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Concerns with Pigweed Control in RR Cotton

Currently, we are investigating control problems involving Palmer amaranth (Palmer pigweed) in Roundup Ready cotton at specific sites in Central Georgia. Field histories, plant/seed collections, greenhouse experiments, and field studies, indicate probable glyphosate resistance in Palmer pigweed. Additional work regarding species verification and the heritability of the trait are needed to provide confirmation of resistance for the scientific and regulatory communities. The problem does not appear to be widespread, but we are evaluating weed response in fields in the vicinity of the identified sites to better understand the situation.

Unquestionably, this poses a serious potential threat to cotton production in our region.

Scientists from Monsanto, registrant of Roundup Ready cotton, are providing technical expertise and material assistance to address the problem. Together we are seeking to determine the distribution of suspected resistant pigweed and to outline control strategies in cotton and other crops. In some instances, we are encouraging producers to eliminate and remove escaped pigweed to limit seed production and the severity of future problems.

Resistance should not be confused with other herbicide performance failures. Among the factors that can reduce weed control with glyphosate are issues linked to environmental effects, sprayer calibration, application procedures, spray coverage, herbicide rate, and weed size. Weed size is particularly critical. We suspect that as pigweed (even susceptible plants) initiate reproductive growth, response to glyphosate may decline considerably, making separation of susceptible and resistance types more difficult this late in the growing season and calendar year.

We expect to provide more definitive statements on the issue by mid-September. Contact your local County Extension Agent for additional information or assistance.

Summary Points:

- UGA county agents and scientists have identified populations of Palmer pigweed which are not effectively controlled with normal rates of glyphosate. This has occurred in a limited number of fields of Roundup Ready cotton in Central Georgia.
- To date, evaluations have included both field and greenhouse studies in which plants were treated with glyphosate at and above recommended rates.
- Roundup Ready cotton was commercialized in Georgia in 1997 and the technology is planted on over 90 percent of the states' acreage. Both RR soybeans and corn are also planted in Georgia. Occasional failures of pigweed occur most years but are often linked to application methods, environmental

stresses, and improper application timing. Response at these identified sites is outside the normal “nonperformance” problems.

- According to the Herbicide Resistance Action Committee, “Weed resistance is the naturally occurring inheritable ability of some weed biotypes within a given weed population to survive a herbicide treatment that would, under normal use conditions, effectively control that weed population.”
- Positive confirmation of resistance requires field and greenhouse evaluations as well as evaluation of a population over more than one generation. At this point, UGA and Monsanto scientists are comfortable in stating that our investigations have detected “probable” resistance. Additional studies are needed to confirm this conclusion, and these experiments are currently being initiated. Since pigweed is a rather diverse genus, UGA scientists are awaiting exact species verification to confirm that the plant involved is Palmer amaranth.
- The occurrence of this problem underscores the importance of using a multiplicity of tools to control weeds in RR crops. Reliance on a sole herbicide (in this case, glyphosate) creates considerable potential for weed resistance and weed population shifts. While work is ongoing to identify the best control strategies for potentially resistant Palmer pigweed in RR cotton and other RR crops, historical weed management efforts indicate the value of employing residual herbicides and cultivation to supplement control. Control strategies will be discussed over the coming months.
- UGA and Monsanto scientists are seeking to determine the distribution of suspected resistant Palmer pigweed. This involves collection of field data, possible re-treatment with glyphosate, and collection of seed for greenhouse evaluation.
- Growers who are confident of their timing and application of glyphosate in RR cotton and yet have a few escapes of Palmer pigweed might consider hand removal to limit future problems.

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