

**EFFICACY OF MEPIQUAT CHLORIDE WHEN
FOLIAR APPLICATION IS FOLLOWED
BY PRECIPITATION**

D. Zhao, D. Oosterhuis and T. Daniel

**Department of Crop, Soil,
and Environmental Sciences
University of Arkansas
Fayetteville, AR**

Abstract

Mepiquat Chloride (PIX) is a plant growth regulator (PGR) widely used to control vegetative growth and to improve lint yield of cotton (*Gossypium hirsutum* L.). However, rainfall is a frequent event in the Mid-South region when PIX is foliarly applied, and this would result in rain washing off some of the PIX from the leaf surface. It is thought that it probably takes several hours for the leaves to absorb the PIX after foliar application, however, there is no published data to support this. A study was conducted at the Arkansas Agricultural Research and Extension Center, University of Arkansas, Fayetteville, AR. in the summer of 1998 to determine the effect of rain washing PIX off plants, at different time intervals after spraying PIX, on the efficacy of PIX in controlling growth.

Cotton (cv. Suregrow 125) seeds were planted in 4-gallon pots on 18 June 1998. The pots were buried in a cotton field (in rows one meter apart) so as to provide representative cotton plants that could be transported to a rainfall simulator. The surface of each pot was level with the surrounding field during growth so as to maintain similar soil temperatures in the pots and surrounding field. Water, fertilizer and the control of weeds and insects were applied as needed. When plants reached the early squaring stage, all pots were separated into six identical groups of 6 pots each (one group was a treatment). The six treatments consisted of (1) a control without PIX application, (2) PIX not washed off, (3) PIX washed off starting 1 h after spraying, (4) PIX washed off starting 2 h after spraying, (5) PIX washed off starting 4 h after spraying, and (6) PIX washed off starting 8 h after spraying.

All PIX treatments foliarly received the same amount of PIX equivalent to 6 ozs PIX per acre in 10 gallons of water. According to the treatments above, the plants were moved into the simulated rainfall shelter at 1, 2, 4 and 8 hours after PIX application, respectively. All rain washing treatments were washed for 30 minutes with a 1 inch rain. During rain washing, pot surface was covered using plastic bags. Plants were moved back to the original place in the field after washing. The effect of PIX on growth was determined by measuring leaf elongation daily, and plant height and nodal development at 2-day intervals for two

weeks. Finally, plants were harvested 2 weeks after PIX application, and leaf area, the number of fruiting sites, and the number of squares were recorded. Dry matters of leaves, stems and squares were also determined.

Results indicated that application of PIX significantly controlled plant height and leaf growth, but did not affect the number of main-stem nodes. Rain wash within eight hours after PIX application significantly reduced the efficacy of PIX controlling plant vegetative growth. Therefore, cotton leaves need more than 8 hours to effectively absorb foliar applied PIX. If it rains within 8 hours after foliar application of PIX, respraying needs to be considered. This study did not determine the minimum critical time after foliar application of PIX when it is not necessary to respray. The study will be repeated with additional treatment intervals next season.