

CONTROL OF DISEASES, PESTS, AND WEEDS IN CULTIVATED GINSENG, 2024

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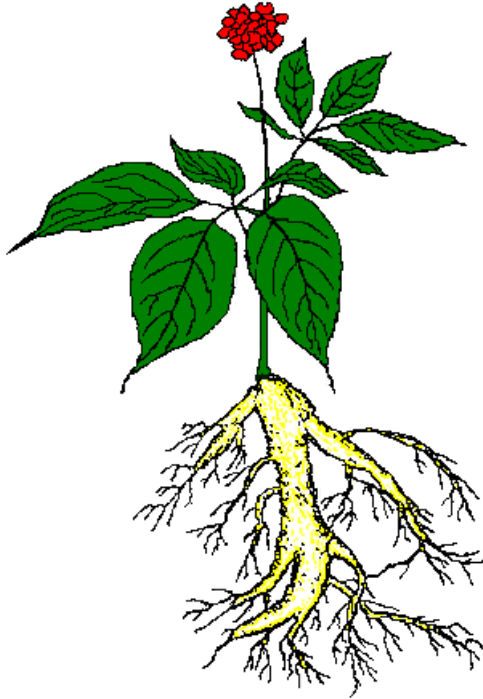


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Remember that the pesticide label is the legal document on pesticide use. Read the label, as they change often and follow all instructions closely. Some chemicals listed in this bulletin may be dropped by the manufacturer or distributor after the publication 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 plant stands are especially at risk for this disease because it takes longer for them to dry following dew periods or rain.

ALTERNARIA LEAF AND STEM BLIGHT (*Alternaria panax*)

Pesticide.....	Rate of product/A	Comments
★ AZOXYSTROBIN★ [11]		
Abound Flowable Solution -or- Aframe -or- Quadris Flowable -or- A-Zox 25SC	6.0-15.5 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 1 foliar application before alternating with a fungicide with a different mode of action. ▪ DO NOT alternate with QoI fungicides such as Cabrio, Flint or Gem. ▪ Please note that resistance of <i>A. panax</i> to group 11 fungicides is a concern in WI. ▪ DO NOT exceed 123 fl oz (2 lb a.i.)/A per season.
Acadia 2SC -or- AzoxyStar -or- Arius 250 -or- Azoxyzone -or- Dexter SC -or- Satori -or- Tetraban -or- Trevo	6.0-20.0 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ Apply in a volume of water for adequate coverage of foliage and stems.
★ AZOXYSTROBIN/BENZOVINDIFLUPYR★ [11/7]		
Elatus Fungicide.....	7.3 oz at 14-day intervals.	<ul style="list-style-type: none"> ▪ Apply in a minimum of 50 gal of water/A. ▪ Do not make more than four applications per year. ▪ Do not apply within 15 days of harvest. ▪ Do not exceed 2.0 lb ai/A/year of azoxystrobin-containing products.
★ AZOXYSTROBIN/DIFENOCONAZOLE★ [11/3]		
Acadia ESQ Fungicide -or- Trevo DCZ -or- Quadris Top...	10.0-14.0 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action. ▪ DO NOT apply more than 56 fl oz/A per year. ▪ Use a minimum of 15-gal water for ground applications and a minimum of 10 gal water for aerial applications.
Tycoon	7.8-11.0 fl oz to 14-day intervals.	
★ AZOXYSTROBIN/MANCOZEB★ [11/M03]		
Dexter Max.....	2.1 lbs at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 8 applications (11.76 lb a.i. mancozeb/0.84 lb a.i. azoxystrobin)/A per year. ▪ DO NOT apply within 30 days of harvest. ▪ In Wisconsin, apply with a minimum of 80 gallons of water/A.

ALTERNARIA LEAF AND STEM BLIGHT (*Alternaria panax*)

Pesticide.....	Rate of product/A	Comments
★ CHLOROTHALONIL ★ [M05]		
Bravo Weather Stik SC -or- Chlorothalonil 720 -or- Echo 720 -or- Oranil 6L -or- Equus 720 SST -or- Initiate 720	2.0 pt at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 8 applications (12 lb a.i.)/A per year. ▪ DO NOT apply within 14 days of harvest.
★ CHLOROTHALONIL/OXATHIAPROLIN ★ [M05/49]		
Orondis Opti (Premix)	1.75-2.5 pt at 14-day intervals at minimum volume of 50 gallons/A.	<ul style="list-style-type: none"> ▪ DO NOT exceed 10 pt/A per year. ▪ DO NOT harvest within 14 days of treatment. ▪ DO NOT apply more than 2 sequential applications of Orondis Opti. ▪ DO NOT apply more than 0.125 lb ai/A per year of oxathiaprolin products. ▪ DO NOT apply more than 12.0 lb ai/A per year of chlorothalonil products.
★ CYPRODINIL/FLUDIOXONIL ★ [9/12]		
Switch 62.5WDG -or- Alterity 62.5WDG	11.0-14.0 oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action for at least 2 applications. ▪ DO NOT exceed 56 oz/A per year. ▪ DO NOT apply within 7 days of harvest.
★ FLUAZINAM ★ [29]		
Omega 500F -or- Orbus 4F -or- Lektivar 40SC	1.0-1.5 pt at 7- to 14-day intervals in a minimum of 100-gal water.	<ul style="list-style-type: none"> ▪ DO NOT exceed 6 pt per season. ▪ DO NOT apply within 30 days of harvest. ▪ Use 1 pt/A when the disease first appears or when conditions are favorable. Under conditions that favor severe disease development, use higher rate.
Vantana™ -or- Omavo™ -or- Oxelid 4F	16.0 to 24.0 fl/A oz at 7- to 14-day intervals in a minimum of 100 gal water.	
★ FLUOPYRAM/TRIFLOXYSTROBIN ★ [7/11]		
Luna Sensation	7.6 fl oz at a 14-day interval.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 15.3 fl oz/A per year. ▪ DO NOT apply within 7 days of harvest. ▪ DO NOT exceed 2 applications before alternating with a different mode of action.
★ MANCOZEB ★ [M03]		
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"> ▪ DO NOT exceed 24 lb (18 lb a.i.)/A Dithane/Fortuna/ManKocide/Koverall/Manzate Pro-Stick/Penncozeb 75DF/Penncozeb 80WP/Roper or 18 qt (18 lb a.i.)/A Manzate Flowable/Penncozeb 4FL/Dithane F-45 Rainshield or 22.5 lb Dithane M-45 per season. ▪ DO NOT apply within 30 days of harvest. ▪ DO NOT exceed 12 applications per year. ▪ Apply in a minimum of 80-gal water/A with ground equipment.
Manzate Max -or- Dithane F-45 Rainshield (supplemental label)	1.5 qt at 7- to 10-day intervals.	
Dithane M-45 Rainshield (supplemental label).....	1.8 lb at 7- to 10-day intervals.	

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

ALTERNARIA LEAF AND STEM BLIGHT (*Alternaria panax*)

Pesticide.....	Rate of product/A	Comments
★PYRACLOSTROBIN/FLUXAPYROXAD★ [11/7]		
Merivon Xemium Brand Fungicide.....	4.0-5.5 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT make more than 2 sequential applications of Merivon before alternating to a labeled non-Group 7 or non-Group 11 fungicide. ▪ DO NOT apply more than 16.5 fl oz/A of Merivon per year. ▪ DO NOT apply more than 3 applications of Merivon per year. ▪ DO NOT apply within 7 days of harvest.
ALUMINUM TRIS [33]		
Aliette WDG	5.0 lb at 7-day intervals in a minimum of 100 gal/A water.	<ul style="list-style-type: none"> ▪ DO NOT exceed 6 applications per year. ▪ DO NOT apply within 31 days of harvest. ▪ DO NOT tankmix with copper compounds. ▪ DO NOT apply with a spreader/sticker. ▪ For suppression only.
BACILLUS SUBTILIS [44]		
Serenade OPTI	14.0-20.0 oz/A at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Apply at stated interval or as needed.
Aviv	10-30 fl oz at 5- to 10-day intervals. Apply preventatively in 100 gallons of water and repeat on 5- to 10-day intervals, or as needed. Begin applications soon after emergence or transplant and when conditions are conducive to disease development. Use higher rates.	
BOSCALID [7]		
Endura 70WG -or- Bonafide...	4.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action for at least 1 application. ▪ DO NOT exceed 5 applications (22.5 oz)/A per year. ▪ Please note that resistance of <i>A. panax</i> to boscalid is a concern in WI.
COPPER AMMONIUM COMPLEX [M01]		
Copper-Count-N.....	3.5 qt at 7-day intervals.	<ul style="list-style-type: none"> ▪ Tankmix with Iprodione/Meteor/Nevado/ Rovral in 100 gal minimum. ▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.
COPPER HYDROXIDE [M01]		
Nu-Cop HB (<i>MI only</i>)	1.5-2.1 lb at 7-day intervals.	<ul style="list-style-type: none"> ▪ Tankmix with Iprodione/Meteor/Nevado/ Rovral in 100 gal minimum. ▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered. ▪ DO NOT apply more than 14.5 pt of Champ Formula 2F/A per year. ▪ DO NOT make more than 5 applications of Champ WG per year. ▪ DO NOT apply more than 69 qt of Previsto/A per year DO NOT apply more than 69 qt of Previsto/A per year.
Champ WG -or- Nu-Cop 50WP -or- Kocide HCu	2.1 lb at 7-day intervals.	
ChamplON++ -or- Kocide 3000-O	1.0-1.75 lb at 7-day intervals.	
Champ Dry Prill.....	1.75 lb at 7-day intervals.	

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ALTERNARIA LEAF AND STEM BLIGHT (*Alternaria panax*)

Pesticide.....	Rate of product/A	Comments
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.	
COPPER OXYCHLORIDE/COPPER HYDROXIDE [M01]		
Badge SC.....	1.0-3.5 pt at 7-day intervals.	<ul style="list-style-type: none"> ▪ Tankmix with Iprodione/Meteor/Nevado/Rovral in 100 gal minimum. ▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.
Badge X ₂	1.0-3.5 lb at 7-day intervals.	
COPPER OCTANOATE [M01]		
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"> ▪ Begin 2 weeks before disease appears. ▪ Apply at the higher rate at 7-day intervals when disease is increasing rapidly. ▪ Reapply after rain. ▪ DO NOT apply more than 33 gal of Cueva/A per year.
COPPER SULFATE [M01]		
Cuprofix Ultra 40 Disperss	1.75-2.5 lb at 7-day intervals.	<ul style="list-style-type: none"> ▪ Tankmix with Iprodione/Meteor/Nevado/Rovral in 100 gal minimum. ▪ Cover stems thoroughly. ▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.
<i>-or-</i> Cuprofix Flex DF		
Cuproxat FL	1.5-2.75 pt at 7-day intervals.	
CUPROUS OXIDE [M01]		
Nordox 75 WG	2.25 lb at 7-day intervals.	<ul style="list-style-type: none"> ▪ Tankmix with 2 lb Rovral 50W in 100 gal minimum. ▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered.
COPPER SULFATE PENTAHYDRATE [M01]		
Instill	15.0-30.0 fl oz at 7-day intervals.	<ul style="list-style-type: none"> ▪ Tankmix with 2 lbs Rovral 50W in 100 gal minimum. ▪ Cover stems thoroughly. ▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered. ▪ DO NOT exceed 1.05 lbs metallic copper/A per single application. ▪ DO NOT exceed 5.25 lbs metallic copper/A per year.
MasterCop.....	0.5-1.5 pt at 7-day intervals.	

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

ALTERNARIA LEAF AND STEM BLIGHT (*Alternaria panax*)

Pesticide.....	Rate of product/A	Comments
<i>BENZOVINDIFLUPYR/DIFENOCONAZOLE [7/3]</i>		
Aprovia Top.....	13.5 fl oz at 14-day intervals.	<ul style="list-style-type: none"> ▪ For resistance management, make no more than 2 applications before alternating to another fungicide with a non-Group 7 mode of action. ▪ DO NOT exceed 0.272 lb ai/A/year of benzovindiflupyr-containing products. ▪ DO NOT exceed 0.46 lb ai/A/year of difenoconazole-containing products. ▪ DO NOT exceed 4 applications per year. ▪ Pre-Harvest Interval (PHI): 15 days
<i>FLUOPYRAM /DIFENOCONAZOLE [7/3]</i>		
Luna Flex	13.6 fl oz/A at 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 0.446 lbs fluopyram/A per year, regardless of formulation or method of application. • ▪ DO NOT apply more than 0.46 lbs difenoconazole/A per year, regardless of formulation or method of application. ▪ DO NOT make more than 2 sequential applications of Luna Flex or any Group 7-containing fungicide before rotating with a fungicide from a different Group.
<i>FLUOPYRAM/PYRIMETHANIL [7/9]</i>		
Luna Tranquility.....	16-27 fl oz at 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 54.7 fl oz/A per year. ▪ DO NOT apply within 30 days of harvest. ▪ DO NOT exceed 2 applications before alternating with a different mode of action.
<i>FLUXAPYROXAD [7]</i>		
Tesaris (TM) Fungicide	3.4 to 4.6 fl oz/A at 7 to 14-day interval.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 4.6 fl ozs of Tesaris (0.089 lb fluxapyroxad)/A per application. ▪ DO NOT make more than 3 applications per year. ▪ DO NOT apply more than 13.8 fl ozs of Tesaris (0.267 lb fluxapyroxad)/A per year. ▪ The preharvest interval is 7 days. ▪ DO NOT make more than two (2) sequential applications of Tesaris before alternating to a labeled non-Group 7 fungicide
<i>HYDROGEN PEROXIDE/PEROXYACETIC ACID</i>		
Rendition	Curative treatment: 3.0 pt in a minimum of 100 gal water repeat daily for up to 3 consecutive days.	<ul style="list-style-type: none"> ▪ 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.
OxiDate 2.0	Preventive treatment: 1:200-1:400 dilution Curative treatment: 1:100 dilution Rescue treatment: 1:40 dilution	
<i>IPRODIONE [2]</i>		
<u>Tankmix programs:</u> Apply at 7- to 10-day intervals.		<ul style="list-style-type: none"> ▪ DO NOT exceed 10 pt/A per season. ▪ DO NOT exceed 5 applications per season. ▪ DO NOT apply within 36 days of harvest. ▪ Apply in a minimum of 10 gal/A. ▪ Always use in a fungicide resistance management program by tankmixing or
Meteor -or- Nevado 4F -or- Rovral Brand 4 Flowable.....	1.0-1.5 pt.	

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

ALTERNARIA LEAF AND STEM BLIGHT (*Alternaria panax*)

Pesticide.....	Rate of product/A	Comments
<p><u>Alternating programs</u>: Apply at 14-day intervals and alternate with another registered fungicide.</p>		
Meteor -or- Nevado 4F -or- Rovral Brand 4 Flowable.....	1.5-2 pt.	<ul style="list-style-type: none"> ▪ alternating with another fungicide registered for Alternaria blight control in ginseng. ▪ Use spreader/sticker products to improve control; be sure stems and leaves are covered. ▪ <i>Alternaria</i> may develop resistance to iprodione products if this fungicide is overused.
LAMINARIN [P4]		
Vacciplant.....	14.0-22.0 fl oz at 7- to- 14-day intervals.	<ul style="list-style-type: none"> ▪ At water volumes less than 70 gal/A apply at 14.0 fl oz/A. At water volumes above 70 gal/A apply at 0.15% v/v.
MEFENTRIFLUCONAZOLE [3]		
Cevya	3-5 fl oz on a minimum interval of 7-days.	<ul style="list-style-type: none"> ▪ DO NOT exceed 15 fl oz of product/A per season. ▪ DO NOT apply within in 7 days of harvest.
NEEM OIL		
Trilogy	0.5-1.0% at 7- to 14-day intervals in 25-100 gal water. For low volume application, 2.0 pt at 7- to 14-day intervals in 5 gal .	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 gal/A per application.
PENTHIOPYRAD [7]		
Fontelis.....	16-30 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 61 fl oz/A per application. ▪ May be applied day of harvest (PHI=0). ▪ DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action.
POLYOXIN D ZINC SALT [19]		
Affirm -or- Ph-D WDG.....	6.2 oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Use in alternation with fungicides that have a different mode of action. ▪ DO NOT exceed 3 applications (2.1 oz a.i./A) per season.
PROPICONAZOLE [3]		
Tilt	3.0 to 4.0 fl oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 16 fl oz of product/A per year. ▪ Although the label for Tilt has Cercospora leaf spot under targeted diseases for ginseng, this product has shown efficacy against Alternaria blight. ▪ DO NOT apply within in 14 days of harvest.
PYDIFLUMETOFEN/FLUDIOXONIL [7/12]		
Miravis Prime	6.8 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 sequential application before alternating with a fungicide with a different mode(s) of action. ▪ DO NOT make more than 4 applications at the maximum rate per year. ▪ DO NOT apply within in 7 days of harvest.

ALTERNARIA LEAF AND STEM BLIGHT (*Alternaria panax*)

Pesticide.....	Rate of product/A	Comments
PYRACLOSTROBIN [11]		
Cabrio 20EG	8.0-12.0 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 1 sequential application before alternating with a fungicide with a different mode of action. ▪ DO NOT rotate with QoI fungicides such as Quadris, Satori, Flint, Gem. ▪ DO NOT exceed 3 applications or 48 oz/A per season. ▪ Please note that resistance of <i>A. panax</i> to group 11 fungicides is a concern in WI.
PYRACLOSTROBIN/DIFENOCONAZOLE [11/3]		
Innliven Elite.....	5.5 to 7.7 fl oz/A to a 7- to 14- day interval. Use a minimum of 15 gal/A of water for ground applications. For aerial applications, use a minimum of 10 gal/A of water	<ul style="list-style-type: none"> ▪ DO NOT apply more than 14.8 fl oz/A/year (0.26 lb ai pyraclostrobin and 0.22 lb ai difenoconazole) of INNLIVEN ELITE per crop. ▪ DO NOT make more than 2 applications at the highest rate 5.5 fl oz/A (0.10 lb ai pyraclostrobin and 0.08 lb ai difenoconazole) of INNLIVEN ELITE/A/year. ▪ DO NOT make more than 4 applications at the lowest rate 3.7 fl oz/A (0.06 lb ai pyraclostrobin and 0.05 lb ai difenoconazole) of INNLIVEN ELITE/A/year.
PYRACLOSTROBIN/BOSCALID [11/7]		
Pristine WG	8.0-10.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 6 applications of Pristine per year. ▪ This product can be applied on the day of harvest (0 day PHI).
PYRIMETHANIL [9]		
Scala SC	18.0 fl oz at minimum 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 54 fl oz/A of Scala SC per crop. ▪ DO NOT apply within 30 days of harvest.
STREPTOMYCES LYDICUS		
Actinovate AG	3.0-12.0 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ For best results use spreader-sticker.
TEE TREE OIL/DIFENOCONAZOLE [46/3]		
Regev	4-8.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 34 fl oz/A of Regev per season. ▪ DO NOT apply within 48 hours of harvest.
TRIFLOXYSTROBIN [11]		
Flint Extra	2.0-2.9 fl oz at 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed one sequential applications of Flint and/or Gem before alternating with a fungicide with a different mode of action. ▪ DO NOT rotate with QoI fungicides such as Quadris, Satori, Cabrio. ▪ DO NOT exceed 4 applications (11.5 oz Gem or 11.5 fl oz Flint/A) per season (see labels). ▪ DO NOT apply within 7 days of harvest. ▪ Please note that resistance of <i>A. panax</i> to group 11 fungicides is a concern in WI.
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.

BOTRYTIS BLIGHT (*Botrytis cinerea*)

Pesticide.....	Rate of product/A	Comments
★ CAPTAN★ [M04]		
Captan 50W	4.0 lb at 7- to 10-day intervals as a foliar spray in a minimum of 100 gal of water/A.	<ul style="list-style-type: none"> ▪ DO NOT exceed 32 lb/A Captan 50W. ▪ DO NOT exceed 30 lb/A Captan 80WDG per year. ▪ DO NOT apply Captan 50W within 365 days of harvest.
Captan 80WDG	3.75 lb at 6- to 8-day intervals as a foliar spray in a minimum of 100 gal of water/A.	<ul style="list-style-type: none"> ▪ DO NOT apply Captan 80WDG within 14 days of harvest.
★ CHOROTHALONIL★ [M05]		
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"> ▪ DO NOT exceed 8 applications (12 lb a.i.)/A per year. ▪ DO NOT apply within 14 days of harvest.
★ CHLOROTHALONIL/OXATHIPIPROLIN★ [M05/49]		
Orondis Opti (Premix)	1.75-2.5 pt at 14-day intervals. For ground application apply in at least 50 gal/A.	<ul style="list-style-type: none"> ▪ DO NOT exceed 10 pt/A per year. ▪ DO NOT harvest within 14 days of treatment. ▪ DO NOT apply more than 2 sequential applications of Orondis. ▪ DO NOT apply more than 0.125 lb ai/A per year of oathiapiprolin products. ▪ DO NOT apply more than 12.0 lb ai/A per year of chlorothalonil products.
★ FENHEXAMID★ [17]		
Elevate 50WDG	1.5 lb at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 consecutive applications before alternating with a fungicide with a different mode of action. ▪ DO NOT exceed 4 applications (6 lb)/A per season.
★ FLUAZINAM★ [29]		
Omega 500F -or- OMAVO - -or- Oxelid 4F -or- VANTANA - -or- Orbus 4F -or- Lektivar 40SC	1.0-1.5 pt at 7- to 14-day intervals in a minimum of 100 gal water.	<ul style="list-style-type: none"> ▪ DO NOT exceed 6 pt per season. ▪ DO NOT apply within 30 days of harvest. ▪ Use 1 pt/A when the disease first appears or when conditions are favorable. Under conditions that favor severe disease development, use higher rate.
★ FLUOPYRAM/TRIFLOXYSTROBIN★ [7/11]		
Luna Sensation	7.6 fl oz at a 14-day interval.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 15.3 fl oz/A per year. ▪ DO NOT apply within 7 days of harvest. ▪ DO NOT exceed 2 applications before alternating with a different mode of action.
★ FLUOPYRAM /DIFENOCONAZOLE★ [7/3]		
Luna Flex	13.6 fl oz/A at 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 0.446 lbs fluopyram/A per year, regardless of formulation or method of application. •

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

BOTRYTIS BLIGHT (*Botrytis cinerea*)

Pesticide.....	Rate of product/A	Comments
		<ul style="list-style-type: none"> ▪ DO NOT apply more than 0.46 lbs difenoconazole/A per year, regardless of formulation or method of application. ▪ DO NOT make more than 2 sequential applications of Luna Flex or any Group 7-containing fungicide before rotating with a fungicide from a different Group.
BACILLUS AMYLOLIQUEFACIENS [44]		
Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates. ▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.
Double Nickel LC	0.5-6.0 qt at 7- to 10-day intervals.	
Stargus.....	2.0 to 4.0 qt at 7- to 10-day intervals.	
BACILLUS SUBTILIS [44]		
Aviv	10.0-30.0 fl oz at 5- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Apply at stated interval or as needed.
BOSCALID [7]		
Endura 70WG <i>-or-</i> Bonafide ...	7.8 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action for at least 1 application. ▪ DO NOT exceed 5 applications (22.5 oz)/A per year.
COPPER OCTANOATE [M01]		
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"> ▪ Begin 2 weeks before disease appears. ▪ Apply at the higher rate at 7-day intervals when disease is increasing rapidly. ▪ Reapply after rain. ▪ DO NOT apply more than 33 gal of Cueva/A per year
FLUOPYRAM/PYRIMETHANIL [7/9]		
Luna Tranquility.....	16-27 fl oz at 7-day interval.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 54.7 fl oz/A per year. ▪ DO NOT apply within 30 days of harvest. ▪ DO NOT exceed 2 applications before alternating with a different mode of action.
NEEM OIL		
Trilogy	0.5-1.0% in 25-100 gal water at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 gal/A per application.
	For low volume applications, 2.0 pt in 5 gal water at 7- to 14-day intervals.	
PENTHIOPYRAD [7]		
DuPont Fontelis.....	16-30 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 61 fl oz/A per season. ▪ May be applied day of harvest (PHI=0). ▪ DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action.
POLYOXIN D ZINC SALT [19]		
Affirm <i>-or-</i> Ph-D WDG.....	6.2 oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Use in alternation with fungicides that have a different mode of action. ▪ DO NOT exceed 3 applications (2.1 oz a.i./A) per season.

BOTRYTIS BLIGHT (*Botrytis cinerea*)

Pesticide.....	Rate of product/A	Comments
PYRIMETHANIL [9] Scala SC	18 fl oz at minimum 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 54 fl oz/A of Scala SC per crop. ▪ DO NOT apply within 30 days of harvest.
STREPTOMYCES LYDICUS Actinovate AG	3.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ For best results use a spreader-sticker.
TEE TREE OIL/DIFENOCONAZOLE [46/3] Regev	4-8.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 34 fl oz/A of Regev per season. ▪ DO NOT apply within 48 hours of harvest.

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.

CYLINDROCARPON ROOT ROT/RUSTY ROOT

Pesticide.....	Rate of product/A	Comments
★ CAPTAN★ [M04] Captan 50W	4.0 lb at 7- to 10-day intervals as a drench in a minimum of 200 gal of water/A.	<ul style="list-style-type: none"> ▪ DO NOT exceed 32 lb/A Captan 50W per year. ▪ DO NOT exceed 30 lb/A Captan 80WDG per year. ▪ DO NOT apply Captan 50W within 365 days of harvest. ▪ DO NOT apply Captan 80WDG within 14 days of harvest.
Captan 80WDG (Product Bulletin).....	3.75 lb at 6- to 8-day intervals as a drench in a minimum of 200 gal of water/A.	
★ FLUDIOXONIL★ [12] Cannonball WG	4.0-8.0 oz/A at 14-21 day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply within 14 days of harvest. ▪ DO NOT exceed 2 lb/A per season. ▪ DO NOT apply more than 32 oz (1.0 lb a.i./A) per crop.
★ PENTHIOPYRAD★ [7] DuPont Fontelis.....	16.0-30.0 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 61 fl oz/A per season. ▪ DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action.
★ THIOPHANATE-METHYL★[1] Topsin M WSB (Special Local Need Registration)	1.0 lb acre at 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT APPLY WITHING 365 DAYS OF HARVEST. ▪ DO NOT exceed 2 lb/A per season. ▪ DO NOT allow workers entry into treated areas during the Restricted Entry Interval (REI) of 24 hours unless appropriate personal protective equipment for early entry is worn.
PYDIFLUMETOFEN/FLUDIOXONIL[7/12] Miravis Prime	6.8 fl oz at 7- to 14-day intervals	<ul style="list-style-type: none"> ▪ Efficacy of the 6.8 fl oz rate against <i>Cylindrocarpon</i> has not been tested. ▪ DO NOT exceed 2 sequential application

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

CYLINDROCARPON ROOT ROT/RUSTY ROOT

Pesticide.....	Rate of product/A	Comments
		<p>before alternating with a fungicide with a different mode(s) of action.</p> <ul style="list-style-type: none"> ▪ DO NOT make more than 4 applications at the maximum rate per year. ▪ DO NOT apply within in 7 days of harvest.
<i>ISOFETAMID</i> [7]		<ul style="list-style-type: none"> ▪ Do not make more than 2 sequential applications of KENJA 400SC Fungicide or other Group 7 containing fungicides before rotating to a fungicide with a different mode of action. ▪ Do Not apply more than 3 applications/A/year (60 fl . oz./A/year (1.56 lb. a.i./A/year)). ▪ The Pre-Harvest Interval (PHI) for this crop is 14 days
Kenja 400 SC	20.0 fl oz/A at 7-days interval.	
Use of Quadris for damping-off may provide control of <i>Cylindrocarpon</i> root rot/rusty root.		

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.

DAMPING-OFF

Pesticide.....	Rate of product/A	Comments
★ AZOXYSTROBIN★ [11]		<ul style="list-style-type: none"> ▪ Active against <i>Rhizoctonia</i>, <i>Pythium</i>. ▪ DO NOT exceed 1 foliar application before alternating with a fungicide with a different mode of action. ▪ DO NOT alternate with QoI fungicides such as Cabrio, Flint, Gem. ▪ DO NOT exceed 4 applications per year. ▪ DO NOT exceed 123 fl oz (2 lb a.i.)/A per season.
<u>Banded applications:</u> band width 7 in. or less. Banded applications contact the foliage and are counted as a foliar application.		
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 in. rows.	
FLUXAPYROXAD[7]		<ul style="list-style-type: none"> ▪ Active against <i>Rhizoctonia</i>.
Systiva® XS Xemium® brand fungicide.....	62.0-123.0 ml/100 kg of seed.	
★ CAPTAN★ [M04]		<ul style="list-style-type: none"> ▪ Active against <i>Cylindrocarpon</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>. ▪ DO NOT exceed 32 lb/A Captan 50W per year. ▪ DO NOT exceed 30 lb/A Captan 80WDG per year. ▪ DO NOT apply Captan 50W within 365 days of harvest.
Captan 50W	4.0 lb at 7- to 10-day intervals as a drench in a minimum of 200 gal of water/A.	
Captan 80WDG.....	3.75 lb at 6- to 8-day intervals as a drench in a minimum of 200 gal of water/A.	

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

DAMPING-OFF

Pesticide.....	Rate of product/A	Comments
		<ul style="list-style-type: none"> ▪ DO NOT apply Captan 80WDG within 14 days of harvest.
★ MEFENOXAM★ [4]		
Ridomil Gold GR	Pre-emergence: 15 lb/A. Post-emergence: 10 lb/A (up to 4 applications) at monthly intervals.	<ul style="list-style-type: none"> ▪ Active against <i>Pythium</i>, <i>Phytophthora</i>. ▪ DO NOT exceed 60 lb/A per growing season. ▪ DO NOT exceed 45 lb/A per growing season if Ridomil Gold EC or Ridomil Gold SL is applied in spring before plants have begun to grow. ▪ DO NOT apply within 9 days of harvest. ▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.
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"> ▪ DO NOT apply to ginseng foliage. ▪ Apply ONCE only as a replacement for the pre-emergence application of Ridomil Gold GR. ▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl. ▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.
Ultra Flourish.....	1.5 pt in 100-400 gal water applied once as a drench.	<ul style="list-style-type: none"> ▪ Active against <i>Phytophthora</i>. ▪ DO NOT make supplemental applications. ▪ DO NOT make more than one application. ▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.
Anchor 3L ST	0.16 - 0.64 fl oz per 100 lb. of seed	<ul style="list-style-type: none"> ▪ Verify the Actual Registered Rate in Country of Destination or Use.
Aproxol XL.....	0.085 - 0.64 fl oz per 100 lb. of seed	<ul style="list-style-type: none"> ▪ Restriction: Maximum Use Rates Specified on This Label Must Not Be Exceeded.
★ METALAXYL★ [4]		
MetaStar 2E	1.5 qt as a drench in 100-400 gal/A water.	<ul style="list-style-type: none"> ▪ Active against <i>Pythium</i>, <i>Phytophthora</i>. ▪ DO NOT exceed 1 application per year. ▪ Apply before early growth, follow with applications of a metalaxyl or mefenoxam granular product. ▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.
★ THIOPHANATE-METHYL★ [1]		
Topsin M WSB (Special Local Need Registration)	1.0 lb acre at 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply within 365 days of harvest. ▪ Active against <i>Cylindrocarpon</i>, <i>Rhizoctonia</i>, and <i>Fusarium</i>. ▪ DO NOT exceed 2 lb/A per season. ▪ DO NOT allow workers entry into treated areas during the Restricted Entry Interval (REI) of 24 hours unless appropriate personal protective equipment for early entry is worn.

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

DAMPING-OFF

Pesticide.....	Rate of product/A	Comments
BACILLUS AMYLOLIQUEFACIENS [44]		
Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Active against <i>Fusarium</i>, <i>Pythium</i>, <i>Phytophthora</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>. ▪ First application as a soil or seedline drench, banded in-furrow at planting. ▪ directly into the rooting zone using shanks, etc. ▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates. ▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.
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.	
FENAMIDONE [11]		
Reason 500SC.....	5.5-8.2 fl oz at 14-day intervals.	<ul style="list-style-type: none"> ▪ Active against <i>Pythium</i>, <i>Phytophthora</i> ▪ Apply only in a 1:1 alternation with a mefenoxam-containing fungicide. ▪ DO NOT exceed 24.6 fl oz/A per year. ▪ DO NOT harvest within 14 days of treatment.
POLYOXIN D ZINC SALT [19]		
Ph-D WDG	6.2 oz drench at 14-day intervals.	<ul style="list-style-type: none"> ▪ Active against <i>Rhizoctonia</i>. ▪ Use in alternation with fungicides that have a different mode of action. ▪ DO NOT exceed 3 applications (2.1 oz a.i./A) per season.
PICARBUTRAZOX [U17]		
Vayantis	0.0384 – 0.384 fl oz/100 lb. seed	<ul style="list-style-type: none"> ▪ DO NOT use at a rate that will result in more than 0.0178 lb a.i./A (8.1 grams ai/A) per year. ▪ Vayantis may be combined with Apron XL (containing mefenoxam, EPA Reg. No. 100-799) for increased <i>Pythium</i> control. ▪ Excludes seed piece treatment.
REYNOUTRIA SACHALINENSIS [P5]		
Regalia Biofungicide	1.0-3.0 qt soil drench in 100 gal water at 10- to 14-day intervals. 1.0-4.0 qt/A 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"> ▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>. ▪ May be applied on day of harvest.
TEE TREE OIL/DIFENOCONAZOLE [46/3]		
Regev.....	4-8.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 34 fl oz/A of Regev per season. ▪ DO NOT apply within 48 hours of harvest. ▪ Active against <i>Fusarium</i> and <i>Rhizoctonia</i>.
TRICHODERMA ASPERELLUM/T. GAMSII		
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 in. 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"> ▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>. ▪ Two or more applications are recommended. ▪ See label for details on application methods

DAMPING-OFF

Pesticide.....	Rate of product/A	Comments
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- Use of **Iprodione/Meteor/Nevado/Rovral** in alternation or as a tankmix with fixed copper fungicides for *Alternaria* leaf and stem blight control may provide some control of damping-off caused by *Rhizoctonia solani*. Adequate coverage of stems is critical for obtaining damping-off and crown/root rot control.
- Use of **Cannonball** for Cylindrocarpon root rot/rusty root or white mold may provide control of damping-off.
- See also Seedborne Pests/Fumigation section for preplant chemical control of damping-off.
- See also Seed Treatment section for chemical control of damping-off through treatment of seeds.

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.

FUSARIUM ROOT ROT

Pesticide.....	Rate of product/A	Comments
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BACILLUS AMYLOLIQUEFACIENS [44]

Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates. ▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.
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.	

PHOSPHOROUS ACID SALTS [33]

Fosphite -or- Resist 57 -or- 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"> ▪ DO NOT apply at intervals less than 3 days. ▪ Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established. ▪ Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached. ▪ DO NOT apply to dormant or heat- or moisture-stressed plants. ▪ DO NOT apply when conditions favor wet tissue for >4 hours.
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.	

POTASSIUM PHOSPHITE [P07]

Rampart -or- Sparra.....	1.0- 3.0 qt minimum of 20.0 gal of water/A (3.0 to 8.0 L in a minimum of water/ha). Disease Prevention Program: Apply lower rate at 2- to 4-week intervals after plants become established. Disease Control Program: Apply higher rate at 2- to 3-week intervals until control is reached.	<ul style="list-style-type: none"> ▪ Do not apply Rampart Fungicide at intervals less than 3 days. ▪ Do not exceed the highest rate per application.
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STREPTOMYCES LYDICUS

Actinovate AG	3.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ For best results use a spreader-sticker.
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THYME OIL [46]

Guarda Soil Drench: 4 gallons per 100 gallons of water at 10-14 days.
In-Furrow: 1 gal/A or 8.8 fl oz per 1000 ft of row before seed covers.

- The alternate use of (1-2 sprays) followed by a conventional, registered fungicide (1-2 sprays) has been successfully used in many crops. In addition, the use of tank mixes with conventional fungicide has also been successful.

TRICHODERMA ASPERELLUM/T. GAMSII

Bio-Tam 2.0 -or- Tenet WP 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 in. 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.

- Active against *Fusarium*, *Phytophthora*, *Pythium*, *Rhizoctonia*.
- Two or more applications are recommended.
- See label for details on application methods.

Use of **Cannonball**, **Topsin M WSB**, and **Fontelis** for *Cylindrocarpum* root rot/rusty root or white mold may provide control of *Fusarium* root rot.

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.

PHYTOPHTHORA ROOT ROT

Pesticide	Rate of product/A	Comments
★ CAPTAN★ [M04]		
Drexel Captan 50W.....	4.0 lb at 7- to 10-day intervals as a drench in a minimum of 200 gal of water/A.	<ul style="list-style-type: none"> ▪ DO NOT exceed 32 lb/A Drexel Captan 50W per year. ▪ DO NOT exceed 30 lb/A Captan 80WDG per year. ▪ DO NOT apply within 365 days of harvest. ▪ DO NOT apply Captan 80WDG within 14 days of harvest.
Captan 80WDG	3.75 lb at 6- to 8-day intervals as a drench in a minimum of 200 gal of water/A.	
★ DIMETHOMORPH★ [40]		
Forum.....	6.0 fl oz at 7-day intervals in a minimum of 20 gal of water/A.	<ul style="list-style-type: none"> ▪ DO NOT exceed 30 fl oz/A or 5 applications/year. ▪ DO NOT harvest within 14 days of treatment. ▪ Begin applications before infection occurs. ▪ DO NOT exceed 1 application of Forum before rotating to a labeled non-Group 40 fungicide for at least 1 application.

PHYTOPHTHORA ROOT ROT

Pesticide	Rate of product/A	Comments
★ ETHABOXAM ★ [22]		
Elumin	8.0 fl oz at 7- to 11-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT make more than 2 applications/year. ▪ DO NOT apply more than 16 fl oz/A per year.
★ FENAMIDONE ★ [11]		
Reason 500SC	5.5-8.2 fl oz at 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 24.6 fl oz/A per year. ▪ DO NOT harvest within 14 days of treatment.
★ FLUOPICOLIDE ★ [43]		
Presidio	3.0-4.0 fl oz at 10-day intervals.	<ul style="list-style-type: none"> ▪ Must be tank mixed with another fungicide that has a different mode of action. ▪ DO NOT exceed 4 applications per year.
★ MANDIPROPAMID ★ [40]		
Revus SC <i>-or-</i> Orondis Ultra B	8.0 fl oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 32 fl oz/A per year. ▪ DO NOT harvest within 2 days of treatment. ▪ Make no more than 2 consecutive applications before switching to another effective non-Group 40 fungicide.
★ OXATHIPIPROLIN ★ [49]		
Orondis Ultra A	4.8-38.6 fl oz at 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 4 applications per year. ▪ DO NOT harvest within 14 days of treatment. ▪ DO NOT apply more than 2 sequential applications of Orondis. ▪ DO NOT exceed 19.2 fl oz of Orondis Gold 200 per year.
Orondis Gold 200	4.8-9.6 fl oz at 14-day intervals.	
★ OXATHIPIPROLIN/CHLOROTHALONIL ★ [49/M05]		
Orondis Opti (Premix)	1.75-2.5 pt at 14-day intervals. For ground application apply in at least 50 gal/A.	<ul style="list-style-type: none"> ▪ DO NOT exceed 10 pt/A per year. ▪ DO NOT harvest within 14 days of treatment. ▪ DO NOT apply more than 2 sequential applications of Orondis. ▪ DO NOT apply more than 0.125 lb a.i./A per year of oxathiapiprolin products. ▪ DO NOT apply more than 12.0 lb a.i./A per year of chlorothalonil products.
★ OXATHIPIPROLIN/MANDIPROPAMID ★ [49/40]		
Orondis Ultra (Premix)	5.5-8.0 fl oz at 14-day intervals. For ground application apply at least 15 gal/A. For aerial application apply at least 5 gal/A.	<ul style="list-style-type: none"> ▪ DO NOT exceed 4 applications per year. ▪ DO NOT harvest within 14 days of treatment. ▪ DO NOT apply more than 2 sequential applications of Orondis. ▪ DO NOT apply more than 0.125 lb a.i./A per year of oxathiapiprolin products. ▪ DO NOT apply more than 0.522 lb a.i./A per year of mandipropamid products.
ALUMINUM TRIS [33]		
Aliette WDG <i>-or-</i> Linebacker WDG	5.0 lb at 7-day intervals in a minimum of 100 gal/A water.	<ul style="list-style-type: none"> ▪ DO NOT exceed 9 applications per year. ▪ DO NOT apply within 31 days of harvest. ▪ DO NOT tank mix with copper compounds. ▪ DO NOT apply with a spreader/sticker.

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

PHYTOPHTHORA ROOT ROT

Pesticide	Rate of product/A	Comments
BACILLUS AMYLOLIQUEFACIENS [44]		
Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates. ▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.
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.	
CYAZOFAMID [21]		
Ranman 400 SC	6 fl oz/A at 10-day schedule.	<ul style="list-style-type: none"> ▪ DO NOT apply more than six sprays of Ranman 400 SC/A per year. ▪ Alternate sprays of Ranman 400 SC with a fungicide with a different mode of action. ▪ DO NOT make more than three consecutive applications of Ranman 400 SC. Follow this by at least three applications of fungicides having a different mode of action before applying additional Ranman 400 SC. ▪ DO NOT apply more than 36 fluid ounces (0.94 lb a.i./A) per year. ▪ DO NOT apply to ginseng via aerial application equipment.
PSEUDOMONAS CHLORORAPHIS STRAIN AFS009 [BM02]		
Howler EVO	Broadcast, Drip and Drench Applications 40-120 oz/A (2.5-7.5 lb/A) on a 5-14-day interval as needed	<ul style="list-style-type: none"> ▪ Use higher rate and shorter intervals when disease pressure is high. ▪ Use lower rates when used in tank mixes and/or rotations with other effective fungicides.
MEFENOXAM [4]		
Ridomil Gold GR	15 lb pre-emergence. 10 lb post-emergence (up to 4 applications) at monthly intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 60 lb/A per growing season. ▪ DO NOT exceed 45 lb/A per growing season if Ridomil Gold EC or Ridomil Gold SL is applied in spring before plants have begun to grow. ▪ DO NOT apply within 9 days of harvest. ▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.
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"> ▪ DO NOT apply to ginseng foliage. ▪ Apply ONCE only as a replacement for the pre-emergence application of Ridomil Gold GR. ▪ NOTE: 80% of isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.
Ultra Flourish.....	1.5 pt in 100-400 gal water applied once as a drench.	<ul style="list-style-type: none"> ▪ DO NOT make supplemental applications. ▪ DO NOT make more than one application. ▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.
Thrive 4M	15.7 – 31.4 fl.oz/A Preplant Incorporated (broadcast or band): Apply sufficient water or liquid fertilizer to provide uniform coverage and mechanically	<ul style="list-style-type: none"> ▪ Maximum Single Application Rate: 31.4 fl.oz/A (1.0 lb a.i./A). ▪ DO NOT apply more than 31.4 fl.oz/A (1.0 lb a.i./A) per year.

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

PHYTOPHTHORA ROOT ROT

Pesticide	Rate of product/A	Comments
	<p>incorporate in the top 2 inches of soil. For banded application, a 7-inch band is advised.</p> <p>Surface Application (broadcast or band): Apply at planting in sufficient water or liquid fertilizer to provide uniform coverage. For banded application, a 7-inch band is advised. Soil surface sprays of this product will not be effective until the fungicide is moved into the root zone by rainfall or irrigation.</p>	<ul style="list-style-type: none"> ▪ DO NOT make more than 2 applications per acre per year at reduced rates. ▪ Pre-harvest interval (PHI): NA
METALAXYL [4]		
MetaStar 2E -or- Metalaxyl 2E AG -or- ReCon 4F	1.5 qt as a drench in 100-400 gal/A water.	<ul style="list-style-type: none"> ▪ DO NOT exceed 1 application per year. ▪ Apply before early growth and follow with applications of a metalaxyl or mefenoxam granular product. ▪ NOTE: 80% of <i>Phytophthora</i> isolates from the northcentral U.S. tested insensitive to mefenoxam/metalaxyl.
PHOSPHOROUS ACID SALTS [33]		
Fosphite -or- Resist 57 -or- 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"> ▪ DO NOT apply at intervals less than 3 days. ▪ Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established. ▪ Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached.
Confine Extra	1.0-4.0 qt foliar application in a minimum of 20 gal water.	<ul style="list-style-type: none"> ▪ DO NOT apply to dormant or heat- or moisture-stressed plants. ▪ DO NOT apply when conditions favor wet tissue for >4 hours.
K-Phite 7LP AG.....	1.0-3.0 qt in a minimum of 20 gal water.	
Alude	4.5 pt/100 gal at 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 9 applications per season.
Reliant Systemic Fungicide.....	2.5 qt at 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 8 applications per season. ▪ Apply in 100 gal water.
Drexel Phiticide -or- Phostrol..	4.5 pt at 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 9 applications per season. ▪ Apply in 100 gal water.
REYNOUTRIA SACHALINENSIS [P5]		
Regalia Biofungicide	1.0-3.0 qt soil drench in 100 gal water at 10- to 14-day intervals. 1.0-4.0 qt/A 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"> ▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>. ▪ May be applied on day of harvest.
STREPTOMYCES LYDICUS		
Actinovate AG	3-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ For best results use a spreader-sticker.
TRICHODERMA ASPERELLUM/T. GAMSII		
Bio-Tam 2.0 -or- Tenet WP	1.5-3.0 oz/1000 row feet in-furrow. 2.5-3.0 lb banded application (see label).	<ul style="list-style-type: none"> ▪ Two or more applications are recommended ▪ See label for details on application methods.

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

PHYTOPHTHORA ROOT ROT

Pesticide	Rate of product/A	Comments
	2.5-5.0 lb broadcast followed by 0.25-0.5 in. 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.	

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).

FOLIAR PHYTOPHTHORA

Pesticide	Rate of product/A	Comments
★ ALUMINUM TRIS★ [33]		
Aliette WDG	5.0 lb at 7-day intervals in a minimum of 100 gal/A water.	<ul style="list-style-type: none"> ▪ DO NOT exceed 9 applications per year. ▪ DO NOT apply within 31 days of harvest. ▪ DO NOT tankmix with copper compounds. ▪ DO NOT apply with a spreader/sticker.
CYAZOFAMID [21]		
Ranman 400 SC	6 fl oz/ A at 10-day schedule.	<ul style="list-style-type: none"> ▪ DO NOT apply more than six sprays of RANMAN 400SC FUNGICIDE/A per year. ▪ Alternate sprays of RANMAN 400SC FUNGICIDE with a fungicide with a different mode of action. ▪ DO NOT make more than three consecutive applications of RANMAN 400SC FUNGICIDE. Follow this by at least three applications of fungicides having a different mode of action before applying additional RANMAN 400SC FUNGICIDE. ▪ DO NOT apply more than 36 fluid ounces (0.94 lb. Al)/A per year. ▪ DO NOT apply to ginseng via aerial application equipment.
★ CHLOROTHALONIL/ZOXAMIDE★ [M05/22]		
Zing!	22.0-30.0 fl oz at 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT harvest within 28 days of treatment. ▪ DO NOT make more than 6 applications or apply more than 1.02 lb zoxamide and 5.88 lb chlorothalonil/A per year. ▪ DO NOT apply through any type of irrigation system. ▪ Use in a minimum spray volume of 80 gal of water/A
★ DIMETHOMORPH★ [40]		
Forum.....	6.0 fl oz at 7-day intervals in a minimum of 20 gal of water/A.	<ul style="list-style-type: none"> ▪ DO NOT exceed 30 fl oz/A or 5 applications. per year. ▪ DO NOT harvest within 14 days of treatment. ▪ Begin applications before infection occurs.

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

FOLIAR PHYTOPHTHORA

Pesticide	Rate of product/A	Comments
		<ul style="list-style-type: none"> DO NOT exceed 1 application of Forum before rotating to a labeled non-Group 40 fungicide for at least 1 application.
★ FENAMIDONE ★ [11]		
Reason 500SC.....	5.5-8.2 fl oz at 14-day intervals.	<ul style="list-style-type: none"> DO NOT exceed 24.6 fl oz/A per year. DO NOT harvest within 14 days of treatment.
★ PHOSPHOROUS ACID SALTS ★ [33]		
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"> DO NOT apply at intervals less than 3 days. Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established. Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached. DO NOT apply to dormant or heat- or moisture-stressed plants. DO NOT apply when conditions favor wet tissue for >4 hours.
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.	
Alude	4.5 pt/100 gal.	
Reliant Systemic Fungicide.....	2.5 qt at 7-day intervals.	<ul style="list-style-type: none"> DO NOT exceed 8 applications per season. Apply in 100 gal water.
Drexel Phiticide <i>-or-</i> Phostrol..	4.5 pt at 7-day intervals.	<ul style="list-style-type: none"> DO NOT exceed 9 applications per season. Apply in 100 gal water.
COPPER OCTANOATE [M01]		
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"> Begin 2 weeks before disease appears. Apply at the higher rate at 7-day intervals when disease is increasing rapidly. Reapply after rain. DO NOT apply more than 33 gal of Cueva/A per year
Soap-Shield Flowable Liquid Copper Fungicide.....	0.5-2.0 fl oz/gal water at 7- to 10-day intervals.	
OXATHIPIPROLINE/CHLOROTHALONIL [49/M05]		
Orondis Opti.....	1.75 – 2.5 pt 14-day interval.	<ul style="list-style-type: none"> DO NOT follow soil applications of oxathiapiprolin (or any other FRAC 49-containing product) with foliar applications of Orondis Opti (or any other FRAC 49-containing product). Where 3 or more fungicide applications are made, use Orondis Opti (or any other FRAC 49-containing product) in no more than 33% of the applications, or a maximum of 4 applications per planting, whichever is fewer. Do not apply more than 0.5 lb a.i./A/year of oxathiapiprolin-containing products. Do not apply more than 12.0 lb a.i./A/year of chlorothalonil-containing products.

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.

POWDERY MILDEW

Pesticide.....	Rate of product/A	Comments
★ AZOXYSTROBIN★ [11]		
Aframe -or- Azoxystar -or- Azoxystrobin -or- Dexter SC -or- Satori -or- Tetraban -or- Trevor -or- Quadris F -or- Azoxystrobin 2SC -or- Satori.....	9.0-15.4 fl oz at 5- to 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 1 foliar application before alternating with a fungicide with a different mode of action. ▪ DO NOT alternate with QoI fungicides such as Cabrio, Flint, Gem. ▪ DO NOT exceed 4 applications per year. ▪ DO NOT exceed 123 fl oz (2 lb a.i.)/A per season.
AZOXYSTROBIN/DIFENOCONAZOLE [11/3]		
Acadia ESQ Fungicide -or- Trevor DCZ -or- Quadris Top...	10-14 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action. ▪ DO NOT apply more than 56 fl oz/A per year. ▪ Use a minimum of 15-gal water for ground applications and a minimum of 10 gal water for aerial applications.
Tycoon	7.8-11.0 fl oz to 14-day intervals.	
AZOXYSTROBIN/EXTRACT OF REYNOUTRIA SACHALINENSIS [11/P5]		
Azterknot.....	7.4 – 24.6 fl oz at 5-to-7-day interval.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 18.4 fl oz (0.25 lb azoxystrobin and 0.14 lb RSE)/A per application. ▪ DO NOT exceed 55.2 fl oz of Azterknot (0.75 lb azoxystrobin and 0.43 lb RSE)/A per calendar year. ▪ DO NOT exceed 0.75 lb azoxystrobin/A per calendar year from all azoxystrobin containing products. ▪ DO NOT apply more than 3 applications per calendar year at the high rate of 18.4 fl oz/A, or 7 applications per calendar year at the low rate of 7.4 fl oz/A.
BENZOVINDIFLUPYR, DIFENOCONAZOLE		
Approvia® Top	13.5 At minimum interval of application of 14-days.	<ul style="list-style-type: none"> ▪ For resistance management, make no more than 2 applications before alternating to another fungicide with a non-Group 7 mode of action. ▪ DO NOT exceed 0.272 lb ai/A/year of benzovindiflupyr-containing products. ▪ DO NOT exceed 0.46 lb a.i./A/year of difenoconazole-containing products. ▪ DO NOT exceed 4 applications per year. ▪ Pre-Harvest Interval (PHI): 15 days.
★ BOSCALID★ [7]		
Endura 70WG	4.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action for at least 1 application. ▪ DO NOT exceed 5 applications (22.5 oz/A) per year.

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

POWDERY MILDEW

Pesticide	Rate of product/A	Comments
PYRACLOSTROBIN/BOSCALID [11/7]		
Pristine WG	8-10.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 6 applications of Pristine per year. ▪ This product can be applied on the day of harvest (0-day PHI).
★ FLUOPYRAM/TRIFLOXYSTROBIN★ [7/11]		
Luna Sensation	7.6 fl oz at a 14-day interval.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 15.3 fl oz/A per year. ▪ DO NOT apply within 7 days of harvest. ▪ DO NOT exceed 2 applications before alternating with a different mode of action.
★ FLUOPYRAM/PYRIMETHANIL★ [7/9]		
Luna Tranquility	16-27 fl oz at a 7-day interval.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 54.7 fl oz/A per year. ▪ DO NOT apply within 30 days of harvest. ▪ DO NOT exceed 2 applications before alternating with a different mode of action.
★ PYDIFLUMETOFEN/FLUDIOXONIL★ [7/12]		
Miravis Prime	6.8 fl oz at 7- to 14-day intervals	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 sequential application before alternating with a fungicide with a different mode(s) of action. ▪ DO NOT make more than 4 applications at the maximum rate per year. ▪ DO NOT apply within in 7 days of harvest.
★ PYRACLOSTROBIN★[11]		
Cabrio 20EG	8.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 1 sequential application before alternating with a fungicide with a different mode of action. ▪ DO NOT rotate with QoI fungicides such as Quadris, Flint, Gem. ▪ DO NOT exceed 3 applications or 48 oz/A per season.
★ PYRACLOSTROBIN/FLUXAPYROXAD★[11/7]		
Merivon Xemium Brand Fungicide	4.0-5.5 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT make more than 2 sequential applications of Merivon before alternating to a labeled non-Group 7 or non-Group 11 fungicide. ▪ DO NOT apply more than 16.5 fl oz/A of Merivon per year. ▪ DO NOT apply more than 3 applications of Merivon per year. ▪ DO NOT apply within 7 days of harvest.
★ TRIFLOXYSTROBIN★[11]		
Flint Extra 50WG.....	2.0-3.0 oz at 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 3 sequential applications of Flint and 1 application of Gem before alternating with a fungicide with a different mode of action. ▪ DO NOT rotate with QoI fungicides such as Quadris, Cabrio. ▪ DO NOT exceed 4 applications (11.5 oz Gem or 12 oz Flint/A) per season (see labels). ▪ DO NOT apply within 7 days of harvest.
Gem 500SC	1.9-2.9 fl oz at 14-day intervals.	

POWDERY MILDEW

Pesticide	Rate of product/A	Comments
BACILLUS AMYLOLIQUEFACIENS [44]		
Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates. ▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.
Double Nickel LC	0.5-6.0 qt at 3- to 10-day intervals.	
BACILLUS PUMILUS [44]		
Sonata.....	2.0-4.0 qt at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ Use higher rates and shorter application intervals under heavy disease pressure.
COPPER OCTANOATE [M1]		
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"> ▪ Begin 2 weeks before disease appears. ▪ Apply at higher rate at 7-day intervals when disease is increasing rapidly. ▪ Reapply after rain. ▪ DO NOT apply more than 33 gal of Cueva/A per year
CYPRODINIL/FLUDIOXONIL [9/12]		
Switch 62.5WDG <i>-or-</i> Alterity 62.5WDG	11-14 oz at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 2 foliar applications before alternating with a fungicide with a different mode of action for at least 2 applications. ▪ DO NOT exceed 56 oz/A per year. ▪ DO NOT apply within 7 days of harvest.
HYDROGEN DIOXIDE/PEROXYACETIC ACID		
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"> ▪ OxiDate 2.0: Preventative treatment: Apply the first 3 treatments at a curative rate at 5-day intervals. Reduce rate to 32.0 fl oz/100 gal water after the completion of the 3rd treatment and maintain 5-day interval until harvest. ▪ OxiDate 5.0: Preventative treatment: Apply at 5- to 10-day intervals.
OxiDate 5.0	Preventive treatment: 1:800-1:500 dilution Curative treatment: 1:256 dilution Rescue treatment: 1:100 dilution	
LAMINARIN [P4]		
Vacciplant	14.0-22.0 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ At water volumes less than 70 gal/A apply at 14.0 fl oz/A. At water volumes above 70 gal/A apply at 0.15% v/v.
NEEM OIL		
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"> ▪ DO NOT exceed 2 gal/A per application.
PENTHIOPYRAD [7]		
DuPont Fontelis	16-30 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 61 fl oz/A per season. ▪ May be applied day of harvest (PHI=0). ▪ DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action.

POWDERY MILDEW

Pesticide	Rate of product/A	Comments
PHOSPHOROUS ACID SALTS [33]		
Fosphite <i>-or-</i> Rampart	1.0-3.0 qt foliar application in a minimum of 100 gal water. 2.0 qt/100 gal (¾ fl oz/gal) as a root dip.	<ul style="list-style-type: none"> ▪ DO NOT apply at intervals less than 3 days. ▪ Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established. ▪ Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached. ▪ DO NOT apply to dormant or heat- or moisture-stressed plants. ▪ DO NOT apply when conditions favor wet tissue for >4 hours.
Confine Extra <i>-or-</i> K-Phite 7LP AG	1.0-4.0 qt foliar application in a minimum of 20 gal water.	
POTASSIUM BICARBONATE		
Kaligreen	2.5-3.0 lbs at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 5 lb per application ▪ DO NOT use when disease pressure is severe.
Milstop	2-5 lb at 7- to 14-day intervals.	
POTASSIUM SILICATE		
Sil-Matrix	1.0-4.0 qt in 50-250 gal water at 7-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 10 qts/A per application. ▪ DO NOT apply more than 20 gal/A per season. ▪ Only apply this product through drip, sprinkler, furrow, flood, or border irrigation systems.
REYNOUTRIA SACHALINENSIS [P5]		
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"> ▪ May be applied on day of harvest.
STREPTOMYCES LYDICUS		
Actinovate AG	3.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ For best results use spreader-sticker.
TEE TREE OIL/DIFENOCONAZOLE [46/3]		
Regev	4-8.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 34 fl oz/A of Regev per season. ▪ DO NOT apply within 48 hours of harvest.

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.

PYTHIUM ROOT ROT

Pesticide	Rate of product/A	Comments
★ CAPTAN★ [M04]		
Drexel Captan 50W	4.0 lb at 7- to 10-day intervals as a drench in a minimum of 200 gal of water/A.	<ul style="list-style-type: none"> ▪ DO NOT exceed 32 lb/A Drexel Captan 50W per year. ▪ DO NOT exceed 30 lb/A Captan 80WDG per year.

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

PYTHIUM ROOT ROT

Pesticide	Rate of product/A	Comments
Captan 80WDG.....	3.75 lb at 6- to 8-day intervals as a drench in a minimum of 200 gal of water/A.	<ul style="list-style-type: none"> ▪ DO NOT apply Drexel Captan 50W within 365 days of harvest. ▪ DO NOT apply Captan 80WDG within 14 days of harvest.
★ FENAMIDONE ★ [11]		
Reason 500SC	5.5-8.2 fl oz at 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 24.6 fl oz/A per year. ▪ DO NOT harvest within 14 days of treatment.
★ MEFENOXAM ★ [4]		
Ridomil Gold GR	15 lb pre-emergence. 10 lb (up to 4 applications) at monthly intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 60 lb/A per growing season. ▪ DO NOT exceed 45 lb/A per growing season if Ridomil Gold EC or Ridomil Gold SL is applied in spring before plants have begun to grow. ▪ DO NOT apply within 9 days of harvest.
Ridomil Gold SL	0.75 pt in 100-400 gal water drench.	<ul style="list-style-type: none"> ▪ DO NOT apply to ginseng foliage.
Thrive 4M	15.7-31.4 fl oz/A. Preplant Incorporated: (broadcast or band): Apply sufficient water or liquid fertilizer to provide uniform coverage and mechanically incorporate in the top 2 inches of soil. For banded application, a 7-inch band is advised. Surface Application: (broadcast or band): Apply at planting in sufficient water or liquid fertilizer to provide uniform coverage. For banded application, a 7-inch band is advised. Soil surface sprays of this product will not be effective until the fungicide is moved into the root zone by rainfall or irrigation.	<ul style="list-style-type: none"> ▪ Apply ONCE only as a replacement for the pre-emergence application of Ridomil Gold GR.
★ METALAXYL ★ [4]		
MetaStar 2E	1.5 qt as a drench in 100 to 400 gal/A water.	<ul style="list-style-type: none"> ▪ DO NOT exceed 1 application per year. ▪ Apply before early growth and follow with applications of a metalyxyl or mefenoxam granular product.
Xyler FC	1.4-2.9 qt/A. Surface Application: Broadcast as a soil application at planting with sufficient spray volume to ensure uniform coverage. Banded applications: a 7-in. band is recommended. See the Banded Application Instructions section for more information and the banded application calculation.	<ul style="list-style-type: none"> ▪ If rainfall is not expected before seed germination starts, Xyler FC should be moved into the seed zone after planting with 0.5 to 1 in. of irrigation
AZOXYSTROBIN [11]		
<u>Banded applications:</u> band width 7 in. or less. Banded applications contact the foliage and are counted as a foliar application.		<ul style="list-style-type: none"> ▪ Active against <i>Rhizoctonia</i>, <i>Pythium</i>. ▪ DO NOT exceed 1 foliar application before alternating with a fungicide with a different mode of action.
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-in. rows.	<ul style="list-style-type: none"> ▪ DO NOT alternate with QoI fungicides such as Cabrio, Flint, Gem. ▪ DO NOT exceed 4 applications per year.

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

PYTHIUM ROOT ROT

Pesticide	Rate of product/A	Comments
<p><u>In-furrow applications:</u> apply in 3-15 gal water at planting.</p> <p>Quadris F See label for fl oz/A depending on row sizes.</p>		<ul style="list-style-type: none"> ▪ DO NOT exceed 123 fl oz (2 lb a.i.)/A per season.
BACILLUS AMYLOLIQUEFACIENS [44]		
Double Nickel 55.....	0.25-3.0 lb at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates. ▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.
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.	
FLUOPICOLIDE [43]		
Presidio	3.0-4.0 fl oz at 10-day intervals.	<ul style="list-style-type: none"> ▪ Must be tank mixed with another fungicide that has a different mode of action. ▪ DO NOT exceed 4 applications per year.
PHOSPHOROUS ACID SALTS [33]		
Fosphite <i>-or-</i> Rampart	1.0-3.0 qt foliar application in a minimum of 100 gal water.	<ul style="list-style-type: none"> ▪ DO NOT apply at intervals less than 3 days. ▪ Disease Prevention Program: Apply lower rate of foliar application at 2-4 week intervals after plants become established. ▪ Disease Control Program: Apply high rate of foliar application at 2-3 week intervals until control is reached. ▪ DO NOT apply to dormant or heat- or moisture-stressed plants.
	2.0 qt/100 gal (2/3 fl oz/gal) as a root dip.	
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.	
CYAZOFAMID [21]		
Ranman 400 SC	6 fl oz/A at 10-day interval.	<ul style="list-style-type: none"> ▪ DO NOT apply more than six sprays of Ranman 400SC/A per year. ▪ Alternate sprays of Ranman 400SC with a fungicide with a different mode of action. ▪ DO NOT make more than three consecutive applications of Ranman 400SC. Follow this by at least three applications of fungicides having a different mode of action before applying additional Ranman 400SC. ▪ DO NOT apply more than 36 fluid ounces (0.94 lb a.i.)/A per year. ▪ DO NOT apply to ginseng via aerial application equipment.
REYNOUTRIA SACHALINENSIS [P5]		
Regalia Biofungicide	1.0-3.0 qt soil drench in 100 gal water at 10- to 14-day intervals. 1.0-4.0 qt/A 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"> ▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>, <i>Verticillium</i>. ▪ May be applied on day of harvest.
STREPTOMYCES LYDICUS		
Actinovate AG	3.0-12 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ For best results use a spreader-sticker.
TRICHODERMA ASPERELLUM/T. GAMSII		
Bio-Tam 2.0	1.5-3.0 oz/1000 row feet in-furrow. 2.5-3.0 lb banded application (see label).	<ul style="list-style-type: none"> ▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>. ▪ Two or more applications are recommended ▪ See label for details on application methods.

PYTHIUM ROOT ROT

Pesticide	Rate of product/A	Comments
	2.5-5.0 lb broadcast followed by 0.25-0.5 in. 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.	
The use of Elumin for Phytophthora root rot control may offer Pythium control.		

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

CULTURAL CONTROL:

Remove and destroy infected plants.

WHITE MOLD LEAF AND STEM BLIGHT AND ROOT ROT

Pesticide	Rate of product/A	Comments
<p style="text-align: center;">★ FLUAZINAM ★ [29]</p> <p>Omega 500F <i>-or-</i> Orbus 4F - <i>or-</i> Lektivar 40SC <i>-or-</i> Vantana <i>-or-</i> Omavo</p>	1.0-1.5 pt at 7- to 14-day intervals in a minimum of 100 gal water.	<ul style="list-style-type: none"> ▪ DO NOT exceed 6 pt per season. ▪ DO NOT apply within 30 days of harvest. ▪ Use 1 pt/A when the disease first appears or when conditions are favorable. Under conditions that favor severe disease development, use higher rate.
<p style="text-align: center;">★ FLUDIOXONIL ★ [12]</p> <p>Cannonball WG.....</p>	4.0-8.0 oz/A at 14-21 day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply within 14 days of harvest. ▪ DO NOT exceed 4 lb/A per season. ▪ DO NOT apply more than 32 oz (1.0 lb a.i./A) per crop.
<p style="text-align: center;">★ THIOPHANATE-METHYL ★ [1]</p> <p>Topsin M WSB (Special Local Need Registration)</p>	1.0 lb acre at 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT APPLY WITHING 365 DAYS OF HARVEST. ▪ DO NOT exceed 2 lb/A per season. ▪ DO NOT allow workers entry into treated areas during the Restricted Entry Interval (REI) of 24 hours unless appropriate personal protective equipment for early entry is worn.
<p style="text-align: center;">BACILLUS AMYLOLIQUEFACIENS [44]</p> <p><u>Foliar application.</u></p> <p>Double Nickel 55.....</p> <p>Double Nickel LC</p> <p>Stargus.....</p>	0.25-3.0 lb at 7- to 10-day intervals. 0.5-6.0 qt at 7- to 10-day intervals. 3 to 4 qt at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates. ▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.
<p><u>Soil application.</u></p> <p>Double Nickel 55.....</p> <p>Double Nickel LC</p>	0.125-1.0 lb at 7- to 10-day intervals. 0.5-6.0 qt at 3- to 10-day intervals.	<ul style="list-style-type: none"> ▪ First application as a soil or seedline drench, banded in-furrow at planting. ▪ Follow-up applications via drip/sprinkler, spray onto soil surface and/or lower plant parts followed immediately with overhead

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

WHITE MOLD LEAF AND STEM BLIGHT AND ROOT ROT

Pesticide	Rate of product/A	Comments
		irrigation, or inject directly into the rooting zone using shanks, etc. <ul style="list-style-type: none"> ▪ Under light disease pressure, when applied to smaller plants or when used in a tank mix, use lower rates. ▪ Under moderate-severe disease pressure, use higher rates, apply more frequently, and mix or rotate with other fungicides.
<i>BACILLUS SUBTILIS</i> [44]		
Serenade OPTI	14.0-20.0 oz/A at 7- to 10-day intervals.	<ul style="list-style-type: none"> ▪ Apply at stated interval or as needed.
Aviv	10-30 fl oz at 5- to 10-day intervals.	
<i>CONIOTHYRIUM MINITANS</i> [M-91]		
Contans WG	1.0-4.0 lb at 7-day intervals	<ul style="list-style-type: none"> ▪ DO NOT tank mix with other fungicides.
<i>Fluxapiroxad</i> [7]		
Tesaris	4.6 fl oz/A at 7 to 14 day interval.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 4.6 fl ozs of Tesaris (0.089 lb fluxapyroxad)/A per application. ▪ DO NOT make more than 3 applications per year. ▪ DO NOT apply more than 13.8 fl ozs of Tesaris (0.267 lb fluxapyroxad)/A per year. ▪ The preharvest interval is 7 days. ▪ DO NOT make more than two (2) sequential applications of Tesaris before alternating to a labeled non-Group 7 fungicide
<i>LAMINARIN</i> [P4]		
Vacciplant	14.0-22.0 fl oz at 7- to- 14-day intervals.	<ul style="list-style-type: none"> ▪ At a water volume less than 70 gal/A, apply at 14.0 fl oz/A. At water volumes above 70 gal/A apply at 0.15% v/v.
<i>PENTHIOPYRAD</i> [7]		
DuPont Fontelis	16-30 fl oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 61 fl oz/A per season. ▪ May be applied day of harvest (PHI=0). ▪ DO NOT exceed 2 sequential applications before switching to a fungicide with a different mode of action.
<i>TEA TREE OIL</i> [BM01]		
TIMOREX ACT	13-35 fl oz/A at 7-14 day intervals.	<ul style="list-style-type: none"> ▪ For preventative control up until 48 hours of harvest. ▪ For best effect from soil treatments, make an application at or near transplanting and during periods of rapid root growth. In high disease pressure, follow with applications every 14-28 days.
<i>TEE TREE OIL/DIFENOCONAZOLE</i> [46/3]		
Regev	4-8.5 oz at 7- to 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 34 fl oz/A of Regev per season. ▪ DO NOT apply within 48 hours of harvest.
<i>TRICHODERMA ASPERELLUM/T. GAMSII</i>		
Bio-Tam 2.0	1.5-3.0 oz/1000 row feet in-furrow. 2.5-3.0 lb banded application (see label).	<ul style="list-style-type: none"> ▪ Active against <i>Fusarium</i>, <i>Phytophthora</i>, <i>Pythium</i>, <i>Rhizoctonia</i>. ▪ Two or more applications are recommended

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

WHITE MOLD LEAF AND STEM BLIGHT AND ROOT ROT

Pesticide	Rate of product/A	Comments
	2.5-5.0 lb broadcast followed by 0.25-0.5 in. 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"> ▪ See label for details on application methods.
See also fumigation section for preplant chemical control of white mold.		

SOIL INSECTS (climbing cutworms, cutworms, white grubs, wireworms) and 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.

SOIL INSECTS and ABOVE-GROUND INSECTS

Pesticide	Rate of product/A	Comments
★ BIFENTHRIN ★		
Brigade WSB -or- Bifenture 10DF -or- Batallion 10 WSP (MI only)	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"> ▪ RESTRICTED USE PESTICIDE. ▪ Apply no more than once every 7 days. ▪ DO NOT apply within 21 days of harvest. ▪ DO NOT exceed 0.5 lb active/A per season.
Bifen 2 AG Gold -or- Bifenture EC -or- Brigade 2EC -or- Fanfare EC -or- Fanfare ES -or- Sniper -or- Tundra -or- Reveal®	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.	

SOIL INSECTS and ABOVE-GROUND INSECTS

Pesticide	Rate of product/A	Comments
★ BIFENTHRIN/ CHLORANTRANILIPROLE ★		
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"> ▪ RESTRICTED USE PESTICIDE. ▪ Apply no more than once every 7 days. ▪ DO NOT apply within 21 days of harvest. ▪ DO NOT exceed 28.8 fl oz of Elevest/A per season.
★ CARBARYL ★		
Carbaryl 4L -or- Sevin Brand XLR Plus -- or- Drexel Carbaryl 4L.....	1.0-2.0 qt at 7-day intervals for bugs, cutworms.	<ul style="list-style-type: none"> ▪ DO NOT exceed 6 applications Carbaryl 4L/Sevin Brand XLR Plus or 3 applications Lebanon Sevin 7G per season. ▪ DO NOT apply within 7 days of harvest. ▪ DO NOT apply to when weed flowers are present.
Lebanon Sevin 7G.....	0.7 lb/1000 sq ft at 7-day intervals.	
★ CHLORANTRANILIPROLE ★		
Coragen	3.5-7.5 fl oz/A at minimum 3-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 4 applications per growing season. ▪ DO NOT apply more than 15.4 fl oz of Coragen or 20.5 fl oz of Vantacor/A per year. ▪ DO NOT make more than 4 applications/A per crop or 16 applications/A per calendar year.
Vantacor.....	1.2-2.5 fl oz/A at minimum 3-day intervals.	
Shenzi 400 SC.....	1.7-3.8 fl oz/A at minimum 3-day intervals.	
★ DIAZINON ★		
Diazinon AG500.....	0.75-1.0 pt applied once for aphids, bugs in 10-100 gal water.	<ul style="list-style-type: none"> ▪ RESTRICTED USE PESTICIDE. ▪ DO NOT exceed 1 application per growing season. ▪ DO NOT apply during flowering on 3- and 4-year-old plants. ▪ DO NOT apply within 30 days of harvest. ▪ DO NOT graze treated areas or feed treated forage to livestock.
Diazinon AG600 WBC	9.5-12.75 fl oz applied once for aphids, bugs in 10-100 gal/A water.	
ALPHA-CYPERMETHRIN		
Fastac EC -or- Fastac CS	1.3-3.8 fl oz/A minimum 4-day reapplication intervals for aphids and cutworms.	<ul style="list-style-type: none"> ▪ DO NOT apply more than 11.4 fl oz of product/A per year. ▪ DO NOT apply to foliage used for livestock feed.
AZADIRACTIN		
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"> ▪ Best results obtained with 2-3 applications. ▪ May be applied on the day of harvest. ▪ AzaGuard- use in combination with 0.25-1.0% non-phytotoxic crop oil in sufficient water to cover the undersides of the leaves.
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.	

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

SOIL INSECTS and ABOVE-GROUND INSECTS

Pesticide	Rate of product/A	Comments
Molt-X.....	8.0 oz for cutworms, leafrollers. 10 oz for aphids, bugs, thrips. Apply at 7- to 10-day intervals for aphids, bugs, cutworms, and leafrollers. Apply at 5- to 7-day intervals for thrips	
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.	<ul style="list-style-type: none"> ▪ Best results obtained with 2-3 applications. ▪ May be applied on the day of harvest.
AZADIRACTIN/PYRETHRINS		
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"> ▪ Use 3-3.5 pt for high populations of adults and/or hard to kill insects.
BACILLUS THURINGIENSIS		
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"> ▪ Under heavy pressure pest population pressure, use higher label rates, shorten the spray interval, and/or raise spray volume.
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.	
BEAUVERIA BASSIANA		
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"> ▪ May be applied on the day of harvest. ▪ Aphids may require 2- to 5-day intervals. ▪ Use up to 3 qt Mycotrol for extreme insect pressure.
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.	
BEAUVERIA BASSIANA/PYRETHRINS [3A]		
BotaniGard Maxx	0.5-1.0 qt/100 gal at 5- to 10-day intervals for aphids.	<ul style="list-style-type: none"> ▪ May be applied on the day of harvest. ▪ Aphids may require 2- to 5-day intervals.
BURKHOLDERIA SPP.		
Venerate XC	1.0-8.0 qt for armyworms, aphids, and thrips.	<ul style="list-style-type: none"> ▪ Labeled for control of Armyworms, European corn borer, and loopers.
CAPSICUM OLERESIN EXTRACT		
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"> ▪ When pest pressure is heavier, use higher rates and consider tank mixes with other insecticides or miticides.
CHROMOBACTERIUM SUBTSUGAE		
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"> ▪ Under heavy pressure pest population pressure, use higher label rates, shorten the spray interval, and/or raise spray volume.

SOIL INSECTS and ABOVE-GROUND INSECTS

Pesticide	Rate of product/A	Comments
CYANTRANILIPROLE		
Exirel	13.5-20.5 fl oz at minimum of 5-day interval for aphids.	<ul style="list-style-type: none"> ▪ For best performance use Exirel with an effective adjuvant. ▪ DO NOT apply more than 0.4 lb ai/A per calendar year.
Verimark.....	10-13.5 fl oz to soil at planting	
DELTA METHRIN		
Delta Gold	1.0 to 2.4 fl oz at 3-day intervals minimum	<ul style="list-style-type: none"> ▪ DO NOT exceed 12 fl oz/A (0.14 lb/Aa a.i.) per growing season. ▪ DO NOT apply within 3 days of harvest. ▪ DO NOT apply to foliage used for livestock feed.
FLONICAMID		
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"> ▪ DO NOT exceed 2.8 oz/A per application. ▪ DO NOT exceed 8.4 oz/A per season. ▪ DO NOT exceed 3 applications at 2.8 oz/A per season. ▪ Use lower rate for building populations, higher rate for greater populations and/or dense foliage. ▪ Scout and retreat as necessary.
FLUPYRADIFURONE		
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"> ▪ DO NOT apply within 7-days of harvest. ▪ Maximum amount of Sivanto 200 SL and Sivanto Prime product applied per year cannot exceed 28.0 fl oz. ▪ Maximum amount of Sivanto HL product applied per year cannot exceed 14 fl oz.
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.	
IMIDACLOPRID		
<u>Foliar applications</u>		
Prey 1.6 -or- Sherpa	3.5 fl oz at 5-day intervals for aphids.	<ul style="list-style-type: none"> ▪ DO NOT exceed 3 applications per season. ▪ DO NOT exceed 10.5 fl oz Prey/Sherpa per season. ▪ DO NOT exceed 8.4 fl oz Macho 2.0FL/Montana 2F/Nuprid 2SC Soil/Foliar per season. ▪ DO NOT exceed 4.2 fl oz Macho 4.0/Alias 4F/Midash Forte/Montana 4F/Nuprid 4F Max per season. ▪ DO NOT exceed 3.7 fl oz Admire Pro per season. ▪ DO NOT exceed 2.8 oz Malice per season. ▪ DO NOT apply within 7 days of harvest.
Macho 2.0FL -or- Montana 2F	2.8 fl oz at 5-day intervals for aphids.	
Malice 75WSP	0.9 oz at 5-day intervals (minimum) for aphids.	
Wrangler -or- Alias 4F -or- Advise Four -or- Macho 4.0 -or- Midash Forte -or- Montana 4F -or- Nuprid 4F Max -or- Provoke	1.4 fl oz at minimum 5-day intervals for aphids.	
Admire Pro	1.2 fl oz at minimum 5-day intervals for aphids.	
Imidashot DF.....	1.0 oz at minimum 5-day intervals for aphids.	

SOIL INSECTS and ABOVE-GROUND INSECTS

Pesticide	Rate of product/A	Comments	
Soil applications			
Admire Pro -or- 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"> ▪ DO NOT exceed 1 application per growing season. ▪ 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. ▪ DO NOT apply within 21 days of harvest. ▪ Chemigate through low-pressure drip, trickle, micro-sprinkler; -or- in furrow spray/shanked in 1-2 in. below seed row during planting; -or- narrow band (2 in. or less) 1-2 in. directly below seed row 14 or fewer days before planting. ▪ DO NOT exceed 3.0 oz/A Imidashot DF 	
Wrangler.....	0.35-0.85 fl oz/1000 row ft (5-12 fl oz/ acre) applied once for aphids.		
Alias 4F -or- Midash Forte -or- Montana 4F -or- 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 -or- Alias 2F -or- Malice 2F -or- Nuprid 2SC Soil/Foliar -or- Widow	0.7-1.7 fl oz/1000 row-feet (10-24 fl oz/A) applied once for aphids.		
Montana 2F -or- Nuprid 2SC ..	0.7-1.7 fl oz/1000 row-feet (10-24 fl oz/A) applied once for aphids, thrips.		
Advise Four -or- Provoke.....	0.4-0.9 fl oz/1000 row-feet (5.0-12.0 fl oz/A) applied once for aphids, thrips.		
Imidashot DF.....	0.25-0.62 oz/1000 row-feet (3.5-8.7 oz/A) applied once for aphids and thrips.		
METHOXYFENOZIDE			
Intrepid 2F -or- Zylor -or- Invertid 2F -or- Vexer Insecticide	8.0-16 fl oz at 14-day intervals for cutworm suppression.		<ul style="list-style-type: none"> ▪ DO NOT exceed 64 fl oz/A per season. ▪ DO NOT apply within 7 days of harvest.
MINERAL OIL			
Biocover MLT -or- Damoil.....	0.75-1.5 gal once or twice per week for aphids and thrips.	<ul style="list-style-type: none"> ▪ For BioCover MLT use higher pressure (minimum 400 psi) and ceramic hollow cone nozzles. ▪ For Damoil use higher pressure (minimum 100 psi) and ceramic hollow cone nozzles. 	
NEEM OIL			
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"> ▪ DO NOT exceed 2 gal/A per application. 	
PETROLEUM OIL			
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 and ABOVE-GROUND INSECTS

Pesticide	Rate of product/A	Comments
PYRETHRINS		
PyGanic EC 1.4 II	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"> ▪ Apply in the early morning or late evening to avoid possible harm to honey bees.
PyGanic EC 5.0 II	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"> ▪ DO NOT apply within 12 hours of harvest. ▪ Apply in the early morning or late evening to avoid possible harm to honey bees. ▪ DO NOT exceed 10 applications per season. ▪ DO NOT reapply within 3 days; 24 hours only under extreme pest pressure.
SPINOSAD		
Entrust Naturalyte Insect Control	1.0-2.0 oz at 5-day (minimum) intervals for thrips.	<ul style="list-style-type: none"> ▪ DO NOT apply within 3 days of harvest. ▪ DO NOT exceed 4 applications (7 oz Entrust Naturalyte/A, 14.4 oz Blackhawk/A, 21 fl oz Spintor or Entrust SC/A) per season. ▪ DO NOT exceed 2 consecutive applications of spinosad and spinetoram before alternating with another insecticide with a different mode of action. ▪ Before making widespread applications, treat a limited number of plants and observe for phytotoxicity over a 10-day period. ▪ Addition of an adjuvant may improve thrips control.
Blackhawk Naturalyte Insect Control	1.7-3.3 oz at 5-day (minimum) intervals for thrips.	
SpinTor 2SC -or- Entrust SC Naturalyte Insect Control	3.0-6.0 fl oz at 5-day (minimum) intervals for thrips.	
Success Naturalyte Insect Control	3.0-6.0 fl oz at 7-day (minimum) intervals for thrips.	
Conserve SC	8.0 fl oz/100 gal at 5-day (minimum) intervals for thrips.	
SPINETORAM		
Radiant SC	6.0-8.0 fl oz at 4-day (minimum).	<ul style="list-style-type: none"> ▪ DO NOT apply within 3 days of harvest. ▪ DO NOT exceed 2 consecutive applications of spinosad and spinetoram before alternating with another insecticide with a different mode of action. ▪ Use the higher rate for heavy infestations. ▪ Addition of an adjuvant may improve thrips control.
Delegate WG	3-4 oz/A at 7-day (minimum).	
SPINETORAM/METHOXYFENOZIDE		
Intrepid Edge	4.5-12 fl oz at 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply within 3 days of harvest. ▪ DO NOT apply more than 48 fl oz/A per year. ▪ DO NOT make more than 4 applications per crop.

SOIL INSECTS and ABOVE-GROUND INSECTS

Pesticide	Rate of product/A	Comments
SULFOXAFLOR		
Transform WG	0.75-1.5 oz at 7-day intervals for aphids.	<ul style="list-style-type: none"> ▪ DO NOT apply within 7 days of harvest. ▪ DO NOT apply more than 8.5 oz/A per year. ▪ DO NOT make more than 2 consecutive applications per crop.
THIAMETHOXAM		
Actara	1.5-3.0 oz at 7-day intervals (minimum) for aphids.	<ul style="list-style-type: none"> ▪ DO NOT use less than 10 GPA. ▪ DO NOT exceed 8 oz/A per growing season. ▪ DO NOT apply within 7 days of harvest.
Platinum	5.0-12 fl oz at or within 24 hours of seeding for aphids.	<ul style="list-style-type: none"> ▪ DO NOT exceed 12 fl oz/A Platinum or 4.01 oz/A Platinum 75SG per growing season. ▪ At seeding: in-furrow spray or narrow surface band above the seedline and water in to seedling depth within 24 hours.
Platinum 75SG	1.7-4.01 oz or within 24 hours of seeding for aphids.	
ZETA-CYPERMETHRIN		
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"> ▪ RESTRICTED USE PESTICIDE. ▪ DO NOT use less than 10 GPA. ▪ DO NOT exceed 0.15 lb active ingredient per growing season. ▪ DO NOT use foliage for feed. ▪ Apply as required by scouting. ▪ Use of this product should conform to resistance management strategies established for the use area. ▪ Aids in control of aphids.
Mustang Maxx	1.28-4.0 oz for cutworms or 3.2-4 oz for aphids, bugs at 4-day (minimum) intervals.	
ZETA-CYPERMETHRIN/BIFENTHRIN		
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"> ▪ DO NOT apply within 21 days of harvest. ▪ DO NOT exceed 11.2 oz/A Hero EW or 4.7 fl oz Steed per application. ▪ DO NOT exceed 46.35 oz (0.2 lb a.i.)/A Hero or 50.4 oz (0.45 lb a.i.)/A Hero EW or 28.1 fl oz (0.33 lb a.i.)/A Steed per season. ▪ DO NOT exceed 2 foliar applications per season. ▪ Apply as required by scouting. ▪ Use of this product should conform to resistance management strategies established for the use area.
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.	
See also fumigation section for preplant chemical control of soil insects.		

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.

SLUGS

Pesticide	Rate of product/A	Comments
★ METALDEHYDE ★		
Deadline GT	33.3 lb/A at 21-day intervals (No more than 6 applications).	<ul style="list-style-type: none"> ▪ DO NOT apply more than 6 applications per year. ▪ DO NOT apply within 21-days of harvest.
IRON PHOSPHATE		
FerroXX AQ	Apply bait granules around or over the plants to be protected at the rate of 4-15 lbs/A (0.09-0.34 lbs per 1000 sq. ft.) and reapply as the bait is consumed or as needed. For heavy pest pressure apply 20-25 lbs/A.	<ul style="list-style-type: none"> ▪ Apply in the evening, as slugs travel and feed mostly in the night or early morning. ▪ DO NOT place in piles. If the ground is dry, wet before application.
SODIUM FERRIC EDTA		
IronFist Slug and Snail Bait.....	10-40 lb/A or 0.25-1 lb/1000 sq ft and repeat as needed or at 2-week intervals.	<ul style="list-style-type: none"> ▪ Use higher rates when infestations are high.
Ferroxx.....	5-20 lbs/A or 0.44 lbs/1000 sq ft. Repeat as needed or at 2-week intervals.	
See also fumigation section for preplant chemical control of slugs.		

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.

NEMATODES

Pesticide	Rate of product/A	Comments
AZADIRACTIN		
AzaGuard -or- Molt-X	15 oz at 3- to 4-week intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 22.5 fl oz/A per season. ▪ Apply in sufficient water to penetrate the soil to a depth of 12 in..
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"> ▪ Repeat as necessary.
FLUENSULFONE		
Nimitz	3.5 to 7 pt applied prior to planting	<ul style="list-style-type: none"> ▪ This product must be applied 7-10 days prior to seeding.

NEMATODES

Pesticide	Rate of product/A	Comments
<i>MYROTHECIUM VERRACARIA</i>		
Ditera DF	0.31-2.4 lb/1000 sq ft.	<ul style="list-style-type: none"> ▪ Apply to the soil as a pre-plant, at planting or post-planting soil treatment. ▪ This product must be applied to and incorporated into the soil.
See also fumigation section for preplant chemical control of nematodes.		

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.

WEEDS

Pesticide	Rate of product/A	Comments
<i>AMMONIATED SOAP OF FATTY ACIDS</i>		
Final-San-O	26 oz/1 gal water applied at 75-200 gal/A at 14- to 21-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT apply over emerged ginseng.
<i>CLETHODIM</i>		
Arrow 2EC -or- Avatar S2 -or- Cleanse 2EC -or- Clethodim 2E -or- Dakota -or- Intensity Post-Emergence Herbicide -or- Select 2EC -or- Shadow -or- Tide Clethodim 2EC -or- Vaquero -or- Volunteer -or- Willowood Clethodim 2EC	6.0-8.0 fl oz at 14-day intervals.	<ul style="list-style-type: none"> ▪ DO NOT exceed 8 fl oz/A in a single application. ▪ DO NOT apply within 30 days of harvest. • DO NOT exceed 5.33 fl oz/A of Section Three or Shadow 3EC in a single application. • DO NOT exceed 16 fl oz/A of Tapout in a single application.
Select Max with Inside Technology	9-16 fl oz to control annual grasses, and 12-16 fl oz to control perennial grasses 14-day intervals.	
Section Three -or- Shadow 3EC	4.0-5.33 fl oz at 14-day intervals.	
Tapout	9.0-16 fl oz annual grass rate or 12-16 fl oz perennial grass rate at 14-day intervals.	
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"> ▪ DO NOT exceed 16 fl oz/A in a single application. ▪ DO NOT exceed 64 fl oz/A per season. ▪ DO NOT apply within 30 days of harvest.
<i>DIQUAT DIBROMIDE</i>		
Aceto Diquat 2L AG -or- Dessicash AG -or- Nufarm		<ul style="list-style-type: none"> ▪ DO NOT apply over emerged ginseng. ▪ DO NOT use for food or feed within 1 year of application.

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

WEEDS

Pesticide	Rate of product/A	Comments
Diquat 2L -or- Reglone Desiccant -or- Verdure X.....	1.5-2.0 pt in a minimum of 15 gal water.	<ul style="list-style-type: none"> ▪ DO NOT graze treated areas. ▪ Can be used during site preparation.
<i>FLUAZIFOP-P-BUTYL</i>		
Fusilade DX	16-24 oz (add 1% crop oil or 0.25% surfactant).	<ul style="list-style-type: none"> ▪ DO NOT apply within 1 year of harvest. ▪ Effective against grasses only. ▪ Apply when grasses are 2-8 in. tall, before tilling or heading. ▪ Direct spray away from ginseng foliage.
<i>GLYPHOSATE</i>		
<ul style="list-style-type: none"> ▪ Glyphosate is nonspecific and may damage actively growing ginseng. ▪ 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. <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 K-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>		<ul style="list-style-type: none"> ▪ DO NOT apply within 1 year of harvest. ▪ DO NOT apply over emerged ginseng.
<i>PELARGONIC ACID/RELATED FATTY ACIDS</i>		
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"> ▪ DO NOT apply over emerged ginseng. ▪ 3-5% for control of annual weeds, mosses and cryptogams. ▪ 5-7% for burndown of perennial herbaceous plant, weeds in a later stage of growth, and sucker growth. ▪ 7-10% for maximum vegetative burndown, edging or foliar trimming. ▪ Can be applied prior to emergence of plants from perennial rootstocks.
<i>PYRAFLUFEN-ETHYL</i>		
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"> ▪ For preplant burndown. ▪ DO NOT make more than 3 applications per year. ▪ DO NOT apply within 24 hours of planting. ▪ To control grassy weeds, tank mix with glyphosate, paraquat, or glufosinate.
See also fumigation section for preplant chemical control of weeds.		

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.

SOILBORNE PESTS/FUMIGATION

Pesticide	Rate of product/A	Comments
DICHLOROPROPENE		
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.	<ul style="list-style-type: none"> ▪ RESTRICTED USE PESTICIDE. ▪ Allow fumigant to dissipate completely before planting.
Telone EC (<i>MI only</i>).....	9.0-18 gal broadcast mineral soil.	<ul style="list-style-type: none"> ▪ RESTRICTED USE PESTICIDE. ▪ Apply using surface or buried drip irrigation and tarp only. ▪ Leave undisturbed 14 days after treatment.
DICHLOROPROPENE/CHLOROPICRIN		
Telone C-35.....	13.0-20.5 gal broadcast mineral soil. 33-36 gal broadcast muck/peat.	<ul style="list-style-type: none"> ▪ RESTRICTED USE PESTICIDE. ▪ Allow fumigant to dissipate completely before planting.
InLine (<i>MI only</i>).....	13-20.5 gal broadcast mineral soil.	<ul style="list-style-type: none"> ▪ RESTRICTED USE PESTICIDE. ▪ Apply using surface or buried drip irrigation and tarp only. ▪ For <i>Phytophthora</i> and <i>Fusarium</i> management, increase dosage to 35 gal/A. ▪ Leave undisturbed 14 days after treatment.
METAM SODIUM		
Vapam HL (Special Local Need Label, <i>WI only</i>).....	37.5-75 gal.	<ul style="list-style-type: none"> ▪ RESTRICTED USE PESTICIDE. ▪ Soil temperature must be between 40-90°F. ▪ Private Pesticide Application Certification and Agricultural Fumigation Certification required to use this product. ▪ 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.

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.

SEED TREATMENTS

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