

Population Responses of Pink Bollworms to a Continuous Short Season Cotton Culture

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Summary

The effects of a continuous short season cotton culture on pink bollworm populations indicated that populations were reduced and boll infestations suppressed following one year of a short season culture. Differences in the percent of diapause between short season and long season cultures would indicate that further population reductions would occur in the 1982 crop.

This research was initiated during the 1980 growing season by establishing a short season cotton culture about one mile from a long season cotton culture. In 1981, DPL-61 cotton was planted in the same locations to assess the effects of early termination of the 1980 short season culture.

Short season cotton was irrigated 6 times and terminated on August 17. Long season cotton received 8 irrigations and was terminated on September 16. No insecticides were used on either of the two treatments.

Pink bollworm populations were sampled at periodic intervals during the season to evaluate the differences in infestation levels between the two cultures. Diapause samples were taken from both the short and long season cultures on September 21. Cotton in the short season plots were then shredded to destroy fruiting parts and prevent pink bollworm increases. Subsequent diapause counts were taken on October 1 and 15 in the long season plots to assess the amount of diapause increase in the later maturing cotton.

In 1980, the first year of this experiment, no differences occurred between the two cultures. Fruit development was terminated on September 27 in short season plots and on October 23 in long season plots. The percent of diapause at time of fruit termination was 12.9 percent in short season and 93.8 percent in long season.

Table 1 shows that the difference in percent of diapause in 1980 was reflected in the amount of infestation that occurred in the 1981 crop. The economic threshold for this area is considered to be 15 percent boll infestation and this rate of infestation was reached just prior to August 3 in long season cotton. However, the short season cotton did not reach economic levels until the third week in August, or about 3 weeks later than the long season. In addition, boll infestations in short season treatments remained considerably lower than in long season treatments during the period of sampling.

The percent of diapausing pink bollworm larvae is shown in Table 2. The first diapause sample, taken on September 21, indicated that both treatments had a diapause rate of about 16 percent. Termination of fruiting parts in short season plots occurred on September 23 to prevent continuation of pink bollworm reproduction.

The diapause rate in long season cotton continued to increase, reaching a peak of 94 percent at time of fruit termination on October 15. These results conclude that only 15.8 percent of the larval population in a short season culture has a chance to survive the winter, but in long season cotton, 94 percent could survive and reproduce the following spring.

Table 1. Percent Boll Infestation.

Treatments	Date of Boll Sample							
	July		August				September	
	20	27	3	11	18	25	2	9
Short Season	0	2	5	9	11	20	41	50
Long Season	6	11	19	27	48	61	76	83

Table 2. Irrigation Termination and Percent Diapause.

Treatments	Number of Irrigations	Date of Last Irrigation	% Diapause		
			9/21	10/1	10/15
Short Season	6	8/17	15.8	--	--
Long Season	8	9/16	16.2	84.3	94.0