



www.ipm.ucdavis.edu

# Cotton—Fruit Retention and Lygus Monitoring

## Supplement to UC IPM Pest Management Guidelines: Cotton

To determine if treatment is needed for lygus, sample both fruit/square retention and lygus populations in the field. If fruit/square retention is lower than expected and lygus are above treatment thresholds, treatment is needed.

### Directions:

#### Lygus Monitoring

Always use a standard sweep net with a diameter of 15 inches (37.5 cm). One sample consists of 50 sweeps across a single row of cotton. Take one sample in each quadrant of the field in fields that are up to 8 acres (32 ha). Take more samples in larger fields.

1. Walk briskly down the row and swing the net in front of you so that the lower edge of the rim strikes the plants about 10 inches (25 cm) from the top.
  - Keep the lower tilted edge slightly ahead of the upper edge.
  - Keep the sweeps far enough apart that you do not sweep plants that have already been jostled by the net.
  - Sweeps that are too closely spaced may cause lygus to fly or drop from the plants and thus be missed.
  - Keep the net moving to prevent adults from flying out.
2. After each set of 50 sweeps, count all the lygus bugs in the net, including nymphs, and record the total number below. Average the samples to follow the lygus population over the course of the season.
  - Be sure not to confuse aphids or bigeyed bug nymphs with small lygus bugs.
3. Stop monitoring lygus when:
  - Acala has 5 nodes above white flower (NAWF)
  - Pima has 3.5 NAWF

#### Fruit Retention Monitoring

1. Randomly select 5 plants from each quadrant of your field.
2. Count the number of first position squares on the **top 5** mainstem nodes and record.
3. Count the number of retained fruit in the first position on the **bottom 5** fruiting branches and record. (Until 10 fruiting branches are available, there will be an overlap between the top 5 and the bottom 5 nodes).
4. Count the number of fruiting branches and record. Total all columns.
5. After the plant has developed more than 10 fruiting branches, you can stop counting fruit on the bottom fruiting branches if the average boll retention remains constant for two weeks in a row. You can use this retention level for the rest of the season.
6. Calculate average percent retention and compare to the expected value derived from the table (p. 2).

Field \_\_\_\_\_ Date \_\_\_\_\_

Quadrant	Number of lygus per 50 sweeps		Plant	Number of first position fruit (Top 5 nodes)	Number of first position fruit (Bottom 5 nodes)	Number of fruiting branches
	Adults	Nymphs				
1			1			
			2			
			3			
			4			
			5			
2			6			
			7			
			8			
			9			
			10			
3			11			
			12			
			13			
			14			
			15			
4			16			
			17			
			18			
			19			
			20			
<b>Total</b>						
<b>Average</b>						

**Cotton—Fruit Retention and Lygus Monitoring Calculations and Thresholds**

Field \_\_\_\_\_ Date \_\_\_\_\_

1. Calculations:

**Fruit retention monitoring:**

**a. Determine the average percent of fruit retained in the top 5 nodes:**

Total 1<sup>st</sup> position fruit retained  
 \_\_\_\_\_ on the **top 5** nodes X 100% = \_\_\_\_\_  
 20 plants X 5 nodes

**Example:**  
 Average percent of fruit retained in the **top 5** nodes, if the total first position fruit obtained for the **top 5** nodes is 60:  
 \_\_\_\_\_ 60 total fruit = 0.6 X 100% = 60% average fruit retention  
 20 plants X 5 nodes

**b. Determine the average percent of fruit retained in the bottom 5 nodes:**

Total 1<sup>st</sup> position fruit retained  
 \_\_\_\_\_ on the **bottom 5** nodes X 100% = \_\_\_\_\_  
 20 plants X 5 nodes

2. Determine if the percent fruit retention in the **top 5** fruiting branches is at, above, or below the expected value. In the table (or using the Web calculator), find the intersection of your sampled number of fruiting branches (from p. 1) and percent fruit retention on the first position of **bottom 5** fruiting branches (b above). This is the expected fruit retention of the **top 5** fruiting branches.

**Expected retention (%) of the first position on the top 5 fruiting branches, from data for Acala cotton.**

Total Fruiting Branches	Percent retention of the first position fruit on the <b>BOTTOM 5</b> fruiting branches									
	10	20	30	40	50	60	70	80	90	100
Less than 5	The expected retention of the top 5 first fruiting positions is 73%. The retention on the first fruiting branch is erratic and at least 3 branches should be present before lygus decisions are made.									
5	73	73	73	73	73	73	73	73	72	71
6	73	73	73	73	73	73	72	72	70	69
7	73	73	73	73	73	72	71	70	68	65
8	73	73	73	73	72	71	69	66	63	60
9	73	73	72	71	70	68	65	62	58	53
10	73	72	71	69	67	65	60	56	51	46
11	71	70	68	66	62	58	54	49	44	39
12	69	67	64	61	56	51	46	41	37	32
13	66	63	59	54	49	44	39	35	30	27
14	61	57	52	47	42	37	33	29	25	22
15	55	50	45	40	35	31	27	24	21	18
16	48	43	38	33	29	25	22	20	18	16
17	40	36	31	28	24	21	19	17	15	14
18	34	29	26	23	20	18	16	14	13	12
19	28	24	21	19	17	15	14	13	12	11
20	23	20	18	16	15	13	12	11	11	10

**Treatment thresholds and how to interpret monitoring results:**

Treatment may be warranted if:

- square/fruit retention is **lower** than expected AND
- the average number of lygus per sample is:
  - Early squaring: 2 to 4 lygus per 50 sweeps
  - Midsquaring (bloom): 7 to 10 lygus (with at least 1 nymph) per 50 sweeps
  - Late squaring (boll filling): more than 10 lygus (including at least one nymph) per 50 sweeps

