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THE MEXICAN BEAN BEETLE IN CONNECTICUT

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ABSTRACT

Distribution, life history studies, host selection and control measures of *Epilachna corrupta* are discussed.

The Mexican bean beetle, *Epilachna corrupta* Muls., was discovered in Connecticut by Dr. E. P. Felt, who reported its presence in Stamford in July, 1929. During that year, the beetle was reported from 17 towns in the western half of the State. In 1930, it was reported from other towns in all parts of the State, and some damage was done by the second generation in several localities. In 1931, the distribution included the entire State and serious injury was noted in many places. The first generation was destructive in Fairfield and New Haven Counties, and the second generation caused damage in all parts of the State.

TABLE 1. AVERAGES OF REARINGS

Date started	Incubation period	First instar	Second instar	Third instar	Fourth instar*	Pupal period	Total
1st generation							
June 20.....	8	6	3	4	7	7	35
July 5.....	8	5	3	3	7	7	33
2nd generation							
July 30.....	7	5	3	4	8	9	36
July 31.....	8	5	3	5	7	9	37
Aug. 5.....	8	4	4	4	9	8	37
Aug 10.....	8	6	2	5	9	9	39

*Includes prepupal period.

LIFE HISTORY. The Mexican bean beetle had two complete generations in Connecticut during 1931. Eggs were found in the field on June 9, and the first generation adults started emerging on July 10. Second generation eggs were found July 25, and second generation adults started emerging September 1. Eggs were found in the field as late as September 24. In the insectary cages, first generation adults deposited eggs un-

til September 29. Third generation eggs were deposited between September 5 and 20. None of these eggs produced adults before frost.

TABLE 2

Host	Date	Number started	Number matured	Larval period* Number	Days	Mean larval period
Phaseolus vulgaris						
Crackerjack wax	July 31	10	8	3	18	
				3	19	18.9
				2	20	
	Aug. 5	30	28	22	21	
				6	22	21.6
	Aug. 10	20	18	5	21	
				10	22	22.0
				2	23	
				1	25	
Mammoth Horticultural	July 30	15	11	4	18	
				4	19	18.9
				3	20	
Bountiful Green Pod	July 31	15	13	2	18	
				4	19	19.5
				6	20	
				1	21	
Navy	July 30	15	13	1	18	
				12	19	18.9
P. coccineus						
Scarlet Runner	July 31	15	9	1	18	
				4	19	19.3
				4	20	
P. lunatus						
Burpee bush lima	July 31	15	10	5	18	
				4	19	18.8
				1	22	
Sieva lima	July 30	15	13	6	19	
				5	20	19.7
				2	21	
Vigna sinensis						
Clay cowpea	July 30	15	10	3	20	
				4	21	21.1
				2	22	
				1	23	
Dolichos lablab						
	July 29	15	0	2	27	27.7
	Aug. 8	12	3	1	29	

*Including prepupal period.

The two generations were rather sharply defined, and there was no evidence that any first generation adults survived until hibernation. One overwintering beetle lived in a cage until August 28, depositing eggs until July 8. In the field, practically all overwintering adults had disappeared before the first generation matured.

The time required from egg to adult is given in Table 1.

The shortest time required by an individual insect was 32 days for a late first generation individual and the longest was 41 days for a second generation individual. The time was greatly influenced by weather conditions.

DURATION OF LARVAL PERIOD ON LEGUMES. In laboratory studies of the first generation host selection, some differences in duration of larval period on various legumes were noted. These differences were checked on second generation larvae, and the results are presented in Table 2. The larvae were reared individually on potted plants.

Reference to Table 2 shows no essential difference in duration of the larval period except in the case of cowpeas and *Dolichos lablab*. Larvae required more than one day longer on cowpeas than on garden beans. In the case of *Dolichos lablab*, only three of 27 newly-hatched larvae matured, and these took eight days longer than larvae on any other legumes.

HOST SELECTION. Small test plots of several legumes were planted to determine host preference. The following rough classification shows the results, the items in the first two groups being listed in the order of preference:

COMMON NAME	SCIENTIFIC NAME
SEVERELY INJURED	
Garden bean (all varieties)	*Phaseolus vulgaris*
Scarlet runner	*P. coccineus*
Lima bean (all varieties)	*P. lunatus*
SLIGHTLY INJURED	
Hyacinth bean	*Dolichos lablab*
Cowpea	*Vigna sinensis*
Yard long bean	*Dolichos sesquipedalis*
Soy bean	*Glycine max*
IMMUNE	
Lentil	*Lens esculenta*
Broad Windsor	*Vicia faba*
Mung bean	*Phaseolus aureus*
Velvet bean	*Styolobium deeringianum*

The Broad Windsor bean is the only immune variety grown in Connecticut.

CONTROL MEASURES. Tests were made against second generation larvae using the following materials:

(1). Spray—Magnesium arsenate	2 lbs.
Casein lime	3 lbs.
Water	100 gals.
(2). Dust—Magnesium arsenate	1 part
Hydrated lime	6 parts
(3). Dust—Barium fluosilicate	1 part
Hydrated lime	6 parts

All of these treatments were applied four times during August to late string and lima beans. All treatments were successful in controlling the Mexican bean beetle, and no burning of foliage resulted from any of them. The spray treatment protected the plants longer than either of the dusts. There was no apparent difference between the arsenical dust and the fluosilicate dust except a slight difference in yield in favor of the magnesium arsenate. This was not necessarily significant, as the experiment was not run accurately enough for such comparisons.

Growers used calcium arsenate both as a spray and as a dust with good results. They also used proprietary dusts containing copper, lime and lead or calcium arsenate with good results. Lead arsenate was used alone and with lime and in Bordeaux mixture by some growers. In a majority of cases, injury resulted.

SUMMARY

The Mexican bean beetle is well established throughout Connecticut.

Two complete generations appeared in the State during 1931.

The first generation required an average time of 33 to 35 days for egg to adult development. The second generation averaged from 36 to 39 days.

Larval development on cowpeas and *Dolichos lablab* was considerably slower than on other host plants.

The common varieties of beans were seriously injured. The Broad Windsor bean is the only immune variety grown in Connecticut.

Magnesium arsenate as a spray was the most satisfactory control. This material and barium fluosilicate used as dusts were equally effective.

TESTS WITH ARSENICALS ON BEANS FOR THE CONTROL OF THE MEXICAN BEAN BEETLE

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ABSTRACT

An attempt is made to appraise the comparative value of a few of the arsenicals when used in spray and dust mixtures for the control of the Mexican bean beetle (*Epilachna corrupta*), as indicated by the comparative safety wherewith such mixtures may be applied to beans. Magnesium arsenate and basic lead arsenate gave the most reliable results, but for eastern growers these arsenicals are comparatively expensive and are not readily procurable. Tests with calcium arsenate, which is comparatively cheap and easily procurable, showed that this insecticide might be used with comparative safety when combined with a copper-lime dust, bordeaux mixture, or a heavy hydrated lime spray.