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Loren J. Giesler

University of Nebraska - Lincoln, lgiesler1@unl.edu

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Seed Treatment Fungicides for Soybeans

By Loren J. Giesler, Extension Plant Pathologist

The most common soybean disease problem in Nebraska is seedling damping off and seed rot caused by several fungi. Early season damping off and root rots are often followed by premature death, which in many instances may be attributed to fungal infections earlier in the season. In some situations, large areas of a field or even entire fields need to be replanted due to early season fungal problems. This is especially true when cool, wet weather early in the growing season creates favorable conditions for infection by certain soil borne pathogens that attack developing soybean plants. Seedling diseases are also active at any time when saturated soil conditions occur. Several pathogens are involved in damping off seedling diseases. The most common in Nebraska are species of *Fusarium*, *Phytophthora*, *Pythium*, and *Rhizoctonia*. All four are capable of killing soybean seedlings or at least causing damage sufficient enough that it affects the ability of the plant to achieve its full yield potential. Diagnostic characteristics of common soybean seedling diseases are described in *Damping Off, Root Rots, and Vascular Disorders of Soybean*, NU Extension Circular EC99-1877.

Seed treatment fungicides are available in a variety of formulations. Some products are labeled for commercial use in slurry- and mist-type seed treaters. Other products are labeled for on-farm application and are commonly referred to as hopper-box or planter-box treatments. Good seed coverage is required for maximum benefit in all cases. To attain good

seed coverage with on-farm application, most seed treatment companies recommend adding half of the seed to the planter-box, then adding half of the seed treatment product and mixing thoroughly before adding the remaining seed and fungicide. Mix this thoroughly again. Good coverage also can be obtained by mixing the seed and treatment in a suitable container before adding seed to the planter-box. Always read and follow label directions before making any chemical application.

Field history is a key component of the decision-making process for managing soybean seedling diseases. In most cases problem fields will have a history of seedling emergence or post-emergence problems; however, the distribution of the problem area within a field can be altered significantly in a wet year and may have a substantial impact on stand fieldwide. It is critical that the fungal problem be correctly identified so that the correct fungicide treatment is used. Fungicides used as **protectants (contacts)** are effective only on the seed surface, while **systemic fungicides** are absorbed by the emerging seedling and inhibit or kill the fungus inside host plant tissues. Contact fungicides usually have shorter residual activity than systemic fungicides. Contact fungicides used for soybean seed treatment include: captan, fludioxonil, PCNB, and thiram. Systemic fungicides used for soybean seed treatment include: azoxystrobin, carboxin, mefenoxam, metalaxyl, and thiabendazole. *Table 1* lists most of the seed treatment fungicides available for soybeans.

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Table 1. Active ingredient and specific activity of some soybean seed-applied fungicides^a.

Trade Names	Manufacturer	Active Ingredient	Application Method			Disease on Label ^b				
			Commercial Treater	Planter Box		Pythium ^c	Phytophthora ^c	Rhizoctonia	Fusarium	Phomopsis
Allegiance Dry	Trace Chem. LLC	Metaxyl	-	+		Excellent	Excellent	NA	NA	NA
Allegiance-FL	Gustafson, Inc.		+	-		+	+	NA	NA	NA
Allegiance LS	Gustafson, Inc.		+	+		+	+	NA	NA	NA
Apron XL LS	Syngenta	Mefenoxam	+	-		Excellent	Excellent	NA	NA	NA
Maxim 4FS	Syngenta	Fludioxonil				NA	NA	Good	Good	Good
Apron Maxx RTA	Syngenta	Mefenoxam + Fludioxonil	+	+		+	NA	+	+	+
Apron Maxx RTA + Moly			+	+		+	+	+	+	+
Warden RTA	Agrifiance LLC		+	+		+	+	+	+	+
Captan 30-DD; Captan 400	Gustafson, Inc. Gustafson, Inc.	Captan ^d	+	-		Poor NS NS	Poor NS NS	Good NS NS	Fair NS NS	Fair NS NS
Bean Guard Enhance	Trace Chem. LLC Trace Chem. LLC	Captan + Carboxin	-	+		Poor NS NS	Poor NS NS	Good NS NS	Fair NS NS	Good NS NS
Bean Guard Allegiance	Trace Chem. LLC	Captan + Carboxin + Metaxyl	-	+		+	+	NS	+	NS
Kickstart VP	Helena Chem. Co.	Carboxin + Permethrin	-	+		NS	NS	NS	NS	NS
Prevail	Trace Chem. LLC	Carboxin + Metaxyl + PCNB	+	+		NS	NS	NS	NS	NS
Protégé	Syngenta	Azoxystrobin	+	-		NA	NA	Good	Good	Poor
SoyGard Fungicide	Gustafson, Inc.	Azoxystrobin + Metaxyl	+	-		+	+	+	NS	NS
Rival Flowable	Gustafson, Inc.	Captan + PCNB + Thiabendazole	+	-		Poor	Poor	Good	Fair	Good
Rival Pak	Gustafson, Inc.	Captan + PCNB + Thiabendazole + Metaxyl	+	-		Good	NA	Good	Good	Good
RTU Flowable	Gustafson, Inc.	Thiabendazole + Thiram	+	+		NS	NS	NS	NS	+
RTU-Vitavax-Thiram	Gustafson, Inc.	Carboxin + Thiram	+	+		Poor NS	NA NS	Fair +	Poor NS	Good +
Vitavax-200	Helena Chem. Co.		+	-		+	+	+	+	NS
Vitavax CT	Trace Chem. LLC		-	+		+	+	+	+	NS
Stiletto-Pak	Trace Chem. LLC	Carboxin + Thiram + Metaxyl	-	+		+	+	+	+	NS
Subtlix	Becker Underwood ³	<i>Bacillus subtilis</i>	-	+		+	NS	+	+	NS
System ³	Helena Chem. Co.	<i>Bacillus subtilis</i> + metalaxyl + PCNB	+	+		+	+	+	NS	NS
Yield Shield	Gustafson, Inc.	<i>Bacillus pumilus</i>	+	+		NS	NS	+	+	NS

^aThis list is presented for information only. No endorsement is intended for products listed nor criticism meant for products not listed. **Read the label carefully before making any application.**

^bSeed treatment fungicide ratings for active ingredient. NA = no activity; NS = not specified on label; (+) = disease on label.

^cControl of Pythium and Phytophthora is rate dependent. Make sure the rate is adequate for the problem you are managing.

^dCaptan formulations have an adverse effect on Rhizobium inoculant. Therefore, they need to be avoided if seed is directly inoculated, or use an in-furrow application of the inoculant with Captan-treated seed.