

The Syngenta logo, featuring the word "syngenta" in a lowercase, sans-serif font with a registered trademark symbol (®) to its upper right. The logo is positioned in the top right corner of a dark green horizontal band.The main headline text, "Ultimate Protection Against Nematodes, Insects & Diseases", is displayed in a large, black, sans-serif font. It is centered vertically and horizontally within the blue sky and white clouds background of the upper half of the page.The logo for Avicta Complete Beans, featuring a stylized leaf icon to the left of the text "Avicta Complete Beans". The word "Avicta" is in black, "Complete" is in purple, and "Beans" is in a smaller black font below "Complete".The logo for Vibrance, featuring a stylized leaf icon to the left of the text "Vibrance™". The word "Vibrance" is in black, and the trademark symbol (™) is to its upper right.A small trademark symbol (TM) located at the bottom right of the page, near the bottom edge of the yellow background.



As many growers diversify their operations to include corn and soybeans, nematode pressure has remained high. Corn and soybeans are host crops to several of the same nematode species. Growers who have historically battled nematode damage in their corn fields should expect to see yield loss due to nematode pressure in their soybean fields. Because crop rotation of corn and soybeans is not an effective method of preventing certain nematode populations, growers need to implement a treatment program to help ensure their soybean fields are adequately protected.

Avicta® Complete Beans, a combination of Avicta 500FS seed treatment nematicide and CruiserMaxx® Beans insecticide/fungicide, is now available with Vibrance™ fungicide seed treatment. This first-of-its-kind seed treatment is immediate and effective, ensuring soybean seedlings are protected from day one. It delivers unmatched protection against damaging nematodes, insects and diseases, while creating healthier roots and maximizing performance.

Vibrance helps soybeans withstand environmental stress; promotes unmatched *Rhizoctonia* root rot protection and root performance; and delivers systemic root defense against certain seedborne, soilborne and foliar disease. Through the unique and distinctive RootingPower capabilities of sedaxane, the active ingredient in Vibrance, soybean plants develop healthier, more robust root systems that lead to consistently higher yields. With limited soybean nematode control options on the market, Avicta Complete Beans applied with Vibrance offers proven, comprehensive protection in the convenience of a seed-delivered treatment – helping increase the health of the plant and yield potential.

## ADVANTAGES OF AVICTA COMPLETE BEANS APPLIED WITH VIBRANCE

- First and only triple-protection seed treatment for soybeans including a nematicide, insecticide and three fungicides
- Promotes better emergence, faster speed to canopy, stress tolerance, nutrient uptake and healthier, more robust roots for higher yield potential
- Helps stimulate healthy, vigorous seedlings, increasing plant stand and vigor
- Offers industry-leading protection against a broad spectrum of nematodes, early-season insects and disease pathogens
- Delivers a greater potential return on investment





## NEMATODE PROTECTION FROM DAY ONE

Oftentimes soybean nematode damage is difficult to identify and can be misdiagnosed. Symptoms can include chlorosis of the leaves, stunting, root damage, poor plant stand, root galling and root branching. Visual symptoms may be mistaken for herbicide injury, disease, micronutrient deficiencies or even the result of harsh environment conditions. Other times, visual symptoms may not be present, yet yield and profit potential are impacted.

Avicta Complete Beans applied with Vibrance ensures unmatched *Rhizoctonia* root rot protection and root performance while promoting stronger stands and better emergence. The nematicide component of Avicta Complete Beans applied with Vibrance, Avicta 500 FS, offers immediate, reliable nematode protection, providing comprehensive plant protection where it matters most – the root system. Avicta 500 FS is a true nematicide that defends soybean roots by moving with the root system as it develops. By eliminating nematodes through contact activity, Avicta Complete Beans applied with Vibrance significantly reduces the initial nematode population, reproduction and the threat of early-season infections.

Avicta Complete Beans applied with Vibrance protects against many damaging nematode species, such as:

- Cyst
- Root-knot
- Reniform
- Lance
- Stubby-root
- Stunt
- Sting

## SUPERIOR PROTECTION AGAINST EARLY-SEASON INSECT PESTS

Market-leading Cruiser® seed treatment is the insecticide component of Avicta Complete Beans which provides soybean growers with effective and consistent early-season protection against a variety of damaging insect pests, including:

- Soybean aphid
- Bean leaf beetle
- Thrips
- Threecornered alfalfa hopper
- Grape colaspis
- Leafhopper
- White grub
- Seedcorn maggot
- Wireworm

## INCREASED DISEASE PROTECTION

Containing the market-leading seed treatment fungicide ApronMaxx®, Avicta Complete Beans helps safeguard the soybean plant from troublesome diseases that can inhibit growth and reduce stand, vigor and yield. For added insurance, Avicta Complete Beans is now applied with Vibrance which offers best in class *Rhizoctonia* root rot protection and root performance. Avicta Complete Beans applied with Vibrance protects against the most harmful seed- and soil-borne disease pathogens, including:

- Early-season *Phytophthora*
- *Pythium*
- *Rhizoctonia*
- *Fusarium*
- Seedborne *Sclerotinia*
- Seedborne *Phomopsis*
- General seed rots





## PROVEN RESULTS

“It is important for soybean growers to understand that they must manage nematodes in their fields because they cannot be eradicated. Since nematodes can exist in all soil environments, growers only have one opportunity to control them – before planting. **Even the slightest discoloration in soybean plants means that growers are already at a 10 to 15 percent yield loss.**”

**JOHN MUELLER;** *Professor, Plant Pathology at Clemson University*

“Root-knot nematodes continue to be problematic in areas that historically have been cotton-producing regions. Besides sampling fields and crop rotation decisions, using a seed treatment nematicide may be beneficial, particularly in combination with a moderately resistant cultivar. **The day the seed is planted is the last day that growers can do anything to control nematodes in that field that year.**”

**TERRY KIRKPATRICK;** *PH.D., Professor, Department of Plant Pathology at the University of Arkansas*

“Farmers need to: 1) use non-host plants where nematodes will not survive, reproduce or cause damage to crops; 2) reduce nematode risk by using good crop rotation systems; 3) plant resistant varieties and 4) other measures such as seed treatments. **Based on 2011 research, using a seed treatment on resistant varieties provides an additional yield boost.**”

**GEORGE BIRD;** *Professor, Department of Entomology at Michigan State University*

“**The number one symptom of soybean cyst nematode is no symptomology.** Growers need to be aware of this. In years of rainfall, we don’t necessarily see the damage caused by SCN. This gives growers a false security about the problem. However, in years of drought, the symptomology growers will see is slow canopy closure, which over time leads to higher weed density in certain parts of the area or field.”

**SHAWN CONLEY;** *Associate Professor, Department of Agronomy at University of Wisconsin*

“To proactively manage nematode problems, it is a good idea to check fields by taking soil samples. Based on what nematode pressure is present, a management program can be implemented. Remember, the higher the population, the higher the damage will be. **It is much easier to manage nematode pressure by keeping low numbers low rather than trying to drive high numbers back down.**”

**GREGORY TYLKA;** *Professor, Department of Plant Pathology at Iowa State University*





## OUTPERFORMING THE COMPETITION

In today's seed treatment market, there are more choices than ever, but not all are created equally. While they may be sold for the same purpose, competitive seed treatment brands can work differently, ultimately providing varying results. Comparing active ingredients, performance, handling, and trial data are just a few ways to see how these choices stack up to each other, or how they stand out from the competition.

When trying to choose the most effective seed-applied nematicide solution, keep in mind the differences between the active ingredients in VOTiVO®, a biological seed treatment from Bayer CropScience, and Avicta seed treatment nematicide, the proven industry standard.

Bayer claims that VOTiVO, which contains spores of the bacterium *Bacillus firmus* (*B. firmus*), will generate and colonize on plant roots, resulting in a barrier or “smoke screen” that protects plant roots from a nematode attack. In order to provide this protection, *B. firmus* must colonize the root as the root system is developing<sup>1</sup>.

There are four barriers that could limit the efficacy of *B. firmus* in soybeans<sup>2</sup>:

### 1. Acidic soils

The bacterium in VOTiVO grows best in environments with a pH above 8 (basic conditions)<sup>3</sup>. Many soils around the country are acidic. **Because of this, *B. firmus* may not grow well in every soybean field.**

### 2. Cool temperatures at planting

Soil temperatures at planting may impact the growth of *B. firmus*. The average soil temperatures at planting for soybeans fall below 75 F. The optimum temperature for *B. firmus* growth is 85 F<sup>4</sup>. **Soil temperatures at planting will probably impact the growth of *B. firmus*.**

### 3. Limited growth on the roots

Both root-knot and soybean cyst nematodes attack roots near the root cap region (tips)<sup>5</sup> in soybeans. Colonization of *B. firmus* in the root cap region is unexpected or limited due to spatial and temporal dynamics.

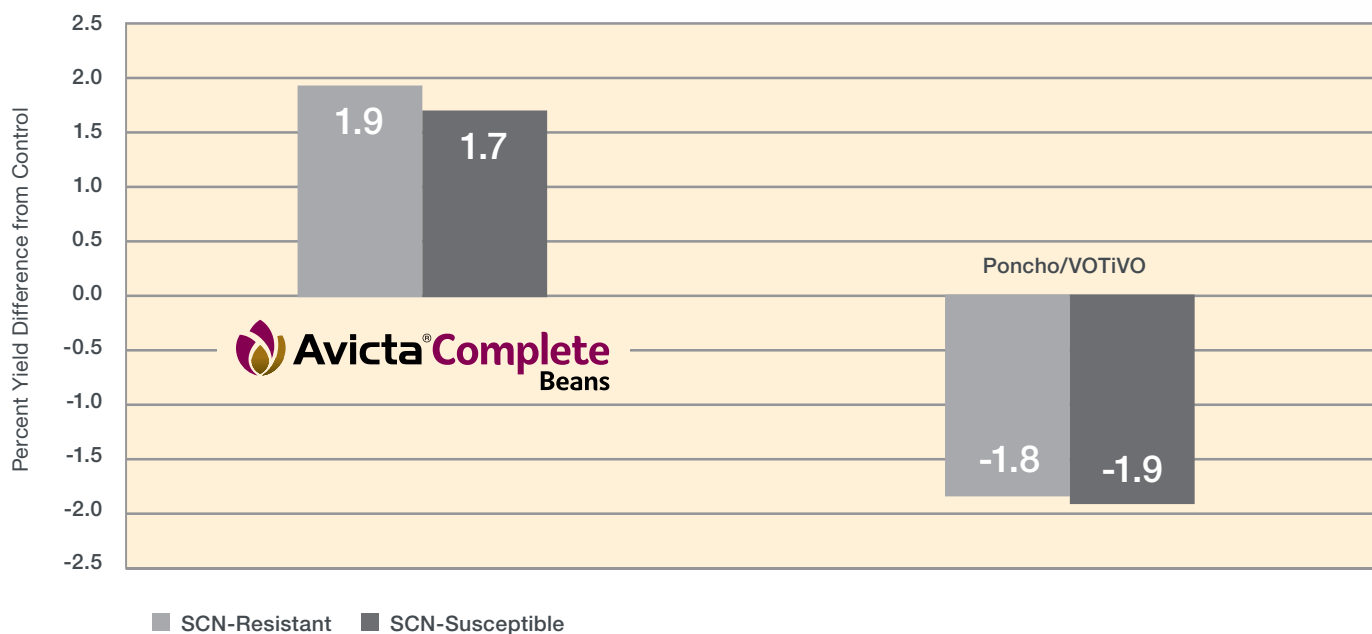
### 4. Lack of nematode protection

Research conducted in controlled conditions and grower fields suggest that VOTiVO does not protect soybeans against nematodes, especially early in the season<sup>6</sup> as effectively as Avicta Complete Beans applied with Vibrance.

In university nematicide field trials sponsored by Syngenta, Avicta Complete Beans out-yielded Poncho®/VOTiVO® in 88 percent of the trials with an average yield increase of approximately three bushels per acre.



## Comparison Between Avicta Complete Beans and Poncho/VOTiVO Compared to the Control Across 12 High SCN Environments (> 1000 eggs/100 cc) in the Midwest, 2011



1 [http://www.bayercropscience.com/bcsweb/cropprotection.nsf/id/SeedTreatment-products/\\$file/M24078\\_ISF\\_Magazine\\_180511\\_Cropped.pdf](http://www.bayercropscience.com/bcsweb/cropprotection.nsf/id/SeedTreatment-products/$file/M24078_ISF_Magazine_180511_Cropped.pdf).

2 Howarth, F.G. – 1991, Environmental Impacts of Classical Biological Control, *Annual Review of Entomology* Vol. 36: 485-509.

3 American Type Culture Collection ([www.atcc.org](http://www.atcc.org)); M.G. Sturr et al. Growth and bioenergetics of alkaliphilic *Bacillus firmus* OF4 in continuous culture at high pH; *J. Bacteriol.* 1994 June; 176(11): 3111-3116.; A.A. Guffanti and D.B. Hicks; Molar growth yields and bioenergetic parameters of extremely alkaliphilic *Bacillus* species in batch cultures, and growth in a chemostat at pH 10.5 *Journal of General Microbiology* 137 (1991), 2375-2379.

4 American Type Culture Collection ([www.atcc.org](http://www.atcc.org)); 30 C optimum; [thelabrat.com](http://thelabrat.com); A.A. Guffanti and H.C. Eisenstein. Purification and Characterization of Flagella from the Alkalophile *Bacillus firmus* RAB, *Journal of General Microbiology* (1983), 129, 3239-3242.

5 Heatherly, L.G. and Hodges, H. F. 1999 – Soybean Production in the MidSouth, CRC Publication: <http://www.apsnet.org/edcenter/intropp/lessons/Nematodes/Pages/RootknotNematode.aspx>; <http://extension.missouri.edu/p/G4259>.

6 Syngenta soybean research conducted with Universities in the South - University of Arkansas, Louisiana State University, Mississippi State University, University of Tennessee, Auburn University, Clemson University, North Carolina State University and Virginia Tech University.



For all of the latest soybean news from Syngenta, visit <http://Soybeans.FarmAssist.com>, the one-stop location for everything soybeans.

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