

Importance of Wheat Seed Treatments

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Why Treat Seed?

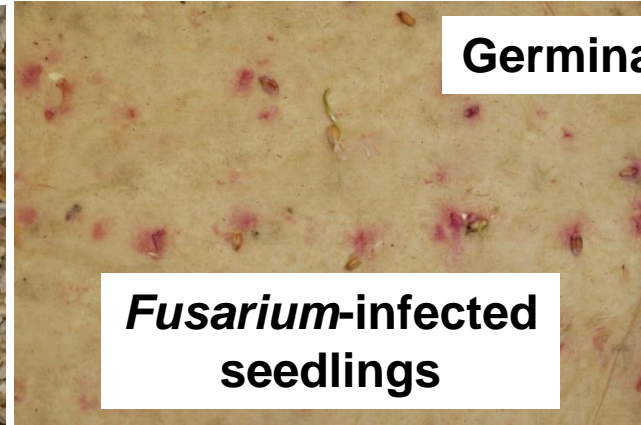
- **Control seed-transmitted diseases**
- **Control residue-borne diseases**
- **Control soilborne diseases**
- **Control foliar fungal diseases at early growing stages (after emergence in the fall)**
- **Control insect pests and disease vectors**
- **Improve stand establishment**

Seed Transmitted Diseases of Wheat Controlled with Fungicide Seed Treatments

- **Loose smut**
- **Common bunt (stinking smut)**
- **Flag smut**
- **Root and crown rots, seedling blight**

Soil- and Residue-borne Fungal Diseases of Wheat Controlled with Fungicide Seed Treatments

- **Common root rot**
- **Rhizoctonia root rot**
- **Pythium root rot**
- **Take-all**
- **Fusarium root and crown rot**
- **Fusarium seedling blight**



Germination test

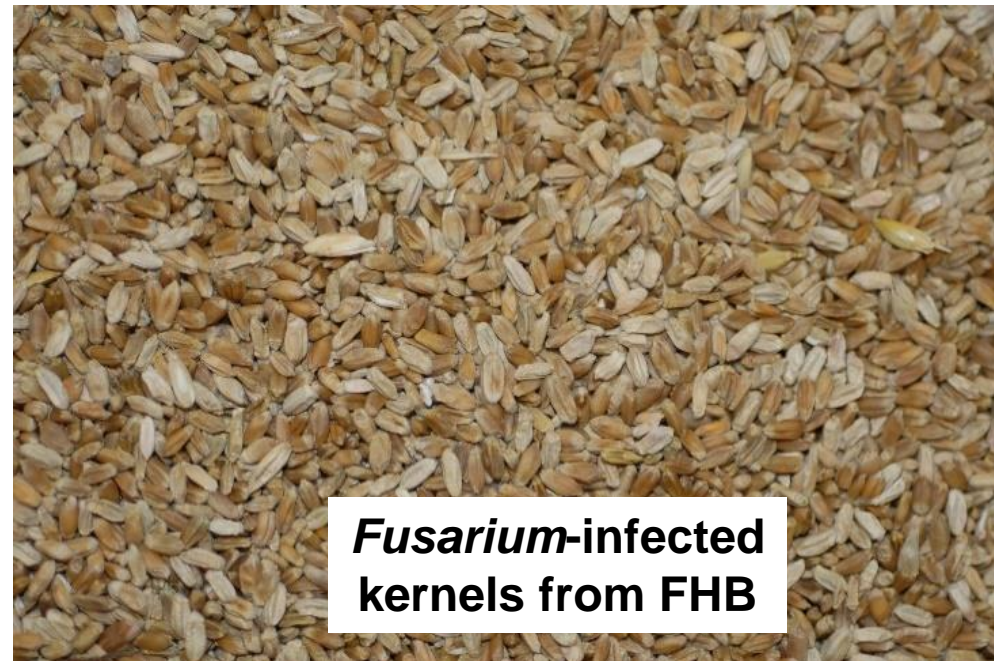
Common bunt and loose smut

- **Seed transmitted, common bunt is also soilborne, loose smut survives as mycelium in the seed**
- **Infection occurs during germination**
- **Mycelium grows within the plant**
- **At heading, kernels are replaced by spores of the fungi**
- **Common bunt can cause total loss due to grain rejection at the elevator**
- **Loose smut can cause up to 40% loss**
- **Both diseases are effectively controlled by fungicide seed treatments**



Fusarium head blight (FHB)

- Fungus survives on corn and wheat residue
- Favored by excessive rain before and during flowering
- Infections occur during flowering
- Infected grain is shriveled and appears chalky white and pinkish
- If infected grain is used as seed, seedling emergence can be reduced by up to 80%
- Fungicide seed treatment increases germination and prevents seedling blight, but has no effect on FHB



Flag smut

- **Seed-borne and soilborne**
- **Infection occurs during germination**
- **Conspicuous on leaves during stem elongation and heading**
- **Black stripes containing spores form between veins of leaf blades and sheaths**
- **Leaves become laterally twisted**
- **Up to 50% loss in growers' fields**
- **100% loss observed in research plots**
- **Grain from affected fields cannot be exported to some countries**
- **Fungicide seed treatment is the most effective control method**



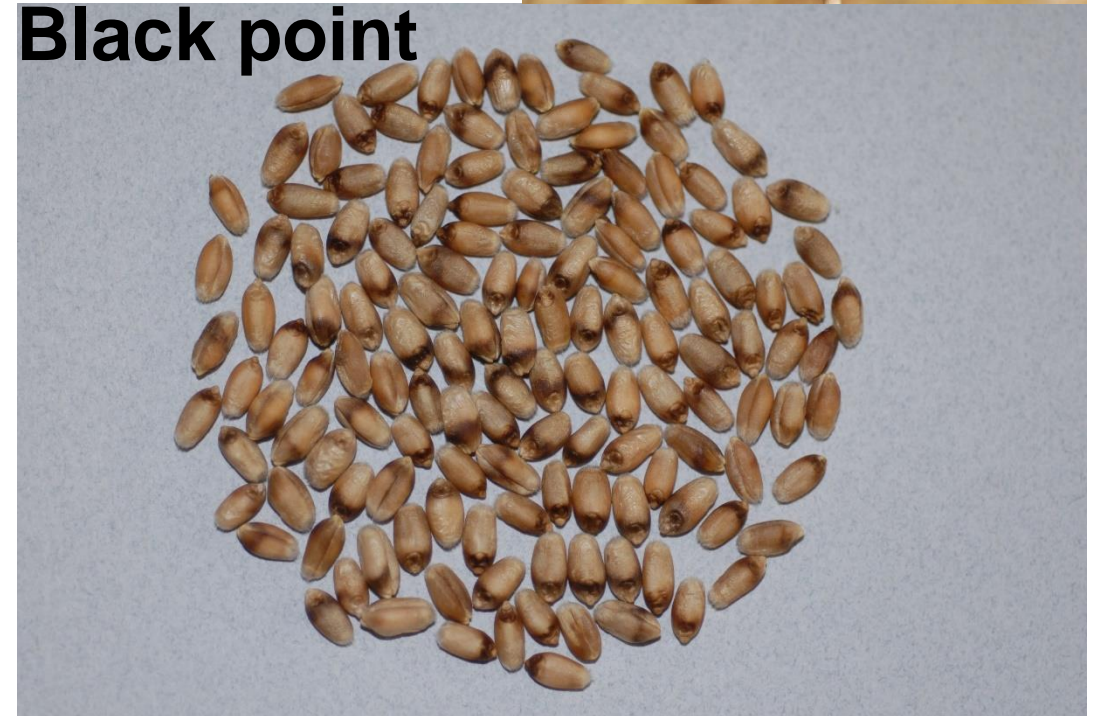
Sooty mold and black point

- Superficial fungi grow on prematurely dead or drying down heads in wet weather
- Mycelium grows and infects grain on the head
- Embryo end of grain is blackened, a disease known as black point
- If grain is used as seed, the fungi cause root rot and damping off, which can be prevented by fungicide seed treatment

**Sooty mold
(Black head mold)**



Black point



Ergot

- **Seed disseminated, not transmitted**
- **Favored by wet weather**
- **Soilborne sclerotia (ergots) germinate in spring to form fruiting bodies which release spores**
- **Spores infect heads during flowering**
- **Infected ovaries swell and become ergots**
- **Grasses are the main source of inoculum**
- **Ergots are poisonous to humans and animals**
- **NOT controlled by fungicide seed treatments**
- **Clean grain to remove ergots**
- **Do not use contaminated grain for food or feed**



**Fruiting
bodies**



Economic Importance of Seed Transmitted / Disseminated and Soilborne Diseases

- **Reduced yield**
- **Reduced grain quality**
- **Grain rejection at the elevator**
- **Grain rejection by livestock**
- **Potential for combine explosions during harvesting – common bunt**
- **Harmful mycotoxins**

West Central Winter Wheat Variety Tests – 1999 Perkins, Hitchcock, Furnas, and Lincoln Counties

Variety	Average Yield
Alliance Maxim + Divid XLTRA	75
Alliance	73
Arapahoe Maxim + Divid XLTRA	69
Arapahoe	66



Lincoln

A 3 bu/A yield increase was observed with fungicide treatment compared to non-treated

Slide credit: Robert Klein

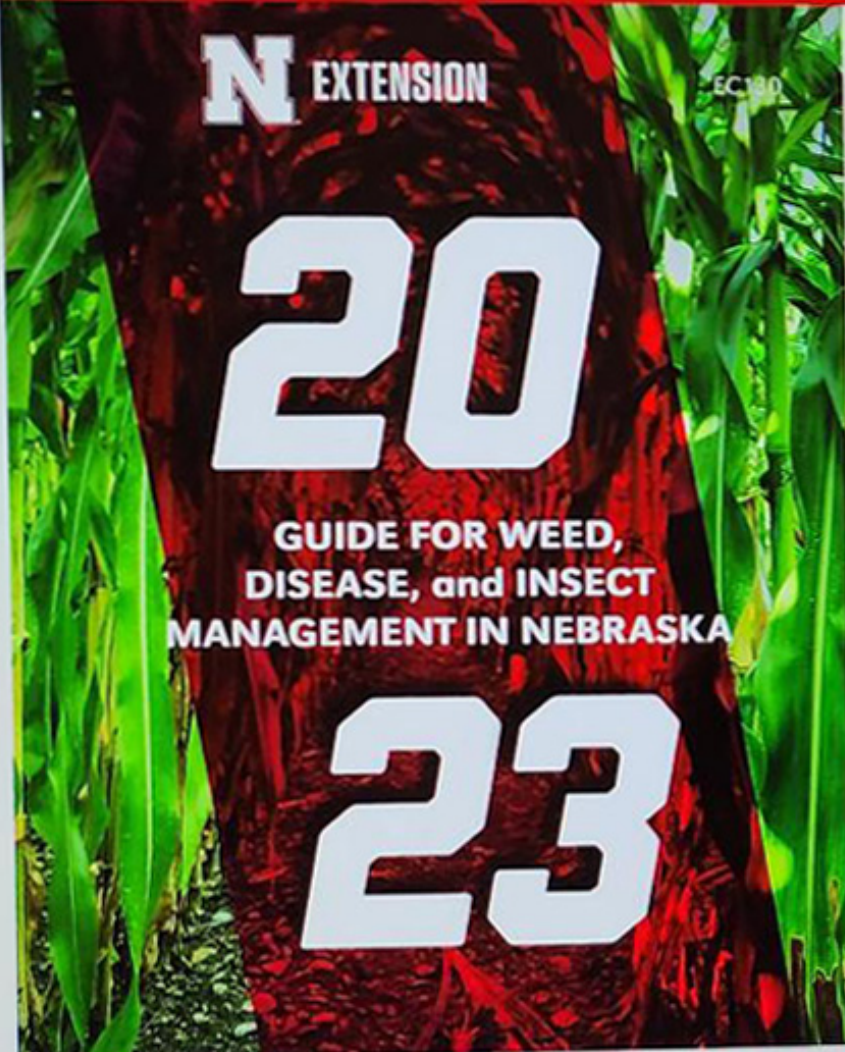
Treating Seed

- **It is best to buy certified treated seed or use a commercial seed service to clean and treat seed**
- **Seed treated on farm should be cleaned before treatment**
- **Thorough coverage is critical; it maximizes the effectiveness of the seed treatment**

Fungicide Seed Treatment Products pp. 288-289

<https://marketplace.unl.edu/extension/ec130.html>

☰ **FEATURED PUBLICATIONS** **EDUCATIONAL PROGRAMS** **PUBLICATIONS** **BACKYARD FARMER** **BUY FRESH BUY LOCAL**



2023 Guide to Weed Management

Availability: In stock

PRODUCT NAME	PRICE	QTY
2023 Guide to Weed Management	\$25.00	<input type="text" value="0"/>
2023 Weed Guide Download	\$15.00	<input type="text" value="0"/>

This 300-page guide is a comprehensive resource for current research-based information and UNL recommendations on weed management in Nebraska crop production, with special sections on fungicides, insecticides, and pesticide application equipment and safety. It includes detailed drawings and photos

Wheat

Seed Treatment Fungicide Product Information

Class		Trade Name Active Ingredients (%)	Rate (per 100 lb)*	
MBC Benzimidazoles (Group 1)		Mertect 340-F Thiabendazole 42.3%	0.17-3.9 fl oz	
DMI Triazoles (Group 3)		Charter Triticonazole 2.4%	3.1 fl oz	
		Raxil 2.6F Tebuconazole 28.3%	0.1 fl oz	
PA Acylalanines (Group 4)		Allegiance FL Metalaxyl 28.35%	0.1-0.375 fl oz	
		Apron XL Mefenoxam 33.3%	0.0425-0.085 fl oz	
		Dyna-Shield Metalaxyl Metalaxyl 28.35%	0.1-0.375 fl oz	
		Dyna-Shield Metalaxyl 318 FS Metalaxyl 30.14%	0.1-0.375 fl oz	
SDHI Carboxamides (Group 7)		Vibrance Sedaxane 43.7%	0.08-0.16 fl oz	
		Vitavax Carboxin 34.0%	2.0-3.0 fl oz	
QoI Strobilurins (Group 11)		Dynasty Azoxystrobin 9.6%	0.153-0.382 fl oz	
Phenylpyrroles (Group 12)		Dyna-Shield Fludioxonil Fludioxonil 40.3%	0.08-0.16 fl oz	
		Maxim 4FS Fludioxonil 40.3%	0.08-0.16 fl oz	
Dithiocarbamates (Group M3)		Dithane M-45 Mancozeb 80.0%	2.2-3.3 oz	
		Grain Guard Mancozeb 50.0%	3.3 oz	
		Penncozeb 75DF Mancozeb 75.0%	2.3-3.5 oz	
		Penncozeb 80WP Mancozeb 80.0%	2.2-3.3 oz	
Mixed Modes of Action	3+3+4	Proceed Metalaxyl 2.75% + Prothioconazole 6.88% + Tebuconazole 1.38%	1.0-1.5 fl oz	
		Raxil MD Extra Imazalil 1.0% + Metalaxyl 0.58% + Tebuconazole 0.43%	5.0 fl oz	
		Charter F2 Metalaxyl 0.79% + Triticonazole 1.32%	5.4 fl oz	
		CruiserMaxx Cereals Difenoconazole 3.36% + Mefenoxam 0.56% + <i>Thiamethoxam</i> 2.8% (I)	5.0 fl oz	
		Dyna-Shield Foothold Metalaxyl 0.668% + Tebuconazole 0.499%	5.0-6.5 fl oz	
		3+4	Dyna-Shield Foothold Extra Metalaxyl 0.607% + Tebuconazole 0.455% + <i>Imidacloprid</i> 11.374% (I)	3.4-5.0 fl oz

*All rates are units per 100 lbs of seed unless otherwise noted
 †Insecticide components are italicized with (I) for designation.

Wheat

Seed Treatment Fungicide Product Information (continued)

Class		Trade Name Active Ingredients (%)	Rate (per 100 lb)		
Mixed Modes of Action	3+4	Dyna-Shield Small Grains Metalaxyl 0.64% + Tebuconazole 0.48%	5.0-6.5 fl oz		
		Incentive RTA Difenoconazole 3.21% + Mefenoxam 0.27%	2.5-10.0 fl oz		
		NipsIt SUTTE Cereals Metalaxyl 0.88% + Metconazole 0.44% + <i>Clothianidin</i> 2.93% (I)	5.0-7.5 fl oz		
		Rancona Crest Ipconazole 0.421% + Metalaxyl 0.562% + <i>Imidacloprid</i> 14.1% (I)	5.0-8.33 fl oz		
		Rancona Pinnacle Ipconazole 0.434% + Metalaxyl 0.579%	5.0-8.33 fl oz		
		Raxil Allegiance MD Metalaxyl 0.64% + Tebuconazole 0.48%	5.0-6.5 fl oz		
		CruiserMaxx Vibrance Cereals Difenoconazole 3.34% + Mefenoxam 0.86% + Sedaxane 0.72% + <i>Thiamethoxam</i> 2.78% (I)	5.0-10.0 fl oz		
		EverGol Energy Metalaxyl 5.74% + Penflufen 3.59% + Prothioconazole 7.18%	1.0 fl oz		
		Rancona V RTU FS Carboxin 12.58% + Ipconazole 0.47% + Metalaxyl 1.26%	4.6 fl oz		
		3+4+7	Vibrance Extreme Difenoconazole 5.86% + Mefenoxam 1.46% + Sedaxane 1.22%	2.8-5.6 fl oz	
			3+7	Rancona V 100 Pro FS Carboxin 35.52% + Ipconazole 2.22%	0.9-1.5 fl oz
			3+M3	Charter PB Thiram 12.5% + Triticonazole 1.25%	5.5 fl oz
		Raxil Thiram Tebuconazole 0.6% + Thiram 20.0%		3.5-4.6 fl oz	
		4+12	Maxim XL Fludioxonil 21.0% + Mefenoxam 8.4%	0.167-0.334 fl oz	
		M1+M3	ManKocide Copper Hydroxide 46.1% + Mancozeb 15.0%	4.0 oz	

*All rates are units per 100 lbs of seed unless otherwise noted
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Take Home Message

Use certified, fungicide treated seed to reduce losses from seed transmitted and soilborne fungal diseases of wheat

Thank You!

Questions?

