

EFFECT OF BENSULFURON ON COTTON GROWTH AND DEVELOPMENT

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Abstract

Excessive vegetative growth in cotton (Gossypium hirsutum), often referred to as "rank" growth, reduces sunlight penetration, increases relative humidity within the canopy, increases insect pressure, and increases boll rot occurrence. Mepiquat chloride (MC) is currently the industry standard for reducing cotton height and increasing earliness. Yield responses to MC have been shown to be variable. Sulfonylurea herbicides are currently labelled for weed control in several crops including cotton. They are low in toxicity, have a low leaching potential, and are generally predictable in activity. Some chemicals in this family may have potential for controlling excessive growth in cotton.

A study was conducted from 1992 through 1994 to evaluate the potential of bensulfuron, currently labelled for rice weed control, for regulating growth in cotton. Standard treatments included MC applied alone at 8 fluid oz/A at the pinhead square (PHS) or early bloom (EBL) stage, 4 followed by (fb) 4 oz/A at each stage, 8 fb 8 oz/A, 8 fb 16 oz/A, and 16 fb 16 oz/A. Bensulfuron treatments included 0.016 or 0.031 lb ai/A applied at PHS or EBL, 0.016 fb 0.016 lb/A, and 0.031 fb 0.031 lb/A. Treatments were arranged in a randomized complete block design with six replications in 1992 and 1993 and four replications in 1994. All treatments were applied postemergence over-the-top of cotton using a hand-held sprayer delivering 25 gpa at 3 mph. Nonionic surfactant was added to all treatments at 0.25% on a volume basis. Data collection included plant mapping in 1992 and 1994, boll counts for boll rot and maturity in 1993 and 1994, and yields from the center two rows each year.

Plant mapping indicated that all MC treatments except 16 fb 16 oz/A reduced first position fruit retention in 1992 and 1994. All bensulfuron treatments decreased first position fruit retention compared to the untreated check and was more detrimental than MC. Bensulfuron and MC were effective for reducing cotton height especially when applied sequentially; however, no treatment reduced boll rot occurrence. Mepiquat chloride did not affect seed cotton yield in 1992 or 1994 but reduced yield in 1993, regardless of the rate. Bensulfuron treatments that reduced height also reduced seed cotton yield; therefore, its potential as a growth regulator appears limited.