

Arkansas Cotton Aphid Threshold Putting Beneficial Insects to Work

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What was our old threshold, and what was wrong with it?

Our old threshold instructed producers to treat their fields when 50% or more of the plants in a field were infested with cotton aphid, and the population was increasing. It served us very well for many years, and nothing was “wrong” with it. However, it did not take into account beneficial insects, which can be numerous, especially following boll weevil eradication and in BT cotton.

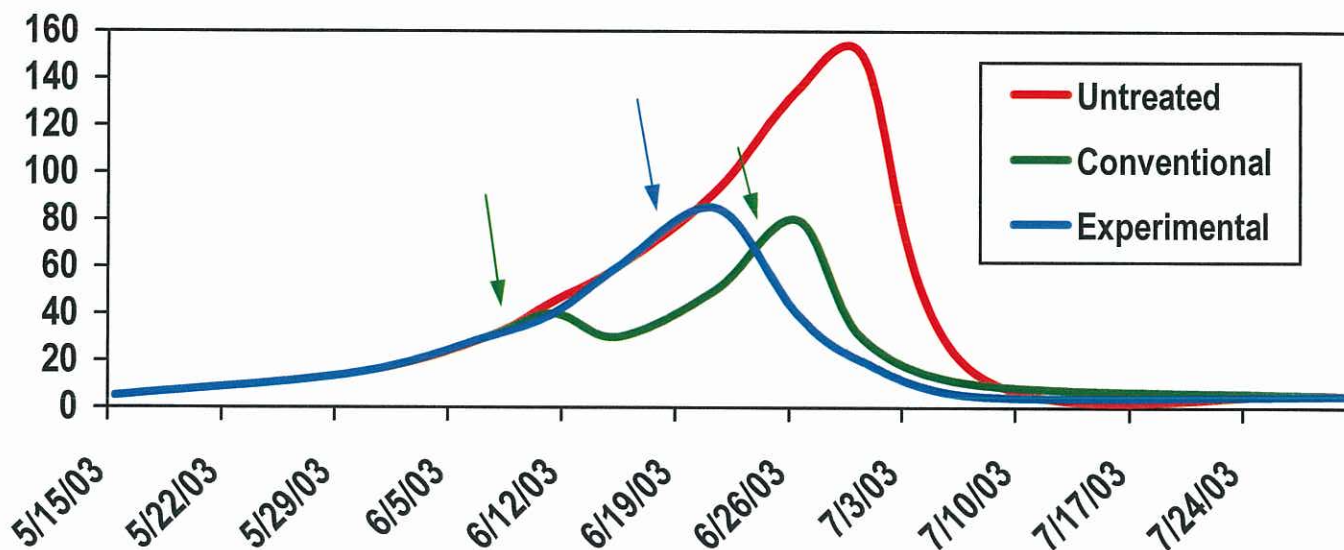
Can thresholds be improved?

Thresholds can always be improved, but the trick is to improve a threshold without causing an increase in costs beyond what you would save. Basic research conducted over 3 years demonstrated that beneficial insects slow the growth of aphid populations. This slowed growth allowed us to delay (yes, delay) applications of insecticides for aphid control. In 3 out of 3 years, the delay in application gave excellent control, did not alter yield, and eliminated the need for a second aphid application. Demonstrations over the next 3 years proved the new threshold worked to eliminate one aphid treatment on every farm (eliminating aphid treatments altogether, or reducing 2 treatments to 1).

Why does the new threshold work?

Basic research on the threshold involved counting aphids on every sampled leaf, and counting and identifying all beneficial insects. We knew this intensive sampling is impossible in the real world. However, our research showed that the presence of lady beetles was a great indicator of potential control by beneficial insects. With the beneficial insects present, growers delay treatment (one week to 10 days). Although this delay in treatment allows aphids to build a week longer than we have in the past, our work showed the building population for one more week did not cause any increases in damage or delays in maturity, and beneficial insects also increased during this time. In most cases, aphid populations were lower after this week delay due to the action of the beneficial insects. If required after this delay, an effective insecticide application reduces aphid densities and eliminates the need for a second aphid application. Note the graph below: 2 applications were made using conventional threshold, only one with the new Arkansas threshold. (Applications at colored arrows).

NOTE: We highly recommend use of Dr. Steinkraus' Aphid Fungus Sampling Service to assist in terminating aphid treatments when fungal epizootics are imminent: <http://www.uark.edu/misc/aphid/>



Arkansas Cotton Aphid Threshold: Directions

STEP 1.
Sample aphids
(as usual)



STEP 2.
Sample Lady beetle
Adults and Larvae

At each stop for aphid sample, sample 3 feet of row (2 "beat pan" widths), by sharply striking plants on wire mesh covering standard white dishpan (*left*).



Are >50% of the plants infested with a growing aphid population?

If answer is **YES**,
Are there at least 0.3 lady beetle adults
OR 0.2 lady beetle larvae (#/row-ft)?
IF YES, WAIT 7-10 days for next
sample (STEP 3).
IF NO, treat with insecticide.

If answer is **NO**, you are
finished until next sample
date, and return to **STEP 1**.

STEP 3.
(After 7-10 day delay)
Sample aphids and lady beetles
as in Steps 1 and 2

Are >50% of the plants still infested with a growing aphid population?

If answer is **YES**, treat with
insecticide.

If answer is **NO**, you are
finished until next sample
date, and return to **STEP 1**.

If answer is that >50% plants infested, but
population is not growing and lady beetles
are still at same level,
WAIT 7-10 days for next sample (return to
STEP 3).