



WITH UP-TO-DATE SOYBEAN PRODUCTION INFORMATION

MISSISSIPPI SOYBEAN PROMOTION BOARD PROJECT NO. 45-2016 2016 FINAL REPORT

TITLE: The Use of Bolt Soybean to Mitigate Off-Target Deposition of Grasp and Regiment Applications to Rice

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OBJECTIVES

Determine the level of tolerance of Bolt soybean to titrated rates of Grasp.

Determine the level of tolerance of Bolt soybean to titrated rates of Regiment.

In 2015, DuPont Pioneer released a new herbicide-tolerant soybean called BOLT™. This is a further development of their STS (sulfonylurea-tolerant) soybean line and was developed from plants that were found to exhibit tolerance higher than available STS soybean. This technology allows producers to spray LeadOff® (rimsulfuron, thifensulfuron) and Basis® Blend (rimsulfuron, thifensulfuron) on soybean crops. Both of these herbicides have active ingredients that are ALS inhibitors and therefore have the same mode of action as Grasp® and Regiment®.

Soybean are often grown in close proximity to rice. Off-target deposition of ALS-inhibiting herbicides used in rice can result in severe soybean injury and yield loss. The increased tolerance to ALS herbicides by BOLT™ soybean may provide protection to these off-target herbicides. Therefore, an overall evaluation of soybean with BOLT™ technology as a drift mitigation tool for off-target deposition of Grasp® and Regiment® herbicides on rice is necessary. If successful, BOLT™ soybean use could be widely adopted by local growers to provide a strong safety net for the protection of off-target herbicides.

The two main objectives of this study were to determine the tolerance level of BOLT™ soybean to titrated rates of Grasp® and Regiment® and their effects on yield. The study was conducted in 2016 in Brooksville, Starkville, and Stoneville, MS.

Six different concentrations of each herbicide (1x, 1/4x, 1/16x, 1/64x, 1/256x, 1/1024x of a full labeled rate) were applied to BOLT™ soybean at the three-leaf growth stage (V3). Each application also included a surfactant with Grasp® including MSO – premium blend at a rate of 2.33 L/ha and Regiment® including Dyne-a-Pack at a rate of 1% v/v. All applications were made at a delivery volume of 140 L/ha using Teejet AIXR 110015 nozzles.

These treatments were then compared to an untreated check and then visual ratings for phytotoxicity were recorded 7, 14, 21, and 28 DAT (days after treatment). Plant heights and node counts were recorded 14 and 28 DAT. Soybean yields (kg/ha) were recorded at the conclusion of the growing season. The results indicate that BOLT™ soybean had a relatively higher tolerance to Grasp® than Regiment® at the rates evaluated. Furthermore, if drift rates of Grasp® have a concentration of a.i. lower than 1/4x of the full rate, then BOLT™ soybean yield was not affected. If drift rates of Regiment® had a concentration of a.i. lower than 1/16x of the full rate, then BOLT™ soybean yield was not affected.



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Evaluate available Bolt varieties for differential tolerance to Grasp and Regiment.

In 2015, DuPont Pioneer released a new herbicide-tolerant trait called BOLT™. This trait is a further development of their STS (sulfonylurea-tolerant) soybean and was developed from plants that were found to exhibit tolerance higher than the normal STS soybean trait. This technology allows producers to spray LeadOff® (rimsulfuron, thifensulfuron) and Basis® Blend (rimsulfuron, thifensulfuron) on soybean crops.

Both of these herbicides have active ingredients that are ALS inhibitors and therefore have the same mode of action as Grasp® and Regiment®. Therefore, an overall evaluation of soybean with BOLT™ technology and evaluating the possibility of using soybean with BOLT™ technology as a drift mitigation tool for off-target deposition of Grasp® and Regiment® herbicides on rice is necessary. If successful, BOLT™ soybean use could be widely adopted by local growers to provide a strong safety net for the protection of off-target herbicides.

The main objective of this study is to evaluate available BOLT™ varieties for differential tolerance to Grasp® and Regiment®. This study was conducted in Brooksville and Starkville, MS. The study was a 3x2x3 factorial arrangement of treatments nested in a RCB design. The factors were three different bean types (Non-STS, STS, and BOLT™), two maturity groups (late group 4, early group 5), and three applications (Grasp, Regiment, untreated check) for a total of 18 treatments. Each application also included a surfactant with Grasp® including MSO – premium blend at a rate of 2.33 L/ha and Regiment® including Dyne-a-Pack at a rate of 1% v/v. All applications were made at the three-leaf growth stage (V3) at a delivery volume of 140 L/ha using Teejet AIXR 110015 nozzles.

Treatments were then compared to their respective untreated checks and visual ratings for phytotoxicity were taken 7, 14, 21, and 28 DAT. Plant heights and node counts were also taken 14 and 28 DAT. Soybean yields (kg/ha) were recorded at the conclusion of the growing season.

The results indicated that BOLT™ soybean varieties showed significantly less injury at 28 DAT than other varieties. However, the yield of BOLT™ soybean varieties was not statistically better than STS varieties but was greater than Non-STS varieties.