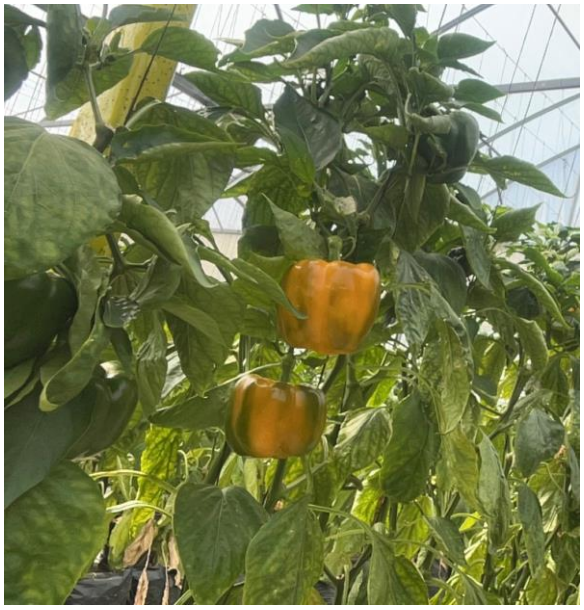
BEE-TECH GROUP
AGRICULTURAL DEVELOPMENT

Pepper Case Study:

Seasonal Climate Impact on Pollen Viability



Seasonal changes have a significant impact on plant health, pollination success, and overall crop yields. By understanding these variations, growers and researchers can refine their practices to improve outcomes and maximize productivity.

During **September 2024** in the Western Cape, **Pepper X** was tested for pollen viability and quality during the **winter** season. The same variety was tested again during the **summer** in February 2025 at the same location.

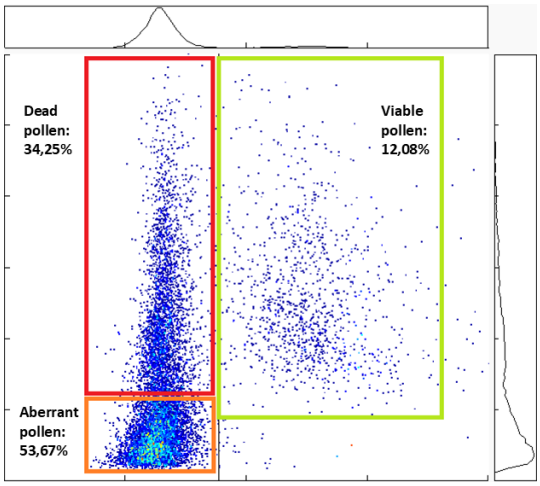
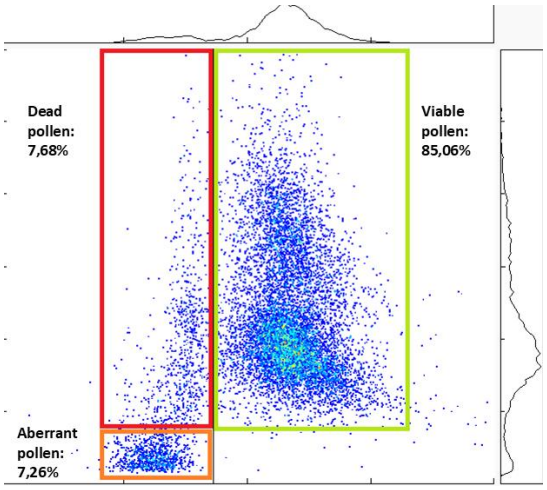


FIGURE A

WINTER VIABILITY

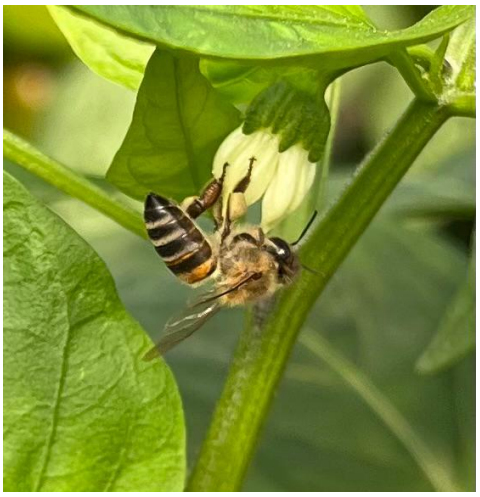
FIGURE B

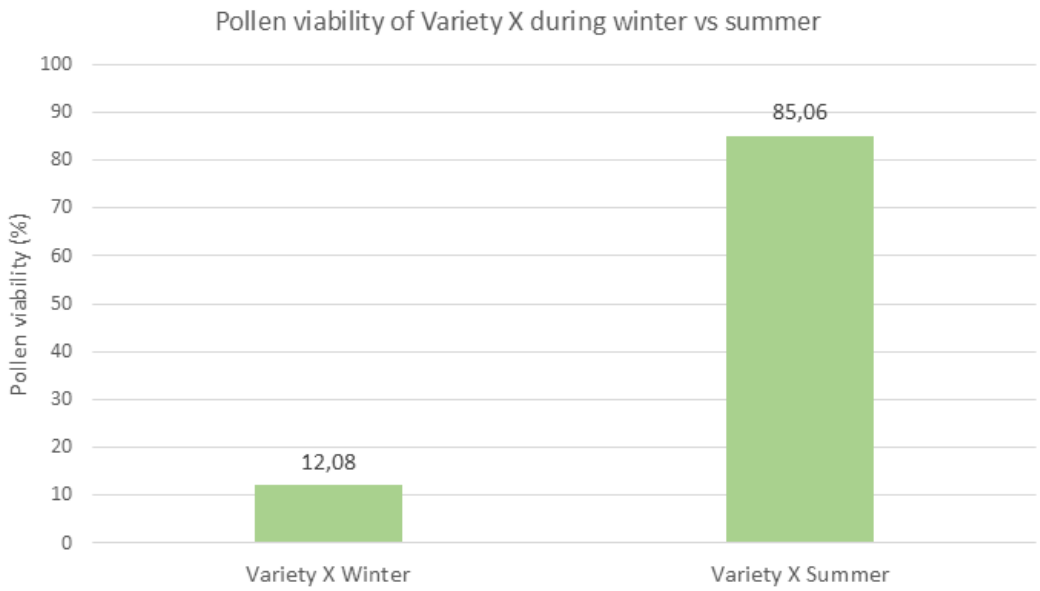
SUMMER VIABILITY



Analysis of the data revealed that pollen viability was significantly higher in **summer. Pollen** produced during this season was **73% more viable** than that produced in winter.

Additionally, the **aberrant pollen** population was **7.5 times higher in winter** compared to summer. Aberrant pollen refers to pollen that has aborted during its developmental stages. High aberrant pollen population soften indicate that a plant is under large amounts of stress.





What does this mean for growers?

Pollen viability is crucial for successful pollination. In colder temperatures, poor pollination can lead to reduced fruit set and smaller fruit size.

By identifying and managing the stressors that reduce pollen viability, growers can improve pollination outcomes, leading to increased fruit set and larger fruit. Effective fertigation, balanced nutrition, and proper plant management can minimize stress, allowing plants to allocate more energy toward producing viable pollen and achieving higher yields.

Managing these stressors can also help reduce aberrant pollen populations, increasing the availability of viable pollen.

Additionally, understanding pollen viability across different varieties allows growers to select the best varieties for specific climates. This knowledge is also valuable for nurseries and varietal suppliers, enabling them to recommend the most suitable varieties to growers for optimal production.

For more information, contact info@bee-techgroup.com or call 071 404 0101.