AIM EC HARVEST AID RESULTS IN SPINDLE PICKER COTTON T.I. Crumby FMC Corporation Bolton, MS H.R. Mitchell FMC Corporation Louisville, MS J.P. Reed FMC Corporation North Little Rock, AR JC Braun FMC Corporation Wylie, TX

Abstract

FMC discovered and conducted field research with several PPO inhibitor herbicides leading to the Section 3 registrations of sulfentrazone and carfentrazone. Field research was conducted with several of these candidate herbicides as pre-plant and atplant burndown, post-directed, lay-by and harvest aid treatments in cotton, resulting in a decision to seek a Section 3 registration for the use of carfentrazone in cotton. That registration was granted in August 2001, just prior to the harvest aid use season. Carfentrazone is sold under the brand names Aim EC herbicide, Aim EW herbicide and Shark herbicide.

Aim EC has been positioned as a harvest aid to be used alone in situations where cotton leaves were mature and cotton bolls were sufficiently open. In situations where boll-opening capabilities were required as well as additional defoliation, Aim was positioned to be tank-mixed with ethephon products. Where there was concern over potential cotton plant regrowth, Aim was positioned to be used in tank-mix combinations with thidiazuron products. In situations of rank cotton plant growth, Aim was positioned as a sequential treatment to be used in conjunction with Aim or other harvest aid products. Aim demonstrated excellent desiccation of problem weeds such as morningglories and defoliation of pigweeds and has proven to be very effective in the removal of juvenile growth on cotton plants. To enhance the performance of Aim EC as a harvest aid, FMC has recommended the use of 1% COC for all treatments with good success. Data from recent trials with Aim EC suggest other adjuvants may also produce desirable results with respect to defoliation and leaf desiccation, especially in warm weather.

In replicated small plot spindle picker research trials (12 in 2002 and 13 in 2003) conducted using the same protocol, Aim applied alone at 0.016 lb. ai/a, and in combination with Prep at 0.75 lb. ai/a provided 70% and 78% defoliation, respectively, at 4-10 days after treatment as compared to 79% defoliation provided by Prep at 1.0 lb. ai/a plus Def at 0.75 lb. ai/a. When evaluated 14 days after application, these treatments provided 77% and 83% defoliation, respectively, as compared to 83% defoliation provided by the standard Prep plus Def treatment. Aim and the Aim mixture treatments provided very similar cotton leaf desiccation and regrowth control as compared to the standard Prep plus Def treatment.

In sequential application programs, Aim at 0.016 lb. ai/a followed by Aim at 0.016 lb. ai/a and Aim at 0.016 lb. ai/a plus Prep at 0.075 lb. ai/a followed by Aim at 0.016 lb. ai/a provided 94% and 91% defoliation, respectively, at 7 days following the second application as compared to 80% defoliation provided by a single treatment of Def at 0.75 lb. ai/a plus Prep at 1.0 lb. ai/a. The Aim sequential treatments provided superior regrowth control.

In a series of small plot replicated trials during 2002 (4) and 2003 (4), FMC investigated the impact on cotton defoliation and leaf desiccation with various adjuvant types and use rates in varying weather conditions. Aim at 0.016 #ai/a plus Prep at 0.75 #ai/a were applied alone and in combination with varying rates of NIS (0.5%v/v and 1.0 % v/v), COC (0.125% v/v and 0.25 % v/v) , and organosilicone surfactants. These treatments were applied at 95, 88, 82 and 73 degrees F. Evaluations were recorded for % defoliation, %leaf desiccation, % open bolls and % regrowth at 7 days after treatment. Aim plus Prep, Aim plus Prep plus 0.5% COC, Aim plus Prep plus 1.0% COC, Aim plus Prep plus 0.125% NIS and Aim plus Prep plus 0.25% NIS when applied at 95F provided 56%, 75%, 75%, 80% and 80% defoliation respectively at 7 days after treatment respectively. When applied at 88F, those treatments provided 45%, 75%, 80%, 83% and 80% defoliation respectively at 7 days after treatment. When applied at 73F, those treatments provided 0%, 45%, 50%, 30% and 40% defoliation respectively at 7 days after treatment. When applied at 95F provided 5%, 15%, 18% 8% and10% leaf desiccation respectively at 7 days after treatment. When applied at 88F, those treatments provided 1%, 10%, 10%, 5% and 5% leaf desiccation respectively at 7 days after treatment. When applied at 95F provided 1%, 10%, 5%, 3% and 5% leaf desiccation respectively at 7 days after treatment. When applied at 82F, those treatments provided 0%, 45%, 50%, 30% and 40% defoliation respectively at 7 days after treatment. When applied at 95F provided 5%, 15%, 18% 8% and10% leaf desiccation respectively at 7 days after treatment. When applied at 82F, those treatments provided 1%, 10%, 5%, 3% and 5% leaf desiccation respectively at 7 days after treatment. When applied at 73F, those treatments provided 1%, 10%, 5%, 3% and 5% leaf desiccation respectively at 7 days after treatment. When applied at 73F, those treatments provided 1%, 5%, 5%, 3% and 5% leaf desiccation respectively at 7 day

0%, 1%, 3%, 1% and 3% leaf desiccation respectively at 7 days after treatment. The varying adjuvant types and use rates did not appear to impact the levels of open bolls in the treatments at 7 days after treatment.

In a series of eleven field trials in 2003, evaluations were made comparing Aim EC to ET for % defoliation, % leaf desiccation, % open bolls and % regrowth at 6-10 and 13-15 days after the initial treatment. Aim EC when applied at 0.5 oz/a, 0.75 oz/a, 1 oz/a and in a combination treatment, Aim at 0.5 oz/a plus Dropp at 12.8 oz/a provided 58%, 66%, 69% and 70% defoliation respectively as compared to ET treatments at 1 oz/a, ET at 1.5 oz/a, ET at 2 oz/a and in a combination treatment, ET at 1 oz/a plus Dropp at 12.8 oz/a that provided 68%, 73%, 71% and 68% defoliation respectively when evaluated at 6-10 days after treatment. These Aim EC treatments provided 76%, 82%, 81% and 80% defoliation respectively when evaluated at 13-15 days after treatment. The ET treatments provided 82%, 81%, 84% and 82% defoliation respectively when evaluated at 13-15 days after treatment. These Aim EC treatments provided 6%, 7%, 11% and 6% leaf desiccation respectively at 6-10 days after treatment as compared to 5%, 8%, 9% and 5% provided by ET when evaluated at 6-10 days after treatment. As with other treatment programs, leaf desiccation declined significantly at the 13-15 days after treatment ratings. The Aim treatments provided 8%, 5%, 3% and 8% regrowth respectively when evaluated at 6-10 days after treatment as compared to 10%, 15%, 6% and 0% respectively with ET treatments. At 13-15 days after treatment, the Aim treatments provided 10%, 15%, 6% and 15% regrowth respectively as compared to 21%, 20%, 20% and 21% respectively of the ET treatments. There did not appear to be any significant differences in open boll ratings among the treatments.

Future research plans for Aim include additional field research trials as a cotton harvest aid to further define product use rates, utilization in spindle and stripper production systems and use as a harvest aid in cotton and other crops. Additional research will be conducted utilizing Aim EC herbicide in cotton as preplant burndown, at-plant burndown, post-directed and lay-by treatments.