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Comments from Dr. Sandy Stewart

Extension Cotton Specialist, LSU AgCenter

Early-season decisions are numerous and critical to the overall success of a cotton crop. This issue of the Cotton Bulletin highlights one of these: weed management decisions. Oftentimes, it is taken for granted that glyphosate will take care of any weed infestations we have in our Roundup Ready production systems. Therefore, we have sometimes reactive weed control strategies that depend upon timeliness of application. Dr. Steve Kelly provides an excellent discussion of how early competition from weeds hurts yield.

As the weather begins to warm and the "sap starts to rise" there are undoubtedly people contemplating planting cotton during the first week of April. Remember that the optimal planting date for cotton in Louisiana is from April 15 to May 15. This has been confirmed numerous times by research conducted in decades past, and re-confirmed in recent years with newer varieties. Remember what a north wind can do to emerging cotton in early April and decide wisely on when to take the planter to the field.

Effects of Early-Season Weed Competition

Dr. Steve Kelly, Extension Weeds Specialist, LSU AgCenter

While we've got a little down time between burndown and planting, I'd like to take the opportunity in this edition to talk about early-season weed competition and its effects on cotton yield. This has a lot of implications now, but is going to be especially important when we see widespread planting of Roundup Ready Flex®.

THIS DAY IN HISTORY

April 2, 1826 - Samuel Mory patented the internal combustion engine.

There has been a lot of research done to evaluate weed competition in cotton. As early as 1968, researchers reported the effects of early-season weed interference on cotton yield. The following figures illustrate these effects. These figures were taken from a manuscript published in 1969. These competition studies were conducted at two locations in Alabama each year over three years.

Figures 1 and 2 are the results of experiments evaluating the critical weed-free period for cotton. In this work, cotton was kept weed-free from cotton emergence for the appropriate weeks noted on the horizontal axis. No additional weed control operations were performed for the remainder of the growing seasons. Although weed interference was not the same level each year, or at each location, the trends were nearly identical. What we need to pay particular attention to in these figures are the point where the arrows are. We see that in 1968 at location 1, keeping cotton weed-free for more than 8 weeks did not affect yield. In 1966 and 1967, the weed-free period was around 11 weeks. So, we can conclude that to maximize cotton yield, we need to keep it weed free from emergence through 11 weeks. At the second location, the critical weed-free period was eight weeks, regardless of the year. The authors of this paper suggest that varying fertility practices and rainfall between the locations account for the differences in weed interference on cotton yield. Now, the first question you might have is about today's cotton varieties. Do the varieties planted in the late 1960's respond to weed competition the same as those planted today? Well, I have the same question. I'd certainly like to see this same work repeated using today's varieties. But in absence of that work, it would be better to be conservative and stick with what we know.

Figures 3 and 4 shed a little different light on early season weed competition. In this scenario, weeds were allowed to compete with cotton for the number of weeks on the horizontal axis, then removed and kept weed-free the rest of the season. This is referred to as the critical weedy period. In Figure 3, the critical weedy period was 2 weeks in two of the years and 8 weeks in 1967. In Figure 4, the critical weed period was 6 weeks. Does this mean that we can let weeds compete with cotton for these lengths of time without sacrificing yield? These data would certainly suggest that, but what we need to remember, is that the weeds are growing right along with the cotton and become much larger, thus more difficult to remove with herbicides without the possibility of reducing yields. In these experiments, the weeds were removed by hand, an expensive alternative by today's standards.

Now, where does Roundup Ready Flex fit in to this scenario? We know that this new generation of Roundup Ready cotton will be tolerant to more over-the-top applications and more total active ingredient used throughout the growing season. Notice any similarities between Flex and Roundup Ready Soybeans? Yes, they are there, but what we have to do is to resist the temptation to treat Flex cotton like Roundup Ready soybeans. Typically, we make two over-the-top applications of glyphosate to soybeans and call it good. If one of these applications is made a little late and we've got a couple of flushes of weeds out there, we don't seem to notice a reduction in yield. But, I don't think we'll be able to treat Flex cotton this way. Looking back on the previous research, we see that cotton yield is affected by this early season competition. The big advantage that Flex is going to bring to the table is the ability to apply glyphosate and get sloppy with it between the fifth cotton leaf and a post-direct application. With some of the herbicides we currently have available, and the ability to put out more glyphosate, we should have pretty clean cotton fields in the future. But, we also need to be pro-active with resistance management strategies, which we'll discuss in a future issue. This is a wonderful technology and we certainly need to be good stewards of it.

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Figure 1. Effect of weed-free period on cotton yield at location 1. *Buchanan & Burns. 1969. Weed Science. 18:149-154.*

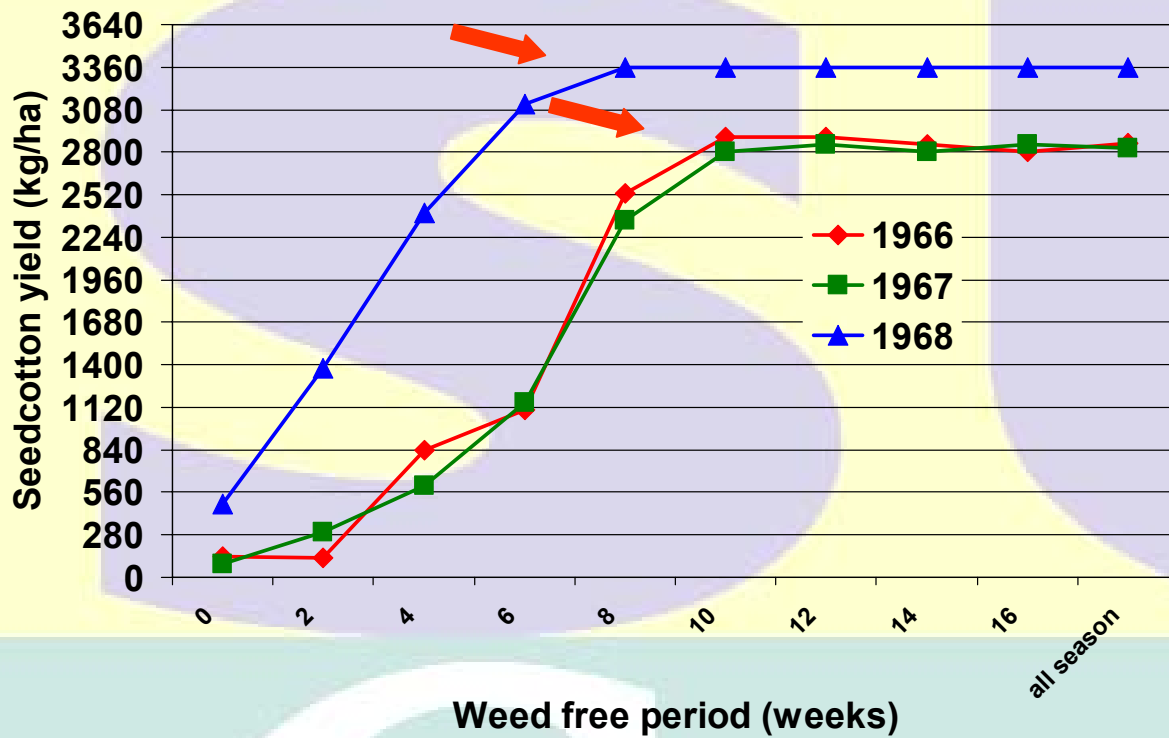


Figure 2. Effect of weed-free period on cotton yield at location 2. *Buchanan & Burns. 1969. Weed Science. 18:149-154.*

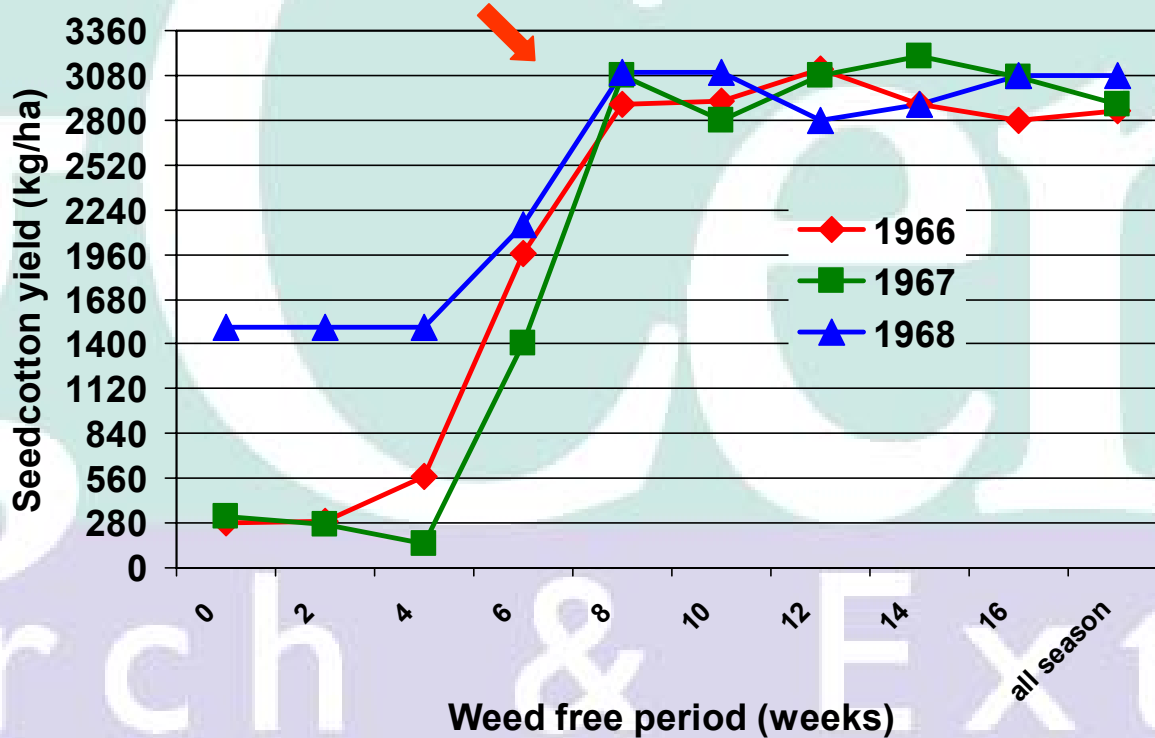


Figure 3. Effect of weedy-period from cotton emergence on cotton yield at location 1. *Buchanan and Burns. 1969. Weed Science. 18:149-154.*

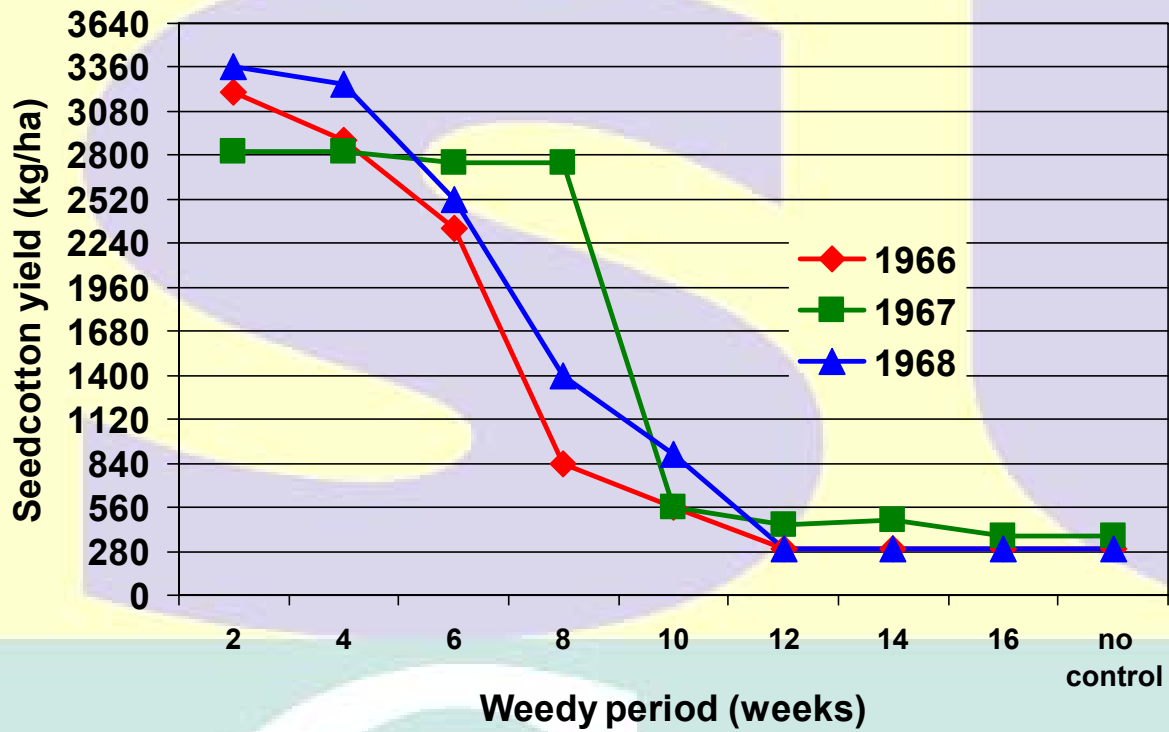
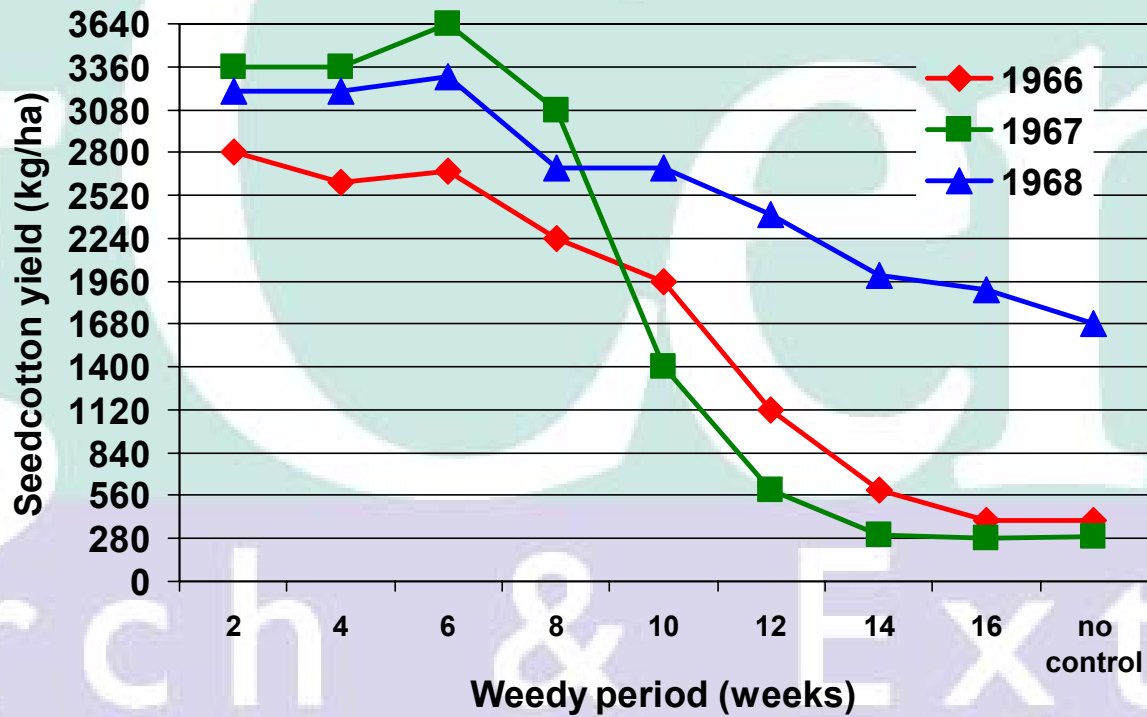


Figure 4. Effect of weedy-period from cotton emergence on cotton yield at location 2. *Buchanan and Burns. 1969. Weed Science. 18:149-154.*



Below is a list of contacts, both agents and specialists, in Louisiana cotton-producing parishes. They are ready and willing to assist you in any way they can.

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