

## **Another Billion Bushel Crop Disease Disaster in 2011 is Likely Without Special Focus on Fertility**

American corn and soybean producers face multiple crop diseases in 2011, warns a team of crop consultants and plant pathologists. They say disease losses this season could be worse than the billion-bushel plunge in corn yields last fall.

More than 300 farmers heard crop specialists present evidence of that threat — and how to defend against it — at a Feb. 4 seminar in Des Moines. These specialists are the same ones who first recognized the explosion of diseases in Midwest corn and soybeans last summer. The “Summit” seminar was organized by Jeff Littrell of Rochester, MN with the staff at FHR Farms and BRT Ag & Turf. Here are some of the points made by crop nutrition and health specialists from four countries:

**Dr. Volker Romheld**, Director of the Institute of Plant Nutrition, University of Hohenheim, Stuttgart, Germany, told Midwest farmers: “In Germany we’re running into more crop disease problems, indicating reduced availability of trace elements such as manganese and zinc. Glyphosate application can induce severe manganese deficiency.”

Dr. Romheld reported that German farmers are seeing the same rise in disease and crop injury as U.S. farmers, although not as severe. “In fields with a 10-year history of glyphosate, we see greatly reduced germination of wheat. After only two years of glyphosate, there’s little influence.”

**Dr. Don Huber**, Professor Emeritus of Plant Pathology at Purdue University reported on years of research showing there is “a 500% increase of Fusarium infection of crop roots in a glyphosate environment. And the more glyphosate applied, the greater is the drop in beneficial soil bacteria such as pseudomonas. Glyphosate is a strong biocide.”

Dr. Huber has assembled worldwide research indicating the need for intensified crop nutrition to reduce vulnerability to crop diseases related to genetically engineered traits and years of glyphosate application.

**Dr. Arden Andersen**, an M.D. with advanced credentials in public health, documented the links between diseased, mineral-deficient corn and soybeans and the declining health of animals and humans eating products from those crops. Fortunately, he said, “We can solve all these problems with good nutrition.”

Dr. Andersen — an internationally known consultant to farmers — expressed deep concern that it may take a serious crop-disease outbreak and resulting food crisis to gain public attention needed to reverse long-term deterioration in health of crops, livestock and humans.

**The Des Moines seminar was prompted largely by the crop-disease drama of 2010.** Here’s a quick recap of what happened: Last August, no unusual corn or soybean disease problems were evident to USDA crop estimators. On Aug. 12, 2010, USDA announced that corn production “is forecast at a record high 13.4 billion bushels, up 2% from the previous record set in 2009.”

However, Iowa-based agronomy consultants Bob Streit and Amie Bandy had been scouting corn and soybean fields all summer, and growing more concerned about multiple diseases emerging in corn and soybeans.

On Aug. 14, they confirmed widespread infestation of a bacterial disease in corn — Goss's Wilt. For years, this disease had been confined mostly to the western Corn Belt. In summer 2010, a few crop scouts found that it was rippling eastward.

In previous seasons, McNeill, Streit, Bandy and other consultants had observed that corn had been dying a few to as much as ten days earlier every season as Fusarium and other fungal problems destroyed root structures. In soybeans, leaf and stem diseases plus 'Sudden Death Syndrome' were spreading from random low patches to kill entire fields.

As fall harvest began, farmers noted that expected yields simply weren't there. USDA gradually scaled back yield expectations with each new crop estimate. By Jan. 12, 2011, USDA announced that 2010 corn production "is estimated at 12.4 billion bushels, 5% below the record high production of 13.1 billion bushels set in 2009." *A billion bushels of corn had disappeared from that August forecast.*

**Even then, not many economists or agronomists fully comprehended** that chronic, recurring diseases were a major factor in slashing 2010 corn crop expectations. Also, USDA's August forecast of a 3.43 billion bushel soybean crop had receded to 3.33 billion by January, as evidence of multiple soybean diseases showed up in harvest reports.

*Those corn and soybean yield losses occurred despite near-ideal harvest weather for most of the Corn Belt.*

There's a reason that McNeill, Streit and Bandy, along with a few other consultants and crop pathologists, knew what they were looking at in those fields last August. They had closely studied crop pathology and crop nutrition research assembled for decades by researchers such as Dr. Don Huber, Professor Emeritus of Purdue University, and Dr. Bob Kremer, ARS-USDA microbiologist based at the University of Missouri. These two researchers are leaders in documenting the disease and nutrition impacts of genetically modified crops — and intensive reliance on glyphosate herbicide, which makes up 30% of all herbicides used worldwide and is now used on roughly 85% of the corn and 90% of the soybean acres. They also recognized the shortfall on an 'NPK only' fertility program which has been the norm on most row cropping acres in the Midwest, and how very few growers test for micronutrient levels in their two or four year soil sampling programs.

Streit told farmers at the Des Moines seminar Feb. 4: "If we had gone into the fields last summer without studying the research assembled by Dr. Huber and Dr. Kremer, we would have been at a loss as to what we saw happening to corn and soybeans."

Streit added, "By mid-August, we knew we had a serious crop health problem across the entire Midwest. Many farmers lost \$150,000 or more to Sudden Death Syndrome (SDS). Most farmers in Nebraska during the 2009 and 2010 seasons saw Goss's Wilt explode in

incidence and severity with most seeing huge yield declines in susceptible hybrids in 2010 and some having fields that yielded nothing during 2009.

**As McNeill, Streit and Bandy alerted clients and other crop consultants,** multiple and chronic problems became clearer to a wider array of observers:

- Early root rots were common, primarily Fusarium, which crippled root exploration.
- Micronutrient deficiencies were showing up in corn and soybeans.
- Some corn hybrids proved genetically vulnerable to ear molds and kernel rots.
- Soil microbial life was skewed to favor Fusarium molds. Beneficial fungal and bacteria needed to make trace elements such as manganese and copper available for disease resistance had disappeared.

Streit knew from research by Dr. Kremer and Dr. Huber that Fusarium mold dominance on roots is one consequence of heavy, repeated applications of glyphosate. This chemical, based on a phosphorus molecule, is a proven killer of beneficial bacteria. Crops exude part of the applied glyphosate through their roots into soil, where it shifts the balance of microbial life toward the fungal pathogen side.

Glyphosate is a strong chelator of every micronutrient needed by crop immune systems, from boron through manganese to zinc. The micronutrients are also essential for defense against environmental stresses. Effects of glyphosate, compounded over many years, were hitting in the 2010 season when the crops were already struggling with excess moisture, soil compaction and disease organisms harbored in previous years' crop residue on the soil surface.

At the Des Moines seminar, Dr. Huber and other crop scientists from Germany, England and Canada explained that some of the GMO and glyphosate impact can be remediated by extra crop nutrition and enhancing soil biological activity.

**Members of the Des Moines seminar panel outlined these basics** to help farmers buffer the disease threats in GMO crops in 2011 and beyond:

- 1. Get soil tests that include micronutrients** as well as NPK. However, results showing sufficient or even high readings of manganese, boron, zinc and other traces in the soil may be misleading if the farm has a long history of glyphosate application. Many trace elements may be chelated with glyphosate in soil and unavailable to the crop.
- 2. Take measures to rebuild soil biological activity,** especially the beneficial pseudomonas bacteria and crop-friendly Trichoderma fungus. Several live microbial products are available to farmers.
- 3. Early in the season,** send samples of the entire plant for tissue testing by a reliable laboratory. Low readings of trace elements signal a vulnerable crop.
- 4. Foliar feeding trace elements** are the most efficient way to remediate the chelating effect of glyphosate. Because of the urgency for adequate trace elements, BRT/FHR has

formulated a rapid-translocating trace element product called Defender G+ which will be available this season.

Crop consultants and farmers at the Feb. 4 seminar reported that many farmers saw *no* significant disease in their 2010 corn and soybean crops. Their corn leaves and stalks remained green until the first frost, with a browned husk over a completely filled ear. Or their bean plants turned color as scheduled in mid-September rather than by mid-August. One major difference: These were among the roughly 10% to 15% of Midwest farmers who haven't switched to GMO hybrids and varieties or have continued to use conventional chemistry to manage weed populations. And they've focused on building biological life in their soils. Those green cornfields were a sharp contrast to neighboring cornfields that had started to yellow by the second week of July.

By September, such "standout" fields were so unusual that farmers driving past them sometimes stopped and asked the owner what he had done to get such a healthy crop.

Dr. Arden Andersen sees a high potential for widespread fungal disease in 2011 crops, which could spawn mycotoxins in harvested corn and soybeans. He challenged farmers: "What if all, or a large portion, of your 2011 crop is condemned and can't be sold? What are you going to do *now*, to prevent that?" That was much closer to reality than growers realize.

Littrell concluded, "Fortunately, at least 300 farmers who attended the Des Moines seminar sponsored by FHR Farms and BRT Ag & Turf have some answers on how to avert disease problems on their own farms in 2011."