

Weed management in conventional, no-till, and transgenic corn  
with mesotrione combinations and other herbicides

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## **ABSTRACT**

Weed management programs in corn typically include herbicides applied both preemergence (PRE) and postemergence (POST) for season-long weed control. Mesotrione is a new triketone herbicide registered for PRE and POST control of broadleaf weeds in corn. Triketone herbicides function through inhibition of the enzyme p-hydroxyphenylpyruvate dioxygenase. Mesotrione applied PRE did not adequately control common lambsquarters (*Chenopodium album* L.), smooth pigweed (*Amaranthus hybridus* L.), common ragweed (*Ambrosia artemisiifolia* L.), or morningglory species (*Ipomoea* spp.) in conventional tillage corn, but control of these weeds was generally improved in no-till corn. Mesotrione combinations with acetochlor did not always improve control of broadleaf weeds, but increased control of smooth pigweed and giant foxtail (*Setaria faberi* Herrm.). POST applications of mesotrione at 105 g ai/ha controlled most annual broadleaf weeds except common ragweed, but did not control giant foxtail. The addition of atrazine at 280 g ai/ha to mesotrione, however, improved control of common ragweed. Tank-mixtures of glyphosate, imazethapyr, or imazethapyr plus imazapyr with mesotrione improved control of giant foxtail in herbicide-resistant corn. Corn injury was usually low from PRE and POST mesotrione applications in non-genetically modified corn, however, greater injury occurred in glyphosate-resistant varieties. Corn treated with mesotrione combinations generally yielded similar to corn treated with commercial standards. Mesotrione applied POST also suppressed the perennial weeds horsenettle (*Solanum carolinense* L.) and Canada thistle [*Cirsium arvense* (L.) Scop.]. Additions of atrazine increased the rate of plant tissue necrosis on these perennial weeds as compared to the slower bleaching symptoms associated with mesotrione applied alone. In general, Canada thistle plants were more susceptible to mesotrione in the rosette stage of growth than when bolting. Absorption, translocation, and metabolism of <sup>14</sup>C mesotrione in Canada thistle was generally low. However, higher levels of absorption and translocation and lower root metabolism of mesotrione in rosette stage plants compared to

bolting stage plants may explain why Canada thistle is more susceptible to mesotrione in the rosette stage of growth. The changes in symptomology and increased control from mesotrione plus atrazine tank-mixtures is likely due to the interrelationship between the modes of action of atrazine and mesotrione.

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