

AGRONOMIC PERFORMANCE OF VARIETIES TOLERANT TO GLUFOSINATE HERBICIDE**Tom Barber****University of Arkansas Division of Agriculture****Little Rock, AR****Darrin Dodds****Mississippi State University****Mississippi State, MS****Christopher L. Main****University of Tennessee****Jackson, TN****Abstract**

Ignite (glufosinate) is a non-selective herbicide used to control broadleaf and grass weed species in tolerant crops. Liberty Link crops including several cotton cultivars have been genetically transformed to contain the BAR and PAT genes which confer glufosinate tolerance. WideStrike cotton cultivars contain cry1Ac and cry1F genes that provide tolerance to certain lepidopteron pests. The WideStrike varieties also contain the PAT gene which was inserted as a selectable marker for the cry1Ac and cry1F transformations. Due to the presence of the PAT gene, WideStrike varieties also confer some tolerance to Ignite herbicide. Research was conducted over five locations in Arkansas, Mississippi and Tennessee focusing on WideStrike cultivar tolerance to multiple applications of Ignite herbicide. WideStrike varieties evaluated in the study include PHY 367 WRF, PHY 375 WRF, PHY 440 W, PHY 499 WRF and PHY 565 WRF. These varieties were compared to several Liberty Link varieties including: FM 1735LLB2, FM 1773LLB2 and FM 1845LLB2. All varieties were subjected to two applications of Ignite at 29 oz/A at 1 to 3 leaf and 6 to 8 leaf cotton, with treated plots compared to untreated, weed free checks for all varieties. Data recorded in this study included plant injury at 7, 14 and 28 days after each Ignite application. Plant heights, number of main stem nodes and nodes above white flower were recorded as well. Node above cracked boll, first position fruit retention, lint yield, lint percent and fiber quality characteristics were measured at maturity. Analysis of the data indicate that the only significant Ignite by variety interactions occurred with plant injury 7 days after initial treatment, number of nodes 14 days after initial application and lint yield at harvest. WideStrike varieties displayed visual injury of approximately 10 to 15 percent after the initial 29-oz/A application of Ignite at the 2 leaf cotton stage. PHY 440 W displayed 3-5 percent higher injury than any of the other WideStrike varieties. Damage to WideStrike varieties was reduced to 5 to 10 percent by 14 days after the initial application. The second application of Ignite did not injure the WideStrike varieties as much as the first. All varieties recovered visually by 28 days after the final application. Injury on all Liberty Link varieties was observed to be less than 2 percent. The number of main stem nodes was affected at 14 days after the initial Ignite application where WideStrike varieties on average contained one less node than Liberty Link varieties. Lint yield of Liberty Link varieties was significantly lower than that of most WideStrike varieties evaluated with the exception of PHY 565 WRF which yielded equivalent to the Liberty Link varieties. PHY 375 WRF and PHY 499 WRF were the highest yielding varieties in the study reaching 1798lbs and 1895lbs lint/A respectively. However, PHY 375 WRF, PHY 367 WRF, PHY 440 WRF and PHY 499 WRF all recorded lint yields of 65 to 110 lbs lint/A less where two applications of Ignite were made compared to these varieties in the untreated check. Results from this data indicate that crop injury can be observed when WideStrike varieties are sprayed with Ignite. Yields can also be reduced, especially in high yield environments. Environmental conditions and high levels of plant stress could increase potential injury and yield loss from Ignite applications on any WideStrike variety.