

Screening Sunflowers for Resistance to Sclerotinia Head Rot: Lessons Learned from Six Years of Research to Improve Screening Nurseries



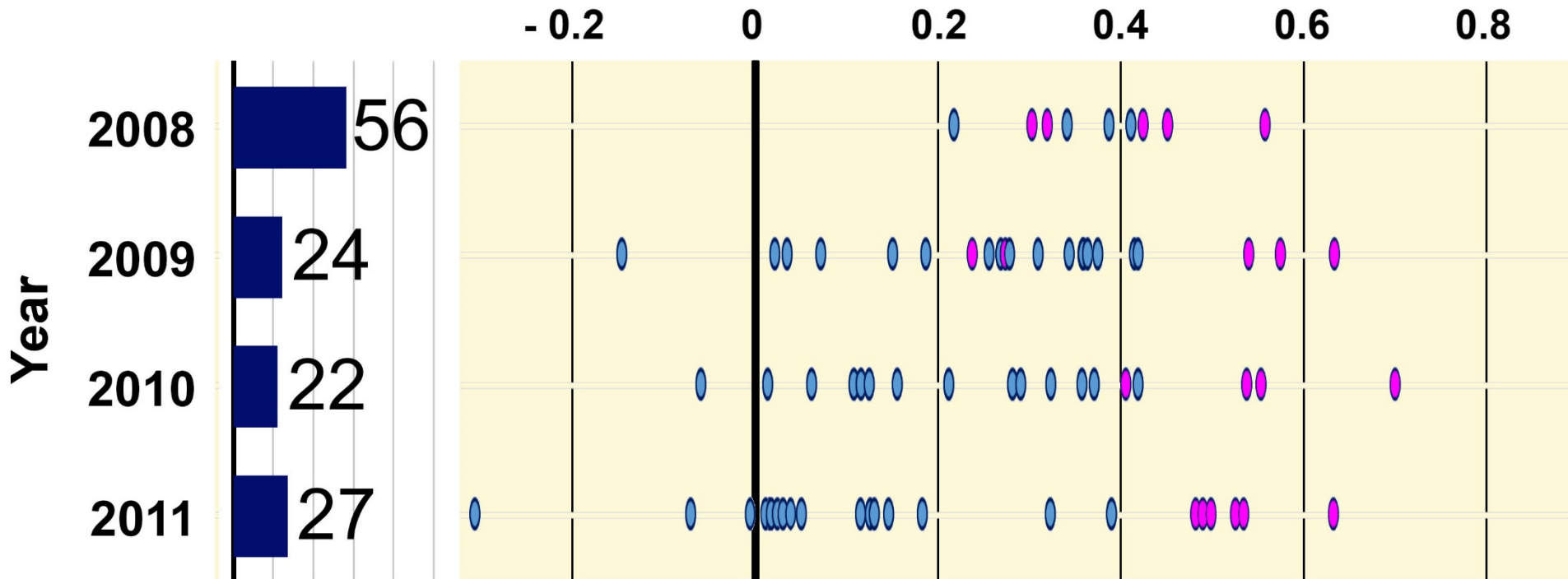
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2008-2011: Multi-location nurseries conducted to screen sunflowers for resistance to *Sclerotinia* head rot produced highly variable results.

Pearson Correlation Coefficient

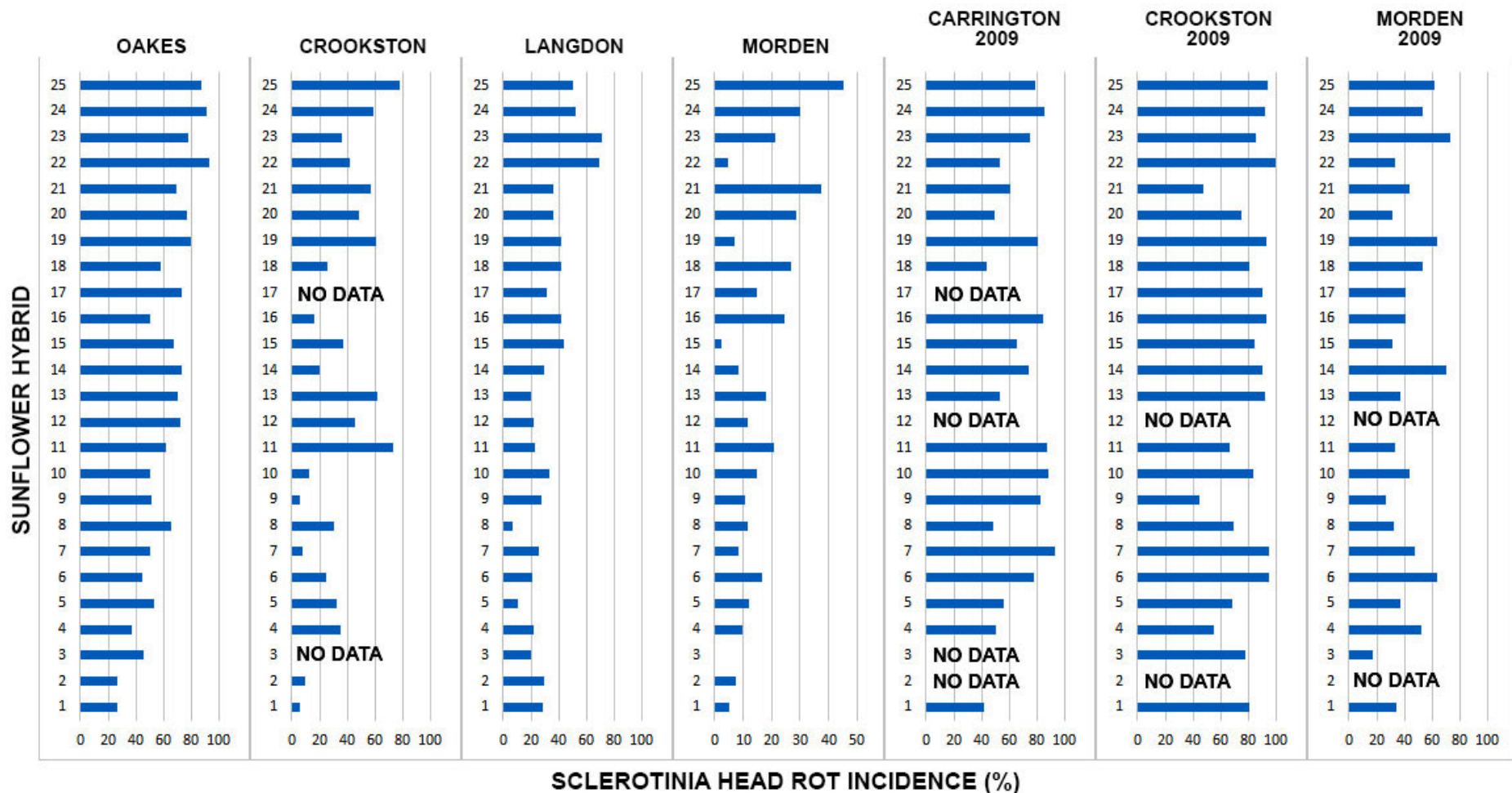


Bars illustrate the frequency of observing significantly correlated results ($P < 0.05$) across screening nurseries.

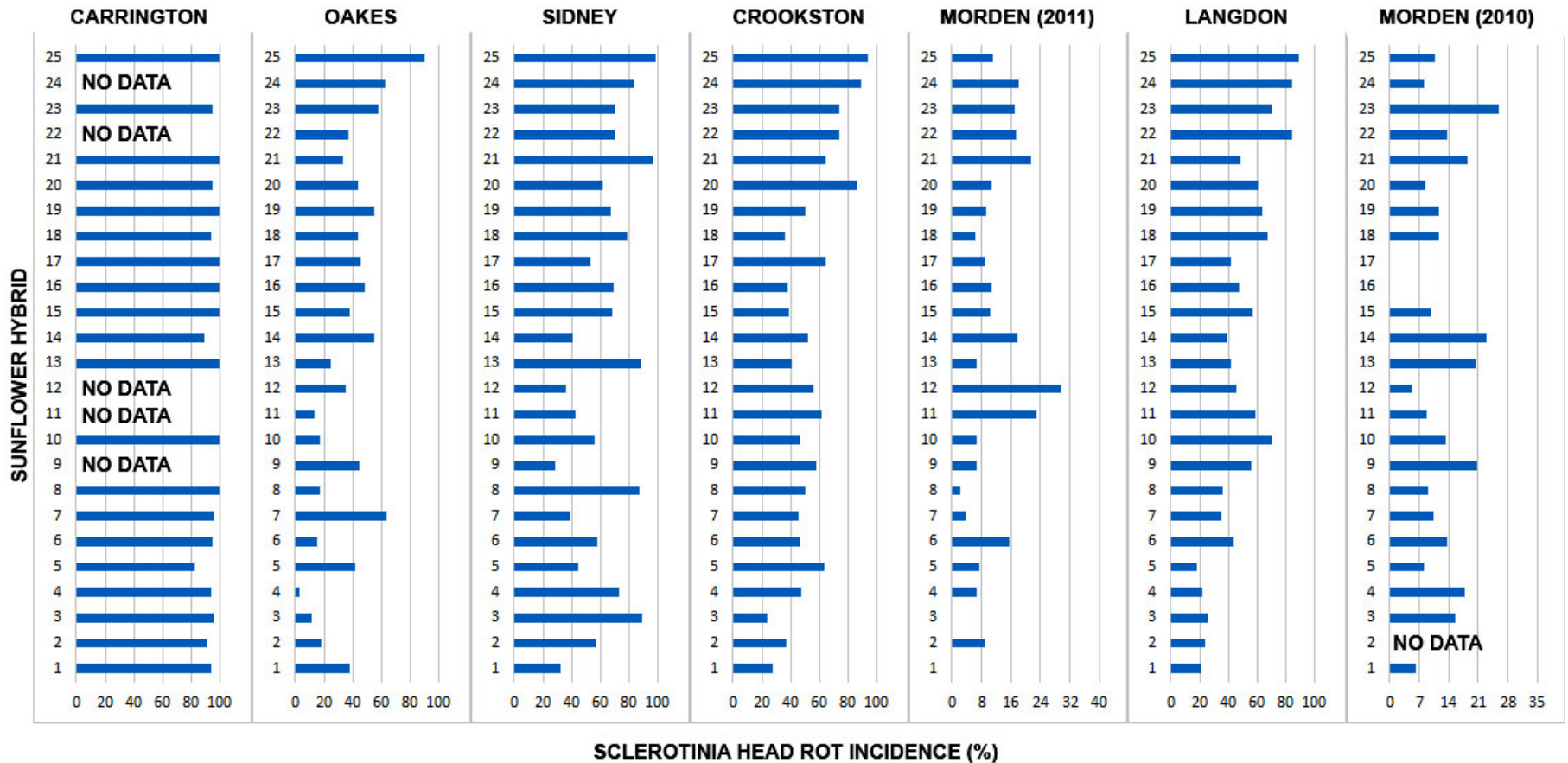
Each oval illustrates the strength of the correlation between trials in which the same hybrids were evaluated.

Pink denotes a statistically significant correlation ($P < 0.05$).

Variability in results across multi-location nurseries conducted in 2009-10:



Variability in results across multi-location nurseries conducted in 2010-11:



Addressing the problem:

Possible explanations for the observed variability

- (1) Does the relative susceptibility of hybrids change under diverse environmental conditions?
- (2) Were inoculation procedures producing biased results?

Addressing the problem:

Possible explanations for the observed variability

Modifications were made to the screening procedures:

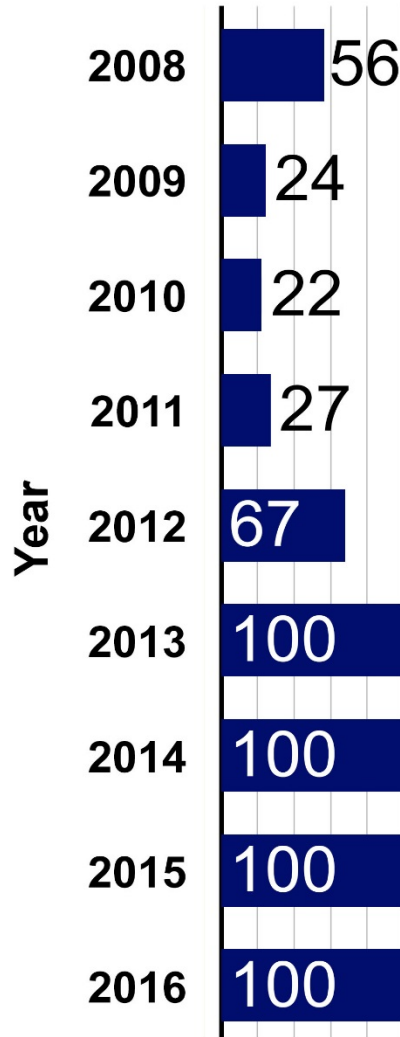
- (1) Every plant was marked upon inoculation
- (2) Every plant was inoculated twice, once at mid-bloom (R5.4-R5.6) and once at late bloom (R5.7-R5.9)

2012-2016:

The new inoculation procedures yielded replicable results

BAR GRAPH:

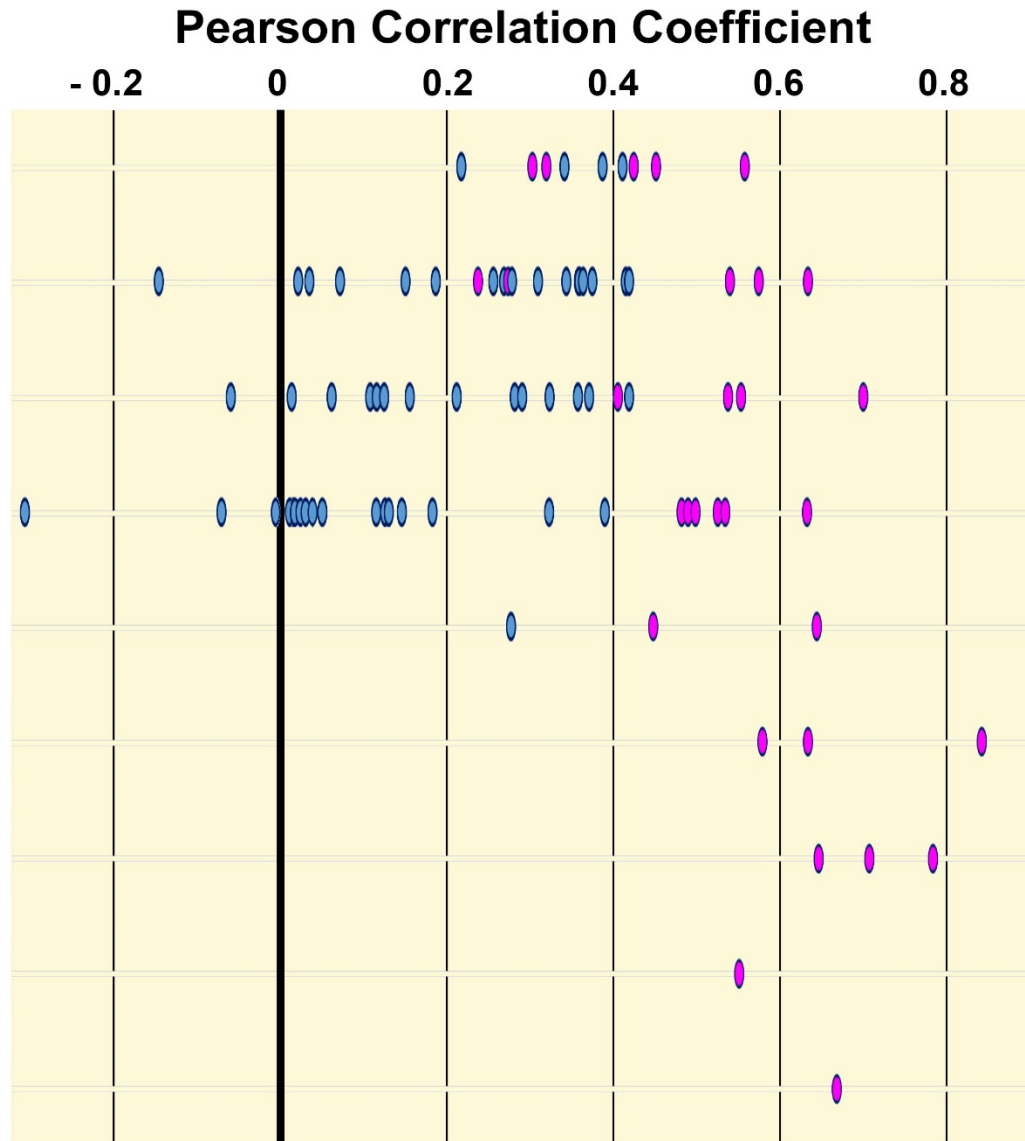
Bars represent the frequency with which significantly correlated results ($P < 0.05$) were observed across screening nurseries.



SCATTER PLOT:

Each oval represents the strength of the correlation in results across a pair of screening nurseries.

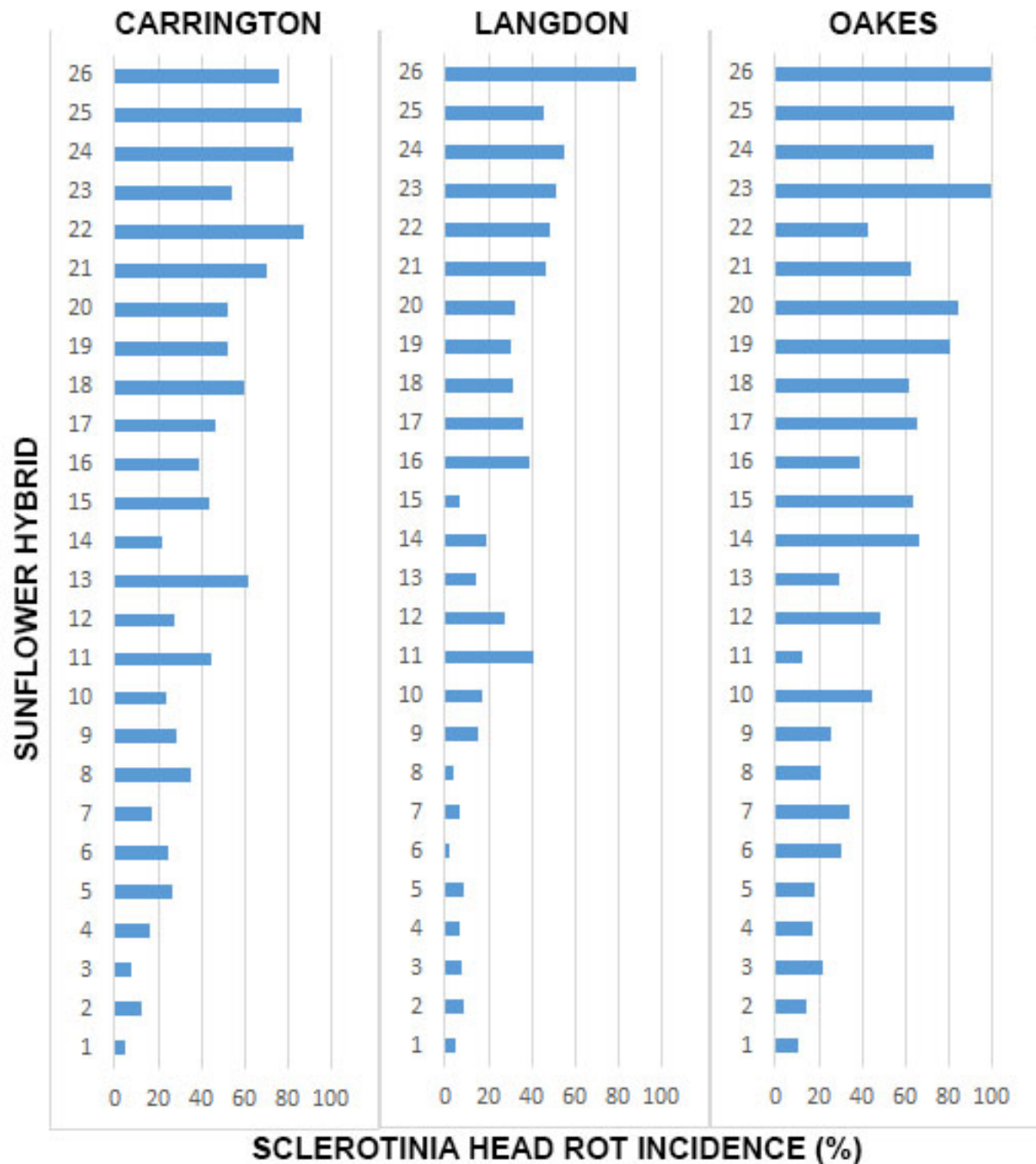
Pink denotes statistically significant correlations ($P < 0.05$).



Multi-location testing, 2013:
The new inoculation procedures have yielded replicable results.

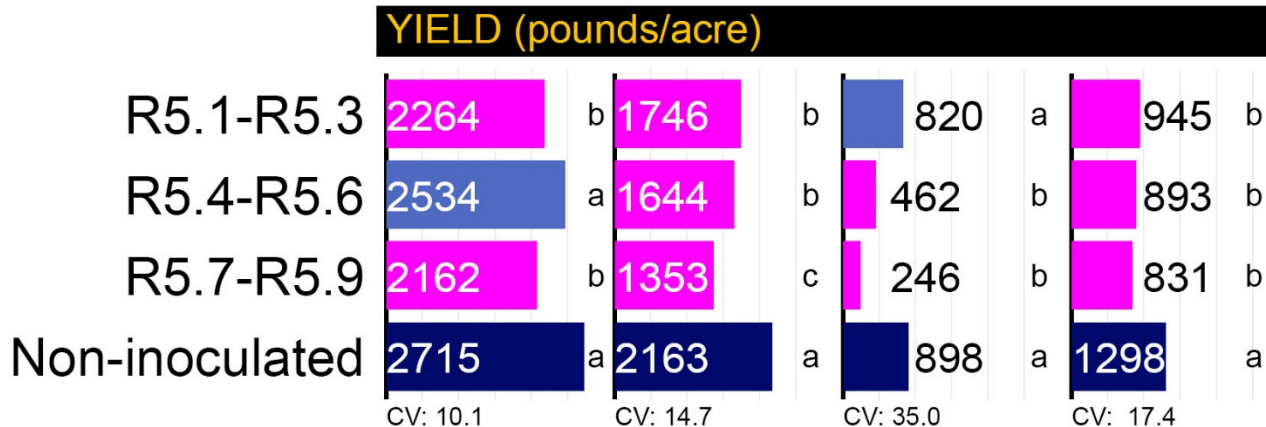
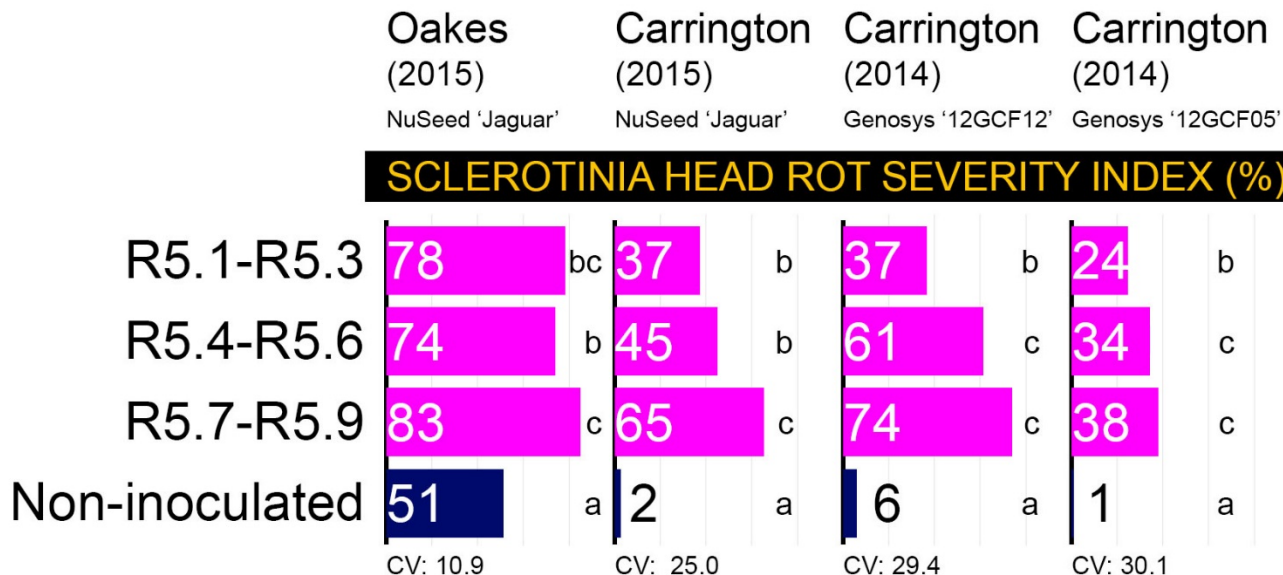


Multi-location testing, 2014:
The new inoculation procedures have yielded replicable results.



Inoculating each plant twice: Time-consuming but reduces the risk of generating biased results.

CONFECTION SUNFLOWERS

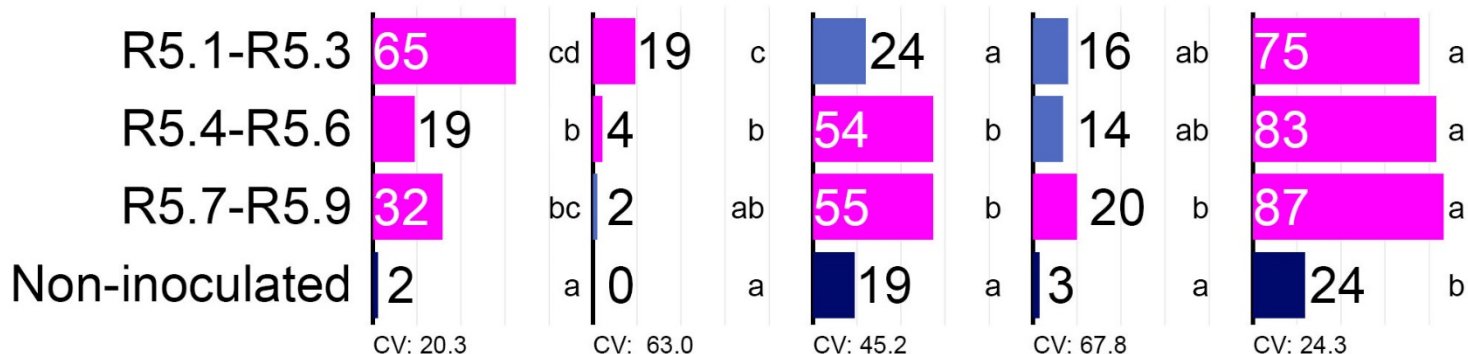


Inoculating each plant twice: Time-consuming but reduces the risk of generating biased results.

OILSEED SUNFLOWERS

Carrington (2014) Carrington (2014) Langdon (2014) Langdon (2014) Carrington (2013)
 Croplan '305' Croplan '343' Croplan '305' Croplan '343' Croplan '305'

SCLEROTINIA HEAD ROT SEVERITY INDEX (%)



YIELD (pounds/acre)

