

IN VIVO AND IN VITRO INTERACTION OF CHLORSULFURON WITH ACETOLACTATE SYNTHASE (ALS) FROM CHLORSULFURON-RESISTANT AND SUSCEPTIBLE *ARABIDOPSIS THALIANA*.

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Growth of chlorsulfuron-resistant and susceptible *A. thaliana* plants was inhibited by lower concentrations of chlorsulfuron than required to inhibit their ALS activity. Fresh weight accumulation was inhibited 82% by 10 nM chlorsulfuron and 34% by 500 nM chlorsulfuron in susceptible and resistant biotypes, respectively. ALS activity was inhibited 40% by 10 nM chlorsulfuron and less than 25% by 5,000 nM chlorsulfuron in susceptible and resistant biotypes, respectively. The difference between *in vivo* and *in vitro* response may be partially explained by deactivation of ALS *in vivo*. Extractable ALS activity was reduced 46% and 24% in susceptible and resistant biotypes, respectively, 12 h after foliar application of chlorsulfuron (0.086 g L^{-1}). The time-course of ALS inhibition was determined *in vitro* for both biotypes. Inhibition of susceptible ALS increased with time until 60 minutes after chlorsulfuron addition and was partially reversible by gel filtration (used to remove chlorsulfuron from the solution). While chlorsulfuron inhibited resistant ALS, inhibition was fully reversed by gel filtration. The results suggest that resistant ALS was less susceptible to *in vivo* deactivation and that herbicide/ALS interaction differs between the two biotypes.