Coffee Berry Borer Patterns of Infestation and Bean Damage Across Jamaica

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Rationale

The Jamaican coffee industry faces significant losses due to the coffee berry borer (CBB), necessitating a knowledge-based pest management approach. This study examined CBB infestation patterns and bean damage in Jamaica's high mountain and Blue Mountain regions, to support the development of targeted, sustainable pest management programs.

Methods

Data were collected at a high mountain farm and a Blue Mountain farm, focusing on CBB infestation relative to different cardinal directions (horizontal infestation patterns) and branch heights (vertical infestation patterns) in selected shrubs. Bean damage length was measured to the nearest 0.5mm after manually pulping the coffee berries, and separating them into individual beans.

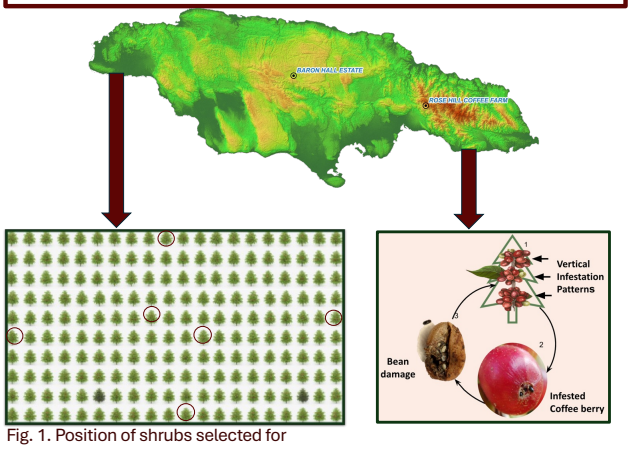
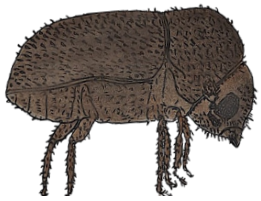


Fig. 1. Position of shrubs selected for monitoring CBB infestation in 0.1 ha plots at Baron Hall Estate (high mountain) and Rosehill (Blue Mountain) farms.

Conclusion And Perspectives

These findings suggest that altitude and cooler temperatures in the Blue Mountain region may no longer mitigate CBB infestations. They highlight the complexity of CBB population dynamics and emphasize the need for location-specific pest management strategies to maintain CBB populations at economically sustainable levels.



Reference: Coffee Berry Borer. NSW Department of Primary Industries,1970. https://www.dpi.nsw.gov.au/biosecurity/plant/insect-pests-and-plant-diseases/coffee-berry-borer.

Results

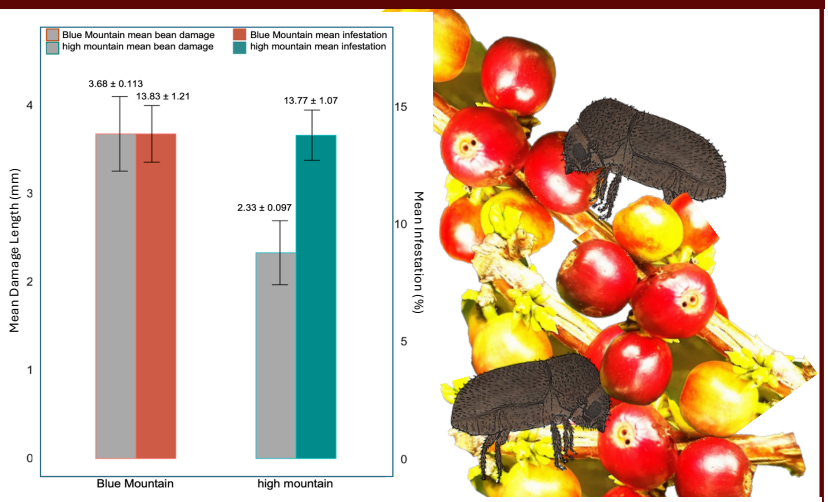


Fig. 2. Mean infestation levels were similar on both farms, but bean damage differed significantly.

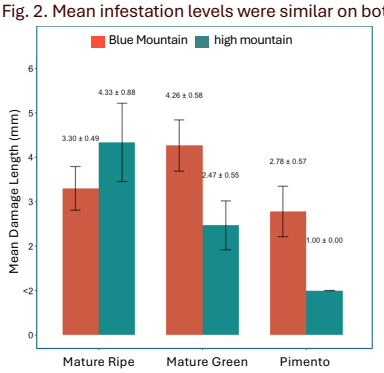


Fig. 3. The highest bean damage occurred in mature ripe berries (~180 days after flowering) on the high mountain farm) and in mature green berries (~120 days after flowering) on the Blue Mountain farm.

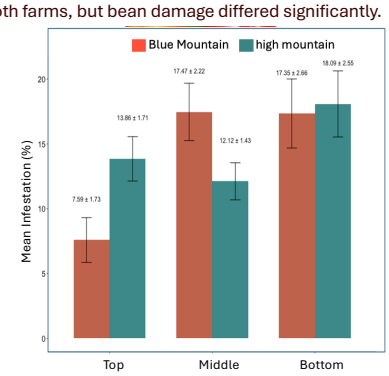


Fig. 4. The highest infestations were observed in mid shrub and lower sections at Blue Mountain, and upper and lower sections in high mountain farms.

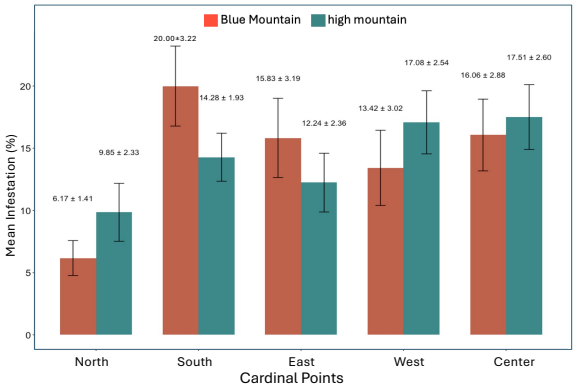


Fig. 5. Cardinal orientation influenced CBB's presence. Northern sections of farms had the lowest infestation, while the highest levels were in the southern shrubs of Blue Mountain and western and central sections of high mountain.

Table 1. Significance levels of the relationships among infestation and location, vertical positions and cardinal points.

Differences Between % Infestation and:	P-value	Significant
Location	0.12	No
Position (Vertical Pattern)	0.09	No
Cardinal Point (Horizontal Pattern):	0.01	Yes
Center: North, South	0.02, 0.02	Yes
North: East, West	0.045, 0.03	Yes
South: North, East	0.0002, 0.03	Yes

Table 2. Significance levels of the relationships among bean damage, location, and phenology

Differences Between Bean Damage Length and:	P-value	Significant
Location	0.01	Yes
Phenology:	0.02	Yes
Pimento Stage: Mature Green	0.01	Yes
Pimento Stage: Mature Ripe	0.01	Yes