

Prospects for managing *Sclerotinia* head rot with fungicides

LESSONS FROM FIELD TRIALS CONDUCTED IN 2011



Photos: Leonard Besemann

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Research questions

FUNGICIDE EFFICACY FOR MANAGEMENT OF SCLEROTINIA HEAD ROT

- (1) Fungicides that are effective against Sclerotinia on other crops
- (2) Experimental fungicides that may be registered on sunflower

Carrington, ND (M. Wunsch); Langdon, ND (S. Halley); Scottsbluff, NE (R. Harveson)



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SUSCEPTIBILITY OF SUNFLOWERS TO SCLEROTINIA HEAD ROT AFTER FLOWERING

- Susceptibility after flowering has long been suspected
- Window of susceptibility will influence fungicide timing

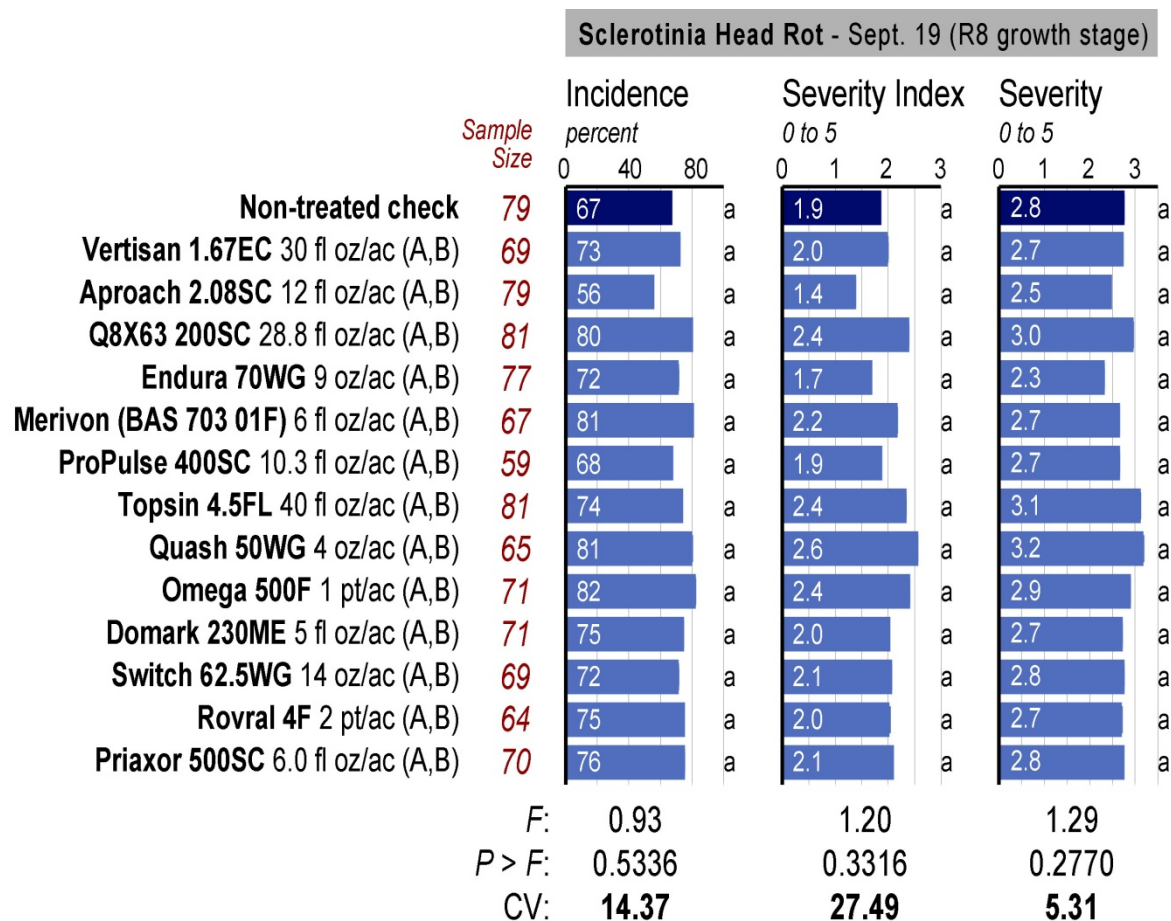
Carrington, ND (M. Wunsch); Langdon, ND (S. Halley); Oakes, ND (L. Besemann)



Fungicide efficacy - Carrington



NO DIFFERENCES IN EFFICACY OBSERVED



Sunflower hybrid = Jaguar (a confection type)

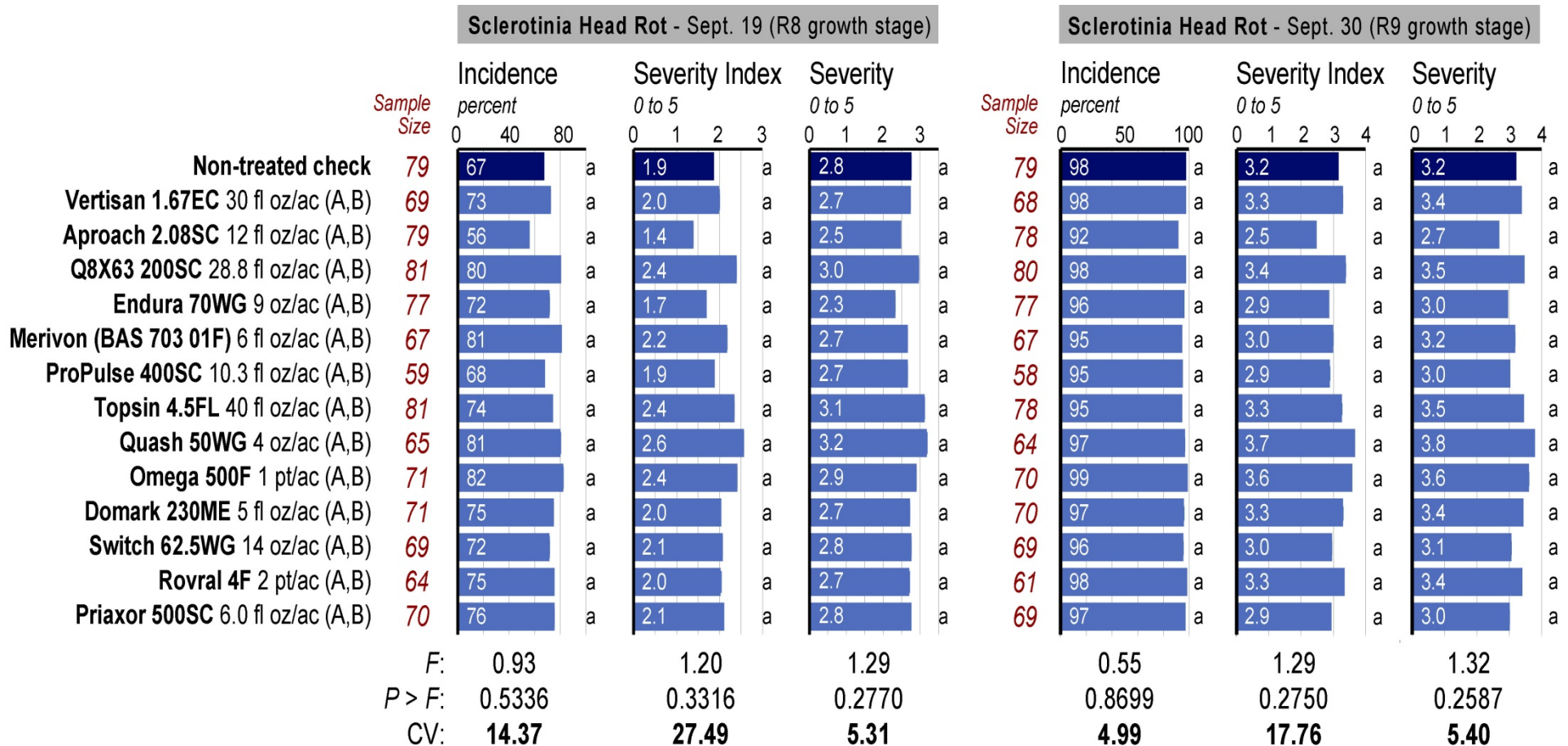
Fungicide application timing = (A) August 14, (B) August 24.

Fungicide efficacy - Carrington



NO DIFFERENCES IN EFFICACY OBSERVED

... but high disease pressure may have overwhelmed treatments



Sunflower hybrid = Jaguar (a confection type)

Fungicide application timing = (A) August 14, (B) August 24.

Fungicide efficacy - Carrington

HAIL DAMAGE PRECLUDED YIELD ASSESSMENT

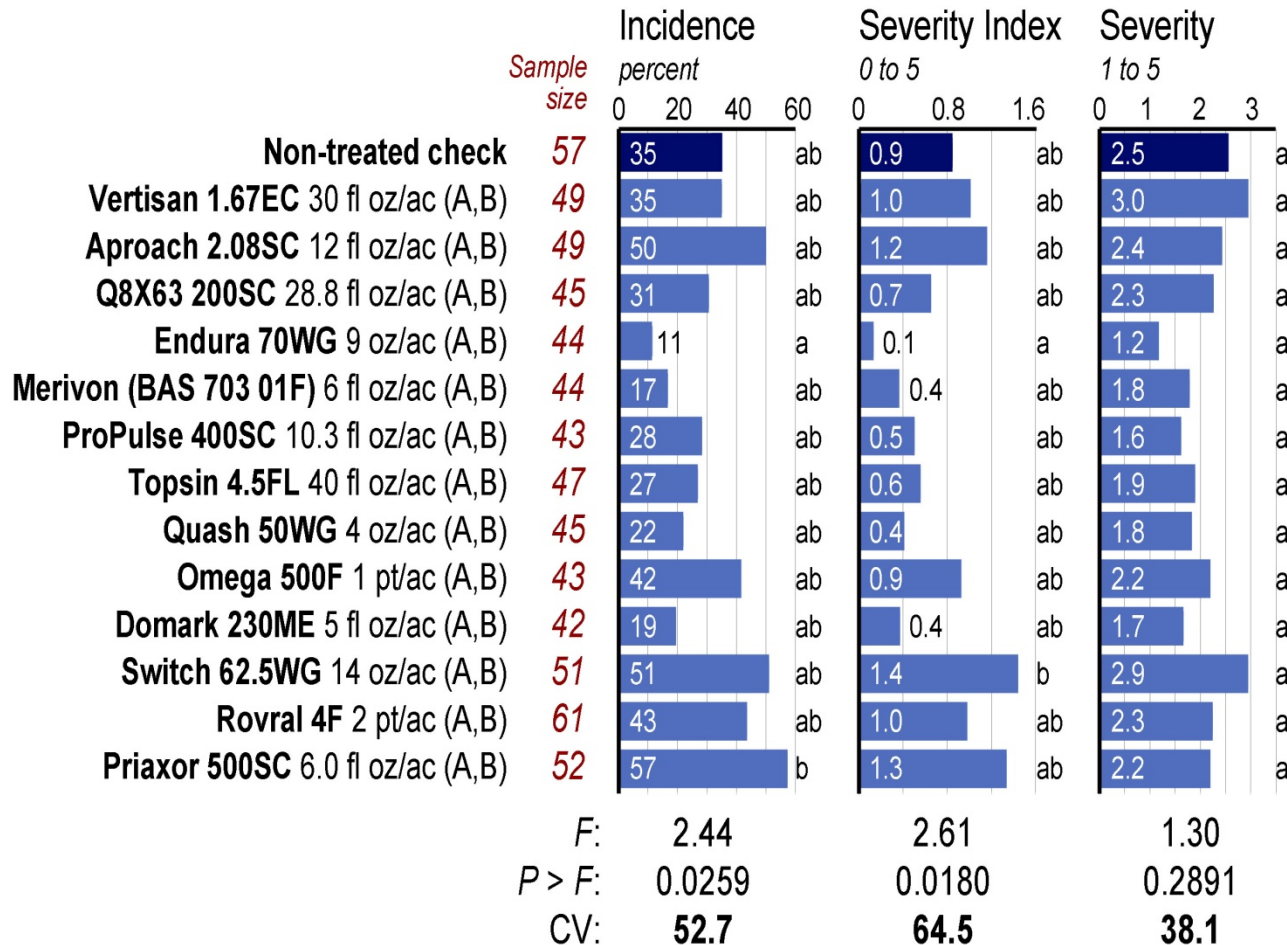


Fungicide efficacy - Langdon

DISEASE PRESSURE OPTIMAL – and treatment differences detected



SCLEROTINIA HEAD ROT

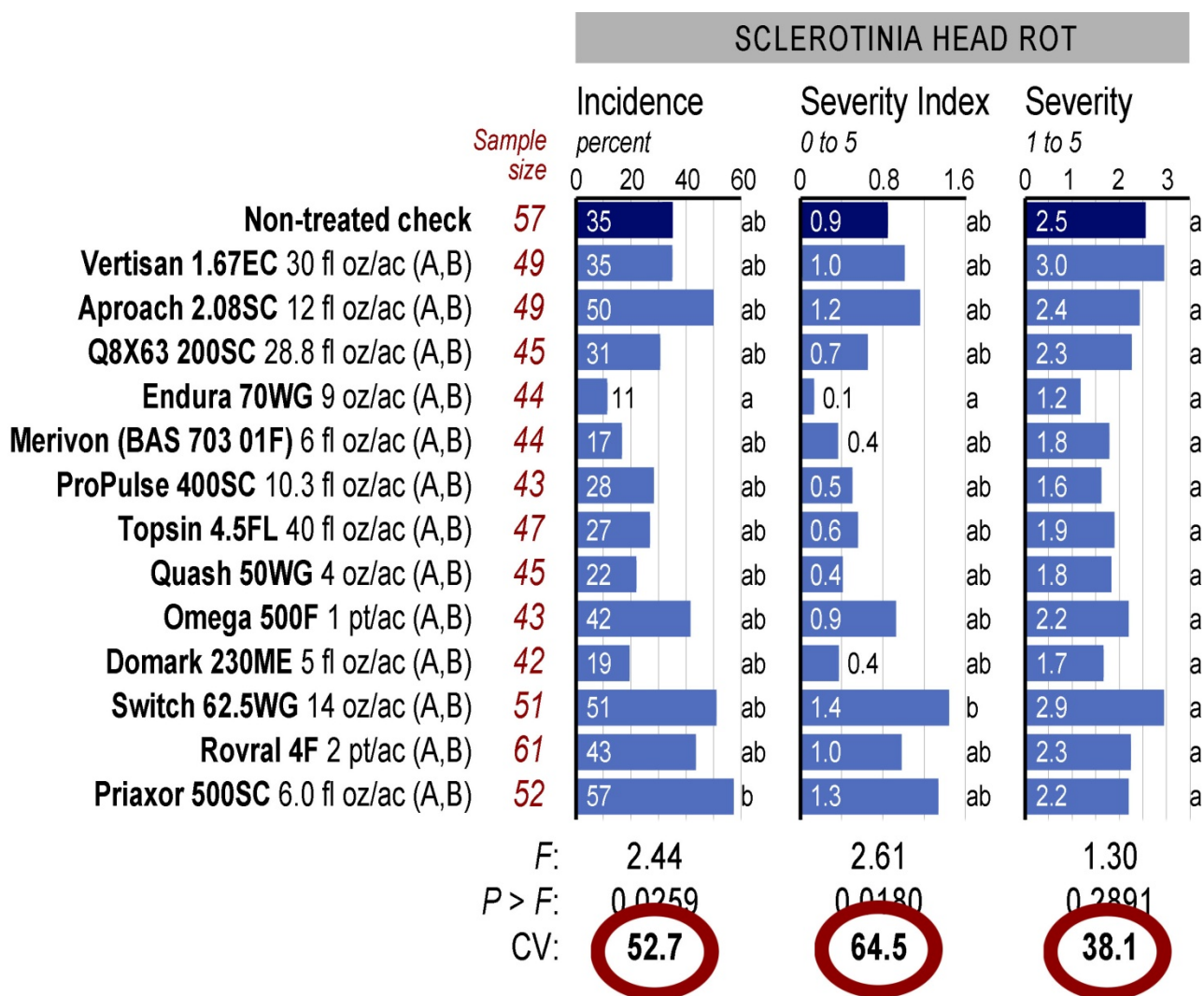


Sunflower hybrid = Jaguar (a confection type)

Fungicide application timing = (A) August 9, (B) August 14. Disease assessment = September 15

Fungicide efficacy - Langdon

BUT RESULTS HIGHLY VARIABLE – impaired ability to discern efficacy differences



Sunflower hybrid = Jaguar (a confection type)

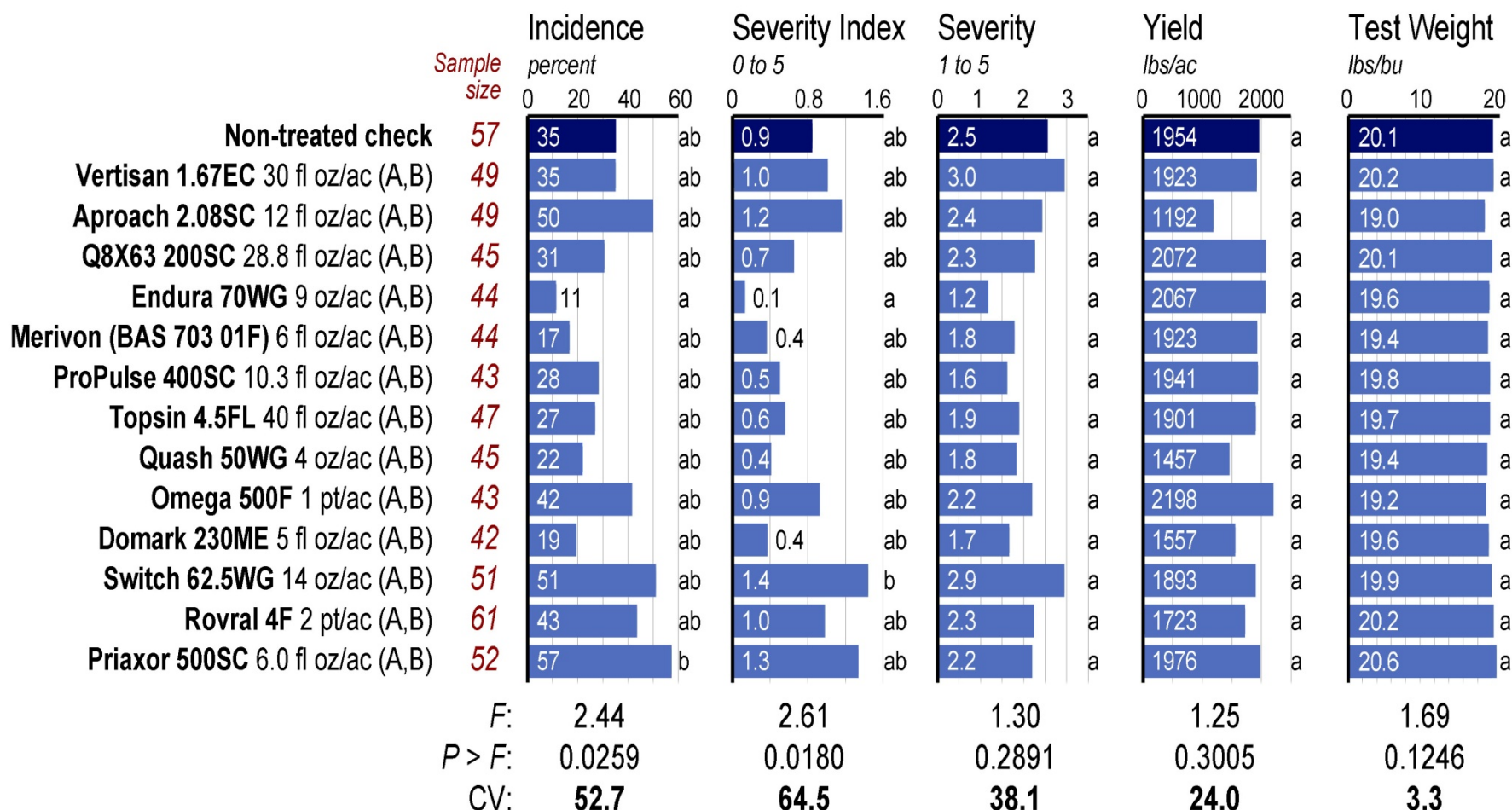
Fungicide application timing = (A) August 9, (B) August 14. Disease assessment = September 15

Fungicide efficacy - Langdon

DIFFERENCES IN YIELD AND QUALITY NOT DETECTED



SCLEROTINIA HEAD ROT



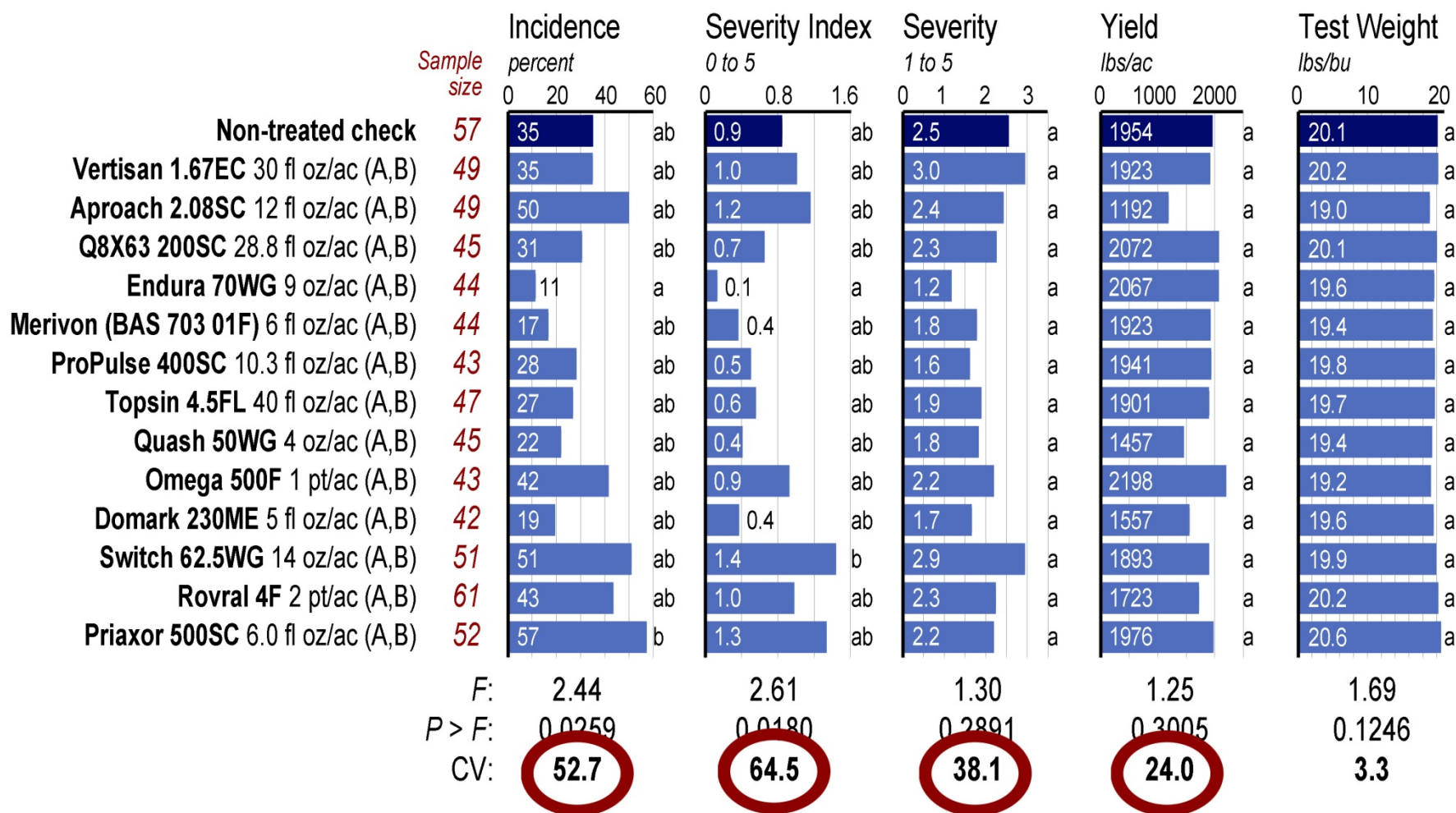
Sunflower hybrid = Jaguar (a confection type)

Fungicide application timing = (A) August 9, (B) August 14. Disease assessment = September 15

Fungicide efficacy - Langdon

... but data were highly variable, impairing ability to discern differences

SCLEROTINIA HEAD ROT



Sunflower hybrid = Jaguar (a confection type)

Fungicide application timing = (A) August 9, (B) August 14. Disease assessment = September 15

Fungicide efficacy - Scottsbluff



Disease establishment was unsuccessful

-very hot and windy in August 2011

-artificial establishment of Sclerotinia has been successful in other crops in previous years

-irrigation with a pivot, not microsprinklers

Fungicide efficacy – FUTURE APPROACHES



All locations: Larger plot sizes

-Harvested plot size = 5 ft x 26 ft *or* 5 ft x 29 ft

-Number of plants per plot = 48 - 53 (*if* confection sunflowers; 16,000 plants/ac)
= 65 - 73 (*if* oil sunflowers; 22,000 plants/ac)

Carrington: less aggressive misting

Scottsbluff: a microsprinkler misting system will be used

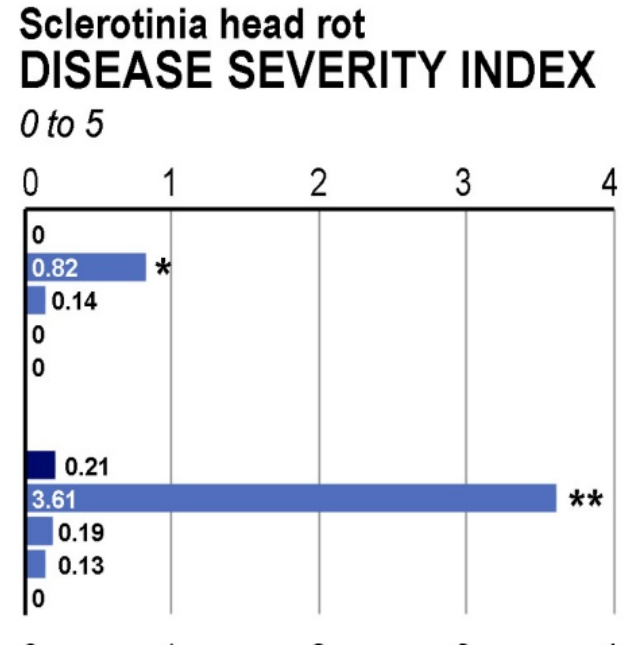
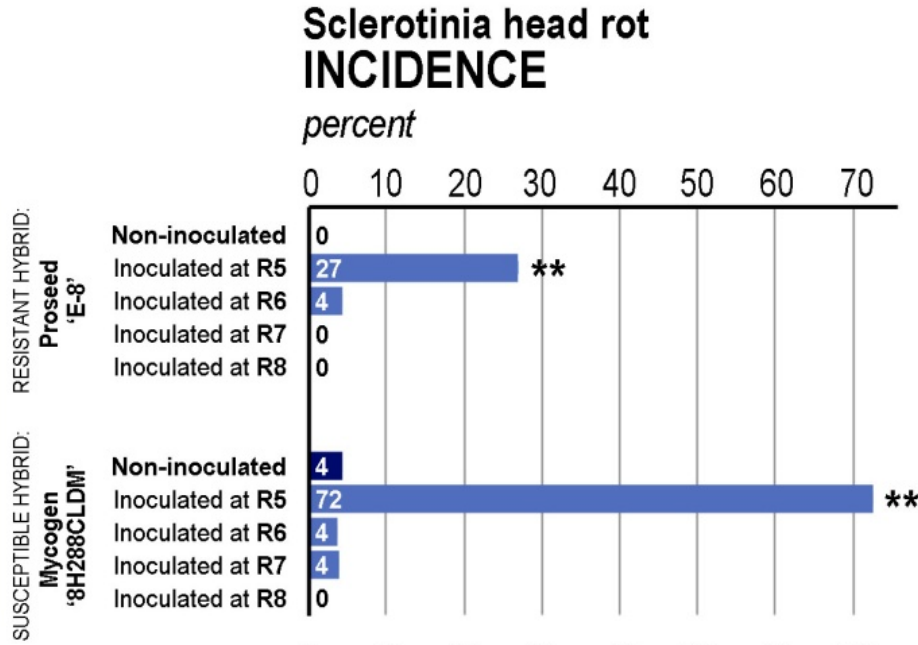


Susceptibility to Sclerotinia head rot after flowering

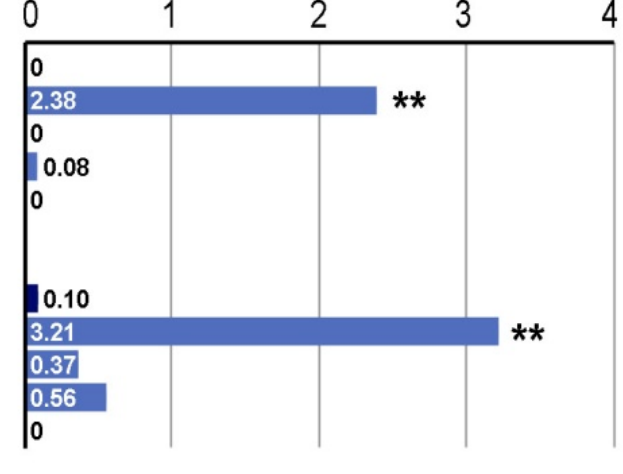
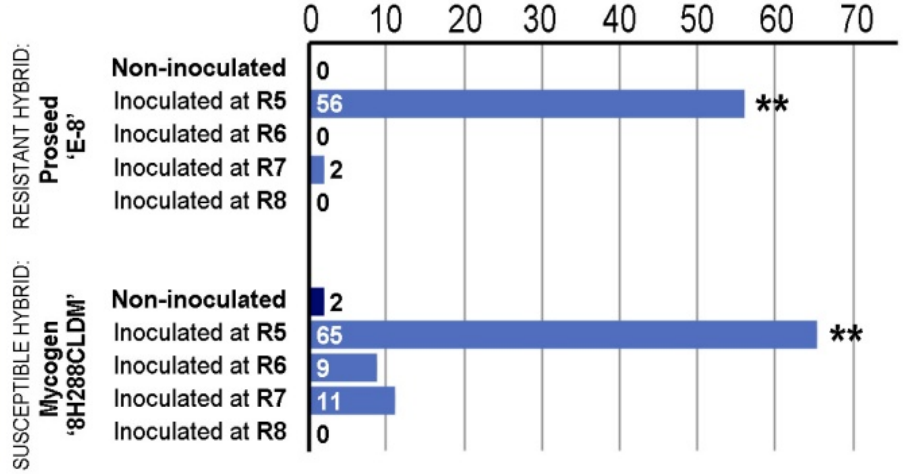


Carrington: Only susceptible at R5

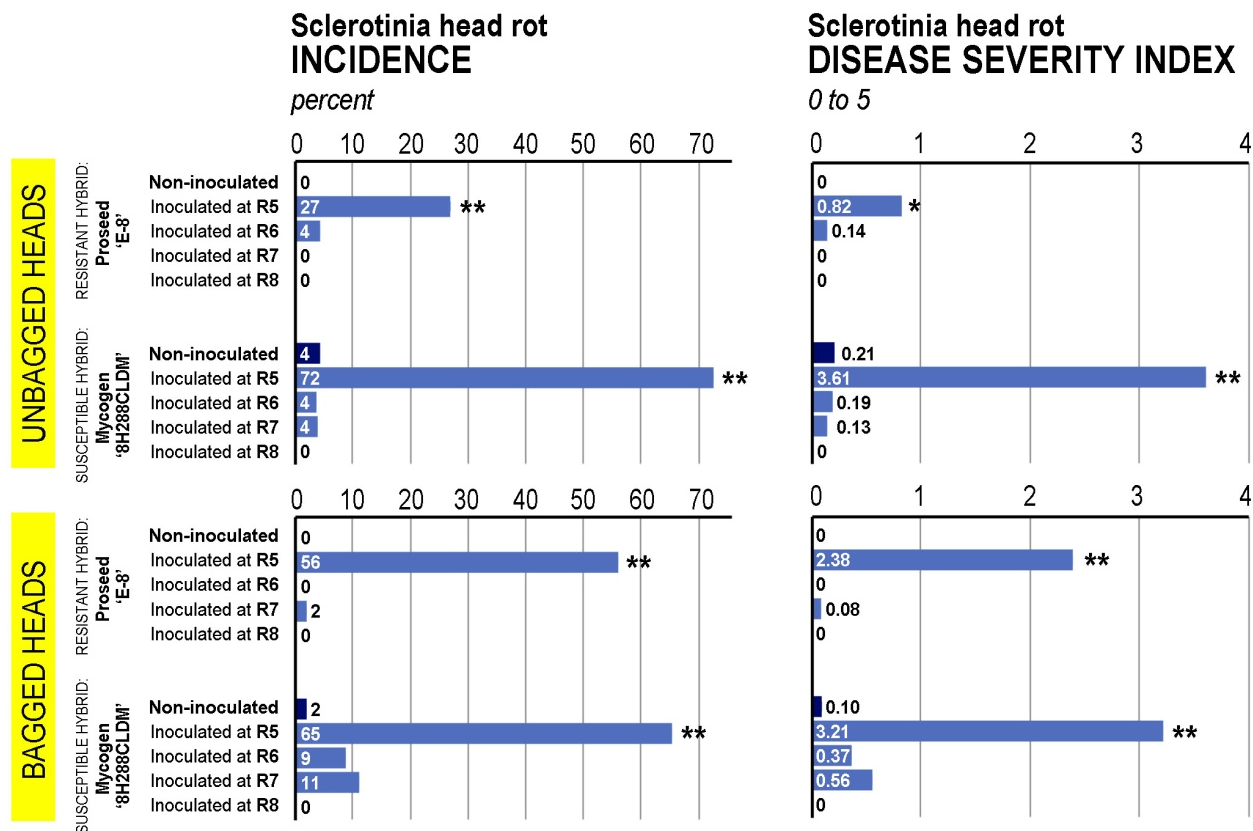
UNBAGGED HEADS



BAGGED HEADS



Carrington:



Incidence:

Effect	DF1	DF2	F	P > F
bag	1	5	2.27	0.1922
hybrid	1	5	17.62	0.0085
trt	4	20	116.4	<0.0001
bag*hybrid	1	62	1.45	0.2324
bag*trt	4	62	1.27	0.2903
hybrid*trt	4	62	6.28	0.0002
bag*hybrid*trt	4	62	4.24	0.0042

DSI:

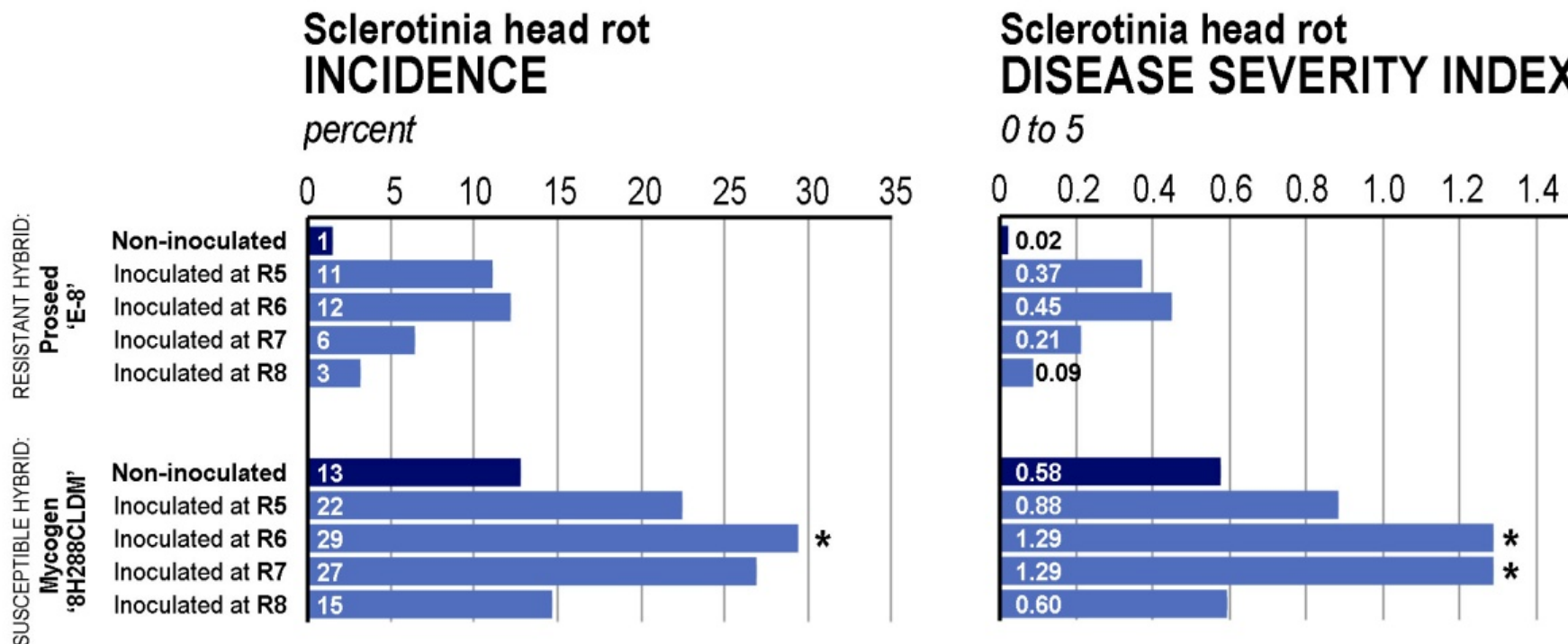
Effect	DF1	DF2	F	P > F
bag	1	5	2.79	0.1454
hybrid	1	5	21.13	0.0059
trt	4	20	105.8	<0.0001
bag*hybrid	1	62	2.19	0.1437
bag*trt	4	62	1.57	0.1944
hybrid*trt	4	62	12.67	<0.0001
bag*hybrid*trt	4	62	5.29	0.0010

Susceptibility to Sclerotinia head rot after flowering



Langdon: Susceptible at R6 and R7

COMBINED DATA:
bagged & unbagged heads



Data from bagged and unbagged heads were combined:

- *There was no difference in disease levels between bagged and unbagged heads (alpha = 0.05)*
- *Bagging heads had no significant interaction effects with hybrid or with inoculation timing*

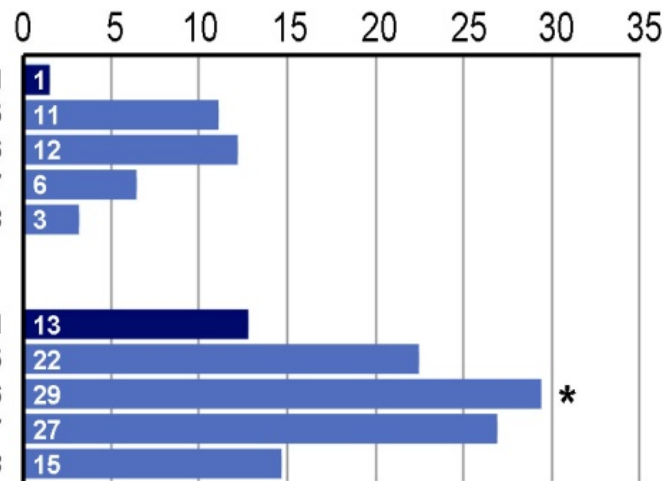
Langdon:

COMBINED DATA:
bagged & unbagged heads

SUSCEPTIBLE HYBRID: 'Mycogen '8H288CLDM'
RESISTANT HYBRID: Proseed 'E-8'

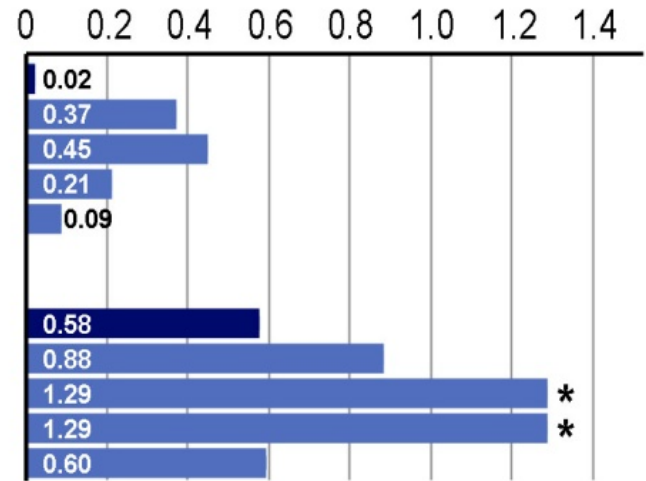
Sclerotinia head rot INCIDENCE

percent



Sclerotinia head rot DISEASE SEVERITY INDEX

0 to 5



Incidence, bagged & unbagged heads separate:

Effect	DF1	DF2	F	P > F
bag	1	3	1.98	0.2536
hybrid	1	3	10.48	0.0479
trt	4	12	1.64	0.2287
bag*hybrid	1	39	2.38	0.1309
bag*trt	4	39	0.27	0.8985
hybrid*trt	4	39	0.73	0.5765
bag*hybrid*trt	4	39	0.80	0.5319

DSI, bagged & unbagged heads separate:

Effect	DF1	DF2	F	P > F
bag	1	3	2.54	0.2094
hybrid	1	3	11.22	0.0441
trt	4	12	1.75	0.2047
bag*hybrid	1	39	1.10	0.2999
bag*trt	4	39	0.54	0.7094
hybrid*trt	4	39	1.59	0.1955
bag*hybrid*trt	4	39	0.43	0.7884

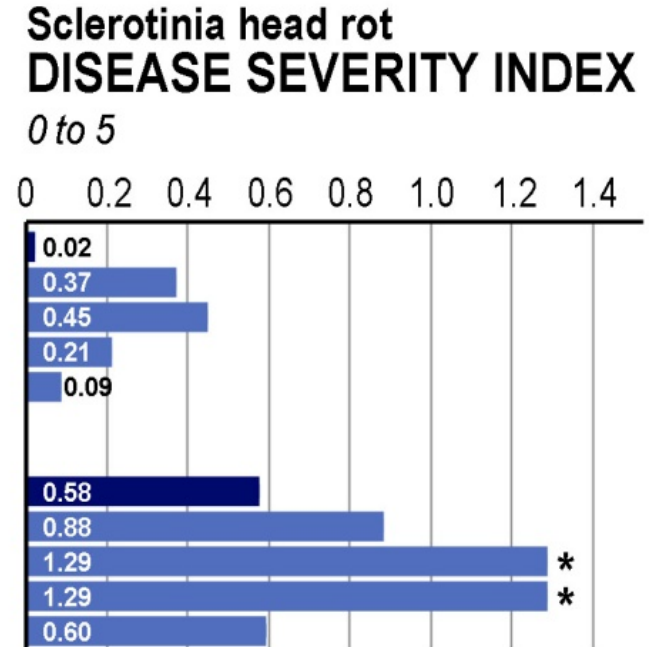
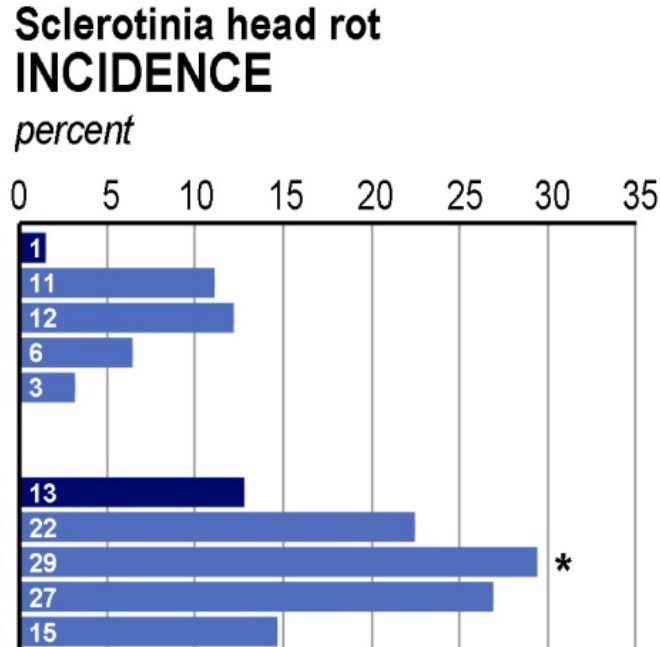
Langdon:

COMBINED DATA:
bagged & unbagged heads

SUSCEPTIBLE HYBRID: '8H288CLDM'
Mycogen

RESISTANT HYBRID: Proseed 'E-8'

Non-inoculated
Inoculated at R5
Inoculated at R6
Inoculated at R7
Inoculated at R8



Incidence, bagged & unbagged heads combined:

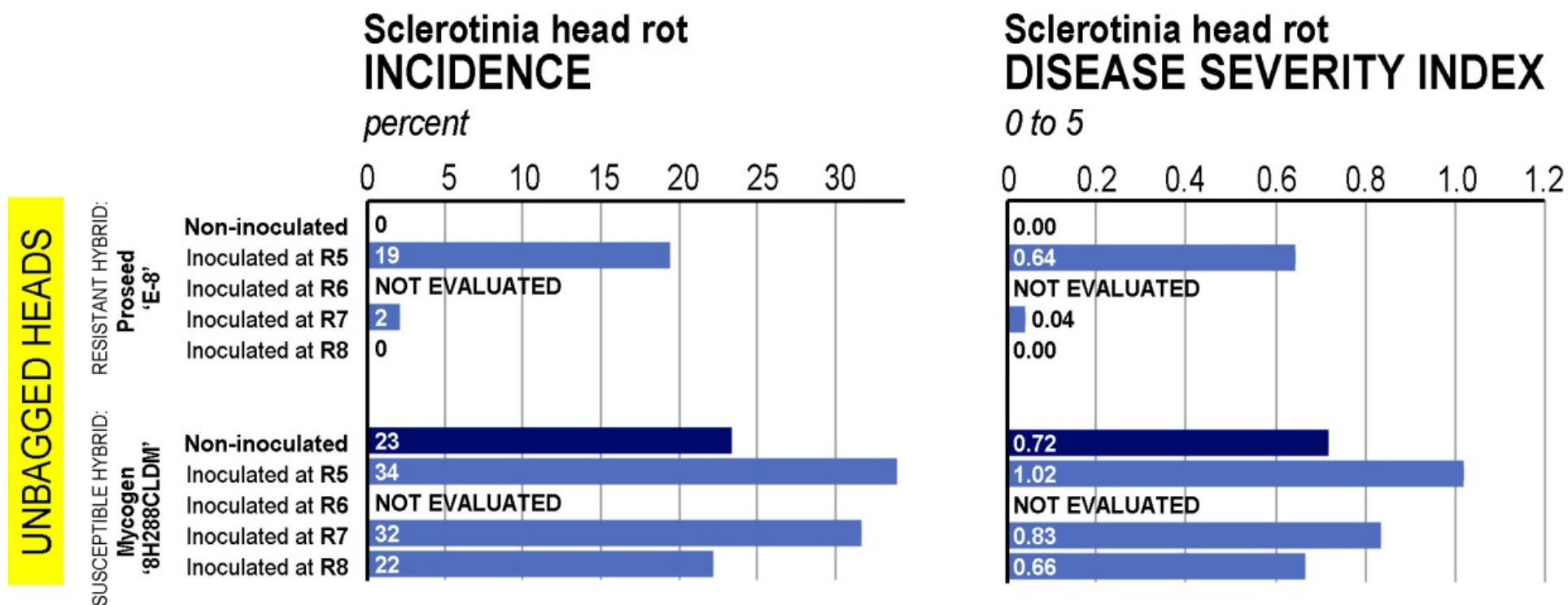
Effect	DF1	DF2	F	P > F
hybrid	1	7	19.93	0.0029
trt	4	56	3.59	0.0112
hybrid*trt	4	56	0.48	0.7474

DSI, bagged & unbagged heads combined:

Effect	DF1	DF2	F	P > F
hybrid	1	7	24.13	0.0017
trt	4	56	4.05	0.0059
hybrid*trt	4	56	1.02	0.4047

Susceptibility to Sclerotinia head rot after flowering

Oakes: Data inconclusive



INCIDENCE:

Effect	DF1	DF2	F	P > F
hybrid	1	3	20.62	0.0200
trt	3	18	3.21	0.0476
hybrid*trt	3	18	0.59	0.6297

DSI:

Effect	DF1	DF2	F	P > F
hybrid	1	3	15.94	0.0282
trt	3	18	3.26	0.0457
hybrid*trt	3	18	0.49	0.6904

Prospects for managing *Sclerotinia* head rot with fungicides: LESSONS FROM FIELD TRIALS CONDUCTED IN 2011

Fungicide efficacy:

- Larger plot sizes needed to discern differences
- Misting must be calibrated properly

Fungicide timing:

- Applications may be needed after flowering during periods of cool, wet weather



Thank you!



Photos: Leonard Besemann

Funding support:
Confection growers
National Sclerotinia Initiative