



## Impact of Pollen Quality on Tomato Seed Production



### Pollen Viability and Seed Set

In a large-scale research project with Rijk Zwaan the [Ampha Z32 Pollen Analyzer](#) was used to analyze the pollen quality of over 800 plants in 500 m<sup>2</sup> greenhouse area.

The results of the study prove that pollen quality has a direct impact on seed set and that it varies over time.

Pollen viability needed to achieve optimum seed set varies for individual lines. Constant monitoring of pollen quality on the Ampha Z32 can therefore be used as an efficient tool to:

- Determine line specific pollen viability threshold to reach optimum seed set
- Select and mix pollen batches to target viability
- Optimize pollen harvest and preservation protocols

Furthermore, a direct comparison with *in-vitro* pollen germination has shown several advantages of Ampha Z32: it is more precise, faster, less prone to human influence and provides more information about cell physiology.

### Impact of Pollen Viability on Seed Set

Tomato seed set is directly linked to pollen viability, as the results of the Rijk Zwaan research project with 12 different tomato varieties and over 800 plants show, a clear and distinctive correlation between pollen viability and seed set was obtained for every line (e.g. Figure 1).

### About Rijk Zwaan

Rijk Zwaan is a Dutch vegetable breeding and seed production company headquartered in De Lier, Netherlands. With a representative market share, Rijk Zwaan is the number four vegetable breeding company worldwide.

### Conclusions of the study:

- Clear correlation between pollen viability and seed set
- Line specific variability of pollen viability to reach optimum seed set
- Ampha Z32 is a reliable tool for pollen analysis

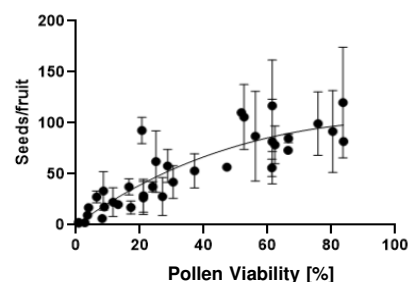


Figure 1: Correlation between pollen viability and seed set.

# CUSTOMER RESEARCH PROJECT



The target pollen quality required to achieve maximum seed set can vary per line. For the example of Figure 1, it was set to >70%. For the same tomato variety, the pollen viability of harvested pollen may change considerably over time (Figure 2). All the batches with a viability below 70% can for example be discarded or mixed appropriately with high viability samples to reach optimal seed set.

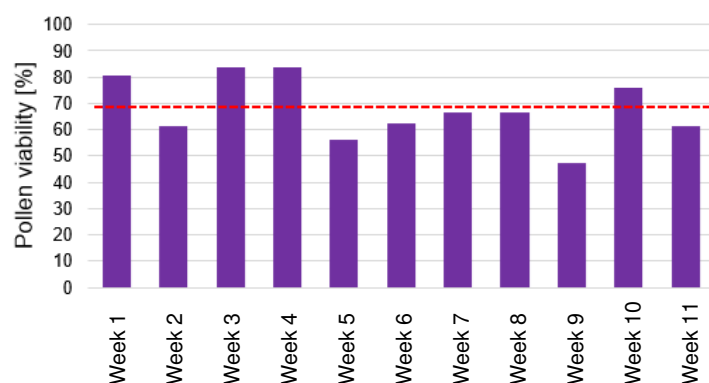


Figure 2: Considerable variation of pollen quality over time. Based on the results of Figure 1 a pollen viability threshold of >70% is needed to obtain an optimal seed set. Several batches are below that level and could be discarded or mixed.

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«Thanks to the expertise of Amphasys with pollen analysis, we were able to identify the minimum pollen quality required for optimum seed set for individual tomato lines»



## Pollen Viability vs. Germination

In-vitro pollen germination and the Ampha Z32 were compared for all tested lines.

What	Viability with Ampha Z32	Pollen Germination
Time to result	1 – 2 min	120 min
Sample size	> 10'000 cells	100 cells
Precision	< 1% SD	3 – 9 % SD
Biased	No	Yes, dependent on technician

### Advantages of Ampha Z32

- Precise and fast results
- Less prone to human influence
- Qualitative characterization (e.g. shrunken cells, debris)

## Contact

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