Cotton Blooming as an Index of the Effect of Timing Insecticide Applications For Boll Weevil Control[1]

F. A. FENTON and JAMES R. DOGGER, Oklahoma A. & M. College, Stillwater

This is the third and final report on the blooming and fruiting of cotton in different plots treated with insecticides. This study was started in 1948 when a seasonal record was kept of the blooming of plants in a plot dusted with toxaphene and in one that did not receive any insecticide application. The original purpose was to determine when the crop was made. It was shown that despite the greater number of blooms produced by July 25 in the dusted plot the number of bolls set on that date was the same in both plots. Beginning with July 25, however, a greater percentage of blooms in the treated plot made bolls.

In 1949, the test was considerably expanded and the bloom plots were replicated in a block of randomized insecticide treated plots. Records were kept of the blooming of plants treated with the standard 3-5-40 dust mixture at 13.6 pounds per acre, and at 10.6 pounds per acre, and a toxaphene-DDT (2-1) spray at 1.8 pounds toxaphene and 0.9 pound DDT per acre, as compared with blooming in non-treated plots. Comparisons were made between the two years as to the dates of the blooming period, the number of blooms and bolls produced, and the percentage of bolls set. At the end of these two years, it was tentatively concluded that the greatest benefit of applying insecticides to cotton was the protection of young bolls from boll weevil and other insect damage. It was also apparent that controlling overwintered weevils would increase the number of early blooms produced and since a higher proportion of these early blooms produced bolls, this insured an early crop.

In 1950, blooms were tagged daily on plants in plots that received the following schedule of treatments:[2]

Toxaphene-DDT

One presquare, three bloom, and five late airplane spray applications.
Two prebloom, three bloom, and five late airplane spray applications.
Three bloom and five late airplane spray applications.
Five late airplane spray applications.

Toxaphene

Two prebloom, three bloom spray applications and five late airplane spray applications.

---

[1] This paper was presented at the 30th annual meeting of the Academy at Chickasha, Okla. December 1, 1950. The manuscript was not received in time for publication in Vol. 31 of Proceedings.

[2] Presquare treatments were made before the blossom buds or squares appeared; prebloom treatments were those made after squares appeared but before the first flowering; bloom treatments were those made in blooming cotton. All plots received airplane applications.

The dates of the above applications were as follows: presquare, June 14; probloom, June 20-21, June 27; bloom, July 7, 12-13, 21; airplane, July 25, 27, August 4, 9-11, and 15.

The toxaphene-DDT spray was prepared by diluting with water an emulsifiable concentrate containing 4 pounds of toxaphene and 2 pounds of DDT per gallon. The amount of water added was sufficient to apply 1 pound (presquare), 1½ pounds (squsre), and 2 pounds (bloom) of toxaphene and half as much of DDT per acre. This same formulation was used in the airplane applications with one exception; namely, July 25 when only toxaphene was used at the rate of 3 pounds per acre. The toxaphene spray was applied so as to use from 2 to 3 pounds of toxaphene per acre. All of these formulations gave equally good control of the weevil and any differences in rate of blooming were therefore due to the number and timing of the spray applications.

Comparative Duration of Blooming Periods, 1948 to 1950.

The blooming started July 3 and ended August 29, giving a blooming period of 57 days as compared with 35 days in 1949 and 50 days in 1948. During the first two years, there was comparatively little difference between the number of blooms produced in the treated and check plots, the increased yields being due to a greater percentage of the blooms in the treated plots making bolls. In 1950, however, because of a much heavier boll weevil infestation, the treated plots outbloomed the check plots in the ratio of 1½ to 1. During all three years there was no significant difference in the duration of the blooming periods of the check and treated plots.

Comparative Rates of Boll Setting 1948 to 1950.

A comparison of the three years (Table I) shows that there were marked differences in the rate of the setting of the crop. Although the variety studied in 1948 (Improved Rowden) was different from the variety studied in the other two years (Stoneville 62) it has been shown by other workers (2) that the character of the growing season is of much more importance than the variety.

TABLE I.

Comparative Rates of the Setting of a Crop of Cotton in Different Years, Canadian, Oklahoma. 1948-1950.

VARIETY AND YEAR	NO. OF DAYS TO SET CROP	PER CENT SET BY 7/10	7/20	7/31	8/10	8/25
Improved Rowden 1948	50	4	19	42	73	100
Stoneville 62 1949	34	35	86	99	100	—
Stoneville 62 1950	47	10	40	68	95	100*

* By August 17

Effect of Timing of Applications on Blooming

The bloom curves for the different plots are shown in Figure 1. Because of inclement weather, the third bloom application made by ground equipment was delayed nine days after the preceding application. As a result, the weevils caused a reduction in blooming. This trend was sharply reversed in all plots during the 5-day period of August 7-11, but a trend toward increased blooming began during the preceding 5-day period in plots which had not been sprayed before blooming, but were receiving bloom treatments. Most of this late season increase must have been due to the beneficial effects of the airplane applications which were started July 25. As an average of 31.7 per cent of these blooms set bolls, applications by air were a definite factor in increasing yields.

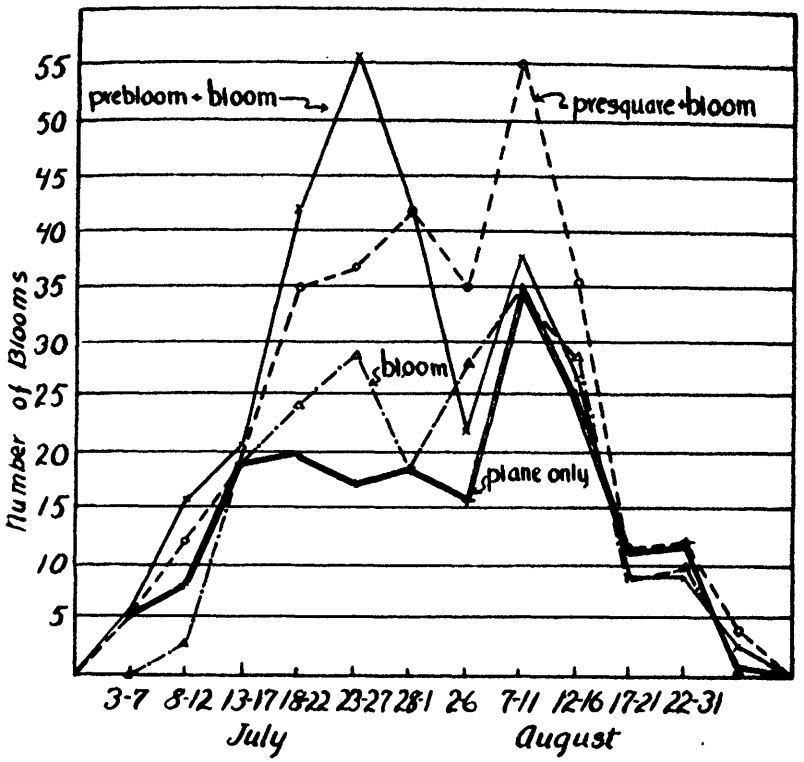

FIGURE 1.

Plots receiving prebloom applications produced blooms in much greater abundance during the period July 8 to August 1 than plots sprayed only during the blooming period. This was due to the fact that control of the overwintered weevils lowered the percentage of squares infested and allowed more to come into bloom. During this 5-day period 66.7 to 76.5 per cent of the crop was made in plots receiving prebloom applications as compared to 51 to 54 per cent in the other plots. These figures emphasize the importance of prebloom applications in obtaining maximum yields in eastern Oklahoma. Plots receiving one presquare application did not reach their peak of blooming until August 7-11 whereas those receiving two prebloom treatments had reached their peak July 23-27.

REFERENCES

FENTON, F. A. and J. T. TIPPIT 1950. The fruiting of cotton in relation to insect control. Proc. Oklahoma Acad. Sci. *29*: 37-38.

FENTON, F. A. 1951. Cotton fruiting in relation to insect infestation. Proc. Oklahoma Acad. Sci. *30*: 56-59.