IGNITE AND LIBERTYLINK COTTON EVALUATIONS FOR THE CALIFORNIA PRODUCTION SYSTEM

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Abstract Herbicide tolerant cotton varieties provide growers a weed management option that can both reduce weed control costs and provide effective management of hard-to-control weeds. Although Roundup Ready varieties comprise 40% of the Acala and Upland cotton acreage, the evaluation and integration of LibertyLink cotton into the California cotton production system will provide growers with an additional control option and herbicide resistant management tool. Field studies were conducted from 2002 to 2004 to evaluated weed control efficacy and tolerance of both LibertyLink and non-LibertyLink Acala cotton to Ignite (glufosinate). Ignite was applied over-the-top of LibertyLink FM966L cotton in the 4 to 5 leaf stage when pigweed (*Amaranthus* spp) and black nightshade (*Solanum nigrum*) were in the 2 to 8 leaf stage. Control was excellent when weeds were 4 true leaves or less with control being poor when weeds were 5 true leaves or greater. When Ignite was tank mixed with either Staple (pyrithiobac sodium) or MSMA, the 5 true leaf weeds were effectively controlled. There were no differences in control regardless of whether Ignite followed a PPI application of Treflan (triflurin) or not. No injury was observed on the cotton with Ignite alone, although some injury was noted when tank mixed with Staple or MSMA. Ignite applied post-directed to non-LibertyLink Acala cotton exhibited mild injury to the lower stem and leaves contacted by the spray solution. Plant mapping indicated no detrimental effect to fruiting nodes. Both pigweed and black nightshade in the 2 to 4 leaf stage were effectively controlled.

Introduction Herbicide tolerant cotton varieties provide growers a weed management option that can both reduce weed control costs and provide effective management of hard-to-control weeds. Although Roundup Ready varieties comprise 40% of the Acala and Upland cotton acreage, the evaluation and integration of LibertyLink cotton into the California cotton production system will provide growers with an additional control option and herbicide resistant management tool.

Materials and Methods Field studies were conducted from 2002 to 2004 to evaluate weed control efficacy and tolerance of both LibertyLink and non-LibertyLink Acala cotton. Treatments were divided into Treflan (trifluralin) pre-plant or not. Ignite alone or in combination with Staple, MSMA or Dual Magnum was applied over-the-top (OT) of FM966L cotton in the 4 to 5 leaf stage when pigweed (*Amaranthus* spp) and black nightshade (*Solanum nigrum*) were in the 2 to 8 leaf stage. Sequential treatments of Ignite in combination with Staple, MSMA and Dual Magnum were applied directed (DIR) when the cotton was at the 12 to 14 leaf stage. OT treatments were applied with a tractor drawn sprayer with 8002 flat fan nozzles delivering 16 to 20 gallons per acre spray solution at 40 psi. DIR applications were made with two OC-02 nozzles per row. Evaluations of weed control and crop injury were taken throughout the season and the cotton was harvested for yield in 2004.

Results and Discussion

2002 Puncturevine (PV) exhibited 90 to 100% control at 9 and 23 DAT. Ignite at 0.522 lb ai/A exhibited the greatest control of barnyardgrass (BYG) at 84% at 9 DAT, by 23 DAT no treatment exhibited acceptable control of BYG at 18 to 38% control. Field bindweed (FB) was suppressed at both 9 and 23 DAT at 38 to 55% control at 9 DAT and 30 to 40% at 23 DAT. At 9 DAT, the greatest control of tumbling pigweed (PW) was exhibited by both rates of Ignite tank mixed with Ammonium Sulfate (AMS). At 23 DAT, no treatment exhibited acceptable control of

PW. The greatest cotton injury was exhibited by Ignite at both rates tank mixed with AMS at 74 to 85% injury. Ignite alone exhibited 18 to 20% injury. Post directed application of Ignite to non LibertyLink cotton results in slight necrotic lesions to the lower portion of the plant that is contacted by the spray solution.

2003 Weed size at application is critical to control as is indicated at the 6/11 (9 DAT) evaluation. Treflan alone or Ignite + Staple either with or without Treflan preplant appeared to overcome the size differential. All treatments except Treflan followed by Staple+ Prism exhibited excellent control of 4 TL or less PW and BNS. The 5 TL or greater stage PW was effectively controlled by Treflan ppi, Ignite + Staple with or without Treflan ppi. Treflan ppi exhibited no control of BNS and all treatments except Ignite tank-mixed with Staple either with or without Treflan preplant exhibited unacceptable control. By 7/8, after cultivation, the treatments exhibited 84 to 100% control of new germination of both PW and BNS.

2004 At 8 and 13 DAT, the OT treatments provided excellent control of black nightshade. The greatest injury was exhibited by the OT treatment of Ignite + MSMA but not significantly different from Ignite + Staple at 8 DAT. By 13 DAT, Ignite + Staple was exhibiting significantly less injury than Ignite + MSMA. The OT application of Ignite + Dual II Magnum exhibited greater injury than the DIR application. Treflan followed by Ignite OT and DIR, and Ignite + Staple, MSMA or Dual II Magnum and applied DIR provided good to excellent control of field bindweed at 7 DAT the DIR application. Ignite + MSMA applied OT still exhibited the greatest crop injury at this time. The greatest yield was exhibited by Treflan PPI followed by an OT and directed application of Ignite at 5945 lb of seed cotton/A. The lowest yield was exhibited by the OT application of Ignite + MSMA at 5312 lb. Although the Ignite and Dual II Magnum OT application exhibited significantly greater injury than the DIR application, there were no significant differences in yield at 5625 and 5735 lb seed cotton/A.

Conclusion Ignite will be an effective cotton weed and resistance management option, however it is important to remember that weed stage of growth at application is critical for satisfactory results.