 day PHI. 1 hour REI. MOA NC. OMRI listed.

Nordox 75 WG- (EPA Reg. #48142-4)

Active Ingredient: Cuprous Oxide

Labeled for certain edible crops in greenhouse and outdoor crops. Foliar spray applied as 1/3 tsp per gal or 10.66 oz per 100. Do not tank mix with Aliette or any phosphonate fungicides such as Agri-phos, Alude, or Fosphite. 0 hr PHI. 12 hr REI. MOA M1. OMRI listed.

Regalia PTO- (EPA Reg. # 84059-3-87865)

Active Ingredient: *Reynoutria sachalinensis*

Foliar spray rates: 2-4 tsp per gal or 32-64 fl oz per 100 gal. Good plant safety. A botanical fungicide that stimulates plants natural defenses. Labeled for use in greenhouses and nurseries. 0 day PHI. 4 hr REI. MOA P5. OMRI listed.

Triathlon BA- (EPA Reg. # 58044-3-59807)

Active Ingredient: *Bacillus amyloliquefaciens* strain D747

Biofungicide foliar spray applied at 2 tsp-2 TbIs per gal or 16-96 oz per 100 gal. Naturally occurring bacteria. Good plant safety including open blooms and no visible residue. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

Zero-Tol 2.0- (EPA Reg. # 70299-12) 

Active Ingredient: Hydrogen dioxide and Peracetic acid

0.5 fl oz per gal or 50 fl oz per 100 gal spray on young tender plants and 1.25 fl oz per gal or 128 fl oz per 100 gal spray on established plants. No visible residue and safe on most open blooms. Contact control with no residual. Labeled for many edible crops. 0 day PHI. 1 hr REI. MOA NC. OMRI listed.

Pythium and Phytophthora -

Actinovate SP- (EPA Reg. # 73314-1)

Active Ingredient: *Streptomyces lydicus*

Drench at 1/2 tsp per gal or 6 oz per 100 gal. Protectant only, apply as early in the crop cycle as possible. Typically only one application per growing season is needed. Long term crops should be retreated with a half-rate application midway through the crop. 1 hr REI. 0 hr REI if no contact with drenched surfaces. MOA NC. OMRI listed.

Cease- (EPA Reg. # 264-1155-68539)

Active Ingredient: *Bacillus subtilis* QST 713 strain

Biofungicide soil drench at 1.25-2.5 fl oz per gal or 1-2 gal per 100 gal. Naturally occurring bacteria. Labeled for certain edible crops. Re-application interval 21-28 days. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

RootShield G- (EPA Reg. # 68539-3)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22

** Not labeled for *Phytophthora*** Incorporation rate: 1.5 lb per cu yd of soil mix. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled for many edible crops in greenhouses and nurseries. 0 hr REI. MOA NC. OMRI listed.

RootShield WP- (EPA Reg. # 68539-7)

Active Ingredient: *Trichoderma harzianum* Rifai strain KRL-AG2

** Not labeled for *Phytophthora*** Drench rate: 2 Tbls per 5 gal or 5 oz per 100 gal applied as early in the crop cycle as possible. Naturally occurring fungus that grows along with the roots to protect them. Protectant. Labeled for vegetables and herbs. Typically only one application per growing season is needed. Long term crops should be retreated with a half-rate application midway through the crop. 0 hr REI. MOA NC. OMRI listed.

RootShield Plus G- (EPA Reg. # 68539-10)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22 and *Trichoderma virens* strain G-41

Incorporation rate: 2-3.0 lb per cu yd of soil mix. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled many edible crops in greenhouses and nurseries. 0 hr REI. MOA NC. OMRI listed.

RootShield Plus WP- (EPA Reg. # 68539-9)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22 and *Trichoderma virens* strain G-41

Drench rates: 1.5-2 Tbls per 5 gal or 5-8 oz per 100 gal. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled for many edible crops in greenhouses and nurseries. Approved for hydroponic applications. Long term crops should be retreated with a half-rate application midway through the crop. 4 hr REI. MOA NC. OMRI listed.

Rhizoctonia (soil borne, see also: aerial)

All of the following recommendations are for soil drenches except as noted.

Actinovate SP- (EPA Reg. # 73314-1)

Active Ingredient: *Streptomyces lydicus*

Drench at 1/2 tsp per gal or 6 oz per 100 gal. Protectant only, apply as early in the crop cycle as possible. Typically only one application per growing season is needed. Long term crops should be retreated with a half-rate application midway through the crop. 1 hr REI. 0 hr REI if no contact with drenched surfaces. MOA NC. OMRI listed.

Cease- (EPA Reg. # 264-1155-68539)

Active Ingredient: *Bacillus subtilis* QST 713 strain

Biofungicide soil drench at 1.25-2.5 fl oz per gal or 1-2 gal per 100 gal. Naturally occurring bacteria. Labeled for certain edible crops. Re-application interval 21-28 days. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

RootShield G- (EPA Reg. # 68539-3)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22

Incorporation rate: 1.5 lb per cu yd of soil mix. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled for many edible crops in greenhouses and nurseries. 0 hr REI. MOA NC. OMRI listed.

RootShield WP- (EPA Reg. # 68539-7)

Active Ingredient: *Trichoderma harzianum* Rifai strain KRL-AG2

Drench rate: 2 Tbls per 5 gal or 5 oz per 100 gal applied as early in the crop cycle as possible.

Naturally occurring fungus that grows along with the roots to protect them. Labeled for vegetables and herbs. Typically only one application per growing season is needed. Long term crops should be retreated with a half-rate application midway through the crop. 0 hr REI. MOA NC. OMRI listed.

RootShield Plus G- (EPA Reg. # 68539-10)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22 and *Trichoderma virens* strain G-41

Incorporation rate: 2-3.0 lb per cu yd of soil mix. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled for ornamentals and many edible crops in greenhouses and nurseries. 0 hr REI. MOA NC. OMRI listed.

RootShield Plus WP- (EPA Reg. # 68539-9)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22 and *Trichoderma virens* strain G-41

Drench rates: 1 1/2-2 Tbls per 5 gal or 5-8 oz per 100 gal. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled for many edible crops in greenhouses and nurseries. Approved for hydroponic applications. Long term crops should be retreated with a half-rate application midway through the crop. 4 hr REI. MOA NC. OMRI listed.

Aerial Rhizoctonia-

All applications in this section are foliar sprays, except as noted.

Camelot O- (EPA Reg. # 67702-2-67690)

Active Ingredient: Copper Octanoate

Foliar spray rate 0.5 fl oz per gal or 50 fl oz per 100 gal. Repeat sprays every 7-10 days. Leaves some visible residue and burns most open blooms. Do not allow this product to come in contact with aluminum sprayer or irrigation parts. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA M1. OMRI listed.

Cease- (EPA Reg. # 264-1155-68539)

Active Ingredient: *Bacillus subtilis* QST 713 strain

Biofungicide foliar spray applied at 1.25 fl oz per gal or 1 gal per 100 gal. Naturally occurring bacteria. Preventative control effective for about 7 days. Good plant safety including open blooms and no visible residue. Tank mixable with most common pesticides. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

Nordox 75 WG- (EPA Reg. # 48142-4)

Active Ingredient: Cuprous Oxide

Labeled for certain edible crops in greenhouse and outdoor crops. Foliar spray applied as 1/3 tsp per gal or 10.66 oz per 100. Do not tank mix with Aliette or any phosphonate fungicides such as Agri-phos, Alude, or Fosphite. 0 hr PHI. 12 hr REI. MOA M1. OMRI listed.

Triathlon BA- (EPA Reg. # 58044-3-59807)

Active Ingredient: *Bacillus amyloliquefaciens* strain D747

Biofungicide foliar spray applied at 2 tsp-2 Tbls per gal or 16-96 oz per 100 gal. Naturally occurring bacteria. Good plant safety including open blooms and no visible residue. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

Zero-Tol 2.0- (EPA Reg. # 70299-12) 

Active Ingredient: Hydrogen dioxide and Peracetic acid

0.5 fl oz per gal or 50 fl oz per 100 gal spray on young tender plants and 1.25 fl oz per gal or 128 fl oz per 100 gal spray on established plants. No visible residue and safe on most open blooms. Contact control with no residual. Labeled for many edible crops. 0 day PHI. 1 hr REI. MOA NC. OMRI listed.

Rusts

Rust pathogens are usually host specific and are identified by the spores they produce. Most rusts produce brown or orange spores while the Chrysanthemum White Rust produces white spores. Please consult with the GGSPRO department for our technical bulletin on Chrysanthemum White Rust.

Camelot O- (EPA Reg. # 67702-2-67690)

Active Ingredient: Copper Octanoate

Foliar spray rate 0.5 fl oz per gal or 50 fl oz per 100 gal. Leaves some visible residue and burns most open blooms. Do not allow this product to come in contact with aluminum sprayer or irrigation parts. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA M1. OMRI listed.

Cease- (EPA Reg. # 264-1155-68539)

Active Ingredient: *Bacillus subtilis* QST 713 strain

Biofungicide foliar spray applied at 1.25 fl oz per gal or 1 gal per 100 gal. Naturally occurring bacteria. Preventative control effective for about 7 days. Good plant safety including open blooms and no visible residue. Tank mixable with most common pesticides. Labeled for several edible crops. 0 day PHI. 4 hr REI. MOA 44. OMRI listed.

MiiStop- (EPA Reg. # 70870-1-68539)

Active Ingredient: Potassium bicarbonate

1Tbls per gal or 40 oz per 100 gal as a foliar spray. Fast acting product that is labeled for many vegetable crops. Formulated with a surfactant so do not add another. Leaves some residue but has good plant safety. 0 day PHI. 1 hour REI. MOA NC. OMRI listed.

Nordox 75 WG- (EPA Reg. # 48142-4)

Active Ingredient: Cuprous Oxide

Labeled for certain edible crops in greenhouse and outdoor crops. Foliar spray applied as 1/3 tsp per gal or 10.66 oz per 100. Do not tank mix with Aliette or any phosphonate fungicides such as Agri-phos, Alude, or Fosphite. 0 hr PHI. 12 hr REI. MOA M1. OMRI listed.

Thielaviopsis

RootShield G- (EPA Reg. # 68539-3)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22

Incorporation rate: 1.5 lb per cu yd of soil mix. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled many edible crops in greenhouses and nurseries. 0 hr REI. MOA NC. OMRI listed.

RootShield WP- (EPA Reg. # 68539-7)

Active Ingredient: *Trichoderma harzianum* Rifai strain KRL-AG2

Drench rate: 2 Tbls per 5 gal or 5 oz per 100 gal applied as early in the crop cycle as possible.

Naturally occurring fungus that grows along with the roots to protect them. Labeled for vegetables and herbs. Typically only one application per growing season is needed. Long term crops should be retreated with a half-rate application midway through the crop. 0 hr REI. MOA NC. OMRI listed.

RootShield Plus G- (EPA Reg. # 68539-10)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22 and *Trichoderma virens* strain G-41

Incorporation rate: 2-3.0 lb per cu yd of soil mix. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled for many edible crops in greenhouses and nurseries. 0 hr REI. MOA NC. OMRI listed.

RootShield Plus WP- (EPA Reg. # 68539-9)

Active Ingredient: *Trichoderma harzianum* Rifai strain T-22 and *Trichoderma virens* strain G-41

Drench rates: 1.5-2 Tbls per 5 gal or 5-8 oz per 100 gal. Naturally occurring fungus that grows along with the roots to protect plants from root and crown diseases. Labeled for many edible crops in greenhouses and nurseries. Approved for hydroponic applications. Long term crops should be retreated with a half-rate application midway through the crop. 4 hr REI. MOA NC. OMRI listed.

