

ENVOKE EFFICACY IN ARIZONA COTTON
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Abstract

Experiments were conducted at University of Arizona Agricultural Centers to evaluate the efficacy of Envoke (trifloxysulfuron or CGA 362622) on two difficult to control weeds in Arizona cotton production systems, purple nutsedge and ivyleaf morningglory. A study at the Maricopa Ag. Center in 1998 examined the effect of sequential topical and post-directed herbicide applications on purple nutsedge. Topical applications of glyphosate at 0.75 lb ae/A, DSMA at 3.6 lb ai/A and Envoke at 0.11 oz ai/A resulted in 54, 27, 64% control of purple nutsedge, respectively, compared to the untreated check 25 days after treatment (DAT). The corresponding injury ratings (primarily stunting) were 5, 18, and 23% compared to 22% stunting in the untreated check 25 DAT. Sequential topical applications followed by (fb) post-directed applications of glyphosate at 0.75 fb 0.75 lb ae/A, DSMA at 3.6 fb MSMA at 2 lb ai/A, Envoke at 0.11 fb 0.14 oz ai/A, Envoke at 0.11 fb 0.21 oz ai/A, and glyphosate at 0.75 lb ae/A fb Envoke at 0.14 oz ai/A resulted in 90, 26, 78, 86 and 88%, respectively, compared to the untreated check 40 DAT and the corresponding injury or stunting 19 DAT was 0, 38, 21, 18, and 15%, respectively, compared to 38% injury in the untreated control due to nutsedge competition. Yield of the sequential treatments listed above were 870(a), 641(bc), 741(ab), 820(a), and 855(a) lb lint/A compared to 555(c) lb lint/A in the untreated control. (Means followed by the same letter were not significantly different at $P=0.05\%$ according to the Student-Newman-Keuls mean separation test.) These data indicate that purple nutsedge competition adversely affected cotton yield in the untreated control and that cotton recovered from the early season injury caused by the topical Envoke applications. At the Tucson Campus Ag. Center in 1999 and 2000, the effects of various rates and number of applications of halosulfuron (a herbicide similar to Envoke), Envoke and glyphosate on purple nutsedge were measured by visually estimating injury (chlorosis and necrosis), by following changes in the number of green leaves of flagged large (8 leaves) and small (4 leaves) plants and by counting regrowth within 3.5 cm of small and large plants. The greatest overall control (70-95%) of purple nutsedge in plots was obtained by applying at least 2 applications of halosulfuron at 0.5, 0.75 and 1 oz ai/A or Envoke at 0.11 and 0.21 oz ai/A. After a single application of each herbicide, purple nutsedge control declined and was similar to the control 85 DAT. All herbicide treatments controlled small plants (resulting in a average of 0.5 green leaves following treatment) including the two lowest rates of Envoke (0.071 and 0.11 oz ai/A). Greatest injury of large plants (about 1.5 green leaves following treatment) was obtained by applying halosulfuron at 0.5, 0.75 and 1 oz ai/A or Envoke at 0.11 and 0.21 oz ai/A. Two applications of halosulfuron at 0.5, 0.75 and 1 oz ai/A or Envoke at 0.11 and 0.21 oz ai/A effectively limited regrowth (only 1 new shoot) around small and large plants. Two glyphosate formulations (Roundup Ultra and Touchdown) at 0.75 lb ae/A were equivalent and provided control comparable to halosulfuron and Envoke if applied at least 3 to 4 times at two week intervals. An experiment was conducted at the University of Arizona Safford Agricultural Center in 2002 to evaluate Envoke for post-directed annual morningglory (MG) weed control at the 12 inch tall growth stage and at layby in Roundup Ready cotton. Trifluralin at 0.5 lb ai/A was applied preplant incorporated to the entire field and all plots were sprayed topically at the 2 to 3 leaf growth stage of cotton with glyphosate (Roundup Ultra) at 1.125 lb ae/A. The standard comparison treatment was a post-directed application of Touchdown at 0.75 lb ae/A plus AMS when the cotton was 12 inches tall followed by a layby treatment of Touchdown at 0.75 lb ae/A plus Caparol at 1.6 lb ai/A when the cotton was about 24 inches tall. This treatment resulted in 74% control of large MG (8 to 10 leaf) and 98% control of small MG (2 leaf or smaller) 15 DAT and 91% control of all MG following the layby application. All of the Envoke post-directed treatments resulted in 95% or better control of small MG plants. Envoke at 0.11 and 0.14 oz ai/A resulted in 86 and 87% large MG control, respectively, and these rates tank-mixed with Touchdown at 0.75 lb ae/A plus AMS resulted in similar large MG control of 78 and 85%, respectively (not significantly different from the Envoke alone treatments). Two types of layby treatments were compared; Caparol alone at 1.6 lb ai/A plus 0.05% v/v NIS or Suprend (a 1:112 ratio of Envoke and Caparol) at 1.28 lb ai/A plus 0.05% NIS. There was little difference between these two treatments when compared across all of the post-directed herbicide treatments with respect to annual morningglory control which ranged from 88 to 92% control. Envoke caused little noticeable injury when post-directed or used at layby and represents a good choice when registered for post-directed and layby applications to cotton especially when nutsedge species are present.