

EFFECT OF GLYPHOSATE RATE AND APPLICATION TIMING ON COMMON COCKLEBUR, VELVETLEAF, AND COMMON WATERHEMP SEED PRODUCTION, VIABILITY, GERMINATION, AND DORMANCY. Brent M. Swart, Micheal D.K. Owen, and Allen D. Knapp, Graduate Student, Professor of Agronomy, and Associate Professor of Agronomy, Iowa State University, Department of Agronomy, Ames, IA 50011-1010

Glyphosate is the primary herbicide for weed control in soybean production systems in the U.S.. Glyphosate programs are very attractive to soybean producers due to the wide use of glyphosate resistant soybeans, the ease and flexibility of application, and the wide weed control spectrum. Soybean producers, looking to lower input costs, may reduce herbicide rates. Unfavorable environmental conditions may force untimely glyphosate applications. Field and laboratory experiments were conducted in Ames, IA in 2002 at two different field locations to determine the influence of post-emergence application timings and rates of glyphosate on seed production, viability, germination, and dormancy of common cocklebur, velvetleaf, and common waterhemp in soybeans. Viability of common cocklebur seed was significantly lower than untreated controls in one location but not the other while common waterhemp viability was also significantly lowered. Germination and dormancy of common cocklebur and common waterhemp seeds were not significantly different than untreated controls at any location. Bur production was considerably affected by glyphosate treatment as nearly all common cocklebur plants treated with any rate of glyphosate died. Common waterhemp seed production was reduced from controls for all timings except the early-postemergence timing. Velvetleaf germination and dormancy were significantly affected by glyphosate rates while viability was not. Velvetleaf seed production responded differently to application timings with greatest reductions when glyphosate was applied during flowering. Overall, reduced seed production was the most consistent affect of glyphosate application timings and rates.