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## Managing Crop Diseases with Seed Treatments

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# Managing Crop Diseases with **Seed Treatments**

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**S**eed treatment fungicides are used in various agricultural crops and are useful tools in promoting stand establishment and seedling vigor. Seed treatments may also help preserve yield potential and prevent quality losses in grain by preventing development of seed and soil-borne diseases. Seed treatments addressed in this guide are those consisting of fungicides or fungicides in combination with insecticides for use in managing disease-causing organisms (pathogens). The development of effective seed treatments can be noted as one of the most significant advancements in plant disease management.

In general, fungicidal seed treatments are used for three primary reasons: (1) To control soil-borne fungal disease organisms such as those causing seed rots, damping-off, or seedling blights in many crops, as well as the agents of root rot complex, smuts, bunts, or downy mildews. (2) To control diseases caused by seed surface-borne fungal pathogens (e.g., covered smuts of barley and oats, bunt of wheat, safflower rust, and *Ascochyta* of legumes). (3) To manage diseases caused by seed-borne fungi, such as loose smut of cereals. Fungicide seed treatments are not effective against bacterial pathogens or in managing viral diseases. Most seed treatment products do not control all types of fungal pathogens.

## **Disease Management Using Seed Treatments**

Disease management in agricultural crops requires a multifaceted approach as part of an integrated pest management (IPM) program. Effective components of an integrated plant disease management program include the following:

- Crop rotation, including rotation to non-host crops to reduce pathogen load.
- Residue and volunteer management for reduction of residue-borne and overwintering diseases.
- Use of high quality, disease-free seed to prevent the spread of seed-borne diseases and promote healthy stand establishment.
- Proper variety selection for host resistance and adaptation to the growing region.

- Proper plant health management. Healthy plants are more able to resist or tolerate the development of plant diseases.
- Judicious use of plant protectant products such as herbicides, insecticides, and fungicides to reduce losses, promote healthy plants, and prevent quality losses in seed.

Field history is a key component of the decision-making process for managing diseases with seed treatments. Keeping in mind the cropping sequence and the history of major disease or insect pests within the field can be important factors in seed treatment decisions. Proper identification of disease agents is also important. Local county Extension agronomy educators or the Plant Disease Diagnostic Clinic at SDSU can assist producers in identifying plant health problems throughout the growing season.

Effectiveness of control will vary with seed treatment product, rate, environmental conditions, and pests present. Seed treatments may provide some level of control for early season diseases as well as control seedling blights and seed- or soil-borne diseases.

## **Newly Opened Land— A Special Consideration**

Newly opened land, such as CRP being returned to crop production, may present a special consideration and most certainly will be a situation where seed treatments should be considered. For example, small grains planted into these areas can be at high risk for the development of diseases and insect pests. Diseases such as root and crown rots, as well as seedling blights, can often be more severe when certain crops are planted into these high-residue situations. Also, insect pressure on newly cultivated lands may differ from a typical cropping situation.

## **Classification of Fungicidal Seed Treatments**

Fungicidal seed treatments can be classified based on movement of the seed treatment product in relation to the seed. Fungicides used as protectants (contacts) are effective

only on the seed surface, providing protection against seed surface-borne pathogens and providing some level of control of soil-borne pathogens. These products generally have a relatively short residual. Protectant fungicides such as captan, maneb, PCNB, thiram, or fludioxonil help control most types of soil-borne pathogens, with the exception of the root rotting organisms. Systemic seed treatment fungicides are absorbed into the emerging seedling and inhibit or kill the fungus inside host plant tissues. Systemic fungicides used for seed treatment include the following: azoxystrobin, carboxin, mefenoxam, metalaxyl, thiabendazole, trifloxystrobin, and various triazole fungicides, including difenoconazole, tebuconazole, and triticonazole. Mefenoxam and metalaxyl are primarily used to target the water mold fungi *Pythium* and *Phytophthora*. Biological agents as seed treatments are also available and may provide some level of protectant activity. Not all fungicides are available as seed treatments for every crop, and not all fungicides have activity against the same range of organisms. Refer to the specific crop-pest combinations listed in the text for product-use recommendations. Always read and follow label directions.

### Proper Application and Use Precautions

Fungicide seed treatment products vary in formulation type, packaging, and use requirements. Products may be dry or liquid and in concentrate or ready-to-use formulations. While many seed treatments may be applied on-farm, several products are limited to use only by commercial applicators using closed application systems. Caution should be used when handling or working with seed treatment products. Fungicide seed treatments can be highly poisonous and many are irritants, so proper handling precautions must be taken when handling seed treatment chemicals, and producers or applicators must strictly adhere to all label directions regarding safe handling, mixing, storage, and disposal. Using personal protection, including an approved chemical respirator, goggles, and pesticide-resistant gloves, is recommended even if not specifically required by the fungicide label. Follow label rates, as over-application may result in unintentional damage to the seed, and under-application may reduce the effectiveness of products.

Properly calibrate all application equipment to assure uniform coverage. Uniform coverage of the seed is critical to optimize effectiveness of the seed treatment. Several seed treatment methods are available, though not all are appropriate for every situation. Commercial application or application through dedicated seed treatment equipment will likely provide the most uniform coverage. Grain auger-mounted treatment equipment is available, and may provide adequate coverage in an on-farm situation; however, an auger that has been used to treat seed may be unusable for moving grain intended for food or feed. Likewise, treated seed should not be allowed to contaminate equipment used to transport or store food or feed grains. Use caution when considering planter-applied (planter-box) seed treatments. Good disease control depends on uniform fungicide coverage of the seed, and this more difficult to accomplish in planter-applied situations.

Always read and follow label directions. Understand the product-specific guidelines for proper application: how and when to apply, pre-harvest intervals, feeding or grazing restrictions, as well as important safety precautions. Always dispose of pesticide containers properly.

### Seed Treatments and Legume Inoculants

Seed treatments containing fungicides or fungicide/insecticide combinations may adversely affect microbial inoculants applied to legume seed, such as soybeans. Producers should carefully read and follow any label instructions and limitations for both the pesticide seed treatment and the inoculant. Liquid fungicides or fungicide/insecticide combinations should not be directly mixed with liquid inoculants prior to application, and care should be taken to limit the time that inoculants and pesticide seed treatments are in direct contact.

### Do Not Use Treated Seed for Food or Feed!!

Following are the seed treatments fungicides or fungicide/insecticide combinations currently labeled for use in South Dakota. The list is dynamic and prone to frequent modifications. Always check the list of products currently registered with the South Dakota Department of Agriculture for legality of use in the state.



South Dakota  
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## SEED TREATMENTS FOR WHEAT

Diseases listed on label									
Common Bunt/ Covered Smut	Loose Smut	Seed & Seedling Rots	Common Root Rot	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products	Application Rate	Special Notes	
X		X			X	<b>azoxystrobin</b> Dynasty	0.153–0.382 fl oz/cwt		
		X				<b>captan</b> Captan 400 Captan 400–C	1.5–4 fl oz/cwt		
X	X	X				<b>captan + carboxin</b> Enhance	4 oz/cwt	Do not graze or feed livestock on treated areas for 42 days after planting.	
X	X	X	X	X	X	<b>captan + carboxin + imidacloprid</b> Enhance AW	4 oz/cwt	Do not graze or feed livestock on treated areas for 45 days after planting.	
X	X					<b>carboxin</b> Vitavax–34	2–3 oz/cwt	Do not graze or feed livestock on treated areas for 6 weeks after planting.	
X	X	X		X	X	<b>carboxin + thiram</b> RTU–Vitavax–Thiram	5–6.8 fl oz/cwt (Use the higher rate where smuts and bunts are severe.)	Do not graze or feed livestock on treated areas for 6 weeks after planting.	
						Vitaflo–280	3.5–5.0 fl oz/cwt (Use the high rate for control of loose smut.)		
X	X	X	X	X	X	<b>difenoconazole + mefenoxam</b> Dividend XL RTA	2.5 fl oz/cwt plus control of Fusarium seed scab.	Green wheat forage may not be grazed until 55 days after planting.	
		X				Incentive RTA	5 fl oz/cwt plus control of Fusarium seed scab and partial control of common root rot.	Do not plant any crop other than wheat or barley within 30 days to fields in which treated seeds were planted.	
							10 fl oz/cwt plus control of Fusarium seed scab and partial control of take-all and common root rot.		
X	X	X	X	X	X	<b>difenoconazole + mefenoxam</b> Dividend Extreme	1 fl oz/cwt plus control of Fusarium seed scab	Green wheat forage may not be grazed until 55 days after planting.	
		X					2 fl oz/cwt plus control of Fusarium seed scab and early season control of common root rot	Do not plant any crop other than wheat or barley within 30 days to fields in which treated seeds were planted.	
							4 fl oz/cwt plus control of Fusarium seed scab and early season control of take all and common root rot		

# SEED TREATMENTS FOR WHEAT

Diseases listed on label								Application Rate	Special Notes
Common Bunt/ Covered Smut	Loose Smut	Seed & Seedling Rots	Common Root Rot	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products			
		X		X	X	<b>fludioxonil</b> Maxim 4 FS	0.08–0.16 fl oz/cwt	Do not graze forage until 30 days after planting.	
X	X	X		X	X	<b>fludioxonil + metenoxam</b> Maxim XL	0.167–0.334 fl oz/cwt		
X	X	X		X	X	<b>ipconazole</b> Rancona 3.8 FS Rancona Apex	0.051–0.085 fl oz/cwt 5–8.33 fl oz/cwt plus suppression of common root rot		
X	X	X		X	X	<b>ipconazole + metalaxyl</b> Rancona Pinnacle	5–8.33 fl oz/cwt plus suppression of common root rot		
X	X	X		X		<b>ipconazole + metalaxyl + imidacloprid</b> Rancona Crest Rancona Crest WR	5–8.33 fl oz/cwt plus suppression of common root rot 5–8.33 fl oz/cwt plus suppression of common root rot Use higher rate when disease pressure will be high or if there is a history of high disease levels in the field.	Do not graze or feed livestock on treated areas for 45 days after planting.	
X	X					<b>mancozeb</b> Dithane M45 Penncozeb 75DF Penncozeb 80WP	2.2–3.3 oz/cwt 2.3–3.5 oz/cwt 2.2–3.3 oz/cwt		
X	X					<b>mancozeb + surfactant</b> Grain Guard Manzate Pro–Stick	2 oz/bu 2.2–3.3 oz/cwt		
X	X					<b>mancozeb + surfactant + copper</b> ManKocide	4 oz/cwt		
X		X				<b>maneb</b> Manex	3.5–5.2 fl oz/cwt		
		X				<b>mefenoxam</b> Apron XL Apron XL LS	0.0425–0.085 fl oz/cwt for Pythium damping off	Use the higher rate when the disease pressure is expected to be high.	

## SEED TREATMENTS FOR WHEAT

Diseases listed on label							Application Rate	Special Notes
Common Bunt/ Covered Smut	Loose Smut	Seed & Seedling Rots	Common Root Rot	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products		
X	X	X		X		mefenoxam + difenoconazole + thiamethoxam Cruiser Maxx Cereals	5 fl oz/cwt plus suppression of common root rot and take all	Do not graze or feed livestock on treated areas for 45 days after planting.
						metalaxyl Acquire	0.75 fl oz/cwt	For control of Pythium damping-off only.
						Allegiance Dry	1.5–2.0 oz/cwt	
		X				Allegiance FL	0.75 fl oz/cwt	
						Dyna—Shield Metalaxyl	0.75 fl oz/cwt	
						MetaStar ST	0.75 fl oz/cwt	
						Sebring 2.65 ST	0.75 fl oz/cwt	
						Sebring 480 FS	0.50 fl oz/cwt	
X	X	X	X	X	X	metalaxyl + tebuconazole + imidacloprid Gaucho XT Flowable	3.4 fl oz/cwt	Do not graze or feed livestock on treated areas for 45 days after planting.
X	X	X	X	X	X	prothioconazole + tebuconazole + metalaxyl Proceed Concentrate	1–1.5 fl oz/cwt	Wheat forage may be grazed or harvested for hay 31 days after seeding.
						Proceed MD	5–7.5 fl oz/cwt	
X	X	X	X	X	X	prothioconazole + tebuconazole + metalaxyl + clothianidin Proceed Plus	5–7.5 fl oz/cwt	Wheat forage may be grazed or harvested for hay 31 days after seeding.
						pyraclostrobin Stamina	0.4–0.8 fl oz/cwt, plus suppression of common root rot	Use higher rates when disease pressure is expected to be high.
X	X	X	X	X	X	pyraclostrobin + triticonazole + metalaxyl Stamina F <sup>®</sup> HL	1.0 fl oz/cwt	

# SEED TREATMENTS FOR WHEAT

## Diseases listed on label

Common Bunt/ Covered Smut		Loose Smut	Seed & Seedling Rots	Common Root Rot	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products	Application Rate	Special Notes
X	X	X	X	X	X	X	<b>tebuconazole</b> Sativa 318 FS TebuStar 250 ST	0.08–0.10 fl oz/cwt 0.1 fl oz/cwt	Wheat forage may be grazed or harvested for hay 31 days after seeding.
X	X	X	X	X	X	X	<b>tebuconazole + metalaxyl</b> Dyna–Shield Foothold Dyna–Shield Small Grains Fungicide Raxil MD Raxil XT Sativa M Sativa M RTU	5–6.5 fl oz/cwt plus early season control of common root rot 5–6.5 fl oz/cwt plus early season control of common root rot 5–6.5 fl oz/cwt plus early season control of common root rot 0.16–0.20 oz/cwt plus early season control of common root rot 5 fl oz/cwt plus early season control of common root rot 5–6.5 fl oz/cwt plus early season control of common root rot	Wheat forage may be grazed or harvested for hay 31 days after seeding.
X	X	X	X	X	X	X	<b>tebuconazole + metalaxyl + imazalil</b> Raxil MD Extra	5 fl oz/cwt plus early season control of common root rot	Do not graze or feed livestock on treated areas for 6 weeks after planting.
X	X	X	X	X	X	X	<b>tebuconazole + metalaxyl + imazalil + imidacloprid</b> Raxil MD Extra W	5.14 fl oz/cwt plus early season control of common root rot	Do not graze or feed livestock on treated areas for 45 days after planting.
X	X	X	X	X	X	X	<b>tebuconazole + metalaxyl + imidacloprid</b> Dyna–Shield Foothold Extra Raxil MD W Sativa IM Max Sativa IM RTU	3.4–5 fl oz/cwt plus early season control of common root rot 5 fl oz/cwt plus early season control of common root rot 3.4–5 fl oz/cwt 5 fl oz/cwt	Do not graze or feed livestock on treated areas for 45 days after planting.

## SEED TREATMENTS FOR WHEAT

Diseases listed on label							Special Notes	
Common Bunt/ Covered Smut	Loose Smut	Seed & Seedling Rots	Common Root Rot	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products		
X	X	X	X	X	X	<b>tebuconazole + thiram</b> Raxil–Thiram  Dyna–Shield Tebuconazole–Thiram	3.5–4.6 fl oz/cwt plus early season control of common root rot and control of Fusarium seed scab  3.4–4.6 fl oz/cwt plus early season control of common root rot and control of Fusarium seed scab	Use low rate under dryland or low rainfall conditions.  Wheat green forage may be grazed or harvested for hay 31 days after seeding.
X		X				<b>thiram</b> Signet 480 FS	2.0 fl oz/bu	
X	X			X		<b>triticonazole</b> Charter	3.1 fl oz/cwt plus suppression of common root rot and Rhizoctonia root rot.	Do not plant any crop not listed on the label in soil treated with Charter within 30 days after planting treated seed.
X	X	X		X	X	<b>triticonazole + metalaxyl</b> Charter F <sup>2</sup>	5.4 fl oz/cwt	Do not plant any crop not listed on the label in soil treated with Charter F <sup>2</sup> within 30 days after planting treated seed.
X	X	X	X	X	X	<b>triticonazole + thiram</b> Charter PB	5.5 fl oz/cwt plus suppression of Rhizoctonia root rot	Do not plant any crop not listed on the label within 30 days after planting.

# SEED TREATMENTS FOR BARLEY

Diseases listed on label					Seed Treatment Products	Application Rate	Special Notes
Covered Smut	Loose Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases			
		X		X	azoxystrobin Dynasty	0.10–3.75 fl oz/cwt	
		X			captan Captain 400 Captain 400–C	2–3 fl oz/cwt 2–3 fl oz/cwt	
X	X	X			captan + carboxin Enhance	4 oz/cwt	Do not graze or feed livestock on treated areas for 42 days after planting.
X	X	X	X	X	captan + carboxin + imidacloprid Enhance AW	4 oz/cwt	Do not graze or feed livestock on treated areas for 45 days after planting.
X	X				carboxin Vitavax–34	2–3 oz/cwt	Do not graze or feed livestock on treated areas for 6 weeks after planting.
X	X	X	X	X	carboxin + thiram RTU–Vitavax–Thiram	5–6.8 fl oz/cwt (Use the higher rate where smuts and bunts are severe.) 3.5–5.0 fl oz/cwt (Use the high rate for control of loose smut.)	Do not graze or feed livestock on treated areas for 6 weeks after planting.
					difenoconazole + mefenoxam Dividend Extreme	2 fl oz/cwt plus partial control of Fusarium seed scab and common root rot. 4 fl oz/cwt plus partial control of Fusarium seed scab and common root rot. 5 fl oz/cwt plus partial control of Fusarium seed scab and common root rot.	Green wheat forage may not be grazed until 55 days after planting. Do not plant any crop other than wheat or barley within 30 days to fields in which treated seeds were planted.
X		X	X	X	Dividend XL RTA	10 fl oz/cwt plus partial control of Fusarium seed scab, take–all and common root rot.	
					Incentive RTA	5 fl oz/cwt plus partial control of Fusarium seed scab and common root rot. 10 fl oz/cwt plus partial control of Fusarium seed scab and take–all and common root rot.	
		X	X	X	fludioxonil Maxim 4FS	0.08–0.16 fl oz/cwt	Cereal forage may not be grazed until 30 days after planting.
		X	X	X	fludioxonil + mefenoxam Maxim XL	0.167–0.334 fl oz/cwt	

## SEED TREATMENTS FOR BARLEY

Diseases listed on label						Application Rate	Special Notes
Covered Smut	Loose Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products		
X	X	X	X	X	<b>ipconazole</b> Rancona 3.8 FS Rancona Apex	0.051–0.085 fl oz/cwt 5–8.33 fl oz/cwt plus suppression of common root rot	
X	X	X	X	X	<b>ipconazole + metalaxyl</b> Rancona Pinnacle	5–8.33 fl oz/cwt plus suppression of common root rot	
X	X	X	X	X	<b>ipconazole + metalaxyl + imidacloprid</b> Rancona Crest  Rancona Crest WR	5–8.33 fl oz/cwt plus suppression of common root rot 5–8.33 fl oz/cwt plus suppression of common root rot Use higher rate when disease pressure will be high or if there is a history of high disease levels in the field.	Do not graze or feed livestock on treated areas for 45 days after planting.
X	X	X			<b>mancozeb</b> Dithane M45 Penncozeb 75DF Penncozeb 80WP	2.7–4.2 oz/cwt 2.9–4.5 oz/cwt 2.7–4.2 oz/cwt	
X	X	X			<b>mancozeb + surfactant</b> Grain Guard Manzate Pro–Stick	2 oz/bu 2.7–4.2 oz/cwt	
X	X	X			<b>mancozeb + surfactant + copper</b> ManKocide	4 oz/cwt	
X	X	X			<b>maneb</b> Manex	4.3–6.7 fl oz/cwt	
		X			<b>mefenoxam</b> Apron XL Apron XL LS	0.0425–0.085 fl oz/cwt for Pythium damping off	Use the higher rates when the disease pressure is expected to be high.

**SEED TREATMENTS FOR BARLEY**

Diseases listed on label						Seed Treatment Products	Application Rate	Special Notes
Covered Smut	Loose Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases				
X	X	X	X		mefenoxam + difenoconazole + thiamethoxam Cruiser Maxx Cereals	5 fl oz/cwt plus suppression of common root rot and take all	Do not graze or feed livestock on treated areas for 45 days after planting.	
					metalaxyl Acquire	0.75 fl oz/cwt	For control of Pythium damping-off only.	
					Allegiance Dry	1.5–2.0 oz/cwt		
					Allegiance FL	0.75 fl oz/cwt		
		X			Dyna–Shield Metalaxyl	0.75 fl oz/cwt		
					MetaStar ST	0.75 fl oz/cwt		
					Sebring 2.65 ST	0.75 fl oz/cwt		
					Sebring 480 FS	0.50 fl oz/cwt		
X	X	X	X	X	metalaxyl + tebuconazole + imidacloprid Gaucho XT Flowable	3.4 fl oz/cwt	Do not graze or feed livestock on treated areas for 45 days after planting.	
X	X	X	X	X	prothioconazole + tebuconazole + metalaxyl Proceed Concentrate	1–1.5 fl oz/cwt	Barley forage may be grazed or harvested for hay 31 days after seeding.	
					Proceed MD	5–7.5 fl oz/cwt		
X	X	X	X	X	prothioconazole + tebuconazole + metalaxyl + clothianindin Proceed Plus	5–7.5 fl oz/cwt	Barley forage may be grazed or harvested for hay 31 days after seeding.	
					pyraclostrobin Stamina	0.4–0.8 fl oz/cwt plus suppression of common root rot (Use the higher rates when disease pressure is expected to be high.)		
X	X	X	X	X	pyraclostrobin + triticonazole+ metalaxyl Stamina F HL	1 fl oz/cwt		

## SEED TREATMENTS FOR BARLEY

Diseases listed on label						Seed Treatment Products	Application Rate	Special Notes
Covered Smut	Loose Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases				
X	X	X	X	X	<b>tebuconazole</b> Sativa 318 FS TebuStar 250 ST	0.08–0.10 fl oz/cwt 0.1 fl oz/cwt	Barley forage may be grazed or harvested for hay 31 days after seeding.	
X	X	X	X	X	<b>tebuconazole + metalaxyl</b> Dyna–Shield Foothold Dyna–Shield Small Grains Fungicide Raxil MD Raxil XT Sativa M Sativa M RTU	5–6.5 fl oz/cwt plus early season control of common root rot. 5–6.5 fl oz/cwt plus early season control of common root rot. 5–6.5 fl oz/cwt plus early season control of common root rot. 0.16–0.20 oz/cwt plus early season control of common root rot. 5 fl oz/cwt plus early season control of common root rot. 5–6.5 fl oz/cwt plus early season control of common root rot.	Barley forage may be grazed or harvested for hay 31 days after seeding.	
X	X	X	X	X	<b>tebuconazole + metalaxyl + imazalil</b> Raxil MD Extra	5 fl oz/cwt plus early season control of common root rot.	Do not graze or feed livestock on treated areas for 6 weeks after planting.	
X	X	X	X	X	<b>tebuconazole + metalaxyl + imazalil + imidacloprid</b> Raxil MD Extra W	5.14 fl oz/cwt plus early season control of common root rot.	Do not graze or feed livestock on treated areas for 45 days after planting.	
X	X	X	X	X	<b>tebuconazole + metalaxyl + imidacloprid</b> Dyna–Shield Foothold Extra Raxil MD W Sativa IM Max Sativa IM RTU	3.4–5 fl oz/cwt plus early season control of common root rot. 5 fl oz/cwt plus early season control of common root rot. 3.4–5 fl oz/cwt 5 fl oz/cwt	Do not graze or feed livestock on treated areas for 45 days after planting.	

## SEED TREATMENTS FOR BARLEY

Diseases listed on label							Application Rate	Special Notes
Covered Smut	Loose Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products	Application Rate		
X	X	X	X	X	<b>tebuconazole + thiram</b> Dyna-Shield Tebuconazole-Thiram	3.5–4.6 fl oz/cwt 3.5–4.6 fl oz/cwt	Do not graze or feed livestock on treated areas for 45 days after planting.	
X		X			<b>thiram</b> Signet 480 FS	2.0 fl oz/bu		
X	X		X		<b>triticonazole</b> Charter	3.1 fl oz/cwt plus suppression of common root rot and Rhizoctonia root rot.	Do not plant any crop not listed on the label in soil treated with Charter F <sup>2</sup> within 30 days after planting treated seed.	
X	X	X	X	X	<b>triticonazole + metalaxyl</b> Charter F <sup>2</sup>	5.4 fl oz/cwt	Do not plant any crop not listed on the label in soil treated with Charter F <sup>2</sup> within 30 days after planting treated seed.	
X	X	X	X	X	<b>triticonazole + thiram</b> Charter PB	5.5 fl oz/cwt plus suppression of Rhizoctonia root rot	Do not plant any crop not listed on the label within 30 days after planting.	

## SEED TREATMENTS FOR OATS

Diseases listed on label							Application Rate	Special Notes
Covered Smut	Loose Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products	Application Rate		
		X			<b>captan</b> Captan 400	2–4 fl oz/cwt		
					Captan 400–C	2–4 fl oz/cwt		
X	X	X			<b>captan + carboxin</b> Enhance	4 oz/cwt	Do not graze or feed livestock on treated areas for 42 days after planting.	
X	X	X	X	X	<b>captan + carboxin + imidacloprid</b> Enhance AW	4 oz/cwt	Do not graze or feed livestock on treated areas for 45 days after planting.	
X	X				<b>carboxin</b> Vitavax-34	2–3 oz/cwt	Do not graze or feed livestock on treated areas for 6 weeks after planting.	
X	X	X			<b>carboxin + thiram</b> RTU-Vitavax-Thiram	5–6.8 fl oz/cwt (Use the higher rate where smuts are severe)	Do not graze or feed livestock on treated areas for 6 weeks after planting.	
					Vitaflo-280	5.0 fl oz/cwt		
		X	X	X	<b>fluidoxonil</b> Maxim 4FS	0.08–0.16 fl oz/cwt	Cereal forage may not be grazed until 30 days after planting.	

## SEED TREATMENTS FOR OATS

Diseases listed on label						Application Rate	Special Notes
Covered Smut	Loose Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products		
		X	X	X	<b>fludioxonil + mefenoxam</b> Maxim XL	0.167–0.334 fl oz/cwt	
X	X	X	X	X	<b>ipconazole</b> Rancona 3.8 FS Rancona Apex	0.051–0.085 fl oz/cwt 5–8.33 fl oz/cwt	
X	X	X	X	X	<b>ipconazole + metalaxyl</b> Rancona Pinnacle	5–8.33 fl oz/cwt	
X	X	X	X	X	<b>ipconazole + metalaxyl + imidacloprid</b> Rancona Crest Rancona Crest WR	5–8.33 fl oz/cwt 5–8.33 fl oz/cwt Use higher rate when disease pressure will be high or if there is a history of high disease levels in the field.	Do not graze or feed livestock on treated areas for 45 days after planting.
X	X	X			<b>mancozeb</b> Dithane M45	4.0–6.3 oz/cwt	
		X			Penncozeb 75DF	4.3–6.7 oz/cwt	
					Penncozeb 80WP	4.0–6.3 oz/cwt	
X		X			<b>mancozeb + surfactant</b> Grain Guard	2 oz/bu	
					Manzate Pro–Stick	4.0–6.3 oz/cwt	
X	X	X			<b>maneb</b> Manex	6.4–10 fl oz/cwt	
		X			<b>mefenoxam</b> Apron XL Apron XL LS	0.0425–0.085 fl oz/cwt for Pythium damping off	Use the higher rates when the disease pressure is expected to be high.
					<b>metalaxyl</b> Acquire	0.75 fl oz/cwt	For control of Pythium damping–off only.
					Allegiance Dry	1.5–2.0 oz/cwt	
					Allegiance FL	0.75 fl oz/cwt	
		X			Dyna–Shield Metalaxyl	0.75 fl oz/cwt	
					MetaStar ST	1.5 fl oz/cwt	
					Sebring 2.65 ST	0.75 fl oz/cwt	
					Sebring 480 FS	0.50 fl oz/cwt	

# SEED TREATMENTS FOR OATS

Diseases listed on label							Application Rate	Special Notes
Covered Smut	Loose Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products			
X	X	X	X	X	<b>metalaxy+ tebuconazole + imidacloprid</b> Gaucho XT Flowable	3.4 fl oz/cwt 5 fl oz/cwt	Do not graze or feed livestock on treated areas for 45 days after seeding.	
		X	X	X	Sativa IM RTU <b>pyraclostrobin</b> Stamina	0.4–0.8 fl oz/cwt	Use higher rates when disease pressure is expected to be high.	
X	X	X	X		<b>pyraclostrobin + triticonazole + metalaxy</b> Stamina F HL	1 fl oz/cwt		
	X	X	X	X	<b>tebuconazole</b> Sativa 318 FS TebuStar 250 ST	0.08–0.10 fl oz/cwt 0.1 fl oz/cwt	Oat forage may be grazed or harvested for hay 31 days after seeding.	
	X	X	X	X	<b>tebuconazole + metalaxy</b> Dyna–Shield Foothold Dyna–Shield Small Grains Raxil MD Raxil XT Sativa M Sativa M RTU	5–6.5 fl oz/cwt 5–6.5 fl oz/cwt 5–6.5 fl oz/cwt 0.16–0.20 oz /cwt 5 fl oz/cwt 5–6.5 fl oz/cwt	Oat forage may be grazed or harvested for hay 31 days after seeding.	
	X	X	X	X	<b>tebuconazole + thiram</b> Dyna–Shield Tebuconazole–Thiram Raxil–Thiram	3.5–4.6 fl oz/cwt 3.5–4.6 fl oz/cwt	Use low rate under dryland or low rainfall conditions. Oat forage may be grazed or harvested for hay 31 days after seeding.	
X		X			<b>thiram</b> Signet 480 FS	2.0 fl oz/bu		

## SEED TREATMENTS FOR RYE

Diseases listed on label					Application Rate	Special Notes
Common Bunt/ Covered Smut	Loose Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases		
		X			2–3 fl oz/cwt 2–3 fl oz/cwt	
		X	X	X	0.08–0.16 fl oz/cwt	Cereal forage may not be grazed until 30 days after planting.
		X	X	X	0.167–0.334 fl oz/cwt	
X	X	X	X	X	0.051–0.085 fl oz/cwt 5–8.33 fl oz/cwt plus suppression of common root rot	
		X	X		5–8.33 fl oz/cwt	Do not graze or feed livestock on treated areas for 45 days after planting.
		X	X		5–8.33 fl oz/cwt 5–8.33 fl oz/cwt	
		X			Use higher rate when disease pressure will be high or if there is a history of high disease levels in the field.	
X		X			2.3–3.6 oz/cwt	
X		X			2 oz/bu 2.3–3.6 oz/cwt	
		X			3.6–5.7 fl oz/cwt	
		X			0.0425–0.085 fl oz/cwt for Pythium damping off	Use the higher rates when the disease pressure is expected to be high.



## SEED TREATMENTS FOR CORN

Diseases listed on label				Seed Treatment Products	Application Rate	Special Notes
Head Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases			
	X	X		<b>Bacillus subtilis GB03</b> Kodiak HB	4 oz/cwt	For suppression of Fusarium and Pythium root diseases.
	X			<b>captan</b> Captan 400	1.25–2.375 fl oz/cwt	
				Captan 400–C	1.25–2.375 fl oz/cwt	
				Captan Moly	2.4 oz/cwt	
X	X		X	<b>carboxin</b> Vitavax–34	2–4 oz/cwt	Do not graze or feed livestock on treated areas for 6 weeks after planting.
	X		X	<b>carboxin + metalaxyl + imidacloprid</b> Latitude	1.5 oz/42 lbs	Do not graze or feed livestock on treated areas for 45 days.
	X		X	<b>carboxin + PCNB + metalaxyl</b> Prevail	1.5–3 oz/bu	Do not graze or feed livestock on treated areas for 6 weeks after planting.
	X			<b>carboxin + permethrin</b> Kernel Guard Supreme	1.5 oz/42lbs	Do not graze or feed livestock on treated areas for 6 weeks after planting.
X	X	X	X	<b>carboxin + thiram</b> Vitaflo 280	4.5 fl oz/cwt for control of seed & seedling rots, Fusarium and Rhizoctonia root diseases. 8.5–11 fl oz.cwt for control of seed–borne head smut.	Do not graze or feed livestock on treated areas for 6 weeks after planting.
	X	X	X	<b>fludioxonil</b> Maxim 4FS	0.08–0.16 fl oz/cwt (0.0064–0.128 mg ai/kernel)	Green forage may not be grazed until 30 days after planting.
	X	X	X	<b>fludioxonil + mefenoxam</b> Maxim XL	0.167–0.334 fl oz/cwt (0.009–0.018 mg ai/kernel)	Corn forage my not be grazed until 30 days after planting.
X	X	X	X	<b>fludioxonil + mefenoxam + azoxystrobin + thiabendazole</b> Maxim Quattro	0.46 fl oz/80,000 kernel count	Forage may not be grazed until 30 days after planting.
	X	X	X	<b>fludioxonil + mefenoxam + azoxystrobin + thiamethoxam</b> Cruiser Extreme	See product label	Forage may not be grazed until 30 days after planting.
	X	X	X	<b>ipconazole</b> Vortex	0.044 fl oz/cwt	
	X			<b>mancozeb</b> Dithane M45	2.7–5.4 oz/cwt	

# SEED TREATMENTS FOR CORN

		Diseases listed on label							
Head Smut	Seed & Seedling Rots	Fusarium root diseases	Rhizoctonia root diseases	Seed Treatment Products	Application Rate	Special Notes			
	X			<b>mancozeb + surfactant</b> Dithane F-45	4.3–8.6 fl oz/cwt				
	X			Manzate Pro–Stick	2.7–5.4 oz/cwt				
	X			<b>maneb</b> Manex	4.3–8.6 fl oz/cwt				
	X			<b>mefenoxam</b> Apron XL	0.0425–0.085 fl oz/cwt (0.0025–0.005 mg ai/kernel)	For control of Pythium damping–off only.			
				Apron XL LS					
	X			<b>metalaxyl</b> Aquire	0.75 fl oz/cwt	For control of Pythium damping–off only.			
				Allegiance Dry	1.5–2.0 oz/cwt				
				Allegiance FL	0.75 fl oz/cwt				
				Dyna–Shield Metalaxyl	0.75 fl oz/cwt				
				MetaStar ST	0.75 fl oz/cwt				
				Sebring 2.65 ST	0.75 fl oz/cwt				
				Sebring 480 FS	0.50 fl oz/cwt				
	X			<b>metalaxyl + imidacloprid</b> Concur	1.5 oz/42 lbs	For control of Pythium seedling diseases.			
	X		X	<b>pyraclostrobin</b> Stamina	0.4–0.8 fl oz/cwt Use the higher rates when disease pressure is expected to be high.				
	X	X	X	<b>pyraclostrobin + triconazole + metalaxyl</b> Stamina F HL	1 fl oz/cwt				
	X	X	X	<b>trifloxystrobin</b> Triflex	0.32–0.64 fl oz/cwt	Do not plant any crop without trifloxystrobin tolerances until 30 days after previous planting.			
	X	X	X	<b>trifloxystrobin + metalaxyl</b> Triflex 2000	0.5 fl oz/cwt	Do not plant any crop without trifloxystrobin tolerances until 30 days after previous planting.			

## SEED TREATMENTS FOR SOYBEANS

Diseases listed on label				Seed Treatment Products	Application Rate	Special Notes
Seed & Seedling Rots	Fusarium root diseases	Pythium root diseases	Rhizoctonia root diseases			
X		X	X	<b>abamectin + one of the following: metenoxam, fludioxonil, and thiamethoxam.</b> Avicta Complete Beans  <b>azoxystrobin</b> Dynasty  <b>Bacillus firmus I-1582 + clothianidin</b> Poncho/NoTivo	See product label  0.153-0.459/cwt plus suppression of white mold.  See product label	For control of soybean nematodes.
X				<b>captan</b> Captan 400 Captan 400-C Captan Moly  <b>captan + carboxin</b> Enhance Vitavax M DC  <b>captan + carboxin + imidacloprid</b> Enhance AW  <b>captan + carboxin + metalaxyl</b> Bean Guard Allegiance  <b>captan + molybdenum</b> Hi Moly/Captan D  <b>carboxin</b> Vitavax-34  <b>carboxin + metalaxyl + imidacloprid</b> Latitude  <b>carboxin + PCNB + metalaxyl</b> Prevail  <b>carboxin + permethrin</b> Kernel Guard Supreme  <b>carboxin + thiram</b> RTU-Vitavax-Thiram Vitaflo 280 Vitavax CT	1.5-2.5 fl oz/cwt 1.5-2.5 fl oz/cwt 3.5 oz/cwt  5 oz/bu 2 oz/bu  5 oz/cwt  2 oz/bu  3-4 fl oz/cwt 3-4 fl oz/cwt 4 oz/cwt 2-4 oz/bu  1.5 oz/50 lbs  6.8 fl oz/cwt 4 fl oz/cwt 12 fl oz/cwt	For control of soybean nematodes. Do not graze or feed forage and hay to livestock.
X	X (Enhance)	X (Enhance)	X (Enhance)			Do not graze or feed forage or hay from treated areas to livestock (Enhance).
X	X	X	X			Do not graze or feed livestock on soybean forage or hay.
X						
X						Do not graze or feed livestock on forage or hay grown from treated seed.
X						Do not graze or feed livestock on forage and hay on treated areas for 6 weeks after planting.
X		X	X			Do not graze or feed livestock on forage or hay grown from treated seed.
X			X			Do not graze or feed livestock on treated areas for 6 weeks after planting.
X	X	X	X			Do not graze or feed livestock on forage and hay grown on treated areas.

## SEED TREATMENTS FOR SOYBEANS

Diseases listed on label				Seed Treatment Products	Application Rate	Special Notes
Seed & Seedling Rots	Fusarium root diseases	Pythium root diseases	Rhizoctonia root diseases			
			X	<b>carboxin + thiram + molybdenum</b> Vitavax M	12 fl oz/cwt	Do not graze or feed livestock on forage and hay grown on treated areas.
X	X		X	<b>fludioxonil</b> Maxim 4FS	0.08–0.16 fl oz/cwt	
X	X		X	<b>ipconazole</b> Rancona 3.8 FS	0.085 fl oz/cwt	
X	X	X	X	<b>ipconazole + metalaxyl</b> Rancona Summit	4 fl oz/cwt	Do not graze or feed livestock on soybean forage or hay.
				Rancona Xxtra	3.5 fl oz/cwt	
		X		<b>mefenoxam</b> Apron XL	0.16–0.64 fl oz/cwt (Use the higher rate for best early season Phytophthora protection.)	
				Apron XL LS		
				<b>mefenoxam + fludioxonil</b> ApronMaxx RFC	1.5 fl oz/cwt plus suppression of seedborne Sclerotinia.	
				ApronMaxx RTA	5 fl oz/cwt plus control of early season Phytophthora and suppression of seedborne Sclerotinia.	
X	X	X	X	Maxim XL	0.167–0.334 fl oz/cwt plus early season Phytophthora control.	
				Warden RTA	5 fl oz/cwt plus control of early season Phytophthora and suppression of seedborne Sclerotinia.	
				<b>mefenoxam + fludioxonil + thiamethoxam</b> Cruiser Maxx	3 fl oz/cwt	
X	X	X	X	Cruiser Maxx Plus	3.2 fl oz/cwt	
				Warden CZ	3.2 fl oz/cwt	

**SEED TREATMENTS FOR SOYBEANS**

Diseases listed on label				Seed Treatment Products	Application Rate	Special Notes
Seed & Seedling Rots	Fusarium root diseases	Pythium root diseases	Rhizoctonia root diseases			
				metalaxyl Aquire	0.75–1.5 fl oz/cwt plus early season control of Phytophthora.	
				Allegiance Dry	1.5–2.0 oz/cwt plus early season control of Phytophthora.	
				Allegiance FL	0.2–1.5 fl oz/cwt plus early season control of Phytophthora.	
		X		Dyna–Shield Metalaxyl	0.75–1.5 fl oz/cwt plus early season control of Phytophthora.	
				MetaStar ST	0.75–1.5 fl oz/cwt plus early season control of Phytophthora.	
				Sebring 2.65 ST	0.75–1.5 fl oz/cwt plus early season control of Phytophthora.	
				Sebring 480 FS	0.50–1.00 fl oz/cwt plus early season control of Phytophthora.	
X				<b>thiabendazole</b> Mertect 340–F	0.08–0.16 fl oz/cwt for control of pod and stem blight.	LSP flowable is for use only by Commercial Seed treaters.
				LSP Flowable	0.125–0.25 fl oz/cwt for control of pod and stem blight.	
		X	X	<b>thiram + metalaxyl + molybdenum</b> Protector–L–Allegiance	6.7 fl oz/cwt	
X				<b>thiram + molybdenum</b> Protector–D	3.3 oz/cwt	
X			X	<b>trifloxystrobin</b> Trilex	0.32 fl oz/cwt	Do not plant any other crop without trifloxystrobin tolerances until 30 days after planting.
X		X	X	<b>trifloxystrobin + metalaxyl</b> Trilex 2000	1 fl oz/cwt	Do not plant any other crop without trifloxystrobin tolerances until 30 days after planting.
				Trilex AL Flowable	5.7 fl oz/cwt	

## SEED TREATMENTS FOR SUNFLOWERS

Diseases listed on label		Systemic Downy mildew	Seed Treatment Products	Application Rate	Special Notes
Seed & Seedling Rots					
X	X		<b>azoxystrobin</b> Dynasty	3.75–37.5 fl oz/cwt (0.025–0.1 mg ai/ kernel)	For suppression of downy mildew.
X			<b>captan</b> Captan 400 Captan 400–C	2–4 fl oz/cwt 2–4 fl oz/cwt	
X			<b>fludioxonil</b> Maxim 4FS	0.08–0.16 fl oz/cwt	
X	X		<b>fludioxonil + mefenoxam</b> Maxim XL	0.167–0.334 fl oz/cwt	
X	X		<b>fludioxonil + mefenoxam + azoxystrobin + thiamethoxam</b> CruiserMaxx Sunflower	See product label	
X			<b>ipconazole</b> Rancona 3.8FS	0.051–0.085 fl oz/cwt	
	X		<b>mefenoxam</b> Apron XL Apron XL LS	1.28 fl oz/cwt (0.029 mg ai/seed)	
		X	<b>metalaxyl</b> Aquire Allegiance Dry Allegiance FL Dyna–Shield Metalaxyl MetaStar ST Sebring 2.65 ST Sebring 480FS	1.5–3.0 fl oz/cwt 4.0 oz/cwt 1.5–3.0 fl oz/cwt 1.5–3.0 fl oz/cwt 1.5–3.0 fl oz/cwt 1.5–3.0 fl oz/cwt 1–2 fl oz/cwt	
X			<b>pyraclostrobin</b> Stamina	0.8–2.3 fl oz/cwt	Use higher rates when disease pressure is expected to be high.

## SEED TREATMENTS FOR SAFFLOWER

Diseases listed on label		Seed Treatment Products	Application Rate	Special Notes
Seed & Seedling Rots	Seedborne Rust			
X		<b>carboxin</b> Vitavax-34	2 fl oz/cwt	
X		<b>fludioxonil</b> Maxim 4FS	0.08-0.16 fl oz/cwt	
	X	<b>mancozeb</b> Dithane M45	2.0 oz/cwt	
X	X	<b>mancozeb + surfactant</b> Dithane F-45 Grain Guard Manzate Pro-Stick	3.2 fl oz/cwt for control of seedborne rust only. 3 oz/cwt 2 oz/cwt	
	X	<b>maneb</b> Manex	3.2 fl oz/cwt	

## SEED TREATMENTS FOR CHICKPEA

Diseases listed on label					Special Notes
Seed & Seedling Rots	Seed borne Ascochyta blight	Seed Treatment Products	Application Rate		
X		<b>azoxystrobin</b> Dynasty	0.153–0.765 fl oz/cwt		
X		<b>captan + carboxin + imidacloprid</b> Enhance AW	5 oz/cwt		Do not allow livestock to graze or feed on forage until 60 days after planting.
X		<b>fludioxonil</b> Maxim 4FS	0.08–0.16 fl oz/cwt		
X		<b>fludioxonil + mefenoxam</b> ApronMaxx RFC	1.5 fl oz/cwt plus early season Phytophthora control.		
		ApronMaxx RTA	5 fl oz/cwt plus early season Phytophthora control.		
		Maxim XL	0.167–0.334 fl oz/cwt plus early season Phytophthora control.		
X		<b>ipconazole</b> Rancona 3.8FS	0.085 fl oz/cwt		
X		<b>ipconazole + metalaxyl</b> Rancona Xxtra	3.5 fl oz/cwt		
X		<b>mefenoxam</b> Apron XL Apron XL LS	0.16–0.64 fl oz/cwt		For Pythium damping-off protection.
X		<b>mefenoxam + fludioxonil + thiamethoxam</b> Cruiser Maxx	3.0 fl oz/cwt		

## SEED TREATMENTS FOR CHICKPEA

Diseases listed on label		Seed Treatment Products	Application Rate	Special Notes
Seed & Seedling Rots	Seed borne Ascochyta blight			
		<b>metalaxyl</b> Acquire Allegiance Dry Allegiance FL	0.75 fl oz/cwt 2 oz/cwt 0.75 fl oz/cwt for early season control of Phytophthora and 1.5 fl oz/cwt for Pythium damping-off.	For Pythium damping-off and early season Phytophthora control.
X		Dyna-Shield Metalaxyl MetaStar ST Sebring 2.65 ST Sebring 480 FS	0.75 fl oz/cwt for early season control of Phytophthora and 1.5 fl oz/cwt for Pythium damping-off. 0.75 fl oz/cwt for early season control of Phytophthora and 1.5 fl oz/cwt for Pythium damping-off. 0.75 fl oz/cwt for early season control of Phytophthora and Pythium damping-off. 0.50 fl oz/cwt for early season control of Phytophthora and Pythium damping-off.	
X		<b>pyraclostrobin</b> Stamina	0.4–1.5 fl oz/cwt (Use the higher rates when disease pressure is expected to be high.)	
	X	<b>thiabendazole</b> Mertect® 430-F	2.04 fl oz/cwt	Mix with an equal amount of water to provide adequate coverage.
X		<b>trifloxystrobin</b> Trilex	0.32 fl oz/cwt	Do not plant any other crop without trifloxystrobin tolerances until 30 days after planting.
X		<b>trifloxystrobin + metalaxyl</b> Trilex 2000 Trilex AL Flowable	1 fl oz/cwt 5.7 fl oz/cwt	Do not plant any other crop without trifloxystrobin tolerances until 30 days after planting.

## SEED TREATMENTS FOR FIELD PEA

Diseases listed on label		Seed Treatment Products	Application Rate	Special Notes
Seed & Seedling Rots	Seed borne Ascochyta blight			
X		<b>captan</b> Captan 400 Captan 400C	2 1/2 fl oz/cwt 2 1/2 fl oz/cwt	
X		<b>captan + carboxin + imidacloprid</b> Enhance AW	5 oz/cwt	Do not allow livestock to graze or feed on forage until 60 days after planting.
X		<b>fludioxonil</b> Maxim 4FS	0.08–0.16 fl oz/cwt	
X		<b>fludioxonil + mefenoxam</b> ApronMaxx RFC Apron Maxx RTA Maxim XL	1.5 fl oz/cwt plus early season Phytophthora control. 5 fl oz/cwt plus early season Phytophthora control. 0.167–0.334 plus early season Phytophthora control.	
X		<b>ipconazole</b> Rancona 3.8FS	0.085 fl oz/cwt	
X		<b>ipconazole + metalaxyl</b> Rancona Xxtra	3.5 fl oz/cwt	
X		<b>mefenoxam</b> Apron XL Apron XL LS	0.16–0.64 fl oz/cwt	For Pythium damping-off protection.
X		<b>mefenoxam + fludioxonil + thiamethoxam</b> Cruiser Maxx	1.5 fl oz/cwt	
		<b>metalaxyl</b> Acquire Allegiance Dry Allegiance FL Dyna-Shield Metalaxyl MetaStar ST Sebring 2.65 ST Sebring 480FS	0.75 fl oz/cwt 2 oz/cwt 0.75 fl oz/cwt for early season control of Phytophthora and 1.5 fl oz/cwt for Pythium damping off. 0.75 fl oz/cwt for early season control of Phytophthora and 1.5 fl oz/cwt for Pythium damping off. 0.75 fl oz/cwt for early season control of Phytophthora and 1.5 fl oz/cwt for Pythium damping off. 0.75 fl oz/cwt for early season control of Phytophthora and 1.5 fl oz/cwt for Pythium damping off and systemic downy mildew. 0.50 fl oz/cwt for early season control of Phytophthora and 1.00 fl oz/cwt for Pythium damping off and systemic downy mildew.	For Pythium damping-off and early season Phytophthora control.

## SEED TREATMENTS FOR FIELD PEA

Diseases listed on label				
Seed & Seedling Rots	Seed borne Ascochyta blight	Seed Treatment Products	Application Rate	Special Notes
X		<b>pyraclostrobin</b> Stamina	0.4–1.5 fl oz/cwt (Use the higher rates when disease pressure is expected to be high.)	
	X	<b>thiabendazole</b> Mertect® 430-F	1.02 fl oz/cwt	
X		<b>thiram + molybdenum</b> Protector-D	4.5 oz/cwt	
X		<b>trifloxystrobin</b> Trilex	0.32 fl oz/cwt	Do not plant any other crop without trifloxystrobin tolerances until 30 days after planting.
X		<b>trifloxystrobin + metalaxyl</b> Trilex 2000	1 fl oz/cwt	Do not plant any other crop without trifloxystrobin tolerances until 30 days after planting.
		Trilex AL Flowable	5.7 fl oz/cwt	

**SEED TREATMENTS FOR ALFALFA**

Diseases listed on label		Downy mildew	Seed Treatment Products	Application Rate	Special Notes
Seed & Seedling Rots	Pythium/ Phytophthora root diseases				
X			<b>captan</b> Captan 400 Captan 400C	5–8 fl oz/cwt 5–8 fl oz/cwt	
X			<b>fludioxonil</b> Maxim 4FS	0.08–0.16 fl oz/cwt	Forage may not be grazed until 30 days after planting.
X	X	X	<b>fludioxonil + metenoxam</b> Maxim XL	0.167–0.334 fl oz/cwt	To be used with additional Apron XL (0.553–0.598 fl oz/cwt– see label for instructions).
X			<b>mefenoxam</b> Apron XL Apron XL LS	0.64 fl oz/cwt 0.64 fl oz/cwt	
			<b>metalaxy</b> Acquire Allegiance Dry Allegiance FL Dyna–Shield Metalaxy MetaStar ST Sebring 2.65 ST Sebring 480FS	0.75–1.5 fl oz/cwt 2 oz/cwt (Also for suppression of early season downy mildew.) 0.75–1.5 fl oz/cwt 0.75–1.5 fl oz/cwt 0.75–1.5 fl oz/cwt 0.75–1.5 fl oz/cwt 0.50–1.0 fl oz/cwt	
X			<b>thiram + molybdenum</b> Protector–D	8.0 oz/cwt	