

WEED CONTROL AND CROP RESPONSE IN TRIBENURON-TOLERANT SUNFLOWER. Amar S. Godar\*, Phillip W. Stahlman, and Anita J. Dille, Graduate Research Assistant, Department of Agronomy, Kansas State University, Manhattan, KS 66506, Research Weed Scientist, Kansas State University Agricultural Research Center, Hays, KS 67601, and Associate Professor, Department of Agronomy, Kansas State University, Manhattan, KS 66506.

Two experiments were conducted at KSU Agricultural Research Center, Hays, KS, in 2007 with moderate to low infestations of broad-leaf weeds to assess the weed control and crop response in tribenuron-tolerant sunflower. Evaluation of weed control level by species, and crop response in terms of stunting, chlorosis, and malformation were made on percent visual basis.

In the first experiment, 10 treatments were combinations of tribenuron in terms of time (3 and 4 weeks after planting (WAP), frequency (single and double), and rate (8.75 and 17.5 g ai/ha) of application with quizalofop (61 g ai/ha), plus two imazamox treatments (35 and 17.5 g ai/ha at 3 and 4 WAP, respectively), a weed-free check, and an untreated check. All the tribenuron treatments provided significantly superior (90-100%) control of Russian thistle compared to both imazamox treatments. The results showed a similar pattern for the control of Puncturevine except for tribenuron at 17.5 g ai/ha applied 4 WAP. Imazamox at 35 g ai/ha applied at 3 WAP appeared to be as good as all the double applications of tribenuron in controlling Pigweeds. However, both imazamox applications and the tribenuron applications of 17.5 g ai/ha at 3 WAP provided the same level of Kochia control as all the double applications of tribenuron. None of the tribenuron treatments caused significant crop injury. At 1 week after application (WAA), imazamox applied at 35 g ai/ha at 3 WAP demonstrated noticeably higher level of stunting ( $31.25 \pm 2.4\%$ ), chlorosis ( $23.75 \pm 1.25\%$ ) and malformation ( $43.75 \pm 3.75\%$ ) as compared to imazamox applied at 17.5 g ai/ha at 4 WAP (stunting  $7.5 \pm 1.45\%$ , chlorosis  $10 \pm 2\%$ , and malformation  $0\%$ ). At 2 WAA, stunting, chlorosis, and malformation decreased to  $20 \pm 4.6\%$ ,  $0\%$ , and  $16.25 \pm 2.4\%$ , respectively for imazamox applied at 35 g ai/ha at 3 WAP and no significant injury symptoms were observed for imazamox applied at 17.5 g ai/ha at 4 WAP. The plant height measured at 8 WAP and the seed yield did not differ significantly among the treatments; however, a weak relationship ( $r^2 = 3.96$ ) was observed between the plant height and the seed yield.

In the second experiment, the treatments consisted of two rates of tribenuron (8.75 and 17.5 g ai/ha) without and in combination with label rates of pendimethalin, sulfentrazone or S-metolachlor. Quizalofop (61 g ai/ha) and COC (1% v/v) were applied tank-mixed with respective post-emergence treatments at 24 days after planting (DAP). Evaluation of pre-emergence applications at 24 DAP showed sulfentrazone as the best treatment for controlling all the weed species evaluated. However, pendimethalin and S-metolachlor were found to be as good as sulfentrazone in controlling Kochia, and Kochia and Pigweeds, respectively. Tribenuron alone provided the same level of control of all the weed species except Pigweeds as tribenuron in combination with pre-emergence herbicides. However, Pigweed control was significantly improved when the rate of tribenuron increased from 8.75 to 17.5 g ai/ha. None of the treatments caused significant stunting and malformation of the sunflower plants at 6 days after application (DAA) of post-emergence treatments. However, 17.5 g ai/ha of tribenuron alone and the same rate in combination with pendimethalin caused  $11.25 \pm 1.25\%$  and  $8.75 \pm 2.4\%$  chlorosis, respectively; and no chlorosis was observed at 12 and 17 DAA, respectively. Height of the sunflower plants measured 8 WAP showed no significant differences among the treatments, and the result was the same for seed yield. However, the seed yield was appeared to be correlated ( $r = 0.73$ ) to the height of the plant. In conclusion, in a condition of a moderate to low infestation of broad-leaf weeds, a single application of tribenuron alone at the higher rate can provide a satisfactory level of weed control without any significant injury to sunflower.

