

GLYPHOSATE-RESISTANT GIANT RAGWEED COMPETITION AND CONTROL IN MID-SOUTH COTTON

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Abstract

Giant ragweed has been primarily considered a weed of floodplains, fence rows, and ditch banks, but in more recent years has become an issue in agronomic crops across the United States. Previous work determined that giant ragweed was one of the most competitive weeds in corn and soybean and can reduce yields with low populations of giant ragweed. However, little is known about the effects of giant ragweed in cotton. Therefore a field study was conducted in 2011 and 2012 to demonstrate the effect of giant ragweed on cotton maturity, lint yield, and fiber quality. Giant ragweed densities were 0, 1, 2, 4, 8, and 16 weeds per 4 row by 30 ft. plot. Plots were maintained weed free throughout the growing season. Cotton heights, node above cracked boll ratings, lint yield, and fiber quality characteristics were assessed. The objectives of this study were to determine if giant ragweed would reduce cotton height, delay maturity, reduce yield, and fiber quality at each of these populations. Cotton height was reduced by low populations of giant ragweed early in the growing season. At the 4-lf stage, a giant ragweed population of 2 or more plants per plot significantly reduced height from the non-treated control and populations of 4 or more plants reduced height at the 8-lf and 12-lf stages. A hyperbolic decay model indicated that low populations of giant ragweed can significantly reduce yield due to season long competition. One giant ragweed plant per plot reduced yield by 250 lb/A and yield continued to decrease with increasing populations. Approximately 2.5 giant ragweed plants reduced yield by 50% from the non-treated control. Yield of the border rows where giant ragweed indirectly competed with cotton also resulted in a steady decrease of yield with increasing populations. At 18.5 giant ragweed plants, just slightly higher than the highest population of 16 plants, 50% yield loss would occur with the border rows. Season long giant ragweed competition significantly impacts cotton growth, development, and yield. Control options will need to be utilized for growers to maintain yields.

GR giant ragweed was first confirmed in 2007 in Tennessee and has continued to become more problematic throughout this region. Few control options are available for control of GR giant ragweed in cotton. Glufosinate is one of the more effective control options for GR giant ragweed; however, this herbicide can only be applied to glufosinate-tolerant varieties. Therefore, field studies were conducted in 2009, 2010, and 2011 to determine control options for GR giant ragweed in cotton. Pyriproxyfen, trifloxysulfuron, and fluometuron were utilized and applied in combination with glyphosate or glufosinate. All applications were applied once at either the 1-lf or 5-lf cotton stage, with the exception of a glufosinate followed by glufosinate application. The objectives of this study were to determine cotton response to herbicide applications, GR giant ragweed control, and lint yield. Few treatments resulted in higher than 80% control of GR giant ragweed at 4 wk after the 5-lf application. Glufosinate plus fluometuron at the 1-lf stage or the 5-lf stage (either rate) were the only single application treatments that resulted in 80% control. Glufosinate followed by glufosinate was the only treatment that resulted in higher than 90% control. While several herbicide treatments statistically did not differ from the highest yielding treatment, these were the only four treatments that were the highest yielding and had at least 80% control. Sequential applications of herbicide treatments containing glufosinate will be important for controlling GR giant ragweed and maintaining cotton yields.

References

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