EFFICACY OF ISOXAFLUTOLE ALONE AND WITH TANK MIX PARTNERS ACROSS THE COTTON BELT

Delaney C. Foster
Peter A. Dotray
Texas Tech University
Lubbock, TX
Seth A. Byrd
Oklahoma State University
Stillwater, OK
Stanley Culpepper
University of Georgia
Tifton, GA
Darrin M. Dodds
Steven D. Hall
Bradley Norris
Mississippi State University
Mississippi State, MS
Reagan L. Noland
Texas A&M Agrilife Extension Service
San Angelo, TX
Scott Nolte
Mason House
Texas A&M University
College Station, TX
Jason K. Norsworthy
Roger B. Farr
University of Arkansas
Fayetteville, AR
Larry Steckel
University of Tennessee
Jackson, TN
Corey N. Thompson
BASF
Lubbock, TX

Abstract

The increase in number of herbicide resistant weeds threatens Texas cotton production, forcing producers to use multiple modes of action to manage weeds. Recent cotton germplasm available on the market includes tolerance to auxinic herbicides; however, this technology has become controversial due to off-target herbicide movement. *P*-hydroxyphenylpyruvate dioxygenase (HPPD) inhibitors are a relatively new class of herbicide chemistry although first available for use in the 1980's. While current varieties do not tolerate HPPD inhibitors, BASF Corporation has developed HPPD-tolerant cotton that will allow growers to use isoxaflutole in future weed management systems. Utilizing multiple modes of action that include the use of soil residual herbicides will increase weed management options and help steward old and new technologies in the battle to minimize the development and spread of herbicide resistant weeds. In 2019, a research project was developed with collaboration from a number of universities across the cotton belt and BASF Corporation to examine weed control following isoxaflutole applied alone and with a number of different tank mix partners. Treatments included isoxaflutole at 3 fl oz/A applied alone and tank mixed with half and full rates of the following cotton herbicides: Cotoran at 16 or 32 fl oz/A, Caparol at 19.2 or 38.4 fl oz/A, Diuron at 16 or 32 fl oz/A, Brake at 8 or 16 fl oz/A, Reflex at 8 or 16 fl oz/A, Prowl at 16.8 or 33.7 fl oz/A, Dual Magnum at 10.5 or 21 fl oz/A, Warrant at 24 or 28 fl oz/A, and Staple at 1.04 or 2.08 fl oz/A. There were nine total locations of this study conducted in Arkansas, Georgia, Mississippi, Oklahoma, Tennessee, and Texas. Several weed species were examined but the target weed was Palmer amaranth. In Texas (Halfway), Georgia, Mississippi, and Tennessee, all full rate tank-mix partners improved Palmer amaranth control when compared to using isoxaflutole alone. Isoxaflutole + Brake controlled Palmer amaranth 80% and 100% 56 day after planting (DAP) in Arkansas and College Station, respectively. In Texas, isoxaflutole tank-mixed with full rates of Brake, Cotoran, Warrant, or Dual at Halfway or tank-

mixed with full rates of Brake, Warrant, Diuron or Dual at College Station controlled Palmer amaranth >98% and >95%, respectively, 56 DAP. A decline in Palmer amaranth control was most rapid in Tennessee, Mississippi, and Arkansas and early postemergence applications will be needed to extend effective weed control in cotton.