

Trap Nursery Data Management

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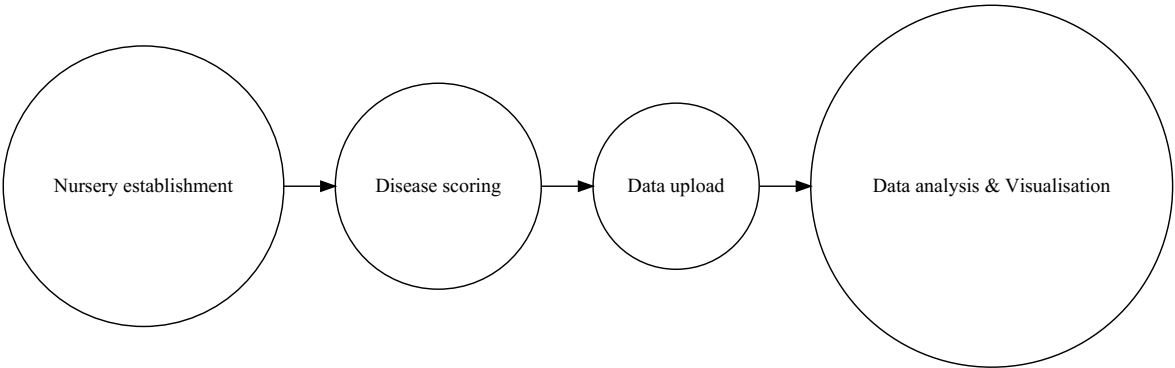
2022-05-11

Why trap nursery?

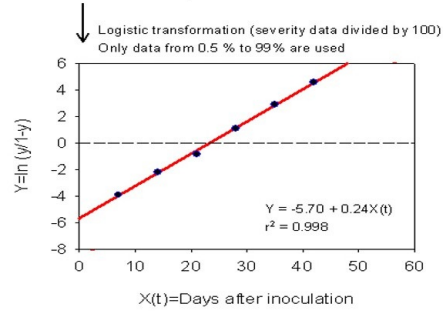
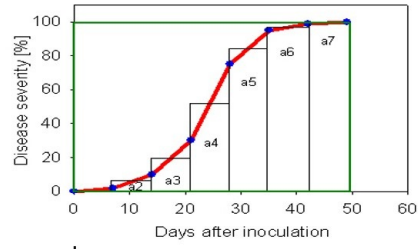
- Monitor the stability and level of R-genes in potato cultivars in space and time
- Hunt for new genotypes of *Phytophthora infestans*.



The Data Management System



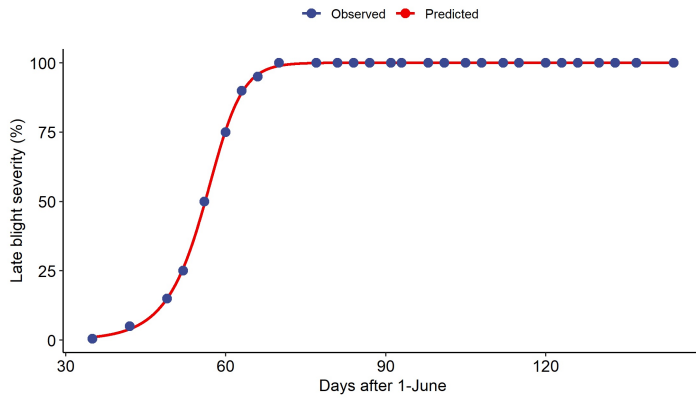
The previous method focused on linearization of non-linear curve



The revised method: Abuley & Hansen (2022). Phytopathology

- use of non-linear modelling
 - *Richards model for flexibility:*

$$Y = \frac{Y_{asm}}{[1 + Ve^{-k(t-Tip)}]^{1/v}}$$



Epidemiological parameters

Based on:

$$Y = \frac{Y_{asym}}{[1 + Ve^{-k(t-T_{ip})}]^{1/v}}$$

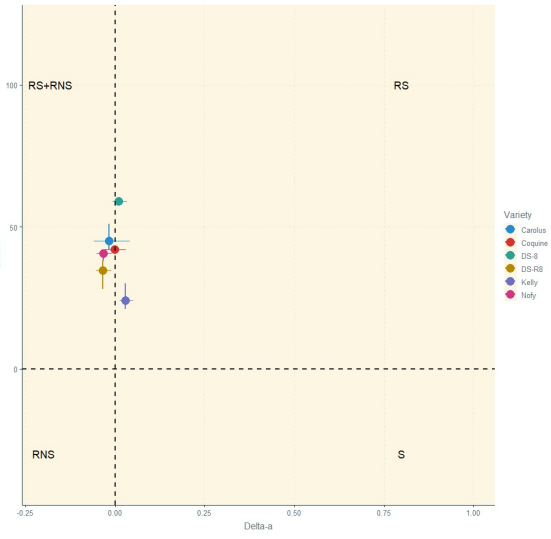
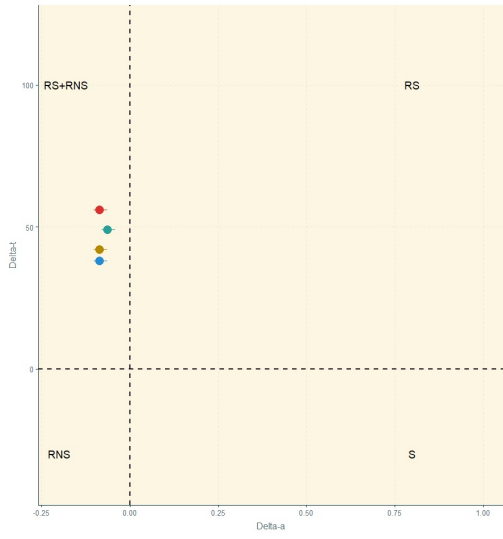
we estimate the following:

- Maximum severity: Y_{asym}
- Inflection point: T_{ip}
 - *This is maximum absolute disease increase occurs*
- Onset (Y_o): days until first symptoms
- Epidemic duration (Duration): from onset until Y_{asm}
 - *if $Y_{asym} = 0$, Duration = days until last assessment*
- Time to reach 1% severity (T_1)
 - *if $Y_{asym} < 1$, $T_1 = Duration$*
- Weighted mean absolute rate:

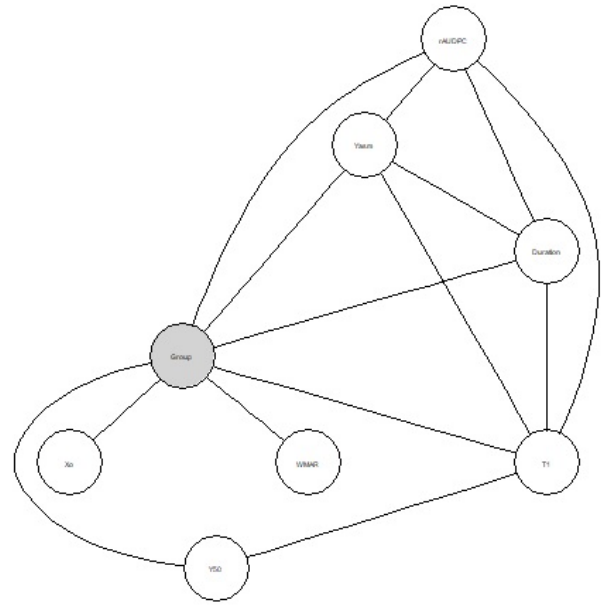
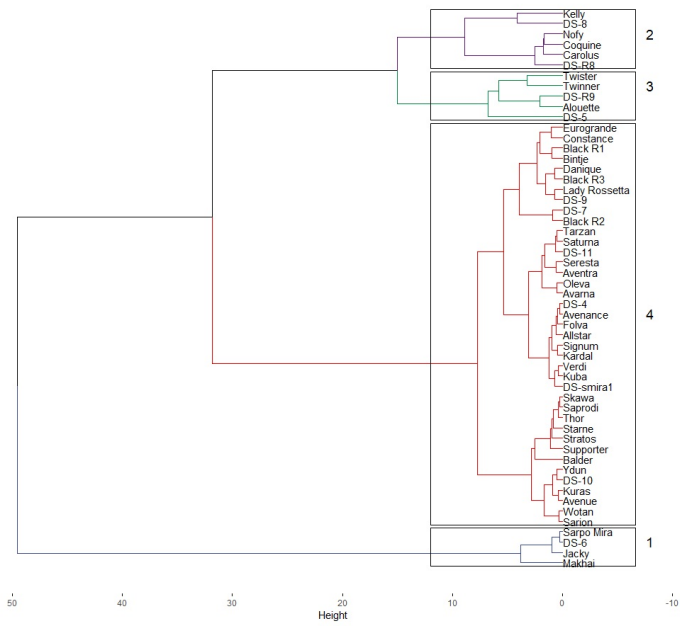
$$WMAR = \frac{K}{[2(v+1)] + 2} \times Y_{asym}$$

- The relative area under the disease progress curve, etc..

Resistant types via delta plot



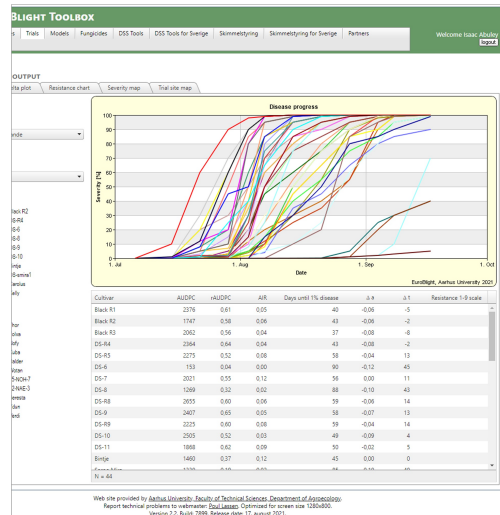
Cluster analysis to classify varieties



The data is stored in the potato late blight tool box

The screenshot shows the 'POTATO LATE BLIGHT TOOLBOX' website. The header is green with the title 'POTATO LATE BLIGHT TOOLBOX' in white. Below the header is a navigation menu with tabs: Home, Survey, Samples, Trials, Models, Fungicides, DSS Tools, DSS Tools for Sverige, Skimmelstyring, Skimmelstyring for Sverige, and Partners. A 'Welcome Isaac Abuley' message with a 'logout' button is in the top right. A dropdown menu is open under 'Trials', listing: Management, Eucablight, Trap nursery (highlighted), Blight Manager, Blight Manager SE, Organic-PLUS, ECOSOL, and Output. A 'Trial input' button is visible next to the 'Trap nursery' item. The main content area is titled 'THE POTATO LATE BLIGHT TOOLBOX' and is currently empty.

Example of the results in the system (Delta plot)



conclusions

- This system is relevant for quantifying resistant level and types
- With data from different countries we can have a good understanding of the $G \times E$
- But we need the following to do a correct analysis: -Frequent assessment: maximum 7 days interval or 3-4 days during rapid epidemics:
 - *At least three replicates per variety/differential*
 - *Continue assessment for as long as possible*

Many thanks for your attention

Processing math: 100%