

GLUFOSINATE PHYSIOLOGY IN COTTON AND TROUBLESOME WEED SPECIES**Wesley J. Everman****Scott B. Clewis****Alan C. York****John W. Wilcut****North Carolina State University****Raleigh, NC****Abstract**

Greenhouse studies were conducted in Raleigh, NC to evaluate absorption, translocation, and metabolism of ^{14}C -glufosinate in glufosinate-resistant cotton, non-transgenic cotton, goosegrass, large crabgrass, Palmer amaranth, pitted morningglory, and sicklepod. Cotton plants were treated at the 4 leaf stage; whereas goosegrass, large crabgrass, Palmer amaranth, pitted morningglory, and sicklepod were treated at 5, 7.5, 7.5, 10, and 10 cm, respectively. All plants were harvested at 1, 6, 24, 48, and 72 h after treatment (HAT). Absorption of ^{14}C -glufosinate was $\geq 87\%$ 24 hours after treatment in Palmer amaranth and sicklepod. Absorption was $< 30\%$ at all harvest intervals for glufosinate-resistant cotton, non-transgenic cotton, and pitted morningglory. Significant levels of translocation were observed in Palmer amaranth. ^{14}C -glufosinate was translocated to the region above the treated leaf and the roots up to 41 and 27%, respectively, and up to 49 and 15% to regions above and below the treated leaf, respectively, in Palmer amaranth. Metabolites of ^{14}C -glufosinate were detected in all crop and weed species. Metabolism of ^{14}C -glufosinate was $< 20\%$ in non-transgenic cotton and pitted morningglory, however metabolism rates were $> 70\%$ in glufosinate-resistant cotton and large crabgrass 72 hours after treatment. Intermediate rates of metabolism were observed for Palmer amaranth, sicklepod, and goosegrass with metabolites comprising $> 30\%$ of detectable radioactivity.