CONTROL OF VOLUNTEER COTTON WITH DICAMBA AND 2,4-D

T.A. Baughman
Oklahoma State University
Ardmore, OK
P.A. Dotray
Texas Tech University
Lubbock, TX

Abstract

Volunteer cotton has developed as a problem with the increase in no-till and reduced-till systems and where in-season cultivation has also been eliminated. This is especially true in the southwest production region where the lack of winter rainfall reduces deterioration of the seed prior to the next season's planting. This combined with a monocrop cotton system can lead to severe issues in which volunteer cotton competes for resources with the subsequent cotton crop. Additionally, if left uncontrolled volunteer cotton can cause harvesting issues. Therefore, studies were initiated to investigate the new technologies (Enlist and Xtend) in controlling volunteer cotton that does not contain that particular technology. Trials where conducted at the Oklahoma State University Caddo Research Station near Ft Cobb, OK during the 2018 growing season. "PhytoGen 340W3FE" was planted in the Enlist trial and volunteer cotton was over seeded by hand spreading seed from a non-Enlist cotton cultivar. "NexGen 4545B2XF" was planted in the Xtend trial and volunteer cotton was over seeded by hand spreading a non-Xtend cotton cultivar. Enlist Duo was applied at 76 fl oz/A and Xtendimax at 22 fl oz/A in their respective technologies. Treatments were applied PRE, POST1 (1-2 leaf), POST2 (4-5 leaf), POST3 (Square), or POST4 (Bloom). Plots were visually evaluated for volunteer control. Plots were harvested with a commercial cotton stripper to determine yield. An additional study was conducted where seed cotton was collected from 7 different cotton fields in the spring of 2019. These fields had been in cotton during the 2018 growing season. Seed was cleaned from the samples and germination test were performed on the seed samples. Germination trials consisted of 4 replications with 25 seeds each for a total of 100 seeds and included 3 runs for each location. Volunteer cotton control was less than 10% for PRE applications of both Enlist Duo and Xtendimax. Enlist Duo controlled volunteer cotton 100% late season when applied at the 1-2 or 4-5 leaf growth stage. Volunteer cotton control decreased to 84% when the Enlist Duo application was delayed to squaring and 64% when the application was delayed to bloom. Volunteer cotton control was 91% and 88% when Xtendimax was applied at the 1-2 or 4-5 leaf stage. Control decreased to 40% when the Xtendimax application was delayed to squaring and to 11% when the application was delayed at bloom. While volunteer cotton control was generally less with Xtendimax it was critical with either the Enlist or the Xtend technology to make application at the 1-2 leaf or 4-5 leaf growth stage to achieve acceptable control. Control was reduced with both technologies when control was delayed till squaring or blooming. Cotton lint yields were increased over the untreated control with all Enlist Duo applications except when control was delayed to the blooming stage. Even though visual control was lower with the PRE and the POST3 applications of Enlist Duo cotton yields were improved compared to the untreated control. Cotton lint yields were improved over 30% when Enlist Duo was applied at the 1-2 or 4-5 leaf growth stage. Cotton lint yields were improved with the PRE, POST1, and POST2 applications of Xtendimax. POST3 and POST4 applications of Xtendimax yielded similar to the untreated control. Cotton lint yield was improved 65% when Xtendimax was applied at the 1-2 leaf growth stage. Cotton seed germination never exceeded 30% in any samples collected in the spring of 2019. The average germination for all locations was 19% with a minimum germination of 13% and a maximum germination of 28%. This is likely due to the rainfall that occurred in the winter and early spring after cotton harvest in 2018. The Altus Mesonet recorded over 9-in of rain from December 2018 through March 2019. This was evident in grower's fields where volunteer cotton was not as severe a problem as during the 2018 growing season (dry winter and spring).