

CORN BOOM: INCREASED YIELDS WITH FUNGICIDES SPUR NEW REQUESTS FOR AERIAL APPLICATIONS

By Mary Lou Jay

For U.S. corn growers, 2007 was a very good year. According to the U.S. Department of Agriculture, corn production reached a record high of 13.1 billion bushels. Ag aviation played a role in this achievement. Since pilots began treating field corn with fungicides a few years ago, yields per acre have grown significantly.

BT Corn: Farmer's Gain Is Ag Pilot's Loss

Corn has been an important market for the ag aviation industry for many decades. "This company and its founders have been spraying corn since 1947," says Terry Sharp of Agri-Tech Aviation in Des Moines, Iowa. "From the time I started in 1979 up through the mid 1990s, corn was always our bread and butter crop. We sprayed commercial corn – regular production corn – primarily for European corn borer and corn rootworm beetle adults."

But in the mid 1990s, the seed industry introduced a corn plant genetically modified with the bacterium *Bacillus thuringiensis*. BT corn produces a protein that kills the European corn borer and similar pests.

"In just a matter of years, we went from basically relying on corn as our core business to having virtually no market with corn," says Sharp. Farmers still needed insecticide applications on seed corn, however, since it does not have BT corn's resistance to insects during all parts of its life cycle. But seed corn is a very small percentage of the overall corn crop.



The 'X' and the thick horizontal line down the field were created using Headline® fungicide. The other areas of the field are untreated. In the areas of the field that were treated, the grower picked up an extra 18 bushels per acre of corn over the untreated acres.



The corn in this field was treated using Headline® fungicide. The corn stood tall all through the harvest and the combine was able to easily work through the field. This reduced the grower's time in the combine, which results in less money spent on fuel and other resources.



The corn in this field was left untreated, which resulted in the corn stalks falling over. This makes it more difficult for the grower because he spends more time in the combine.

Photos courtesy Craig Bair of AgFlight, Inc.

Better Yields And Stronger Plants

Because of the value of the seed corn crop, ag aviators routinely treated it for diseases like gray leaf spot, rusts and leaf blights.

“The farmers would get five to seven bushel yield increases, and on seed corn, that’s huge,” notes Eric Klindt, a pilot with Tri-State Air Ag in Wahpeton, North Dakota. It was still not cost effective for farmers to treat their regular field corn with fungicides, however.

Several things happened to change that. One was the introduction of new, more effective fungicide products. Originally, Mancozeb was the active ingredient in most fungicides used on corn, but in the mid 1990s, Syngenta’s Tilt and a few other chemicals containing Propiconazole came into the market.

With the introduction of strobil-based fungicides (BASF’s Headline®, Syngenta’s Quadris® and Bayer’s Stratego®) in the early 2000s, farmers began taking another look at their benefits.

“When the Asian soybean rust scare came about three years ago, everybody really started looking at fungicides for disease prevention,” says Sharp. “The first year, we made applications on several thousand acres of soybeans as a preventive measure. Because of my experience spraying fungicide on corn, and because of the results we’d seen on seed corn, I started spraying a few fields of corn with fungicide as a trial. The response was exceptional. At the same time, BASF and other manufacturers started looking at their fungicide products as part of a yield-enhancing, disease reduction process.” BASF in particular took a lead in promoting the use of its Headline® product for corn.

Craig Bair of Ag Flight, Inc. in Nebraska started experimenting with Headline four years ago, starting with 250 acres of test plots the first year, going to 500 the next, 10,000 the third and 80,000 acres last year.

“The least increase I had was 5 bushels per acre, and one field went to 42 bushels per acre,” Bair says. “The difference is that some plants are more susceptible to gray leaf spot than oth-

ers. The fields where they’re only seeing five bushels per acre increase have some pretty good disease tolerance built into the plant already.”

Scott Schertz of Schertz Aerial Service, Inc. in central Illinois says he has seen yields grow from 10 to 30 bushels per acre. “Some genetic developments in the corn have compounded this,” he says. “There are some very high-yielding corn varieties that usually respond very well to the fungicide.”

Fungicide also improves the corn’s standability. “The pulp of the stalk is a lot stronger and lasts longer in the season when the plant has been treated with fungicides,” says Garrett Lindell of Lindell Aerial Ag Service in Aledo, Ill. “I’ve had some people tell me they’re willing to do the treatment just for the harvestability.”

Rising Prices Fuel Fungicide Demands

Treatment with the strobil fungicides costs somewhere around \$20 an acre, however, so its more widespread use would not have occurred without a rise in the demand for and the price of corn.

“With land prices and fertilizer prices and everything else going up, farmers need to maximize what they can get out of the crop,” says Klindt. “With the price of corn around \$4.50 a bushel – double what it was a year ago – I think you’ll see an even bigger demand for spraying because the return on investment is even greater.

“Before, you would look at a 15 to 20 bushel increase, and dollar-wise, you were looking at right around \$35 to \$40 an increase per acre. Now with these prices, you’re looking at around a \$60 to \$80 increase. If those prices hold, I see a pretty substantial increase in spraying with fungicides for the next couple of years.”

Prices are likely to stay high for at least the next few years, with greater demand for U.S. corn in the export market and for ethanol. In 2007, almost 25 percent of the U.S. corn crop – 3.2 billion bushels – went to the production of ethanol and co-products. The U.S. General Accountability Office

estimates that usage could increase to 30 percent by 2011.

Careful Stewardship Required

There’s a relatively narrow window during which ag aviators can treat cornfields with fungicides. “What they’re telling us now is that they want the flag leaf that wraps around the tassel to be exposed before you start treating. Then you have up until the brown silk stage, when you should start shutting down operations,” says Lindell. Fungicides are applied just once for field corn.

Aerial application is the preferred method of fungicide treatment because the corn is so tall at this stage. “Ground rigs have done some of it, but the results aren’t as good, and they damage quite a bit of the corn,” says Mike Bartholomew of Bart’s Flying Service in Iowa. “There are also some concerns about the possibility of spreading disease when ground rigs are going from field to field with the fungicide. With an airplane, we’re not in the crop, so there’s no cross-contamination.”

In northwest Nebraska, some farmers have tried chemigation from a center pivot since they’re already irrigating their crops. Most have gone back to spraying by air. “But that’s something we have to watch,” says Bair. “If the operators don’t do a good job of applying this product and the growers can see that, they have an alternative method in my area.”

Bair applies the fungicide flying about 10 feet above the tassel. “You have to make sure that your aircraft is set up right. We spend a lot of time going over our operation safety equipment to make sure that we are getting the pattern evened out, because the corn will show streaks if your airplane is not putting the fungicide out evenly.”

“I really hope that everyone does the best job they can rather than as many acres as they can,” says Sharp. “We’ve learned over the years that you can see every mistake that you make. It’s real visible from the air, it’s visible

from the ground and it's visible from the combine."

"I think it can be a challenge to treat as much as people want in a timely manner," says Schertz. "We have to be really careful in operating our businesses to meet demands, so that we do it in a good way and offer proper stewardship of the materials."

"I believe that it is very important that people coming in are working with a local operator, someone who knows the area, and has the proper facilities, knowledge and equipment to conduct operations," he continues. "We've got a potentially big market for the industry, and, in many cases, it's being done in areas where it is unusual for the majority of fields to be sprayed by air. It really does need to be done in a conscientious manner."

"We all have to be more proactive as we visit with different people in the agricultural community," Sharp adds. "I'm talking to my customers and to others, explaining there's more to the process than just having an airplane show up and fly. We have to tell them what it takes to do a good job."

"I'm very concerned that this opportunity could self-destruct if we don't approach it with the highest level of professionalism that we can muster."

Good Outlook For The Short Term

Several aerial applicators have actively marketed the use of fungicides on corn to local farmers and co-ops, often in conjunction with BASF's efforts with Headline®. They've received mostly positive responses, but they understand that this opportunity may not last forever.

"I think we're going to see a good demand for it for a few years yet, at least until the seed corn companies figure out a way to develop resistance to these diseases," says Bair. "I think when that happens, we will be back in the same boat as we were a few years ago with BT corn."

The rising prices of all farm commodities may persuade some farmers to plant something other than corn. "You don't have to put as much fertilizer on the ground for wheat and soybeans as you do for corn, and fertilizer prices are way up," observes Klindt.

Although increased ethanol production could continue to spur the demand for corn, researchers are looking at ways to use other materials, such as switch grass, wood chips or plant stalks in the process. If they are successful, corn could be in less demand and its

price could go down, making fungicide treatments less cost-effective.

Bair is also concerned that the price of corn could get so high that ethanol plants will cut production because they'd have to charge too much for their fuels. "Ethanol is not as efficient a fuel as fossil fuel. Right now, at its current price, it pays to burn ethanol, but if it gets up to the price of regular gas, it doesn't pay to use it."

"There is certainly an increase in application right now, and there will be a decrease," observes Lindell. "I don't know that I see that happening for several years, but when the price of grain goes down, I believe we will see a decline in application. That's just the law of supply and demand." He believes, however, that when the hot corn market cools off, ag aviators will find new opportunities. "Mother Nature has a unique way of creating work for people." ✖