

A View from Industry: Using Biotechnology to Improve the Yield of Maize

Jeff Habben

Corteva Agriscience

During my career at Corteva, I have been involved with different research programs whose objectives were to improve the yield of field crops. I will describe two specific projects that were targeted to enhance maize performance. The first was a transgenic approach to increase the yield and yield stability of hybrids, and the second was the use of genome editing (CRISPR) to improve disease resistance in maize. For the first initiative, we discovered that increased and extended expression of a maize MADS-box transcription factor, *zmm28*, resulted in maize transgenic events with increased plant growth, photosynthesis capacity, and nitrogen utilization. When these events were tested in the field, they provided a significant increase in grain yield that was consistent across years, environments, and elite germplasms. In the second initiative, we used gene editing to co-locate maize disease resistant genes into elite hybrids. This initial product concept, which we call a "Disease Super Locus", is comprised of genes that are resistant to Northern Leaf Blight, Gray Leaf Spot, Anthracnose Stalk Rot, and Southern Rust. This gene-edited product will combine native maize resistance genes in elite commercial hybrids to combat some of the most devastating diseases in North America.