

Guidelines for Use of a Wick Applicator for Applying Mepiquat Chloride

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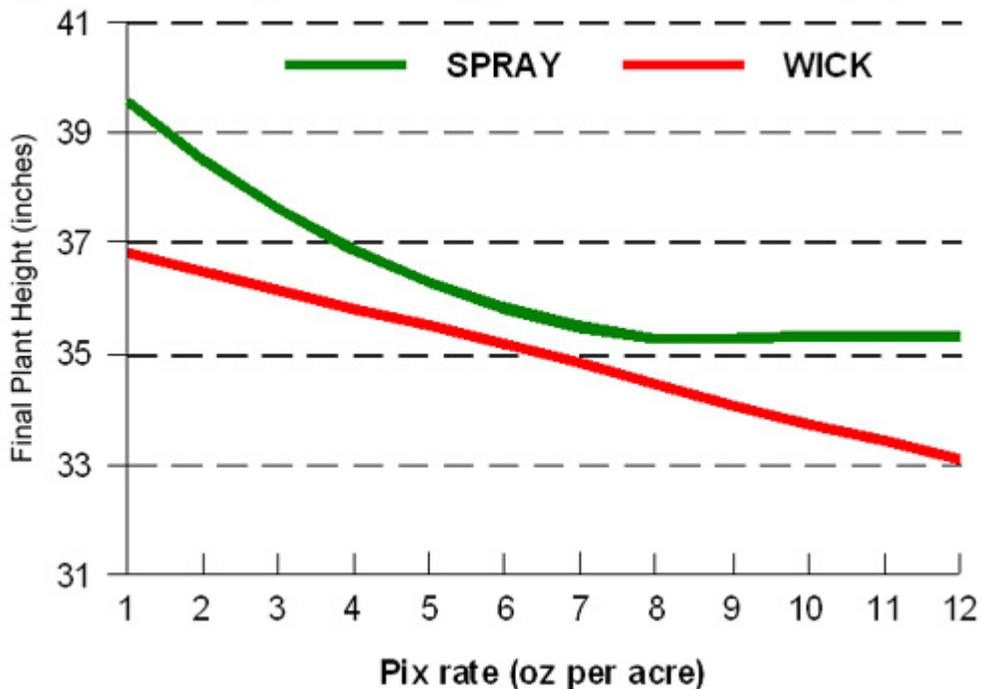
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A tremendous amount of interest has developed recently in using a wick applicator for making mepiquat chloride (Pix, Mepi-Chlor, others) applications. The wick applicator wipes the growth regulator on to the top three to four nodes of cotton as opposed to a typical broadcast spray in which most of the foliage is affected. The wick applicator for Pix also differs from some of the older wicks that were used for Roundup applications. As opposed to those older models, the Pix wick applicator gravity feeds a Pix solution through holes drilled in a PVC pipe and on to a canvas wicking surface. The rate of flow on to the canvas surface is governed by an orifice which regulates the air-flow into the system. A larger orifice results in more solution being wicked on to the canvas. Conversely, a smaller orifice results in a smaller volume of solution being wicked. The constant flow through the wick applicator allows for accurate calibration so that Pix rates can be expressed in terms of ounces per acre.

The wick applicator can be mounted to implements and sprayers and set at a constant height relative to the cotton. Only cotton tall enough to come into contact with the wick will be affected. This provides a number of advantages for growers, particularly when making an early application of Pix. Most cotton fields in North Carolina vary in terms of soil type, topography, and drainage. This often results in an uneven crop with tall and short plants in the same field at various stages of maturity. An early application of Pix to short, stressed cotton has the potential to reduce yields. Therefore, many growers are faced with the prospect of 1) making a broadcast application of Pix even though some of the cotton may not need it, 2) waiting for the smaller cotton to catch up with the taller cotton, 3) applying Pix at a rate appropriate to the large cotton and too high for the small cotton, 4) applying Pix at a rate appropriate for the small cotton and too low for the tall cotton, or 5) spot-spraying Pix. None of these alternatives will provide a Pix application appropriate for the entire field. Because the wick applicator can be mounted at a specified height, it is possible to make a Pix application only to the cotton that needs it, allowing the slower growing portions of the field to go untreated.

Figure 1. Rate response of Pix applied with a wick and a spray



The wick applicator applies a very small amount of solution per acre which may facilitate a piggy-backed application with either post-directed herbicides, or side-dress nitrogen applications. The low volume of application also can allow for more acres to be covered without the need for re-filling compared to typical spray applications.

Over the past two years, research conducted in North Carolina has attempted to establish a rate response curve for Pix applied through a wick applicator as well as a broadcast spray. A reduction in plant height is the most consistent response observed following a Pix application. Figure 1 shows the rate response curve for plant height that was found for Pix applied through a wick applicator and through a spray. Averaged across eight locations in 1998 and 1999, the maximum amount of height control resulting from Pix applied through a spray was obtained between 9 and 12 oz per acre. When applied through the wick applicator, Pix at the 6 oz per acre rate resulted in equal height control to 9 oz per acre sprayed and was similar to 12 oz per acre sprayed. In fact, the maximum amount of height control with Pix applied through the wick applicator was not obtained over the rates that were tested.

These data suggest that Pix rate reductions are possible when it is applied with a wick compared to a spray. Data collected in North Carolina over the past two years suggest that Pix rates can be reduced by 33-50% when applied with a wick compared to a spray. Those growers who have used a wick applicator in the past two years have found similar results on their farms. Table 1 shows the recommended rate reduction for Pix when applied through a wick. This does not mean that a grower's Pix management strategy should change. However, if a Pix application is to be made, Table 1 shows the rate through a wick that has been found to be equal to a certain rate sprayed.

Table 1. Suggested equivalent rates for Pix applied through a wick and a spray

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Rate of Pix applied with a broadcast spray	Equivalent rate of Pix when applied with a wick
4 oz per acre	2 oz per acre
6 oz per acre	3-4 oz per acre
8 oz per acre	4-6 oz per acre
10 oz per acre	5-7 oz per acre
12 oz per acre	6-9 oz per acre
14 oz per acre	7-10 oz per acre
16 oz per acre	8-12 oz per acre

Does this mean that Pix is more effective when applied through a wick compared to a spray? Probably not. However, the wick applicator is applying Pix only to the top 3 to 4 nodes of the plant and is essentially making a banded application, concentrating the Pix into the width of the band instead of diluting it on a broadcast basis. The width of the band is dependent on the amount of foliage it comes into contact with. Would the same results be obtained with a banded spray application of Pix? Although that research has not been conducted, it is logical to assume that they would be. However, a banded spray application would affect all of the plants while a wick application affects only the plants tall enough to come into contact with the wick.

A frequent question about the wick applicator is how high should it be set relative to the cotton? Most research has been conducted with the wick applicator set to treat only the top 3 inches of the plant. There is some concern that setting the wick lower than 3 inches from the terminal of cotton may result in too much mechanical injury to the plant. In two of six trials, setting the wick to treat the top 9 inches resulted in a yield decrease compared to cotton sprayed with an equal rate of Pix. In 23 separate trials, setting the wick to treat the top 3 inches only resulted in a yield increase once and yield decrease once compared to cotton sprayed with an equal rate of Pix. Therefore, growers are encouraged to treat only the top 3 inches of cotton when making a wick application of Pix.

By reducing the Pix rate by 33 to 50% when making a wick application of Pix, growers can expect to obtain similar results to a spray application. Yield responses to Pix are highly dependent on growing conditions at and following application, and situations in which a Pix application is not warranted are no different when wicking than when spraying. However, the effects of Pix in reducing plant stature and hastening maturity are similar when applied with a wick and a spray and may justify a Pix application. Whether applying Pix with a wick or a spray, always refer to the "Suggestions for Pix Use" chapter of the Cotton Information book for guidelines.

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