



BASF
We create chemistry



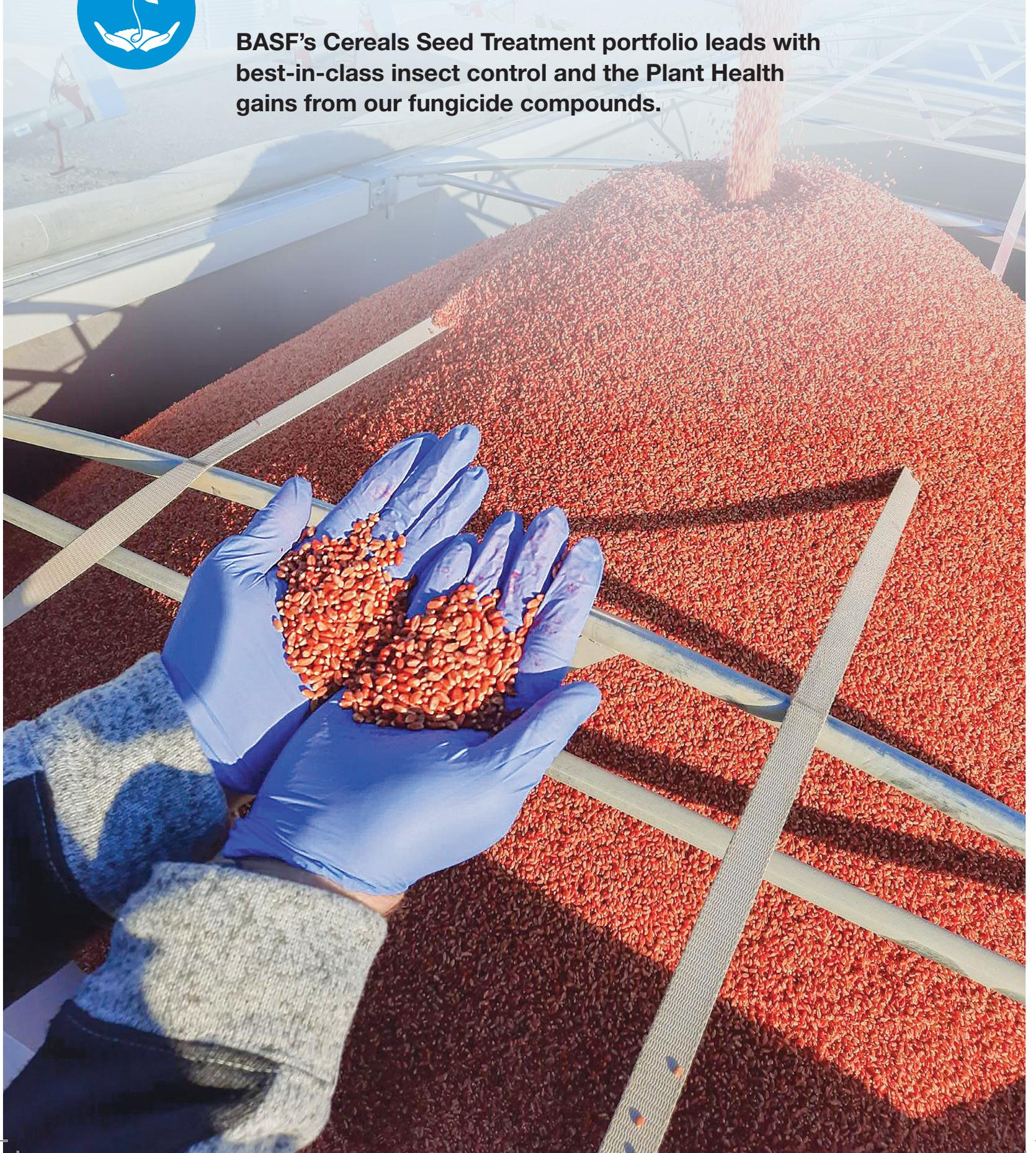
Cereals Seed Treatment Guide

**Pacific Northwest
2022 Season**

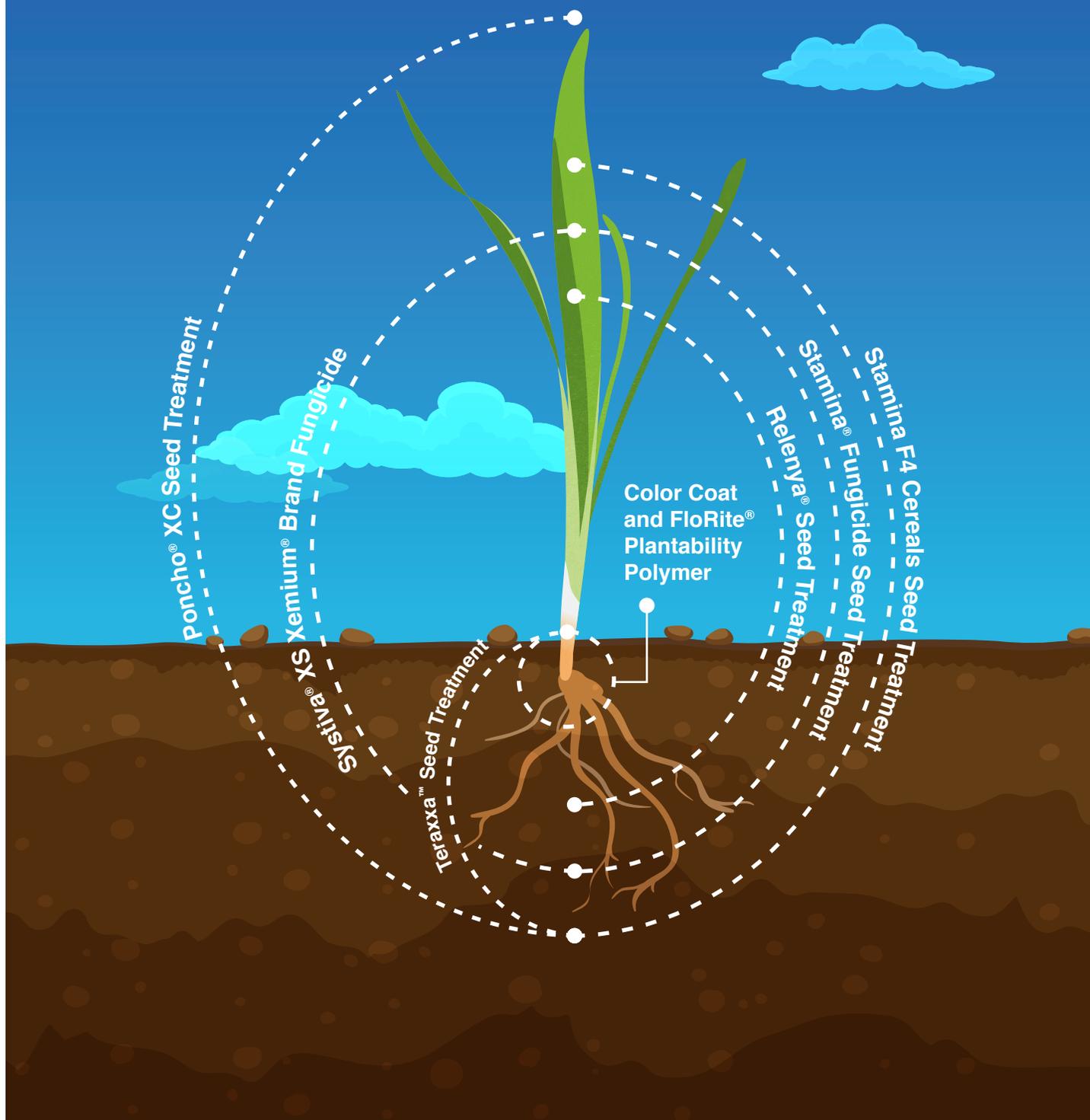


Outperform With Innovation

BASF's Cereals Seed Treatment portfolio leads with best-in-class insect control and the Plant Health gains from our fungicide compounds.



Powerful Protection to Minimize Early Season Risks and Maximize Opportunities for a Successful Season





Teraxxa™

Seed Treatment

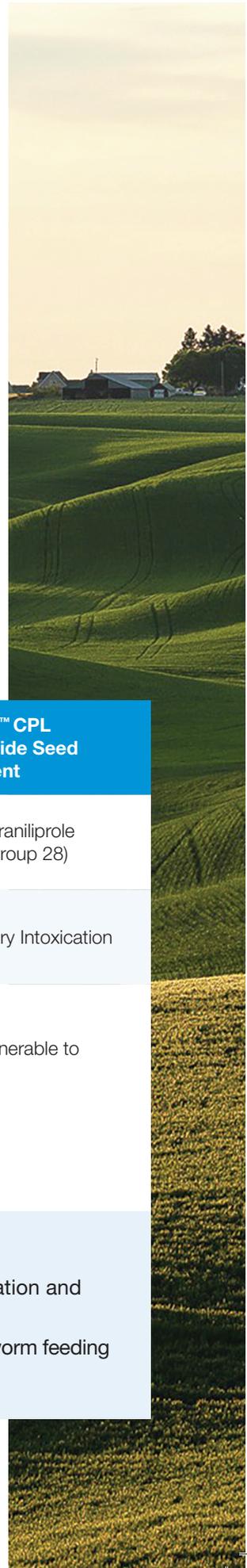
Teraxxa™ F4

Seed Treatment

A Powerful New Insecticide to Knockdown Wireworms

Teraxxa™ Seed Treatment

- Rapidly eliminates wireworms across all species and developmental stages
- Reduces overwintering wireworm larvae and neonates, which will reduce the feeding damage potential later in the season
- Partners with systemic insecticides for additional protection from above-ground insect pests



	Teraxxa & Teraxxa F4 Seed Treatment	Raxil® PRO Shield Seed Treatment	CruiserMaxx® Vibrance® Cereals Seed Treatment	Lumivia™ CPL Insecticide Seed Treatment
Insecticide Active Ingredient	Broflanilide (IRAC: Group 30)	Imidacloprid (IRAC: Group 4A)	Thiamethoxam (IRAC: Group 4A)	Chlorantraniliprole (IRAC: Group 28)
Activity on wireworms	Control	Temporary Intoxication	Temporary Intoxication	Temporary Intoxication
Benefits	<ul style="list-style-type: none"> ■ Eliminates wireworms on contact ■ Reduces resident populations ■ Early stand protection and complete in-season control 	<ul style="list-style-type: none"> ■ Early stand protection through wireworm intoxication ■ Systemic insecticide moves through the roots, leaving roots vulnerable to feeding ■ No population control 		

Powered by Broflanilide

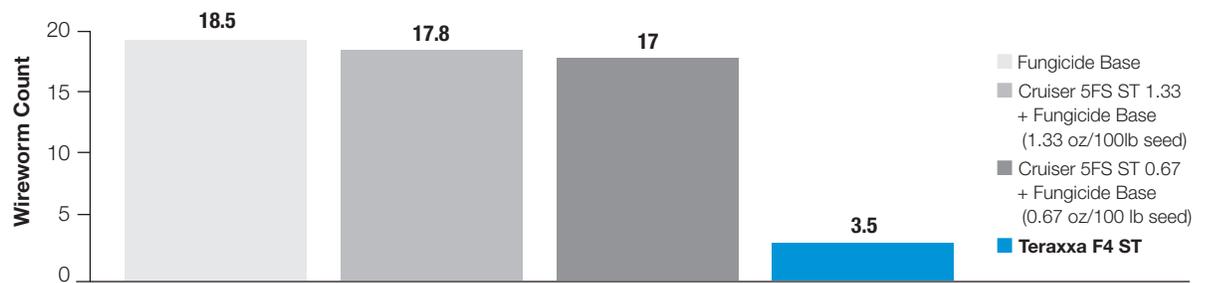
- Broflanilide interferes with nerve signal communication in the wireworm's cells, causing over-excitation and incapacitation, resulting in quick mortality
- Broflanilide is not systemic in the plant and stays in the root zone where you need protection from wireworm feeding
- Broflanilide provides protection to the root from wireworm feeding

A New Mode of Action for True In-Season Control and Effective Management of Wireworms



2018 Reardon, WA.

Teraxxa F4 Seed Treatment Reduces Wireworm Populations

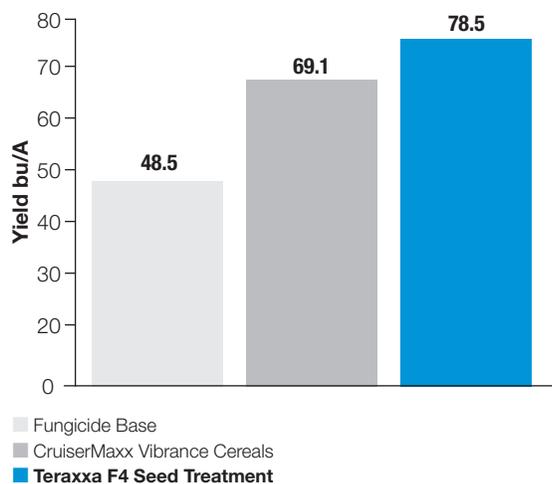


2018-2019 Reddy Montana State, MT. Spring 2019 wireworm bait sampling collected in season following 2018 wheat grown with seed treatments.

Teraxxa F4 Seed Treatment Redefines Performance and Wins Year After Year

2020 Trial Summary

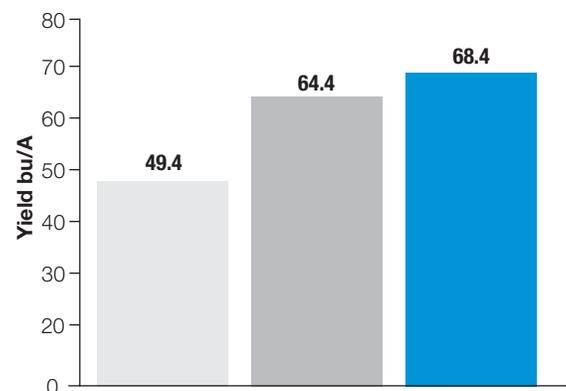
+9.0 bu/A over the competition



2020 company sponsored spring wheat trials (n=8). MT, WA under wireworm pressure.

2015-20 Trial Summary

+4.0 bu/A over the competition



2015-2020 company sponsored spring wheat trials (n=22). MT, WA, ND under wireworm pressure. Cruiser applied at 26 g a/100kg in combination with fungicide base or as CruiserMaxx Vibrance Cereals applied at 56 g a/100kg.



The Pillars of Plant Health

DISEASE CONTROL	ENVIRONMENTAL STRESS CONTROL	OPTIMIZED GROWTH EFFICIENCY
------------------------	-------------------------------------	------------------------------------

Metalaxyl

Systiva[®] XS

Xemium[®] Brand Fungicide

Xemium[®] Fungicide

Stamina[®]

Fungicide Seed Treatment

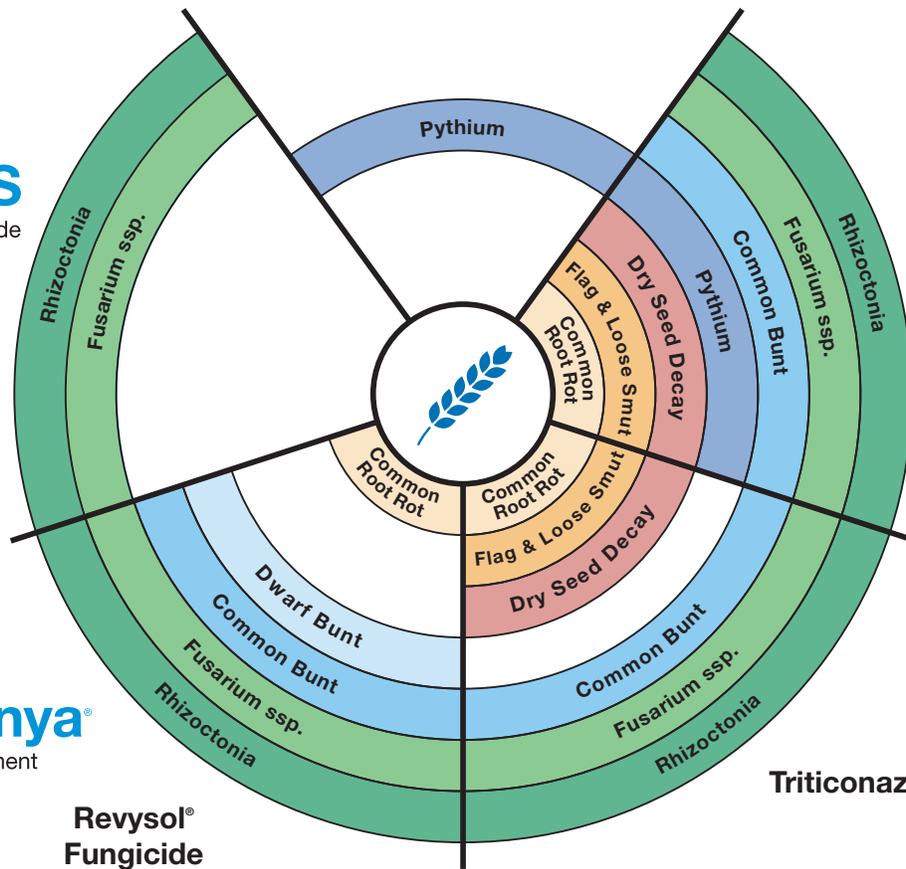
F500[®] Fungicide

Relenya[®]

Seed Treatment

Revysol[®] Fungicide

Triticonazole



Stamina[®]

Fungicide Seed Treatment

Powerful Stress Tolerance and Disease Prevention

- Powered by F500[®] fungicide, a pioneering strobilurin stemming from decades of research and innovation.
- F500 blocks fungal cells' energy supply and therefore, inhibits other vital functions.
- Stamina[®], the seed treatment F500 formulation, is the catalyst of the Plant Health benefits:
 - Disease control
 - Environmental stress control
 - Optimized growth efficiency

F500 within Stamina F4 Seed Treatment Promotes Better Cold Tolerance



Untreated



Stamina F4 Seed Treatment

BASF laboratory study in Research Triangle Park, NC. 50°F (10°C) cold saturated soil. 2017.





Stamina® F4 Cereals

Seed Treatment

Start Fast, Finish Strong

Protection from the Start

In order to maximize yield potential and maintain healthy crops, you need a seed treatment that works as hard as you do. Seeds need protection as soon as they hit the soil, especially during critical early crop development stages.

Plant Earlier for Higher Yields

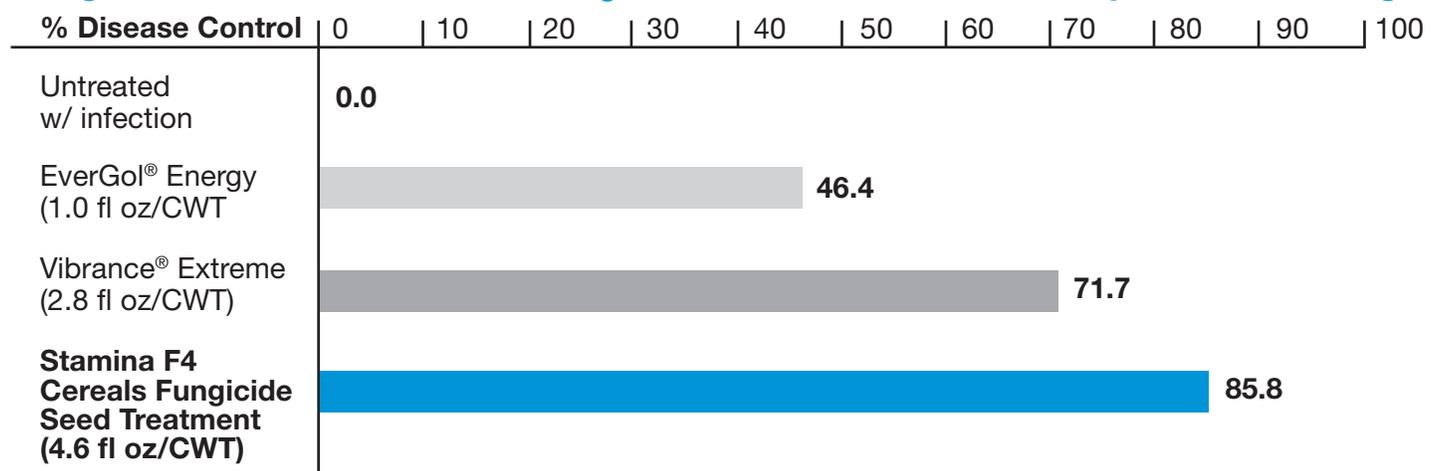
Stamina® F4 Cereals seed treatment is the seed applied fungicide that offers industry- leading, 4 mode-of-action, broad-spectrum disease control with the plant health benefits of F500® fungicide, while providing for the addition of insecticide where needed for maximum flexibility.

The formula protects and controls disease for the growing seedling, allowing you to plant earlier, maximize your yield potential and maintain a healthy harvest.



PROTECTION	VITALITY	PERFORMANCE
<ul style="list-style-type: none"> Broad spectrum – 4 modes of action in one formulation, including Xemium® fungicide Protects your seed investment while providing an earlier growing window Enhanced Fusarium and <i>Rhizoctonia solani</i> control 	<ul style="list-style-type: none"> F500® fungicide molecule provides plant health benefits, in addition to disease control, like cold tolerance, stress tolerance, and early vigor Faster and more consistent germination and seedling emergence under certain cold conditions 	<ul style="list-style-type: none"> Provides flexibility to add insecticide when/where needed Improved field stand and higher yield potential Lower freeze point for cold weather application

Longer Term Control of *Fusarium graminearum* in Wheat. 28 Days after Planting.



Formulated with Xemium® Fungicide for Unsurpassed Rhizoctonia Control

- Xemium fungicide exhibits unique plant mobility and translocation characteristics, enabling it to spread throughout the entire seedling, roots and shoots
- Plant wide distribution ensures protection right from initial developmental stages, providing reliable, consistent disease control
- Contributes to a better plant stand, which is the foundation for a healthier crop and yield potential

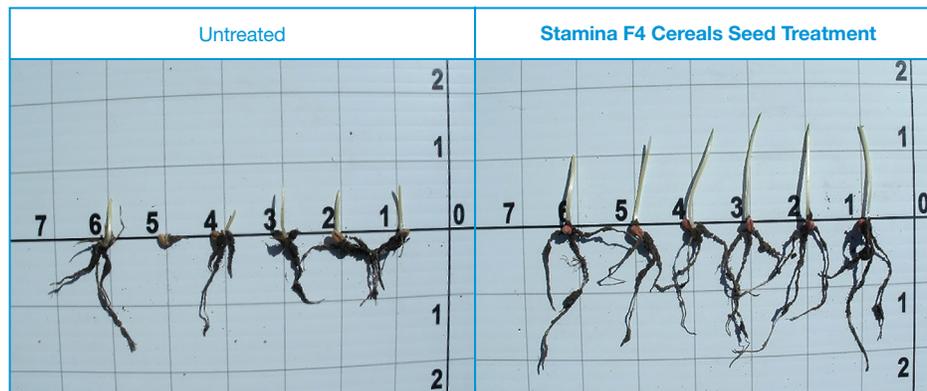
Ready to Use, All-in-One, Four-Way Fungicide for Broad Spectrum Control and Plant Health Benefits

Includes:

- F500 for improved stress tolerance and prevention.
- Xemium for exceptional translocation and systemicity for consistent and continuous seedling disease control.
- Triconazole for smuts, bunts, *fusarium* and *rhizoctonia*.
- Metalaxyl for pythium control.

Beyond disease control:

- Stress and cold tolerance
- Increased vigor
- Faster, more consistent germination



April 26, 2017. On farm – 14 days after planting – Regent, ND.

Increased Cold Emergence and Vigor

Untreated	Treated	Target Disease
		<ul style="list-style-type: none"> ■ Common root rot ■ Covered smut ■ Dry seed decay ■ False loose smut ■ Fusarium seed rot and seedling blight ■ Pythium damping off ■ Rhizoctonia root rot ■ Loose smut ■ True loose smut ■ Common bunt ■ Flag smut ■ Fusarium crown and root rot**
<p>Seed treatment applications with Stamina F4 Cereals seed treatment have been associated with more rapid and increased emergence under disease pressure and stressful conditions.</p>		<p>**Suppression only</p>

2017 Greenhouse Demo. Plants kept in saturated 10°C for 7 Days; Stamina F4 Cereals Seed Treatment, 4.6 fl oz/CWT



Relenya[®]

Seed Treatment

Boost Performance with Relenya[®] Seed Treatment on Cereals

Benefits of Relenya Seed Treatment

- Adds to a base foundation to boost disease protection under Fusarium and Rhizoctonia pressure
- Partners with a base package to boost yield potential under varied levels of disease pressure

Powered by Revysol[®] Fungicide

The newest active ingredient from BASF, Revysol fungicide is the first and only isopropanol-azole of its kind in the market.



Outperforming on Winter Wheat



CruiserMAXX[®] Vibrance[®]
Cereals Seed Treatment (0.08 fl oz/CWT)

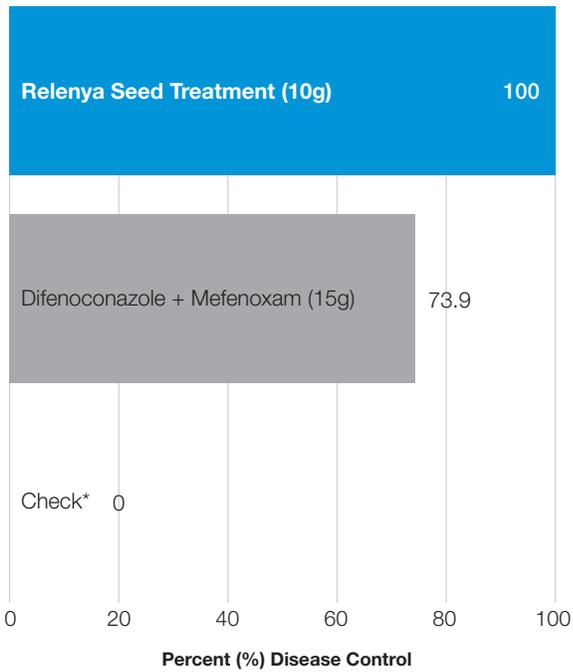


**Stamina[®] F4 Cereals Fungicide Seed Treatment
+ Poncho[®] XC Seed Treatment
+ Relenya Seed Treatment**



Excellent Dwarf Bunt Control

Relenya® Seed Treatment/Winter Wheat/Dwarf Bunt



2015-2019 BASF Sponsored and Internal Research, US.
*Infection level = 17.3 inf. heads/plot.

Boosts Rhizoctonia Control



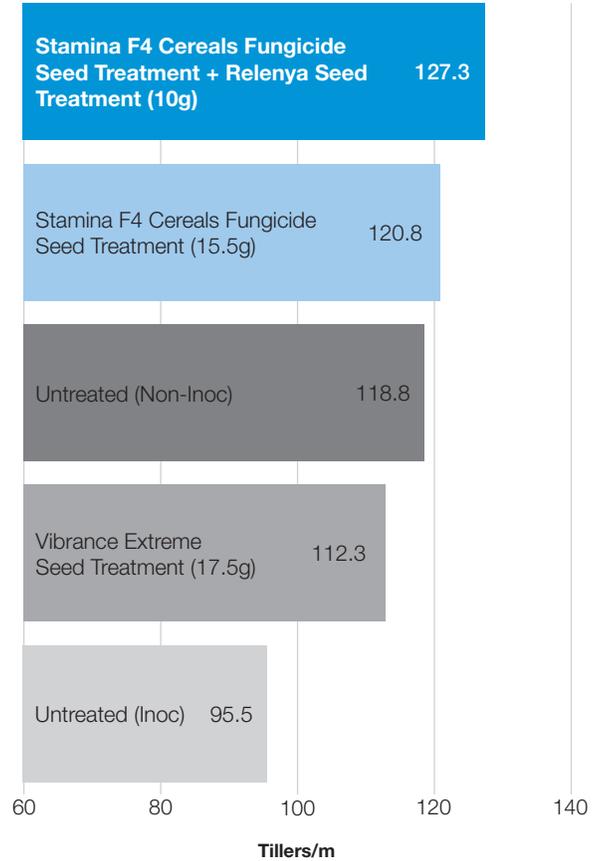
Site: 2020 Fargo, ND. Relenya seed treatment applied at 0.2 fl oz/CWT.

Labeled Crops

- Barley
- Buckwheat
- Millet (pearl and proso)
- Oats
- Rye
- Triticale
- Wheat

More Tillers With Stamina® F4 Cereals Seed Treatment and Relenya Seed Treatment

Relenya Seed Treatment/Winter Wheat/*Rhizoctonia solani* (Montana)



2015-2019 BASF Sponsored and Internal Research, US.

Boost Base Package Performance



A: Vibrance Extreme Seed Treatment. **B:** Stamina F4 Cereals Fungicide Seed Treatment. **C:** Stamina F4 Cereals Fungicide Seed Treatment + Relenya Seed Treatment (0.4 fl oz/CWT). Source: 2020 BASF Trial Carrington, ND.



Systiva® XS

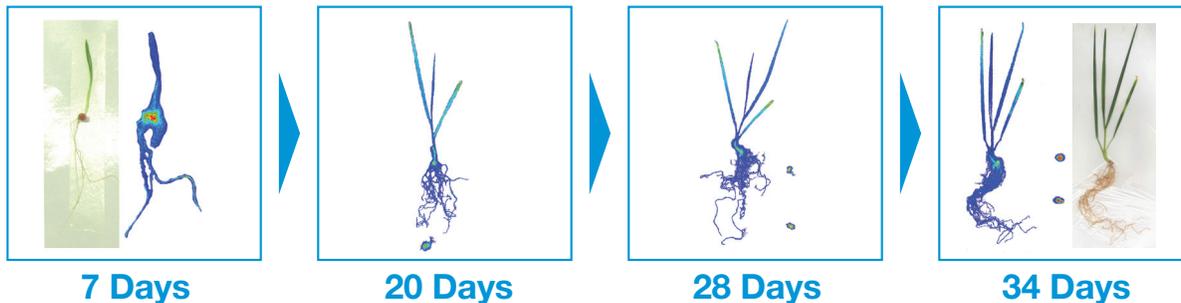
Xemium® Brand Fungicide

Long-lasting Activity for Better Disease Control

Benefits of Systiva® XS Xemium® Brand Fungicide

- Xemium fungicide technology is the foundation of BASF Plant Health powerhouses like Priaxor® and Nexicor® fungicides, and seed treatment brand Systiva XS.
- Exceptional translocation and systemicity provides more consistent and continuous seedling disease control.
- Systiva XS enters the transpiration stream and travels through the plant, the plant-wide distribution, together with high activity level, ensure protection from the first development stages.

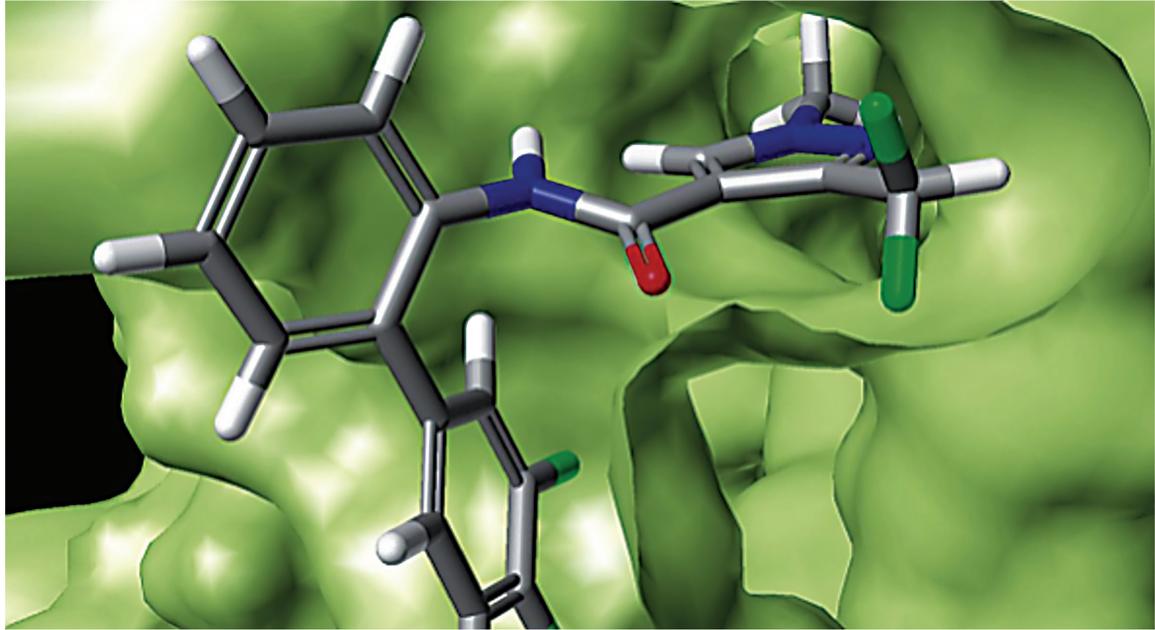
Xemium Fungicide Systemicity for Enhanced Disease Control



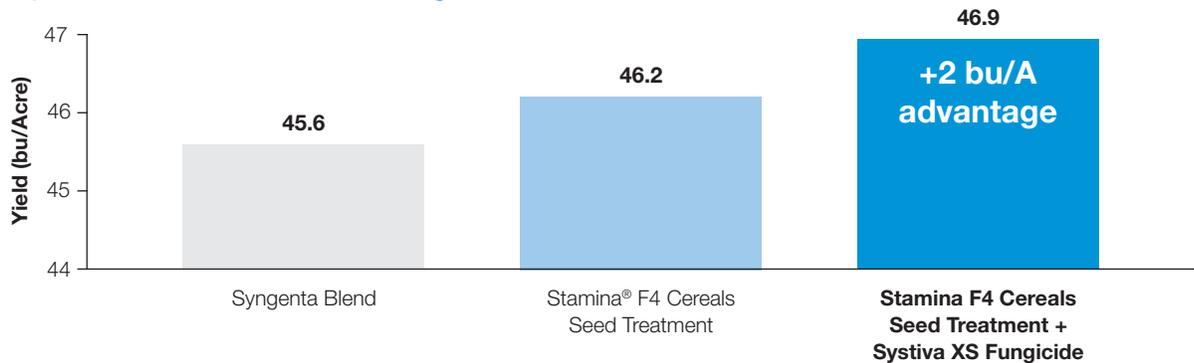
Radiolabeled Xemium fungicide, shown to translocate from the seed throughout the seedling, providing continuous, consistent disease control. BASF Internal Study, Germany 2012.



The Unique Molecular Properties Make it More Readily Available to the Plant

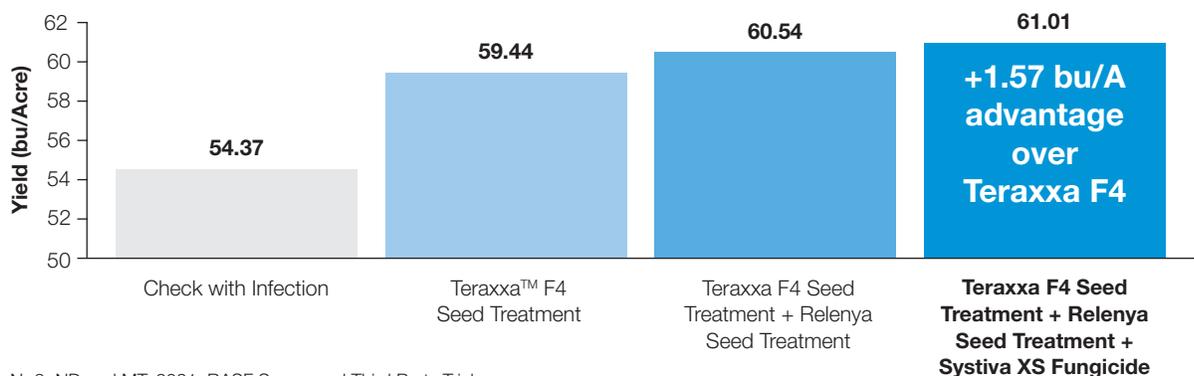


Systiva XS Xemium Brand Fungicide Boosts Overall Performance in Blends



Syngenta blend includes: Salstro (Tribusset) – 0.31 fl oz per cwt; Vibrance – 0.06 fl oz per cwt; Vibrance Flexi – 6 fl oz per cwt, Cruiser 5FS – 0.66 fl oz per cwt. N=4, WA, 2021. BASF Sponsored Third Party Trials.

Relenya Seed Treatment and Systiva® XS Fungicide Boost Overall Performance in Blends



N=3, ND and MT, 2021. BASF Sponsored Third Party Trials.



Poncho[®] XC

Seed Treatment

Maximize Your Harvest From The Start

Benefits of Poncho[®] XC Seed Treatment

- Controls of a broad range of chewing and sucking soil and leaf pests
- Highest intrinsic activity at the CNI receptor in chemical class
- Systemic mode of action protects the entire plant, supporting healthier plant establishment
- Fast acting for immediate protection
- Long-lasting protection of seeds and young plants
- Consistent performance independent from soil and climatic conditions
- Unprecedented seed and crop safety ensures homogenous germination and emergence
- Promotes higher yields through a healthier root system and a more vigorous and uniform crop

Immediate Insect Efficacy

- Delivers immediate insect efficacy and protects against many early season insects

Consistent Yield Benefit

- Provides a consistent yield benefit across a wide range of geographies and environments

Guidelines for Handling and Applying Poncho XC Seed Treatment

Product Use and Application

- For Soybeans, apply Poncho XC seed treatment at 0.11 mg ai/seed (0.87 fl oz/140,000 seeds)
- For Cereal crops listed on the label, apply Poncho XC seed treatment at 0.25-1.79 fl oz/100 lbs seed
- Poncho XC seed treatment should be applied to cereal seed with the multifunctional coating Flo Rite 1197 plantability polymer, at the recommended rates. Laboratory studies show these coating systems are consistent with the performance seed treaters and growers have come to expect. A seed-applied colorant is needed to help ensure compliance with U.S. law.

Product Handling

Poncho XC seed treatment is a suspension concentrate, called an FS formulation. Store Poncho XC seed treatment at temperatures between 40°F and 90°F. It is very important to prevent the product from freezing. Prolonged exposure to temperatures above and below the recommended range may cause the product to stratify in the container.

Dust Control

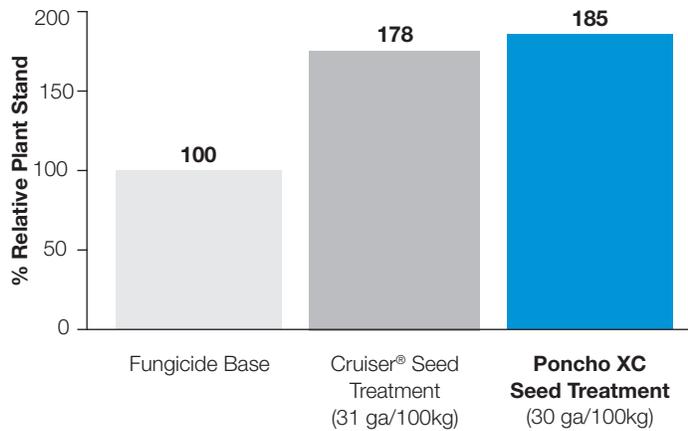
The Poncho XC seed treatment applied with Flo Rite 1197 plantability polymer for cereals at the recommended rates provides excellent dust control. Always follow your planter manufacturer recommendations for the proper use of planter lubricants.



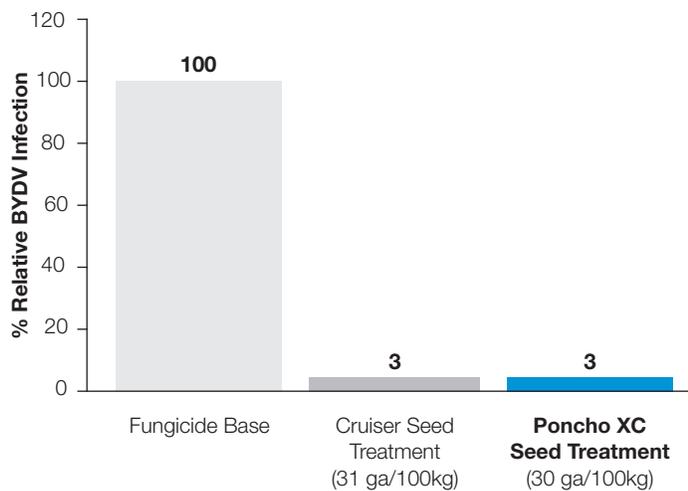
Seed Treatment

Excellent Insect Control on Wheat Means Better Stand and Yield Potential

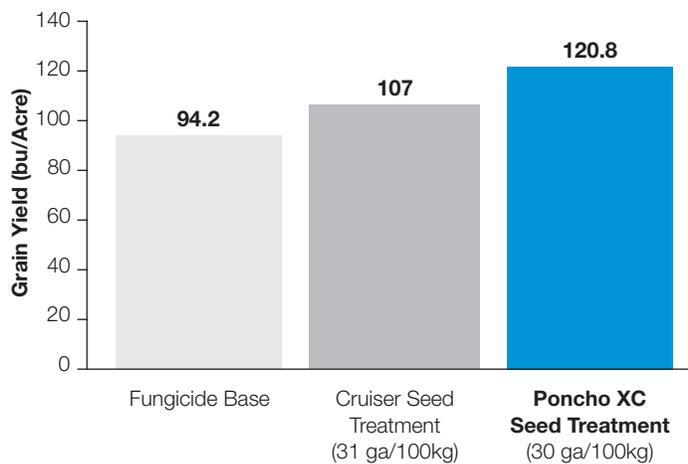
Relative Plant Stand



Relative BYDV (Barley Yellow Dwarf Virus) Infection

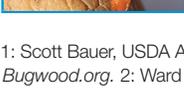


Grain Yield



BASF Sponsored Winter Wheat Trials (2005 – Central Ferry, WA).

PESTS

PONCHO® XC SEED TREATMENT		Wheat
	Aphids	✓
	Grasshopper	✓
	Hessian Fly ¹	✓
	Bean Leaf Beetle ²	
	Grape Colaspis	
	Leafhoppers	
	Seed Corn Maggot	
	Three Cornered Alfalfa Hopper	
	Thrips	
	White Grubs	
	Wireworm	✓

1: Scott Bauer, USDA Agricultural Research Service, Bugwood.org. 2: Ward Upham, Kansas State University, Bugwood.org.

Labeled Crops

- Barley
- Buckwheat
- Millet (pearl and proso)
- Oats
- Rye
- Triticale
- Wheat



Cereal Seed Treatment Portfolio

BASF's Seed Treatment portfolio provides the most comprehensive system available today for cereals to thrive in all types of field conditions. For you, that means reliable protection, measurable results, and peace of mind.

Fungicide and Insecticide Seed Treatments

Product	Key Disease/Pests	Standard Use Rate	Key Benefits
Teraxxa™ Seed Treatment	<ul style="list-style-type: none"> ■ Wireworms 	<ul style="list-style-type: none"> ■ 0.26 fl oz/100 lbs seed; Please refer to label for rates 	<ul style="list-style-type: none"> ■ New mode of action for true in-season control and effective management of wireworms
Teraxxa F4 Seed Treatment	<ul style="list-style-type: none"> ■ Wireworms ■ <i>Fusarium</i> seed rot and seedling blight ■ <i>Fusarium</i> crown and root rot* ■ <i>Pythium</i> damping off ■ <i>Rhizoctonia</i> root rot ■ Common root rot ■ Covered smut ■ Dry seed decay ■ False loose, loose and true loose smut ■ Common bunt ■ Flag smut 	<ul style="list-style-type: none"> ■ 4.6 fl oz/100 lbs seed; Please refer to label for rates 	<ul style="list-style-type: none"> ■ Blockbuster 5 MoA seed treatment for wireworm control and broad-spectrum disease control ■ New mode of action for true in-season control and effective management of wireworms ■ Broad spectrum protection with four modes of action in one formulation including Xemium® and F500® technologies ■ Cold tolerance, rapid emergence and highly systemic disease protection against key seedling diseases ■ Flexible blending partner for customized mixtures ■ Unique, systemic activity provides longer and more complete disease protection ■ Labeled on wheat, barley, oats, triticale and rye
Stamina® Fungicide Seed Treatment	<p>Control of seedling disease caused by:</p> <ul style="list-style-type: none"> ■ <i>Rhizoctonia solani</i> ■ <i>Penicillium oxalicum</i> <p>Suppression of seed and seedling disease caused by:</p> <ul style="list-style-type: none"> ■ <i>Aspergillus</i> spp. ■ <i>Fusarium</i> spp. ■ <i>Pythium</i> spp. 	<ul style="list-style-type: none"> ■ 0.4-0.8 fl oz/100 lbs seed; Please refer to label for rates 	<ul style="list-style-type: none"> ■ Faster emergence, excellent cold tolerance ■ Flexible blending partner for customized mixtures

*Labeled for suppression.



Fungicide and Insecticide Seed Treatments, cont.

Product	Key Disease/Pests	Standard Use Rate	Key Benefits
Stamina® F4 Cereals Fungicide Seed Treatment	<ul style="list-style-type: none"> ■ <i>Fusarium</i> seed rot and seedling blight ■ <i>Fusarium</i> crown and root rot* ■ <i>Pythium</i> damping off ■ <i>Rhizoctonia</i> root rot ■ Common root rot ■ Covered smut ■ Dry seed decay ■ False loose, loose and true loose smut ■ Common bunt ■ Flag smut 	<ul style="list-style-type: none"> ■ 4.6 fl oz/100 lbs seed 	<ul style="list-style-type: none"> ■ Broad spectrum protection with four modes of action in one formulation including Xemium® and F500® technologies ■ Cold tolerance, rapid emergence and highly systemic disease protection against key seedling diseases ■ Flexible blending partner for customized mixtures ■ Unique, systemic activity provides longer and more complete disease protection ■ Labeled on wheat, barley, oats, triticale and rye
Poncho® XC Seed Treatment	<ul style="list-style-type: none"> ■ Aphids including Bird cherryoat, English grain, Greenbug, and Russian wheat aphid ■ Hessian fly ■ Wireworms 	<ul style="list-style-type: none"> ■ 0.25-1.79 fl oz/100 lbs seed; Please refer to label for rates 	<ul style="list-style-type: none"> ■ Systemic insect protection from early season damage ■ Labeled on barley, buckwheat, millet, oats, rye, teosinte, triticale and wheat
Relenya® Fungicide Seed Treatment	<ul style="list-style-type: none"> ■ Dwarf bunt ■ Common root rot ■ Common bunt ■ <i>Fusarium</i> ■ <i>Rhizoctonia</i> 	<ul style="list-style-type: none"> ■ 0.2-0.4 fl oz/100 lbs seed; Please refer to label for rates 	<ul style="list-style-type: none"> ■ Unique seed-applied azole innovation from Revyso® active ingredient ■ Excellent control of dwarf bunt and seedling diseases and protects seed and root zone during early development ■ Highly flexible blending partner ■ Labeled on barley, buckwheat, millet, oats, rye, triticale and wheat
Systiva® XS Xemium Brand Fungicide	<p>Seed and seedling control:</p> <ul style="list-style-type: none"> ■ <i>Rhizoctonia solani</i> <p>Seed and seedling suppression:</p> <ul style="list-style-type: none"> ■ <i>Fusarium</i> spp. <p>Early season suppression of:</p> <ul style="list-style-type: none"> ■ Powdery mildew ■ Brown rust ■ <i>Septoria</i> leaf spot ■ <i>Cephalosporium</i> strip 	<ul style="list-style-type: none"> ■ 0.24-2.36 fl oz/100 lbs seed; Please refer to label for rates 	<ul style="list-style-type: none"> ■ Xemium fungicide technology is the foundation of BASF Plant Health powerhouses like Priaxor® and Nexicor™ fungicides, and seed treatment brand Systiva XS ■ Exceptional translocation and systemicity provides more consistent and continuous seedling disease control

Colors and Coatings

Product	Technology	Standard Use Rate	Key Benefits
Color Coat	<ul style="list-style-type: none"> ■ Colorant 	<ul style="list-style-type: none"> ■ 0.20-1.20 fl oz/cwt (wheat) 	<ul style="list-style-type: none"> ■ Effectively colors any seed, regardless of size, shape or texture for functional and aesthetic uses ■ Water-based, low viscosity solution with neutral pH that offers convenience and easy cleanup ■ Available in a variety of vibrant colors to add a distinctive appearance to seed
Flo Rite® 1197 Plantability Polymer	<ul style="list-style-type: none"> ■ Plantability Polymer 	<ul style="list-style-type: none"> ■ 2.0 fl oz/cwt (wheat) 	<ul style="list-style-type: none"> ■ Improves uniform coverage and application of seed-applied insecticides and fungicides ■ Reduces stickiness, seed bridging, clumping, skips and doubles ■ Delivers best-in-class retention of active seed treatment ingredients



We create chemistry



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The BASF logo consists of a white square with a smaller white square inside it, followed by the letters "BASF" in a bold, white, sans-serif font.

We create chemistry



To learn more about crop protection products from BASF, visit www.agproducts.basf.us

Always read and follow instructions.

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