

POTENTIAL FIT OF ROUNDUP READY COTTON IN GEORGIA

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Abstract

Roundup Ready cotton is expected to be commercially available on a limited basis in 1997. Previous research and experience with Roundup in conservation tillage, hooded sprayers, and Roundup-tolerant crops provide considerable knowledge about how this new technology might be adapted in cotton in Georgia.

To date, there are few independent evaluations of the agronomic characteristics of Roundup Ready cotton. An important assumption regarding this technology is that the yield and fiber quality of these transgenic varieties are comparable to existing commercial standards.

Labeled uses of Roundup in Roundup Ready cotton include over-the-top applications in cotton up to the 4th leaf stage with directed applications necessary thereafter. Timing restrictions are related to the potential for square and boll shed following topical applications during fruiting.

Existing weed management programs have developed over a number of years and involve multiple chemical and mechanical control measures. Each component of existing systems has specific weed targets, and for this new technology to be practical, Roundup must effectively replace two or more current inputs.

Identified weaknesses of Roundup include Florida pusley, yellow and purple nutsedge, morningglories, and volunteer peanuts. In addition, inadequate control of many weeds results if applications are made during periods of temperature and/or moisture stress, particularly if weeds exceed a few inches.

The three most significant questions regarding Roundup Ready technology in cotton are: 1) Can Roundup replace preplant incorporated treatments? 2) Can Roundup replace preemergence treatments? 3) As a directed treatment, is Roundup comparable to alternatives?

Displacement of the preplant incorporated dinitroaniline herbicides is unlikely because of the consistent residual control these treatments provide on small seeded annual weeds. Of particular importance in this list is Florida pusley, a species difficult to control with any postemergence herbicide including Roundup. While it might be desirable to leave off the dinitroanilines because of the expense and

problems associated with incorporation and because of potential adverse effects on crop vigor, risks of escapes of such species entrenches the value of these treatments.

Preemergence treatments are inherently erratic, especially in dryland production. Common complaints involve weed control failures and crop injury. Sicklepod, cocklebur, morningglories and several other broadleaves are among the weeds most often targeted with preemergence treatments. The decision to NOT use preemergence herbicides increases the importance of the timing of postemergence control. In much of Georgia, early season rain delays are rarely more than a couple of days, and thus timely application of Roundup may provide comparable control of many of these species, with only suppression expected for morningglories. The consistency of early postemergence applications of Roundup is expected to be comparable to current systems which include both preemergence and early post directed or over-the-top treatments.

Accordingly, the goal of an early Roundup treatment is to replace preemergence and other early post treatments, allowing the crop to reach 7 or 8 inches with only small weeds remaining. That stage is the obvious time for a follow-up directed application. With weaknesses on nutsedge and morningglories, a second Roundup application (directed) is probably not the best choice. Alternatives include cyanazine (Bladex, Cy-Pro) or diuron (Karmex, Direx, etc.) plus MSMA. In addition to superior control of nutsedge and morningglories, these combinations also provide some residual control.

The possibilities are many. Incorporating these ideas suggests a system which includes 1) preplant dinitroaniline, 2) early post Roundup, and 3) Bladex plus MSMA. Other programs may prove successful, but those that eliminate all residual herbicides require greater management and have greater risk.