



Abraham Gomez Gutierrez - PhD

# Downy Mildew in Baby Leaf Kale (*Brassica oleracea*)



# Baby Leaf Kale (BLK)

- Leaves of the young immature kale plant
- Popularized as a “superfood” in U.S.A and Europe
- Short period between sowing and harvesting ( $\approx$  28 days)



# Baby Leaf Kale (BLK)

- High density sowing per m<sup>2</sup>
  - Restricts the airflow
- Use of nets to avoid insects
  - Increase humidity levels and temperature
  - Restricts airflow even further



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# AIMs of the PhD

- Test the association between PAMP-triggered immunity (PTI) and Quantitative Disease Resistance (QDR)
- Use QDR more efficiently

# Downy Mildew Scoring Methodology

- 5 categories:



**NO BLACKENING  
NO SPORULATION**

# Downy Mildew Scoring Methodology

- 5 categories:



**BLACKENING  
NO SPORULATION**

# Downy Mildew Scoring Methodology

- 5 categories:



**BLACKENING  
LOCAL SPORULATION**

# Downy Mildew Scoring Methodology

- 5 categories:



**BLACKENING  
HIGH SPORULATION**

# Downy Mildew Scoring Methodology

- 5 categories:



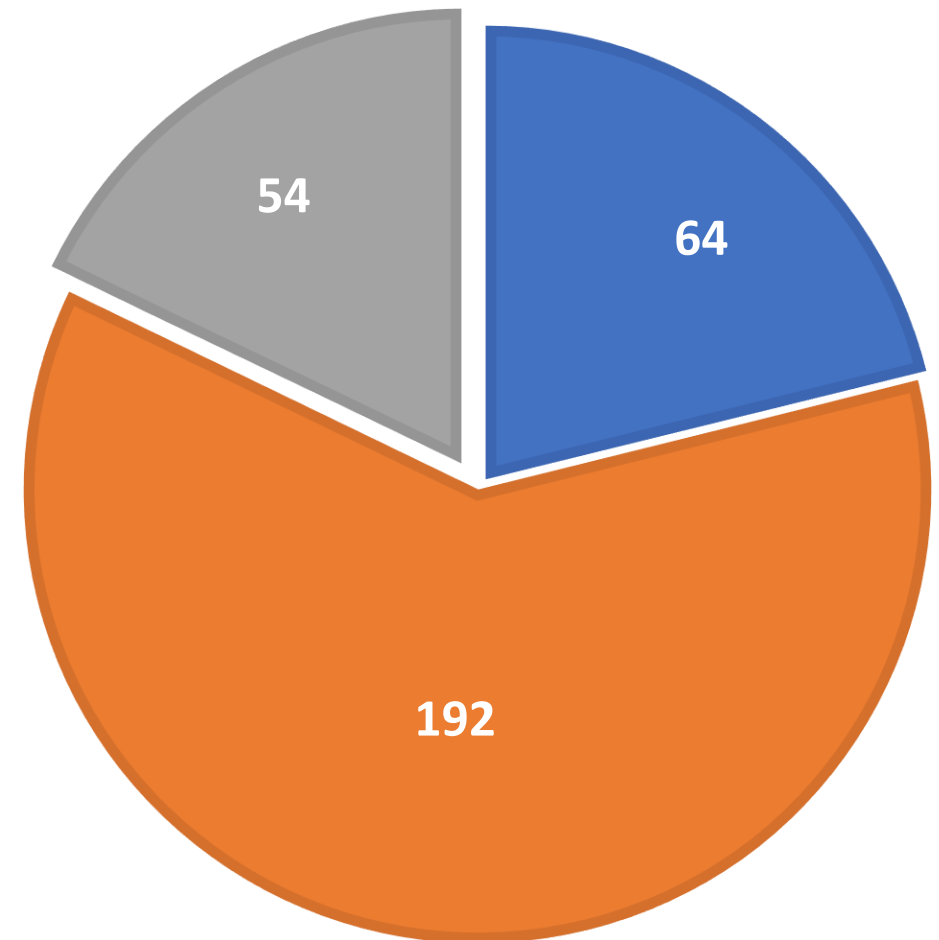
**NO BLACKENING  
HIGH SPORULATION**

## RESULTS: 10 days post inoculation

- 100% - Resistance: **54**
- >70-99% - Tolerance: **64**
- Susceptible Accessions: **192**
- Repeat accessions **<49.9%** emergence

1<sup>ST</sup> DM SCORING – RESISTANCE ACCESSIONS (10 DPI)

■ >70% ■ <70% ■ 100% Tolerance

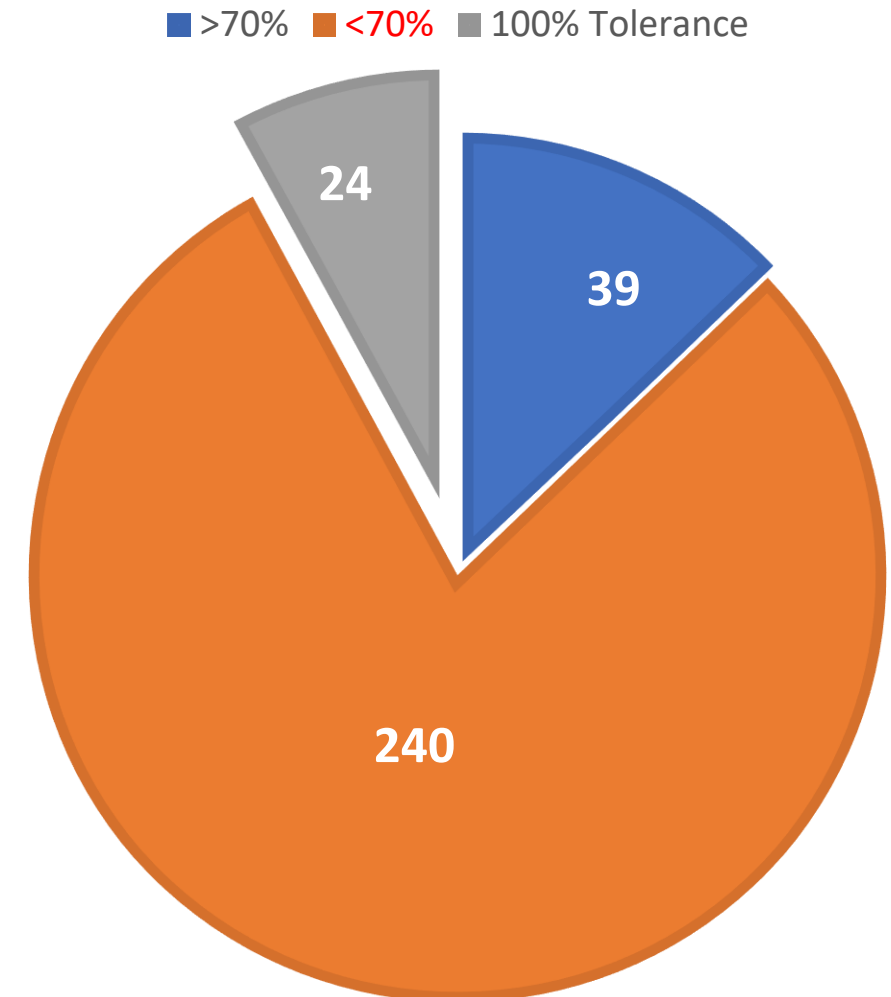


**DM: Colchester Isolate  
10 seedlings**

## RESULTS: 17 days post inoculation

- 100% - Resistance: **24**
- >70-99% - Tolerance: **39**
- Susceptible Accessions: **240**
- Repeat accessions **<49.9%** emergence

2<sup>ND</sup> DM SCORING – RESISTANCE ACCESSIONS (17 DPI)

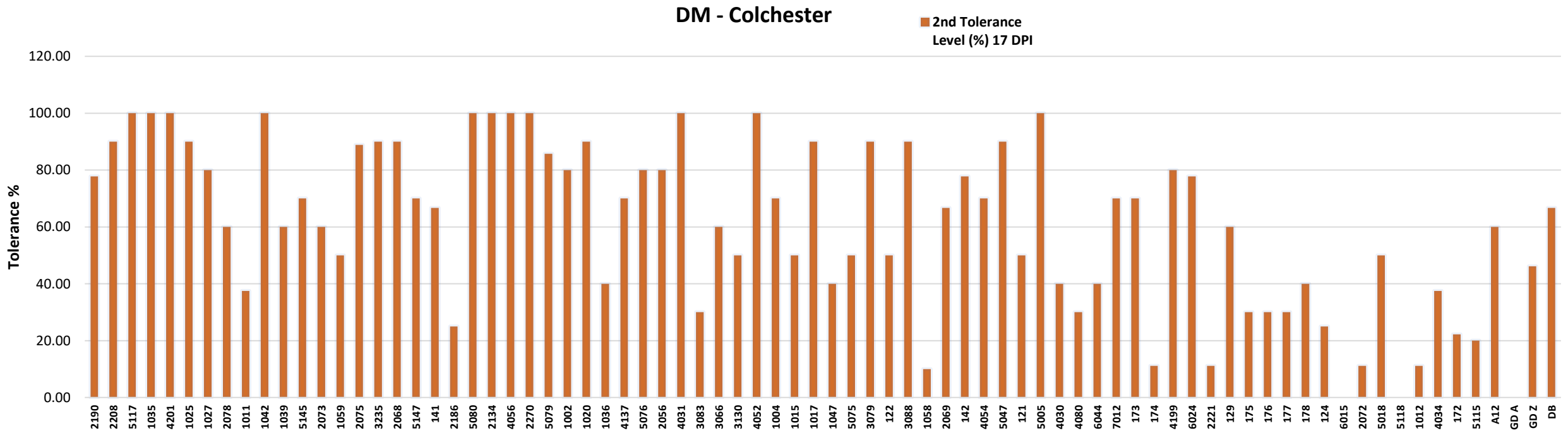


**DM: Colchester Isolate  
10 seedlings**

# RESULTS: Whole population

# A12xGD mapping population

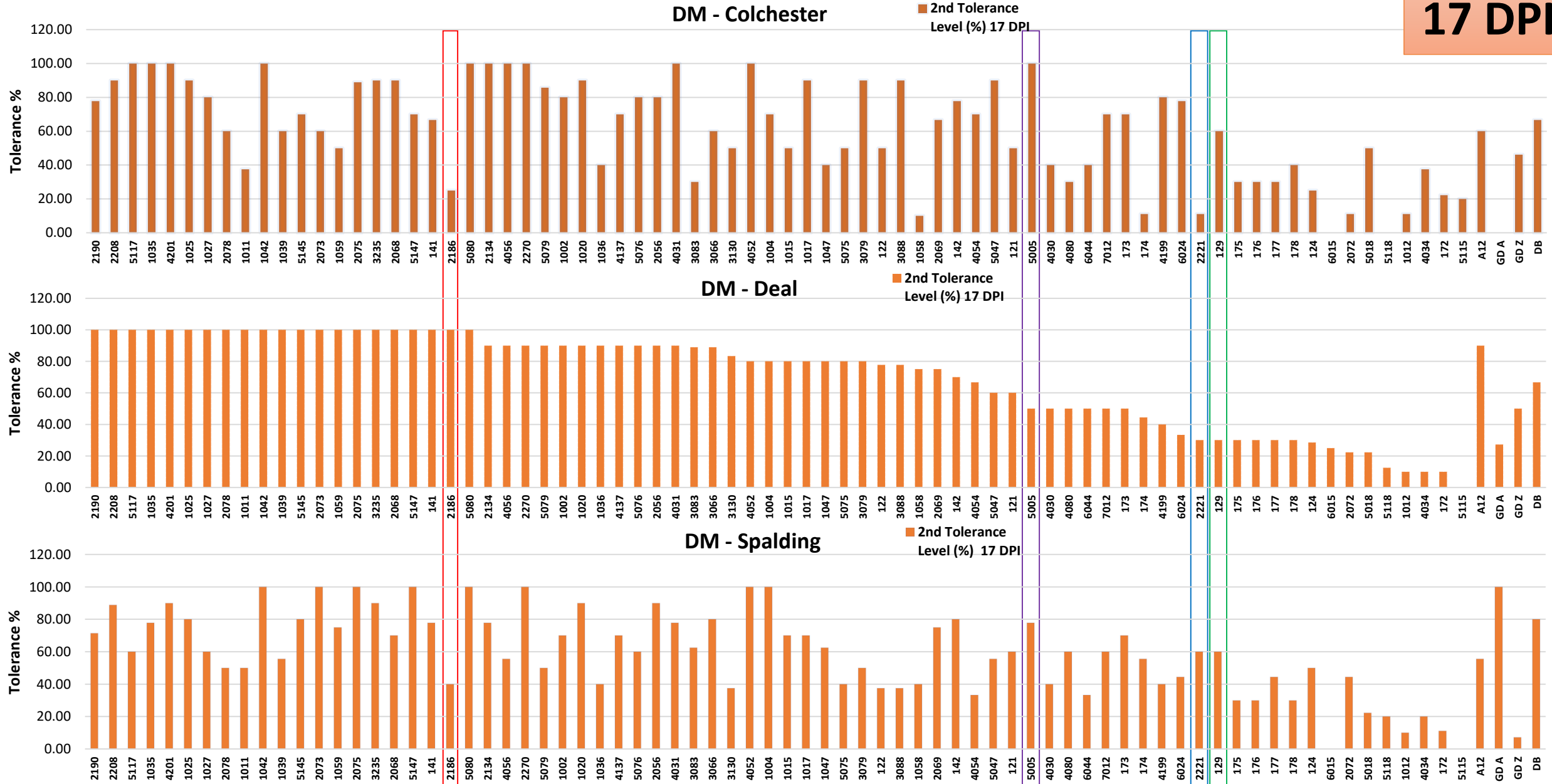
17 DPI



# RESULTS: Whole population

# A12xGD mapping population

17 DPI



# Further Work

- 2 more repetitions for both plant materials
- Test additional DM isolates
- Test other ways to score DM infection in *B. oleracea*
  - Spore counting
  - qPCR
- Test associations between PTI and QDR in the A12xGD mapping population

# Acknowledgements

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