

# **1854 Glufosinate-Tolerant Cotton: What Have We Learned in Three Years of Commercial Use on the Texas Southern High Plains?**

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Tolerance to glufosinate-ammonium has been bioengineered into cotton (*Gossypium hirsutum* L.) by *Agrobacterium tumefaciens* through the expression of a gene encoding the enzyme phosphinothricin acetyl transferase. This enzyme inactivates glufosinate by transferring the acetyl group of acetyl-coenzyme A to the free amino group of glufosinate. Field and growth chamber studies have confirmed that transgenic glufosinate-tolerant cotton has high levels of glufosinate tolerance (up to 8X labeled rates). Glufosinate-ammonium, a non-selective amino acid inhibitor, is foliarly applied to control many annual and perennial weeds. To achieve effective weed control with glufosinate, weed size and spray coverage are critical for maximum herbicidal activity. To accomplish season-long weed control, sequential glufosinate applications were necessary throughout the growing season. The use of residual herbicides in a LibertyLink cotton system improved weed control in most instances. Glufosinate plus pyrithiobac (Staple) applied early-postemergence (EP) followed by (fb = followed by) glufosinate plus pyrithiobac applied mid-postemergence (MP), and pyrithiobac applied preemergence (PRE) fb sequential glufosinate applications (EP fb MP) controlled Palmer amaranth and devil's-claw at least 95%.