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PP-559 [Pollination and Bee Flora]

Use of Jataí Bee Colonies (*Tetragonisca angustula*) for Commercial Pollination of Strawberries (*Fragaria x ananassa*) in Protected Cultivation

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INTRODUCTION

Pollination is a key factor in improving the yield and quality of many crops, including strawberries (*Fragaria x ananassa*).Stingless bees, such as *Tetragonisca angustula* (Jataí), have been identified as potential commercial pollinators for protected cultivation systems.

This study evaluates the impact of Jataí bee colonies on fruit weight, deformation rate, and sweetness in greenhouse-grown strawberries.

Tetragonisca angustula
Font: Cristiano Menezes

Tetragonisca angustula guards at the colony entrance
Font: Cristiano Menezes

METHODOLOGY

The experiment was conducted in two identical greenhouses (1,638 m^2 each),containing 15,000 hydroponically grown 'San Andreas' strawberry plants under drip irrigation and biological pest control. Twelve *T. angustula* colonies were introduced in Greenhouse 1 during the flowering period, while Greenhouse 2 served as a control (without bees).

The colonies remained in the greenhouse for three months, corresponding to the peak flowering period. A total of 166 fruits were collected from Greenhouse 1 and 133 from Greenhouse 2. Fruit weight, deformation rate, and sweetness level (°Brix) were compared between treatments.

Strawberry's Greenhouse with *Tetragonisca angustula* colonies.
Font: Joyce M.V. Almeida-Dias

RESULTS AND CONCLUSION

Strawberries from the pollinated greenhouse (G1) had a significantly higher average weight compared to those from the control greenhouse (G2). The °Brix level was also significantly higher in G1 than in G2. Only seven fruits (4.2%) showed deformation in E1, while in E2, 24 fruits (18.1%) showed deformation, indicating a 76.6% reduction in fruit deformation (Table 1).

	G1	G2	Statistical Analysis
Weight (g)	15.1 ± 5.4	13.4 ± 5.0	$t = 2.87$, $df = 297$, $p < 0.01$
ºBrix level	8.7 ± 1.6	7.3 ± 1.0	$t = 4.07$, $df = 51.9$, $p < 0.001$
Fruits deformation	7	24	$X^2 = 9.32$, $df = 1$, $p < 0,01$

Strawberry's fruits without deformation
Font: Joyce M.V. Almeida-Dias

Strawberry fruit with deformation
Font: Joyce M.V. Almeida-Dias

Jataí bees (*T. angustula*) enhance strawberry fruit quality and yield by increasing fruit weight and sweetness while reducing deformities, making them effective commercial pollinators for protected strawberry cultivation when deployed during flowering.

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Pollination is a key factor in improving the yield and quality of many crops, including strawberries (“”Fragaria x ananassa””). Stingless bees, such as “”Tetragonisca angustula”” (Jataí), have been identified as potential commercial pollinators for protected cultivation systems. This study evaluates the impact of Jataí bee colonies on fruit weight, deformation rate, and sweetness in greenhouse-grown strawberries. The experiment was conducted in two identical greenhouses (1,638 m² each), containing 15,000 hydroponically grown ‘San Andreas’ strawberry plants under drip irrigation and biological pest control. Twelve “”T. angustula”” colonies were introduced in Greenhouse 1 during the flowering period, while Greenhouse 2 served as a control (without bees). The colonies remained in the greenhouse for three months, corresponding to the peak flowering period. A total of 166 fruits were collected from Greenhouse 1 and 133 from Greenhouse 2. Fruit weight, deformation rate, and sweetness level (°Brix) were compared between treatments. Strawberries from the pollinated greenhouse (Greenhouse 1) had a significantly higher average weight (15.1 ± 5.4 g) compared to those from the control greenhouse (13.4 ± 5.0 g; $t = 2.87$, $df = 297$, $p < 0.01$). The °Brix level was also significantly higher in Greenhouse 1 (8.7 ± 1.6°Brix) than in Greenhouse 2 (7.3 ± 1.0°Brix; $t = 4.07$, $df = 51.9$, $p < 0.001$). Fruit deformation was substantially reduced by 76.6% in the pollinated treatment, with only 4.2% of fruits showing deformities in Greenhouse 1, compared to 18.1% in Greenhouse 2 ($\chi^2 = 9.32$, $df = 1$, $p < 0.01$). These findings suggest that Jataí bees contribute to improved fruit quality and yield.The introduction of “”T. angustula”” colonies significantly increased strawberry fruit weight and sweetness while reducing deformities. This study demonstrates the effectiveness of “”T. angustula”” as a commercial pollinator in protected strawberry cultivation, emphasizing the potential for targeted bee deployment during flowering to enhance fruit production.