Southern Corn Leaf Blight: A Story Worth Retelling

An article in the July–August 2017 issue of Agronomy Journal recounts one of the most costly disease outbreaks to affect North American agriculture and the lessons we can draw from it for the future. Southern corn leaf blight (SCLB), a disease that had been around for decades but never a serious pest, mutated in the early 1960s to become exceptionally virulent to plants that had a common genetic background. The mutation of SCLB, first discovered in the Philippines, probably came to North America around 1968 through breeding material or seed stock. First reports of the disease were in the Corn Belt in 1969.

This came at a time when male sterile plants were discovered and used as female parents in hybrid seed corn production, eliminating hand detasseling of plants in a seed field. One male sterile, Texas male sterile, became so widely used that by 1970 it was part of the genetic constitution of 85% of all hybrid corn grown. A favorable environment in 1970 set off an epidemic of SCLB that destroyed 15% of the North American crop at a cost of more than $1 billion (>$6 billion by 2015 standards).

Male sterile germplasm is rarely used today, but a lack of genetic diversity in our crops can still leave us vulnerable to future epidemics.


Delineating Soybean Maturity Groups across the U.S.

Photoperiod and in-season temperature are the primary factors that dictate the region where a soybean variety is adapted. The first study that defined hypothetical maturity group (MG) adaptation zones across the U.S. was published 45 years ago, and the most recent study used data up to 2003. Although photoperiod remains constant, climatic conditions, management practices, and soybean genetics have changed during the past decades.

In a paper recently published in Agronomy Journal, researchers re-delineated soybean MGs across the U.S. using elite commercial germplasm yield data from publically available university variety trials conducted in 312 locations from 2005–2015.

The team identified seven MG zones starting from MG=0 in North Dakota to MG=6 in southern Georgia and South Carolina. The width of MG=4 and MG=5 zones cover the largest geographic region. In contrast to previous studies, the MG zones were defined by a downward deflection of the MG lines moving from east to west rather than convex parallel lines.

This study updates current knowledge by providing valuable information for MG decision making and regional modeling. It also highlights the need to continuously monitor and adjust the U.S. MG zones due to the constantly changing climate as well as genetic improvement and changes in crop management.