

Research Note

SUSCEPTIBILITY OF 7 CULTIVARS OF COFFEA ARABICA L. TO LEUCOPTERA COFFEELLA (GUÉRIN-MÉNEVILLE)¹

Coffee, the main agricultural enterprise in the west-central region of Puerto Rico, is attacked by the coffee leafminer, *Leucoptera coffeella* (Guérin-Ménéville). The larvae of this moth, feeding on the mesophyll of the leaf for about 3 weeks produce brown spots, reducing the photosynthetic activity of the leaves and tree yield.

This insect is found throughout the Neotropical region in almost every country where coffee is grown. It was probably brought to the New World from Reunion with the first coffee plants.² The first record for Puerto Rico was reported by O. W. Barrett³ in 1903. From that year to the present, different entomologists^{4, 5, 6} have studied this insect in Puerto Rico.

Field observations indicate that different cultivars of *C. arabica* L. show different grades of leafminer infestation. In an attempt to confirm those observations, I evaluated seven cultivars of *C. arabica* under greenhouse and sunlight coffee grove conditions.

In the greenhouse, 10 plantules (cotyledon stage) were selected and planted in soil bags of 10 cm diameter. For observation the plantules were placed in a complete randomized block design with five replicates per cultivar. To determine the infestation percentage per cultivar, I recorded the total number of leaves and mines. The percentage of infestation was recorded 1 month after the establishment of the experiment. A natural high infestation of the leafminer was obtained in the greenhouse, so no artificial inoculation was needed.

The following tabulation shows that under greenhouse conditions cultivar "Pacas" had the highest leafminer infestation (97.3%), followed by Caturra 494 (94.6%), significant at the 1% level when compared with

¹ Manuscript submitted to Editorial Board February 21, 1986.

² Green, D. S., 1984. A proposed origin of the coffee leafminer, *Leucoptera coffeella* (Guérin-Ménéville) (Lepidoptera: Lyonetiidae). Bull. Entomol. Soc. Am. Spring 1984, pp. 30-31.

³ Barrett, O. W., 1904. Ann. Rep. P.R. Agric. Exp. Stn. 1903, pp. 429-50. Washington, D.C.

⁴ Pérez Escobar, M. E., 1962. Recomendaciones para controlar el minador del café con el insecticida sistemático Di-syston, Esta. Exp. Agric., Río Piedras, P.R., Publ. Misc. 42.

⁵ Wolcott, G. N., 1947. A Quintessence of sensitivity: The coffee leafminer. J. Agric. Univ. P.R. 31 (3): 215-19.

⁶ Van Zwaluwenburg, R. H., 1917. Insects affecting coffee in Puerto Rico. J. Econ. Entomol. 10 (6): 513-17.

the lowest infestation percentage of cultivar Puerto Rico 401 (31.8%). No other comparisons were significant.

<i>Cultivar</i>	<i>Percent infestation</i>
Pacas	97.3* ⁷
Caturra 494	94.6*
Bourbon Amarillo 3595	66.1
Harrar	61.2
Mundo Nuevo	50.0
Bourbon Rojo	46.3
Puerto Rico 401	31.8

* P = 0.01.

A field experiment (1982-83) was carried out with a complete randomized block design with four replicates and five plants per replicate. Four lateral branches were randomly selected at the four cardinal points of each plant. They were examined twice during the year according to the seasonal activity of the leafminer in Puerto Rico (December-March and June-July). The number of leaves and mines were recorded. Infestation percentage means were analyzed statistically and a "t" test of significance was performed.

In this experiment, it was impossible to determine significance according to the statistical analysis. Nevertheless, Pacas cultivar showed the highest leafminer infestation percentage (81.2%) followed by Caturra 494 (62.5%). Puerto Rico 401 had the lowest percentage (31.2%), as shown in the following tabulation.

<i>Cultivar</i>	<i>Percent infestation</i>
Pacas	81.2
Caturra 494	62.5
Bourbon Rojo	50.0
Bourbon Amarillo 3595	43.7
Harrar	43.7
Mundo Nuevo	43.7
Puerto Rico 401	31.2

The two experiments showed that there is a real difference in susceptibility between Puerto Rico 401 and Pacas or Caturra 494. It was observed in the unshaded experiment that in some cultivars such as Pacas and Caturra 494, leafminer infestations were higher in the middle leaves of the branches than in the leaves exposed to direct sunlight. This probably explains the differences between Pacas and Puerto Rico 401, because in the latter there are wider spaces between branches and leaves.

These differences could be explained by the following hypothesis: 1) internal leaves that receive less direct sunlight are physiologically different from the outer leaves and are apparently more palatable to the leafminer, and 2) cultivars Pacas and Caturra 494 create a microclimate favorable for increasing the coffee leafminer population. Both hypotheses should be studied in more detail.

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