DOW AGROSCIENCES HERBICIDE TOLERANCE TRAITS (DHT) IN COTTON, CORN AND SOYBEAN

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Abstract

Dow AgroSciences is developing a family of herbicide tolerance traits, commonly referred to as Dow AgroSciences Herbicide Tolerance (DHT) traits, that provide tolerance to various broadleaf and grass herbicides, including the phenoxy auxins (e.g., 2,4-D, MCPA) as well as the aryloxyphenoxypropionate grass herbicides (e.g., quizalofop, haloxyfop)1. Two traits, DHT1 and DHT2, have been introduced recently that were developed from the gram-negative soil bacteria *Sphingobium herbicidovrans* and *Delftia acidovorans*, respectively. The basis for herbicide tolerance for each trait is a codon-optimized gene encoding for an α-ketoglutarate-dependent dioxygenase enzyme catalyzing, *in planta*, a rapid, single-step metabolic detoxification of the herbicides of interest. Tolerance to glyphosate and glufosinate will be enabled through breeding or molecular stacking with commonly known tolerance traits for these herbicides. The DHT traits have demonstrated robust herbicide tolerance in multiple broadleaf and grass crop species including cotton, soybean and corn. Candidate herbicide systems enabled by the traits have broad utility in enhancing the performance of current weed control systems and in improving the durability of the glyphosate cropping system.