

OPTIMUM™ GAT™ TRAIT – NEW TECHNOLOGY FOR WEED MANAGEMENT IN ROW CROPS. David W. Saunders, Raymond Forney, Tim Chicoine, Jerry Green, Linda Castle, and Christine Hazel; Product Development Manager, Global Stewardship Manager, Global Product Manager, and Research Associate, DuPont Crop Protection, Newark, DE 19714; Research Coordinator and Trait Champion, Pioneer Hi-Bred International, Johnston, IA 50131.

In Optimum™ GAT™ trait plants, two traits are combined to provide a new approach to tolerance to two classes of herbicides (glyphosate and ALS-inhibitors) with broad efficacy against weeds in North Central states. The glyphosate N-acetyltransferase gene confers tolerance to glyphosate based on its rapid conversion in crops to the non-herbicidal compound N-acetylglyphosate. The gene coding for this enzyme was isolated from a naturally occurring soil bacterium, improved by gene shuffling to be more active on glyphosate, and incorporated into the germplasm of several crop species via standard molecular biology techniques. The enzyme is expressed constitutively, and confers tolerance to extremely high dosages of glyphosate throughout the plant life cycle. The acetolactate synthase gene in the Optimum™ GAT™ trait plants codes for an ALS enzyme with specific modifications in the amino acid sequence that prevent the ALS-inhibitor herbicides from binding. It provides tolerance to all classes of ALS inhibitors. This technology enables the opportunity to bring new ALS-inhibitor herbicides into crops to address a variety of weed management needs, including species that glyphosate is now having difficulty controlling. DuPont will develop solutions based on industry supported integrated management practices, including utilization of the most appropriate herbicides of various modes-of-action possessing inherent or enhanced selectivity to crops, to address glyphosate, ALS, and other herbicide resistant weed populations. These systems, delivered through proprietary blends technologies, will provide greater flexibility and choices to customers for sustainable weed control practices.