



Current Report

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SEQUENTIAL SAMPLING OF THE BOLL WEEVIL IN OKLAHOMA

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The boll weevil is a pest in cotton throughout the state of Oklahoma. Treatment of this pest with the appropriate chemical is often necessary if economic damage is to be avoided. Making the proper decision of when to treat is critical, because treatment for boll weevils often increases the chance for bollworm-budworm outbreaks. Thus treating before the economic threshold is reached may cause unnecessary expense and exposure to bollworms and failing to spray when the economic threshold is reached will cause loss of yield.

Sequential sampling is probably the quickest most accurate system of making "treat-nontreat" decisions in insect scouting. This system usually reduces sampling time by 50% over other methods (Waters, 1955). It has been used on a wide variety of insects (Pieters and Sterling, 1974).

How to sample

Boll weevils damage is assessed by collecting squares (non-flared) from the upper one-third of the plant at random throughout the field. Examine the squares for egg and feeding punctures and record the number damaged.

How to use the sequential sampling table

The cotton insect control fact sheet for Oklahoma, No. 7162, recommends treatment for boll weevils when 25% of the squares are punctured. The upper limit or treatment level is based on 25% dam-

age. The lower limit or not treatment level is based on 15%. The K value (a value that denotes the degree of clumping of any insect) is 2.2, and for weevils this is based on large numbers of samples taken from southwestern Oklahoma.

Start sampling at some point in the field and take 10 squares. Examine the squares and record the number of punctured squares (record no. of damaged squares in the first blank in the table under running total). Then take 10 more squares, stop and examine for punctures. Record the number of damaged squares, and add it to the number of damaged squares found in the first 10 squares. If the total number of damaged squares from the first 20 squares is 12 or more, stop sampling and treat. If it is less than 12, take another 10 samples. Stop and examine the squares for punctures. Add the number of damaged squares to the number found in the first 20 squares. If the number is 14 or more, stop and treat the field. If the number is less than 14, then take another 10 squares. Add the damaged squares from this 10 squares to the damaged squares. In the first 30 squares, if the number is 16 or more, stop sampling and treat the field. If the number is less than 16, take 10 more squares. Add the damaged squares for this 10 to the damaged squares from the first 40 squares. If the number is 18 or more, stop sampling and treat the field. If the number is

Sequential table for sampling Boll weevil
damaged squares on cotton plants.

K = 2.2

(90 Percent Confidence Level)

Number of Squares Examined	Don't Treat	(Damaged Squ.)	
		Running Total	Begin Treatment
10	ND*	_____	ND
20	ND	_____	12
30	ND	_____	14
40	ND	_____	16
50	2	_____	18
60	4	_____	20
70	6	_____	22
80	7	_____	24
90	9	_____	26
100	11	_____	27
110	13	_____	29
120	15	_____	31
130	17	_____	33
140	19	_____	35
150	21	_____	37
160	23	_____	39
170	25	_____	41
180	27	_____	43
190	29	_____	45
200	31	_____	47

*ND - NO DECISION

2 or less, stop sampling, and do not treat the field. If the number is between 2 and 18 continue sampling. Continue this process until the number of samples falls into the treat or no-treat side. ND in the table means no decision. If no decision is reached after 200 squares have been examined, sampling can be discontinued, but you should return in 3 days and resample.

References Cited:

- Pieters, Edward P., Windfield L. Sterling. 1974. A sequential sampling plan for cotton fleahopper. Environ. Entomol. 3: 102-106.
- Waters, W. E. 1955. Sequential Sampling in forest insects surveys. Forest Sci. 1: 68-79.