Screening for Resistance to *Dickeya dianthicola*

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Introduction

- Little data is available regarding the susceptibility of potato genotypes to *Dickeya* spp.
- Previous work primarily focused on tuber susceptibility/resistance
- Foliar and tuber resistance may be controlled by different genes

Objectives of this work:

- Develop a screening protocol for testing foliar resistance to Dickeya spp.
  - Modification of methods developed by Bisht et al. (1993) and Rietman et al. (2014)
- Apply the screening procedure to a breeding program population
  - Test breeding genotypes of the NDSU potato germplasm for resistance to foliar soft rot caused by *Dickeya dianthicola*

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Material and Methods

Germplasm
- 262 expt. Lines
- 26 cultivars
- 3 checks

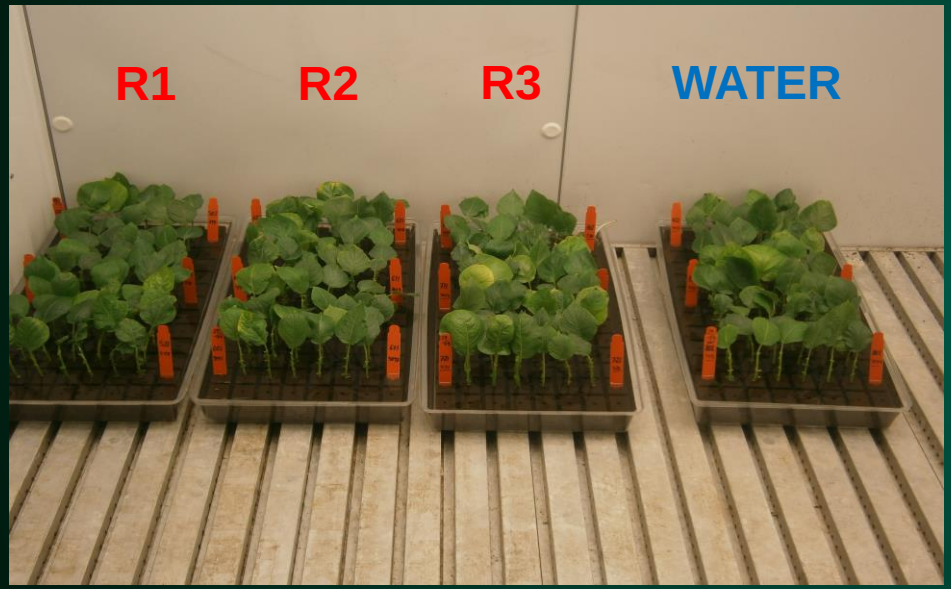
Design
- RCBD Augmented
- 16 Runs
- 3 Reps
- 1 H_2O Control

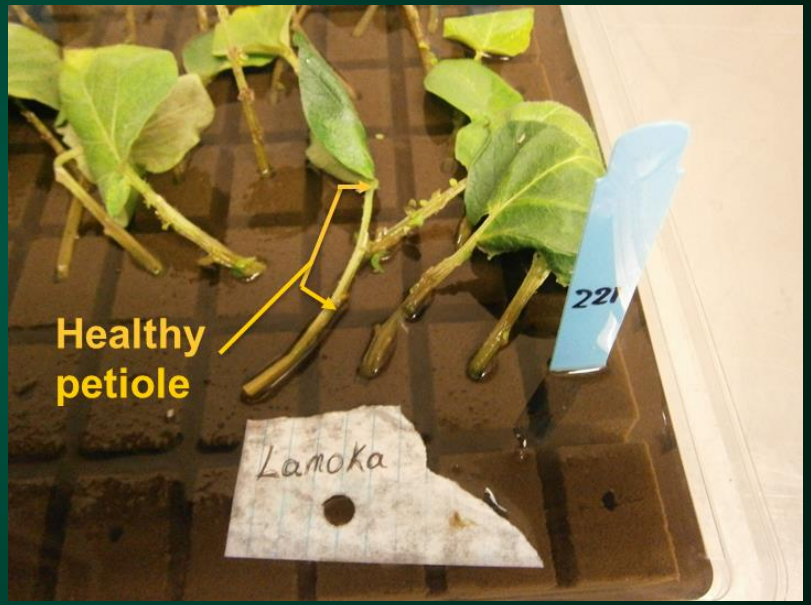
Inoculum
- *Dickeya dianthicola* ME23
- 48 hour old cultures
- Adjusted to 3.8×10^4 CFU/ml

Inoc. Method
- Floral foam in plastic flats
- 6 L of inoculum/flat
- 3 petioles/clone (one per cube)
- Incubation: 30°C for 48 h

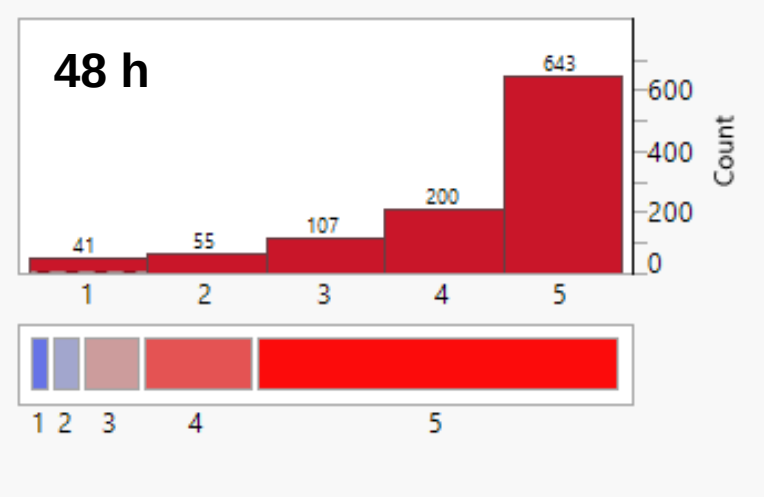
Data Collection
- Petiole:
- **24 h:**
  - Wilt
- **48 h:**
  - Wilt
  - Chlorosis
  - Rot length

Foliar Evaluation





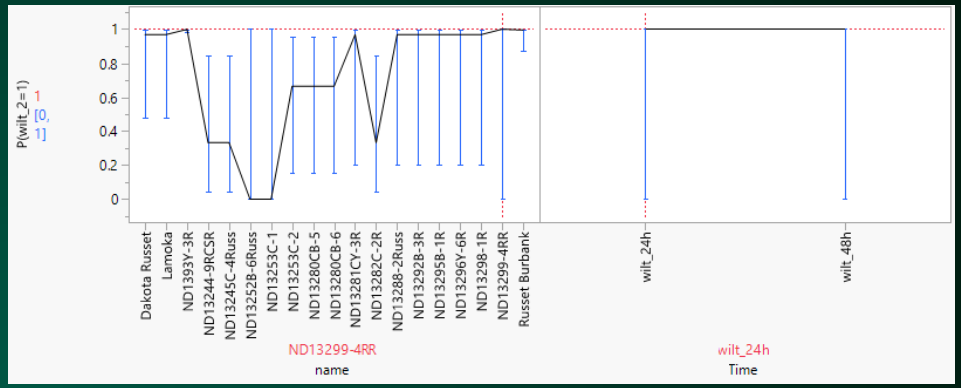
Results - Wilt

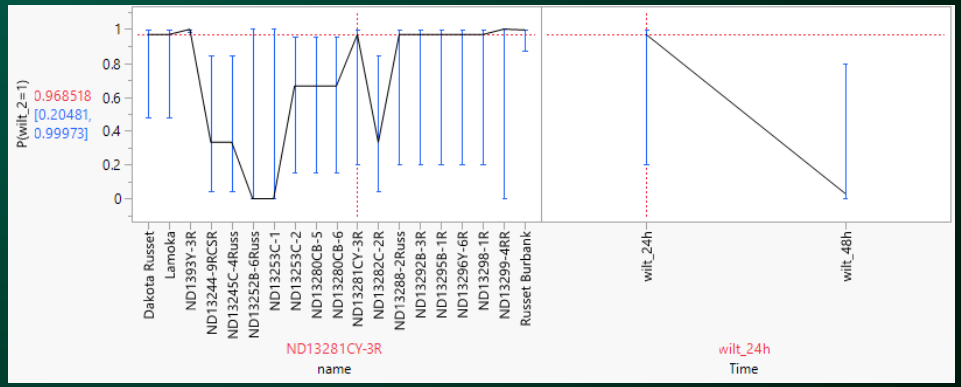


Frequencies

Level	Count	Prob
1	41	0.03920
2	55	0.05258
3	107	0.10229
4	200	0.19120
5	643	0.61472
Total	1046	1.00000

N Missing 10
5 Levels

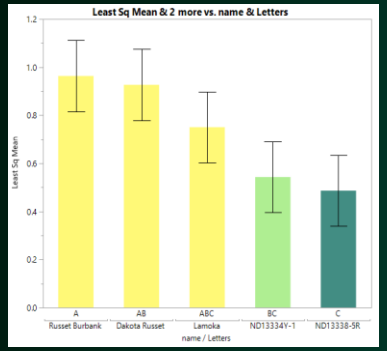




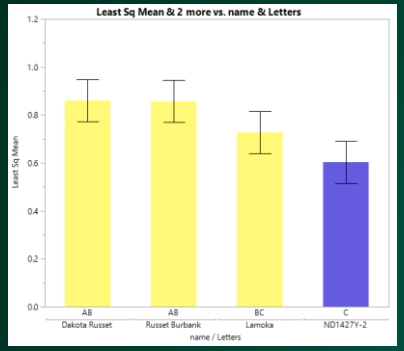
Significant differences in time (24 h to 48 h) for Wilt

Results - Rot Length

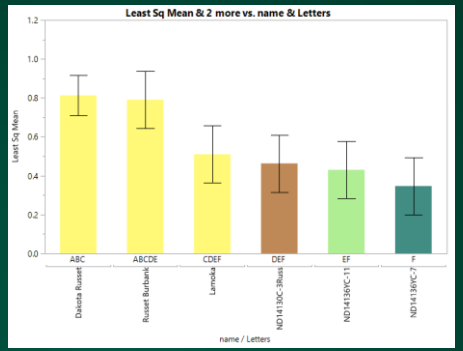
Expt. 1



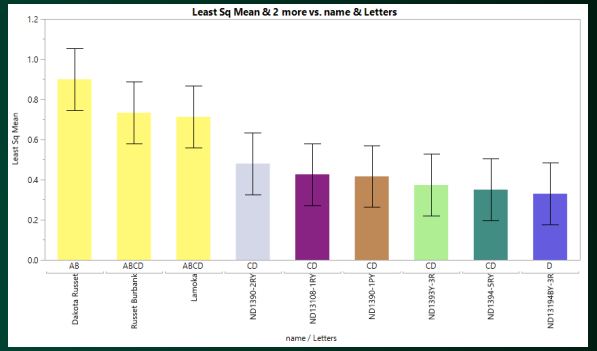
Expt. 2



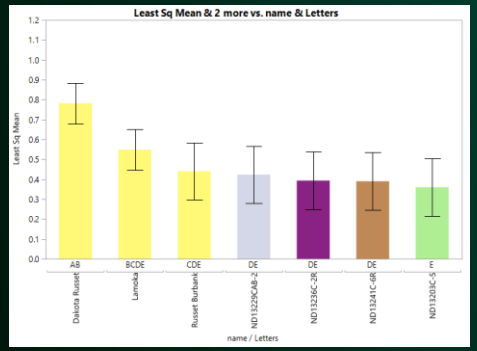
Expt. 6



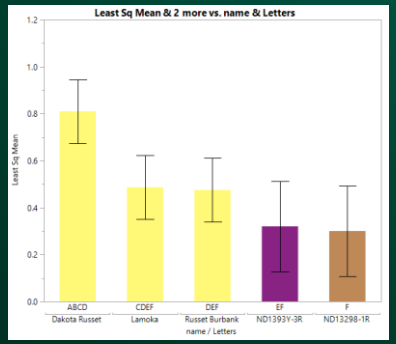
Expt. 7



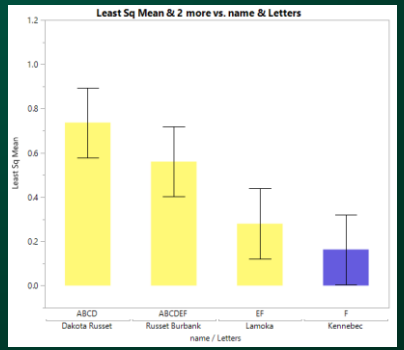
Expt. 8



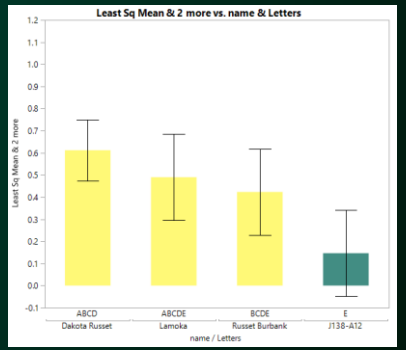
Expt. 9



Expt. 10

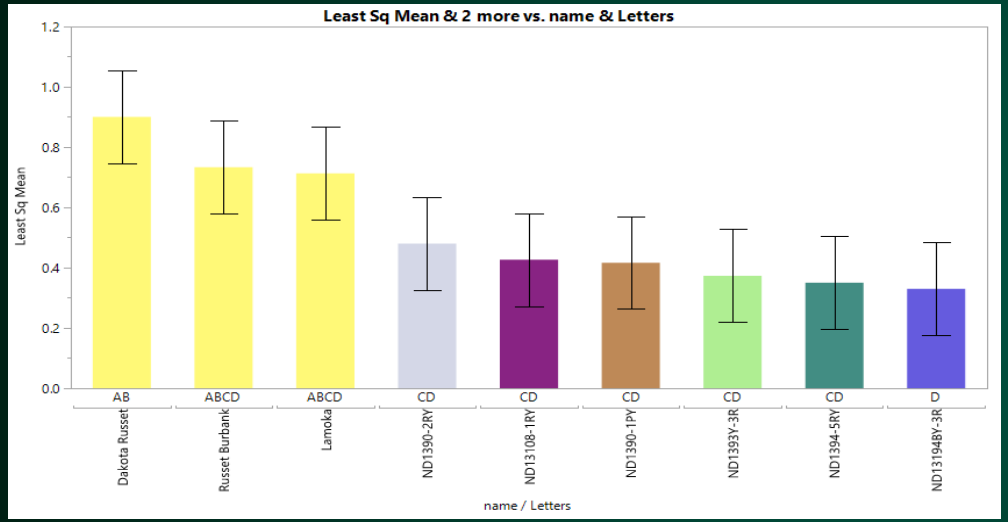


Expt. 16



Results - Rot Length

Expt. 7



Expt.	#Res Lines
1	2
2	1
6	3
7	6
8	4
9	2
10	1
16	1
Total	**20**

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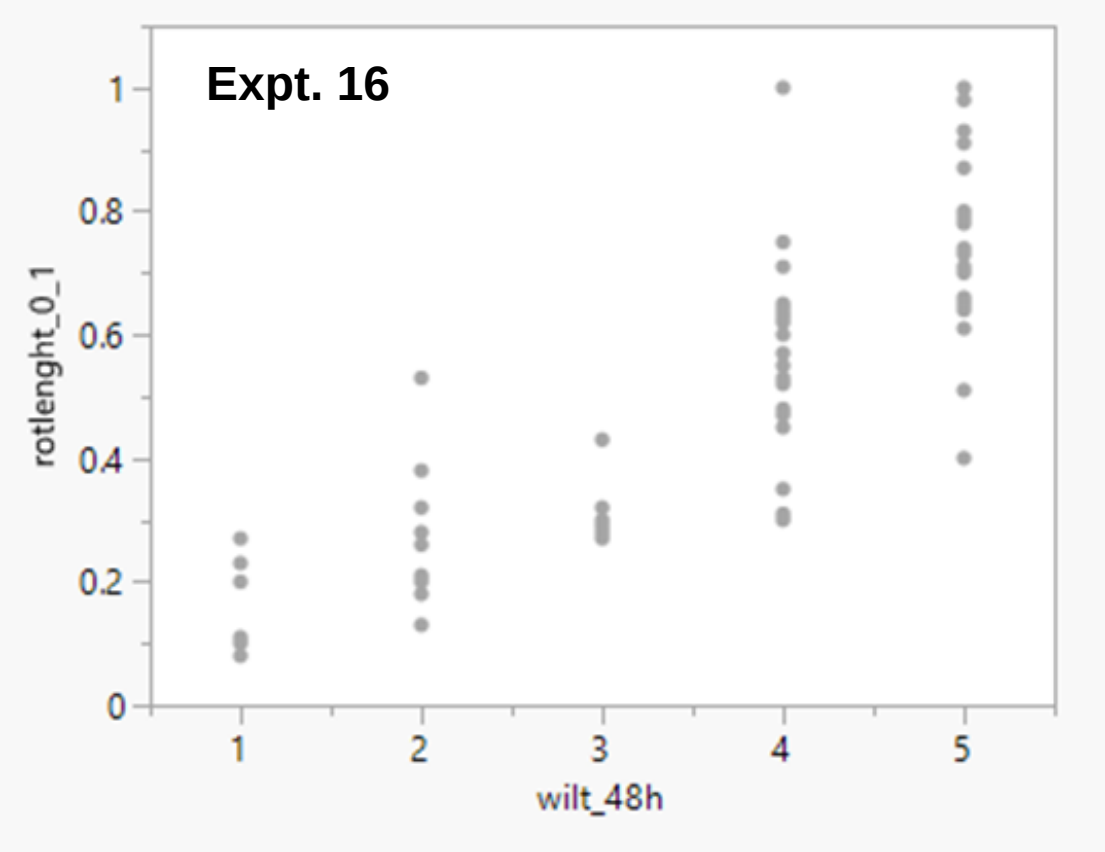
Association - Rot Length vs Wilt



Promising Genotypes:
ND14136YC-7
ND1393Y-3R
J138-A12
Kennebec

Conclusions

- We established a protocol for evaluating foliar resistance to *D. dianthicola*
- Significant differences were found for both wilt and rot length
- It appears that wilt and rot are associated
- Two NDSU selections were identified with high levels of foliar resistance

Thanks

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