

BENCHMARK STUDY: SEEDBANK EMERGENCE PATTERNS IN BEST MANAGEMENT PRACTICES FIELDS VERSUS GROWER PRACTICES. Robert G. Wilson, Gustavo M. Sbatella, Stephen C. Weller, Bryan G. Young, David L. Jordan, Micheal D.K. Owen, Philip Dixon, and David R. Shaw, Professor and Post-doc, University of Nebraska, Scottsbluff, NE 69361, Professor, Purdue University, West Lafayette, IN 47907, Professor, Southern Illinois University, Carbondale, IL 62901, Professor, North Carolina State University, Raleigh, NC 27695, Professor and Professor, Iowa State University, Ames, IA 50011, Professor, Mississippi State University, Mississippi State, MS 39762.

A multi-state, four-year field scale study was initiated in 2006 to assess the impact of weed management tactics on weed populations in glyphosate-resistant (GR) crops. A total of 155 commercial fields in Illinois, Indiana, Iowa, Mississippi, Nebraska and North Carolina were included in the study and seedbank, weed populations and yields were enumerated during the growing season. Fields selected for the project in 2006 had been in a glyphosate-resistant cropping system for the previous 3 yr. Each field was divided into two sections with half managed for weed control as typical for the grower and the other half managed following recommendations by a university weed specialist within the state. Forty sample locations were established throughout each field with GPS coordinates within the two sides of the study site. Cropping systems examined in the study included; continuous GR crop (corn, soybean, and cotton), a rotation of two GR crops and a rotation of a GR crop and a non-GR crop. The seedbank was measured each spring by taking a 6.4 cm diameter by 15 cm deep soil core in 20 locations in each half of the field. Soil samples were kept separate and placed in a greenhouse and exposed to three cycles of wetting, drying and freezing conditions over a 104-day period and weed seedling emergence was utilized to estimate the weed seedbank during each cycle. Measurement of the seedbank in the spring of 2006 indicated that weed seed density was similar in the grower and university sections of the field for each of the seven cropping systems. However the seedbank in fields that had previously been in continuous glyphosate-resistant soybean (GRS) had a greater seed density than fields in a cropping system of continuous glyphosate-resistant corn (GRC). Interestingly by rotating GRS with another glyphosate-resistant crop reduced the number of weed seed in the seedbank and the number of weed seedlings emerging before crop planting compared to continuous GRS. In the spring of 2007 the number of seed in the seedbank in the grower and university managed sections of the field were again similar for all cropping systems except GRS rotated with a non-glyphosate-resistant crop. These studies have continued and results will allow us to further delineate the influence of cropping systems and degree of weed management on species shifts and resistance management.