

A KANSAS KOCHIA POPULATION FOUND RESISTANT TO A USE RATE OF GLYPHOSATE.
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Kochia (*Kochia scoparia* L.) has been reported to be resistant to herbicides in the triazine, ALS inhibiting, and synthetic auxin families. An increased number of complaints concerning inadequate control of kochia with glyphosate have occurred during the growing seasons of 2006 through 2008 in western Kansas. Seed was gathered from a meandering row of kochia indicating a common maternal parent kochia plant had rolled across a cotton field in Stevens County, KS. The cotton field was generally free of weeds except for the row of kochia plants. The field had been treated three times with 0.84 kg ha⁻¹ ae glyphosate. The objective of this experiment was to determine if the suspected glyphosate resistant kochia population would respond differently to glyphosate than a known susceptible kochia population. Greenhouse experiments were conducted using the Stevens County biotype (R) and a susceptible kochia biotype (S) which was gathered from the sandhills of Finney County, KS. Seeds were planted in 1 L pots and after emergence thinned to four plants per pot. Glyphosate at 0, 0.42, 0.84, 1.68, and 3.36 kg ae ha⁻¹ was applied to 2 to 4 cm kochia in Experiment 1 and at the same rates plus 1.26 and 2.52 kg to 7 to 10 cm kochia in Experiment 2. All glyphosate treatments were applied with ammonium sulfate at 2% w/w. Visual injury ratings were taken 2 and 4 weeks after treatment (WAT). Live and dead kochia plants were counted to determine percent mortality 2 and 4 WAT. The S kochia biotype was controlled 100% when glyphosate at 0.84 kg was applied to kochia 2 to 4 or 7 to 10 cm tall 4 WAT. However, the R kochia biotype treated with 0.84 kg glyphosate when plants were 2 to 4 cm tall was injured 88% and had 42% mortality 4 WAT. When 7 to 10 cm R kochia were treated with 0.84 kg glyphosate, a 43% injury rating and 0% mortality rate were observed. Clearly there is a differential response to glyphosate when the R and S biotypes were compared. The R biotype had escapes when glyphosate at 3.36 kg was applied to 2 to 4 cm plants and when glyphosate at 1.68 kg was applied to 7 to 10 cm plants. Thus 0.84 kg ae use rate of glyphosate likely will not control the R kochia biotype in the field. The greenhouse experiments confirm the 2007 field observation which suggests that the R biotype would withstand 0.84 kg ae glyphosate and actual field observations indicate that kochia would produce viable seed while other genetically unrelated kochia in the treated field were controlled. Glyphosate resistance in kochia likely will become an increasing problem where glyphosate only is used for weed control.