USE OF FLURIDONE FOR RESIDUAL PALMER AMARANTH (*AMARANTHUS PALMERI*) CONTROL ON DITCHBANKS AND TURNROWS

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Abstract

The evolution of herbicide resistance in Palmer amaranth has had a detrimental effect on Arkansas crops over the past 20 years, with resistance being confirmed to two mechanisms of action; acetolactate synthase (ALS) inhibitors in 1994 and glyphosate in 2006. Herbicide-resistant Palmer amaranth control requires that diverse mechanisms of action be used in a herbicide program; albeit, no new modes of action have been discovered and commercialized for almost 30 years. Controlling glyphosate-resistant Palmer amaranth on turnrows and ditchbanks is as important as controlling it in crop fields, because of its pernicious weed characteristics, including the ability to produce high numbers of seed, adding to the existing soil seedbank, and its ability to successfully grow under many environmental conditions. Controlling herbicide-resistant Palmer amaranth on ditchbanks and turnrows is also important to reduce seed dispersal into surrounding crop fields. Besides controlling Palmer amaranth on ditchbanks and turnrows, allowing a high percentage of grass groundcover to remain is important to prevent ground erosion and further reduce Palmer amaranth emergence. The herbicide fluridone was synthesized in the 1970s. Since 1985, fluridone has been marketed for use in waterways, including ditches as an aquatic herbicide under the trade name Sonar®. Research also concluded that fluridone is highly persistent in various textured soil. Because of its persistence, fluridone could possibly provide season-long control of Palmer amaranth on ditchbanks and turnrows.

An experiment was conducted to understand the effectiveness of fluridone and other labeled herbicides for controlling Palmer amaranth on ditchbanks along with their impact on grass groundcover. The experiment consisted of two rates of fluridone, 1.0 and 2.0 lb ai/A; six rates of diuron from 2.0 to 12.0 lb ai/A; aminopyralid at 0.44 lb ae/A; indaziflam at 0.41 lb ai/A; and saflufenacil at 0.134 lb ai/A. The first rainfall event was received more than two weeks after treatments (WAT) were applied.

At 9 WAT, both rates of fluridone provided greater than 90% Palmer amaranth control and were comparable to all other treatments. The higher rate of fluridone and the six rates of diuron allowed for less than or equal to 20% grass groundcover. While fluridone at 1.0 lb/A, aminopyralid, indaziflam, and saflufenacil allowed for greater than or equal to 40% grass groundcover. By 18 WAT, no herbicide provided effective season-long control. Significant differences were seen between the two fluridone rates. The highest rate of fluridone was comparable to all rates of diuron, except for the lowest rate of 2.0 lb/A. Both rates of fluridone and the six rates of diuron allowed for less than 30% grass groundcover. Conversely, the treatments of aminopyralid, indaziflam, and saflufenacil allowed for greater than 40% grass groundcover. In conclusion, Palmer amaranth control with fluridone was fair compared to other herbicides that are registered for use on ditchbanks or turnrows, such as diuron. Palmer amaranth control with fluridone was lower than anticipated probably because of insufficient rainfall for adequate activation throughout the season.