WINTER SURVIVAL OF IMMATURE STAGES OF THE BOLL WEEVIL[1]

By EDGAR F. GROSSMAN

No live stages of immature boll weevils *(Anthonomus grandis* Boh) were found on making a mid-winter examination of a large number of bolls and squares attached to cotton plants which had been plowed up late in the fall of 1927 and subsequently piled together to serve as a windbreak. Numerous live adult weevils, however, were found among the large number of dead weevils, pupae and larvae, which were discovered in the cotton debris. A later examination which was conducted in April also failed to yield live immature forms.

In order to eliminate such factors as predators, parasites and mechanical injury which greatly increase the boll weevil mortality rate during the winter months, a number of cotton squares and bolls were removed from an infested field on November 17, 1928. They were then placed in a low temperature incubator regulated to maintain a temperature of 55°F. and 80 percent to 90 percent relative humidity. The selected temperature and relative humidity conditions were previously determined to be near the optimum[2]. After the cotton fruit had been in the incubator 69, 92, 123, 131 and 139 days, respectively, individual squares and bolls were opened until a live weevil stage was found.

Though the examinations yielded many dead larvae, not a single live one was discovered. Several live pupae, however, were found, two having lived as long as ninety-two days after having been placed in the incubator. Live adults were found after periods of 92, 123 and 131 days, respectively, in the incubator. After 138 days no more live weevil stages were found.

Hinds and Yothers[3] conducted an experiment for determining the effectiveness of cotton bolls as hibernation quarters for the boll weevil and in the experiment tabulated the larvae and pupae found within the bolls. No live stages were found in March, though a few representatives of all stages were found in Feb-

---

[1]Contribution from the Department of Cotton Investigations, Florida Agricultural Experiment Station.

[2]Grossman, E. F. "Some Humidity and Temperature Effects on Development and Longevity". Fla. Ent. Vol. XIV, No. 4, pp. 66-71. Dec. 1930.

[3]Hinds, W. E., and W. W. Yothers. "Hibernation of the Mexican Cotton Boll Weevil". U. S. D. A. Bur. Ent. Bul. 77, pp. 1-106. 1909.

ruary. The earlier months of December and January, however, yielded a large number of live individuals.

In Florida, it is quite probable that the larval stages in cotton squares and bolls fail to develop into adults during the winter months. The late pupal stages in squares and bolls, however, may develop into adults and, unless the winter is severe, emerge along with other adult weevils quitting hibernation. The toughness of the overwintered cotton bolls, however, generally tends to confine the newly hatched adult until it dies. Though abandoned cotton stalks may yield but few additional weevils for a renewed spring infestation, they should nevertheless be destroyed early in autumn in order to remove the favorable hibernation quarters they provide for adult weevils.

SURVIVAL OF IMMATURE STAGES OF THE BOLL WEEVIL IN COTTON SQUARES AND BOLLS COLLECTED IN THE FIELD, NOVEMBER 17, 1928, AND PLACED IN A LOW TEMPERATURE INCUBATOR

Date examined, 1929	Days in incubator	Number Cotton Squares Examined							
			Larvae		Pupae		Adults		Total
		Uninfested	Live	Dead	Live	Dead	Live	Dead	Squares
Jan. 24	69	16	0	26	0	8	0	0	50
Feb. 16	92	449	0	335	2	24	2	47	859

		Number Cotton Bolls Examined							
			Larvae		Pupae		Adults		Total
		Uninfested	Live	Dead	Live	Dead	Live	Dead	Bolls
Jan. 24	69	1	0	0	1	0	0	0	2
Feb. 16	92	6	0	2	0	2	1	1	12
March 18	123	69	0	13	0	22	2	15	121
March 26	131	3	0	0	0	0	1	0	4
April 3	139	88	0	33	0	5	0	6	132