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Impact of Adjuvants and Nozzle Types on Cotton Injury From Flumioxazin Applied Post-Directed

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Flumioxazin {2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1H-isoindole-1,3(2H)-dione}, a soil residual herbicide that is practically non-selective when applied to plant foliage, is being developed for post-directed application to cotton (*Gossypium hirsutum* L). The extent of cotton injury by flumioxazin when applied with various spray nozzles and adjuvant combinations is unknown. Therefore, field experiments were conducted to determine the effect of eight adjuvants and 10 nozzle types on cotton injury by flumioxazin postdirected at 70 g ai ha⁻¹. The adjuvants had minor impact on cotton injury by flumioxazin. None of the adjuvants caused more than 10% injury 7 days after treatment (DAT), and cotton yield was not different among adjuvants. Cotton injury 7 DAT was less than 8% for all nozzles except for flat-fan flood nozzles, which produced 19% injury. Cotton injury at 28 DAT and cotton yield were not different among nozzles. Laboratory studies were also conducted to determine the effect of adjuvants and placement of ¹⁴C-flumioxazin on the cotton stem on absorption. Adjuvants had little effect on stem absorption, but placement of flumioxazin on green stem tissue resulted in greater absorption than placement on bark tissue. Recovery of ¹⁴C-flumioxazin placed on green stem was 10 to 23%, and on bark tissue was 21 to 35%. Lower recovery of ¹⁴C-flumioxazin from the green stem indicates greater absorption by the plant. Based on these data, it was concluded that for maximum cotton safety, flumioxazin should be post-directed after bark formation, and care should be taken to avoid contact with green stem tissue.