Leaf blight development on different cultivars in relation to fungicide input

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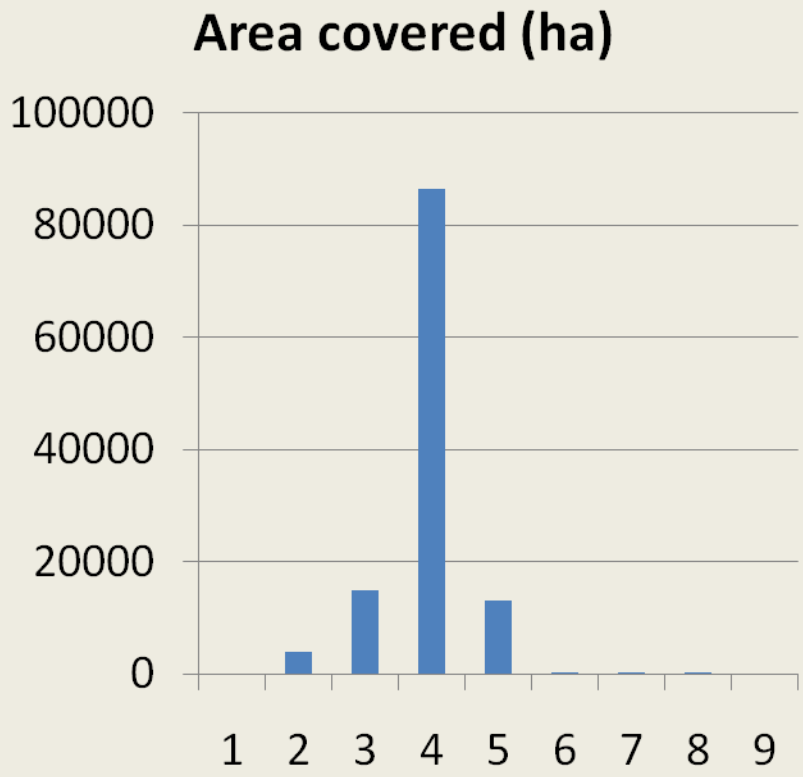
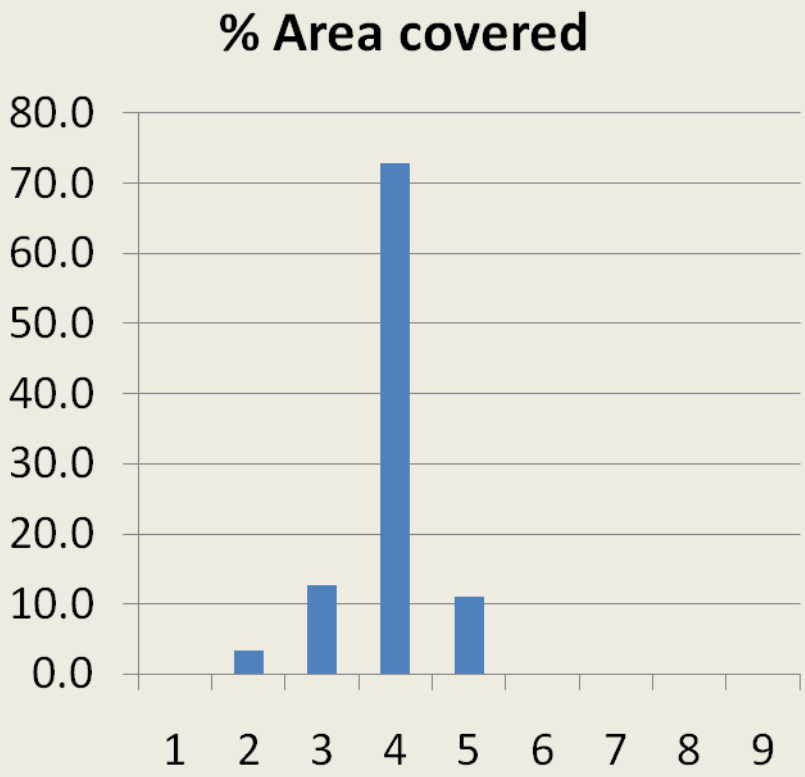
JHI: Alison Lees

BioSS : Adrian Roberts

Proportion of the 2010 GB potato area with 1 to 9 ratings for foliar blight resistance

Data from AHDB – Potato Council



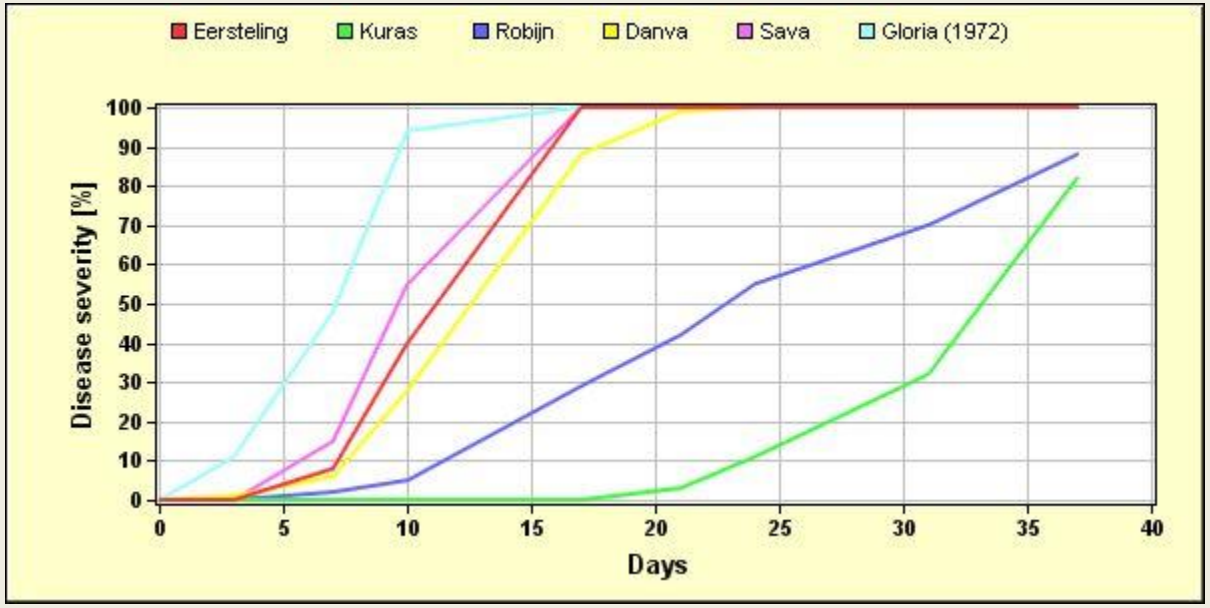


Cultivar resistance in integrated control

- A key requirement for integrated control is sufficiently large differences in foliar resistance between cultivars

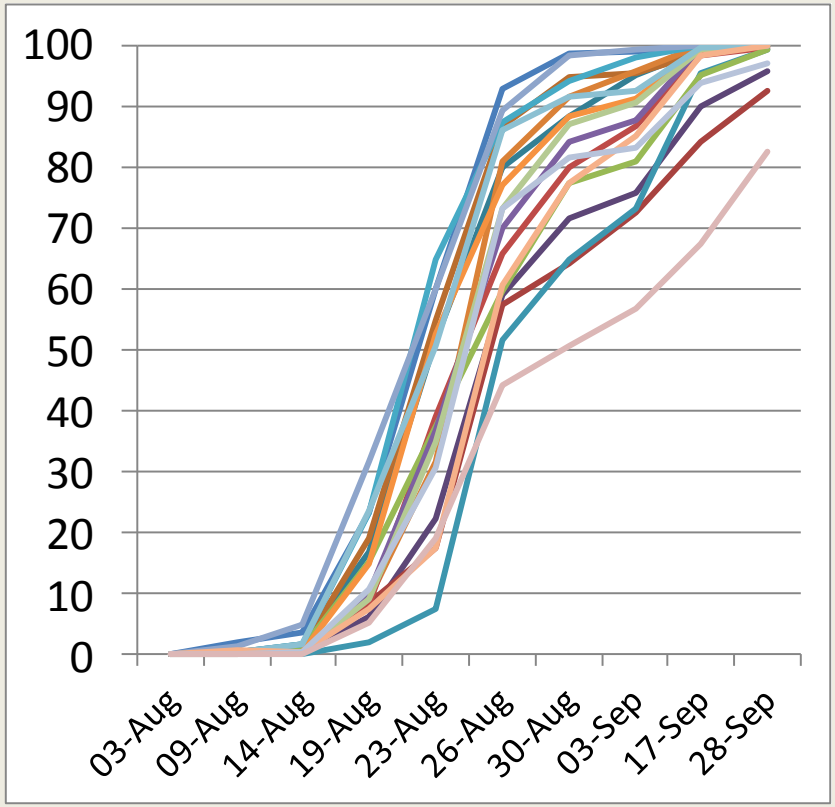
- In resistance screening trials cultivar differences depend on *P. infestans* genotype (virulence and aggressiveness) but also disease pressure

Denmark 2005
(data from Eucablight)

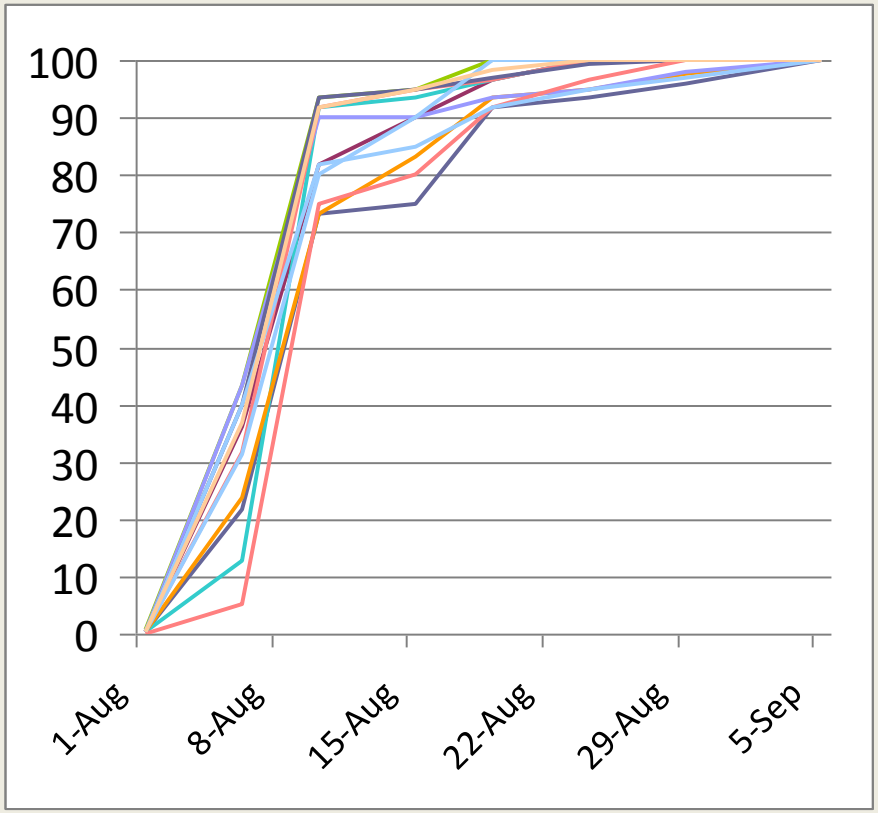


Disease progress curves for 18 cultivars

SAC 2010 Untreated

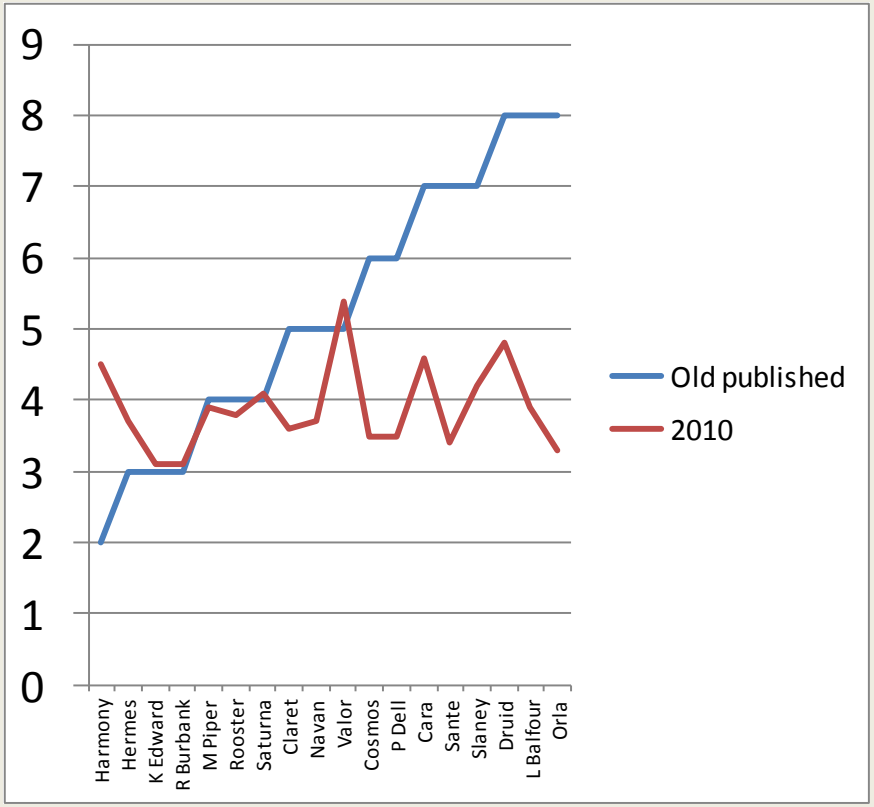


ADAS 2010 Untreated

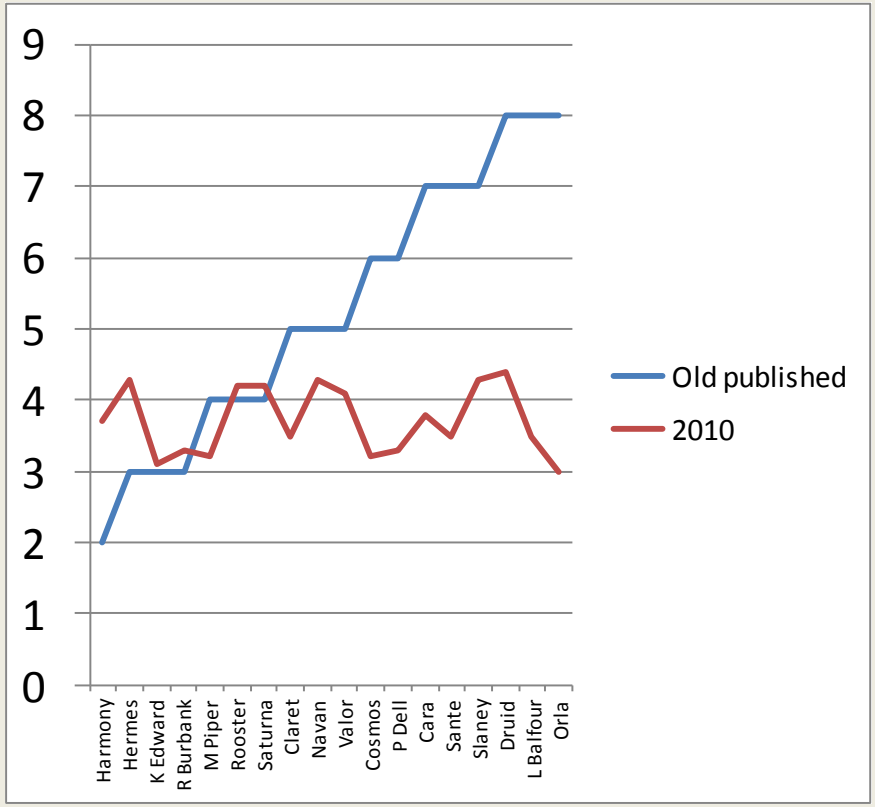


Old published ratings versus ratings from two 2010 trials

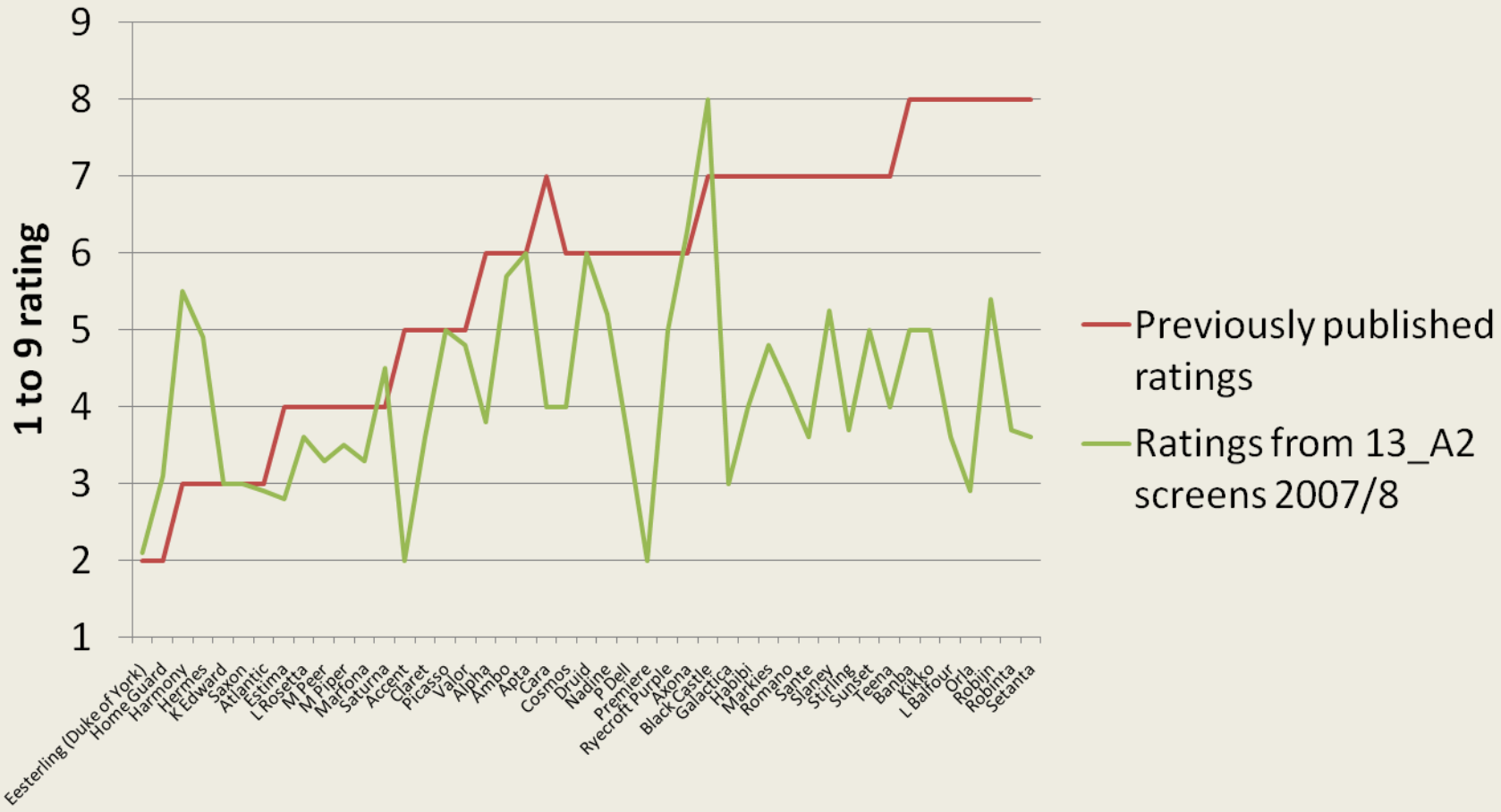
SAC 2010



ADAS 2010



New (13_A2) ratings for cultivars compared with previously published ratings between 2 and 8



- Differences in resistance between some cultivars may be underestimated in some ratings trials

- Does the use of a fungicide programme improve discrimination between cultivars?

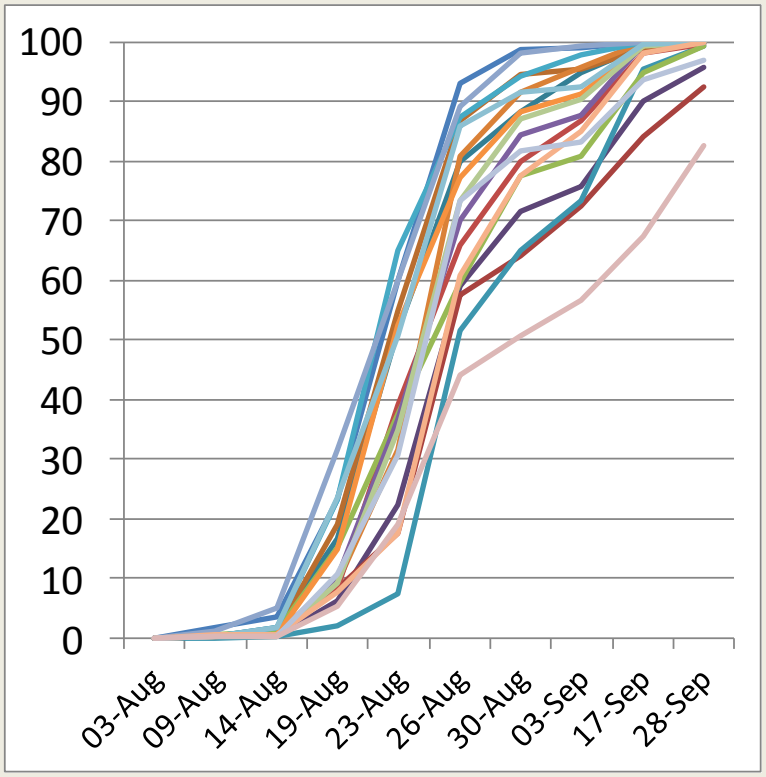
2010 Cultivar x fungicide trials

One trial in Scotland (SAC), one in Wales (ADAS)

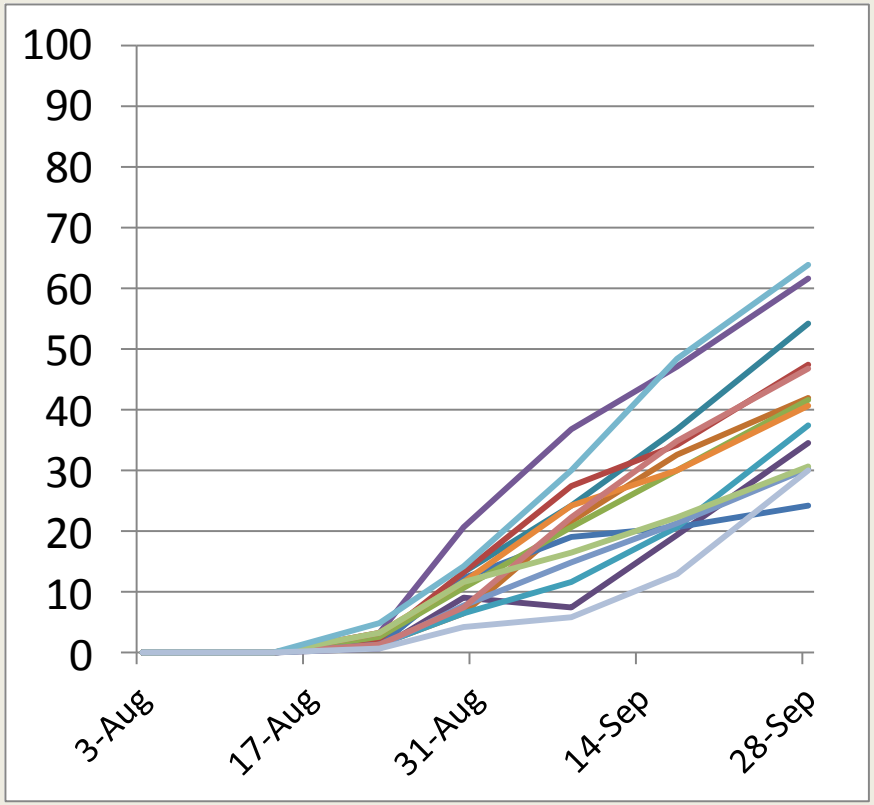
- 20 cultivars
- Standard cultivar resistance trial but split plot with fungicide/variety:
  - Untreated
  - 0.2 l/ha Shirlan
  - 0.4 l/ha Shirlan

Disease progress curves for 18 cultivars

SAC 2010 Untreated

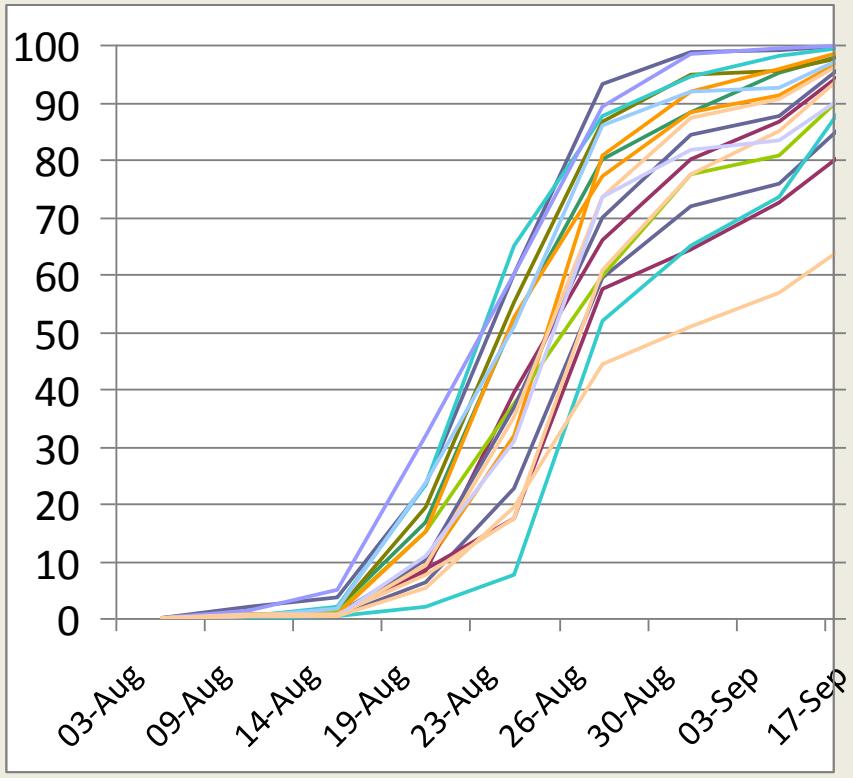


SAC 2010 Full rate Shirlan

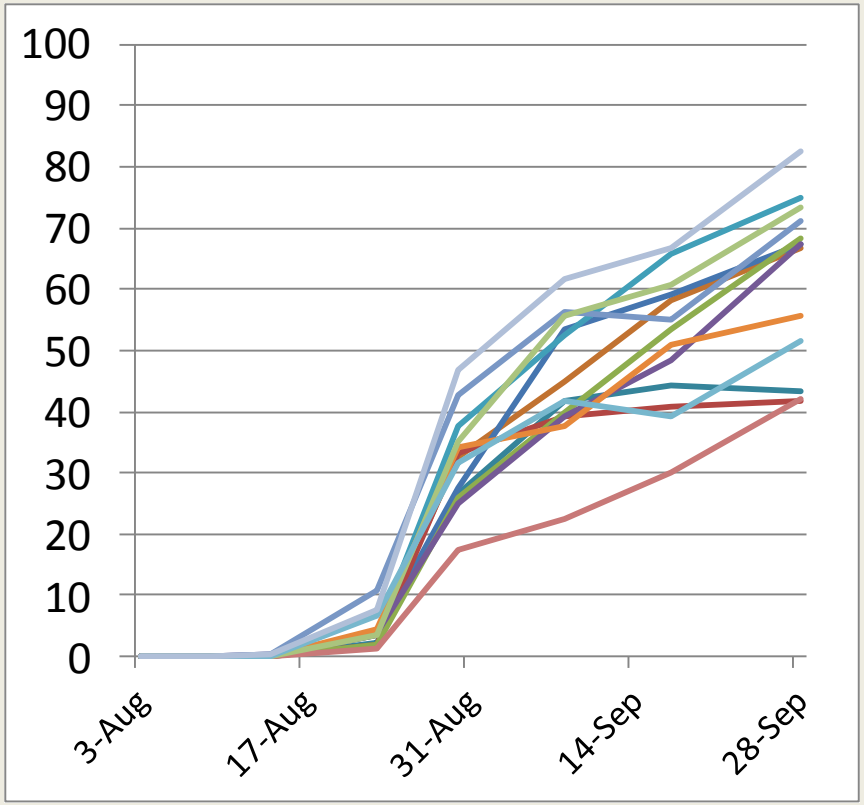


Disease progress curves for 18 cultivars

SAC 2010 Untreated

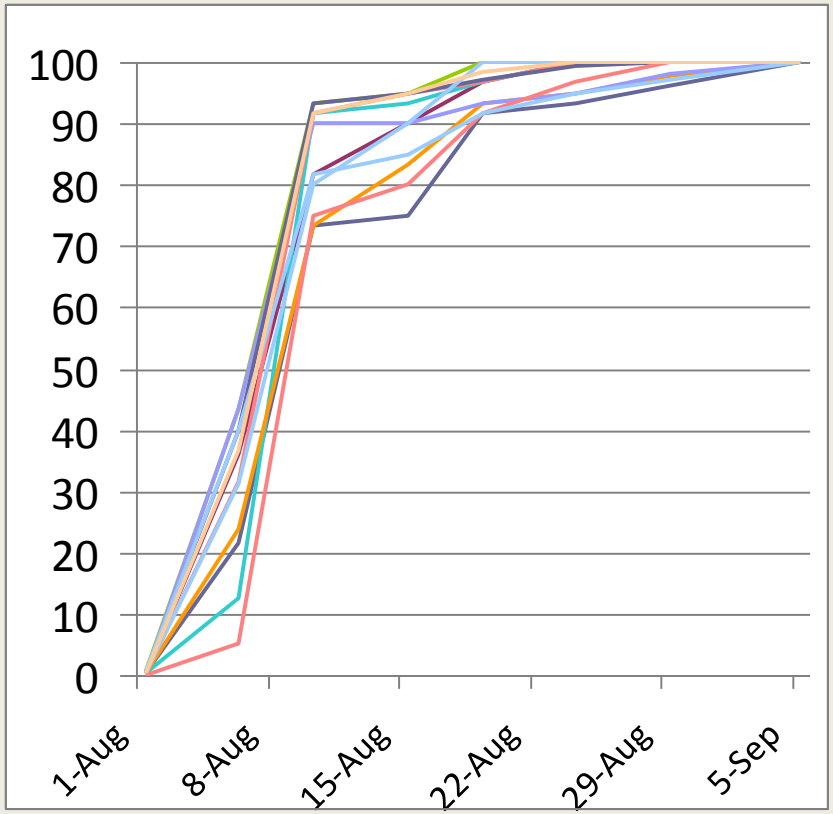


SAC 2010 Half-rate Shirlan

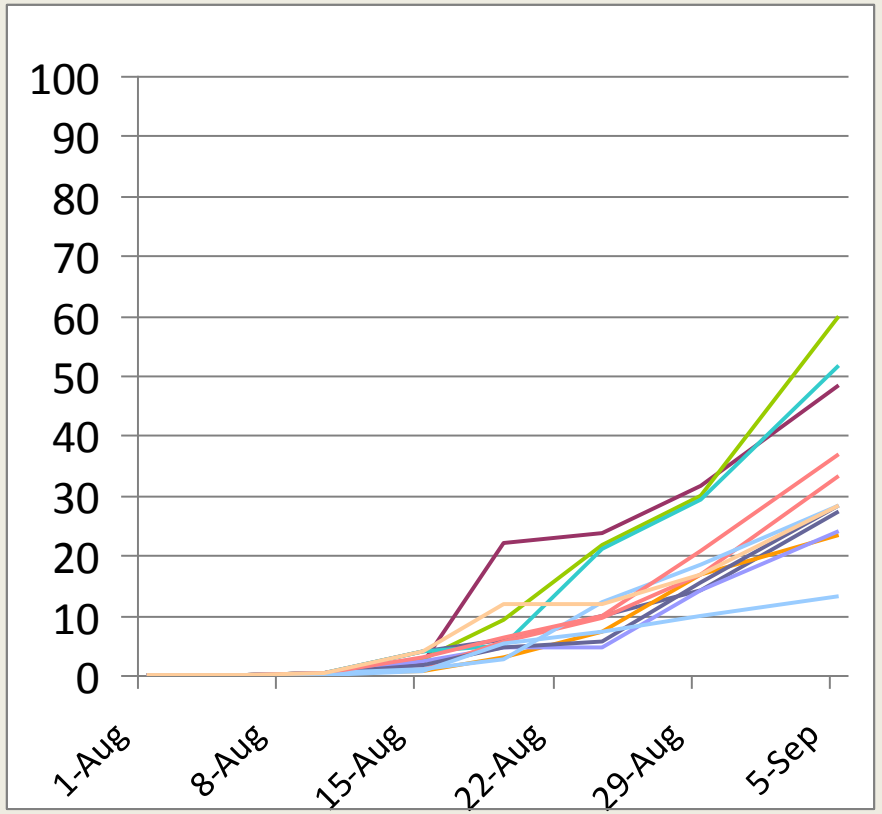


Disease progress curves for 18 cultivars

ADAS 2010 Untreated



ADAS 2010 Full rate Shirlan



Disease progress curves for 18 cultivars

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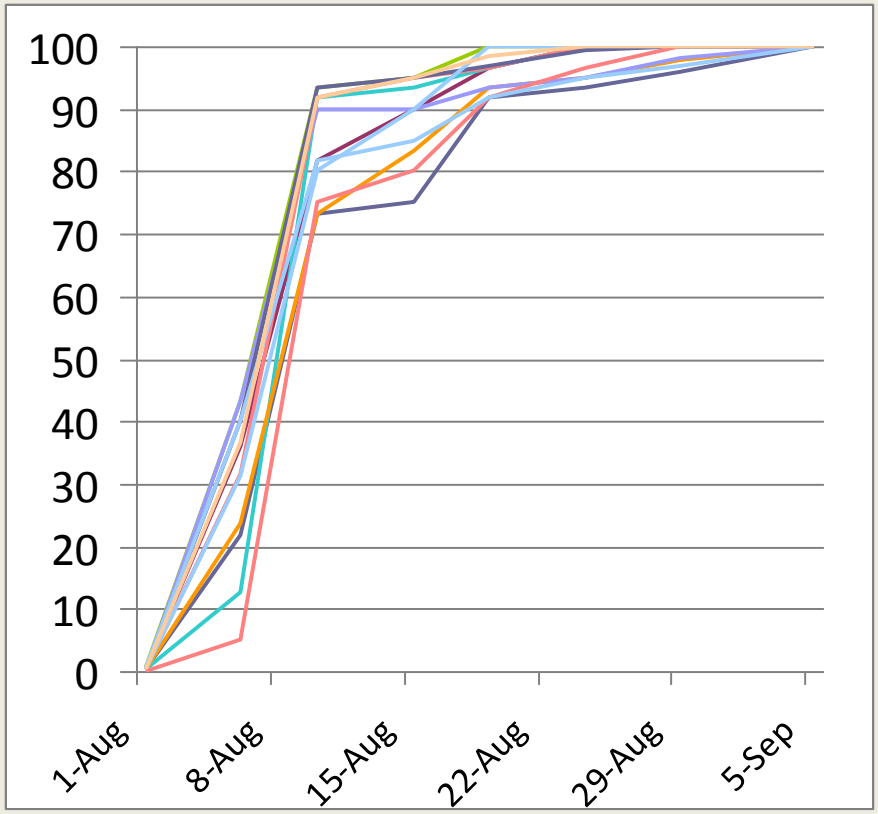
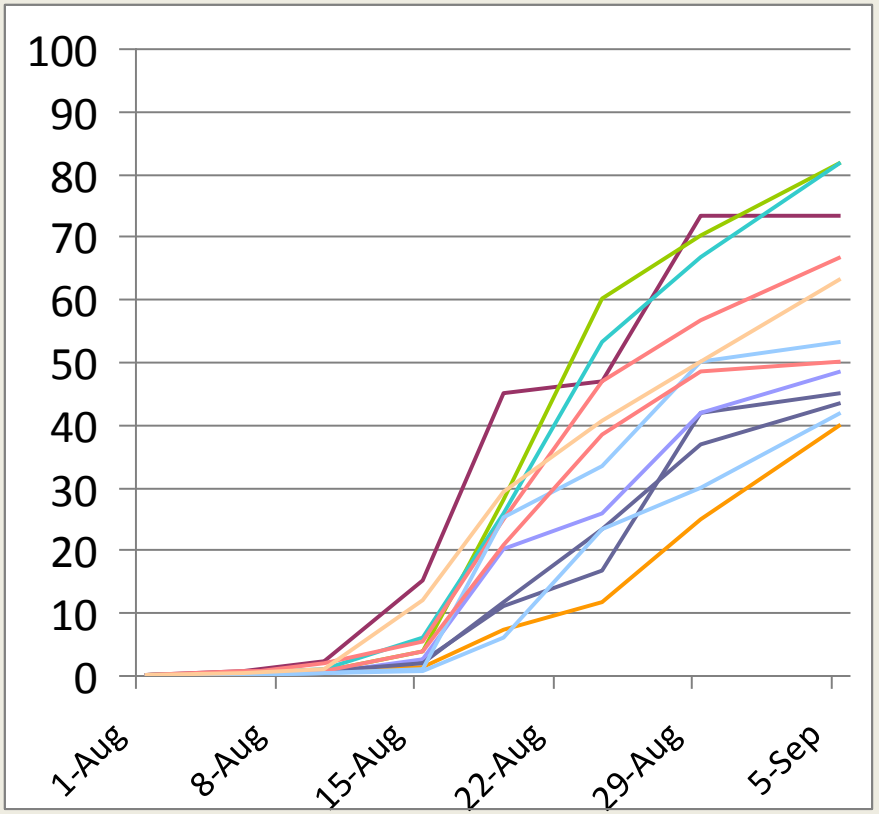
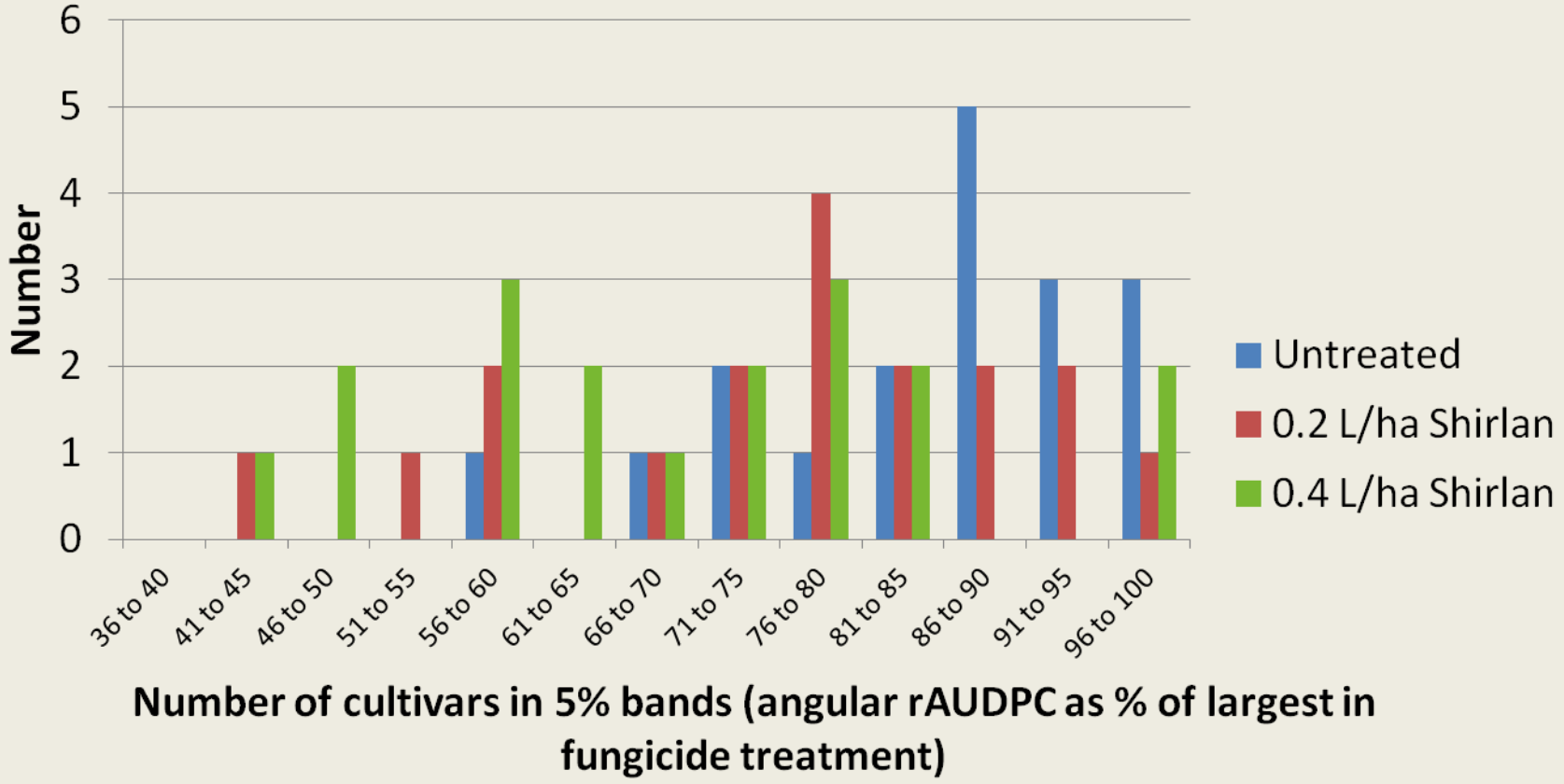


ADAS 2010 Half-rate Shirlan



2010 Cultivar “resistance” discrimination in relation to fungicide input (SAC)

(Sarpo Mira and Axona excluded)



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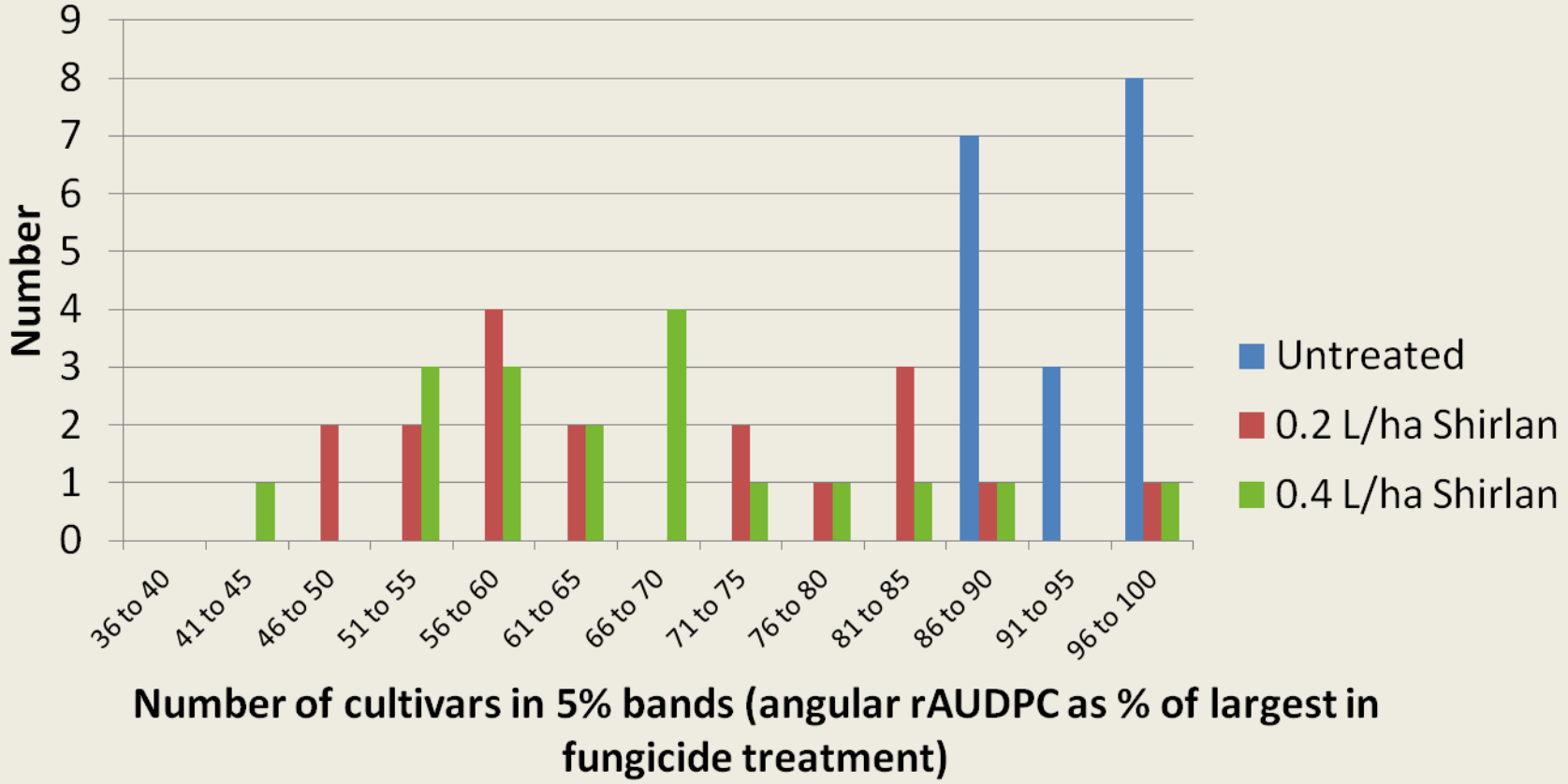
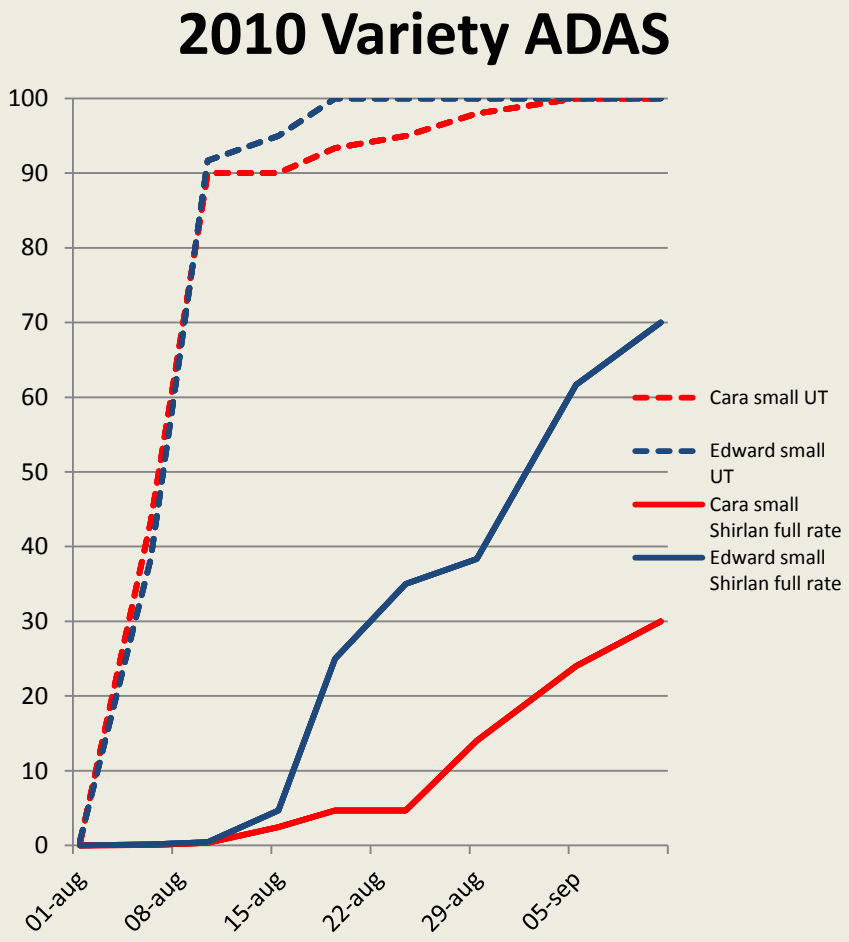


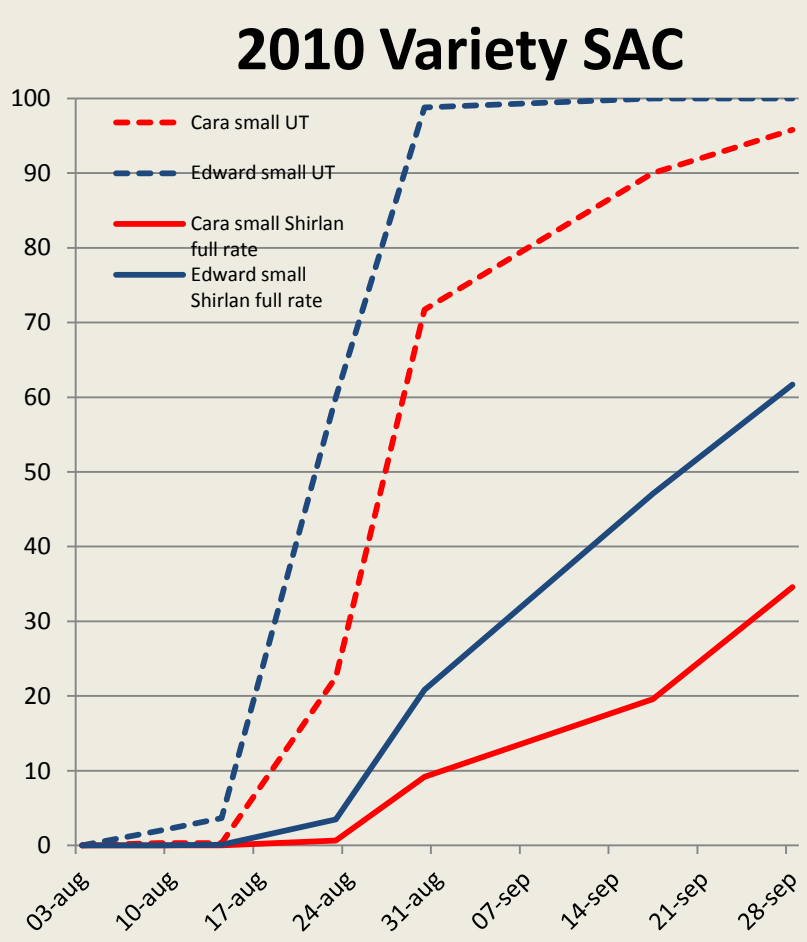
Effect of fungicide input on foliar epidemics in two cultivars differing in resistance

- Cara and K Edward have foliar resistance ratings of c. 5.5 and 3.5 respectively

- Fungicide input comparison
  - Plots treated with zero and full label rate fungicide @ 7-day intervals

Effect of fungicide input on differences in epidemic progress for two cultivars





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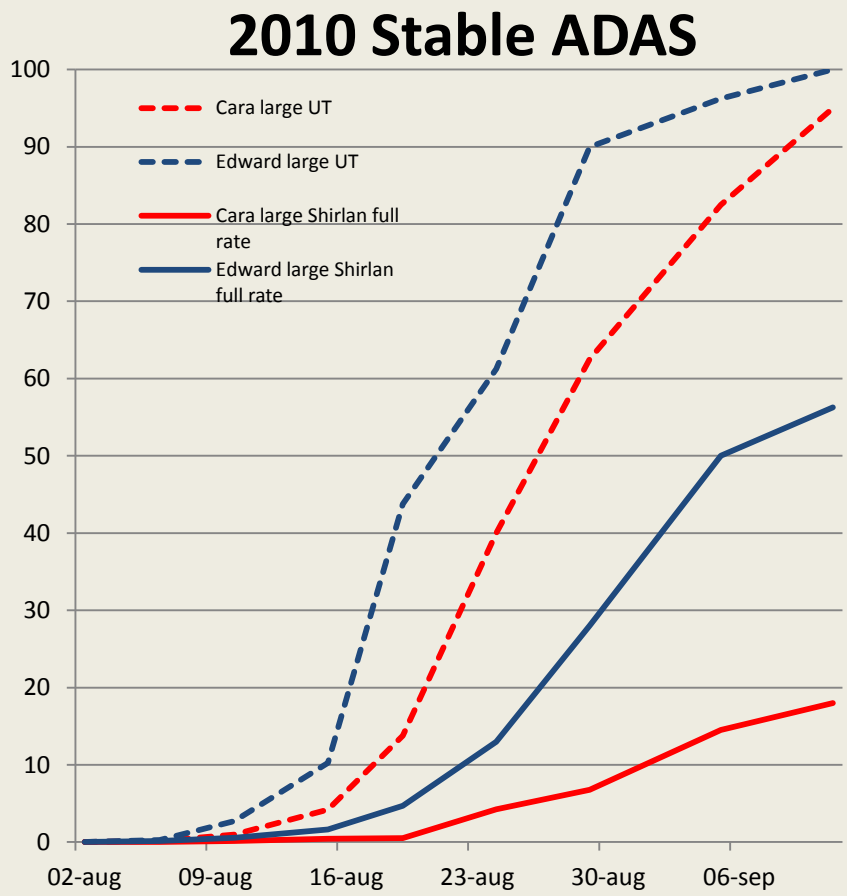
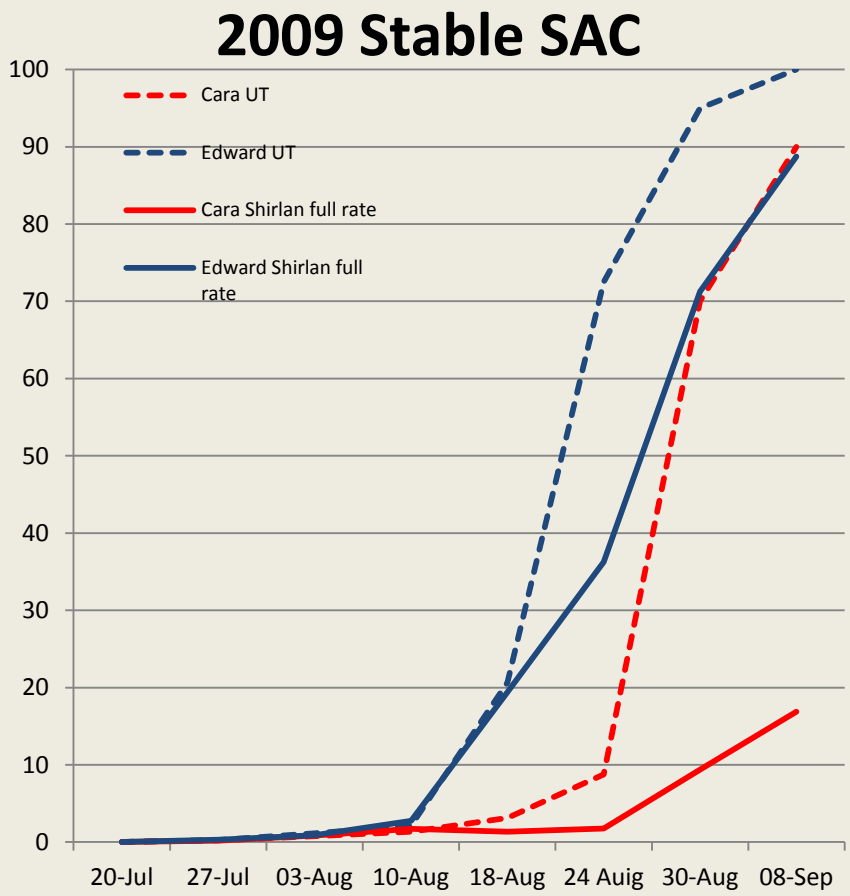
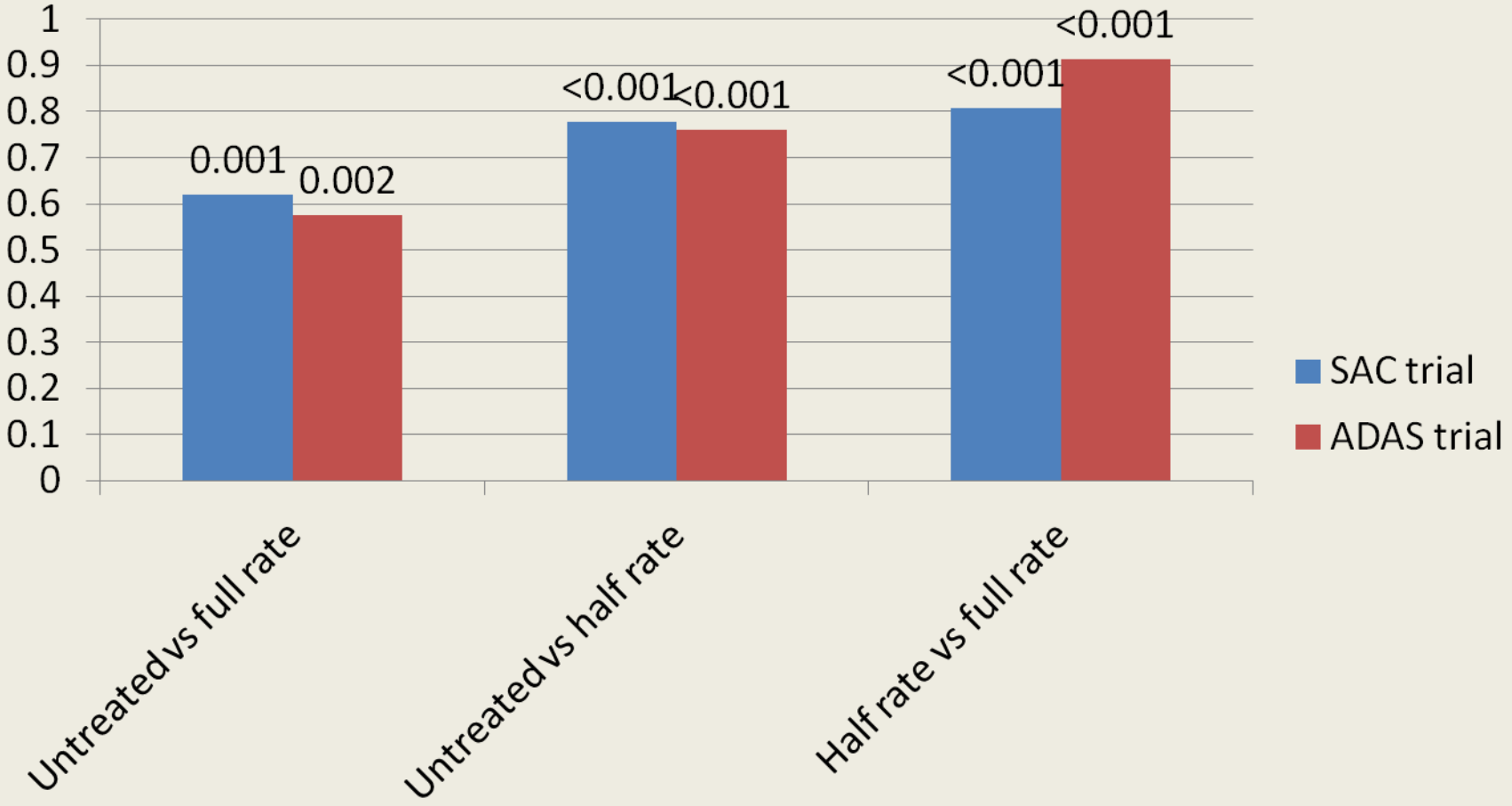


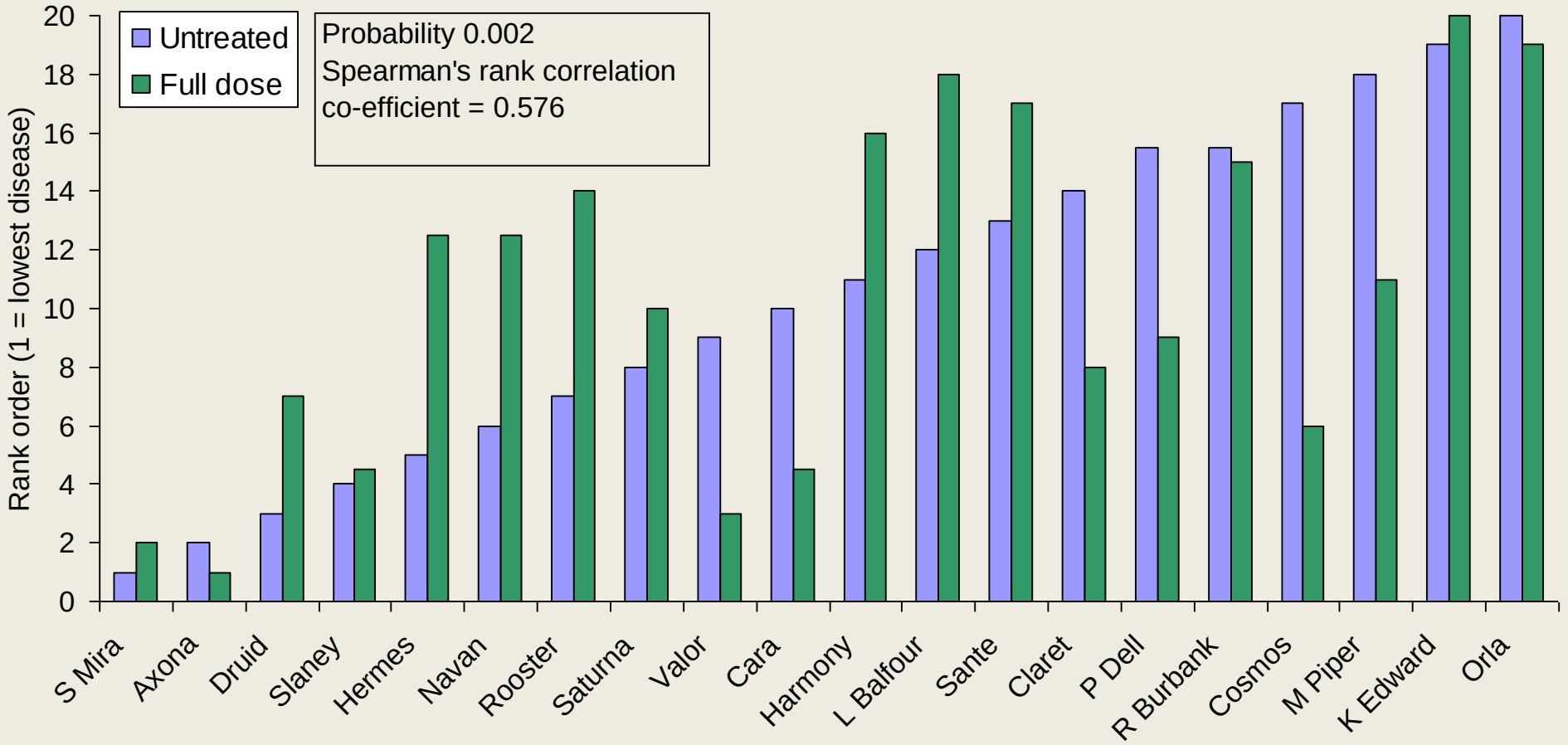


- Is the ranking order of cultivars affected by the use of a fungicide programmme?

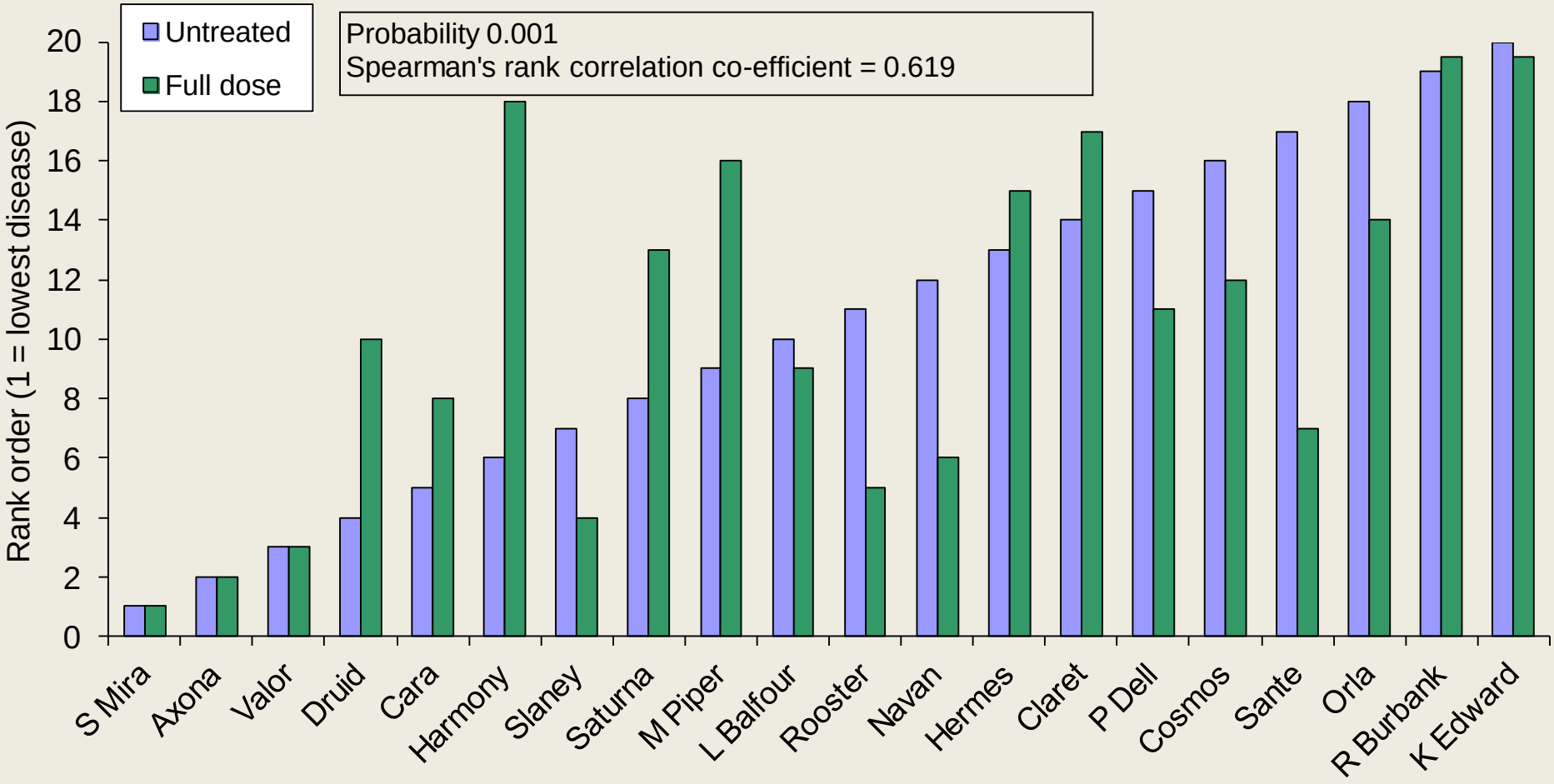
Spearman's rank correlation coefficients



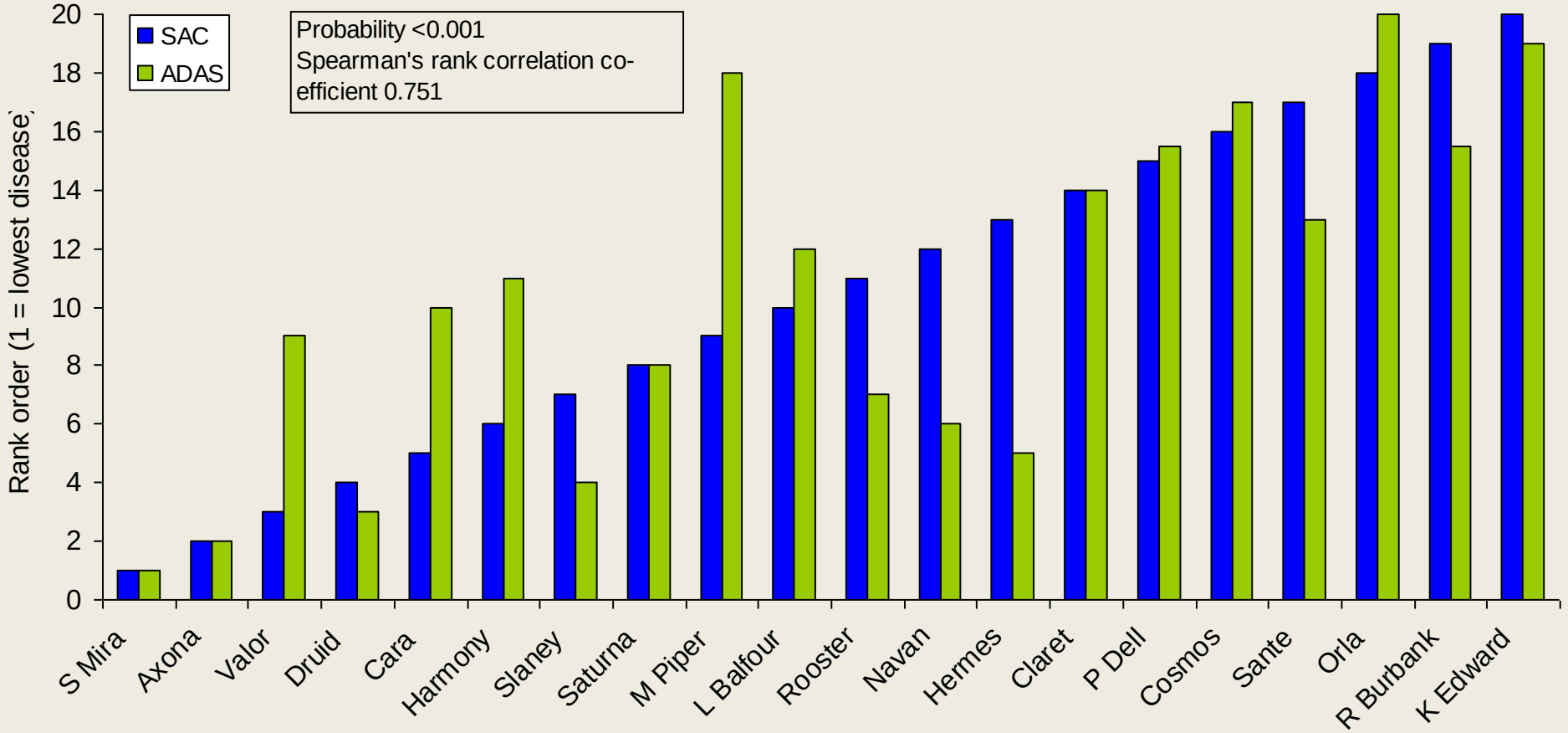
Untreated vs full dose fungicide - ADAS



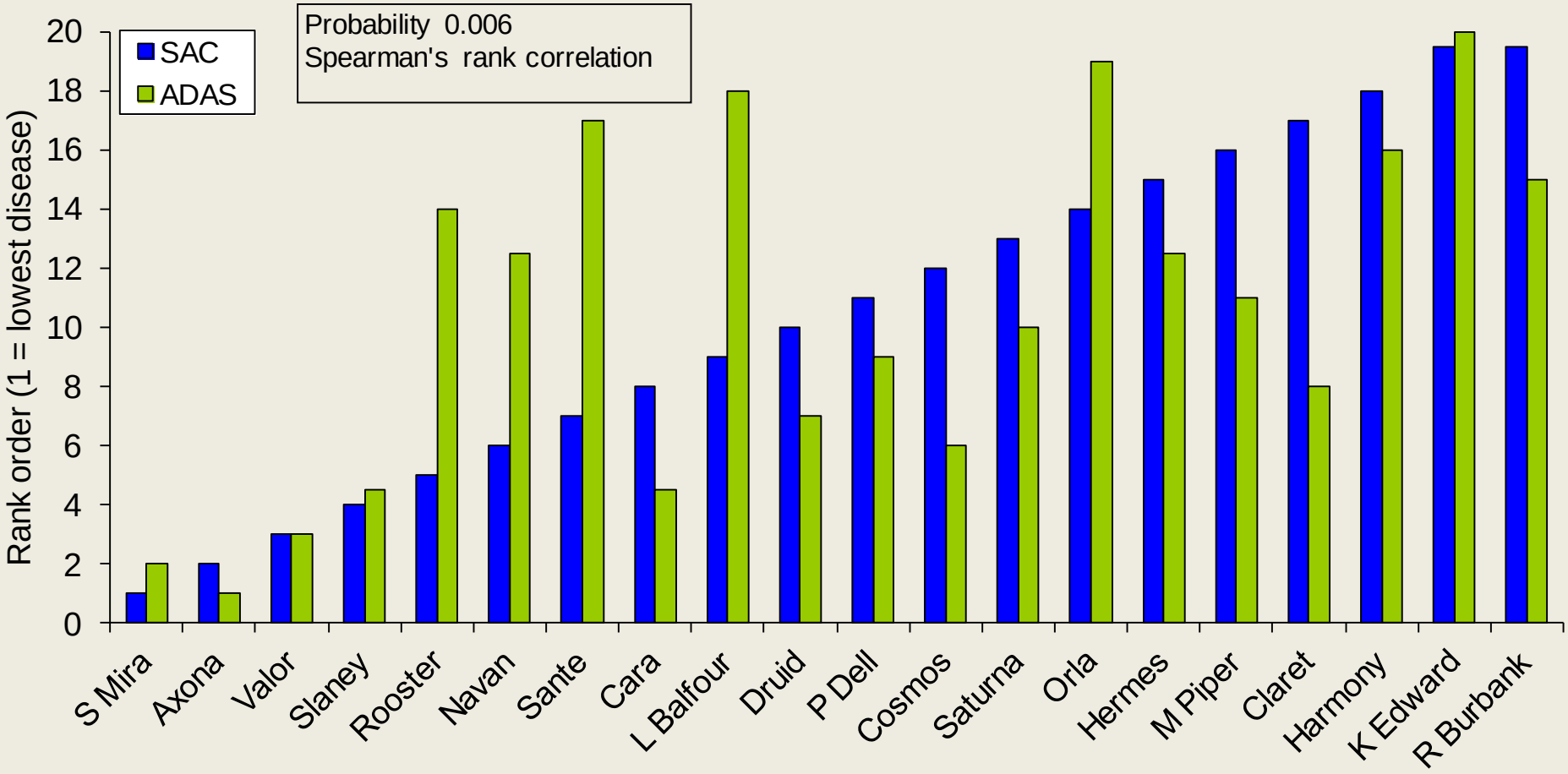
Untreated vs full dose fungicide - SAC



SAC vs ADAS - Untreated



SAC vs ADAS – full dose



Questions

- Now that more aggressive strains are used in cultivar resistance screening trials should inoculum pressure be managed more to avoid diminished discrimination between cultivars?
- If so, how?
    - Fungicide?
    - Location of trial?
    - Isolation of trial?
    - Reduced ratio of susceptible infectors to test cultivars ?
    - Larger plots of test cultivars?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