

VELVETLEAF EPSPS MRNA EXPRESSION WITH TIME OF DAY, GLYPHOSATE APPLICATION, AND LEAF NUMBER. Aaron L. Waltz, Don J. Lee, Alex R. Martin, and Fred W. Roeth, and Scott R. Baerson, Graduate Student, Professor, Professor, Professor, Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, NE 68583-0915, and Research Scientist, USDA-ARS Natural Products Research Unit, University, MS 38655.

Much is known about commercialized glyphosate-resistant EPSPS expression, but very little information exists about native EPSPS expression. What are the expression levels or patterns of the EPSPS enzymes from important weed species? Does mRNA expression data give any information as to the susceptibility of weed species to glyphosate or changes in expression with growth stage, time of day, or in response to glyphosate application?

EPSPS mRNA expression was studied using real-time PCR. Degenerate EPSPS primers were designed using consensus sequence from available databases. The species involved was velvetleaf. Plants were placed in a growth chamber (25 +/- 2 C night/day, 60-70% RH, 15 hr photoperiod from 6:00 to 21:00) one week before treatments were applied. For time of day experiments, leaves were extracted at 5:00, 7:00, 13:30, 20:00, and 22:00. For glyphosate application experiments, plants were sprayed with 1 lb ai/A glyphosate at 13:30. Untreated leaves were extracted at 13:30, while treated and untreated leaves were extracted at 14:15, 15:00, 16:30, 19:30, and 1:30 and 13:30 the following day. Leaf number experiments consisted of extracting leaves 6 through 9 from the same plant. Total RNA was isolated from frozen leaf samples using a modified Trizol method. All experiments for velvetleaf were conducted twice. Initial results indicate changes in EPSPS mRNA expression.