Protein Treatment May Boost Yields

Harper Ross didn't quite know what to expect when his crop consultant suggested trying a new cotton production tool in 2000. But he had confidence in David DuBard, so he was willing to look at any technique the advisor brought to his attention.

Still, as he made the prescribed foliar treatments on a 100-acre field, Ross, of Leland, Miss., occasionally wondered if DuBard had gone off the deep end. The product he was using had no weed or pest control activity, offered no height control and wasn't a plant food.

All doubts vanished at harvest.

"The field substantially out-yielded our farm average," Ross recalls.

DuBard, owner of DuBard Entomological Services in Cleveland, Miss., conducted a similar test on Ross's farm the next year. Again, the results were positive. At this point, the product – Messenger – definitely had claimed their attention.

Treated More Acreage

In 2002 and 2003 Ross continued to use the product on greater portions of his crop.

It was in 2003 that he was to get a clearer view of the benefits. He used his standard practices on a 135-acre field, then came back 10 days before first bloom and applied Messenger on part of the acreage. That fall, using pickers equipped with yield monitors, he saw a difference he could not reject.

Messenger, from Eden Bioscience, is described as a "plant health regulator." It is based on harpin, a protein occurring naturally in numerous plant pathogenic bacteria.

Research has shown that harpin protein, first isolated in Cornell University research more than a decade ago, triggers the plant's natural defense mechanisms. It activates genes that influence cell growth, flower initiation, fruit set and size.

Photosynthesis, root biomass, nutrient uptake and plant health are significantly improved. Trials have even shown a positive effect in suppressing nematode reproduction on cotton roots.

Yield Map Reveals Improvement

The yield map generated from Ross's test field revealed that harpin protein technology had improved production significantly. Assuming a gin turnout of 35 percent, the gain was 152 pounds of lint per acre.

In 2004, Ross treated his entire crop with a new formulation, Messenger STS. Numerous producers in the area, many of them influenced by Ross's yield map, applied the technology to part or all of their cotton.

"I believe the treated cotton definitely had more time to overcome the fruit loss experienced during our extended period of cloudy, rainy weather."

Rusty Stubbs, Producer, Benoit, Miss.

While the visual evidence of harpin protein activity is often undetectable before harvest, Rusty Stubbs of Maxwell Farms in Benoit, Miss., observed a mid-season difference last year. He notes that treated cotton stays greener and healthier than untreated cotton following heavy June rains, and the treated cotton cut out later in the season.

"I believe the treated cotton definitely had more time to overcome the fruit loss experienced during our extended period of cloudy, rainy weather," Stubbs says.

New advances in harpin technology are becoming available. ProAct, an improved, high-potency foliar-applied material, was tested during 2004 in more than 20 replicated plot trials in six states.

Significant Yield Increase

When tankmixed and applied with glyphosate to Roundup Ready cotton at the 2- to 4-leaf stage, ProAct increased yield an average of 11 percent over untreated checks. When applied alone to 8-leaf cotton, it increased yield an average of 9 percent.

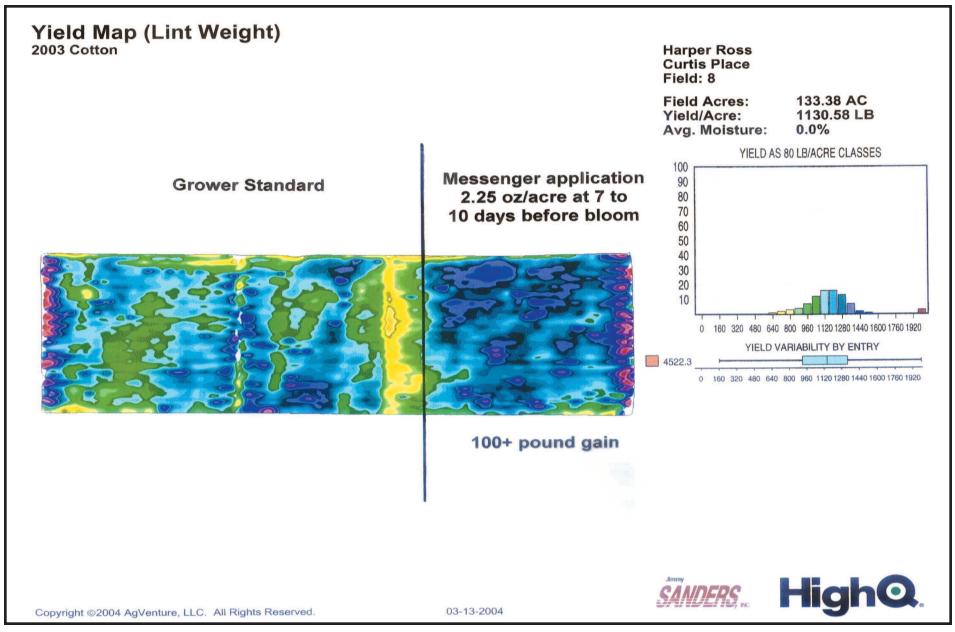
Charlie Guy, with G&S Associates in Tillar, Ark., saw a 132-pound increase of lint where he applied ProAct at 1 ounce per acre at the 2-4 leaf stage.

"The treated cotton averaged 1,415 pounds, while the untreated check averaged 1,283 pounds," he says. "It was a statistically significant increase in a replicated trial."

This next-generation material is more active than its predecessors and represents the first of Eden's foliar-applied protein products to carry the Harp-N-Tek technology identity. ProAct contains active components from four different harpin proteins instead of one and is formulated specifically for row crops.

The company has received registration in time for use during 2005.

Eden Bioscience, of Bothell, Wash., holds the patents covering harpin proteins and their uses.



This yield map from Harper Ross's test near Leland, Mississippi shows that the field treated with Messenger substantially out-produced the overall farm average. Assuming a gin turnout of 35 percent, the gain was 152 pounds of lint per acre.