BEE-TECH GROUP
AGRICULTURAL DEVELOPMENT

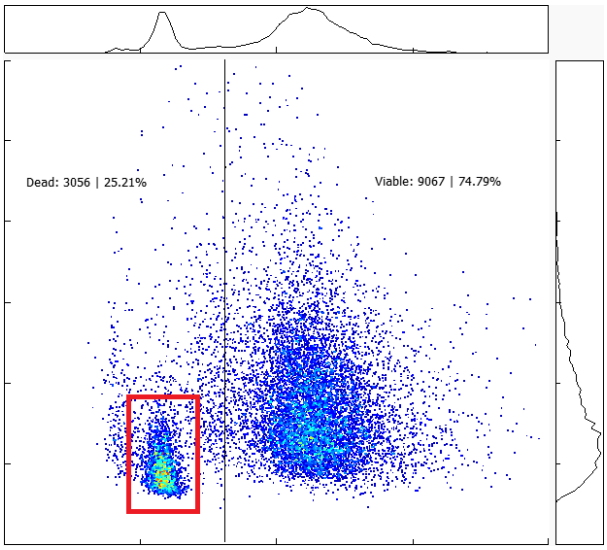
# Understanding Aberrant Pollen and its Practical Implications


Pollen plays a crucial role in plant reproduction, but not all pollen is capable of fulfilling this role effectively. Viable pollen can be defined as pollen that has the ability to germinate when it comes into contact with the stigma of a flower and form a pollen tube. Contrastingly, non-viable pollen is defined as pollen grains that cannot form a pollen tube.

Non-viable pollen can be split into two categories:

1. **Mature dead pollen** – pollen that has passed all necessary developmental stages, matured into viable pollen and then died as a result of numerous external factors.

2. **Aberrant pollen** – pollen that has aborted its developmental stages due to abiotic stress factors. This means there was potential for the pollen to become viable, but due to unfavourable conditions it aborted its developmental processes.




## What does aberrant pollen look like?

In the figure we see a red box marked on the pollen analysis scatter plot:

This population represents aberrant pollen.

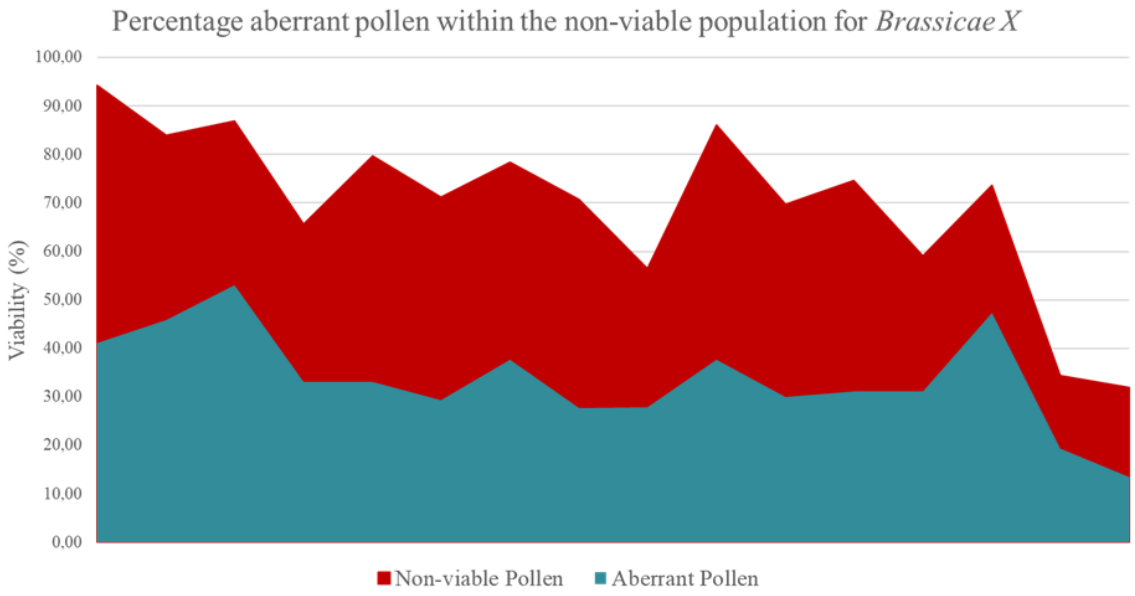
- We see that the box falls within the the 'dead population' zone. Most of the pollen in this zone are aberrant.
- These aberrant pollen grains had the potential to become fully mature (viable) if abiotic stresses were managed more effectively.

## Why investigate aberrant pollen populations?

Investigating aberrant pollen populations is crucial for several reasons, particularly when it comes to improving crop productivity and overall plant health:

- **Impact on Pollen Viability**: High populations of aberrant pollen can significantly reduce the viability of the overall pollen population produced by a crop. Aberrant pollen does not contribute to successful fertilization, leading to fewer viable pollen grains that can germinate and form pollen tubes.
- **Association with Seed and Fruit Yield**: Low pollen viability is strongly correlated with a decrease in seed/fruit yield and quality as well as the quality of those seeds and fruits. Without sufficient viable pollen, pollination efficiency is compromised, leading to poor fertilization and consequently, lower crop production.
- **Opportunity for Increased Viability**: By preventing the abortion of pollen development and addressing the stress factors that lead to aberrant pollen, there is potential to increase the number of viable pollen grains. This would improve the chances of successful fertilization, ultimately enhancing crop yield and quality.

**Reducing amount of aberrant pollen = Higher viability = Higher seed/fruit set**




In the graph above we see an analysis performed on the aberrant pollen population of a high value ***Brassicae*** crop. The analysis was performed over a period of six weeks

Across the trial period, we see a ratio of **1:1 (aberrant pollen : mature dead pollen)**.

This means that; of the non-viable population, nearly **50%** of all dead pollen was aberrant!

In other words, about 50% of the dead pollen could have been viable if we had better understood and managed the external stressors affecting its development. This highlights a significant opportunity to improve pollen viability by addressing those stressors.

## How can we help you?

Should you want to know more about aberrant pollen or how to increase your pollen viability, please email us at info@bee-techgroup.com or call us at **071 404 0101** and let us know how we can assist.