UTILIZING AIM HERBICIDE IN COTTON PRODUCTION SYSTEMS T.I. Crumby FMC Corporation Bolton, MS H.R. Mitchell FMC Corporation Louisville, MS J.P. Reed FMC Corporation North Little Rock, AR

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 at-plant 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 and Shark herbicide.

In replicated trials as a pre-plant burndown treatment Aim has shown the ability to speed up weed response to traditional burndown treatments such as glyphosate. Other research with Aim has shown that when mixed with 2,4-D and applied in the fall at the rate of Aim at 0.016 lb. ai/a plus 2,4-D at 1 pt/acre or Aim at 0.016 plus 2,4-D at 1 pt/a plus 1% COC or Aim at 0.016 lb. ai/a plus 2,4-D at 1 pt/a plus 00%, 100% and 99% control of marestail, respectively.

In other trials, Aim EC when applied at 0.016 lb. ai/a plus 1% COC has demonstrated excellent control of broadleaf weeds such as morningglory, pigweed, cocklebur, velvetleaf and smartweed that are often present at planting time. Aim EC may be applied alone or in combination with other herbicides and/or insecticides for increased weed control spectrum and/or residual weed control and/or insect control.

In replicated trials applied at late post-directed or early lay-by, Aim at 0.016 lb. ai/a and 0.025 lb. ai/a provided 84% and 88% control, respectively, of morningglories at 4-9 days after treatment. When Aim at 0.016 lb. ai/a plus Roundup at 0.56 lb. ai/a was applied to morningglories, the treatment provided 92% and 89% control of morningglories at 4-9 and 11-16 days after treatment, respectively. Similar pigweed control was provided by Aim and the Aim plus Roundup mixture.

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.

In replicated small plot spindle picker research trials, Aim applied alone at 0.016 lb. ai/a, and in combination with Prep at 0.75 lb. ai/a provided 73% and 78% defoliation, respectively, at 7 days after treatment as compared to 78% 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 82% and 82% 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 followed by Aim at 0.016 lb. ai/a followed by Aim at 0.016 lb. ai/a provided 92% and 88% defoliation, respectively, at 7 days following the second application as compared to 83% defoliation provided by a single treatment of Def at 0.75 lb. ai/a. The Aim sequential treatments provided superior regrowth control.

In small plot stripper cotton research trials, Aim EC applied at 0.016 and 0.025 lb. ai/a provided 80% defoliation as compared to Cyclone treatments at 0.125, 0.025 and 0.50 lb. ai/a that provided 80%, 77% and 50% defoliation, respectively, at 7 days following treatment. In sequential treatments of Aim at 0.016 lb. ai/a followed by Cyclone at 0.25 lb. ai/a or Cyclone at 0.25 lb. ai/a followed by Aim at 0.016 lb. ai/a, both treatments provided very similar results of 70% and 69% defoliation, respectively, at 7 days after treatment and 89% and 92% defoliation, respectively, at 14 days after treatment. In a small plot replicated study, Aim applied at 0.016 lb. ai/a provided 92%, 94% and 97% leaf desiccation and 63%, 86% and 97% stem desiccation at 3,7, and 13 days after treatment, respectively.

Future research plans for Aim include additional investigations for use in cotton as preplant burndown, at-plant burndown, post-directed and lay-by treatments. Field research trials as a cotton harvest aid will further define product use rates, utilization in spindle and stripper production systems and use as a harvest aid in other crops such as rice, grain sorghum, soybeans and corn.