

2016

Advanced Seed Enhancement Guide

Soybeans



Peas/Lentils



Peanuts



Seed Enhancements



We create chemistry



Contents

Innovative Technology	4
Inoculation	5
Soybeans	6
Peanuts	7
Pulse	8
Fungicide Seed Treatments	9
Coatings and Colorants	10
Seed Enhancement Products	11



Maximize Yield Potential

Crop Potential Starts with the Seed

Protecting that seed and giving it a strong start will help every seed do its part to maximize yield. BASF offers a complete portfolio of industry-leading seed enhancements including breakthrough chemistry, biologicals, inoculants, coatings, and colorants to help growers get the most that every seed has to offer.

To help our customers be more successful, BASF conducts extensive research in the laboratory as well as in the field, and partners with farmers and other customers to incorporate input and feedback. Our scientists continuously develop new ideas and technologies to help farmers get the most out every acre.

At BASF, research on Advanced Seed Enhancements never stops, and innovation never sleeps.

All BASF inoculants are produced fresh for each growing season

Inoculation Improves Yield Potential

Yield potential begins in the root zone; what happens in the first several inches of the soil can make the difference in the final yield for legumes. Every year more yield trials show today's inoculant products are helping to increase the yield potential of every acre.

For maximum yield potential, growers should not depend on sluggish indigenous *rhizobia* or use an inoculant product that was carried over from the previous year. Dry soils, waterlogged and flooded conditions or extremely high or low topsoil temperatures can significantly reduce the levels of *rhizobia* in the soil. The best way to ensure there are abundant levels of *rhizobia* present to maximize nodulation and nitrogen fixation is to use a fresh high-count inoculant containing a crop-specific strain of *rhizobia*.

All BASF inoculants are made fresh each season, with crop-specific strains that are selected to deliver the most robust, high-count *rhizobia* available to help maximize yield potential.



Inoculate Every Time Seed is Planted

Inoculation is a production practice that can pay benefits every year. Using BASF inoculant products each season can improve plant vigor and return-per-acre potential.

The largest yield gains from using inoculants can occur in adverse growing conditions, where extra nitrogen helps crops reach their fullest potential. Inoculate every time seed is planted to improve yield potential, especially if any of the following situations may exist:

- Cool, wet soils (no-till and conservation tillage)
- Early planting
- Low pH (<5.8) and high pH (>8.5) soils
- Sustained use of some soil-applied pesticides
- Previous flooding or ponding (even for a short period)
- Low organic matter (<1.0%)
- Legume crop not grown in previous years
- Topsoil temperature exceeding 80° F
- Eroded soils



Fresher *Rhizobia* are Better

The *rhizobia* in all BASF inoculant products are produced fresh each season to ensure maximum performance in treatment systems and growers' fields. *Rhizobia* are living organisms whose numbers are reduced over time in storage and with temperature variations. Fewer *rhizobia* will be available from two-year dated products than from made-fresh-each-season BASF inoculants.

Maximize the effectiveness of *rhizobia*-containing inoculant products by following these recommended handling practices:

- Store between 40° and 77° F
- Keep out of direct sunlight — avoid overheating
- Avoid storing outside or unprotected from the elements
- Prevent from freezing
- Avoid exposure to fumigants
- Know compatibility with fungicide and insecticide products to be applied
- Use and mix liquid treatments only with non-chlorinated water
- Do not use if package seal is broken
- Do not use after labeled expiration date
- Read and follow all label directions
- Regularly check calibration of application equipment
- Use opened inoculant product within 24 hours



Discover Lost Yield Potential

Vault® HP plus Integral® Biological Seed Treatment with Triple BioStacked® Technology

- Three-way, multi-component growth-enhancing system
- Integral biofungicide extends suppression of yield-robbing *Fusarium* and *Rhizoctonia*
- More vigorous roots, enhanced nutrient uptake and nodule formation for maximized yield potential
- Minimum guaranteed count of 10 billion CFUs of advanced *rhizobia* per mL through product expiration date
- Ultra-low application rate of 2.0 fl oz/CWT of seed allows for addition of more treatment options
- Industry-leading, days-on-seed *rhizobia* survival with popular fungicide and insecticide packages

Vault NP Inoculant

- Highly effective USDA-developed TA-11 Nod+ *rhizobia* strain
- Concentrated liquid formula provides high *rhizobia* counts
- Apply directly to seed or in-furrow
- Convenient commercial application or on-farm use

Vault SP for Soybeans Inoculant

- USDA-developed TA-11 Nod+ *rhizobia* strain for maximum results
- Sterile, peat-based carrier for high *rhizobia* potency
- Easily applied in planter box with excellent adhesion to seed

Rhizo-Flo® Soybean Inoculant

Peat Granular Inoculant for Soybean In-Furrow Applications

- Granular formulation protects *rhizobia* from high surface soil temperatures and dry soil conditions
- Contains the highly effective USDA-developed TA-11 Nod+ *rhizobia* strain
- Supplies large dose of *rhizobia* directly to the root zone

Vault® HP plus Integral® Biological Seed Treatment

Crop & Product	Package Size	Formulation	Application	Fresh Each Season	Strain	BioStacked Technology	Application Rate	OMRI Listed
SOYBEANS								
Vault HP Biological Seed Treatment	4 x 50, 2 x 100, 2 x 200 36 cases/pallet	Liquid	Commercial	✓	<i>Bradyrhizobium japonicum</i>	✓ Integral <i>Bacillus subtilis</i> (MBI 600) biofungicide & Patented Rhizobial Enhancer for improved nodulation	2.0 fl oz/CWT* (0.93 fl oz/140k seed)	—
Vault NP Inoculant	1 x 200 unit, 4 x 50 unit	Liquid	Commercial or On-Farm	✓	<i>Bradyrhizobium japonicum</i>	—	4.2 fl oz/CWT* (1.96 fl oz/140k seed)	✓
Vault SP Inoculant	10 x 1.76 lb	Peat-Based	Planter Box	✓	<i>Bradyrhizobium japonicum</i>	—	2.8 oz/ CWT	—
Rhizo-Flo Inoculant	1 x 40 lb bag, 1 x 520 lb mini bulk	Granules	In-Furrow	✓	<i>Bradyrhizobium japonicum</i>	—	6.5 lb/A	—

*At 3,000 seeds per pound.

More From Every Acre

Vault® Liquid for Peanuts Inoculant with BioStacked® Technology

- Improved yield potential in multi-year testing
- Advanced strain of *rhizobia* selected for compatibility and viability
- Integral® biofungicide extends disease suppression and enhances nodulation, root-vigor and nutrient uptake
- Guaranteed fresh for maximum effectiveness
- In-furrow soil application

Vault SP for Peanuts Inoculant

- Fresh, high-potency, sterile peat-based inoculant
- High adhesion level for effective seed coverage
- Mixed directly in the planter box with seed

For 150 years, BASF has provided growers with high-quality yield-enhancing products

Vault® Liquid Peanut plus Integral®

Inoculant



Crop & Product	Package Size	Formulation	Application	Fresh Each Season	Strain	BioStacked Technology	Application Rate	OMRI Listed
PEANUTS								
Vault Liquid for Peanuts Inoculant	4 x 1.1 gal 30 cases/pallet	Liquid	In-Furrow	✓	<i>Bradyrhizobium sp.</i>	✓ Integral <i>Bacillus subtilus</i> (MBI 600) biofungicide	14.0 oz/A	—
Vault SP Inoculant	20 x 14 oz packets 45 cases/pallet	Peat-Based	Planter Box	✓	<i>Bradyrhizobium sp.</i>	—	7.0 oz/CWT	—



#1 Choice on Pea/Lentil Acres

Nodulator® Peat Granules Inoculant

- Proven *rhizobia* strain in a convenient peat-based formulation
- Convenient soil application
- Pelletized particles remain intact for excellent integrity through application equipment
- Superior *rhizobia* dominate nodule sites for more effective nitrogen fixation

Nodulator Liquid Inoculant



- High levels of *rhizobia* in a liquid formulation
- Sterile production ensures more than 750 million *rhizobia* per gram
- Simple to use planter-box or commercial bulk-seed treatment
- Unique, crop-specific strain chosen for its effectiveness on peas and lentils

Nodulator Sterile Peat-Based Inoculant

- Advanced self-adhering properties for more uniform seed coverage
- Sterile production provides more than 1 billion *rhizobia* per gram
- Sterile, peat-based carrier for high *rhizobia* potency
- Easily applied by mixing with seed directly in planter box

Nodulator® Inoculant



Crop & Product	Package Size	Formulation	Application	Fresh Each Season	Strain	Application Rate	OMRI Listed
PULSE							
Nodulator Granules Inoculant	40 lb bags 50 bags/pallet 520 lb mini bulk 2 mini bulk/pallet	Granules	In-Furrow	✓	<i>Rhizobium leguminosarum</i> <i>bv. viciae</i>	6.5 lbs/A	—
Nodulator Liquid Inoculant	4 x 1.2 gal 36 cases/pallet	Liquid	Commercial & On-Farm	✓	<i>Rhizobium leguminosarum</i> <i>bv. viciae</i>	2.5 fl oz/60 lbs of seed	✓
Nodulator Sterile Peat-Based Inoculant	5 x 42 oz packets 45 cases/pallet	Peat-Based	Planter Box	✓	<i>Rhizobium leguminosarum</i> <i>bv. viciae</i>	2.0 oz/60 lbs of seed	—



Fungicide Seed Treatments

Stamina® F3 Cereals

Fungicide Seed Treatment

Faster Start, Stronger Finish

Stamina® F3 Cereals Fungicide Seed Treatment: Early Season Benefits

- Is the Plant Health Seed Treatment product because it contains F500®, the active ingredient in Headline® fungicide
- Provides broad-spectrum seed and seedling disease control with three modes of action
- Contains F500 fungicide, the active ingredient in Headline fungicide and Stamina fungicide seed treatment along with triticonazole & metalaxyl
- Convenient, colored formulation. Registered for on-farm use and commercial use.

Stamina®

Fungicide Seed Treatment

Stamina Fungicide Seed Treatment

- Use for broad-spectrum seed and seedling disease control
- Can be used alone or added to your current seed treatment program for crops listed on the Stamina fungicide seed treatment labels

Obvius®

Fungicide Seed Treatment

Obvius® Fungicide Seed Treatment

- Use for broad-spectrum seed and seedling disease control in pulse crops, dry beans, and canola
- Three powerful fungicide modes of action providing excellent systemcity and long term residual control

Seed Treatment	Package Size	Active Ingredients	Labeled Crops	Rates	Disease
Stamina Fungicide Seed Treatment	2 x 2.5 (36 Cases/Pallet) One case is minimum order 1 x 30	Pyraclostrobin (1.67 lbs/Gal)	Alfalfa, barley, corn (field, pop, sweet, seed production), dried shelled peas and beans, podded legume vegetables, oats, rye, sorghum, succulent shelled peas and beans, sugar beets, sunflower, wheat	Small grains: from 0.4 – 0.8 fl oz/CWT Check label for rates on other crops	Common root rot, <i>Pythium</i> spp., <i>Fusarium</i> spp., Fusarium seed rot and seedling blight, <i>Rhizoctonia solani</i> , Dry seed decay, Common bunt, Covered smut
Stamina F3 Cereals Fungicide Seed Treatment	2 x 2.5 (36 Cases/Pallet) 1 x 200	Pyraclostrobin (0.14 lbs/Gal) Triticonazole (0.14 lbs/Gal) Metalaxyl (0.08 lbs/Gal)	Barley, oats, rye, triticale, wheat	4.6 fl oz/CWT	Common root rot, Covered smut, Dry seed decay, False loose smut, <i>Fusarium</i> seed rot & seedling blight, <i>Pythium</i> damping off, <i>Rhizoctonia</i> root rot, Loose smut, True loose smut, Common bunt, Flag smut, <i>Fusarium</i> crown and root rot
Obvius Fungicide Seed Treatment	2 x 2.5 (36 Cases/Pallet) 1 x 200	Pyraclostrobin (0.139 lbs/Gal) Xemium® (0.139 lbs/Gal) Metalaxyl (0.111 lbs/Gal)	Dried shelled peas and beans – crop subgroup 6C (field pea, lentil, chickpea, guar, lablab, lupines, fava bean, pigeon pea); <i>Phaseolus</i> spp. (field, kidney, lima, navy, pinto beans); <i>Vigna</i> spp. (adzuki bean, black-eyed pea, catjang, cowpea, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean); Flaxseed; Rapeseed (canola)	4.6 fl oz/CWT	<ul style="list-style-type: none"> ■ Seed-borne <i>Anthraco</i>se ■ <i>Fusarium</i> seedling blight, root and seed rots ■ <i>Pythium</i> seedling blight, root and seed rots ■ <i>Rhizoctonia</i> seedling blight, root and seed rots ■ <i>Botrytis cinerea</i> seed-borne seed rot and seedling blight ■ Seed-borne <i>Ascochyta</i> seedling blight

Coatings and Colorants

Protecting high-value genetics and keeping seed-applied protection products on the seed all the way through planting is essential. BASF offers commercial seed treaters a complete line of plantability polymers, binding polymers, and colorants that can be used individually or combined for optimum seed-handling and plantability.

Flo Rite® Plantability Polymers

- Keep seed-applied protection products on the seed
- Reduce dust-off – keep actives on the seed
- Enhance seed flow – less stickiness and bridging
- Improve plantability – decrease skips and doubles
 - **Flo Rite 1706 Plantability Polymer** – Lower, uniform application rate, and better performance through treatment and handling equipment for soybeans, dry beans and peas. *Rhizobia*-friendly formulation.
 - **Flo Rite 1197 Plantability Polymer** – Polymer for canola, corn, sunflowers, sweet corn, wheat and other crops

Flo Rite®
Plantability Polymer

Binding Polymers

- **CF Clear™ Binding Polymer** – Low-rate, binding polymer
- **CF Neutral™ Binding Polymer** – Binding polymer with glossy appearance
- **Secure™ 67C Binding Polymer** – High binding-strength polymer

Seed Buildup Polymer

- **Equate™ Polymer** – Small seed coating and build up

Colorants

- **Color Coat™ Colorant** – Six ready-to-use color choices



(Actual product color and color on seed will vary based on application rate, other treatments and seed coat color.)



Seed Enhancement Products

Product	Package Size	Crop	Standard Use Rate
COLORANTS			
Color Coat™ Black	2 x 2.5 gal Case, 260 gal Tote	Corn, Sorghum, Soybean, Wheat, Sunflower, Beans and Peas	Sorghum: 0.30 – 0.60 fl oz/CWT Soybean, Beans, Peas: 0.20 – 0.60 fl oz/CWT Wheat: 0.20 – 1.20 fl oz/CWT Sunflower: 2.00 – 4.00 fl oz/CWT
Color Coat Blue	2 x 2.5 gal Case, 30 gal Drum, 260 gal Tote		
Color Coat Green	2 x 2.5 gal Case, 30 gal Drum, 260 gal Tote		
Color Coat Purple	2 x 2.5 gal Case, 30 gal Drum, 260 gal Tote		
Color Coat Red	2 x 2.5 gal Case, 30 gal Drum, 260 gal Tote		
Color Coat White	2 x 2.5 gal Case, 260 gal Tote		
Custom Seed Gloss 661	2 x 2.5 gal Case, 30 gal Drum, 260 gal Tote	Corn, Sorghum, Soybean, Wheat, Alfalfa, Edible Beans	Corn, Soybean: 0.50 – 1.50 fl oz/CWT Sorghum, Wheat: 1.00 – 5.00 fl oz/CWT Sunflower: 2.00 – 6.00 fl oz/CWT Aflafla, Edible Beans: Consult manufacturer
PLANTABILITY POLYMERS			
Flo Rite® 1706 Plantability Polymer	1 x 260 gal Tote, 1 x 30 gal Drum, 2 x 2.5 gal	Soybean	w/Fungicide – 1.0 fl oz/CWT w/Fungicide and Insecticide – 1.0 fl oz/CWT
Flo Rite 1197 Plantability Polymer	1 x 260 gal Tote, 1 x 30 gal Drum, 2 x 2.5 gal	Corn, Wheat, Sunflower	Corn – 2.0 fl oz/CWT Corn w/Neonic Insecticide (@ 0.25mg ai/seed – 2.0 fl oz/CWT) (@ 0.50mg ai/seed – 4.0 fl oz/CWT) (@ 1.25mg ai/seed – 9.5 fl oz/CWT)
			Sunflower – 6.0 fl oz/CWT
			Wheat: 1.0 – 2.0 fl oz/CWT
BINDING POLYMERS			
CF Clear™ Binding Polymer	2 x 2.5 gal, 260 gal Tote, 1 x 30 gal	Corn, Soybean, Wheat, Sunflower, Alfalfa, Edible Beans, Peas	Corn: 0.10 – 0.50 fl oz/CWT Soybean, Peas: 0.20 – 0.80 fl oz/CWT Wheat, Edible Beans: 0.20 – 0.50 fl oz/CWT Sunflower: 0.04 – 1.00 fl oz/CWT Alfalfa: 3.00 – 5.00 fl oz/CWT
CF Neutral™ Binding Polymer	2 x 2.5 gal, 260 gal Tote, 1 x 30 gal	Corn, Sorghum, Soybean, Wheat, Sunflower, Peas	Corn, Soybean, Wheat, Peas: 0.80 – 3.20 fl oz/CWT Sorghum: 0.80 – 4.80 fl oz/CWT Sunflower: 1.60 – 6.40 fl oz/CWT
Secure™ 67C Binding Polymer	1 x 260 gal, 2 x 2.5 gal	Cotton, Canola	Cotton: 1.00 – 2.00 fl oz/CWT Canola: 0.50 – 2.00 fl oz/CWT
SEED BUILDUP POLYMER			
Equate™ Polymer	1 x 1000 lb	Canola, Alfalfa	Contact manufacturer for specific rates



Always read and follow label directions

BioStacked, Vault, Rhizo-Flo, Integral, Flo Rite, Nodulator, Stamina, Obvius, Xemium, F500, and Headline are registered trademarks and CF Clear, CF Neutral, Equate, Secure, Color Coat, and Custom Coat are trademarks of BASF Corporation. ©2016 BASF Corporation. All Rights Reserved. APN# 1509014 Advanced Seed Enhancement Guide For more information on BASF Crop Protection products, visit agproducts.basf.us