SEQUENTIAL SAMPLING OF THE COTTON FLEAHOPPER IN OKLAHOMA

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Increasing cost of chemical control and the loss of beneficial insects have made it necessary to more accurately determine when to apply insecticides to cotton for fleahopper control. Controls for fleahoppers often result in bollworm increases, especially if they are applied late.

To successfully integrate control of fleahoppers with other insect control, it is necessary to have a sampling technique that is quick and accurate. The sequential sampling is an accurate sampling technique that may save more than 50% in time over other sampling methods (Waters 1975). It has been widely applied for insect control sampling (Pieters and Sterling 1974).

How to Sample

Fleahopper sampling should begin as soon as pin-head squares appear. The terminal of each plant should be examined thoroughly. Select plants to be sampled at random. The sampling pattern is unimportant so long as all parts of the field are covered.

How to Use the Sequential Sampling Table

The cotton insect control fact sheet for Oklahoma No. 7162 recommends treatment for fleahopper when 40 or more fleahoppers are found per 100 plants. Therefore, the following decision table is based on 40 fleahoppers per 100 terminals as the economic threshold.

To use the table, begin by sampling and recording the number of fleahoppers (if any) on the first plant. You then move to a second plant and count the fleahoppers present, and add the number (if any) to those on the first plant count, etc. The number of fleahoppers is recorded in the center column entitled running total. The running total column then is not the number of fleahoppers found on the plant, but the total number of fleahoppers found on all plants sampled. If the running totals are equal to or above the decision to treat column, stop sampling and treat. If the running totals are equal to or lower than the decision to not treat, stop sampling and do not treat. As long as the running total remains between the two limits, continue to sample. The ND symbol means no decision. As can be seen from the table, no decision can be made to treat until at least 10 plants are sampled and a decision not to treat cannot be made until at least 26 plants are sampled. The values to determine this table were derived from extensive sampling in southwestern Oklahoma.

If table indicates that no decision can be made after 100 plants are checked, then the field should be resampled within 3 days.

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*Footnote
Research in Oklahoma indicates that treatment of fleahoppers in Oklahoma is generally not economical.

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 insect surveys. Forest Sci. 1:68-79.

Table 1. Sequential Sampling for Fleahoppers
K = 4.46
confidence interval 90%

Plant	Decision No Treat	Running Total	Decision Begin Treatment	Plant Number	Decision No Treat	Running Total	Decision Begin Treatment
1	ND	___	ND	51	9	___	26
2	ND	___	ND	52	10	___	26
3	ND	___	ND	53	10	___	27
4	ND	___	ND	54	11	___	27
5	ND	___	ND	55	11	___	27
6	ND	___	ND	56	11	___	28
7	ND	___	ND	57	12	___	28
8	ND	___	ND	58	12	___	28
9	ND	___	ND	59	12	___	29
10	ND	___	12	60	13	___	29
11	ND	___	12	61	13	___	29
12	ND	___	12	62	13	___	30
13	ND	___	13	63	14	___	30
14	ND	___	13	64	14	___	30
15	ND	___	13	65	14	___	31
16	ND	___	14	66	15	___	31
17	ND	___	14	67	15	___	32
18	ND	___	14	68	15	___	32
19	ND	___	15	69	16	___	32
20	ND	___	15	70	16	___	33
21	ND	___	16	71	16	___	33
22	ND	___	16	72	17	___	33
23	ND	___	16	73	17	___	34
24	ND	___	17	74	17	___	34
25	ND	___	17	75	18	___	34
26	1	___	17	76	18	___	35
27	1	___	18	77	19	___	35
28	1	___	18	78	19	___	35
29	2	___	18	79	19	___	36
30	2	___	19	80	20	___	36
31	3	___	19	81	20	___	36
32	3	___	19	82	20	___	37
33	3	___	20	83	21	___	37
34	4	___	20	84	21	___	37
35	4	___	20	85	21	___	38
36	4	___	21	86	22	___	38
37	5	___	21	87	22	___	38
38	5	___	21	88	22	___	39
39	5	___	22	89	23	___	39
40	6	___	22	90	23	___	39
41	6	___	22	91	23	___	40
42	6	___	23	92	24	___	40
43	7	___	23	93	24	___	41
44	7	___	24	94	24	___	41
45	7	___	24	95	25	___	41
46	8	___	24	96	25	___	42
47	8	___	25	97	25	___	42
48	8	___	25	98	26	___	42
49	9	___	25	99	26	___	43
50	9	___	26	100	27	___	43

* ND means no decision can be made.