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BIOLOGY OF THE MEXICAN COTTON BOLL WEEVIL
IV. Duration of Fertility After Copulation[1]

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The successful development of artificial hibernation quarters which enabled the cotton boll weevil (*Anthonomus grandis* Boh.) to live through the winter while being closely observed, led to definite information concerning the longevity of active spermatozoa in the spermatheca. A low temperature incubator, brine cooled to hold an average temperature of 55° Fahrenheit, provided artificial hibernation quarters. Individual weevils placed in small wire cages filled with Spanish moss provided that isolation of females which is necessary in order to determine the length of time spermatozoa can survive in the spermatheca.

A total of about seven hundred pairs of boll weevils were observed to copulate; thereupon the females were isolated and placed in the described hibernation quarters. A temperature of 60° Fahrenheit was maintained for two days after which it was lowered to and held at 55° Fahrenheit.

Beginning with a seven day period of isolation, several of the females were removed from hibernation, placed in a constant temperature incubator registering 80° F., and fed fresh cotton squares. After several days of feeding the weevils began to lay eggs. By examining the squares daily, egg punctures were recognized and each square in which the weevil had oviposited was isolated until the egg hatched. Though the majority of weevils were allowed to lay but few eggs, due to the scarcity of cotton squares, several weevils in each group were provided with squares for continued oviposition. In all cases the eggs laid were fertile. Following the seven day period, other weevils were tested after increasing lengths of time, until finally, suc-

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

cessful oviposition of fertile eggs occurred after one hundred and seventy-nine days of isolation. This individual continued to lay eggs until a total of two hundred and one days had elapsed between the time of copulation and laying of fertile eggs.

OVIPOSITION RECORDS OF ISOLATED WEEVILS

Number Weevils Placed in Hibernation	Duration of Hibernation	Number Days Without Food	Number Days After Copulation During Which Fertile Eggs were Laid	Number Weevils Removed From Hibernation and Observed to Oviposit
60	Nov. 12–19	7	8–16	10
92	Oct. 15–Nov. 19	35	39–49	4
78	Oct. 26–Dec. 3	38	44–55	6
66	Oct. 26–Dec. 18	53	60–66	5
13	Oct. 19–Dec. 31	73	80–88	3
40	Oct. 20–Jan. 23	95	102–115	1
38	Oct. 16–Jan. 23	99	107–124	2
159	Nov. 15–Apr. 3	108	115–118	2
32	Oct. 16–Feb. 25	132	142–180	1
6	Nov. 19–Apr. 20	152	157–193	2
86	Jan. 23–July 2	161	168–175	1
4	Nov. 19–May 17	179	183–194	1
4	Nov. 19–May 14	176	187–201	1

The following information is presented in the accompanying table:

The number of isolated weevils placed in hibernation. Though large numbers of weevils were isolated, but comparatively few weevils lived for any considerable length of time. For example, one hundred and eighty two weevils were isolated and placed in hibernation quarters November 4th. By April 3rd, all were dead, none having been used for oviposition tests. Such groups of weevils are not recorded.

The duration of the period spent in hibernation: A record of the dates on which the weevils were placed in and subsequently removed from hibernation quarters. The weevils become par-

tially inactive when placed in an incubator averaging a temperature of 68° F. They became completely inactive when the temperature was reduced to 55° F. From time to time the isolated weevils were examined, those which had died were removed.

The number of days without food. This column represents the number of days each weevil which was used for the oviposition tests spent in hibernation; a repetition of the "Duration of hibernation" column, with numerical values substituted for the recorded dates.

The number of days after copulation during which fertile eggs were laid. The information presented in this column shows increasing periods of time during which active spermatozoa survived in the spermatheca.

Number of weevils removed from hibernation and observed to oviposit. But few weevils were removed at a time from each group of individuals placed in hibernation. Both the scarcity of cotton squares, obtainable during the winter months only from plants grown in the greenhouse, and the difficulty of handling large numbers of isolated weevils, necessitated experimentation with small numbers of weevils.

It is significant that fertile eggs were laid after a period of almost seven months after copulation. Oviposition after the weevil emerges from hibernation is, therefore, not delayed until chance copulation insures fertilization of the eggs. Consequently, the ability of boll weevils to lay fertile eggs seven months after copulation insures early infestation of the cotton fields in the spring.

The author has not observed parthenogenesis in the boll weevil to occur.

THE MEDITERRANEAN FRUIT FLY

The progress made towards the eradication of the fruit fly since our last issue has been very gratifying indeed. As a result of the thorough cleanup of all known and suspected hosts in and about the infested areas and the systematic spraying with the poisoned bait, the fly is now very scarce. At the time of going to press it has been several weeks since a fly has been caught.

Although cage experiments are frequently adding wild fruits to the known list of hosts, no infestations are being found in wild hosts in uncultivated areas.