

**EFFECT OF PENDIMETHALIN OR S-METOLACHLOR CO-APPLIED WITH GLYPHOSATE AND
PYRITHIOBAC ON COTTON GROWTH AND YIELD**

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Abstract

Research was conducted at the Dean Lee Research and Extension Center in Alexandria, LA, Northeast Research Station in St. Joseph, LA, Northwest Research Station in Bossier City, LA, and the Delta Research and Extension Center in Stoneville, MS in 2009. Research investigated the effect of co-applying pendimethalin or *S*-metolachlor with glyphosate plus pyriithiobac with nonionic surfactant (NIS) or without NIS on cotton growth and yield. Data collected included cotton phytotoxicity, plant heights, plant node number, and cotton yield.

Rainfall, or lack thereof, caused variable results across all locations. Co-applications of glyphosate, *S*-metolachlor, and pyriithiobac caused 33% cotton injury 3 d after application (DAA) in Alexandria, LA. The addition of NIS in the co-application of glyphosate, pendimethalin, and pyriithiobac injured cotton 27% 3 DAA in Alexandria, but the same treatment without NIS caused only 20% injury. Injury 3 DAA by the *S*-metolachlor three-way co-application was 19% in Bossier City with and without the addition of NIS. Like Alexandria, the addition of NIS to the pendimethalin three-way co-application increased injury of cotton. No injury from any treatment was observed in St. Joseph, which may be attributed to the lack of rainfall prior to and soon after application reducing cotton growth. In Stoneville, MS, all treatments containing *S*-metolachlor injured cotton more than pendimethalin-containing treatments and no difference in injury was observed when comparing pyriithiobac with and without NIS 3 DAA. No differences in location were observed for cotton injury 14 DAA. All *S*-metolachlor treatments injured cotton more than pendimethalin-containing treatments 14 DAA. Also, no differences in cotton injury were observed between pyriithiobac and pyriithiobac plus NIS 14 DAA, but both caused greater injury than all treatments without pyriithiobac 14 and 21 DAA.

All treatments that contained *S*-metolachlor plus pyriithiobac reduced cotton heights an average of 4 cm 21 DAA in Alexandria, LA. In Bossier City, LA and Stoneville, M.S, all three-way co-applications reduced cotton heights 2-6 cm 21 DAA. Cotton heights were not reduced by any treatment in St. Joseph, LA 21 DAA. No treatment reduced cotton height 43 DAA or cotton node number 21 or 43 DAA.

Rainfall amounts of 11 to 17 inches were recorded at all locations in October 2009, which may have masked any differences treatments may have caused. Yields ranged 600 to 850 lb lint/acre. Although data was highly influenced by rainfall throughout the growing season at each location, it indicates that applications of glyphosate, *S*-metolachlor, and pyriithiobac (with and without NIS) can cause significant injury 3 DAA. Adding pendimethalin

rather than *S*-metolachlor may reduce the incidence of injury 3 DAA if no NIS is added to the treatment. As seen in previous research, injury lessens 14 to 21 DAA and cotton growth is not severely affected. Research of the feasibility of these treatments will continue.