

New Technologies Solve Problems

Less Refuge Acres, More Pest Control Boosts Crop Performance

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New GMO technologies in field corn including the stacked Bt traits was the topic of a presentation by Dr. Sandy Steckel, research coordinator of the University of Tennessee.

"The first Bt corn traits that were sold have a single toxin from *Bacillus thuringiensis* which gives excellent control of tunneling caterpillar pests such as Southwestern and European corn borers in corn," she said. "We see a lot of South-

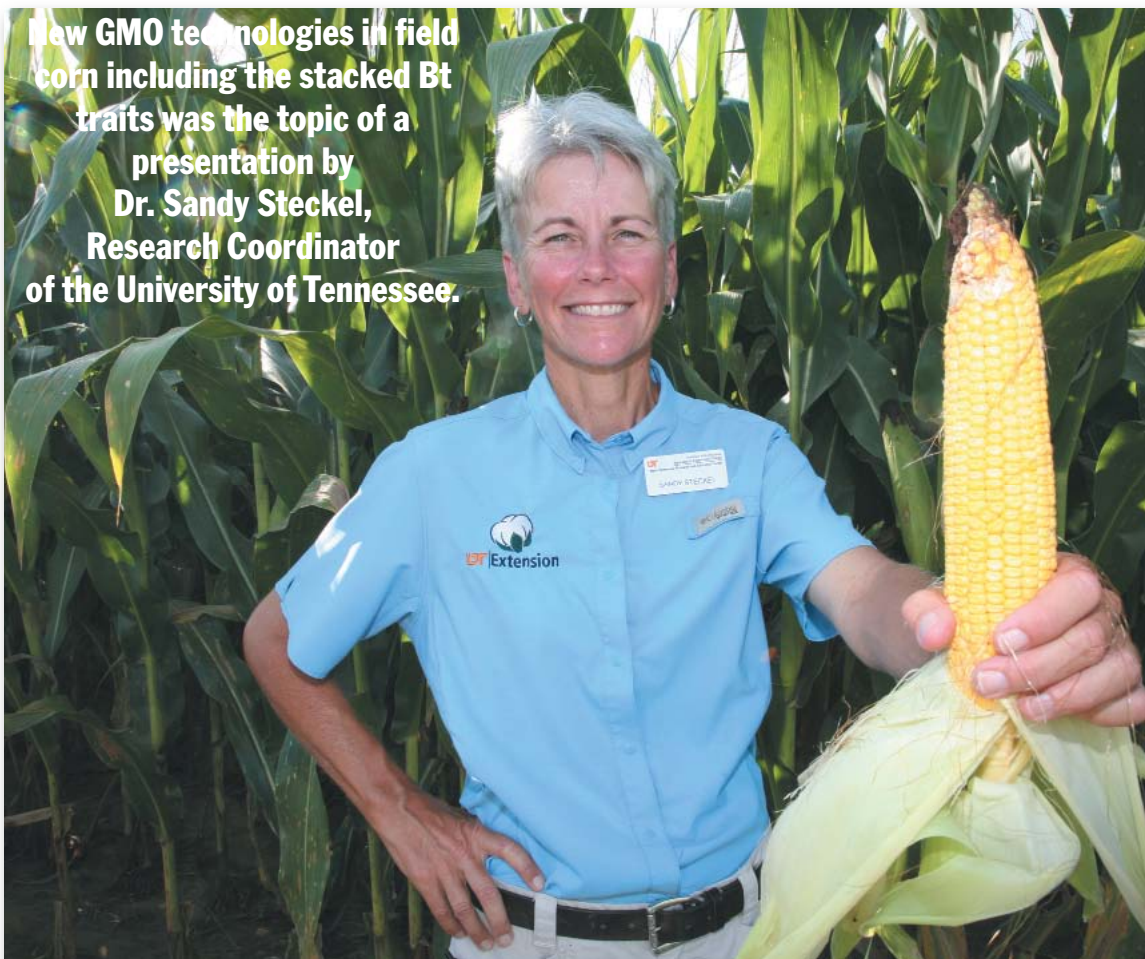
western."

Genuity VT Triple Pro, since it has stacked Bt caterpillar toxins, has an 80/20 requirement in all counties. The SmartStax is also 80/20 for cotton counties, and only a 5 percent refuge requirement in corn counties.

"The reason SmartStax is eligible for only a 5 percent refuge in corn counties is that it has multiple Bt traits for control of caterpillar pests and corn rootworms" she said. "Triple Pro has one rootworm trait, so it still requires a 20 percent non-Bt corn refuge."

There is plenty of data showing excellent con-

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western corn borer here in Tennessee."

The new GMO technologies have multiple Bt traits. These are Genuity VT Triple Pro, Genuity SmartStax and Agrisure Viptera.

"The Genuity traits are marketed by Monsanto. Genuity VT Triple Pro has two Bt caterpillar toxins plus one rootworm toxin and the RoundUp Ready II trait. SmartStax is an eight-way GMO stack," Steckel explained. "It has three Bt caterpillar toxins, three rootworm toxins, as well as the Roundup Ready II and LibertyLink herbicide traits; and the Agrisure Viptera corn which gives us two caterpillar toxins and Roundup Ready II also."

One impact of these technologies is better control of fall armyworm.

"The new Bt corn technologies provide better control of fall armyworm in both the whorl and the ear," she said. "However, the biggest impact the newer Bts are going to have is on corn earworm. They provide excellent control of corn earworm feeding in the ear, resulting in a reduction in damaged kernels from this pest compared with the older technologies."

Another implication of these newer Bt technologies is a reduction in the refuge requirements. Tennessee is unique in that the state has counties designated as "corn counties" and "cotton counties. This designation is made because cotton contains many of the same Bt genes as are found in corn. With the older Bt technologies, the requirement is for an 80/20 refuge in corn counties.

"That means you can plant up to 80 percent of your corn in Bt technologies, but 20 percent have to be a non-Bt hybrid planted as a refuge," she explained. "It's 50/50 in the cotton counties. The reason we have those refuges is because we want a susceptible population of moths coming out of those non-Bt crops to mate with any potentially resistant moths which might come out of the Bt. It's all about insect resistance management, to try to combat insects developing resistance to these traits. The new technologies are changing these require-

ments." Steckel said farmers should really pay attention to hybrid performance overall.

"We might see more advantages on a later planted crop where we tend to get more insects," she said. "There is the potential for a reduction in mycotoxins or diseases that we might see in those ears with the newer technologies because ear feeding insects can passively spread diseases."

She finds the reduced refuge requirements for fewer non-Bt corn acres one of the big impacts of the new technologies. However, there are a lot of corn earworms that get funneled through the corn crop every year.

"A lot of corn earworms come out of our corn crop later in the season and infest our cotton and soybeans, so if this new technology is widely adapted we're definitely going to see an impact on overall earworm populations," she summed. "That could, in turn, impact these other host crops."

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