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Corn Seed Trait Trial:
Dow AgroSciences: Trials Showing Smartstax Trait Combination Effective

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Two years of pre-registration field trials conducted by Dow AgroSciences demonstrate the broad-spectrum insect control of SmartStax seed corn trait, a revolutionary new trait combination that is expected to be available in elite hybrids for 2010 planting.

SmartStax is the first trait package to provide multiple modes of action for above- and below-ground pest control by combining the two leading trait families: HERCULEX Insect Protection and YieldGard. SmartStax is under review by the U.S. Environmental Protection Agency (EPA), with registration anticipated in time for 2010 planting. The technology was jointly developed and submitted for EPA registration by Dow AgroSciences and Monsanto.

"SmartStax will provide more durable insect protection than current insect traits, which offer only a single mode of action. By combining multiple modes of action, SmartStax not only will provide a broader spectrum of control, but will also lessen the likelihood of target pests developing resistance," says Brent Stauffacher, SmartStax product manager for Mycogen Seeds. "That's why we've asked the EPA to consider the potential of a reduced refuge requirement when growers plant hybrids containing SmartStax."

Field tests conducted by Dow AgroSciences researchers in 2007 and 2008 showed that SmartStax offers a greater level of insect protection versus single mode-of-action insect traits that are currently on the market.

"SmartStax will provide the broadest spectrum of control for pests that damage corn yields and reduce grower income," says Bill Hendrix, Dow AgroSciences North America biology team leader for insect management traits. "Our research shows that the control provided by SmartStax is more consistent than first-generation insect traits with a single mode of action, even under heavy pest pressure."

Effective below-ground pest control

Field trials show that SmartStax consistently provides better control than single mode-of-action traits, and it prevents rootworm damage that causes node injury and reduces yield.

Researchers monitored rootworm damage using a node injury scale developed by Iowa State University. In the scale, 0.00 represents no root damage and a value of 3.00 is the highest damage rating, indicating three nodes or circles of roots have been destroyed by rootworms.

Hendrix points out that a node injury rating of 0.25 indicates that a quarter of a node has been eaten. "This is the level where yield damage starts to occur. Plants with node injury ratings of 1.00 or higher are more susceptible to lodging and further yield loss," he says. "Corn rootworm damage is particularly stressful to the plant under drought conditions, because the plant cannot take up enough moisture to maintain optimum yield."

Dow AgroSciences research trials across eight states in 2007 and 2008 demonstrated that roots of SmartStax corn hybrids suffered little damage from western corn rootworm. SmartStax also provided the highest level of consistency, with 96 percent of all root samples showing node injury ratings below 0.25.

"Although the trials were conducted over two very different growing seasons, SmartStax showed the same pattern of performance in both years, consistently preventing corn rootworm feeding that damages yield," Hendrix says.

Hendrix adds that SmartStax field trials will continue in 2009, as researchers gather additional information on the insect protection performance of the trait combination, as well as its impact on grain quality and yield.

Above-ground pest protection

A summary of 2007-08 field trials proves the efficacy of SmartStax in reducing crop injury from corn earworm, western bean cutworm and fall armyworm. SmartStax hybrids provided broader insect protection compared with hybrids with HERCULEX XTRA Insect Protection or YieldGard VT Triple PRO alone.

Field trials also confirm that SmartStax provides excellent control of corn borer species, such as southwestern corn borer, as well as control of black cutworm.

"SmartStax will be particularly effective in protecting seedling corn under extreme black cutworm pressure," Hendrix says.

Growers can expect SmartStax corn hybrids to be available from Dow AgroSciences for 2010 planting in the Mycogen, Triumph, Dairyland, Renze and Brodbeck brands.