

INVESTIGATING THE DISSEMINATION OF HERBICIDE RESISTANCE IN WATERHEMP. Jianyang Liu, Patrick J. Tranel, and Adam S. Davis, Postdoctoral Research Assistant and Professor, Department of Crop Science, University of Illinois, Urbana, IL 61801, Ecologist, USDA-ARS, Urbana, IL 61801.

Glyphosate-resistant (GR) waterhemp poses a great threat to crop production in the midwestern United States. Seed and pollen dispersal contribute to the dissemination of GR waterhemp, and this dispersal may be facilitated by anthropogenic forces. We conducted field surveys to model the dynamics of a GR waterhemp population in south-central Illinois during 2008 and 2009. This population was identified as GR in 2006. In 2008, seed collections (accessions) from single females were obtained within an approximately 30-ha area around the initial resistant population. Glyphosate treatment of plants grown from these seed collections indicated that GR waterhemp plants could be found throughout the sampled area. However, accessions did not have uniform frequencies of resistant individuals. More widespread sampling was performed in 2009, with over 900 accessions collected in an area ranging up to 45 km from the original field site. These accessions are currently being analyzed for glyphosate resistance. Tissue samples were also obtained in 2009 from the maternal plants of each accession. Glyphosate resistance in maternal plants will be determined using a molecular assay. Resistance data from both maternal plants and their progeny should enable estimation of the relative contributions of seed vs. pollen movement to the dissemination of GR waterhemp.