PLANT GROWTH REGULATOR USE

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The cotton plant has a natural mechanism (good boll set) to prevent excessive vegetative growth if nitrogen levels, soil moisture, temperature, insect, disease, and nematode controls, and plant populations are all well balanced. In many cases, these factors are not well balanced and growth regulators are needed to maintain proper plant size and to promote boll set and early maturity. Additionally, certain growthy, indeterminate varieties also require plant growth regulator applications to shift cotton from vegetative to reproductive growth. Applying growth regulators based only on stage of development (ex. pinhead square) is not recommended as plant vigor may vary across fields. Although plant growth regulator applications can be an important part of an overall cotton management program, they can result in reduced yields if applied while plants are undergoing stressful conditions. Before applying plant growth regulators, variety, soil type, fertility, irrigation potential, and field history must be taken into consideration.

Mepiquat chloride is the most commonly used cotton-plant growth regulator. It is used to control plant growth and is available under a number of trade names that include Pix, Mepex, Pix Plus, Pix Ultra, and others. Pentia is a new mepiquat product containing a boron molecule (mepiquat pentaborate). This addition of boron is not enough to serve as a replacement for boron fertilization; however, a reduced rain-free interval (1 hour) may make this product attractive in some situations. All mepiquat-containing products will be collectively referred to as Pix through the remainder of this section.

Based on similarities in growing conditions between North Carolina and Virginia, plant growth regulator application rules are likely very similar. Therefore, the early-bloom strategy developed and widely adopted in North Carolina should prove useful to Virginia producers as well. Using this strategy, 0.5 to 1 pt of Pix is applied to cotton 24 inches and taller where conditions favor a response at early bloom. Early bloom is defined as five to six white blooms per 25 ft of row. Conditions favoring a Pix response include: high nitrogen levels, growthy varieties, late-planted cotton, thick stands, excessive rainfall, fields with a history of rank growth, and fields where cotton is to be harvested first. The 0.5 to 1 pt rate of Pix should also be applied to cotton reaching an average of 28 inches prior to early bloom. These same rates can be applied to cotton past early bloom if growth is excessive. The longer the application is delayed, however, the less opportunity there is for Pix activity and thus less potential for reducing plant growth and achieving a desirable response. The early-bloom strategy should serve as a general guideline for making Pix application decisions and it can be modified to fit the needs of individual conditions. As previously mentioned, Pix should not be applied when cotton is undergoing stress conditions (especially moisture stress). Consult the label for additional precautions.

One difficulty in implementing the early-bloom strategy occurs when the amount of cotton that needs to be sprayed outweighs the amount that the producer can spray in a timely manner. Some producers may prefer to utilize the modified

early-bloom strategy on a portion of their acreage to help manage this situation. The modified early-bloom strategy involves the use of height-to-node ratios and measurement of the most recently expanded internode length. The most recently expanded internode is measured by counting down the plant from the highest mainstem leaf (> quarter size) to the fourth leaf. Examine the internode above and below the fourth leaf and measure the larger of the two. This is a good indicator of the plant vigor over that past week or so. Long internodes will range between 2.5 to 3 inches while short internodes will be below 2 inches. The charts below provide an aid in determining Pix application decisions using the modified early bloom strategy.

10 to 14 days after first square.

	Plant height		
	< 17 in	**17 – 20 in**	**>20 in**
Height to node ratio > 1.85 in	4 oz	6 oz	8 oz
*Internode > 2.5 in	4 oz	6 oz	8 oz

Do not apply if soil moisture is poor.
** most recently expanded internode (see measurement description above).*

Early bloom – use this chart if prior Pix has been applied.

	Plant height			
	< 24 in	**24 – 27 in**	**27 – 30 in**	**> 30 in**
Plant height	0 oz	6 oz	9 oz	12 oz
*Internode > 2.5 in	6 oz	6 oz	9 oz	12 oz

Do not apply if soil moisture is poor.
Do not apply if nodes above the highest first position white bloom < 7.
** most recently expanded internode (see measurement description above).*

Early bloom – use this chart if no prior Pix has been applied.

	Plant height			
	< 24 in	**24 – 27 in**	**27 – 30 in**	**> 30 in**
Plant height	0 oz	8 oz	12 oz	16 oz
*Internode > 2.5 in	8 oz	8 oz	12 oz	16 oz

Do not apply if soil moisture is poor.
Do not apply if nodes above the highest first position white bloom < 7.
** most recently expanded internode (see measurement description above).*

10 to 14 days after early bloom		
	Pix applied at early bloom	
	> 8 oz	0 – 8 oz
*Internode < 2.5 in	0 oz	0 oz
Internode 2.5 – 3.5 in	8 oz	12 oz
Internode > 3.5 in	12 oz	16 oz

Do not apply if soil moisture is poor.
Do not apply if nodes above the highest first position white bloom < 5.5.
** most recently expanded internode (see measurement description above).*