

THE EFFECTS OF TOPICAL APPLICATIONS OF PROWL® H₂O ON COTTON FRUITING**J. Trenton Irby****Daniel B. Reynolds****Darrin M. Dodds****Jonathan A. Huff****Mississippi State University****Mississippi State, MS****Alvin Rhodes****BASF Corporation****Madison, MS****Abstract**

The introduction of glyphosate-resistant (GR) cotton in 1997 brought forth changes with respect to weed management in cotton production. Prior to 1997, weed control was achieved with soil applied herbicides, postemergence herbicides (POST), postemergence-directed herbicides (PD), and cultivation. Due to the utilization of early postemergence treatments of glyphosate on GR cotton, the use of preemergence (PRE) residual herbicides has declined. Without using residual herbicides, problems such as late season weed pressure, shifts in weed populations, or weed resistance may arise. Residual herbicides such as Prowl® (pendimethalin) have been shown to provide excellent control of several annual grass species with no injury to cotton when applied PRE. Extensive research has been conducted with regards to the effect of PRE and pre-plant incorporated (PPI) applications of Prowl® to cotton. However, limited data are available for the effects of different formulations of POST applied Prowl® to cotton growth and development. Therefore, field experiments were performed in order to determine the effect of formulation and application rate of Prowl® applied POST on fruit partitioning in cotton. Experiments were conducted at the Blackbelt Branch Experiment Station in Brooksville, MS in 2005 and 2006 and at the R.R. Foil Plant Science Research Center near Starkville, MS in 2006. In 2005, DP 444 B/R cotton was planted in 12.6 by 40 feet plots. The same plot size was used in 2006 when ST 4554 B2RF and DP 444 B/R cotton was planted at the Brooksville and Starkville locations, respectively. The experimental design was a randomized complete block with treatments being replicated 4 times. The herbicide treatments were applied at the 4th true leaf stage. Herbicide treatments were comprised of Roundup Original Max® (4.5 lb ae glyphosate /G) at 22 oz/A applied in combination with each of the following: Prowl® H₂O 3.8EC at 1.6 pt/A, 3.2 pt/A, and 6.4 pt/A; Prowl® 3.3 EC at 1.8 pt/A, 3.6 pt/A, and 7.2 pt/A; and Dual Magnum® 7.62 EC at 1.33 pt/A. Applications were made using a compressed air hooded sprayer system at an output rate of 15 gallons per acre. At harvest, treatments were box mapped in order to determine boll partitioning on the plant. In each plot, a 10 foot section was harvested and bolls were counted and weighed by node position on the plant and boll position on each node. From the box mapping data, yield totals were calculated in lbs/A. The results of these data indicate that Prowl® H₂O had no effect on fruit partitioning in horizontal zones or yields when compared to Roundup Original Max®, Dual Magnum®, or the untreated. With respect to fruit partitioning in horizontal positions, significant differences were only observed for position 1 on plants receiving more than a 1X rate of Prowl® H₂O or any rate of Prowl® 3.3 EC. No differences were observed for partitioning on vegetative branches. Differences were observed for aborted plants receiving a 2X or 3X rate of Prowl® H₂O or a 3X rate of Prowl® 3.3 EC when compared to the untreated. This study shows that labeled residual herbicides can be applied POST to cotton with low occurrences of injury. Utilizing these herbicides as POST applications could add residual activity to GR cotton systems; however, further research needs to be conducted in order to properly assess the injury that may occur, particularly with treatments such as Prowl®, which are not currently labeled for use POST.