Sclerotinia Head Rot and Sunflower Hybrids

Blaine G. Schatz[-1], Tom Gulya[-2], Ezra Aberle[-1], Scott Halley[-3] and Walt Albus[-1]

North Dakota State University Carrington Research Extension Center[-1]
Sunflower Research Unit, USDA-ARS Northern Crop Science Laboratory[-2]
North Dakota State University Carrington Research Extension Center[-3]

Screening Experimental and Commercial Sunflower Hybrids for Head Rot Resistance

- Two phases of hybrid screening.
  - First phase =

- "Initial Screening"
  - New set of hybrids not previously tested.
  - Limited to 75 hybrids including 'resistant' and 'susceptible' check.
  - Carrington, ND & Morden, MB.
  - 14 companies represented in 2009.

NDSU

Screening Experimental and Commercial Sunflower Hybrids for Head Rot Resistance

- Two phases of hybrid screening.
  - Second phase =

- "Repeat Screening"
  - 20 best hybrids identified from previous year's 'Initial' test.
  - Carrington, Langdon, Oakes, and Morden.
  - 10 companies represented.

NDSU

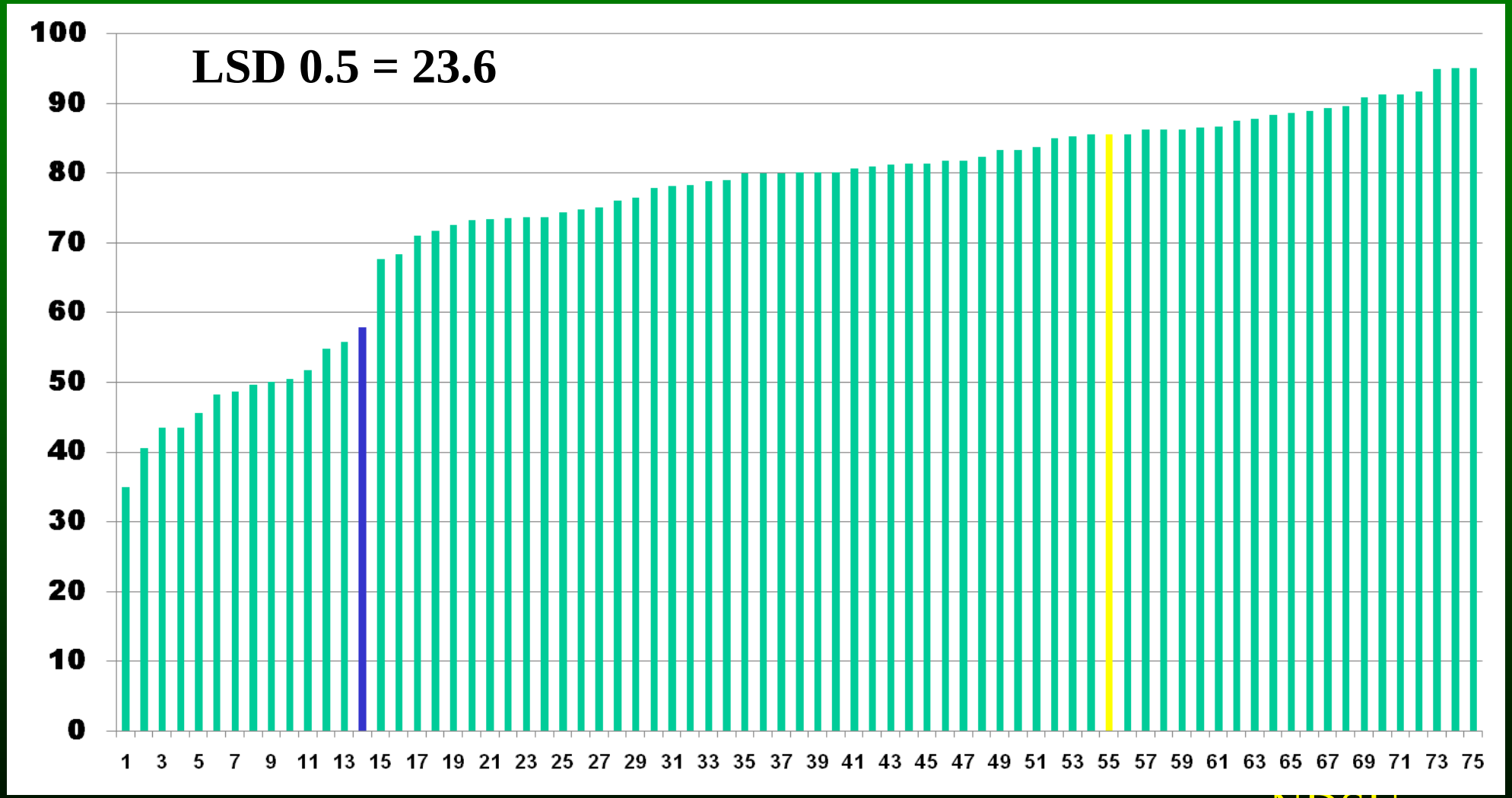
Review of Misting System Effectiveness at Sunflower Head Rot Research Sites in 2009.

Location	Incidence Mean	Incidence Range	Severity Mean	Severity Range
	%	%	1 to 5	1 to 5
Carrington	**76**	**35 to 95**	**4.7**	**4.2 to 5.0**
Langdon	**62**	**34 to 84**	**4.0**	**3.7 to 4.3**
Oakes	**61**	**33 to 93**	**3.7**	**2.8 to 4.5**
Morden	**44**	**17 to 75**		

Sunflower : Sclerotinia Head Rot Field Screening Methodology

- Hybrids planted in 1-row plots, typically 25ft long.
- Randomized complete block, 4 replications.
- Individual sunflower heads are inoculated with an ascospore suspension at about 25% anthesis (minimum of 15/plot).
- Misting systems are constructed prior to sunflower bloom and are activated and managed after inoculation.
- Sunflower heads are rated for incidence and severity of infection at multiple times

Incidence of Sclerotinia Head Rot among Sunflower Hybrids in 'Initial Screening' at Carrington, 2009.



NDSU

Sunflower Head Rot :“Initial Screening”. Top 25% of Hybrids: Carrington, 2009.

Brand	Hybrid	Brand	Hybrid
Pannar	PEX 7803	Seeds 2000	9427
Proseed	E-8	Triumph	9427
Advanta Pacific	F51137	Tom Heaton	XFG3
Tom Heaton	XFG4	CHS	09HRT-4
CHS	09HRT-3	Seeds 2000	4537
Advanta Pacific	F51122	Tom Heaton	XFG6
CHS	09HRT-7	Tom Heaton	XFG7
CHS	09HRT-6	Nidera	LN 9992
Advanta Pacific	F51311	Interstate	MH9001
CHS	09HRT-1	Croplan	WF09-01

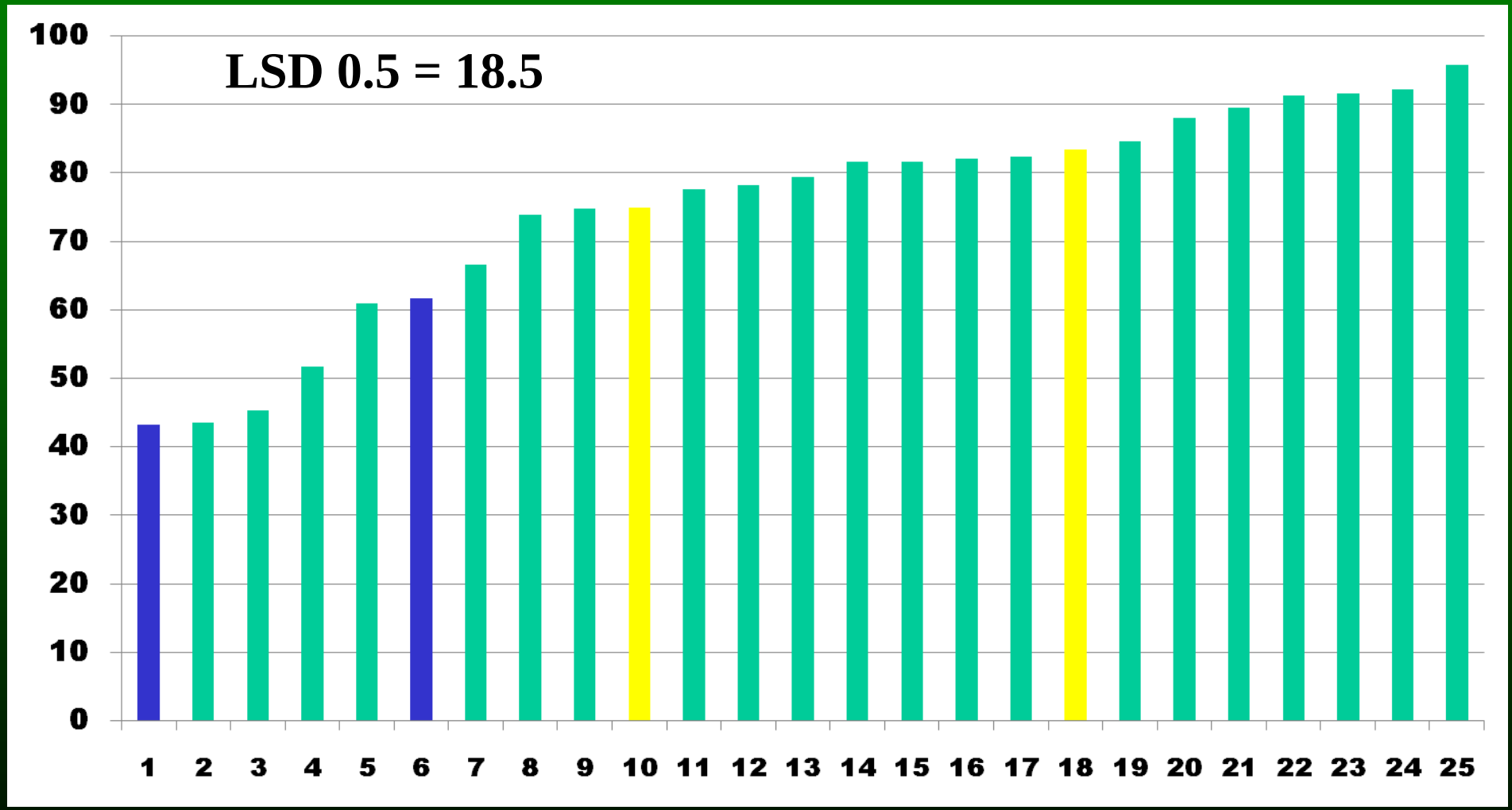
NDSU

Sunflower Head Rot :“Initial Screening”.
Top 25% of Hybrids: Carrington & Morden, 2009.

Brand	Hybrid	Brand	Hybrid
Proseed	E-8		
		CHS	09HRT-4
CHS	09HRT-3	Seeds 2000	4537
CHS	09HRT-7		
CHS	09HRT-6	Nidera	LN 9992
CHS	09HRT-1		

NDSU

Incidence of Sclerotinia Head Rot among Sunflower Hybrids in "Repeat Screening" at Carrington, 2009.



NDSU

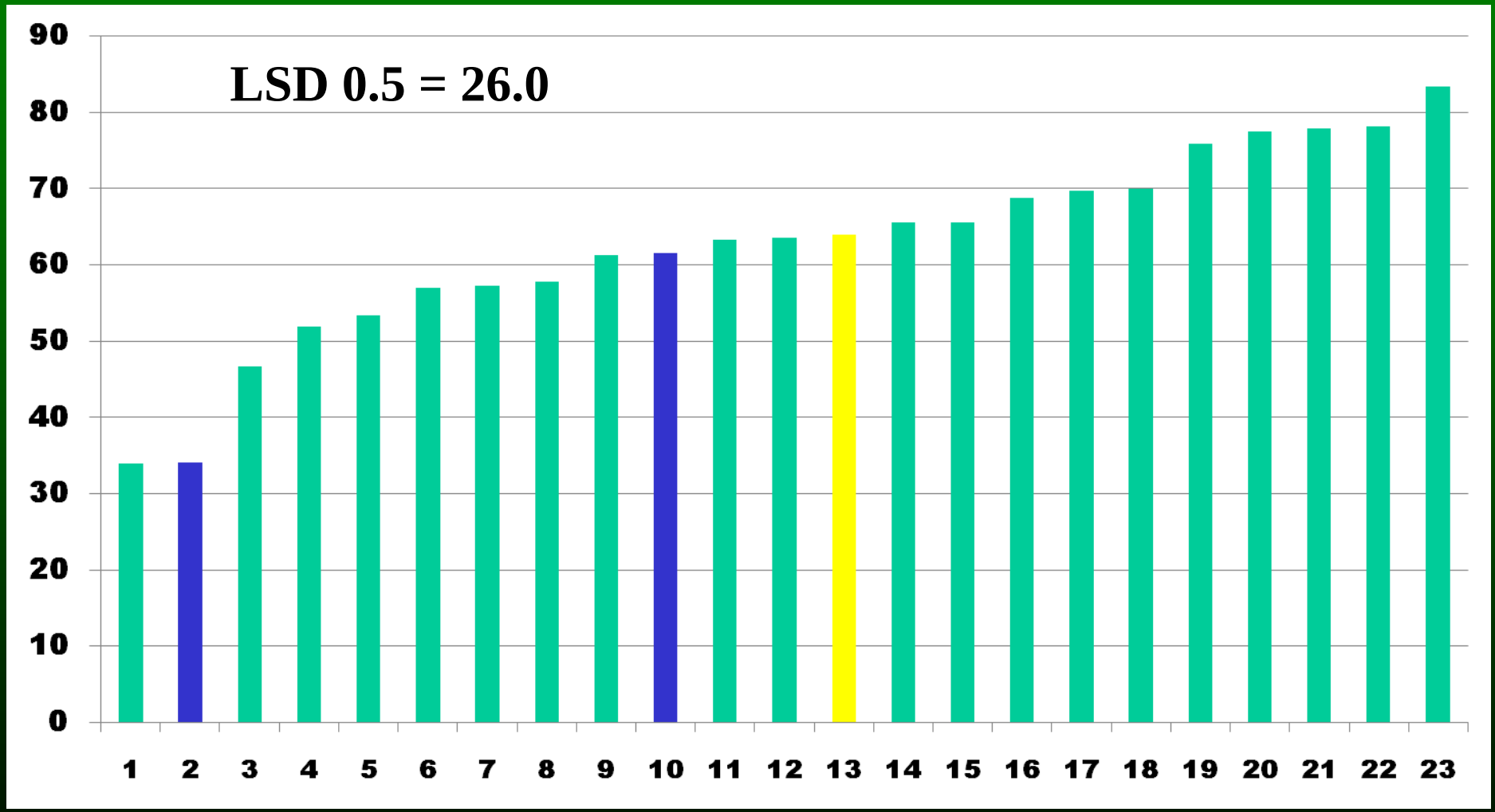
Incidence of Sclerotinia Head Rot among Sunflower Hybrids in "Repeat Screening" at Carrington, 2009

{Lowest Incidence (Numerically)}

Brand	Hybrid	Incidence %	Severity %
Pannar	PEX 3426	44	4.7
Proseed	7207	45	4.9
Agricol	5283	52	4.9
Dahlgren	9519	61	5.0
Agricol	8751	67	4.3

NDSU

Incidence of Sclerotinia Head Rot among Sunflower Hybrids in "Repeat Screening" at Langdon, 2009.



NDSU

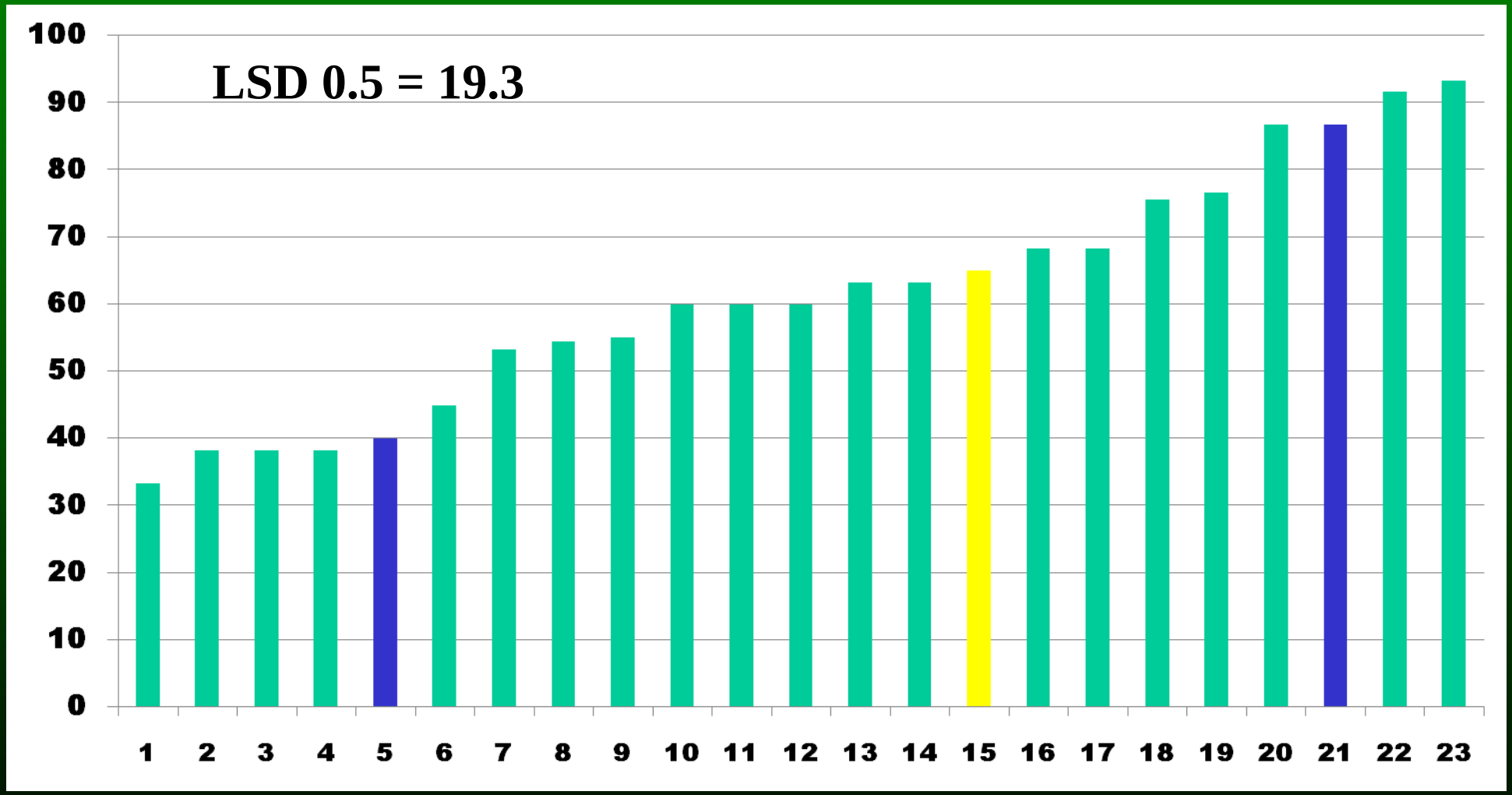
Incidence of Sclerotinia Head Rot among Sunflower Hybrids in "Repeat Screening" at Langdon, 2009.

{Lowest Incidence (Numerically)}

Brand	Hybrid	Incidence %	Severity %
Pannar	PEX 3426	34	3.8
Seeds 2000	X9466	47	4.0
Dahlgren	9583	52	4.0
Proseed	7052	53	4.2
Interstate	DKL39-80CL	57	4.0

NDSU

Incidence of Sclerotinia Head Rot among Sunflower Hybrids in "Repeat Screening" at Oakes, 2009.



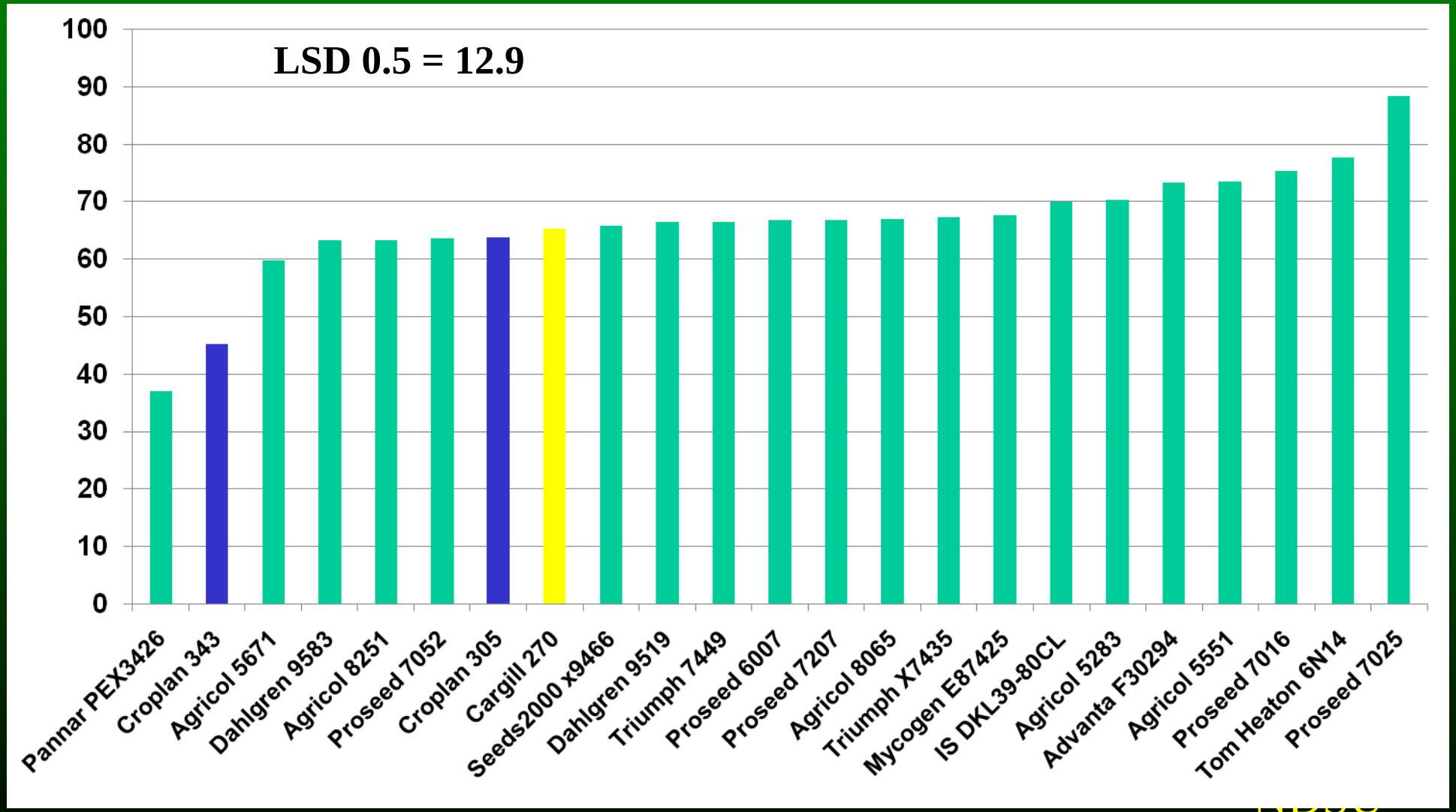
NDSU

Incidence of Sclerotinia Head Rot among Sunflower Hybrids in "Repeat Screening" at Oakes, 2009.

{Lowest Incidence (Numerically)}

Brand	Hybrid	Incidence %	Severity %
Pannar	PEX 3426	33	3.6
Agricol	5671	38	2.8
Agricol	8251	38	3.2
Agricol	8065	38	2.6
Triumph	X7435	45	3.7

Incidence of Sclerotinia Head Rot among Sunflower Hybrids in 'Repeat Screening'. 3 Site Average, 2009.



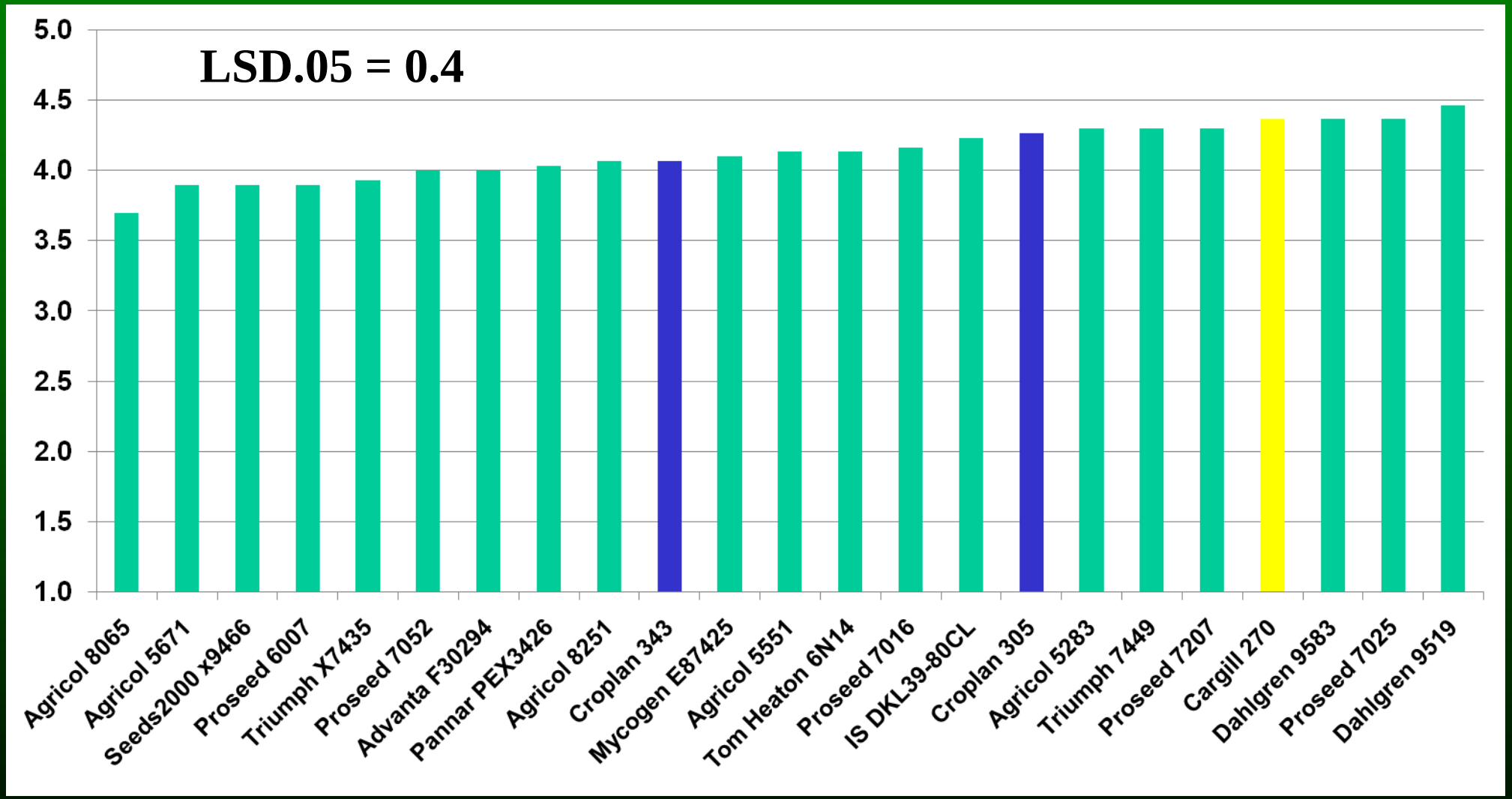
Incidence of Sclerotinia Head Rot among Sunflower Hybrids in "Repeat Screening", 2009. Three (3) Site Average

- **Pannar PEX3426 had significantly lower sclerotinia head rot incidence in the 3 location average.**
  - Only hybrid among top 5 hybrids in each of 3 locations.

- **The better hybrid resistance was inconsistent among research locations.**

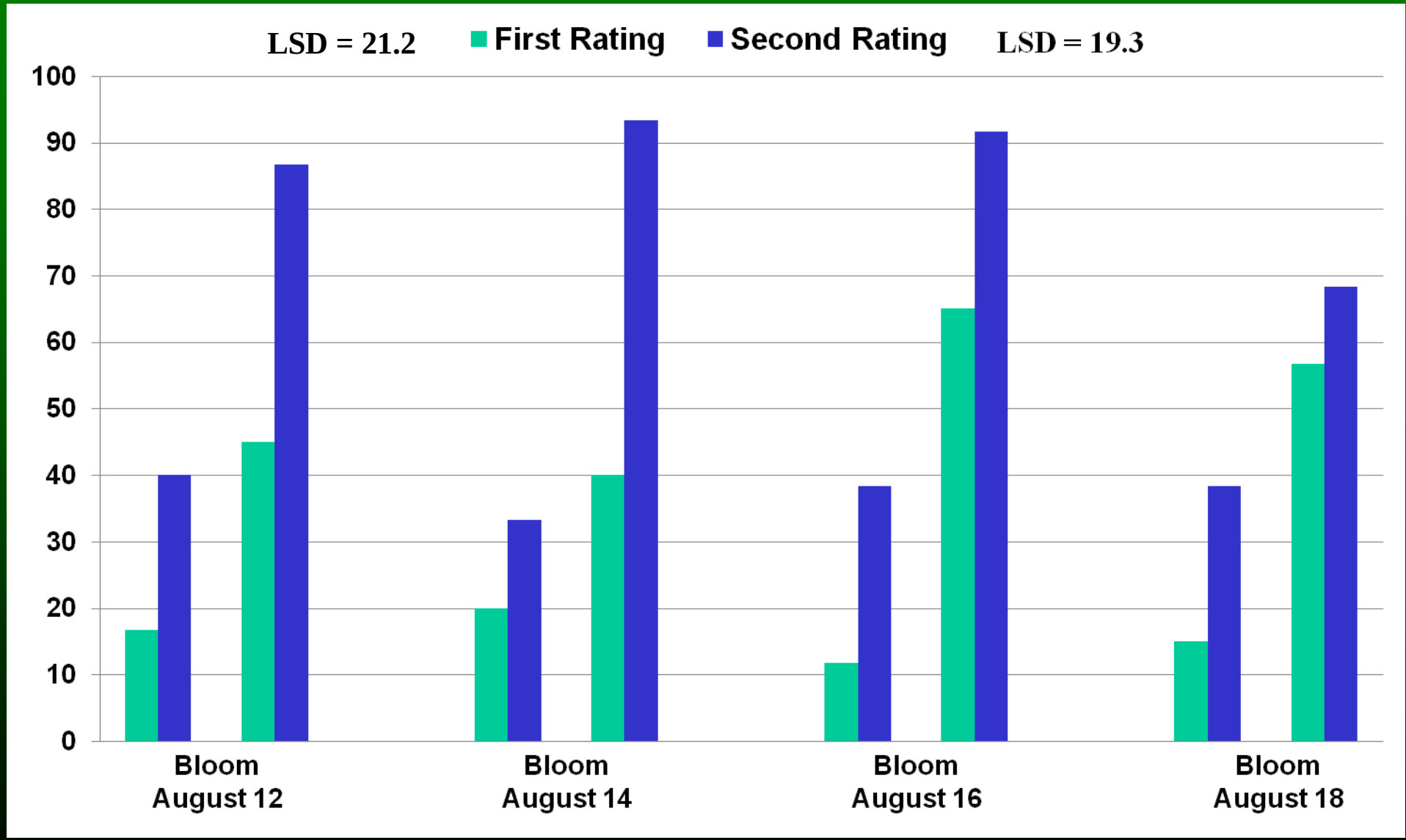
NDSU

Severity of Sclerotinia Head Rot among Sunflower Hybrids in 'Repeat Screening'. 3 Site Average, 2009.



NDSU

Effect of Bloom Date on Incidence of Head Rot:
Oakes Research Site 2009 {Repeat Test}



Sclerotinia Head Rot and Sunflower Hybrids

Summary:

- Significant differences in head rot resistance were identified within each trial at each of the research locations.
- However, the hybrids included within the 2009 trials were generally inconsistent in their reaction across locations.
- We may wish to review our selection criteria of hybrids for 'Repeat' test.
- The effectiveness and thereby importance of the Misting Systems was again verified during the 2009 season.
- **Appreciation to:** USDA-ARS Sclerotinia Initiative for funding support.

- *This material is based upon work supported by the U.S. Department of Agriculture under Agreement No. 58-5442-9-238. Any opinions, findings, conclusions, or recommendations expressed are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture.*

NDSU