Effect of Spray Dilution on PIX on Cotton, Safford Agricultural Center 1986

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Abstract

PIX was applied to cotton in 10 and 20 gallons of water to evaluate the effect of dilution rate on plant growth regulation. No statistical differences were seen at the one pint rate, but the trends looked like the higher rate of water increased the plant growth regulation (i.e., decreased plant height and increased yield). Increasing the rate of PIX to 2 pints in 20 gallons of water, to maintain the same concentration as 1 pint in 10 gallons of water, was detrimental to the yields.

Introduction

Plant growth regulation with chemicals is one of the least understood but potentially most powerful management tools that cotton farmers have available to them today. The most productive cotton varieties grown in the upper Safford valley in Graham county and into San Simon and Bowie in Cochise county are tall varieties which can grow rank if given too much water or nutrients. But, on the other hand, they lose yield if water or nutrients are withheld to force them to fruit. These plants must be monitored and managed to bring out their optimal yields. Our practical knowledge of the cotton plant physiology, of when and how and what to apply are still limiting our management skills.

This study was designed to look at the dilution effect of PIX in water and how this affects its ability as a plant growth regulator.

SOIL TYPE: Pima silty clay
PREVIOUS CROP: Wheat
EXPERIMENTAL DESIGN: Randomized complete block designs with 5 replications
PLOT SIZE: 4 40 inch rows wide by 35 feet long
PLANTING: Date: 9 April 1986 Rate: 12 lbs/ac
HERBICIDE: 2 pts/ac Prowl pre-plant, caparol at layby
FERTILIZER: 200 lbs/ac urea pre-plant
PIX APPLICATION: 12 July, plant height approximately 24 inches
IRRIGATION: Pre-irrigation plus 7 irrigations, ca. 46 ac inches
HARVEST: First pick: Short 7 Oct, long 17 Oct Second: 25 Nov
SPRAY EQUIPMENT: Pull type sprayer with roller pump, mechanical agitation, Teejet nozzles on 20 inch centers and booms that adjust for height.
INSECTICIDES: 3 applications of Pydrin

Table 1. Seed Cotton Yields (lbs/ac) and Plant Heights (inches) with Delta Pine 90.

Treatment	*First Pick**	*% of Tot*	*Total Yield*	*Pl Ht*
Check	2968 a	86.6 a	3431 a	30.8a
1 pt PIX/10 gal	2841 a	83.4 a	3420 a	28.5a
1 pt PIX/20 gal	3009 a	85.9 a	3514 a	26.3a
2 pt PIX/20 gal	2789 a	86.8 a	3211 a	27.7a

Table 2. Seed Cotton Yields (lbs/ac) and Plant Heights (inches) with Pima S-6.

Treatment	*First Pick**	*% of Tot*	*Total Yield*	*Pl Ht*
Check	1774 a	66.8 a	2647 a	32.7a
1 pt PIX/10 gal	1755 a	66.5 a	2636 a	33.2a
2 pt PIX/20 gal	1572 b	66.1 a	2382 b	31.4a

** Values with the same letter are not significantly different at the 5% level using the Student-Newman-Keul's Test.*

DISCUSSION

The cotton for this trial was grown on a light textured soil and conditions were not right for rank growth, PIX was applied, however, according to the experimental plan at the 24 inch growth stage. It is not surprising, then, that spectacular results were not achieved.

Looking at the trends, though, of total yield and plant heights from Table 1, the plant height decreased 2 inches and the yield decreased slightly, going from the check to 1pt/10gal. However, diluting this amount of PIX in 20 gallons decreased the height 2 more inches and increased the seed cotton yields by almost 200 pounds.

Were these affects were due to dilution or due to greater coverage in the higher spray volume? Perhaps the next treatment can shed more light on the subject, where the dilution is the same as the 1pt/10gal and the coverage is at the 20 gallon rate. Here we see that the yield is decreased from that of the check and the plant height is between the other two treatments.

Instead of answering the question, another one is raised. Is too much of a good thing bad, or is the dilution of 1 pint to 10 gallons too concentrated? Clearly, more research is needed to answer these questions.

The data from Table 2 on Pima cotton, follows the same trends as with Delta Pine 90 but with one treatment missing.