

IMPACT OF WEEDS THAT SURVIVE THE FIRST GLYPHOSATE APPLICATION IN SOYBEAN. Bryan G. Young, Julie M. Young, Joseph L. Matthews, Associate Professor and Researchers, Department of Plant, Soil, and Agricultural Systems, Southern Illinois University, Carbondale, IL 62901.

Sole reliance on glyphosate for weed management in soybean continues to be the major strategy implemented by growers. With increasing commercial frequency, the first in-season application of glyphosate may not provide complete weed control and is influenced by weed size, species, and adverse environmental conditions for foliar herbicide activity. Some commercial instances have been reported where glyphosate provided minimal suppression of certain weed species which results in the need for a second application of glyphosate within weeks of the first herbicide application. Questions have developed concerning the extent of competition the surviving weeds may apply on the developing soybean crop in terms of potential yield loss. Even though a second glyphosate application may provide complete weed control, the weeds were not removed from the crop at the desired timing with the initial glyphosate application. Field research was conducted over three years to determine the competitive load from the weeds that may potentially survive glyphosate applications in soybean. A rate titration of glyphosate was applied to weeds at 10 to 20 and 25 to 35 cm in height. This resulted in a gradient of minimal to high levels of weed control to simulate a range of possible glyphosate failures. Two weeks after treatment a full rate of glyphosate was applied to remove any weeds that survived the initial glyphosate application.

Yellow nutsedge, common ragweed, common waterhemp, and giant ragweed were controlled to a lesser extent by the reduced rates of glyphosate than other weed species evaluated. Even though the growth of these weeds was suppressed to a certain degree by the lowest rate of glyphosate utilized (54 g ae/ha), soybean yield data suggests these weeds did compete with soybean over a two-week period, pooled over the two initial glyphosate application timings. The magnitude of soybean yield loss varied by the extent of weed control achieved with the initial glyphosate application as well as the environmental conditions over years and the primary weed species present. This research confirms that any potential soybean yield loss as a result of weed survival from sublethal rates of glyphosate may be greater than the additional cost for higher application rates of glyphosate.