

The Science of Roundup Ready® Technology, Glyphosate, and Micronutrients

Part V - Allegations of U.S. Crop System Collapse: How do Allegations Stack up With the Facts?

On January 17, 2011, Don Huber, Professor Emeritus at Purdue University, sent a confidential letter to the U.S. Secretary of Agriculture advising that a “team of senior plant and animal scientists” have discovered “an electron microscopic pathogen” that “could result in a collapse of the U.S. soy and corn export markets and significant disruption of domestic food and feed supplies.” The letter also alleges that this pathogen is more prevalent on herbicide tolerant GM crops, and calls attention to previous allegations regarding effects of glyphosate on mineral uptake in plants. No data were provided or cited, and no collaborators were identified. In Part V of the series “The Science of Roundup Ready® Technology, Glyphosate, and Micronutrients,” the question of just how well these allegations stack up with the facts is addressed.

Fact: U.S. Yields per acre in GM Crops are stable or increasing

U.S. yields for soybean (GM introduced 1996, now over 98% GM), corn (GM introduced 1998, now over 85% GM), cotton (GM introduced 1998, now over 93% GM), and wheat (100% non-GM for comparison) are in fact stable or rising since the introduction of GM crops (Figure 1). If anything, yield improvements in GM corn, soybean, and cotton seem to be accelerated following the introduction of GM technology.

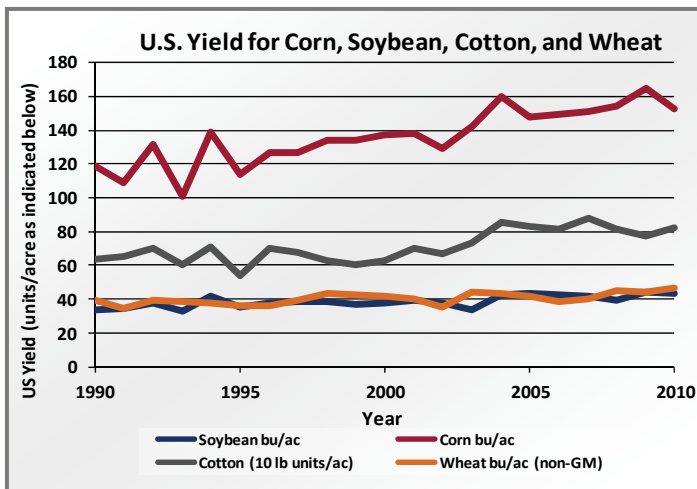


Figure 1. U.S. yield per acre in major commodity field crops. Corn, soybean, and cotton have GM varieties available at this time. Wheat is not available as GM and is provided for comparison. (Yield for corn/soy/wheat in bushels/acre. Yield for cotton is in pounds per acre, divided by 10 to improve readability of other crops.) Source: USDA-NASS: <http://nass.usda.gov>

Fact: Soybean disease rates fluctuate, but no “collapse” is evident

The University of Missouri’s Delta Research Center conducts an ongoing survey to estimate soybean yield loss. Data are now available from 1996-2009, covering almost precisely the period of time in which Roundup Ready® soybean was introduced. While these are estimates, these appear to be the best available data. Similar national data do not exist for corn or cotton to the best of our knowledge.

Since the introduction of GM technology in 1996, total U.S. soybean production and yield per acre have been rising overall, with some degree of year-to-year fluctuation (Figures 2 and 3). Total estimated disease loss has remained nearly constant.

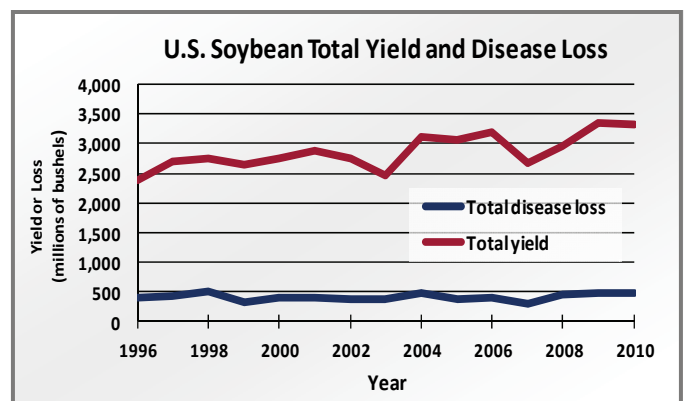


Figure 2. U.S. soybean production from 1996-2009 in relation to total yield loss from disease. Sources: Soybean Disease Loss Estimates for the United States, 1996-2010. University of Missouri Delta Research Center. <http://aes.missouri.edu>; USDA-NASS.

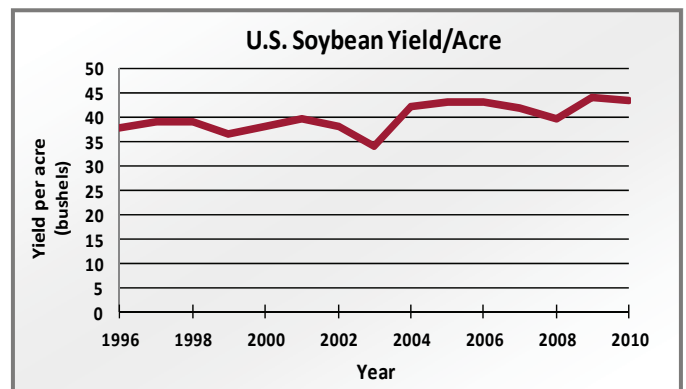


Figure 3. U.S. soybean yield per acre from 1996-2010. Source: USDA-NASS: <http://www.nass.usda.gov>

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Soybean losses to diseases such as Soybean Sudden Death Syndrome (SDS) fluctuate from year-to-year based on many different factors, including rainfall, temperature, and previously existing disease pressure. Data are available for a wide variety of soybean conditions, all of which fluctuate significantly over time (Figure 4). These disorders show no apparent relationship with the adoption of plant biotechnology or with the rapidly increasing presence of GM soybean.

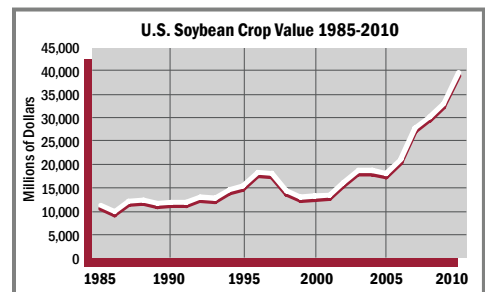
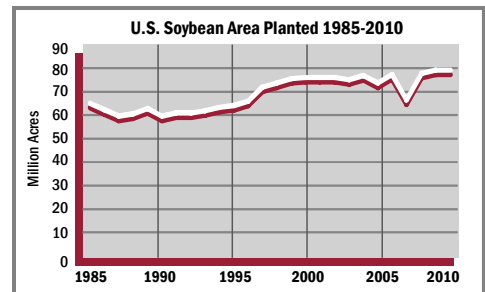
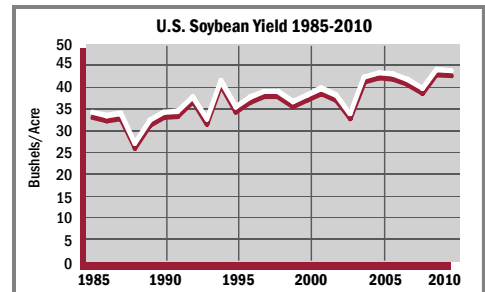
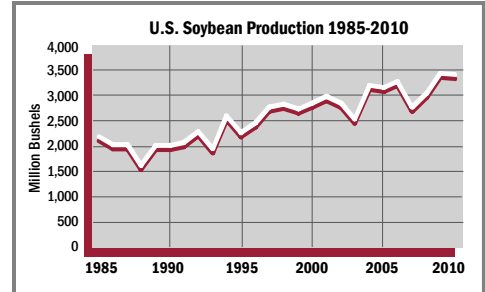
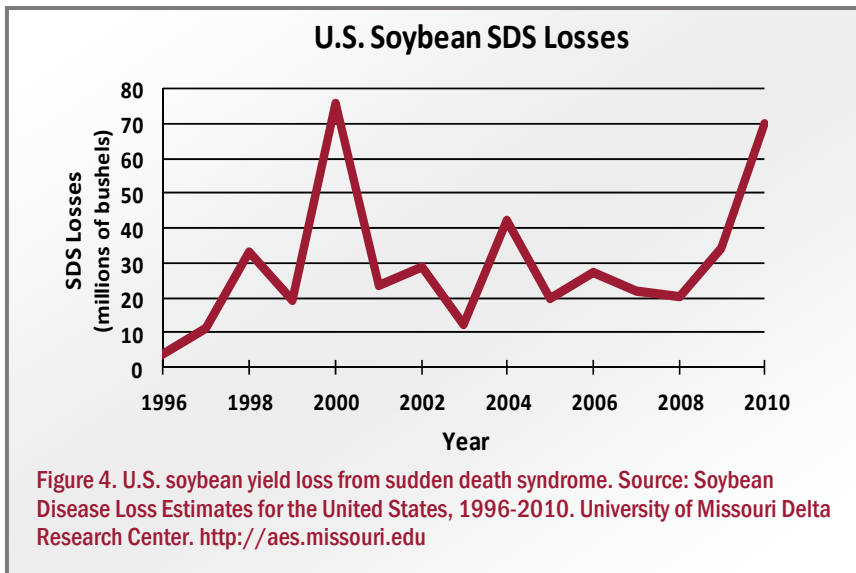


Figure 5. U.S. soybean production, yield, planted acres, and value from 1985-2010. Source: USDA-NASS: <http://www.nass.usda.gov>

Fact: Soybean Statistics Demonstrate 25 Years of Continued Success - NOT Failure

Soybean yields have continued to rise, with some fluctuation, for the past 25 years. This trend has continued since the introduction of GM soybean (Roundup Ready®) in 1996. Today, nearly 99% of U.S. soybeans are genetically modified. Yield per acre remains steady to increasing. Despite a fairly level number of planted acres for the past 15 years, overall production continues to increase, and net crop value has markedly increased (Figure 5).

The Facts:

The facts speak for themselves: since the introduction of GM soybean (1996), corn (maize, 1998), and cotton (1998), yield and productivity have continued to increase while yield performance of a non-GM comparator (wheat) remains relatively flat by comparison. In soybean (the only crop for which detailed disease data are available), individual disease losses have fluctuated (and presumably will continue to fluctuate) based on many different factors as illustrated by SDS data above, but total disease loss remains flat. Allegations of U.S. agricultural system collapse are not consistent with the facts.

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