EVALUATION OF WEED CONTROL WITH ALITE 27 IN HPPD-TOLERANT COTTON

Jennifer L. Dudak
Zachary R. Treadway
Todd A. Baughman
Oklahoma State University
Ardmore, OK
L. Tom Barber
University of Arkansas-Extension
Lonoke, AR
Charlie W. Cahoon
North Carolina State University
Raleigh, NC
A. Stanley Culpepper
University of Georgia
Tifton, GA
Scott A. Nolte
Texas A&M AgriLife Extension
College Station, TX
Adam C. Hixson
BASF
Lubbock, TX

Abstract

In the cotton belt, many of the utilized herbicide sites of action are proving to be of lower utility due to the increasing populations of resistant weeds. This in combination with observations of weeds resistant to auxin herbicides is of considerable concern to weed management practitioners. One of the methods to reduce pressure on the auxin herbicide technology is through the application of residual herbicides at planting. However, this can add additional challenges since early season cotton injury is often observed with these applications. BASF is currently integrating a tolerance trait to isoxaflutole (HPPD inhibitor) in cotton to provide producers another tool for weed management. Studies were conducted to evaluate the use of isoxaflutole on weed efficacy, cotton response and lint yield. A multi-state research project was conducted at seven locations across the cotton belt, including: Tillar, AR; Ty Ty, GA; Clayton, NC; Bixby, Altus, and Fort Cobb, OK; and College Station, TX. HPPD-tolerant cotton was planted and managed based on local growing practices. The following herbicide treatments were applied PRE at 6 of 7 locations: isoxaflutole (112 g ai ha^{-1}) alone and either diuron/fluometuron (560-1120 g ai ha^{-1}) or fomesafen/fluridone (210-275 g ai ha^{-1}) alone or in combination with isoxaflutole. All PRE treatments were followed by a POST application of dicamba (560 g ae ha^{-1}) + dimethenamid-P (673 g ai ha^{-1}) + glyphosate (1648 g ai ha^{-1}) + potassium carbonate (406 g ai ha^{-1}). At Tillar, AR PRE treatments included: fluometuron (841 g ai ha^{-1}) alone or in combination with isoxaflutole (112 g ai ha^{-1}), fluometuron + prometryn (560 g ai ha^{-1}), and a three-way combination of these herbicides. Three POST applications of various herbicide combinations were made following all PRE treatments at Tillar. Less than 10% visible cotton injury was observed at any location 2 weeks after planting (WAP). Additionally, the incidence of injury did not increase when isoxaflutole was combined with other herbicides. Isoxaflutole alone PRE controlled Palmer amaranth (*Amaranthus palmeri* S. Watson) and annual grass 97% or greater 2 WAP at Altus, Bixby, Fort Cobb, and Ty Ty. Isoxaflutole + diuron was the only PRE treatment that controlled over 90% of Palmer amaranth and annual grass at all locations 4 weeks after the POST application. Control of Palmer amaranth and annual grass was excellent season long at Tillar, AR. Cotton lint was harvested at all three Oklahoma locations however, differences among treatments were only documented at Bixby. Diuron, fomesafen, and isoxaflutole + diuron yielded higher than isoxaflutole or isoxaflutole + fomesafen. Isoxaflutole exhibited excellent cotton tolerance while providing control of Palmer amaranth and annual grass when used as part of an overall cotton herbicide management program.