

TIMELY INFORMATION

Agriculture & Natural Resources

COTTON WEED MANAGEMENT: GLYPHOSATE-RESISTANT PIGWEED

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Cotton in Alabama and much of the Southeastern U.S. is primarily grown with transgenic varieties. Over 90 percent of Alabama cotton contains a Roundup Ready gene giving the variety tolerance to glyphosate herbicide. Roundup Ready Flex varieties will replace older Roundup Ready varieties by 2010. Glyphosate-resistant palmer pigweed was found in a South Georgia cotton field in 2005 and has since spread to an estimated 500,000 to one million acres in Georgia and South Carolina. Alabama Cooperative Extension System personnel and USDA-ARS weed scientists confirmed the presence of glyphosate-resistant palmer pigweed in Barbour county Alabama during 2008. We anticipate it will spread across South Alabama fields in the coming years. Managing this weed in cotton will require the use of soil-residual herbicides and timely postemergence herbicides other than glyphosate.

Soil-applied (residual) herbicides available for weed control in all varieties of cotton in Alabama include: fomesafen (Reflex), metolachlor (Dual, etc), pendimethalin (Prowl), trifluralin (Treflan, etc.), fluometuron (Cotoran, etc.), prometryn (Caparol, etc.), diuron (Karmex, etc.), norflurazon (Solicam), pyriithiobac (Staple), and flumioxazin (Valor). Trifluralin must be incorporated within eight hours of application to be effective. Metolachlor must be applied early postemergence after cotton emerges in order to prevent crop injury on most Alabama soils. Valor must be used either early preplant (14 to 21 days ahead of planting) or post-directed to prevent crop injury. Metolachlor, trifluralin, and pendimethalin primarily control small-seeded broadleaf weeds (pigweed, Florida pusley, etc.) and annual grasses (crabgrass, goosegrass, etc.). Reflex, Solicam, and metolachlor have some nutsedge activity in addition to good residual pigweed activity. Fluometuron, prometryn, diuron, norflurazon, pyriithiobac, and flumioxazin also have significant activity on large-seeded broadleaf weeds like morningglory. All of these soil-residual products have significant activity on pigweed (**including glyphosate-resistant biotypes**) and are foundations for resistant pigweed management in crop rotations.

There are limited options for **postemergence-over-top weed management** in cotton. Pyriithiobac (Staple), trifloxysulfuron (Envoke) and MSMA (at low rates) are available for broadleaf weed control in all cotton varieties after emergence. They have activity on pigweed, but the weeds must be less than two inches tall in most cases. Envoke application must be delayed until cotton has at least five true leaves. **If soil-applied herbicides fail due to lack of activation (no timely rainfall), then it will almost impossible to control glyphosate-resistant palmer pigweed with these herbicides due to the weeds rapid growth rate.** Liberty-Link cotton varieties are available that are genetically modified to tolerate gluphosinate (Ignite) herbicide. Ignite has good postemergence activity on small pigweed (three inches or less). Post-directed herbicides including prometryrn, diuron, linuron (Lorox, etc.), lactofen (Cobra),

oxyflurofen (Goal), and flumioxazin all have good activity on emerged pigweed but they must be directed to the base of the cotton stalk and some require cotton a minimum of 12 inches tall to prevent crop injury. They should also be mixed with MSMA for better foliar activity. Paraquat (Gramoxone, etc.) has activity on pigweed but must be applied with a hooded sprayer for crop safety. Most of these herbicides in addition to fluometuron can also be used as layby (the last time a tractor sprayer can get through the field before the crop gets too tall) treatments in cotton. **Layby treatments with residual activity will be extremely important in controlling glyphosate-resistant pigweed.**

Finally, in order to maintain season-long control of weeds, especially glyphosate-resistant pigweed in cotton, a systems approach should be used. Start with a good soil-applied residual herbicide or herbicides, follow with the appropriate postemergence over-the-top foliar herbicides in a timely manner (when weeds are small), and follow lastly with residual layby herbicide applications.

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