

Prowl And Treflan In A Roundup-Cotton Reduce Tillage System

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With the long-term use of Roundup (glyphosate), Roundup resistant weeds are expected to become more prevalent. Preplant residual herbicides in a Roundup cotton weed management program have the potential to reduce the potential for Roundup resistant weeds and preserve the Roundup Ready Technology. A 2-year (2007-2008) study at Verona and Stoneville, MS evaluated preplant incorporated herbicides (Prowl H2O and Treflan) as a substitute for one early postemergence Roundup application in a Roundup weed management program. The preplant herbicides were applied and incorporated as a one-pass operation system with an incorporator-bed-roller implement (Prepmaster®, Bigham Brothers, Lubbock, TX), 4 to 6 weeks before and at planting. This implement also eliminates harrowing beds at planting.

The preplant herbicides were applied to both no-tillage (no fall tillage) and conventional tillage [fall in-row subsoil plus hip (bed) followed by spring rehip and roll] main plot treatments at Stoneville; and no-tillage (no fall tillage) and conventional tillage (fall Paratill® under-the-row subsoil plus bed-roller) main plot treatments at Verona. The Prowl H2O (pendimethalin) and Treflan (trifluralin) preplant incorporated "Prepmaster" treatments only received a mid-postemergence (MPOT, 4 to 6-leaf cotton) Roundup application, while the "Prepmaster" alone (no preplant herbicides) treatment received two Roundup applications [early postemergence (EPOT, 1 to 3 leaf cotton) and MPOT]. All treatments received a Roundup burndown application in February-March and at planting, and a Roundup + Direx (diuron) post-directed application at layby. Phytogen PHY 485WRF variety was planted in late April or mid-May in 38-inch rows at Verona, MS and in 40-inch rows at Stoneville, MS.

Weed infestations at both locations were light to moderate in 2007 and 2008. However, at MPOT application, the preplant Treflan and Prowl H2O treatments which received no Roundup application at EPOT showed lower weed control than treatments without preplant herbicides that had received an EPOT Roundup application. However, mid to late season weed control at both locations was excellent with no

differences among treatments.

Above normal rainfall occurred at both locations in August and September 2007 and 2008. The 2007 and 2008 study lint yield averages were 1632 and 1450 lb/acre for Verona and 1320 and 932 lb/acre for Stoneville, respectively. Treflan incorporated at planting with the "Prepmaster" at Verona in 2007 and 2008 had 14% stand reductions, 7 to 13% early season crop stunting injury and 2 to 8% lower yield than the study mean yield. However, Prowl and Treflan applied preplant 4 to 6 weeks before planting and Prowl applied preplant at planting in both years had no negative effect on plant population, crop injury and yield. However, both Prowl and Treflan preplant applications made 4 to 6 weeks before and at planting at Stoneville in 2007 and 2008 had no negative effect on plant populations, crop injury or yield.

There were no yield differences between no-tillage and conventional tillage systems in 2007 and 2008 at Verona and in 2007 at Stoneville. But, there was a tillage by Prepmaster-herbicide system interaction for yield at Stoneville in 2008. With the "Prepmaster" (no preplant herbicides) applications, no-tillage had higher yield than conventional tillage when applied in late March, with no tillage differences when the "Prepmaster" was applied at planting. Treflan "Prepmaster" applications in late March and at planting with conventional tillage had higher yield than no-tillage. Conventional tillage had higher yield than no-tillage when Prowl "Prepmaster" applications were made at planting in late March, with no tillage differences when "Prepmaster" was applied in late March. Treflan "Prepmaster" late March application had the highest yield for conventional tillage while the Prepmaster (no preplant herbicides) had the highest yield for the no tillage treatments. Both of these treatments showed no yield differences.

In summary, Prowl or Treflan in combination with "Prepmaster" implement, applied in late March or at planting, has the potential to minimize the development of Roundup resistance weeds. However, Treflan has the potential to cause some initial crop injury when applied at planting. The use of the "Prepmaster" implement also can reduce the number of trips across the field and improve cotton planting efficiency. Δ