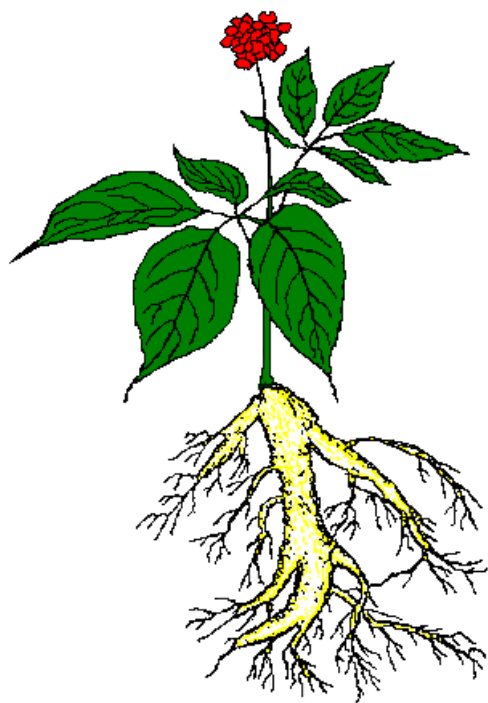


# CONTROL OF DISEASES, PESTS, AND WEEDS IN CULTIVATED GINSENG, 2023

Dr. Mary K. Hausbeck  
Michigan State University  
Department of Plant, Soil and Microbial Sciences  
East Lansing, MI 48824



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Remember that the pesticide label is the legal document on pesticide use. Read the label, as they change often and follow all instructions closely. Some chemicals listed in this bulletin may be dropped by the manufacturer or distributor after the publication of this bulletin. The use of a pesticide in a manner not consistent with the label can lead to the injury of crops, humans, animals, and the environment. The use of a pesticide inconsistent with the label directions can also lead to civil or criminal fines and/or condemnation of the crop. Pesticides are good management tools for the control of pests on crops, but only when they are used in a safe, effective and prudent manner according to the label.

These recommendations are not intended to replace the specific product labels. Always read and follow label instructions carefully.

- This information does not take the place of the product label; changes to product label information can occur without notice. Always read and follow ALL label directions.
- Follow ALL requirements of the worker protection standard (WPS) to protect agriculture workers from exposure to these materials.
- Use only approved materials.
- Some products are registered for use only in Michigan (**MI only**) or in Wisconsin (**WI only**), but not in both states.

## Disease: **ALTERNARIA LEAF AND STEM BLIGHT (*Alternaria panax*)**

### CULTURAL CONTROL:

This disease is favored by long periods of rain, dew, fog, and high humidity. Choose garden sites that have good soil drainage with rows oriented in the direction of the prevailing winds. Avoid sites that are bordered by woods. Smaller gardens allow better air movement than larger gardens. Side and end curtains will decrease air movement and should be used only as needed. Dense plants stands are especially at risk for this disease because it takes longer for them to dry following dew periods or rain.

Pesticide	Rate of product/acre	Comments
<b>★ AZOXYSTROBIN/BENZOVINDIFLUPYR★ [11/7]</b>		
Elatus Fungicide .....	7.3 fl oz at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ Apply in a minimum of 50 gal of water per acre.</li> <li>▪ Do not make more than four applications per year.</li> <li>▪ Do not apply within 15 days of harvest.</li> <li>▪ Do not exceed 2.0 lb ai/A/year of azoxystrobin-containing products.</li> </ul>
<b>★ AZOXYSTROBIN/DIFENOCONAZOLE★ [11/3]</b>		
Quadris Top .....	10-14 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT apply more than 56 fl oz/acre per year.</li> <li>▪ Use a minimum of 15 gal water for ground applications and a minimum of 10 gal water for aerial applications.</li> </ul>
<b>★ AZOXYSTROBIN/MANCOZEB★ [11/M03]</b>		
Dexter Max .....	2.1 lbs at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 8 applications (11.76 lb a.i. mancozeb/0.84 lb a.i. azoxystrobin)/acre per year.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> <li>▪ In Wisconsin, apply with a minimum of 80 gallons of water per acre.</li> </ul>
<b>★ CHOROTHALONIL★ [M05]</b>		
Bravo Weather Stik SC -or- Chlorothalonil 720 -or- Echo 720 -or- Oranil 6L -or- Equus 720 SST -or- Initiate 720 -or- Periapt Fungicide ...	2.0 pt at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 8 applications (12 lb a.i.)/acre per year.</li> <li>▪ DO NOT apply within 14 days of harvest.</li> </ul>
<b>★ CHLOROTHALONIL/OXATHIPIPROLIN★ [M05/49]</b>		
Orondis Opti.....	1.75-2.5 pt at 14-day intervals at minimum volume of 50 gallons per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 10 pt per acre per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> <li>▪ DO NOT apply more than 2 sequential applications of Orondis Opti.</li> <li>▪ DO NOT apply more than 0.125 lb ai per acre per year of oxathiapiprolin products.</li> <li>▪ DO NOT apply more than 12.0 lb ai per acre per year of chlorothalonil products.</li> </ul>
<b>★ CYPRODINIL/FLUDIOXONIL★ [9/12]</b>		
Switch 62.5WDG -or- Alterity 62.5WDG.....	11-14 oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action for at least 2 applications.</li> <li>▪ DO NOT exceed 56 oz/acre per year.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> </ul>

★Products with starred active ingredients are particularly recommended for problem infestations.

## ALTERNARIA LEAF AND STEM BLIGHT continued

Pesticide	Rate of product/acre	Comments
<b>★ DIFENOCONAZOLE/BENZOVINDIFLUPYR★ [3/7]</b>		
Aprovia Top .....	13.5 fl oz at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 4 applications per season.</li> <li>▪ DO NOT apply within 15 days of harvest.</li> <li>▪ Do not apply more than 0.46 ai/A/year of difenoconazole-containing products.</li> </ul>
<b>★ FLUAZINAM★ [29]</b>		
Omega 500F -or- Orbus 4F .	1.0-1.5 pt at 7- to 14-day intervals in a minimum of 100 gal water.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 6 pt per season.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> <li>▪ Use 1 pt/acre when the disease first appears or when conditions are favorable. Under conditions that favor severe disease development, use higher rate.</li> </ul>
<b>★ FLUOPYRAM/TRIFLOXYSTROBIN★ [7/11]</b>		
Luna Sensation .....	7.6 fl oz at a 14-day interval.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 15.3 fl oz per acre per year.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> <li>▪ DO NOT exceed 2 applications before alternating with a different mode of action.</li> </ul>
<b>★ MANCOZEB★ [M03]</b>		
ManKocide -or- Koverall -or- Manzate Pro-Stick -or- Penncozeb 75DF -or- Penncozeb 80WP -or- Roper DF Rainshield..	2.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 24 lb (18 lb a.i.)/acre Dithane/Fortuna/ManKocide/Koverall/Manzate Pro-Stick/Penncozeb 75DF/Penncozeb 80WP/Roper or 18 qt (18 lb a.i.)/acre Manzate Flowable/Penncozeb 4FL/Dithane F-45 Rainshield or 22.5 lb Dithane M-45 per season.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> <li>▪ DO NOT exceed 12 applications per year.</li> <li>▪ Apply in a minimum of 80 gal water/acre with ground equipment.</li> </ul>
Manzate Max .....	1.5 qt at 7- to 10-day intervals.	
Dithane M-45 Rainshield ..	1.8 lb at 7- to 10-day intervals.	
<b>★ PYRACLOSTROBIN/FLUXAPYROXAD★ [11/7]</b>		
Merivon Xemium Brand Fungicide .....	4.0-5.5 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT make more than 2 sequential applications of Merivon before alternating to a labeled non-Group 7 or non-Group 11 fungicide.</li> <li>▪ DO NOT apply more than 16.5 fl oz/A of Merivon per year.</li> <li>▪ DO NOT apply more than 3 applications of Merivon per year.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> </ul>
<b>AZOXYSTROBIN [11]</b>		
Aframe -or- Quadris Flowable -or- A-Zox 25SC -or- Azoxy 2SC.....	6.0-15.5 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 1 foliar application before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT alternate with QoI fungicides such as Cabrio, Flint or Gem.</li> <li>▪ Please note that resistance of <i>A. panax</i> to group 11 fungicides is a concern in WI.</li> <li>▪ DO NOT exceed 123 fl oz (2 lb a.i.)/acre per season.</li> <li>▪ Apply in a volume of water for adequate coverage of foliage and stems.</li> </ul>
Acadia 2SC -or- AzoxyStar -or- Arius 250 -or- Azoxyzone -or- Dexter SC -or- Satori -or- Tetraban -or- Treva .....	6.0-20.0 fl oz at 7- to 14-day intervals.	
<b>ALUMINUM TRIS [33]</b>		
Aliette WDG .....	5.0 lb at 7-day intervals in a minimum of 100 gal/acre water.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 9 applications per year.</li> <li>▪ DO NOT apply within 31 days of harvest.</li> <li>▪ DO NOT tankmix with copper compounds.</li> <li>▪ DO NOT apply with a spreader/sticker.</li> <li>▪ For suppression only.</li> </ul>

★Products with starred active ingredients are particularly recommended for problem infestations.

## ALTERNARIA LEAF AND STEM BLIGHT *continued*

Pesticide	Pesticide	Pesticide
<b>BACILLUS SUBTILIS [44]</b>		<ul style="list-style-type: none"> <li>▪ Apply at stated interval or as needed.</li> </ul>
Cease .....	3.0-6.0 qt at 7- to 10-day intervals.	
Serenade OPTI .....	14.0-20.0 oz/acre at 7- to 10-day intervals.	
Aviv.....	10-30 fl oz at 5- to 10-day intervals.	
<b>BOSCALID [7]</b>		<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action for at least 1 application.</li> <li>▪ DO NOT exceed 5 applications (22.5 oz)/acre per year.</li> <li>▪ Please note that resistance of <i>A. panax</i> to boscalid is a concern in WI.</li> </ul>
Endura 70WG .....	4.5 oz at 7- to 14-day intervals.	
<b>COPPER AMMONIUM COMPLEX [M01]</b>		<ul style="list-style-type: none"> <li>▪ <b>Tankmix with Meteor/Rovral in 100 gal minimum.</b></li> <li>▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.</li> </ul>
Copper-Count-N.....	3.5 qt at 7-day intervals.	
<b>COPPER HYDROXIDE [M01]</b>		<ul style="list-style-type: none"> <li>▪ <b>Tankmix with Meteor/Rovral in 100 gal minimum.</b></li> <li>▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.</li> <li>▪ DO NOT apply more than 14.5 pt of Champ Formula 2F per acre per year.</li> <li>▪ DO NOT make more than 5 applications of Champ WG per year.</li> <li>▪ DO NOT apply more than 69 qt of Previsto per acre per year DO NOT apply more than 69 qt of Previsto per acre per year</li> </ul>
Nu-Cop HB ( <i>MI only</i> ) .....	1.5-2.1 lb at 7-day intervals.	
Champ WG <i>-or-</i> Nu-Cop 50WP <i>-or-</i> Kocide HCu....	2.1 lb at 7-day intervals.	
ChamplON++ <i>-or-</i> Kocide 3000-O .....	1-1.75 lb at 7-day intervals.	
Champ Dry Prill.....	1.75 lb at 7-day intervals.	
Champ Formula 2F .....	1.75 pt at 7-day intervals.	
Nu-Cop 3L .....	2.0-2.6 pt. at 7-day intervals.	
Kentan DF.....	2.0-2.6 lb at 7-day intervals.	
Kocide 2000-O .....	2.0-3.0 lb at 7-day intervals.	
Previsto.....	1.0-3.0 qt at 7-day intervals.	
Nu-Cop XLR .....	2.4-8.4 pt at 7-day intervals.	
<b>COPPER OXYCHLORIDE/COPPER HYDROXIDE [M01]</b>		<ul style="list-style-type: none"> <li>▪ <b>Tankmix with Meteor/Rovral in 100 gal minimum.</b></li> <li>▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.</li> </ul>
Badge SC .....	1.0-3.5 pt at 7-day intervals.	
Badge X <sub>2</sub> .....	1.0-3.5 lb at 7-day intervals.	
<b>COPPER OCTANOATE [M01]</b>		<ul style="list-style-type: none"> <li>▪ Begin 2 weeks before disease appears.</li> <li>▪ Apply at the higher rate at 7-day intervals when disease is increasing rapidly.</li> <li>▪ Reapply after rain.</li> <li>▪ DO NOT apply more than 33 gal of Cueva per acre per year</li> </ul>
Camelot O <i>-or-</i> Cueva .....	0.5-2.0 gal/100 gal at 7- to 10-day intervals.	
Soap-Shield Flowable Liquid Copper Fungicide.....	0.5-2.0 fl oz/gal water at 7- to 10-day intervals.	

## ALTERNARIA LEAF AND STEM BLIGHT *continued*

Pesticide	Rate of product/acre	Comments
<b>CUPROUS OXIDE [M01]</b>		<ul style="list-style-type: none"> <li>▪ <b>Tankmix with iprodione in 100 gal minimum.</b></li> <li>▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.</li> </ul>
Nordox 75 WG .....	2.25 lb at 7-day intervals.	
<b>COPPER SULFATE [M01]</b>		<ul style="list-style-type: none"> <li>▪ <b>Tankmix with Meteor/Rovral in 100 gal minimum.</b></li> <li>▪ Cover stems thoroughly.</li> <li>▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.</li> </ul>
Cuprofix Ultra 40 Disperss..	1.75-2.5 lb at 7-day intervals.	
Cuproxat FL .....	1.5-2.75 pt at 7-day intervals.	
<b>COPPER SULFATE PENTAHYDRATE [M01]</b>		<ul style="list-style-type: none"> <li>▪ <b>Tankmix with iprodione in 100 gal minimum.</b></li> <li>▪ Cover stems thoroughly.</li> <li>▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.</li> <li>▪ DO NOT exceed 1.05 lbs metallic copper per acre per single application.</li> <li>▪ DO NOT exceed 5.25 lbs metallic copper per acre per year.</li> </ul>
Instill .....	15.0-30.0 fl oz at 7-day intervals.	
MasterCop .....	0.5-1.5 pt at 7-day intervals.	
<b>FLUOPYRAM/DIFENOCONAZOLE [7/3]</b>		<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 27.2 fl oz per acre per year.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> <li>▪ DO NOT exceed 2 applications before alternating with a different mode of action.</li> </ul>
Luna Flex .....	13.6 fl oz at 7-day intervals.	
<b>FLUOPYRAM/PYRIMETHANIL [7/9]</b>		<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 54.7 fl oz per acre per year.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> <li>▪ DO NOT exceed 2 applications before alternating with a different mode of action.</li> </ul>
Luna Tranquility .....	16-27 fl oz at 7-day intervals.	
<b>HYDROGEN PEROXIDE/PEROXYACETIC ACID</b>		<ul style="list-style-type: none"> <li>▪ Preventative treatment: 3 pt in a minimum of 100 gal water at 5-day intervals for 3 total applications. Reduce to 1 pt in a minimum of 100 gal water at 5- to 14-day intervals. Then follow with curative treatment.</li> </ul>
OxiDate 2.0.....	Preventive treatment: 1:200-1:400 dilution Curative treatment: 1:100 dilution Rescue treatment: 1:40 dilution	
OxiDate 5.0.....	Apply at a dilution rte of 1:500-1:100	
<b>IPIRODIONE[2]</b>		<ul style="list-style-type: none"> <li>▪ DO NOT exceed 10 pt/acre per season.</li> <li>▪ DO NOT exceed 5 applications per season.</li> <li>▪ DO NOT apply within 36 days of harvest.</li> <li>▪ Apply in a minimum of 10 gal/acre.</li> <li>▪ Always use in a fungicide resistance management program by tankmixing or alternating with another fungicide registered for Alternaria blight control in ginseng.</li> <li>▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.</li> <li>▪ <i>Alternaria</i> may develop resistance to iprodione products if this fungicide is overused.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Tankmix programs: Apply at 7- to 10-day intervals.</li> </ul>		
Meteor <i>-or-</i> Rovral Brand 4 Flowable .....	1.0-1.5 pt.	
<ul style="list-style-type: none"> <li>▪ Alternating programs: Apply at 14-day intervals and alternate with another registered fungicide.</li> </ul>		
Meteor <i>-or-</i> Rovral Brand 4 Flowable .....	1.5-2 pt.	
<b>LAMINARIN [P4]</b>		<ul style="list-style-type: none"> <li>▪ At water volumes less than 70 gal per acre apply at 14.0 fl oz per acre. At water volumes above 70 gal per acre apply at 0.15% v/v.</li> </ul>
Vacciplant.....	14.0-22.0 fl oz at 7- to- 14-day intervals.	

## ALTERNARIA LEAF AND STEM BLIGHT *continued*

Pesticide	Rate of product/acre	Comments
<b>MEFENTRIFLUCONAZOLE [3]</b>		
Cevya.....	3-5 fl oz on a minimum interval of 7-days.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 15 fl oz of product per acre per season.</li> <li>▪ DO NOT apply within in 7 days of harvest.</li> </ul>
<b>NEEM OIL</b>		
Trilogy.....	0.5-1.0% at 7- to 14-day intervals in 25-100 gal water. 2.0 pt at 7- to 14-day intervals in 5 gal water.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 gal/acre per application.</li> </ul>
<b>PENTHIOPYRAD [7]</b>		
Fontelis.....	16-30 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 61 fl oz/acre per application.</li> <li>▪ May be applied day of harvest (PHI=0).</li> <li>▪ DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action.</li> </ul>
<b>POLYOXIN D ZINC SALT [19]</b>		
Affirm <i>-or-</i> Ph-D WDG .....	6.2 oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Use in alternation with fungicides that have a different mode of action.</li> <li>▪ DO NOT exceed 3 applications (2.1 oz a.i./acre) per season.</li> </ul>
<b>PROPICONAZOLE [3]</b>		
Tilt.....	3.0 to 4.0 fl oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 16 fl oz of product per acre per year.</li> <li>▪ Although the label for Tilt has Cercospora leaf spot under targeted diseases for ginseng, this product has shown efficacy against Alternaria blight.</li> <li>▪ DO NOT apply within in 14 days of harvest.</li> </ul>
<b>PYDIFLUMETOFEN/FLUDIOXONIL [7/12]</b>		
Miravis Prime.....	6.8 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 sequential application before alternating with a fungicide with a different mode(s) of action.</li> <li>▪ DO NOT make more than 4 applications at the maximum rate per year.</li> <li>▪ DO NOT apply within in 7 days of harvest.</li> </ul>
<b>PYRACLOSTROBIN [11]</b>		
Cabrio 20EG .....	8.0-12.0 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 1 sequential application before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT rotate with QoI fungicides such as Quadris, Satori, Flint, Gem.</li> <li>▪ DO NOT exceed 3 applications or 48 oz/acre per season.</li> <li>▪ Please note that resistance of <i>A. panax</i> to group 11 fungicides is a concern in WI.</li> </ul>
<b>PYRACLOSTROBIN/BOSCALID [11/7]</b>		
Pristine WG.....	8-10.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 6 applications of Pristine per year.</li> <li>▪ This product can be applied on the day of harvest (0 day PHI).</li> </ul>
<b>PYRIMETHANIL [9]</b>		
Scala SC.....	18 fl oz at minimum 7-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 54 fl oz/A of Scala SC per crop.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> </ul>
<b>STREPTOMYCES LYDICUS</b>		
Actinovate AG .....	3.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ For best results use spreader-sticker.</li> </ul>

★ *Products with starred active ingredients are particularly recommended for problem infestations.*

## ALTERNARIA LEAF AND STEM BLIGHT *continued*

Pesticide	Rate of product/acre	Comments
<b><i>TEE TREE OIL/DIFENOCONAZOLE [46/3]</i></b>		<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 34 fl oz/A of Regev per season.</li> <li>▪ DO NOT apply within 48 hours of harvest.</li> </ul>
Regev .....	4-8.5 oz at 7- to 14-day intervals.	
<b><i>TRIFLOXYSTROBIN [11]</i></b>		<ul style="list-style-type: none"> <li>▪ DO NOT exceed one sequential applications of Flint and/or Gem before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT rotate with QoI fungicides such as Quadris, Satori, Cabrio.</li> <li>▪ DO NOT exceed 4 applications (11.5 oz Gem or 11.5 fl oz Flint/acre) per season (see labels).</li> <li>▪ DO NOT apply within 7 days of harvest.</li> <li>▪ Please note that resistance of <i>A. panax</i> to group 11 fungicides is a concern in WI.</li> </ul>
Flint Extra .....	2.0-2.9 fl oz at 14-day intervals.	
Gem 500SC .....	1.9-2.9 fl oz at 14-day intervals.	

## Disease: BOTRYTIS BLIGHT (*Botrytis cinerea*)

### CULTURAL CONTROL:

*Botrytis* can grow and survive on any dead plant material found in a ginseng garden. Keep humidity in the gardens as low as possible by promoting good air movement (also see cultural notes listed under *Alternaria* for additional tips). *Botrytis* readily invades damaged tissue. Minimize plant wounding via equipment. Avoid foliar fertilizers or products that cause plant burn.

Pesticide	Rate of product/acre	Comments
<b>★ AZOXYSTROBIN/DIFENOCONAZOLE★ [11/3]</b>		
Quadris Top .....	10-14 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 foliar application before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT apply more than 56 fl oz/acre per year.</li> <li>▪ Use a minimum of 15 gal water for ground applications and a minimum of 10 gal water for aerial applications.</li> </ul>
<b>★ CAPTAN★ [M04]</b>		
Captan 50W .....	4.0 lb at 7- to 10-day intervals as a foliar spray in a minimum of 100 gal of water per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 32 lb/acre Captan 50W.</li> <li>▪ DO NOT exceed 30 lb/acre Captan 80WDG per year.</li> <li>▪ DO NOT apply Captan 50W within 365 days of harvest.</li> <li>▪ DO NOT apply Captan 80WDG within 14 days of harvest.</li> </ul>
Captan 80WDG .....	3.75 lb at 6- to 8-day intervals as a foliar spray in a minimum of 100 gal of water per acre.	
<b>★ CHOROTHALONIL★ [M05]</b>		
Bravo Weather Stik SC -or- Chlorothalonil 720 -or- Echo 720 -or- Equus 720 SST -or- Oranil 6L -or- Initiate 720 -or- Periapt.....	2.0 pt at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 8 applications (12 lb a.i.)/acre per year.</li> <li>▪ DO NOT apply within 14 days of harvest.</li> </ul>
<b>★ CHLOROTHALONIL/OXATHIPIPROLIN★ [M05/49]</b>		
Orondis Opti.....	1.75-2.5 pt at 14-day intervals. For ground application apply in at least 50 gal per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 10 pt per acre per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> <li>▪ DO NOT apply more than 2 sequential applications of Orondis.</li> <li>▪ DO NOT apply more than 0.125 lb ai per acre per year of oathiapiprolin products.</li> <li>▪ DO NOT apply more than 12.0 lb ai per acre per year of chlorothalonil products.</li> </ul>
<b>★ FENHEXAMID★ [17]</b>		
Elevate 50WDG .....	1.5 lb at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 consecutive applications before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT exceed 4 applications (6 lb)/acre per season.</li> </ul>
<b>★ FLUAZINAM★ [29]</b>		
Omega 500F -or- Orbus 4F	1.0-1.5 pt at 7- to 14-day intervals in a minimum of 100 gal water.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 6 pt per season.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> <li>▪ Use 1 pt/acre when the disease first appears or when conditions are favorable. Under conditions that favor severe disease development, use higher rate.</li> </ul>



## BOTRYTIS BLIGHT continued

Pesticide	Rate of product/acre	Comments
<b>★FLUOPYRAM/TRIFLOXYSTROBIN★ [7/11]</b>		
Luna Sensation .....	7.6 fl oz at a 14-day interval.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 15.3 fl oz per acre per year.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> <li>▪ DO NOT exceed 2 applications before alternating with a different mode of action.</li> </ul>
<b>BACILLUS AMYLOLIQUEFACIENS [44]</b>		
Double Nickel 55 .....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates.</li> <li>▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.</li> </ul>
Double Nickel LC .....	0.5-6.0 qt at 7- to 10-day intervals.	
Stargus .....	2 to 4 qt at 7- to 10-day intervals.	
<b>BACILLUS SUBTILIS [44]</b>		
Cease .....	3.0-6.0 qt at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Apply at stated interval or as needed.</li> </ul>
Serenade OPTI .....	14.0-20.0 oz/acre at 7- to 10-day intervals.	
Aviv.....	10-30 fl oz at 5- to 10-day intervals.	
<b>COPPER OCTANOATE [M01]</b>		
Camelot O <i>-or-</i> Cueva .....	0.5-2.0 gal/100 gal at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Begin 2 weeks before disease appears.</li> <li>▪ Apply at the higher rate at 7-day intervals when disease is increasing rapidly.</li> <li>▪ Reapply after rain.</li> <li>▪ DO NOT apply more than 33 gal of Cueva per acre per year</li> </ul>
Soap-Shield Flowable Liquid Copper Fungicide.....	0.5-2.0 fl oz/gal water at 7- to 10-day intervals.	
<b>FLUOPYRAM/DIFENOCONAZOLE [7/3]</b>		
Luna Flex.....	13.6 fl oz at 7-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 27.2 fl oz per acre per year.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> <li>▪ DO NOT exceed 2 applications before alternating with a different mode of action.</li> </ul>
<b>FLUOPYRAM/PYRIMETHANIL[7/9]</b>		
Luna Tranquility .....	16-27 fl oz at 7-day interval.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 54.7 fl oz per acre per year.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> <li>▪ DO NOT exceed 2 applications before alternating with a different mode of action.</li> </ul>
<b>NEEM OIL</b>		
Trilogy.....	0.5-1% in 25-100 gal water at 7- to 14-day intervals. 2.0 pt in 5 gal water at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 gal/acre per application.</li> </ul>
<b>PENTHIOPYRAD [7]</b>		
DuPont Fontelis .....	16-30 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 61 fl oz/acre per season.</li> <li>▪ May be applied day of harvest (PHI=0).</li> <li>▪ DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action.</li> </ul>
<b>POLYOXIN D ZINC SALT [19]</b>		
Affirm <i>-or-</i> Ph-D WDG .....	6.2 oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Use in alternation with fungicides that have a different mode of action.</li> <li>▪ DO NOT exceed 3 applications (2.1 oz a.i./acre) per season.</li> </ul>

★Products with starred active ingredients are particularly recommended for problem infestations.

## BOTRYTIS BLIGHT continued

Pesticide	Rate of product/acre	Comments
<b>PYRIMETHANIL [9]</b>		<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 54 fl oz/A of Scala SC per crop.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> </ul>
Scala SC.....	18 fl oz at minimum 7-day intervals.	
<b>REYNOUTRIA SACHALINENSIS [P5]</b>		<ul style="list-style-type: none"> <li>▪ May be applied on day of harvest.</li> </ul>
Regalia Biofungicide .....	1.0-4.0 qt foliar application in 25-100 gal water at 7- to 10-day intervals.	
<b>STREPTOMYCES LYDICUS</b>		<ul style="list-style-type: none"> <li>▪ For best results use a spreader-sticker.</li> </ul>
Actinovate AG.....	3.0-12 oz at 7- to 14-day intervals.	
<b>TEE TREE OIL/DIFENOCONAZOLE [46/3]</b>		<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 34 fl oz/A of Regev per season.</li> <li>▪ DO NOT apply within 48 hours of harvest.</li> </ul>
Regev .....	4-8.5 oz at 7- to 14-day intervals.	
<b>ULOCLADIUM OUDEMANSII</b>		<ul style="list-style-type: none"> <li>▪ This product can be mixed with fungicides.</li> </ul>
BotryStop .....	2-4 lb at 7- to 10-day intervals.	
<ul style="list-style-type: none"> <li>▪ Use of <b>Meteor/Rovral</b> combined with fixed copper fungicides for Alternaria leaf and stem blight may provide some control of Botrytis blight.</li> </ul>		

**Disease: CYLINDROCARPON ROOT ROT/RUSTY ROOT**  
**(*Cylindrocarpon destructans*, *Rhexocercosporidium panacis*; other fungi are involved)**

**CULTURAL CONTROL:**

Use treated seed from healthy gardens. Work in diseased gardens at the end of the day. After equipment has been used in a garden with *Cylindrocarpon*, use a power washer to remove soil and plant debris from it, then clean with a detergent.

Pesticide	Rate of product/acre	Comments
<b>★CAPTAN★[M04]</b>		
Captan 50W .....	4.0 lb at 7- to 10-day intervals as a drench in a minimum of 200 gal of water per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 32 lb/acre Captan 50W per year.</li> <li>▪ DO NOT exceed 30 lb/acre Captan 80WDG per year.</li> <li>▪ DO NOT apply Captan 50W within 365 days of harvest.</li> <li>▪ DO NOT apply Captan 80WDG within 14 days of harvest.</li> </ul>
Captan 80WDG.....	3.75 lb at 6- to 8-day intervals as a drench in a minimum of 200 gal of water per acre.	
<b>★FLUDIOXONIL★[12]</b>		
Cannonball WG.....	4.0-8.0 oz/acre at 14-21 day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply within 14 days of harvest.</li> <li>▪ DO NOT exceed 2 lb/acre per season.</li> <li>▪ DO NOT apply more than 32 oz (1.0 lb a.i./A) per crop.</li> </ul>
<b>★PENTHIOPYRAD★ [7]</b>		
DuPont Fontelis .....	16-30 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 61 fl oz/acre per season.</li> <li>▪ DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action.</li> </ul>
<b>PYDIFLUMETOFEN/FLUDIOXONIL[7/12]</b>		
Miravis Prime.....	6.8 fl oz at 7- to 14-day intervals	<ul style="list-style-type: none"> <li>▪ Efficacy of the 6.8 fl oz rate against <i>Cylindrocarpon</i> has not been tested.</li> <li>▪ DO NOT exceed 2 sequential application before alternating with a fungicide with a different mode(s) of action.</li> <li>▪ DO NOT make more than 4 applications at the maximum rate per year.</li> <li>▪ DO NOT apply within in 7 days of harvest.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Use of <b>Quadris</b> for damping-off may provide control of <i>Cylindrocarpon</i> root rot/rusty root.</li> </ul>		

**Disease: DAMPING-OFF (*Cylindrocarpon destructans*, *Fusarium* spp.,  
*Phytophthora cactorum*, *Pythium* spp., *Rhizoctonia solani*)**

**CULTURAL CONTROL:**

Use treated seed produced in healthy gardens. Choose sites and soil types with good drainage. Minimize soil compaction. Avoid standing water by digging trenches as needed to drain water away from the garden.

Pesticide	Rate of product/acre	Comments
<b>★ AZOXYSTROBIN★[11]</b>		
<ul style="list-style-type: none"> <li>Banded applications: band width 7" or less. Banded applications contact the foliage and are counted as a foliar application.</li> </ul>		<ul style="list-style-type: none"> <li>Active against <i>Rhizoctonia</i>, <i>Pythium</i>.</li> <li>DO NOT exceed 1 foliar application before alternating with a fungicide with a different mode of action.</li> <li>DO NOT alternate with QoI fungicides such as Cabrio, Flint, Gem.</li> <li>DO NOT exceed 4 applications per year.</li> <li>DO NOT exceed 123 fl oz (2 lb a.i.)/acre per season.</li> </ul>
Aframe -or- Azoxystar -or- Azoxyzone -or- Dexter SC -or- Satori -or- Tetraban -or- Quadris F -or- Azoxy 2SC ..	0.4-0.8 fl oz/1000 row feet. 0.7 fl oz/1000 row feet maximum for 22" rows.	
<b>★ CAPTAN★[M04]</b>		
Captan 50W .....	4.0 lb at 7- to 10-day intervals as a drench in a minimum of 200 gal of water per acre.	<ul style="list-style-type: none"> <li>Active against <i>Cylindrocarpon</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>.</li> <li>DO NOT exceed 32 lb/acre Captan 50W per year.</li> <li>DO NOT exceed 30 lb/acre Captan 80WDG per year.</li> <li>DO NOT apply Captan 50W within 365 days of harvest.</li> <li>DO NOT apply Captan 80WDG within 14 days of harvest.</li> </ul>
Captan 80WDG.....	3.75 lb at 6- to 8-day intervals as a drench in a minimum of 200 gal of water per acre.	
<b>★ MEFENOXAM★[4]</b>		
Ridomil Gold GR .....	pre-emergence: 15 lb per acre post-emergence: 10 lb per acre (up to 4 applications) at monthly intervals.	<ul style="list-style-type: none"> <li>Active against <i>Pythium</i>, <i>Phytophthora</i>.</li> <li>DO NOT exceed 60 lb/acre per growing season.</li> <li>DO NOT exceed 45 lb/acre per growing season if Ridomil Gold EC or Ridomil Gold SL is applied in spring before plants have begun to grown.</li> <li>DO NOT apply within 9 days of harvest.</li> <li>NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.</li> </ul>
Orondis Gold B -or- Ridomil Gold SL.....	0.75 pt as a drench in 100-400 gal water. 1.0-2.0 pt/A preplant incorporated or soil spray at planting.	
Ultra Flourish .....	1.5 pt in 100-400 gal water applied once as a drench.	<ul style="list-style-type: none"> <li>Active against <i>Phytophthora</i>.</li> <li>DO NOT make supplemental applications.</li> <li>DO NOT make more than one application.</li> <li>NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.</li> </ul>

★Products with starred active ingredients are particularly recommended for problem infestations.

## DAMPING-OFF continued

Pesticide	Rate of product/acre	Comments
<b>★METALAXYL★[4]</b>		
MetaStar 2E.....	1.5 qt as a drench in 100-400 gal/acre water.	<ul style="list-style-type: none"> <li>▪ Active against <i>Pythium</i>, <i>Phytophthora</i>.</li> <li>▪ DO NOT exceed 1 application per year.</li> <li>▪ Apply before early growth, follow with applications of a metalaxyl or mefenoxam granular product.</li> <li>▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.</li> </ul>
<b>BACILLUS AMYLOLIQUEFACIENS [44]</b>		
Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>, <i>Pythium</i>, <i>Phytophthora</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>.</li> <li>▪ First application as a soil or seedline drench, banded in-furrow at planting.</li> <li>▪ directly into the rooting zone using shanks, etc.</li> <li>▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates.</li> <li>▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.</li> </ul>
Double Nickel LC .....	0.5-6.0 qt at 7- to 10-day intervals.	
Stargus .....	3 to 4 qt at 7- to 10-day intervals.	
<b>FENAMIDONE [11]</b>		
Reason 500SC.....	5.5-8.2 fl oz at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ Active against <i>Pythium</i>, <i>Phytophthora</i></li> <li>▪ Apply only in a 1:1 alternation with a mefenoxam-containing fungicide.</li> <li>▪ DO NOT exceed 24.6 fl oz/acre per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> </ul>
<b>POLYOXIN D ZINC SALT [19]</b>		
Ph-D WDG.....	6.2 oz drench at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ Active against <i>Rhizoctonia</i>.</li> <li>▪ Use in alternation with fungicides that have a different mode of action.</li> <li>▪ DO NOT exceed 3 applications (2.1 oz a.i./acre) per season.</li> </ul>
<b>REYNOUTRIA SACHALINENSIS [P5]</b>		
Regalia Biofungicide .....	1.0-3.0 qt soil drench in 100 gal water at 10- to 14-day intervals. 1.0-4.0 qt/acre or 2.2-8.8 fl oz per 1000 ft-row in-furrow applications in 5-15 gal water.	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>.</li> <li>▪ May be applied on day of harvest.</li> </ul>
<b>TEE TREE OIL/DIFENOCONAZOLE [46/3]</b>		
Regev .....	4-8.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 34 fl oz/A of Regev per season.</li> <li>▪ DO NOT apply within 48 hours of harvest.</li> <li>▪ Active against <i>Fusarium</i> and <i>Rhizoctonia</i>.</li> </ul>

## DAMPING-OFF continued

Pesticide	Rate of product/acre	Comments
<b><i>TRICHODERMA ASPERELLUM/T. GAMSII</i></b>		
Bio-Tam 2.0 .....	1.5-3.0 oz/1000 row feet in-furrow. 2.5-3.0 lb banded application (see label). 2.5-5.0 lb broadcast followed by 0.25-0.5" water irrigation or 0.92-1.8 oz/100 square feet in 3-5 gal water. 0.025-0.075 oz/gal water handheld or backpack drench.	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>.</li> <li>▪ Two or more applications are recommended</li> <li>▪ See label for details on application methods.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Use of <b>Meteor/Rovral</b> in alternation or as a tankmix with fixed copper fungicides for <i>Alternaria</i> leaf and stem blight control may provide some control of damping-off caused by <i>Rhizoctonia solani</i>. Adequate coverage of stems is critical for obtaining damping-off and crown/root rot control.</li> <li>▪ Use of <b>Cannonball</b> for <i>Cylindrocarpum</i> root rot/rusty root or white mold may provide control of damping-off.</li> <li>▪ See also Seedborne Pests/Fumigation section for preplant chemical control of damping-off.</li> <li>▪ See also Seed Treatment section for chemical control of damping-off through treatment of seeds.</li> </ul>		

## Disease: FUSARIUM ROOT ROT (*Fusarium* spp.)

### CULTURAL CONTROL:

Use treated seed from healthy gardens. Work in diseased gardens at the end of the day. After equipment has been used in a garden with *Fusarium*, use a power washer to remove soil and plant debris from it, then clean with a detergent. Use disposable, plastic boots over footwear before entering a garden with *Fusarium*. Clean hand tools with a disinfectant such as bleach (10% solution) and rinse.

Pesticide	Rate of product/acre	Comments
<b>BACILLUS AMYLOLIQUEFACIENS [44]</b>		
Double Nickel 55 .....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates.</li> <li>▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.</li> </ul>
Double Nickel LC .....	0.5-6.0 qt at 7- to 10-day intervals.	
Stargus .....	3 to 4 qt at 7- to 10-day intervals.	
<b>PHOSPHOROUS ACID SALTS [33]</b>		
Fosphite <i>-or-</i> Resist 57 <i>-or-</i> Rampart.....	1.0-3.0 qt foliar application in a minimum of 100 gal water. 2.0 qt/100 gal (2/3 fl oz/gal) as a root dip.	<ul style="list-style-type: none"> <li>▪ DO NOT apply at intervals less than 3 days.</li> <li>▪ Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established.</li> <li>▪ Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached.</li> <li>▪ DO NOT apply to dormant or heat- or moisture-stressed plants.</li> <li>▪ DO NOT apply when conditions favor wet tissue for &gt;4 hours.</li> </ul>
Confine Extra .....	1.0-4.0 qt foliar application in a minimum of 20 gal water.	
K-Phite 7LP AG.....	1.0-3.0 qt in a minimum of 20 gal water.	
<b>STREPTOMYCES LYDICUS</b>		
Actinovate AG .....	3.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ For best results use a spreader-sticker.</li> </ul>
<b>TRICHODERMA ASPERELLUM/T. GAMSII</b>		
Bio-Tam 2.0 .....	1.5-3.0 oz/1000 row feet in-furrow. 2.5-3.0 lb banded application (see label). 2.5-5.0 lb broadcast followed by 0.25-0.5" water irrigation or 0.92-1.8 oz/100 square feet in 3-5 gal water. 0.025-0.075 oz/gal water handheld or backpack drench.	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>.</li> <li>▪ Two or more applications are recommended</li> <li>▪ See label for details on application methods.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Use of <b>Cannonball</b> and <b>Fontelis</b> for <i>Cylindrocarpum</i> root rot/rusty root or white mold may provide control of <i>Fusarium</i> root rot.</li> </ul>		

## Disease: PHYTOPHTHORA ROOT ROT (*Phytophthora cactorum*)

### CULTURAL CONTROL:

Plant only treated seed produced in a healthy garden. Select a site with a soil type that provides good drainage. Avoid working in the garden when the soil is wet to avoid compaction. Form plant beds with a flat top to allow water to runoff and prevent pooling. Avoid standing water by digging trenches to drain water away from the garden. Do not allow water from older ginseng gardens to drain into younger gardens. Work in diseased gardens at the end of the day. After equipment has been used in a garden with *Phytophthora*, use a power washer to remove soil and plant debris from it, then clean with a detergent. Use disposable, plastic boots over footwear before entering a garden with *Phytophthora*. Clean hand tools with a disinfectant such as bleach (10% solution) and rinse.

Fungicide Resistance Management: Alternate applications of different fungicides to prevent the development of strains of *Phytophthora cactorum* that are resistant to these fungicides. Strains of *Phytophthora cactorum* that are resistant to Ridomil Gold (mefenoxam) are prevalent in Wisconsin and some Michigan ginseng gardens.

Pesticide	Rate of product/acre	Comments
<b>★ CAPTAN★ [M04]</b>		
Drexel Captan 50W.....	4.0 lb at 7- to 10-day intervals as a drench in a minimum of 200 gal of water per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 32 lb/acre Drexel Captan 50W per year.</li> <li>▪ DO NOT exceed 30 lb/acre Captan 80WDG per year.</li> <li>▪ DO NOT apply within 365 days of harvest.</li> <li>▪ DO NOT apply Captan 80WDG within 14 days of harvest.</li> </ul>
Captan 80WDG .....	3.75 lb at 6- to 8-day intervals as a drench in a minimum of 200 gal of water per acre.	
<b>★ DIMETHOMORPH★ [40]</b>		
Forum.....	6.0 fl oz at 7-day intervals in a minimum of 20 gal of water per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 30 fl oz/acre or 5 applications per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> <li>▪ Begin applications before infection occurs.</li> <li>▪ DO NOT exceed 1 application of Forum before rotating to a labeled non-Group 40 fungicide for at least 1 application.</li> </ul>
<b>★ ETHABOXAM★ [22]</b>		
Elumin.....	8.0 fl oz at 7- to 11-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT make more than 2 applications per year.</li> <li>▪ DO NOT apply more than 16 fl oz per acre per year.</li> </ul>
<b>★ FENAMIDONE★ [11]</b>		
Reason 500SC.....	5.5-8.2 fl oz at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 24.6 fl oz/acre per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> </ul>
<b>★ FLUOPICOLIDE★ [43]</b>		
Presidio.....	3.0-4.0 fl oz at 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Must be tankmixed with another fungicide that has a different mode of action.</li> <li>▪ DO NOT exceed 4 applications per year.</li> </ul>
<b>★ MANDIPROPAMID★ [40]</b>		
Revus SC .....	8.0 fl oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 32 fl oz/acre per year.</li> <li>▪ DO NOT harvest within 2 days of treatment.</li> <li>▪ Make no more than 2 consecutive applications before switching to another effective non-Group 40 fungicide.</li> </ul>
<b>★ OXATHIPIPROLIN★ [49]</b>		
Orondis Gold 200.....	4.8-9.6 fl oz at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 4 applications per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> <li>▪ DO NOT apply more than 2 sequential applications of Orondis.</li> <li>▪ DO NOT exceed 19.2 fl oz of Orondis Gold 200 per year.</li> </ul>



## PHYTOPHTHORA ROOT ROT continued

Pesticide	Pesticide	Pesticide
<b>★ OXATHIPIPROLIN/CHLOROTHALONIL★ [49/M05]</b>		
Orondis Opti.....	1.75-2.5 pt at 14-day intervals. For ground application apply in at least 50 gal per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 10 pt per acre per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> <li>▪ DO NOT apply more than 2 sequential applications of Orondis.</li> <li>▪ DO NOT apply more than 0.125 lb ai per acre per year of oathiapiprolin products.</li> <li>▪ DO NOT apply more than 12.0 lb ai per acre per year of chlorothalonil products.</li> </ul>
<b>★ OXATHIPIPROLIN/MANDIPROPAMID★ [49/40]</b>		
Orondis Ultra.....	5.5-8.0 fl oz at 14-day intervals. For ground application apply at least 15 gal per acre. For aerial application apply at least 5 gal per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 4 applications per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> <li>▪ DO NOT apply more than 2 sequential applications of Orondis.</li> <li>▪ DO NOT apply more than 0.125 lb ai per acre per year of oathiapiprolin products.</li> <li>▪ DO NOT apply more than 0.522 lb ai per acre per year of mandipropamid products.</li> </ul>
<b>ALUMINUM TRIS[33]</b>		
Aliette WDG .....	5.0 lb at 7-day intervals in a minimum of 100 gal/acre water.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 9 applications per year.</li> <li>▪ DO NOT apply within 31 days of harvest.</li> <li>▪ DO NOT tankmix with copper compounds.</li> <li>▪ DO NOT apply with a spreader/sticker.</li> </ul>
<b>BACILLUS AMYLOLIQUEFACIENS [44]</b>		
Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates.</li> <li>▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.</li> </ul>
Double Nickel LC .....	0.5-6.0 qt at 7- to 10-day intervals.	
Stargus .....	3 to 4 qt at 7- to 10-day intervals.	
<b>MEFENOXAM [4]</b>		
Ridomil Gold GR.....	15 lb pre-emergence. 10 lb post-emergence (up to 4 applications) at monthly intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 60 lb/acre per growing season.</li> <li>▪ DO NOT exceed 45 lb/acre per growing season if Ridomil Gold EC or Ridomil Gold SL is applied in spring before plants have begun to grown.</li> <li>▪ DO NOT apply within 9 days of harvest.</li> <li>▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.</li> </ul>
Orondis Gold B -or- Ridomil Gold SL.....	0.75 pt as a drench in 100-400 gal water. 1.0-2.0 pt/A preplant incorporated or soil spray at planting.	<ul style="list-style-type: none"> <li>▪ DO NOT apply to ginseng foliage.</li> <li>▪ Apply ONCE only as a replacement for the pre-emergence application of Ridomil Gold GR.</li> <li>▪ NOTE: 80% of isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl..</li> </ul>
Ultra Flourish .....	1.5 pt in 100-400 gal water applied once as a drench.	<ul style="list-style-type: none"> <li>▪ DO NOT make supplemental applications.</li> <li>▪ DO NOT make more than one application.</li> <li>▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.</li> </ul>

## PHYTOPHTHORA ROOT ROT *continued*

Pesticide	Rate of product/acre	Comments
<b>METALAXYL [4]</b>		
MetaStar 2E <i>-or-</i> Metalaxyl 2E AG.....	1.5 qt as a drench in 100-400 gal/acre water.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 1 application per year.</li> <li>▪ Apply before early growth and follow with applications of a metalaxyl or mefenoxam granular product.</li> <li>▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.</li> </ul>
<b>PHOSPHOROUS ACID SALTS[33]</b>		
Fosphite <i>-or-</i> Resist 57 <i>-or-</i> Rampart.....	1.0-3.0 qt foliar application in a minimum of 100 gal water. 2.0 qt/100 gal (2/3 fl oz/gal) as a root dip.	<ul style="list-style-type: none"> <li>▪ DO NOT apply at intervals less than 3 days.</li> <li>▪ Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established.</li> <li>▪ Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached.</li> <li>▪ DO NOT apply to dormant or heat- or moisture-stressed plants.</li> <li>▪ DO NOT apply when conditions favor wet tissue for &gt;4 hours.</li> </ul>
Confine Extra .....	1.0-4.0 qt foliar application in a minimum of 20 gal water.	
K-Phite 7LP AG.....	1.0-3.0 qt in a minimum of 20 gal water.	
Reliant Systemic Fungicide	2.5 qt at 7-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 8 applications per season.</li> <li>▪ Apply in 100 gal water.</li> </ul>
Drexel Phiticide <i>-or-</i> Phostrol	4.5 pt at 7-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 9 applications per season.</li> <li>▪ Apply in 100 gal water.</li> </ul>
<b>REYNOUTRIA SACHALINENSIS [P5]</b>		
Regalia Biofungicide .....	1.0-3.0 qt soil drench in 100 gal water at 10- to 14-day intervals. 1.0-4.0 qt/acre or 2.2-8.8 fl oz per 1000 ft-row in-furrow applications in 5-15 gal water.	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>.</li> <li>▪ May be applied on day of harvest.</li> </ul>
<b>STREPTOMYCES LYDICUS</b>		
Actinovate AG.....	3-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ For best results use a spreader-sticker.</li> </ul>
<b>TRICHODERMA ASPERELLUM/T. GAMSII</b>		
Bio-Tam 2.0 .....	1.5-3.0 oz/1000 row feet in-furrow. 2.5-3.0 lb banded application (see label). 2.5-5.0 lb broadcast followed by 0.25-0.5" water irrigation or 0.92-1.8 oz/100 square feet in 3-5 gal water. 0.025-0.075 oz/gal water handheld or backpack drench.	<ul style="list-style-type: none"> <li>▪ Two or more applications are recommended</li> <li>▪ See label for details on application methods.</li> </ul>

## Disease: FOLIAR PHYTOPHTHORA (*Phytophthora cactorum*)

### CULTURAL CONTROL:

Straw mulch prevents the splash of *Phytophthora* spores from soil onto ginseng stems and foliage. See additional suggestions for *Phytophthora* root rot (above).

Pesticide	Rate of product/acre	Comments
<b>★ALUMINUM TRIS★[33]</b>		
Aliette WDG .....	5.0 lb at 7-day intervals in a minimum of 100 gal/acre water.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 9 applications per year.</li> <li>▪ DO NOT apply within 31 days of harvest.</li> <li>▪ DO NOT tankmix with copper compounds.</li> <li>▪ DO NOT apply with a spreader/sticker.</li> </ul>
<b>★CHLOROTHALONIL/ZOXAMIDE★ [M05/22]</b>		
Zing! .....	22.0-30.0 fl oz at 7-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT harvest within 28 days of treatment.</li> <li>▪ DO NOT make more than 6 applications or apply more than 1.02 lb zoxamide and 5.88 lb chlorothalonil per acre per year.</li> <li>▪ DO NOT apply through any type of irrigation system.</li> <li>▪ Use in a minimum spray volume of 80 gal of water per acre.</li> </ul>
<b>★DIMETHOMORPH★[40]</b>		
Forum .....	6.0 fl oz at 7-day intervals in a minimum of 20 gal of water per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 30 fl oz/acre or 5 applications per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> <li>▪ Begin applications before infection occurs.</li> <li>▪ DO NOT exceed 1 application of Forum before rotating to a labeled non-Group 40 fungicide for at least 1 application.</li> </ul>
<b>★FENAMIDONE★[11]</b>		
Reason 500SC.....	5.5-8.2 fl oz at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 24.6 fl oz/acre per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> </ul>
<b>★PHOSPHOROUS ACID SALTS★[33]</b>		
Fosphite <i>-or-</i> Resist 57 <i>-or-</i> Rampart.....	1.0-3.0 qt foliar application in a minimum of 100 gal water. 2.0 qt/100 gal (2/3 fl oz/gal) as a root dip.	<ul style="list-style-type: none"> <li>▪ DO NOT apply at intervals less than 3 days.</li> <li>▪ Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established.</li> <li>▪ Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached.</li> <li>▪ DO NOT apply to dormant or heat- or moisture-stressed plants.</li> <li>▪ DO NOT apply when conditions favor wet tissue for &gt;4 hours.</li> </ul>
Confine Extra .....	1.0-4.0 qt foliar application in a minimum of 20 gal water.	
K-Phite 7LP AG.....	1.0-3.0 qt in a minimum of 20 gal water.	
Reliant Systemic Fungicide	2.5 qt at 7-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 8 applications per season.</li> <li>▪ Apply in 100 gal water.</li> </ul>
Drexel Phiticide <i>-or-</i> Phostrol .....	4.5 pt at 7-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 9 applications per season.</li> <li>▪ Apply in 100 gal water.</li> </ul>
<b>COPPER OCTANOATE [M01]</b>		
Camelot O <i>-or-</i> Cueva .....	0.5-2.0 gal/100 gal at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Begin 2 weeks before disease appears. Apply at the higher rate at 7-day intervals when disease is increasing rapidly.</li> <li>▪ Reapply after rain.</li> <li>▪ DO NOT apply more than 33 gal of Cueva per acre per year</li> </ul>
Soap-Shield Flowable Liquid Copper Fungicide.....	0.5-2.0 fl oz/gal water at 7- to 10-day intervals.	

★Products with starred active ingredients are particularly recommended for problem infestations.

## Disease: POWDERY MILDEW (*Erysiphe* sp.)

### CULTURAL CONTROL:

Cool, humid conditions favor this disease. Choose garden sites that have good soil drainage with rows oriented in the direction of the prevailing winds. Avoid sites that are bordered by woods. Smaller gardens allow better air movement than larger gardens. Side and end curtains will decrease air movement and should be used only as needed.

Pesticide	Rate of product/acre	Comments
<b>★ AZOXYSTROBIN★[11]</b>		
Aframe <i>-or-</i> Azoxystar <i>-or-</i> Azoxyzone <i>-or-</i> Dexter SC <i>-or-</i> Satori <i>-or-</i> Tetraban <i>-or-</i> Trevo <i>-or-</i> Quadris F <i>-or-</i> Azoxy 2SC.....	9.0-15.4 fl oz at 5- to 7-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 1 foliar application before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT alternate with QoI fungicides such as Cabrio, Flint, Gem.</li> <li>▪ DO NOT exceed 4 applications per year.</li> <li>▪ DO NOT exceed 123 fl oz (2 lb a.i.)/acre per season.</li> </ul>
<b>★ BOSCALID★[7]</b>		
Endura 70WG .....	4.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action for at least 1 application.</li> <li>▪ DO NOT exceed 5 applications (22.5 oz)/acre per year.</li> </ul>
<b>★ DIFENOCONAZOLE/BENZOVINDIFLUPYR★[3/7]</b>		
Aprovia Top .....	13.5 fl oz at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 4 applications per season.</li> <li>▪ DO NOT apply within 15 days of harvest.</li> <li>▪ Do not apply more than 0.46 ai/A/year of difenoconazole-containing products.</li> </ul>
<b>★ FLUOPYRAM/TRIFLOXYSTROBIN★ [7/11]</b>		
Luna Sensation .....	7.6 fl oz at a 14-day interval.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 15.3 fl oz per acre per year.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> <li>▪ DO NOT exceed 2 applications before alternating with a different mode of action.</li> </ul>
<b>★ FLUOPYRAM/PYRIMETHANIL★ [7/9]</b>		
Luna Tranquility .....	16-27 fl oz at a 7-day interval.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 54.7 fl oz per acre per year.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> <li>▪ DO NOT exceed 2 applications before alternating with a different mode of action.</li> </ul>
<b>★ PYDIFLUMETOFEN/FLUDIOXONIL★ [7/12]</b>		
Miravis Prime.....	6.8 fl oz at 7- to 14-day intervals	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 sequential application before alternating with a fungicide with a different mode(s) of action.</li> <li>▪ DO NOT make more than 4 applications at the maximum rate per year.</li> <li>▪ DO NOT apply within in 7 days of harvest.</li> </ul>
<b>★ PYRACLOSTROBIN★[11]</b>		
Cabrio 20EG .....	8.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 1 sequential application before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT rotate with QoI fungicides such as Quadris, Flint, Gem.</li> <li>▪ DO NOT exceed 3 applications or 48 oz/acre per season.</li> </ul>

## POWDERY MILDEW continued

Pesticide	Rate of product/acre	Comments
<b>★PYRACLOSTROBIN/FLUXAPYROXAD★[11/7]</b>		
Merivon Xemium Brand Fungicide .....	4.0-5.5 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT make more than 2 sequential applications of Merivon before alternating to a labeled non-Group 7 or non-Group 11 fungicide.</li> <li>▪ DO NOT apply more than 16.5 fl oz/A of Merivon per year.</li> <li>▪ DO NOT apply more than 3 applications of Merivon per year.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> </ul>
<b>★TRIFLOXYSTROBIN★[11]</b>		
Flint Extra 50WG.....	2.0-3.0 oz at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 3 sequential applications of Flint and 1 application of Gem before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT rotate with QoI fungicides such as Quadris, Cabrio.</li> <li>▪ DO NOT exceed 4 applications (11.5 oz Gem or 12 oz Flint/acre) per season (see labels).</li> <li>▪ DO NOT apply within 7 days of harvest.</li> </ul>
Gem 500SC.....	1.9-2.9 fl oz at 14-day intervals.	
<b>BACILLUS AMYLOLIQUEFACIENS [44]</b>		
Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates.</li> <li>▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.</li> </ul>
Double Nickel LC .....	0.5-6.0 qt at 3- to 10-day intervals.	
<b>BACILLUS PUMILUS [44]</b>		
Sonata .....	2.0-4.0 qt at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ Use higher rates and shorter application intervals under heavy disease pressure.</li> </ul>
<b>COPPER OCTANOATE [M1]</b>		
Camelot O <i>-or-</i> Cueva .....	0.5-2.0 gal/100 gal at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Begin 2 weeks before disease appears.</li> <li>▪ Apply at higher rate at 7-day intervals when disease is increasing rapidly.</li> <li>▪ Reapply after rain.</li> <li>▪ DO NOT apply more than 33 gal of Cueva per acre per year</li> </ul>
Soap-Shield Flowable Liquid Copper Fungicide.....	0.5-2.0 fl oz/gal water at 7- to 10-day intervals.	
<b>CYPRODINIL/FLUDIOXONIL [9/12]</b>		
Switch 62.5WDG <i>-or-</i> Alterity 62.5WDG.....	11-14 oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action for at least 2 applications.</li> <li>▪ DO NOT exceed 56 oz/acre per year.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> </ul>
<b>FLUOPYRAM/DIFENOCONAZOLE [7/3]</b>		
Luna Flex.....	13.6 fl oz at 7-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 27.2 fl oz per acre per year.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> <li>▪ DO NOT exceed 2 applications before alternating with a different mode of action.</li> </ul>
<b>HYDROGEN DIOXIDE/PEROXYACETIC ACID</b>		
OxiDate 2.0.....	Preventive treatment: 1:200-1:400 dilution Curative treatment: 1:100 dilution Rescue treatment: 1:40 dilution	<ul style="list-style-type: none"> <li>▪ OxiDate 2.0: Preventative treatment: Apply the first three treatments at a curative rate at 5-day intervals. Reduce rate to 32.0 fl oz per 100 gal water after the completion of the third treatment and maintain 5-day interval until harvest.</li> <li>▪ OxiDate 5.0: Preventative treatment: Apply at 5- to 10-day intervals.</li> </ul>
OxiDate 5.0.....	Preventive treatment: 1:500-1:100 dilution	

★Products with starred active ingredients are particularly recommended for problem infestations.

## POWDERY MILDEW continued

Pesticide	Rate of product/acre	Comments
<b>LAMINARIN [P4]</b>		
Vacciplant .....	14.0-22.0 fl oz at 7- to- 14-day intervals.	<ul style="list-style-type: none"> <li>▪ At water volumes less than 70 gal per acre apply at 14.0 fl oz per acre. At water volumes above 70 gal per acre apply at 0.15% v/v.</li> </ul>
<b>NEEM OIL</b>		
Trilogy.....	0.5-1% at 7- to 14-day intervals in 25-100 gal water. 2.0 pt at 7- to 14-day intervals in 5 gal water.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 gal/acre per application.</li> </ul>
<b>PENTHIOPYRAD [7]</b>		
DuPont Fontelis .....	16-30 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 61 fl oz/acre per season.</li> <li>▪ May be applied day of harvest (PHI=0).</li> <li>▪ DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action.</li> </ul>
<b>PHOSPHOROUS ACID SALTS [33]</b>		
Fosphite <i>-or-</i> Rampart .....	1.0-3.0 qt foliar application in a minimum of 100 gal water. 2.0 qt/100 gal (2/3 fl oz/gal) as a root dip.	<ul style="list-style-type: none"> <li>▪ DO NOT apply at intervals less than 3 days.</li> <li>▪ Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established.</li> <li>▪ Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached.</li> <li>▪ DO NOT apply to dormant or heat- or moisture-stressed plants.</li> <li>▪ DO NOT apply when conditions favor wet tissue for &gt;4 hours.</li> </ul>
Confine Extra <i>-or-</i> K-Phite 7LP AG .....	1.0-4.0 qt foliar application in a minimum of 20 gal water.	
<b>POTASSIUM BICARBONATE</b>		
Kaligreen .....	2.5-3.0 lbs at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 5 lb per application</li> <li>▪ DO NOT use when disease pressure is severe.</li> </ul>
Milstop .....	2-5 lb at 7- to 14-day intervals.	
<b>POTASSIUM SILICATE</b>		
Sil-Matrix.....	1.0-4.0 qt in 50-250 gal water at 7-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 10 qts per acre per application.</li> <li>▪ DO NOT apply more than 20 gal per acre per season.</li> <li>▪ Only apply this product through drip, sprinkler, furrow, flood, or border irrigation systems.</li> </ul>
<b>REYNOUTRIA SACHALINENSIS [P5]</b>		
Regalia Biofungicide .....	1.0-4.0 qt foliar application in 25-100 gal water at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ May be applied on day of harvest.</li> </ul>
<b>STREPTOMYCES LYDICUS</b>		
Actinovate AG.....	3.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ For best results use spreader-sticker.</li> </ul>
<b>TEE TREE OIL/DIFENOCONAZOLE [46/3]</b>		
Regev .....	4-8.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 34 fl oz/A of Regev per season.</li> <li>▪ DO NOT apply within 48 hours of harvest.</li> </ul>

## Disease: **PYTHIUM ROOT ROT** (*Pythium* spp.)

### CULTURAL CONTROL:

Select a site with a soil type that provides good drainage. Avoid working in the garden when the soil is wet to avoid compaction. Form plant beds with a flat top to allow water to run off and prevent pooling. Avoid standing water by digging trenches to drain water away from the garden. Do not allow water from older ginseng gardens to drain into younger gardens.

Pesticide	Rate of product/acre	Comments
<b>★ CAPTAN★ [M04]</b>		
Drexel Captan 50W.....	4.0 lb at 7- to 10-day intervals as a drench in a minimum of 200 gal of water per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 32 lb/acre Drexel Captan 50W per year.</li> <li>▪ DO NOT exceed 30 lb/acre Captan 80WDG per year.</li> <li>▪ DO NOT apply Drexel Captan 50W within 365 days of harvest.</li> <li>▪ DO NOT apply Captan 80WDG within 14 days of harvest.</li> </ul>
Captan 80WDG.....	3.75 lb at 6- to 8-day intervals as a drench in a minimum of 200 gal of water per acre.	
<b>★ FENAMIDONE★ [11]</b>		
Reason 500SC.....	5.5-8.2 fl oz at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 24.6 fl oz/acre per year.</li> <li>▪ DO NOT harvest within 14 days of treatment.</li> </ul>
<b>★ MEFENOXAM★ [4]</b>		
Ridomil Gold GR.....	15 lb pre-emergence. 10 lb (up to 4 applications) at monthly intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 60 lb/acre per growing season.</li> <li>▪ DO NOT exceed 45 lb/acre per growing season if Ridomil Gold EC or Ridomil Gold SL is applied in spring before plants have begun to grown.</li> <li>▪ DO NOT apply within 9 days of harvest.</li> </ul>
Ridomil Gold SL.....	0.75 pt in 100-400 gal water drench.	
<b>★ METALAXYL★ [4]</b>		
MetaStar 2E.....	1.5 qt as a drench in 100 to 400 gal/acre water.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 1 application per year.</li> <li>▪ Apply before early growth and follow with applications of a metalyxyl or mefenoxam granular product.</li> </ul>
<b>AZOXYSTROBIN [11]</b>		
<ul style="list-style-type: none"> <li>▪ Banded applications: band width 7" or less. Banded applications contact the foliage and are counted as a foliar application.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Active against <i>Rhizoctonia</i>, <i>Pythium</i>.</li> <li>▪ DO NOT exceed 1 foliar application before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT alternate with QoI fungicides such as Cabrio, Flint, Gem.</li> <li>▪ DO NOT exceed 4 applications per year.</li> <li>▪ DO NOT exceed 123 fl oz (2 lb a.i.)/acre per season.</li> </ul>
Aframe -or- Azoxystar -or- Azoxyzone -or- Satori -or- Tetraban -or- Trevo -or- Quadris F.....	0.4-0.8 fl oz/1000 row feet. 0.7 fl oz/1000 row feet maximum for 22" rows.	
<ul style="list-style-type: none"> <li>▪ In furrow applications: apply in 3-15 gal water at planting.</li> </ul>		
Quadris F.....	See label for fl oz/acre depending on row sizes.	
<b>BACILLUS AMYLOLIQUEFACIENS [44]</b>		
Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates.</li> <li>▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.</li> </ul>
Double Nickel LC.....	0.5-6.0 qt at 7- to 10-day intervals.	
Stargus.....	3 to 4 qt at 7- to 10-day intervals.	
<b>FLUOPICOLIDE [43]</b>		
Presidio.....	3.0-4.0 fl oz at 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Must be tankmixed with another fungicide that has a different mode of action.</li> <li>▪ DO NOT exceed 4 applications per year.</li> </ul>

★Products with starred active ingredients are particularly recommended for problem infestations.

## PYTHIUM ROOT ROT continued

Pesticide	Rate of product/acre	Comments
<b>GLIOCLADIUM VIRENS</b>		
Soilgard .....	2.0-10 lbs in a 50 gal water minimum.	<ul style="list-style-type: none"> <li>▪ Apply in 50-100 gallons of water per acre as banded drench in-furrow at or immediately before planting.</li> </ul>
<b>PHOSPHOROUS ACID SALTS [33]</b>		
Fosphite <i>-or-</i> Rampart .....	1.0-3.0 qt foliar application in a minimum of 100 gal water. 2.0 qt/100 gal (2/3 fl oz/gal) as a root dip.	<ul style="list-style-type: none"> <li>▪ DO NOT apply at intervals less than 3 days.</li> <li>▪ Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established.</li> <li>▪ Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached.</li> <li>▪ DO NOT apply to dormant or heat- or moisture-stressed plants.</li> </ul>
Confine Extra .....	1.0-4.0 qt foliar application in a minimum of 20 gal water.	
K-Phite 7LP AG.....	1.0-3.0 qt in a minimum of 20 gal water.	
<b>REYNOUTRIA SACHALINENSIS [P5]</b>		
Regalia Biofungicide .....	1.0-3.0 qt soil drench in 100 gal water at 10- to 14-day intervals. 1.0-4.0 qt/acre or 2.2-8.8 fl oz per 1000 ft-row in-furrow applications in 5-15 gal water.	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>.</li> <li>▪ May be applied on day of harvest.</li> </ul>
<b>STREPTOMYCES LYDICUS</b>		
Actinovate AG .....	3.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ For best results use a spreader-sticker.</li> </ul>
<b>TRICHODERMA ASPERELLUM/T. GAMSII</b>		
Bio-Tam 2.0 .....	1.5-3.0 oz/1000 row feet in-furrow. 2.5-3.0 lb banded application (see label). 2.5-5.0 lb broadcast followed by 0.25-0.5" water irrigation or 0.92-1.8 oz/100 square feet in 3-5 gal water. 0.025-0.075 oz/gal water handheld or backpack drench.	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>.</li> <li>▪ Two or more applications are recommended</li> <li>▪ See label for details on application methods.</li> </ul>
<ul style="list-style-type: none"> <li>▪ The use of <b>Elumin</b> for <i>Phytophthora</i> root rot control may offer <i>Pythium</i> control.</li> </ul>		



## Disease: RHIZOCTONIA CROWN AND ROOT ROT (*Rhizoctonia solani*)

### CULTURAL CONTROL:

Maintain even moisture conditions to avoid plant stress. Avoid soil situations that range from too dry to soil saturation.

Pesticide	Rate of product/acre	Comments
<b>★ AZOXYSTROBIN ★ [11]</b>		
<ul style="list-style-type: none"> <li>▪ Banded applications: band width 7" or less. Banded applications contact the foliage and are counted as a foliar application.</li> </ul>		<ul style="list-style-type: none"> <li>▪ Active against <i>Rhizoctonia</i>, <i>Pythium</i>.</li> <li>▪ DO NOT exceed 1 foliar application before alternating with a fungicide with a different mode of action.</li> <li>▪ DO NOT alternate with QoI fungicides such as Cabrio, Flint, Gem.</li> <li>▪ DO NOT exceed 4 applications per year.</li> <li>▪ DO NOT exceed 123 fl oz (2 lb a.i.)/acre per season.</li> </ul>
Aframe <i>-or-</i> Azoxystar <i>-or-</i> Azoxyzone <i>-or-</i> Azoxy 2SC <i>-or-</i> Satori <i>-or-</i> Tetraban <i>-or-</i> Trevo <i>-or-</i> Quadris F.....	0.4-0.8 fl oz/1000 row feet. 0.7 fl oz/1000 row feet maximum for 22" rows.	
<ul style="list-style-type: none"> <li>▪ In furrow applications: apply in 3-15 gal water at planting.</li> </ul>		
Quadris F .....	See label for fl oz/acre depending on row sizes.	
<b>★ FLUAZINAM ★ [29]</b>		
Omega 500F <i>-or-</i> Orbus 4F	1.0-1.5 pt at 14-day intervals in a minimum of 100 gal water.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 6 pt per season.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> </ul>
<b>BACILLUS AMYLOLIQUEFACIENS [44]</b>		
Double Nickel 55 .....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates.</li> <li>▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.</li> </ul>
Double Nickel LC .....	0.5-6.0 qt at 7- to 10-day intervals.	
Stargus .....	3 to 4 qt at 7- to 10-day intervals.	
<b>CAPTAN [M04]</b>		
Drexel Captan 50W .....	4.0 lb at 7- to 10-day intervals as a drench in a minimum of 200 gal of water per acre.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 32 lb/acre Drexel Captan 50W per year.</li> <li>▪ DO NOT exceed 30 lb/acre Captan 80WDG per year.</li> <li>▪ DO NOT apply Drexel Captan 50W within 365 days of harvest.</li> <li>▪ DO NOT apply Captan 80WDG within 14 days of harvest.</li> </ul>
Captan 80WDG.....	3.75 lb at 6- to 8-day intervals as a drench in a minimum of 200 gal of water per acre.	
<b>GLIOCLADIUM VIRENS</b>		
Soilgard .....	2.0-10 lbs in a 50 gal water minimum.	<ul style="list-style-type: none"> <li>▪ Apply in 50-100 gallons of water per acre as banded drench in-furrow at or immediately before planting.</li> </ul>
<b>HYDROGEN DIOXIDE/PEROXYACETIC ACID</b>		
OxiDate 2.0.....	Preventive treatment: 1:200-1:400 dilution Curative treatment: 1:100 dilution Rescue treatment: 1:40 dilution	<ul style="list-style-type: none"> <li>▪ OxiDate 2.0: Preventative treatment: Apply the first three treatments at a curative rate at 5-day intervals. Reduce rate to 32.0 fl oz per 100 gal water after the completion of the third treatment and maintain 5-day interval until harvest.</li> <li>▪ OxiDate 5.0: Preventative treatment: Apply at 5- to 10-day intervals.</li> </ul>
OxiDate 5.0.....	Preventive treatment: 1:500-1:100 dilution	

## RHIZOCTONIA CROWN AND ROOT ROT continued

Pesticide	Rate of product/acre	Comments
<b>PHOSPHOROUS ACID SALTS [33]</b>		
Fosphite <i>-or-</i> Resist 57 <i>-or-</i> Rampart.....	1.0-3.0 qt foliar application in a minimum of 100 gal water. 2.0 qt/100 gal (⅔ fl oz/gal) as a root dip.	<ul style="list-style-type: none"> <li>▪ DO NOT apply at intervals less than 3 days.</li> <li>▪ Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established.</li> <li>▪ Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached.</li> <li>▪ DO NOT apply to dormant or heat- or moisture-stressed plants.</li> <li>▪ DO NOT apply when conditions favor wet tissue for &gt;4 hours.</li> </ul>
Confine Extra .....	1.0-4.0 qt foliar application in a minimum of 20 gal water.	
K-Phite 7LP AG.....	1.0-3.0 qt in a minimum of 20 gal water.	
<b>POLYOXIN D ZINC SALT [19]</b>		
Affirm <i>-or-</i> Ph-D WDG .....	6.2 oz drench at 14- to 28-day intervals.	<ul style="list-style-type: none"> <li>▪ Use in alternation with fungicides that have a different mode of action.</li> <li>▪ DO NOT exceed 3 applications (2.1 oz a.i./acre) per season.</li> </ul>
<b>REYNOUTRIA SACHALINENSIS [P5]</b>		
Regalia Biofungicide .....	1.0-3.0 qt soil drench in 100 gal water at 10- to 14-day intervals. 1.0-4.0 qt/acre or 2.2-8.8 fl oz per 1000 ft-row in-furrow applications in 5-15 gal water. 1.0-4.0 qt/acre chemigation at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>.</li> <li>▪ May be applied on day of harvest.</li> </ul>
<b>STREPTOMYCES LYDICUS</b>		
Actinovate AG .....	3.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> <li>▪ For best results use a spreader-sticker.</li> </ul>
<b>TRICHODERMA ASPERELLUM/T. GAMSII</b>		
Bio-Tam 2.0 .....	1.5-3.0 oz/1000 row feet in-furrow. 2.5-3.0 lb banded application (see label). 2.5-5.0 lb broadcast followed by 0.25-0.5" water irrigation or 0.92-1.8 oz/100 square feet in 3-5 gal water. 0.025-0.075 oz/gal water handheld or backpack drench.	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>.</li> <li>▪ Two or more applications are recommended</li> <li>▪ See label for details on application methods.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Use of <b>Meteor/Rovral</b> tankmixed or alternated with fixed copper fungicides for control of Alternaria leaf and stem blight may provide some control of Rhizoctonia crown and root rot. Adequate coverage of lower stems is critical for obtaining any crown/root rot control.</li> <li>▪ Use of <b>Cabrio 20EG</b> for control of Alternaria leaf and stem blight may provide some control of Rhizoctonia crown and root rot.</li> <li>▪ Use of <b>Cannonball</b> for Cylindrocarpon root rot/rusty root or white mold may provide control of Rhizoctonia crown and root rot.</li> <li>▪ See also fumigation section for preplant chemical control of Rhizoctonia crown and root rot.</li> </ul>		

**Disease: WHITE MOLD LEAF AND STEM BLIGHT AND ROOT ROT**  
**(*Sclerotinia sclerotiorum*)**

CULTURAL CONTROL:

Remove and destroy infected plants.

Pesticide	Rate of product/acre	Comments
<b>★FLUAZINAM★[29]</b>		<ul style="list-style-type: none"> <li>▪ DO NOT exceed 6 pt per season.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> <li>▪ Use 1 pt/acre when the disease first appears or when conditions are favorable. Under conditions that favor severe disease development, use higher rate.</li> </ul>
Omega 500F <i>-or-</i> Orbus 4F	1.0-1.5 pt at 7- to 14-day intervals in a minimum of 100 gal water.	
<b>★FLUDIOXONIL★[12]</b>		<ul style="list-style-type: none"> <li>▪ DO NOT apply within 14 days of harvest.</li> <li>▪ DO NOT exceed 4 lb/acre per season.</li> <li>▪ DO NOT apply more than 32 oz (1.0 lb a.i./A) per crop.</li> </ul>
Cannonball WG.....	4.0-8.0 oz/acre at 14-21 day intervals.	
<b>BACILLUS AMYLOLIQUEFACIENS [44]</b>		<ul style="list-style-type: none"> <li>▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates.</li> <li>▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.</li> </ul>
▪ Foliar application.		
Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	
Double Nickel LC .....	0.5-6.0 qt at 7- to 10-day intervals.	
Stargus .....	3 to 4 qt at 7- to 10-day intervals.	
▪ Soil application.		
Double Nickel 55.....	0.125-1.0 lb at 7- to 10-day intervals.	
Double Nickel LC .....	0.5-6.0 qt at 3- to 10-day intervals.	
<b>BACILLUS SUBTILIS [44]</b>		<ul style="list-style-type: none"> <li>▪ First application as a soil or seedline drench, banded in-furrow at planting.</li> <li>▪ Follow-up applications via drip/sprinkler, spray onto soil surface and/or lower plant parts followed immediately with overhead irrigation, or inject directly into the rooting zone using shanks, etc.</li> <li>▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates.</li> <li>▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.</li> </ul>
Apply at stated interval or as needed.		
Cease .....	3.0-6.0 qt at 7- to 10-day intervals.	
Serenade OPTI.....	14.0-20.0 oz/acre at 7- to 10-day intervals.	
Aviv.....	10-30 fl oz at 5- to 10-day intervals.	
<b>LAMINARIN [P4]</b>		<ul style="list-style-type: none"> <li>▪ At a water volume less than 70 gal per acre, apply at 14.0 fl oz per acre. At water volumes above 70 gal per acre apply at 0.15% v/v.</li> </ul>
Vacciplant .....	14.0-22.0 fl oz at 7- to- 14-day intervals.	
<b>PENTHIOPYRAD [7]</b>		<ul style="list-style-type: none"> <li>▪ DO NOT exceed 61 fl oz/acre per season.</li> <li>▪ May be applied day of harvest (PHI=0).</li> <li>▪ DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action.</li> </ul>
DuPont Fontelis .....	16-30 fl oz at 7- to 14-day intervals.	

## WHITE MOLD LEAF AND STEM BLIGHT AND ROOT ROT continued

Pesticide	Rate of product/acre	Comments
<b>REYNOUTRIA SACHALINENSIS [P5]</b>		<ul style="list-style-type: none"> <li>▪ May be applied on day of harvest.</li> </ul>
Regalia Biofungicide .....	1.0-4.0 qt foliar application in 25-100 gal water at 7- to 10-day intervals.	
<b>STREPTOMYCES LYDICUS</b>		<ul style="list-style-type: none"> <li>▪ For best results use a spreader-sticker.</li> </ul>
Actinovate AG .....	3.0-12 oz at 7- to 14-day intervals.	
<b>TEE TREE OIL/DIFENOCONAZOLE [46/3]</b>		<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 34 fl oz/A of Regev per season.</li> <li>▪ DO NOT apply within 48 hours of harvest.</li> </ul>
Regev .....	4-8.5 oz at 7- to 14-day intervals.	
<b>TRICHODERMA ASPERELLUM/T. GAMSII</b>		<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>.</li> <li>▪ Two or more applications are recommended</li> <li>▪ See label for details on application methods.</li> </ul>
Bio-Tam 2.0 .....	1.5-3.0 oz/1000 row feet in-furrow. 2.5-3.0 lb banded application (see label). 2.5-5.0 lb broadcast followed by 0.25-0.5" water irrigation or 0.92-1.8 oz/100 square feet in 3-5 gal water. 0.025-0.075 oz/gal water handheld or backpack drench.	
<ul style="list-style-type: none"> <li>▪ See also fumigation section for preplant chemical control of white mold.</li> </ul>		

**SOIL INSECTS (climbing cutworms, cutworms, white grubs, wireworms)**  
**ABOVE-GROUND INSECTS (aphids, true bugs, cutworms, leafrollers, thrips, white grubs, wireworms)**

**CULTURAL CONTROL:**

Climbing cutworms and cutworms: Cutworms are one of the top three insect problems affecting ginseng. Cutworms are the larvae of night-flying moths and feed on stems, girdling young plants and chewing ginseng tops. These insects are an especially troubling pest in seedling beds. These insects feed on weed species, particular grasses. If a garden site is selected that follows cereals, till the site thoroughly.

White grubs: White grubs feed on the root, resulting in a “hollowing out” of the root. They have a long life cycle and are a common problem. Prior to establishing a new garden, provide a one-year fallow period. Minimize the weeds in the fallow area.

Wireworm: Wireworms feed on roots and ungerminated or newly germinated seeds, especially of cereal crops. Prior to establishing a new garden, provide a one- to two-year fallow period. Minimize the weeds in the fallow area. Choose sites that have not recently hosted cereal crops.

Aphids may infest the berries and leaves and feed via sucking. Aphids may be an occasional problem later in the season, especially when gardens are located near an alfalfa field. Scout and spot-treat infested area.

Pesticide	Rate of product/acre	Comments
<b>★ BIFENTHRIN ★</b>		
Brigade WSB .....	12.8-16.0 oz at 7-day intervals minimum in a minimum of 25 gal water for aphids, cutworms.	<ul style="list-style-type: none"> <li>▪ RESTRICTED USE PESTICIDE.</li> <li>▪ Apply no more than once every 7 days.</li> <li>▪ DO NOT apply within 21 days of harvest.</li> <li>▪ DO NOT exceed 0.5 lb active/acre per season.</li> </ul>
Bifen 2 AG Gold <i>-or-</i> Bifenture EC <i>-or-</i> Brigade 2EC <i>-or-</i> Discipline 2EC <i>-or-</i> Fanfare EC <i>-or-</i> Fanfare ES <i>-or-</i> Lancer 2EC <i>-or-</i> Sniper <i>-or-</i> Tundra EC .....	5.12-6.4 fl oz at 7-day intervals, in a minimum of 25 gal water for aphids, cutworms.	
Sniper LFR.....	6.8-8.5 fl oz at 7-day intervals in a minimum of 25 gal water for aphids, cutworms.	
<b>★ BIFENTHRIN/ CHLORANTRANILIPROLE ★</b>		
Elevest.....	5.6-9.6 fl oz at 7-day intervals in a minimum of 5 gal/A water for aphids, cutworms, armyworms.	<ul style="list-style-type: none"> <li>▪ RESTRICTED USE PESTICIDE.</li> <li>▪ Apply no more than once every 7 days.</li> <li>▪ DO NOT apply within 21 days of harvest.</li> <li>▪ DO NOT exceed 28.8 fl oz pf Elevest per acre per season.</li> </ul>
<b>★ CARBARYL ★</b>		
Carbaryl 4L <i>-or-</i> Sevin Brand XLR Plus.	1.0-2.0 qt at 7-day intervals for bugs, cutworms.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 6 applications Carbaryl 4L/Sevin Brand XLR Plus or 3 applications Lebanon Sevin 7G per season.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> <li>▪ DO NOT apply to when weed flowers are present.</li> </ul>
Lebanon Sevin 7G.....	0.7 lb/1000 sq ft at 7-day intervals.	
<b>★ CHLORANTRANILIPROLE ★</b>		
Coragen.....	3.5-7.5 fl oz per acre at minimum 3-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 4 applications per growing season.</li> <li>▪ DO NOT apply more than 15.4 fl oz of Coragen or 20.5 fl oz of Vantacor per acre per year.</li> </ul>
Vantacor .....	1.2-2.5 fl oz per acre at minimum 3-day intervals.	

## SOIL INSECTS, ABOVE-GROUND INSECTS *continued*

Pesticide	Rate of product/acre	Comments
<b>★ DIAZINON★</b>		
Diazinon AG500 .....	0.75-1.0 pt applied once for aphids, bugs in 10-100 gal water.	<ul style="list-style-type: none"> <li>▪ RESTRICTED USE PESTICIDE.</li> <li>▪ DO NOT exceed 1 application per growing season.</li> <li>▪ DO NOT apply during flowering on 3- and 4-year-old plants.</li> <li>▪ DO NOT apply within 30 days of harvest.</li> <li>▪ DO NOT graze treated areas or feed treated forage to livestock.</li> </ul>
Diazinon AG600 WBC.....	9.5-12.75 fl oz applied once for aphids, bugs in 10-100 gal/acre water.	
<b>ALPHA-CYPERMETHRIN</b>		
Fastac EC <i>-or-</i> Fastac CS ..	1.3-3.8 fl oz/acre minimum 4-day reapplication intervals for aphids and cutworms.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than 11.4 fl oz of product per acre per year.</li> <li>▪ DO NOT apply to foliage used for livestock feed.</li> </ul>
<b>AZADIRACTIN</b>		
Aza-Direct .....	1.0-2.0 pt at 7- to 10-day intervals for aphids, bugs, cutworms, leafrollers, thrips as a foliar spray or soil drench. Up to 3.5 pt for heavy infestations.	<ul style="list-style-type: none"> <li>▪ Best results obtained with 2-3 applications.</li> <li>▪ May be applied on the day of harvest.</li> <li>▪ AzaGuard- use in combination with 0.25-1.0% non-phytotoxic crop oil in sufficient water to cover the undersides of the leaves.</li> </ul>
AzaGuard .....	10.0-16.0 fl oz for thrips, aphids at 7-10-day intervals. 2.0-4.0 fl oz for cutworms, armyworms spray when they first appear.	
Ecozin Plus 1.2% ME.....	15-30 oz at 7- to 10 day intervals for aphids, bugs, cutworms, leafrollers, thrips.	
Molt-X.....	8.0 oz for cutworms, leafrollers. 10 oz for aphids, bugs, thrips. <ul style="list-style-type: none"> <li>▪ Apply at 7- to 10-day intervals for aphids, bugs, cutworms, and leafrollers.</li> <li>▪ Apply at 5- to 7-day intervals for thrips.</li> </ul>	
Neemix 4.5.....	5.0-7.0 fl oz for aphids at 7- to 10-day intervals. 4.0-16 fl oz for leafroller larvae/nymphs at 7- to 10-day intervals.	
<b>AZADIRACTIN/PYRETHRINS</b>		
Azera .....	1.0-3.5 pt at 5- to 7-day intervals in a minimum of 30 gal water for aphids, true bugs, cutworms, leafrollers, thrips.	<ul style="list-style-type: none"> <li>▪ Use 3-3.5 pt for high populations of adults and/or hard to kill insects.</li> </ul>

## SOIL INSECTS, ABOVE-GROUND INSECTS *continued*

Pesticide	Rate of product/acre	Comments
<b><i>BACILLUS THURINGIENSIS</i></b>		
Dipel DF Insecticide .....	0.5-2.0 lb at 3- to 14-day intervals in a minimum of 20 gal water.	<ul style="list-style-type: none"> <li>▪ Under heavy pressure pest population pressure, use higher label rates, shorten the spray interval, and/or raise spray volume.</li> </ul>
Xentari Biological Insecticide	0.5-2.0 lb at 3- to 14-day intervals in a minimum of 10 gal water for leafrollers and cutworms. Or 0.5-2 lb for armyworms.	
<b><i>BEAUVERIA BASSIANA</i></b>		
BotaniGard ES .....	0.5-1.0 qt/100 gal at 5- to 10-day intervals in a minimum of 30 gal water for aphids, bugs. 1.0-2.0 qt/100 gal thrips.	<ul style="list-style-type: none"> <li>▪ May be applied on the day of harvest.</li> <li>▪ Aphids may require 2- to 5-day intervals.</li> <li>▪ Use up to 3 qt Mycotrol for extreme insect pressure.</li> </ul>
Mycotrol ESO.....	0.25-1.0 qt at 5- to 10-day intervals for aphids, bugs.	
Mycotrol WPO.....	0.5-3.0 lb/100 gallons at 5- to 10-day intervals for aphids, bugs.	
<b><i>BEAUVERIA BASSIANA/PYRETHRINS [3A]</i></b>		
BotaniGard Maxx .....	0.5-1.0 qt/100 gal at 5- to 10-day intervals for aphids.	<ul style="list-style-type: none"> <li>▪ May be applied on the day of harvest.</li> <li>▪ Aphids may require 2- to 5-day intervals.</li> </ul>
<b><i>BURKHOLDERIA SPP.</i></b>		
Venerate XC .....	1.0-8.0 qt for armyworms, aphids, and thrips.	<ul style="list-style-type: none"> <li>▪ Labeled for control of Armyworms, European corn borer, and loopers.</li> </ul>
<b><i>CAPSICUM OLERESIN EXTRACT</i></b>		
Captiva .....	1.0-2.0 pt/100 gal water at 4- to 7-day intervals for thrips and leafhoppers.	<ul style="list-style-type: none"> <li>▪ When pest pressure is heavier, use higher rates and consider tank mixes with other insecticides or miticides.</li> </ul>
<b><i>CHROMOBACTERIUM SUBTSUGAE</i></b>		
Grandevo.....	1.0-3.0 lb for armyworms or 2-3 lb for aphids at 3- to 10-day intervals.	<ul style="list-style-type: none"> <li>▪ Under heavy pressure pest population pressure, use higher label rates, shorten the spray interval, and/or raise spray volume.</li> </ul>
<b><i>CYANTRANILIPROLE</i></b>		
Exirel.....	13.5-20.5 fl oz at minimum of 5-day interval for aphids.	<ul style="list-style-type: none"> <li>▪ For best performance use Exirel with an effective adjuvant.</li> <li>▪ DO NOT apply more than 0.4 lb ai/acre per calendar year.</li> </ul>
Verimark.....	10-13.5 fl oz to soil at planting	
<b><i>DELTAMETHRIN</i></b>		
Delta Gold.....	1.0 to 2.4 fl oz at 3-day intervals minimum	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 12 fl oz/acre (0.14 lb/acrea a.i.) per growing season.</li> <li>▪ DO NOT apply within 3 days of harvest.</li> <li>▪ DO NOT apply to foliage used for livestock feed.</li> </ul>

## SOIL INSECTS, ABOVE-GROUND INSECTS *continued*

Pesticide	Rate of product/acre	Comments
<b>FLONICAMID</b>		
Beleaf 50SG .....	2.0-2.8 oz at minimum of 7-day intervals in minimum of 10 gal water for aphids, bugs.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2.8 oz/acre per application.</li> <li>▪ DO NOT exceed 8.4 oz/acre per season.</li> <li>▪ DO NOT exceed 3 applications at 2.8 oz/acre per season.</li> <li>▪ Use lower rate for building populations, higher rate for greater populations and/or dense foliage.</li> <li>▪ Scout and retreat as necessary.</li> </ul>
<b>FLUPYRADIFURONE</b>		
Sivanto 200 SL.....	7.0-10.5 fl oz at 10-day intervals in a minimum of 10 gal water for aphids.	<ul style="list-style-type: none"> <li>▪ DO NOT apply within 7-days of harvest.</li> <li>▪ Maximum amount of Sivanto 200 SL and Sivanto Prime product applied per year cannot exceed 28.0 fl oz.</li> <li>▪ Maximum amount of Sivanto HL product applied per year cannot exceed 14 fl oz.</li> </ul>
Sivanto Prime.....	7.0-14.0 fl oz at 10-day intervals in a minimum of 10 gal water for aphids.	
Sivanto HL .....	3.5-7.0 fl oz at 10-day intervals.	
<b>IMIDACLOPRID</b>		
<ul style="list-style-type: none"> <li>▪ Foliar applications</li> </ul>		
Prey 1.6 <i>-or-</i> Sherpa.....	3.5 fl oz at 5-day intervals for aphids.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 3 applications per season.</li> <li>▪ DO NOT exceed 10.5 fl oz Prey/Sherpa per season.</li> <li>▪ DO NOT exceed 8.4 fl oz Macho 2.0FL/Montana 2F/Nuprid 2SC Soil/Foliar per season.</li> <li>▪ DO NOT exceed 4.2 fl oz Macho 4.0/Alias 4F/Midash Forte/Montana 4F/Nuprid 4F Max per season.</li> <li>▪ DO NOT exceed 3.7 fl oz Admire Pro per season.</li> <li>▪ DO NOT exceed 2.8 oz Malice per season.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> <li>▪ DO NOT apply Alias 2F within 21 days of harvest.</li> </ul>
Macho 2.0FL <i>-or-</i> Montana 2F .....	2.8 fl oz at 5-day intervals for aphids.	
Wrangler <i>-or-</i> Alias 4F <i>-or-</i> Advise Four <i>-or-</i> Macho 4.0 <i>-or-</i> Midash Forte <i>-or-</i> Montana 4F <i>-or-</i> Nuprid 4F Max <i>-or-</i> Provoke.....	1.4 fl oz at 5-day intervals (minimum) for aphids.	
Admire Pro.....	1.2 fl oz at 5-day intervals (minimum) for aphids.	
Alias 2F.....	10-24 fl oz. One application allowed per year.	



## SOIL INSECTS, ABOVE-GROUND INSECTS *continued*

Pesticide	Rate of product/acre	Comments
<b>IMIDACLOPRID (CONTINUED)</b>		
▪ Soil applications		
Admire Pro <i>-or-</i> Nuprid 4.6F Pro.....	0.31-0.74 fl oz/1000 row ft (4.4-10.5 fl oz/ acre) applied once for aphids, thrips.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 1 application per growing season.</li> <li>▪ DO NOT exceed 24 fl oz Macho 2.0FL /Alias/AmTide Imidacloprid/Couraze 2F/Midash 2SC Ag/ Widow/Montana2F/Nuprid 2F/Nuprid 2SC Soil/Foliar per season.</li> <li>▪ DO NOT apply within 21 days of harvest.</li> <li>▪ Chemigate through low-pressure drip, trickle, micro-sprinkler; <i>-or-</i> in furrow spray/shanked in 1-2" below seed row during planting; <i>-or-</i> narrow band (2" or less) 1-2" directly below seed row 14 or fewer days before planting.</li> <li>▪ DO NOT exceed 3.0 oz/acre Imidashot DF</li> </ul>
Wrangler .....	0.35-0.85 fl oz/1000 row ft (5-12 fl oz/ acre) applied once for aphids.	
Alias 4F <i>-or-</i> Midash Forte <i>-or-</i> Montana 4F <i>-or-</i> Nuprid 4F Max.....	0.35-0.85 fl oz/1000 row ft (5-12 fl oz/ acre) applied once for aphids, thrips	
Macho 2.0FL <i>-or-</i> Malice 2F <i>-or-</i> Widow .....	0.7-1.7 fl oz/1000 row-feet (10-24 fl oz/acre) applied once for aphids.	
Montana 2F.....	0.7-1.7 fl oz/1000 row-feet (10-24 fl oz/acre) applied once for aphids, thrips.	
Advise Four <i>-or-</i> Provoke....	0.4-0.9 fl oz/1000 row-feet (5.0-12.0 fl oz/acre) applied once for aphids, thrips.	
<b>METHOXYFENOZIDE</b>		
Intrepid 2F <i>-or-</i> Invertid 2F <i>-or-</i> TurnStyle <i>-or-</i> Zylor .....	8.0-16 fl oz at 14-day intervals for cutworm suppression.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 64 fl oz/acre per season.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> </ul>
<b>MINERAL OIL</b>		
Biocover MLT <i>-or-</i> Damoil Dormant & Summer Spray Oil .....	0.75-1.5 gal once or twice per week for aphids and thrips.	<ul style="list-style-type: none"> <li>▪ For BioCover MLT use higher pressure (minimum 400 psi) and ceramic hollow cone nozzles.</li> <li>▪ For Damoil use higher pressure (minimum 100 psi) and ceramic hollow cone nozzles.</li> </ul>
<b>NEEM OIL</b>		
Trilogy.....	0.5-1% in 25-100 gal water at 7- to 14-day intervals for aphids, thrips. 2.0 pt in 5 gal water at 7- to 14-day intervals for aphids, thrips.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 2 gal/acre per application.</li> </ul>
<b>PETROLEUM OIL</b>		
Glacial Spray Fluid.....	0.75-1.0 gal 1-2 times weekly for aphids, thrips.	
Purespray Green.....	0.75-1.5 gal in 50-100 gal water 1-2 times weekly for apids, thrips.	

## SOIL INSECTS, ABOVE-GROUND INSECTS *continued*

Pesticide	Rate of product/acre	Comments
<b>PYRETHRINS</b>		
PyGanic EC 1.4 Il.....	1.0 pt-2.0 qt in a minimum of 5 gal water and repeat as needed for aphids, bugs, leafrollers, thrips.	<ul style="list-style-type: none"> <li>▪ Apply in the early morning or late evening to avoid possible harm to honey bees.</li> </ul>
PyGanic EC 5.0 Il.....	4.5-15.61 fl oz in a minimum of 5 gal water and repeat as needed for aphids, bugs, leafrollers, thrips.	
Tersus Insecticide .....	4.5-16.35 fl oz in a minimum of 5 gal water and repeat as needed for aphids, bugs, leafrollers, thrips.	
Evergreen Crop Protection EC 60-6 .....	2.0-16 oz in repeat as needed for aphids, leafrollers, and thrips.	<ul style="list-style-type: none"> <li>▪ DO NOT apply within 12 hours of harvest.</li> <li>▪ Apply in the early morning or late evening to avoid possible harm to honey bees.</li> <li>▪ DO NOT exceed 10 applications per season.</li> <li>▪ DO NOT reapply within 3 days; 24 hours only under extreme pest pressure.</li> </ul>
<b>SPINOSAD</b>		
Entrust Naturalyte Insect Control .....	1.0-2.0 oz at 5-day (minimum) intervals for thrips.	<ul style="list-style-type: none"> <li>▪ DO NOT apply within 3 days of harvest.</li> <li>▪ DO NOT exceed 4 applications (7 oz Entrust Naturalyte/acre, 14.4 oz Blackhawk/acre, 21 fl oz Spintor or Entrust SC/acre) per season.</li> <li>▪ DO NOT exceed 2 consecutive applications of spinosad and spinetoram before alternating with another insecticide with a different mode of action.</li> <li>▪ Before making widespread applications, treat a limited number of plants and observe for phytotoxicity over a 10-day period.</li> <li>▪ Addition of an adjuvant may improve thrips control.</li> </ul>
Blackhawk Naturalyte Insect Control .....	1.7-3.3 oz at 5-day (minimum) intervals for thrips.	
SpinTor 2SC <i>-or-</i> Entrust SC Naturalyte Insect Control....	3.0-6.0 fl oz at 5-day (minimum) intervals for thrips. minimum) intervals for thrips.	
Conserve SC .....	8.0 fl oz/100 gal at 5-day (minimum) intervals for thrips.	
<b>SPINETORAM</b>		
Radiant SC.....	6.0-8.0 fl oz at 4-day (minimum)	<ul style="list-style-type: none"> <li>▪ DO NOT apply within 3 days of harvest.</li> <li>▪ DO NOT exceed 2 consecutive applications of spinosad and spinetoram before alternating with another insecticide with a different mode of action.</li> <li>▪ Use the higher rate for heavy infestations.</li> <li>▪ Addition of an adjuvant may improve thrips control.</li> </ul>

## SOIL INSECTS, ABOVE-GROUND INSECTS *continued*

Pesticide	Rate of product/acre	Comments
<b>SPINETORAM/METHOXYFENOZIDE</b>		
Intrepid Edge.....	4.5-12 fl oz at 14-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply within 3 days of harvest.</li> <li>▪ DO NOT apply more than 48 fl oz/acre per year.</li> <li>▪ DO NOT make more than four applications per crop.</li> </ul>
<b>SULFOXAFLOLOR</b>		
Transform WG.....	0.75-1.5 oz at 7-day intervals for aphids.	<ul style="list-style-type: none"> <li>▪ DO NOT apply within 7 days of harvest.</li> <li>▪ DO NOT apply more than 8.5 oz/acre per year.</li> <li>▪ DO NOT make more than two consecutive applications per crop.</li> </ul>
<b>THIAMETHOXAM</b>		
Actara.....	1.5-3.0 oz at 7-day intervals (minimum) for aphids.	<ul style="list-style-type: none"> <li>▪ DO NOT use less than 10 GPA.</li> <li>▪ DO NOT exceed 8 oz/acre per growing season.</li> <li>▪ DO NOT apply within 7 days of harvest.</li> </ul>
Platinum.....	5.0-12 fl oz at or within 24 hours of seeding for aphids.	
<b>ZETA-CYPERMETHRIN</b>		
Mustang.....	1.4-4.3 oz for cutworms or 3.4-4.3 oz for aphids, bugs at 4-day (minimum) intervals.	<ul style="list-style-type: none"> <li>▪ RESTRICTED USE PESTICIDE.</li> <li>▪ DO NOT use less than 10 GPA.</li> <li>▪ DO NOT exceed 0.15 lb active ingredient per growing season.</li> <li>▪ DO NOT use foliage for feed.</li> <li>▪ Apply as required by scouting.</li> <li>▪ Use of this product should conform to resistance management strategies established for the use area.</li> <li>▪ Aids in control of aphids.</li> </ul>
Mustang Maxx.....	1.28-4.0 oz for cutworms or 3.2-4 oz for aphids, bugs at 4-day (minimum) intervals.	
<b>ZETA-CYPERMETHRIN/BIFENTHRIN</b>		
Hero.....	2.6-6.1 oz for cutworms or 4-10.3 oz for aphids, bugs at 21-day (minimum) intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply within 21 days of harvest.</li> <li>▪ DO NOT exceed 11.2 oz/acre Hero EW or 4.7 fl oz Steed per application.</li> <li>▪ DO NOT exceed 46.35 oz (0.2 lb a.i.)/acre Hero or 50.4 oz (0.45 lb a.i.)/acre Hero EW or 28.1 fl oz (0.33 lb a.i.)/acre Steed per season.</li> <li>▪ DO NOT exceed 2 foliar applications per season.</li> <li>▪ Apply as required by scouting.</li> <li>▪ Use of this product should conform to resistance management strategies established for the use area.</li> </ul>
Hero EW.....	2.8-6.7 oz for cutworms or 4.5-11.2 oz for aphids, bugs at 21-day (minimum) intervals.	
Steed.....	2.5-3.5 fl oz for cutworms or 3.5-4.7 fl oz for aphids, bugs at 21-day (minimum) intervals.	
<ul style="list-style-type: none"> <li>▪ See also fumigation section for preplant chemical control of soil insects.</li> </ul>		

## SLUGS

### CULTURAL CONTROL:

Eliminate shady, damp areas; employ clean cultivation and removal of sheltering sites along hedgerows and fences. Do not plant in low, flat, wet, or recently plowed ground that has been left idle for several years. Keep the perimeter of gardens free of plants and weeds to reduce favorable habitat and keep slugs from moving into gardens.

Pesticide	Rate of product/acre	Comments
<b>★METALDEHYDE★</b>		
Deadline GT.....	33.3 lb per acre at 21-day intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT apply more than six applications per year.</li> <li>▪ DO NOT apply within 21-days of harvest.</li> </ul>
<b>IRON PHOSPHATE</b>		
Sluggo Slug & Snail Bait ....	20-44 lb per acre or 0.5-1 lb/1000 sq ft.	<ul style="list-style-type: none"> <li>▪ Apply in the evening, as slugs travel and feed mostly in the night or early morning.</li> <li>▪ DO NOT place in piles. If the ground is dry, wet before application.</li> </ul>
<b>SODIUM FERRIC EDTA</b>		
Ferroxx .....	5-20 lb per acre.	<ul style="list-style-type: none"> <li>▪ Use higher rates when infestations are high.</li> </ul>
Ferroxx AQ .....	4-25 lb per acre.	
IronFist Slug and Snail Bait	10-40 lb per acre or 0.25-1 lb/1000 sq ft and repeat as needed or at 2-week intervals.	
<ul style="list-style-type: none"> <li>▪ See also fumigation section for preplant chemical control of slugs.</li> </ul>		

## NEMATODES

### CULTURAL CONTROL:

.....A high density of nematodes in soil causes areas of missing or stunted plants in a garden. Nematodes attack many different crops. Select nematode-free sites for garden establishment by testing soil samples for nematodes prior to planting.

Pesticide	Rate of product/acre	Comments
<b>AZADIRACTIN</b>		
AzaGuard <i>-or-</i> Molt-X .....	15 oz at 3- to 4-week intervals.	<ul style="list-style-type: none"> <li>▪ DO NOT exceed 22.5 fl oz/acre per season.</li> <li>▪ Apply in sufficient water to penetrate the soil to a depth of 12".</li> </ul>
Neemix 4.5.....	1.0 qt to 3.0 gal at 7-day intervals.	
Ecozin Plus ME .....	25-56 oz at 10- to 14-day intervals	<ul style="list-style-type: none"> <li>▪ Repeat as necessary.</li> <li>▪ Apply as a drench.</li> </ul>
<b>FLUENSULFONE</b>		
Nimitz .....	3.5 to 7 pt applied prior to planting	<ul style="list-style-type: none"> <li>▪ This product must be applied 7-10 days prior to seeding.</li> </ul>
<b>MYROTHECIUM VERRACARIA</b>		
Ditera DF .....	0.31-2.4 lb/1000 sq ft	<ul style="list-style-type: none"> <li>▪ Apply to the soil as a pre-plant, at planting or post-planting soil treatment.</li> <li>▪ This product must be applied to and incorporated into the soil.</li> </ul>
<ul style="list-style-type: none"> <li>▪ See also fumigation section for preplant chemical control of nematodes.</li> </ul>		

## WEEDS

### CULTURAL CONTROL:

Be sure that beds are adequately covered with weed-free mulch to reduce the chance of moving weed seeds into a garden.

Pesticide	Rate of product/acre	Comments
<b>AMMONIATED SOAP OF FATTY ACIDS</b>		<ul style="list-style-type: none"> <li>▪ <b>DO NOT</b> apply over emerged ginseng.</li> </ul>
Final-San-O .....	26 oz/1 gal water applied at 75-200 gal/acre at 14- to 21-day intervals.	
<b>CARFENTRAZONE-ETHYL</b>		<ul style="list-style-type: none"> <li>▪ <b>DO NOT</b> apply over emerged ginseng.</li> </ul>
Aim EC <i>-or-</i> Longbow EC ...	0.5-2.0 fl oz per acre applied to non-crop areas.	
<b>CLETHODIM</b>		<ul style="list-style-type: none"> <li>▪ <b>DO NOT</b> exceed 8 fl oz/acre in a single application.</li> <li>▪ <b>DO NOT</b> apply within 30 days of harvest.</li> <li>▪ <b>DO NOT</b> exceed 5.33 fl oz/acre of Section Three or Shadow 3EC in a single application.</li> <li>▪ <b>DO NOT</b> exceed 16 fl oz/acre of Tapout in a single application.</li> </ul>
Arrow 2EC <i>-or-</i> Avatar S2 <i>-or-</i> Cleanse 2EC <i>-or-</i> Clethodim 2E <i>-or-</i> Dakota <i>-or-</i> Intensity Post-Emergence Herbicide <i>-or-</i> Shadow <i>-or-</i> Tide Clethodim 2EC <i>-or-</i> Vaquero <i>-or-</i> Volunteer <i>-or-</i> Willowood Clethodim 2EC.....	6.0-8.0 fl oz at 14-day intervals.	
Select Max with Inside Technology .....	9.0-16 fl oz at 14-day intervals.	
	4.0-5.33 fl oz at 14-day intervals.	
Section Three <i>-or-</i> Shadow 3EC <i>-or-</i> Trizenta 3EC.....	9.0-16 fl oz annual grass rate or 12-16 fl oz perennial grass rate at 14-day intervals.	
Tapout .....		
Intensity One.....	9.0-16 fl oz at 14-day intervals for annual grasses. 12-16 fl oz at 14-day intervals for perennial grasses.	<ul style="list-style-type: none"> <li>▪ <b>DO NOT</b> exceed 16 fl oz/acre in a single application.</li> <li>▪ <b>DO NOT</b> exceed 64 fl oz/acre per season.</li> <li>▪ <b>DO NOT</b> apply within 30 days of harvest.</li> </ul>
<b>DIQUAT DIBROMIDE</b>		
Aceto Diquat 2L AG <i>-or-</i> Dessicash AG <i>-or-</i> Nufarm Diquat 2L <i>-or-</i> Reglone Dessicant <i>-or-</i> Verdure X....	1.5-2.0 pt in a minimum of 15 gal water.	<ul style="list-style-type: none"> <li>▪ <b>DO NOT</b> apply over emerged ginseng.</li> <li>▪ <b>DO NOT</b> use for food or feed within 1 year of application.</li> <li>▪ <b>DO NOT</b> graze treated areas.</li> <li>▪ Can be used during site preparation.</li> </ul>
<b>FLUAZIFOP-P-BUTYL</b>		
Fusilade DX .....	16-24 oz (add 1% crop oil or 0.25% surfactant).	<ul style="list-style-type: none"> <li>▪ <b>DO NOT</b> apply within 1 year of harvest.</li> <li>▪ Effective against grasses only.</li> <li>▪ Apply when grasses are 2-8" tall, before tilling or heading.</li> <li>▪ Direct spray away from ginseng foliage.</li> </ul>

## WEEDS

### CULTURAL CONTROL:

Be sure that beds are adequately covered with weed-free mulch to reduce the chance of moving weed seeds into a garden.

Pesticide	Rate of product/acre	Comments
<b>GLYPHOSATE</b>		
<ul style="list-style-type: none"> <li>▪ Glyphosate is nonspecific and may damage actively growing ginseng.</li> <li>▪ NOTE for all glyphosate products: Rates vary by concentration of the product and by the weeds to be targeted. Refer to weed control tables in label for rates and timing.</li> </ul>		<ul style="list-style-type: none"> <li>▪ DO NOT apply within 1 year of harvest.</li> <li>▪ <b>DO NOT apply over emerged ginseng.</b></li> </ul>
<p>Glyphosate products which are labeled for ginseng include but are not limited to: Abundit Edge, Buccaneer, Buccaneer Plus, Buccaneer 5 Extra, Cornerstone 5 Plus, Cornerstone Plus, Credit 41 Extra, Credit Xtreme, Credit 5.4 Extra, Duramax, Durango DMA, Envy, Envy Intense, Envy Six Max, Four Power Plus, GlyStar 5 Extra, GlyStar Original, GlyStar Plus, Glyphosate 4 Plus, Glyphogan, Glyphogan Plus, Honcho K6, Mad Dog 5.4, Mad Dog Plus, Makaze Herbicide, Makaze Yield Pro, Razor, Roundup Power Max, Roundup WeatherMax, Sunphosate 41%.</p>		
<b>PELARGONIC ACID/RELATED FATTY ACIDS</b>		
Scythe.....	3-5% or 5-7% or 7-10% depending on weeds to be controlled (see label), repeat as needed.	<ul style="list-style-type: none"> <li>▪ <b>DO NOT apply over emerged ginseng.</b></li> <li>▪ 3-5% for control of annual weeds, mosses and cryptogams.</li> <li>▪ 5-7% for burndown of perennial herbaceous plant, weeds in a later stage of growth, and sucker growth.</li> <li>▪ 7-10% for maximum vegetative burndown, edging or foliar trimming.</li> <li>▪ Can be applied prior to emergence of plants from perennial rootstocks.</li> </ul>
<b>PYRAFLUFEN-ETHYL</b>		
Vida .....	0.5-2.0 fl oz in a minimum of 10 gal of water at 30-day intervals.	<ul style="list-style-type: none"> <li>▪ For preplant burndown.</li> <li>▪ DO NOT make more than 3 applications per year.</li> <li>▪ DO NOT apply within 24 hours of planting.</li> <li>▪ To control grassy weeds, tank mix with glyphosate, paraquat, or glufosinate.</li> </ul>
<ul style="list-style-type: none"> <li>▪ See also fumigation section for preplant chemical control of weeds.</li> </ul>		

## SOILBORNE PESTS/FUMIGATION

**(Fungi: *Cylindrocarpon destructans*, *Fusarium* spp., *Phytophthora cactorum*, *Pythium* spp., *Rhizoctonia solani*, other; Root Knot and Lesion Nematodes; Insects: climbing cutworms, cutworms, white grubs, wireworms; Slugs; Weeds)**

### CULTURAL CONTROL:

Do not reintroduce pests and soils into the fumigated garden. Do not mix soil that has not been fumigated with treated soil. See additional cultural controls listed above for suggestions regarding specific pest problems.

### FUMIGATION: GENERAL COMMENTS

- USE ONLY as a pre-plant treatment, DO NOT fumigate established ginseng gardens.
- After incorporation of fumigants, seal the soil with a plastic sheet. Alternatively, water the soil to wet it to a depth of 0.5-0.75 inches and/or roll the soil.
- Be sure to test fumigant-treated soil using a seed germination test prior to planting to insure that all residues of the fumigant have dissipated.
- Use of soil fumigants may reduce initial levels of soilborne pests, but is unlikely to control these pests throughout the lifetime of a garden.

<b>DICHLOROPROPENE</b>		<ul style="list-style-type: none"> <li>▪ RESTRICTED USE PESTICIDE.</li> <li>▪ Allow fumigant to dissipate completely before planting.</li> </ul>
Telone II .....	9.0-12 gal broadcast mineral soil. 26-35 fl oz/1000 row feet/outlet mineral soil. 25 gal broadcast muck/peat. 74 fl oz/1000 row feet/outlet muck/peat.	
Telone EC ( <i>MI only</i> ).....	9.0-18 gal broadcast mineral soil.	<ul style="list-style-type: none"> <li>▪ RESTRICTED USE PESTICIDE.</li> <li>▪ Apply using surface or buried drip irrigation and tarp only.</li> <li>▪ Leave undisturbed 14 days after treatment.</li> </ul>
<b>DICHLOROPROPENE/CHLOROPICRIN</b>		<ul style="list-style-type: none"> <li>▪ RESTRICTED USE PESTICIDE.</li> <li>▪ Allow fumigant to dissipate completely before planting.</li> </ul>
Telone C-35.....	13-20.5 gal broadcast mineral soil. 33-36 gal broadcast muck/peat.	
InLine ( <i>MI only</i> ).....	13-20.5 gal broadcast mineral soil.	
<b>METAM SODIUM</b>		<ul style="list-style-type: none"> <li>▪ RESTRICTED USE PESTICIDE.</li> <li>▪ Soil temperature must be between 40-90°F.</li> <li>▪ Private Pesticide Application Certification and Agricultural Fumigation Certification required to use this product.</li> <li>▪ Use of metam sodium in Wisconsin is restricted beyond the label instructions under ATCP 29.254, Wisconsin Administrative Code. For more information, contact the Wisconsin Department Agriculture, Trade and Consumer Protection at (608) 2245-4500.</li> </ul>
Vapam HL (Special Local Need Label, <i>WI only</i> ) .....	37.5-75 gal.	

## SEED TREATMENTS

### CULTURAL CONTROL:

Be sure to harvest seed from healthy gardens. It is recommended that seeds are treated prior to stratification and prior to planting.

Pesticide	Rate/100 lb seed	Comments
<b>AZOXYSTROBIN</b>		
Dynasty <i>-or-</i> Azoxystrobin 100 ST.....	0.1-0.38 fl oz/100 lb seed.	<ul style="list-style-type: none"> <li>▪ Apply as a water-based slurry using seed treatment application equipment that will provide uniform coverage on the seed surface.</li> <li>▪ It is recommended that Dynasty be combined with <i>Pythium</i>-active seed treatment such as Apron XL.</li> <li>▪ Allow seed to dry prior to bagging.</li> </ul>
<b>FLUDIOXONIL</b>		
Maxim 4FS <i>-or-</i> Spirato 480FS <i>-or-</i> Dyna-Shield Fludioxonil .....	0.08-0.16 fl oz/100 lb seed.	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i> and <i>Rhizoctonia</i>.</li> <li>▪ Apply as a water-based slurry utilizing slurry seed treatment equipment which provides uniform seed coverage.</li> <li>▪ Allow seed to dry before bagging.</li> </ul>
<b>FLUXAPYROXAD</b>		
Systiva XS .....	0.95-1.9 fl oz/100 lb seed.	<ul style="list-style-type: none"> <li>▪ Apply as a water-based slurry utilizing slurry seed treatment equipment which provides uniform seed coverage.</li> <li>▪ Active against <i>Rhizoctonia</i>, <i>Alternaria</i>, and other seedborne fungi causing seed decay, seeding damping-off.</li> </ul>
<b>MEFENOXAM</b>		
Apron XL.....	0.085-0.64 fl oz/100 lb seed.	<ul style="list-style-type: none"> <li>▪ For protection against (<i>Pythium</i> damping off) other soilborne diseases, such as <i>Rhizoctonia</i> spp., apply in combination with other registered seed treatment fungicides.</li> <li>▪ Apply as a water-based slurry with other registered seed treatment insecticides and fungicides through standard slurry- or mist-type commercial seed treatment equipment.</li> <li>▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.</li> </ul>
<b>METALAXYL</b>		
Agri Star Metalaxyl 265ST <i>-or-</i> Allegiance-FL <i>-or-</i> Belmont 2.7FS <i>-or-</i> Dyna-Shield Metalaxyl 318FS <i>-or-</i> Startup METXL.	0.75 fl oz/100 lb seed.	<ul style="list-style-type: none"> <li>▪ Active against <i>Pythium</i>.</li> <li>▪ Use only as a seed treatment.</li> <li>▪ Acquire and Dyna-Shield Metalaxyl are for use for exporting to countries that require treatment prior to import.</li> <li>▪ Use of seed treatments for <i>Pythium</i> may provide control of <i>Phytophthora</i>.</li> <li>▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.</li> </ul>
Acquire .....	0.75-1.5 fl oz/100 lb seed.	
Dyna-Shield Metalaxyl.....	0.75-1.5 fl oz/100 lb seed.	
Sebring 480 FS.....	0.5 fl oz/100 lb seed.	
<b>THIABENDAZOLE</b>		
Mertect 340-F.....	0.002 mg/ai per seed	<ul style="list-style-type: none"> <li>▪ Active against <i>Fusarium</i>.</li> <li>▪ Use only as a seed treatment.</li> </ul>