

Seed Treatment Fungicidesⁱ Labeled for Use on Winter Wheat

Updated January 2002

by Laura E. Sweets

University of Missouri

This table was prepared using current company product label books and web sites. However, label registrations can change at any time. Before using any agricultural pesticide, read and follow directions on the label accompanying that product. Product trade names have been used for clarity. References to specific trade names does not imply endorsement by the University of Missouri; discrimination is not intended against similar products not listed.

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
Allegiance Dry Trace Chemicals LLC	metalaxyl 12.50%	1.5 to 2.0 oz. per 100 lbs. of seed	For control of <i>Pythium</i> damping-off. Do not use this product on seed which has been commercially treated with metalaxyl fungicide. Planter box treatment.
Allegiance-FL Gustafson LLC	metalaxyl 28.35%	0.75 fl. oz. per 100 lbs. of seed	For <i>Pythium</i> damping-off control. May be applied at a reduced rate (0.10 to 0.375 fl. oz. per 100 lbs. of seed) in combination with EPA registered rates of Gustafson broad spectrum seed treatment fungicides, to aid in control of seed decay and damping-off caused by <i>Pythium</i> spp.
Allegiance-LS Gustafson LLC	metalaxyl 17.70%	1.2 fl. oz. per 100 lbs. of seed	For <i>Pythium</i> damping-off control. May be applied at a reduced rate (0.175 to 0.66 fl. oz. per 100 lbs. of seed) in combination with EPA registered rates of Gustafson broad spectrum seed treatment fungicides, to aid in control of seed decay and damping-off caused by <i>Pythium</i> spp.
Allegiance 50WP Gustafson LLC	metalaxyl 50.00%	0.25 to 0.5 oz. per 100 lbs. of seed	For <i>Pythium</i> damping-off control. May be applied at a reduced rate (0.067 to 0.25 oz. per 100 lbs. of seed) in combination with EPA registered rates of Gustafson broad spectrum seed treatment fungicides, to aid in control of seed decay and damping-off caused by <i>Pythium</i> spp. For use only by commercial seed treaters.
Apron Flowable	metalaxyl 28.35%	0.82 to 1.64 fl. oz.	For control of <i>Pythium</i> damping-off and

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
Wilbur-Ellis		per 100 lbs. of seed	<p>early season Phytophthora.</p> <p>For Pythium damping-off control when less disease is expected, apply Apron Flowable as a seed treatment at the rate of 0.11 to 0.41 fl. oz. per 100 lbs. of seed in combination with Captan or another registered seed treatment product.</p> <p>For use only by commercial seed treaters.</p>
Apron TL Wilbur-Ellis	metalaxyl 11.50%	2.0 to 4.0 fl. oz. per 100 lbs. of seed	<p>For control of Pythium damping-off and early season Phytophthora.</p> <p>For Pythium damping-off control when less disease is expected, apply Apron TL as a seed treatment at the rate of 0.27 fl. oz. per 100 lbs. of seed.</p> <p>For use only by commercial seed treaters.</p>
Apron XL LS Syngenta	mefenoxam 32.30%	0.32 to 0.64 fl. oz. per 100 lbs. of seed	<p>For Pythium damping-off control.</p> <p>May be applied at a reduced rate (0.0425 to 0.085 fl. oz. per 100 lbs. of seed) for Pythium damping-off control in wheat when applied in combination with Dividend or other seed treatment products at labeled rates.</p> <p>Apron XL LS may be applied as a water-based slurry with other registered seed treatment insecticides and fungicides through standard slurry- or mist-type commercial seed treatment equipment.</p>
Baytan 30 Gustafson LLC	triadimenol 30.00%	0.75 to 1.5 fl. oz. per 100 lbs. of seed	<p>Controls or suppresses certain designated seed and soilborne diseases of wheat. The systemic activity of Baytan 30 will provide early season control of infections by powdery mildew and rusts.</p> <p>Apply the 0.75 oz. rate for control of stinking smut, flag smut and loose smut.</p> <p>Apply the 1.5 oz. rate for control or suppression of glume blotch, foot rot and take-all and for early season control of powdery mildew, leaf rust and stripe rust</p> <p>In the absence of significant disease pressure, seed treated with Baytan may</p>

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
			<p>emerge slightly slower than nontreated. This effect usually disappears 2-3 days after initial emergence. For best results, do not plant seed at depths greater than 1.5 inches.</p> <p>For use only by commercial seed treaters.</p>
Captan 30-DD Gustafson LLC	captan 28.70%	1.5 fl. oz. per 100 lbs. of seed	<p>To protect seed from seedborne and soilborne fungi which cause seed decay, damping-off and seedling diseases but not for control of bunt or smut.</p> <p>Contains Rhodamine B (dye).</p>
Captan 400 Gustafson LLC	captan 37.40%	1.5 to 4.0 fl. oz. per 100 lbs. of seed	<p>To protect seed from seedborne and soilborne fungi which cause seed decay, damping-off and seedling diseases but not for control of bunt or smut.</p>
Dithane- 45 Rohm & Haas	mancozeb 80.00%	2.2 to 3.3 oz. per 100 lbs. of seed	<p>For control of bunt, damping-off, seed rots and seedling blights.</p> <p>For planter box treatment only.</p>
Dividend XL Syngenta	difenoconazol 16.50% e 1.38% mefenoxam	1.0 or 2.0 fl. oz. per 100 lbs. of seed	<p>Dividend XL is a systemic seed dressing that controls or suppresses certain seedborne, soilborne and fall foliar diseases of wheat. It is a mixture of Dividend and Apron XL LS.</p> <p>Use 1.0 fl. oz. per 100 lbs. of seed for control of common bunt, dwarf bunt, flag smut, seedborne Septoria, loose smut, general seed rots, Fusarium seed scab and Pythium damping-off and for partial control of common foot rot and Rhizoctonia root rot.</p> <p>Use 2.0 fl. oz per 100 lbs. of seed for control of common bunt, dwarf bunt, loose smut, flag smut, seedborne Septoria, general seed rots, Fusarium seed scab and Pythium damping-off; for control of fall season powdery mildew, fall season leaf rust, fall season Septoria leaf blotch in winter wheat for the first 6 weeks after planting and for partial control of common foot rot, Fusarium foot rot, Fusarium crown rot, take-all and Rhizoctonia root rot.</p>
Dividend XL RTA	difenoconazol 3.21%	2.5, 5.0 or 10.0 fl.	Dividend XL is a systemic seed dressing

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
Syngenta	e mefenoxam 0.27%	oz. per 100 lbs. of seed	<p>that controls or suppresses certain seedborne, soilborne and fall foliar diseases of wheat. It is a mixture of Dividend and Apron XL LS.</p> <p>Use 2.5 fl. oz. per 100 lbs. of seed for control of common bunt and loose smut.</p> <p>Use 5.0 fl. oz. per 100 lbs. of seed for control of common bunt, dwarf bunt, flag smut, seedborne Septoria, loose smut, general seed rots, Fusarium seed scab and Pythium damping-off and for partial control of common foot rot and Rhizoctonia root rot.</p> <p>Use 10.0 fl. oz. per 100 lbs. of seed for control of common bunt, dwarf bunt, loose smut, flag smut, seedborne Septoria, general seed rots, Fusarium seed scab and Pythium damping-off; for control of fall season powdery mildew, fall season leaf rust, fall season Septoria leaf blotch in winter wheat for the first 6 weeks after planting and for partial control of common foot rot, Fusarium foot rot, Fusarium crown rot, take-all and Rhizoctonia root rot.</p> <p>Dividend XL RTA is especially formulated for on-farm treatment, using standard mechanical slurry- or mist-type seed treatment equipment. This product does not require the addition of water for application.</p>
Enhance Trace Chemicals LLC	captan 19.10% carboxin 20.00%	4.0 oz. per 100 lbs. of seed	<p>For control of covered smut (<i>Tilletia caries</i> and <i>Tilletia foetida</i>) and loose smut (<i>Ustilago nuda</i>) and reduces seed rot and seedling blight caused by soil fungi.</p> <p>Planter box treatment.</p>
Enhance Plus Trace Chemicals LLC	carboxin 20.00% maneb 35.00% lindane 18.75%	2.0 oz. per bushel of seed	<p>For protection against wireworms and other soil-borne insects as well as providing protection against stinking smut (bunt) of wheat and seed decay.</p> <p>Planter box treatment.</p>
FLO-PRO-IMZ Gustafson LLC	imazalil 31.00%	0.25 to 0.5 fl. oz. per 100 lbs. of seed	<p>For control of common root rot (<i>Helminthosporium sativum</i>).</p>

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
			<p>Apply using commercial slurry or on-farm seed treating equipment.</p> <p>Recommended that FLO-PRO IMZ be applied in combination with Vitavax-200 or other flowable suspension seed treatments to provide additional disease control at the respective labeled rates.</p>
Grain Guard Trace Chemicals LLC	mancozeb 50.00%	2.0 oz. per bushel of seed	For control of bunt, damping-off, seed rot and seedling blights. Drill box treatment.
Grain Guard Plus Trace Chemicals LLC	mancozeb 50.00% lindane 18.75%	2.0 oz. per bushel of seed	To protect against stinking smut (bunt), seed decay and damping-off and to protect seed and seedlings from wireworm damage. Drill box seed treatment.
Kodiak Concentrate Biological Fungicide Gustafson LLC	<i>Bacillus subtilis</i> GBO3 2.75%	0.05 to 0.1 oz. per 100 lbs. of seed	For suppression of root diseases caused by <i>Rhizoctonia</i> and <i>Fusarium</i> . Kodiak Concentrate contains bacteria which colonize the developing root system, suppressing disease organisms such as <i>Fusarium</i> , <i>Rhizoctonia</i> , <i>Alternaria</i> and <i>Aspergillus</i> that attack root systems. When used in combination with a chemical seed treatment, the combination of chemicals and Kodiak provides protection to the root for a much longer time than with chemicals alone. Pre-test for compatibility with other seed treatment products.
Kodiak HB Trace Chemicals LLC	<i>Bacillus subtilis</i> GBO3 0.30%	4.0 to 8.0 oz. per 100 lbs. of seed	For suppression of root diseases caused by <i>Rhizoctonia</i> , <i>Fusarium</i> and <i>Pythium</i> . Kodiak HB contains bacteria which colonize the developing root system, suppressing disease organisms such as <i>Fusarium</i> , <i>Rhizoctonia</i> , <i>Alternaria</i> and <i>Aspergillus</i> that attack root systems. When used in combination with a chemical seed treatment, the combination of chemicals and Kodiak provides protection to the root for a much longer time than with chemicals alone. Pre-test for compatibility with other seed treatment products. Hopper box treatment.

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
LSP Flowable Gustafson LLC	thiabendazole 30.00%	2.0 or 4.0 fl. oz. per bushel of seed	Recommended for control of seed and soilborne common bunt (stinking smut) attacking wheat. 2.0 fl. oz. per bushel of seed for control of seedborne common bunt. 4.0 fl. oz. per bushel of seed for control of soilborne common bunt. For use only by commercial seed treaters.
Maxim 4FS Syngenta	fludioxonil 40.30%	0.08 to 0.16 fl. oz. per 100 lbs. of seed	For control of seed-borne and soil-borne fungi which cause seed decay, damping-off and seedling blights.
Maxim XL Syngenta	fludioxonil 21.00% mefenoxam 8.40%	0.167 to 0.334 fl. oz. per 100 lbs. of seed	For control of damping-off caused by <i>Fusarium</i> spp., <i>Rhizoctonia</i> spp. and <i>Pythium</i> spp.; general seed rots caused by <i>Aspergillus</i> spp. and <i>Penicillium</i> spp.; and common bunt.
Mertect LSP Syngenta	thiabendazole 30.00%	2.0 to 4.0 fl. oz. per bushel of seed	For the control of seed- and soilborne common bunt attacking wheat; also aids in control of dwarf bunt. 2.0 fl. oz. per bushel of seed for seedborne common bunt. 2.0 to 4.0 fl. oz. per bushel of seed for soilborne common bunt. Not for use on agricultural establishments in hopper-box, planter-box, slurry-box or other seed treatment applicators at or immediately before planting.
Nu-Gro Captan 4000 Wilbur-Ellis	captan 37.66%	1.5 to 4.0 fl. oz. per 100 lbs. of seed	To prevent seed and seedling rots, not for control of bunt smut. For use as a commercial seed treatment.
Nu-Gro PCNB 2-E Wilbur-Ellis	PCNB 24.00%	3.35 fl. oz. per 100 lbs. of seed	For control of seedling disease complex, esp. <i>Rhizoctonia</i> and <i>Fusarium</i> and for control of common smut or bunt. For use as a commercial seed treatment.
Nu-Gro PCNB Flowable Wilbur-Ellis	PCNB 20.00%	4.0 fl. oz. per 100 lbs. of seed	For control of seedling disease complex, esp. <i>Rhizoctonia</i> and <i>Fusarium</i> and for control of common smut or bunt.

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
			For use as a commercial seed treatment.
Nu-Zone 10 ME Wilbur-Ellis	imazalil 10.00%	0.8 to 1.5 fl. oz. per 100 lbs. of seed	For control of seedborne net blotch and <i>Septoria nodorum</i> and protection against the seed and soilborne phases of the common root rot disease complex (<i>Helminthosporium</i> , <i>Fusarium</i>). Promotes stand establishment by protecting against seed and seedling blights caused by <i>Helminthosporium</i> , <i>Fusarium</i> or <i>Penicillium</i> . For use as a commercial seed treatment.
PCNB Seed-Coat Wilbur-Ellis	PCNB 24.00%	2.0 oz. per bushel of seed	For control of common smut or bunt and damping-off caused by <i>Rhizoctonia</i> . For use as a commercial seed treatment.
Penncozeb 75DF Elf Atochem	mancozeb 75.00%	2.3 to 3.5 oz. per 100 lbs. of seed	For control of bunt, damping-off, seed rots and seedling blights. For planter box treatment only.
Penncozeb 80WP Elf Atochem	mancozeb 80.00%	2.2 to 3.3 oz. per 100 lbs. of seed	For control of bunt, damping-off, seed rots and seedling blights. For planter box treatment only.
Prevail Trace Chemicals LLC	carboxin 15.00% PCNB 15.00% metalaxyl 3.12%	3.0 oz. per bushel of seed	For protection against Pythium and Rhizoctonia seedling disease complex, loose smut and common bunt or stinking smut of wheat. May be used as a planter box treatment or applied at planting utilizing an on-farm mechanical treater to maximize coverage.
Raxil MD Gustafson LLC	tebuconazole 0.48% metalaxyl 0.64%	5.0 fl. oz. per 100 lbs. of seed	Combination of the systemic fungicides tebuconazole and metalaxyl which aids in the control or suppression of stinking smut, flag smut, loose smut, early season Septoria disease complex, general seed rots, Pythium damping-off, early season Rhizoctonia root rot, early season common root rot, seedborne Fusarium scab, early season Fusarium foot rot, early season suppression of powdery mildew and rust. This product is intended for commercial or on-farm application. It is not intended for

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
			direct application into a planter box.
Raxil MD Extra Gustafson LLC	tebuconazole 0.43% metalaxyl 0.58% imazalil 1.00%	5.0 fl. oz. per 100 lbs. of seed	Combination of the systemic fungicides tebuconazole and metalaxyl which aids in the control or suppression of stinking smut, flag smut, loose smut, early season Septoria disease complex, general seed rots, Pythium damping-off, early season Rhizoctonia root rot, early season common root rot, seedborne Fusarium scab, early season Fusarium foot rot, early season suppression of powdery mildew and rust. This product is intended for commercial or on-farm application. It is not intended for direct application into a planter box.
Raxil-Thiram Gustafson LLC	tebuconazole 0.60% thiram 20.00%	3.5 to 4.6 fl. oz. per 100 lbs. of seed	For control of stinking smut, flag smut, loose smut, early season Septoria disease complex, general seed rots, Pythium damping-off, early season Rhizoctonia root rot, early season common root rot, seedborne Fusarium scab, early season Fusarium root rot, early season suppression of powdery mildew and early season suppression of wheat leaf rust.
Raxil XT Gustafson LLC	tebuconazole 15.0% metalaxyl 20.0%	0.16 oz. per 100 lbs. of seed	Combination of the systemic fungicides tebuconazole and metalaxyl which aids in the control or suppression of stinking smut, flag smut, loose smut, early season Septoria disease complex, general seed rots, Pythium damping-off, early season Rhizoctonia root rot, early season common root rot, seedborne Fusarium scab, early season Fusarium foot rot, early season suppression of powdery mildew and rust.
Rival Flowable Gustafson LLC	captan 19.80% PCNB 8.40% thiabendazole 1.00%	4.0 fl. oz. per 100 lbs. of seed	For protection of wheat seed from seed and soilborne diseases which cause seed decay, damping-off (including <i>Rhizoctonia</i> species), seedling blights during germination and early seedling stages. For use only by commercial seed treaters. For use only in closed system commercial seed treatment equipment.
RTU-Baytan-Thiram Gustafson LLC	triadimenol 5.00% thiram 15.30%	4.5 to 9 fl. oz. per 100 lbs. of seed	Combines the systemic action of Baytan with the surface action of thiram to control or suppress various seed, seedling and

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
			<p>soilborne diseases of wheat.</p> <p>Apply the 4.5 fl. oz. rate for control of stinking smut, flag smut and loose smut.</p> <p>Apply the 9 fl. oz. rate for control or suppression of scab, glume blotch, foot rot, take-all and Pythium rot and for control of early season powdery mildew, leaf rust and stripe rust.</p> <p>For use only by commercial seed treaters.</p> <p>For use only through commercial seed treating equipment which are closed application systems.</p>
RTU Flowable Gustafson LLC	thiram 12.60% thiabendazole 0.34%	6.6 fl. oz. per 100 lbs. of seed	Provides protection from seedborne and soilborne diseases which cause damping-off, seed decay, seedling blight and seedborne common bunt (stinking smut) during germination and early seedling stages.
RTU-PCNB Gustafson LLC	PCNB 24.00%	3.0 fl. oz. per 100 lbs. of seed	For control of seedling disease complex caused by <i>Rhizoctonia</i> and <i>Fusarium</i> and common smut or bunt. For use only by commercial seed treaters.
RTU-Vitavax-Extra Gustafson LLC	carboxin 16.70% imazalil 1.20% thiabendazole 1.50%	5.0 fl. oz. per 100 lbs. of seed	Particularly effective against <i>Rhizoctonia solani</i> and various <i>Helminthosporium</i> , <i>Fusarium</i> species and <i>Penicillium</i> dry rot. Seedborne glume blotch, <i>Septoria nodorum</i> , common bunt and loose smut are controlled in wheat. Also provides protection against the seed and soilborne phases of the common root-rot disease complex.
RTU-Vitavax-Thiram Gustafson LLC	carboxin 10.00% thiram 10.00%	5.0 to 6.8 fl. oz. per 100 lbs. of seed	Particularly effective against <i>Rhizoctonia solani</i> and shows good activity against various <i>Helminthosporium</i> , <i>Fusarium</i> and <i>Pythium</i> species. In addition, loose smut and common bunt are controlled on wheat. Ready to use seed treatment which can be applied as a commercial seed treatment or as a pour-on hopper box application.
Sorghum Guard Trace Chemicals LLC	captan 32.75% lindane 16.60%	2.0 oz. per 100 lbs. of seed	Specially formulated combination of lindane for protection against wireworms

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
			and captan for protection against fungus diseases of seeds and seedlings.
System 3 Seed Treatment Helena	PCNB 16.67% metalaxyl 4.25% <i>Bacillus subtilis</i> 0.10% GBO3	2.0 to 3.0 oz. per bushel of seed	For control of Pythium and Rhizoctonia seedling disease complex and common smut or bunt of wheat. May be used as a planter box treatment or applied at planting time utilizing commercial seed treating equipment to maximize coverage.
42-S Thiram Gustafson LLC	thiram 42.00%	2.0 fl. oz. per bushel	To reduce losses caused by many seedborne and soilborne organisms and to control covered smuts or bunt of wheat.
Vitaflo-280 Gustafson LLC	carboxin 14.90% thiram 13.20%	3.5 to 5.0 fl. oz. per 100 lbs. of seed	A combination of a systemic fungicide and a contact fungicide to control seed and soilborne seedling diseases including damping-off and seed decay and control of loose smut and common bunt. The 3.5 fl. oz. rate will give partial control of true loose smut in wheat. Use the 5 fl. oz. rate for control of true loose smut. For use only by commercial seed treaters.
Vitavax CT Helena	carboxin 5.70% thiram 5.70%	9.0 to 12.0 fl. oz. per 100 lbs. of seed	For control of loose smut and common bunt. May be used as a planter box treatment or applied using a mechanical seed treater.
Vitavax-PCNB Gustafson LLC	carboxin 17.00% PCNB 17.00%	3.0 to 4.0 fl. oz. per 100 lbs. of seed	For control of various seed and seedling diseases, especially <i>Rhizoctonia solani</i> . On wheat also controls loose smut and common bunt. For use only by commercial seed treaters.
Vitavax-Thiram-Lindane Gustafson LLC	carboxin 14.00% thiram 12.00% lindane 8.00%	5.0 fl. oz. per 100 lbs. of seed	Provides systemic protection against loose smut and common bunt on wheat and protects seeds against seed decay and damping-off while providing protection to seeds and seedlings against damage from wireworms and seed corn maggot.
Vitavax-200 Gustafson LLC	carboxin 17.00% thiram 17.00%	3.0 to 4.0 fl. oz. per 100 lbs. of seed	Reduces seed rot/seedling blight diseases, is particularly effective against <i>Rhizoctonia solani</i> and shows good activity against various <i>Helminthosporium</i> , <i>Fusarium</i> and

Trade Name Company	Common Chemical Name and % of Active Ingredients	Rate	Additional Label Information
			<i>Pythium</i> species. Also controls loose smut and common bunt in wheat. Contains Rhodamine B (dye).
Vitavax-34 Gustafson LLC	carboxin 34.00%	2.0 to 3.0 oz. per 100 lbs. of seed	For control of loose smut and common bunt of wheat. For use as a commercial seed treatment.

i. Do not use treated seed for food, feed or oil purposes.

All treated seed must be colored with an EPA-approved dye which imparts unnatural color to the seed.

Federal law requires that bags containing treated seeds shall be labeled with the following information: “This seed has been treated with (common chemical name of active ingredients) fungicides(s). Do not use treated seed for feed, food or oil purposes.”

Store away from feeds and food stuffs.

Check pesticide label for grazing restrictions if treated seed is planted.