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DEVELOPMENTAL RESPONSE OF CABAGE LOOPER, TRICHOP LUSIA NI (HUBNER) UNDER FLUCTUATING TEMPERATURES

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ABSTRACT

Response of development to temperature was observed for Cabbage Looper, *Trichoplusia ni* (Hubner). The development was performed under 19.18°C, 24.97°C, and 37.18°C. Duncan's(1) new multiple-range test showed that there exists significant difference in the insect development for the three treatments.

Cabbage looper, *Trichoplusia ni*, is a common insect pest in Arizona. This species attacks lettuce, spinash, tomato, cabbage, cotton, etc.

In this experiment three different temperatures were used to observe the response of this insect concerning.

METHODS AND MATERIALS

Thirty creamer cups containing artificial diet were used as container for hatching insects. In each cup three hatching larvae were placed, and the cups were covered and placed in a large one. The ratio was 10 small cups per large cup. Then each group of ten small cups with the hatching larvae were placed in three temperature controlled rearing boxes and kept for one week. After this time, the insects were weighed individually. Temperature in the three rearing boxes were: 19.98°C, 24.97°C and 37.18°C. The range for the first, second and third boxes were: 18.87 — 21.09°C, 24.42 — 25.53°C, and 34.41 — 37.74°C, respectively.

RESULTS

Table 1, shows the analysis of variance for *T. ni* reared at 19.98°C, 24.97° C, 37.18°C. F test confirmed significant difference among treatments at 0.05 level, with 2 and 57 degrees of freedom.

Table 2, shows the mean in grams of the insects reared at three different temperatures. At 37.18°C the insects showed a high development, with a mean of 0.11041 grams. The lowest development was observed at 19.98°C ($\overline{X}_1$ = 0.00178 g).

Based on Table 3, DUNCAN'S(1) test shows that there exists significant difference among the means of the three treatments, at 0.05 level.

Table 4, brings the percentage of mortality for the three treatments. The highest mortality (26.9%), was observed at 37.18°C in spite of the great development. Under 19.98°C, the mortality was 14.8%; at 24.97°C there was no mortality, and all the larvae were healthy.

DISCUSSION AND CONCLUSION

Most of the discussion was included on the preceding portions of this paper. In general, these range of temperature is found on the natural environment in Arizona. The temperature

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TABLE 1

Analysis of Variance for *T. ni*, Reared at Three Different Temperatures. Tucson, Arizona, 1971.

Source of variation	Sum of squares	df	mean square	F*
Treatments	0.125	2	0.0625	
Error	0.056	57	0.0009	69.44
Total	0.181	59		

* Ftab 0.05 level, with 2 and 57 df = 3.944 less than 69.44, denoting significant difference among tretments.

TABLE 2

Means in Grams of the Weights of *T. ni*, Reared at Three Different Temperatures. Tucson, Ar., 71.

TEMPERATURE (°C)		
19.98	24.97	37.18
$\overline{X}_1$	$\overline{X}_2$	$\overline{X}_3$
0.00178 a	0.03399 b	0.11041 c

TABLE 3

Rank of the Means, for *T. ni*, Reared at Three Different Temperatures. Tucson, Arizona, 1971.

	$\overline{X}_3 - \overline{X}_1$	$\overline{X}_3 - \overline{X}_2$	$\overline{X}_2 - \overline{X}_1$
LSR	0.108 0.020	0.076 0.019	0.032 0.019

TABLE 4

Percent of Mortality for *T. ni*, Reared at Three Different Temperatures. Tucson, Arizona, 1971.

MORTALITY IN PERCENTAGE		
24.97°C	19.98°C	37.18°C
0.00	14.80	26.90

of 37.18°C, gave a high development of the insect, but at this temperature, the mortality was the highest. According the data compiled in this work, the best temperature for the insect development was 24.97°C, which could be considered a dangerous situation (without consider the other limiting factors on the field), when extrapolated to the natural environment. Under this treatment the insect developed well and mortality was 0%.

SUMÁRIO

O presente trabalho relata a influência de diferentes temperaturas sobre o desenvolvimento da lagarta da couve, *Trichoplusia ni* (Hubner).

O desenvolvimento da praga foi observado sob condições de 19,18°C; 24,97°C e 37,18°C. Verificou-se diferença estatística entre os tratamentos, evidenciada pelo teste de DUNCAN(1). A temperatura de 24,97°C foi a mais favorável, propiciando bom desenvolvimento da praga, sem ocorrência de mortalidade.

REFERENCE CITED

1. DUNCAN, D.B. 1955. Multiple range and multiple F tests. Biometrics, (11): 1-42.