



Questions & Answers

What is thiamethoxam?

Thiamethoxam is the active ingredient in the Helix XTra® and Cruiser® seed treatment insecticide brands and offers effective broad-spectrum pest protection on numerous crops around the world. Thiamethoxam is a second generation neonicotinoid insecticide, belonging to the thianicotinyl subclass of chemistry, and possesses unique chemical properties.

How does thiamethoxam work?

Thiamethoxam interferes with a specific receptor site in the insect's nervous system. Once insects feed on the plant or come into contact with thiamethoxam, feeding is irreversibly stopped and insect damage halts.

What are the unique effects of Thiamethoxam Vigor™?

Thiamethoxam offers growers additional benefits beyond broad-spectrum insect protection. The increased vigor is evidenced by:

- Faster emergence
- Greater plant stands
- Increased root mass
- Earlier canopy
- Taller and greener plants
- Improved quality

What proof do you have for the resulting higher yields and how does this compare to competitive products?

Field and greenhouse testing has shown that both Helix XTra® and Cruiser® brands, as an example, offer significant advantages in relation to offering higher yields over imidacloprid and clothianidin, two competitive insecticide chemistries. In more than 1,000 third-party yield comparisons conducted in different countries and on multiple crops, both Helix XTra and Cruiser yielded higher than imidacloprid and clothianidin in more than two-thirds of the trials, even in the absence of visible pest attack.

What is the mechanism behind the Thiamethoxam Vigor™ effect?

Thiamethoxam positively affects the plant through its ability to increase the biosynthesis of functional proteins resulting in more effective defense against numerous environmental stress conditions. More specifically, thiamethoxam allows the plant to better cope under stressful growing conditions such as:

- Drought
- Low pH
- Protein degradation resulting from heat stress
- High soil salinity
- Wounding from pests, wind, hail, etc.
- Toxic levels of aluminum

As thiamethoxam helps the plant defend itself against these factors, it increases the crops' ability to reach much more of its genetic yield potential under a broad range of field conditions.

Will I always see this vigor effect?

Normally stress factors as described above occur early in the plant's life cycle. Thiamethoxam treated plants can better cope with environmental stress and this is the reason why many growers see more pronounced differences between plants treated with thiamethoxam versus untreated or competitive products.

What evidence is available to support these claims of increased functional proteins?

Syngenta has conducted more than 10 years of research at its research biology station located in Stein, Switzerland as well as thousands of additional field trials worldwide. The FUB University of Berlin in Germany and researchers at various institutions in Europe, the United States and Brazil have conducted more than three years of testing to determine the scientific reason behind the Thiamethoxam Vigor™ effect. These tests have confirmed the increase in the production of functional proteins is the key mechanism.

Do these effects apply to foliar and soil application of thiamethoxam?

Syngenta researchers have determined that the Thiamethoxam Vigor™ effect is more pronounced when thiamethoxam is applied as a seed treatment or soil application. This helps the plant defend itself against stress factors in the critical youth development stage, providing a robust start for more vigorous growth throughout the season.

Do the other neonicotinoids such as imidacloprid and clothianidin provide the same effect?

Although other neonicotinoid products may claim increased plant vigor, years of laboratory and field research prove that thiamethoxam delivers more vigorous plant growth and higher yields in direct comparisons versus competitive products.

Do you have any patents for this Thiamethoxam Vigor™ effect?

Yes. Patents relating to a method for producing increased vigor have been granted in Canada, the United States and in 17 other countries. Additional patents are being pursued.

Syngenta is a world-leading agribusiness committed to sustainable agriculture through innovative research and technology. The company is a leader in crop protection, and ranks third in the high-value commercial seeds market. Sales in 2005 were approximately \$8.1 billion. Syngenta employs some 19,000 people in over 90 countries. Syngenta is listed on the Swiss stock exchange (SYNN) and in New York (SYT). Further information is available at www.syngenta.com.

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