PALMER AMARANTH POPULATION DYNAMICS IN COTTON WITH HERBICIDE PROGRAMS INCLUDING DICAMBA
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Abstract
Selection for herbicide-resistant biotypes, especially Palmer amaranth (*Amaranthus palmeri* S. Wats) has made managing weeds in cotton challenging. Cotton with traits expressing tolerance to dicamba, glufosinate, and glyphosate is being developed for the US market and has shown promise in managing weeds that are resistant to glyphosate and other herbicides. The majority of weed management trials focus on comparing the effectiveness of cultural practices and herbicides during a single season at many locations. The effectiveness of dicamba in controlling Palmer amaranth over multiple growing seasons has not been determined in cotton. Research was conducted to monitor changes in the Palmer amaranth populations over four years when herbicide programs including residual herbicides and total postemergence herbicides with glyphosate and dicamba in dicamba-tolerant cotton were used. A rapid increase in Palmer amaranth population and frequency of resistance to glyphosate when glyphosate was the only herbicide applied was observed. Including dicamba, an herbicide with a MOA different than glyphosate, was effective in preventing the frequency of glyphosate resistance from increasing during the first three years of the experiment compared with levels noted for glyphosate alone. The residual herbicides with a MOA different from glyphosate (diuron, pendimethalin) contributed to reductions in Palmer amaranth population throughout the experiment and the frequency of glyphosate resistance early in the experiment. Although these results indicate that dicamba can have a positive impact on herbicide resistance and weed management in cotton, herbicide programs with dicamba-tolerant cotton will require multiple tactics to preserve this technology.