# PLANT-BACK INTERVAL FOR ELEVORE AND QUELEX PRIOR TO PLANTING COTTON

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## Abstract

Auxin herbicides are widely used preplant burndown prior to planting cotton to control glyphosate- and ALS-resistant horseweed. Halauxifen-methyl, the active ingredient in Elevore™ and a component of Quelex™, is a new auxin herbicide marketed by Corteva Agrisciences for horseweed control. Unlike 2,4-D and dicamba, cotton tolerance to halauxifen applied preplant burndown to cotton is not well established. Labels for Elevore™ and Quelex™ require at least 30 and 90 days between application of these herbicides and cotton planting, respectively. The objective of this study was to evaluate cotton tolerance to Elevore™ and Quelex™ applied preplant burndown at intervals shorter than 30 days. Experiments were established at 8 locations across North Carolina and Virginia during 2017 and 2018. Cotton was planted either strip- or no-till at all locations; if planted strip-till, tillage was performed at least 30 days prior to cotton planting and before any herbicide treatments were applied. Cotton cultivars 'ST 4946 GLB2' and 'ST 5020 GLT' were planted early to mid-May. Experiments consisted of a 5x4 factorial arrangement of treatments including 5 burndown timings and 4 herbicide treatments. Burndown herbicides were applied 4, 3, 2, and 1 weeks before planting (WBP) and at planting. Herbicide treatments included Elevore (1 fl oz/A), Clarity (8 fl oz/A), Weedar 64 (32 fl oz/A) and no herbicide. Plots were organized in a randomized complete block design with treatments replicated 4 times. During 2018, additional treatments included Quelex (0.75 oz wt/A) applied at 2 and 4 WBP. Herbicides were applied using a $CO_2$-pressurized backpack sprayer calibrated to deliver 15 GPA. Data collected included cotton injury 7, 14, and 28 days after emergence (DAE), cotton stand and percent cotton plants with distorted leaves 14 and 28 DAE, cotton height 28 and 56 DAE, and seed cotton yield. Analysis of variance was preformed using PROC GLIMMIX procedure in SAS 9.4 and means were separated using Fisher's protected LSD at $P = 0.05$ where appropriate. Cotton response was greatest from auxin herbicides applied at planting; therefore, data for this timing are presented separately. Data for burndown timings 1-4 WBP are presented pooled across timings. Dicamba and 2,4-D applied at planting were most injurious, causing 17 to 20, 21 to 26, and 17 to 22% growth reduction, total injury, and distorted leaves at 14 days after emergence (DAE), respectively. In contrast, Elevore applied at the same timing caused 3, 9, and 6% growth reduction, total injury, and distorted leaves 14 DAE, respectively. Furthermore, 2,4-D and dicamba applied at planting reduced cotton stand 14 DAE compared to the nontreated check whereas Elevore did not. Cotton injury from all auxin herbicides applied 1 to 4 WBP was minimal and had no effect on cotton stand. Despite early season injury from auxin herbicides applied at planting, cotton yield was not affected. Quelex applied 2 or 4 WBP injured cotton 2% or less. In conclusion, cotton tolerance to Elevore and Quelex is good if current label requirements are followed. At shorter intervals, cotton was more tolerant to Elevore than 2,4-D and dicamba. It should be noted that wet springs were experienced during 2017 and 2018. Like other auxin herbicides, it is expected that dry conditions between application and planting will exacerbate cotton injury resulting from Elevore and Quelex; future research efforts should focus on these conditions.