

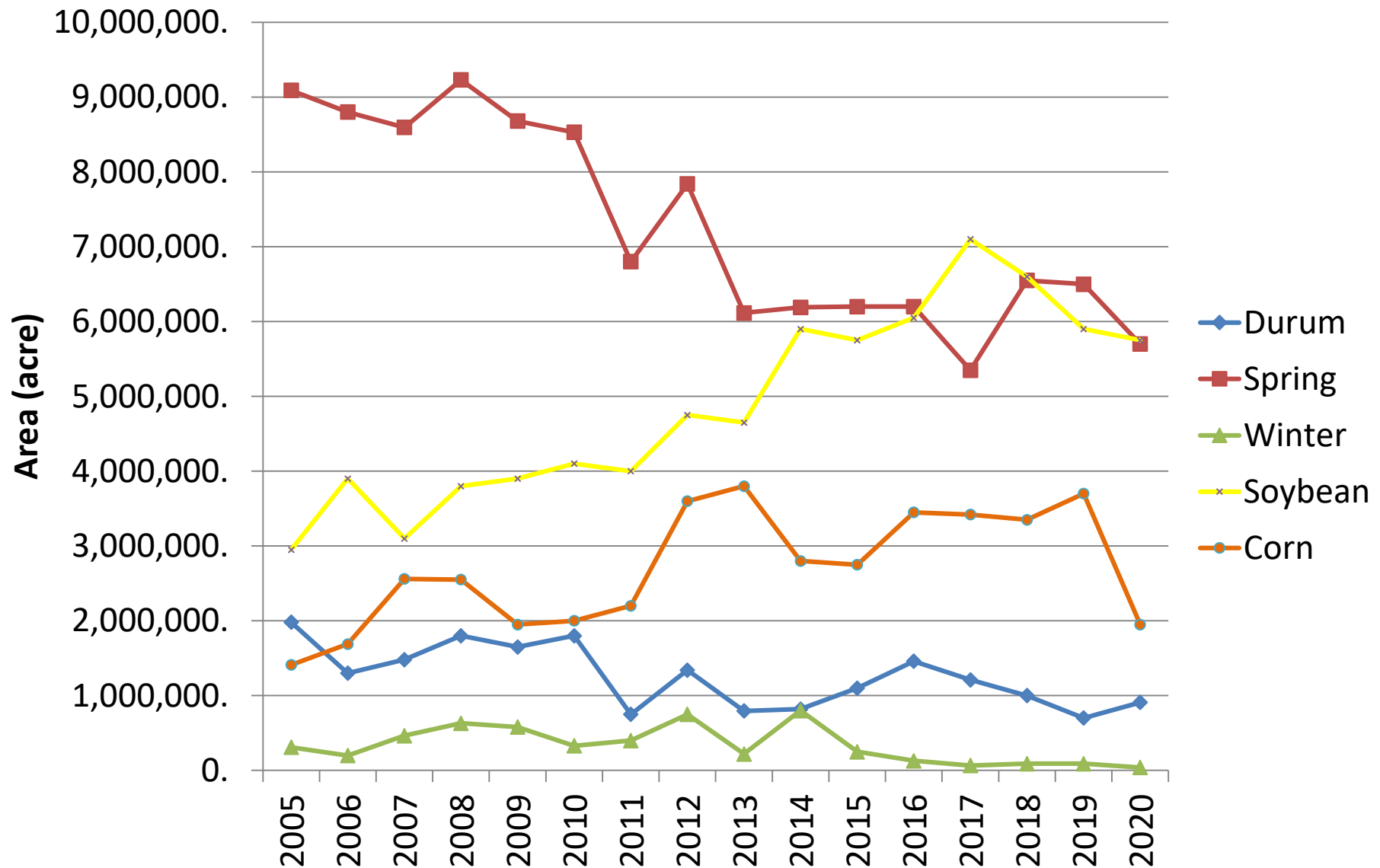
Small Grain Variety Update

Langdon REC – 2020

Bryan Hanson – Research Agronomist
Lawrence Henry - Research Specialist II



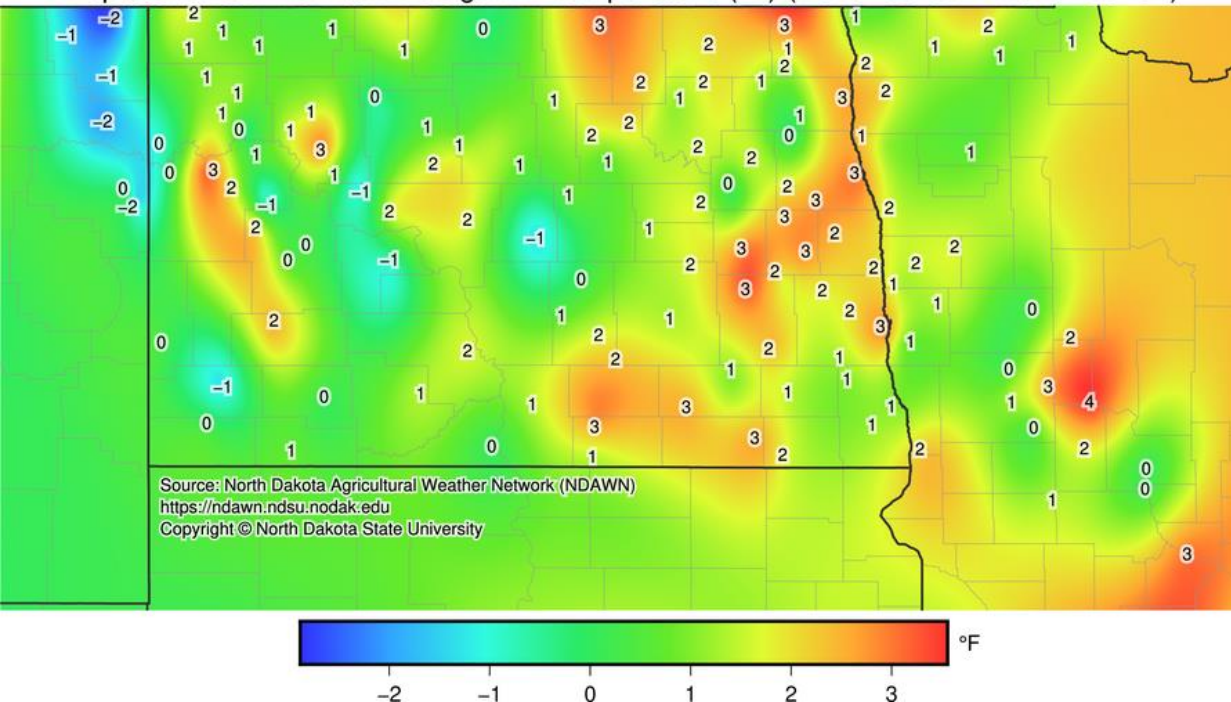
Trends in area planted in ND over the past 15 years for three classes of wheat, soybeans and corn.



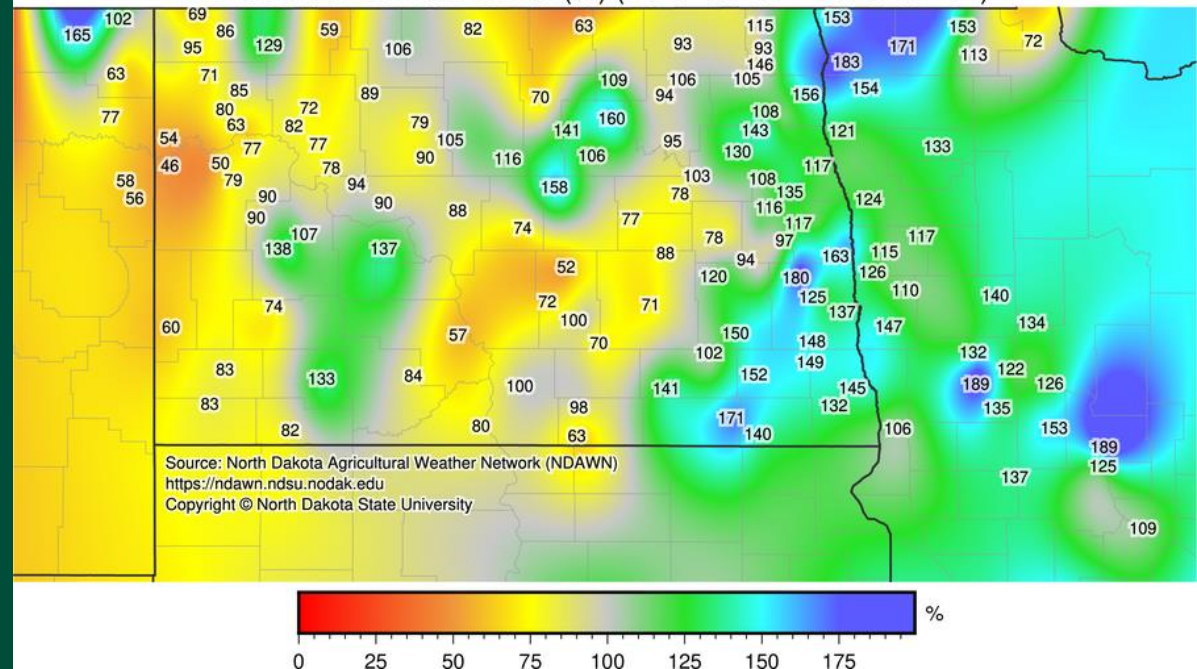
Yield for the state near trendline

- Cool spring delayed early planting
- Warmer than average June and July temperatures may have reduced yield potential
- Full profiles this spring provided moisture during dry periods in central and western North Dakota
- Disease pressure was generally quite low except for higher rainfall areas in eastern North Dakota
- Generally good conditions for harvesting the crop

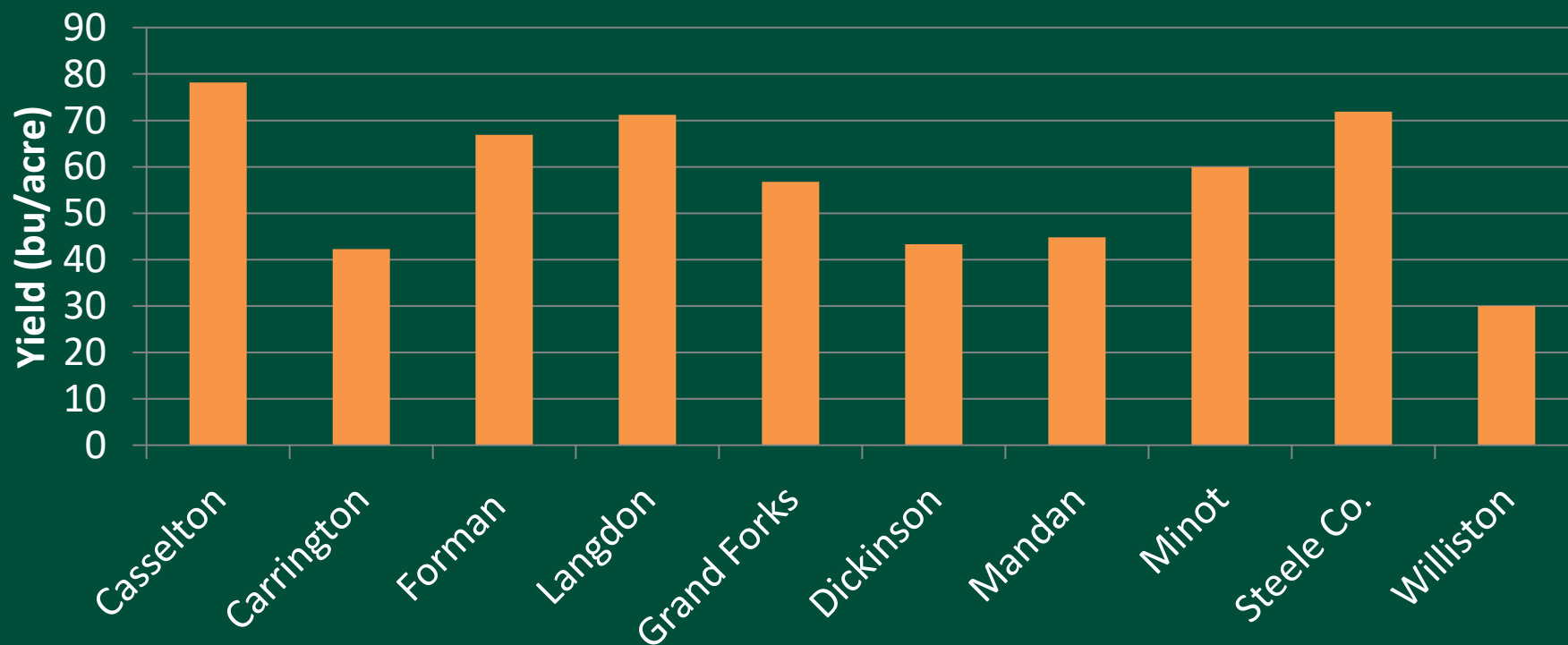
Departure from Normal Average Air Temperature (°F) (2020-06-01 – 2020-08-31)



Percent of Normal Rainfall (%) (2020-06-01 – 2020-08-31)

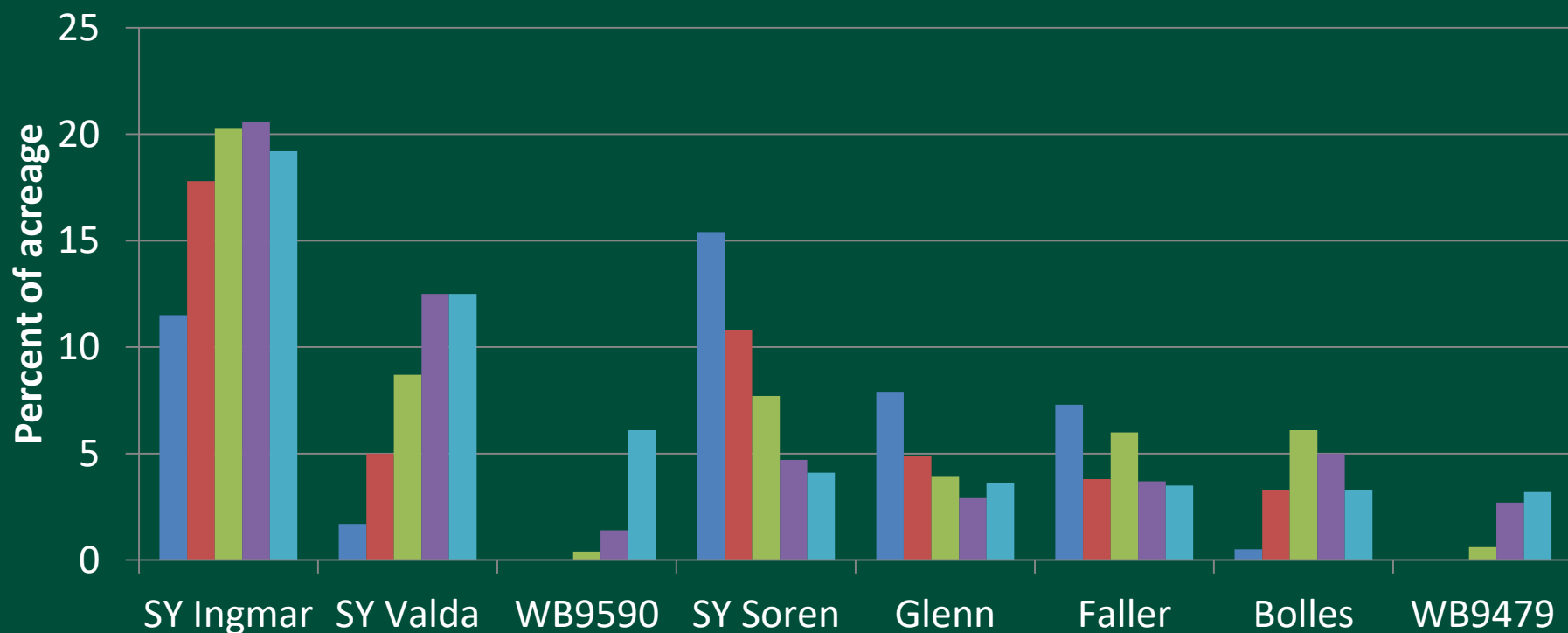


Average yields from spring wheat variety trials in various parts of the state, 2020.

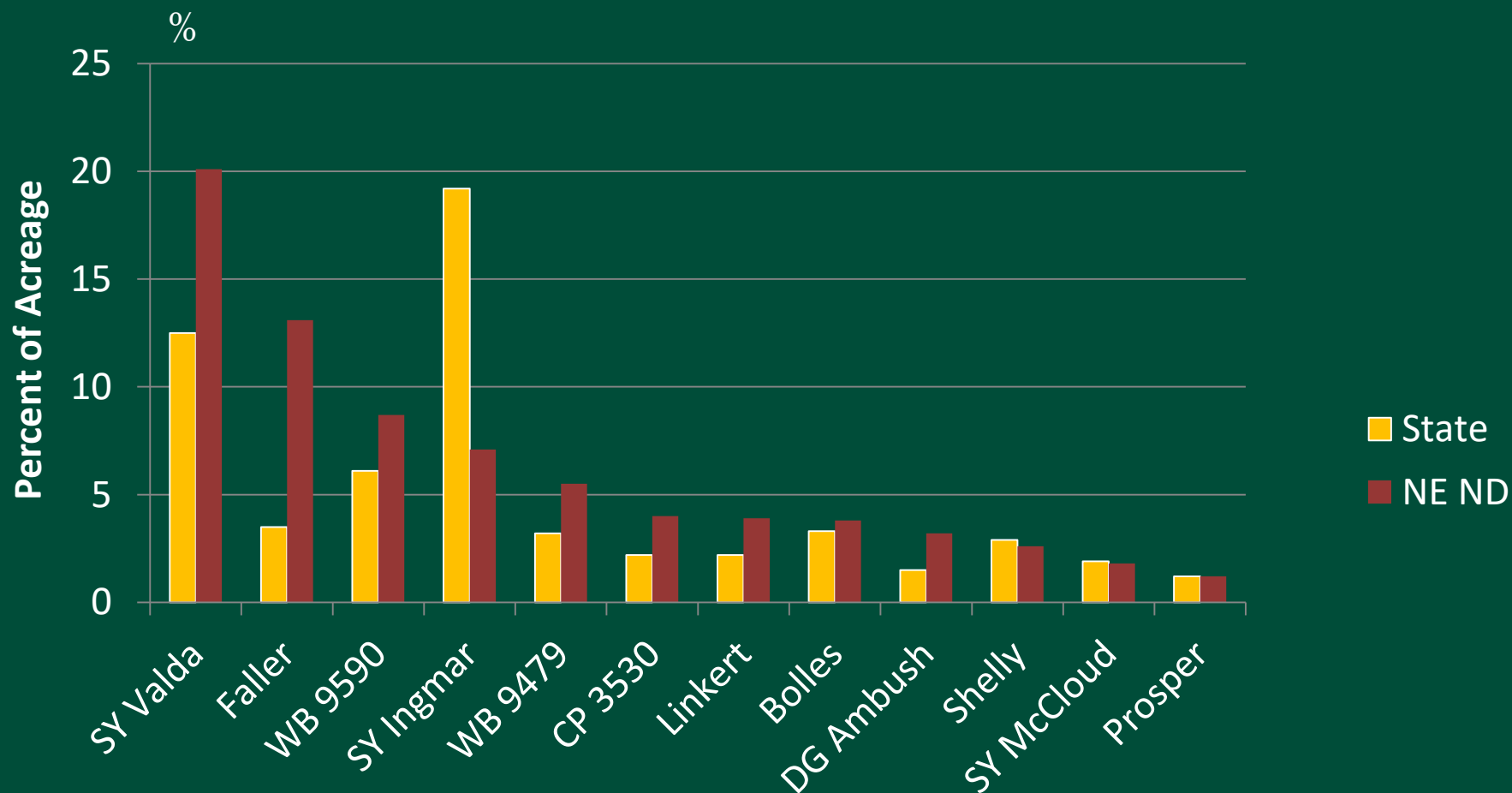


Trends in HRSW variety use in ND

2016 2017 2018 2019 2020



HRSW variety acres in NE ND 2020



Releases in 2020

Variety	Origin
CP3903	Croplan
CP3055	Croplan
LCS Buster	Limagrain
MN-Torgy	MN
MS Ranchero	Meridian Seed
ND Frohberg	NDSU
TCG-WildCat	21 st Century Genetics
Allegiant 822	CHS
Allegiant 834	CHS
Allegiant 8432	CHS

NDSU Varieties

Glenn

Barlow

Faller

Elgin-ND

ND VitPro

ND Frohberg



MN Varieties

Linkert

Bolles

Shelly

Lang-MN

MN-Washburn

MN-Torgy



Syngenta/AgriPro Varieties

SY Soren

SY Ingmar

SY Valda

SY McCloud



SY Longmire*

SY611CL2

SY Rockford

AP Murdock

*Solid/semisolid stem

SY SOREN

SY INGMAR

SY VALDA



SY LONGMIRE

SY MC CLOUD

AP MURDOCK



SD

MT

Varieties

Boost

Driver

Lanning

Dagmar



Limagrain Varieties

LCS Breakaway

LCS Cannon

LCS Trigger

LCS Rebel

LCS Buster



Croplan Varieties

CP3055

CP3530

CP3903

CP3910

CP3915



Varieties

Monsanto/Westbred

Meridian

Did not submit any varieties for testing with NDSU in 2019-2020.



MS Chevelle

MS Ranchero

MS Barracuda

Varieties

21st Century Genetics

Dyna-Gro

TCG-Spitfire

TCG-Climax

TCG-Heartland

DG Ambush

DG Commander

DG Ballistic

DG Velocity



Leaf and Stripe rust

- Not a major concern in 2020



Scab Reaction

DG Ballistic	3
Driver	3
Lang-MN	3
LCS Trigger	3
MN-Torgy	3
Glenn	4
Faller	4
Elgin-ND	4
Barlow	4
Boost	4
LCS Trigger	4
ND-VitPro	4
CP3903	4
SY Longmire	7
SY Soren	7
Dagmar	7

All other varieties were 5-6

1=resistant and 9=very susceptible

FHB - Scab



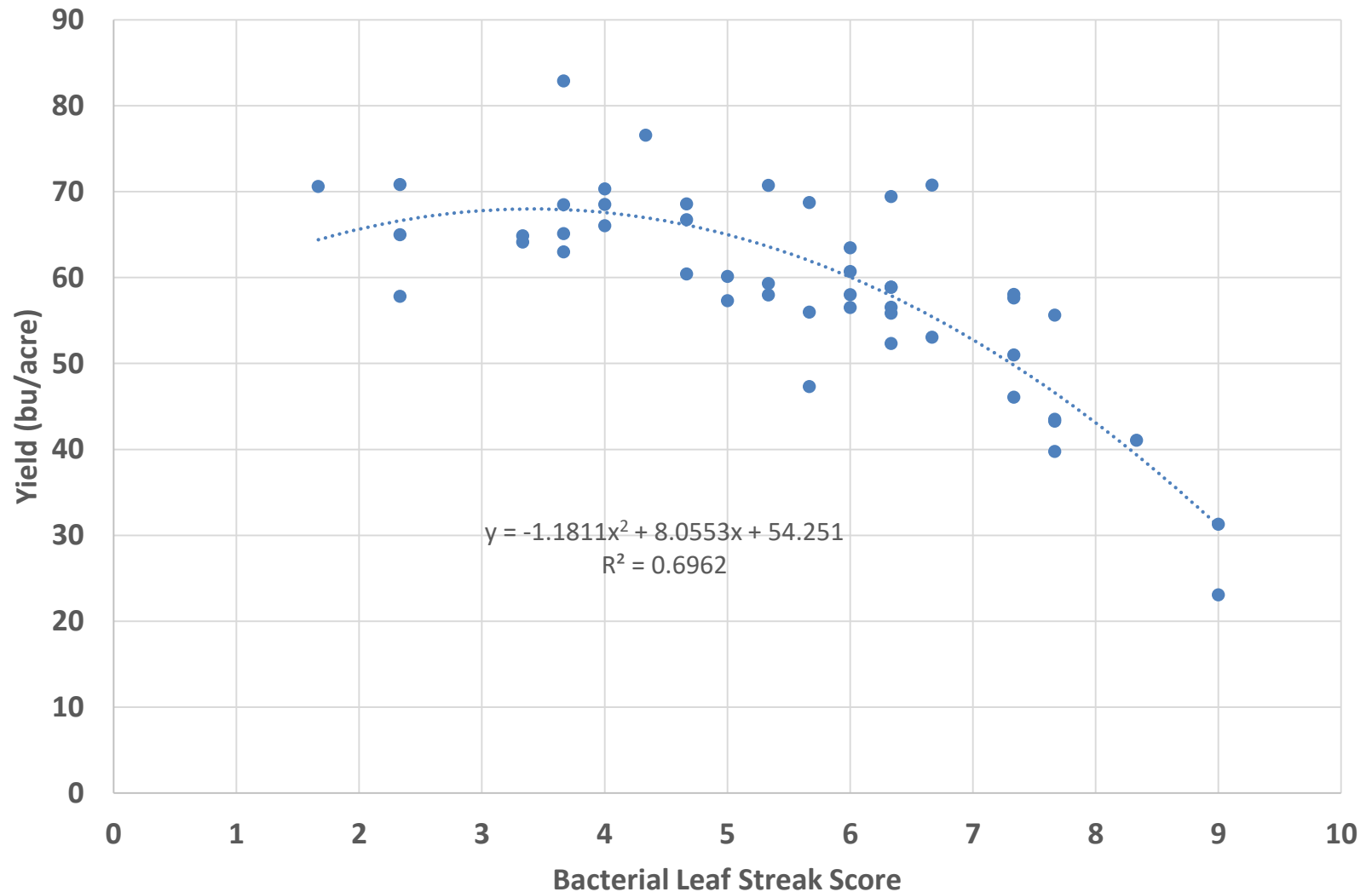
Bacterial Leaf Streak (BLS) ratings

Most resistant		Most susceptible	
Rating=2	Rating=3	Rating=6	
Boost	Lang-MN LCS Trigger MN Torgy	Bolles Dyna-Gro Ambush Dyna-Gro Velocity Elgin-ND Linkert	MS Ranchero SY 611CL2 SY Longmire SY Valda
Rating=4		Rating=7	
Barlow Commander ND VitPro Glenn CP3915 CP3055	LCS Buster LCS Rebel ND Frohberg SY Ingmar TCG-Spitfire	Dagmar Driver LCS Cannon MS Barracuda	MS Chevelle Shelly SY Soren TCG-Heartland
Rating=5		Rating=8	
AP Murdock DG Ballistic CP3530 CP3503 Faller	MN-Washburn TCG-Wildcat	CP3910 Lanning SY McCloud SY Rockford	

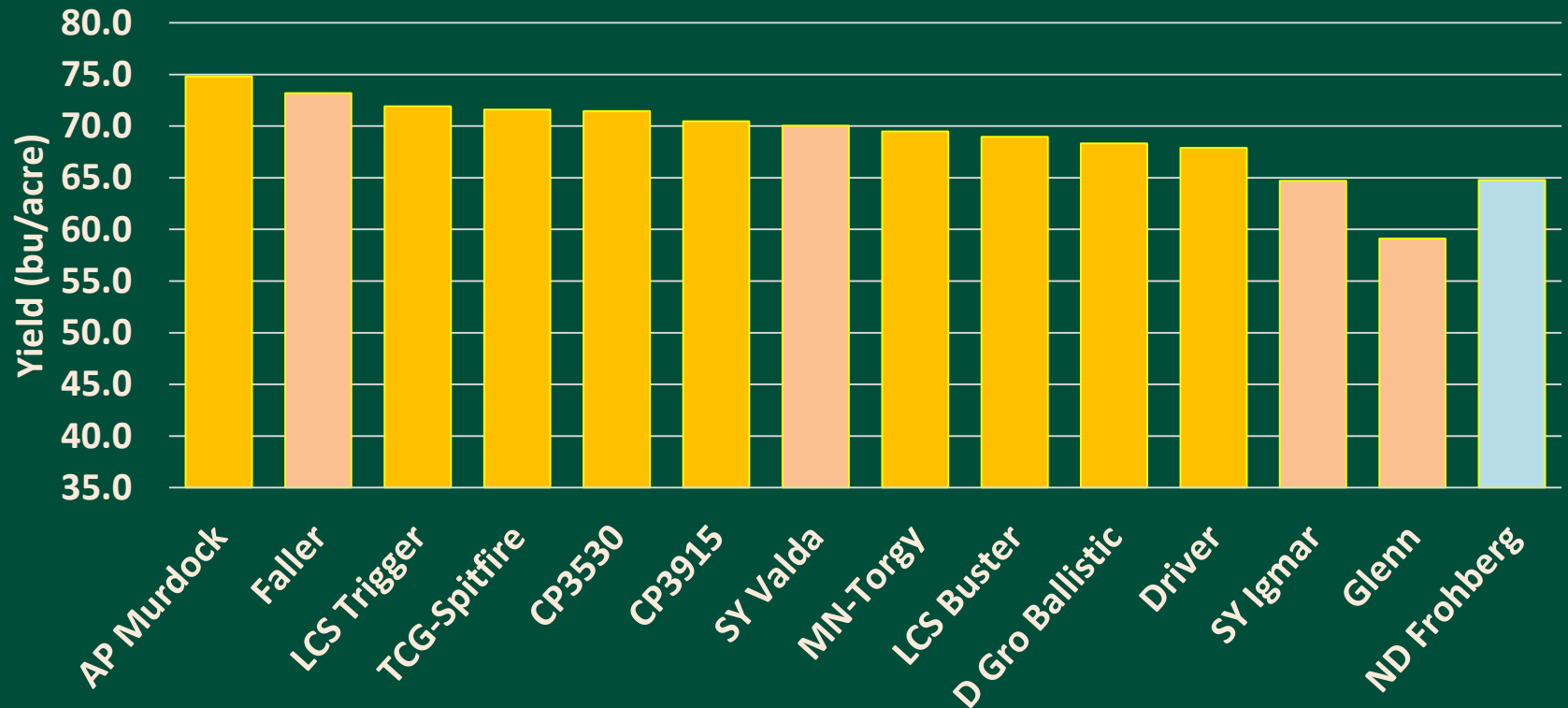


Figure 1. Symptoms of bacterial leaf streak (BLS). Photo credit: Marcia McMullen

Relationship between BLS score and yield at Grand Forks, ND, 2019.



Top yielding varieties in eastern ND with checks, 2020



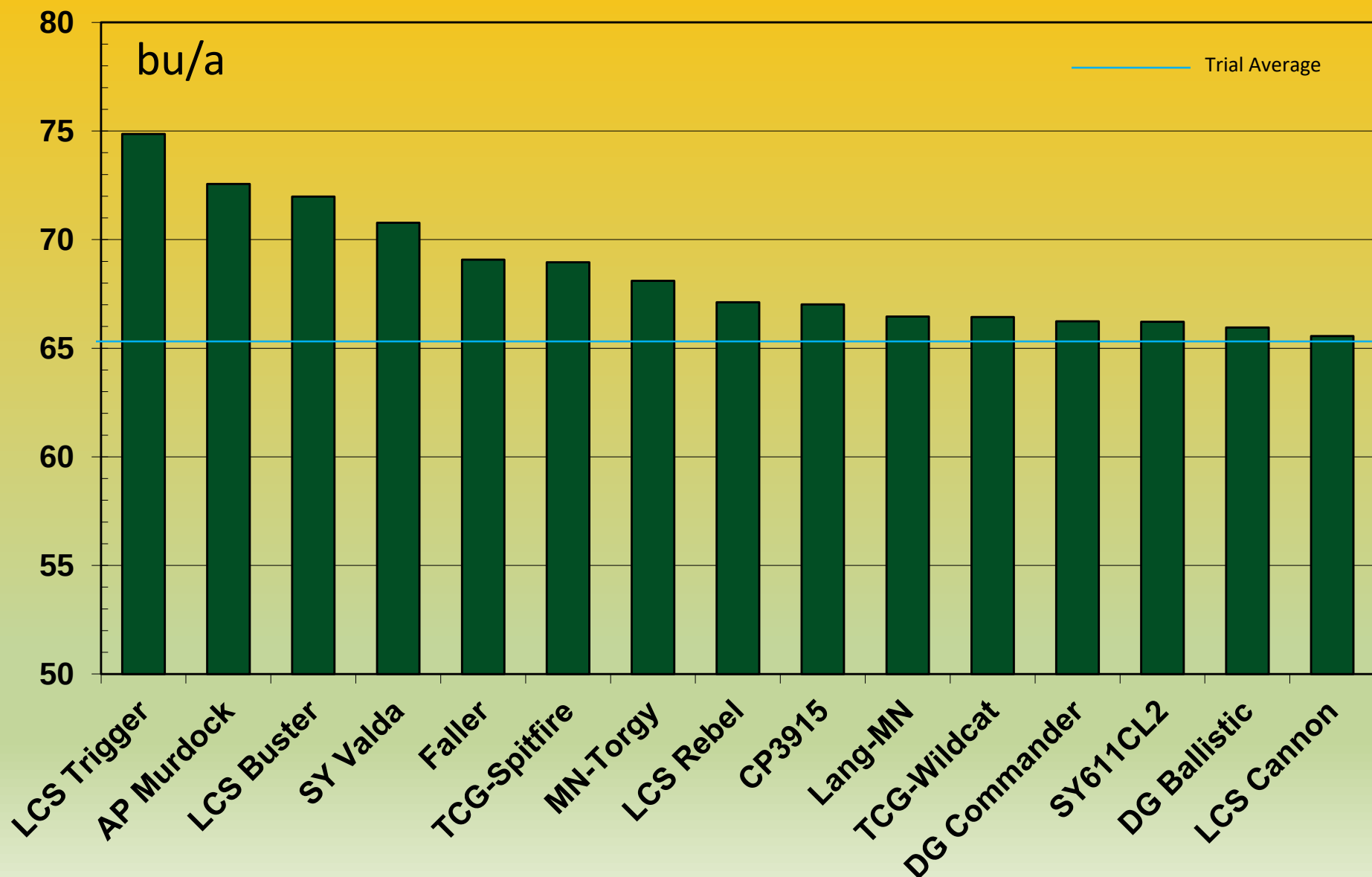
Yield and protein content of top yielding varieties.
(Langdon, Cavalier, Park River, Pekin, Cando), 2020

Variety	Yield (bu/a)	Protein(%)
LCS Trigger	75	12.3
AP Murdock	73	14.3
LCS Buster	72	12.5
SY Valda	71	14.3
Faller	69	14.4
TCG-Spitfire	69	14.1
MN-Torgry	68	15.5
LCS Rebel	67	15.3
CP3915	67	14.6

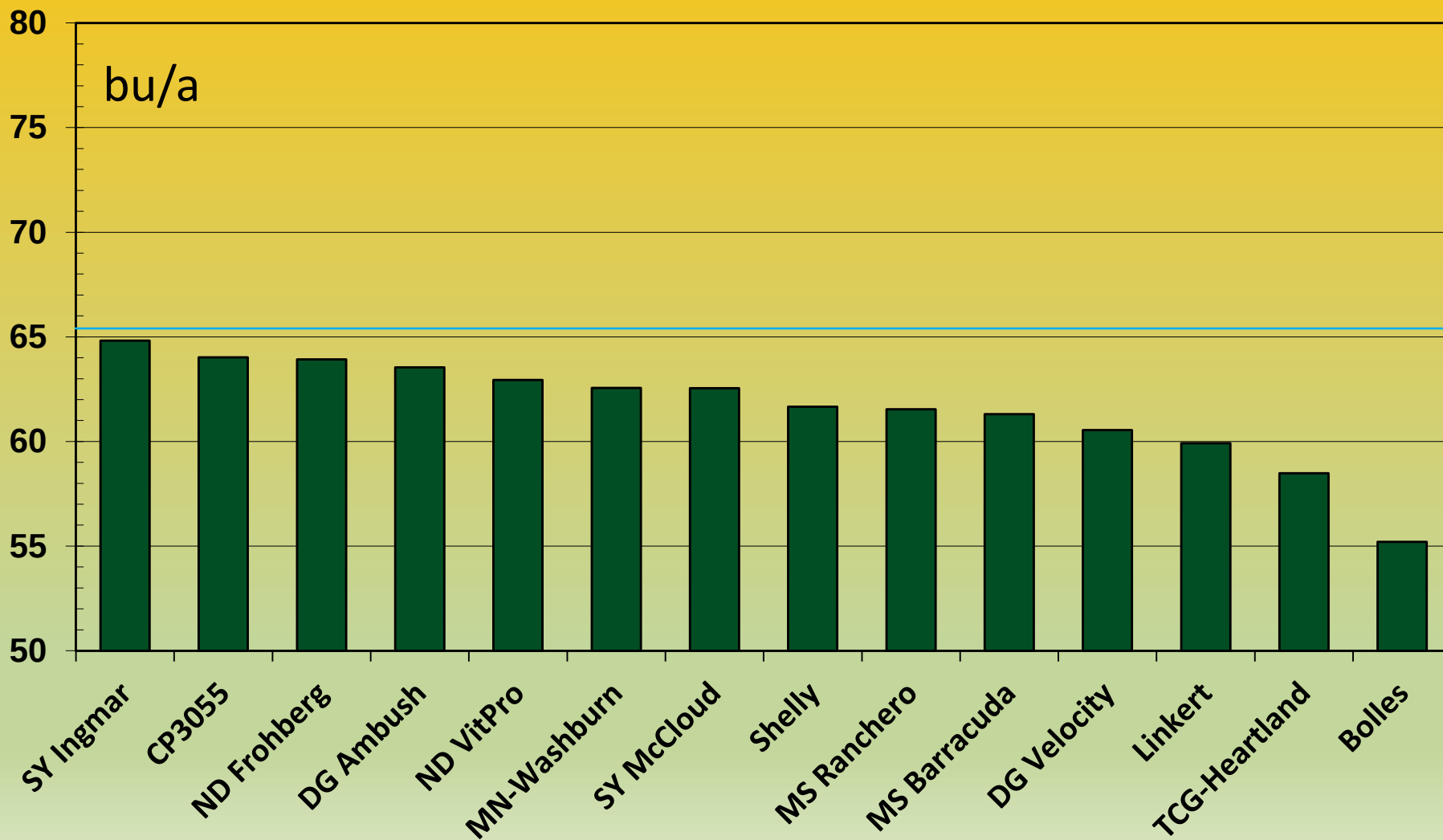
Protein and yield content of top protein varieties.
(Langdon, Cavalier, Park River, Pekin, Cando), 2020

Variety	Yield (bu/a)	Protein (%)
Bolles	55	16.7
DG Velocity	61	16.1
MS Barracuda	61	15.8
TCG-Heartland	58	15.7
DG Ambush	64	15.6
Linkert	60	15.5
SY McCloud	63	15.5
ND VitPro	63	15.5
MN-Torgy	68	15.5

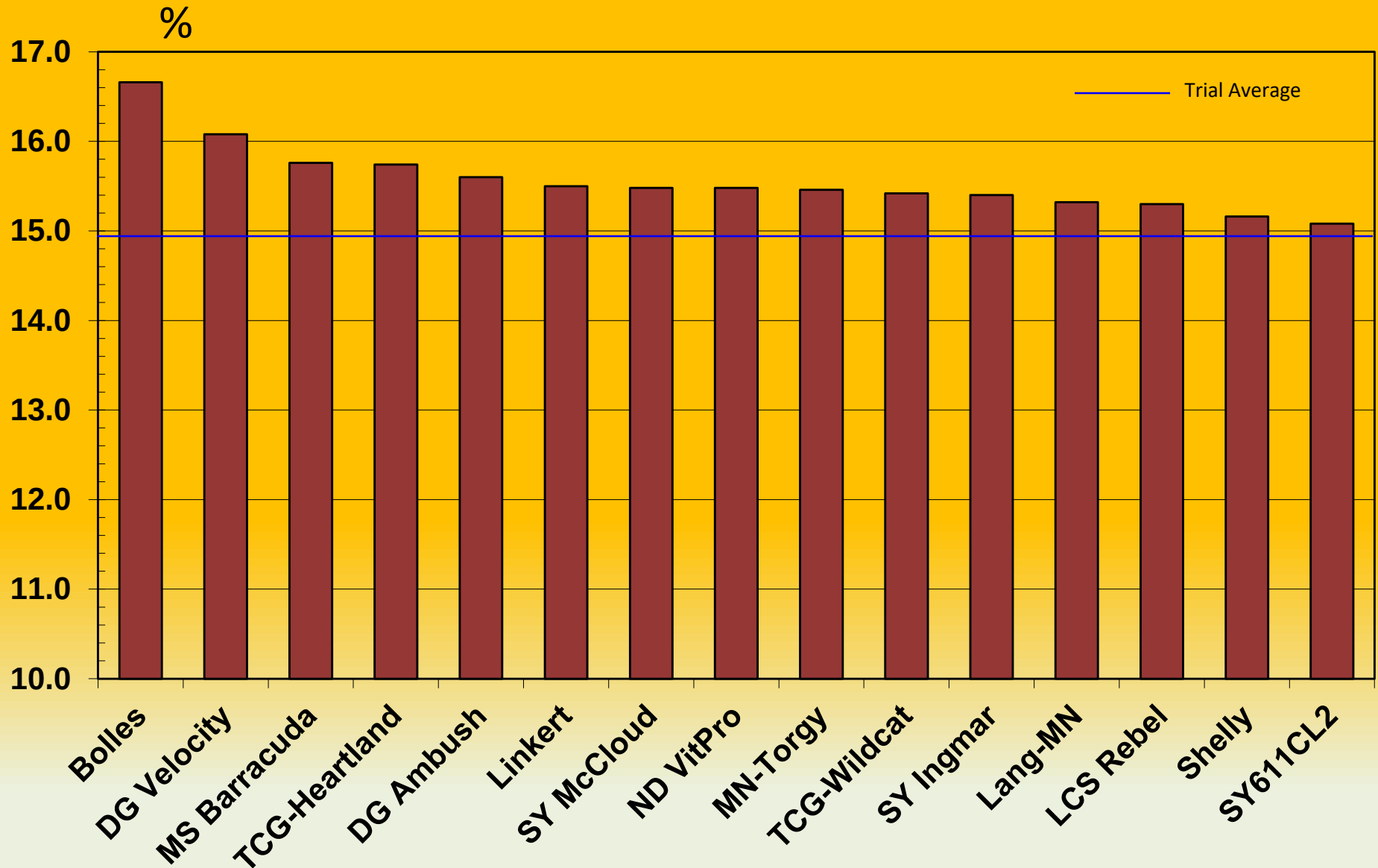
2020 HRSW 5-site Yield



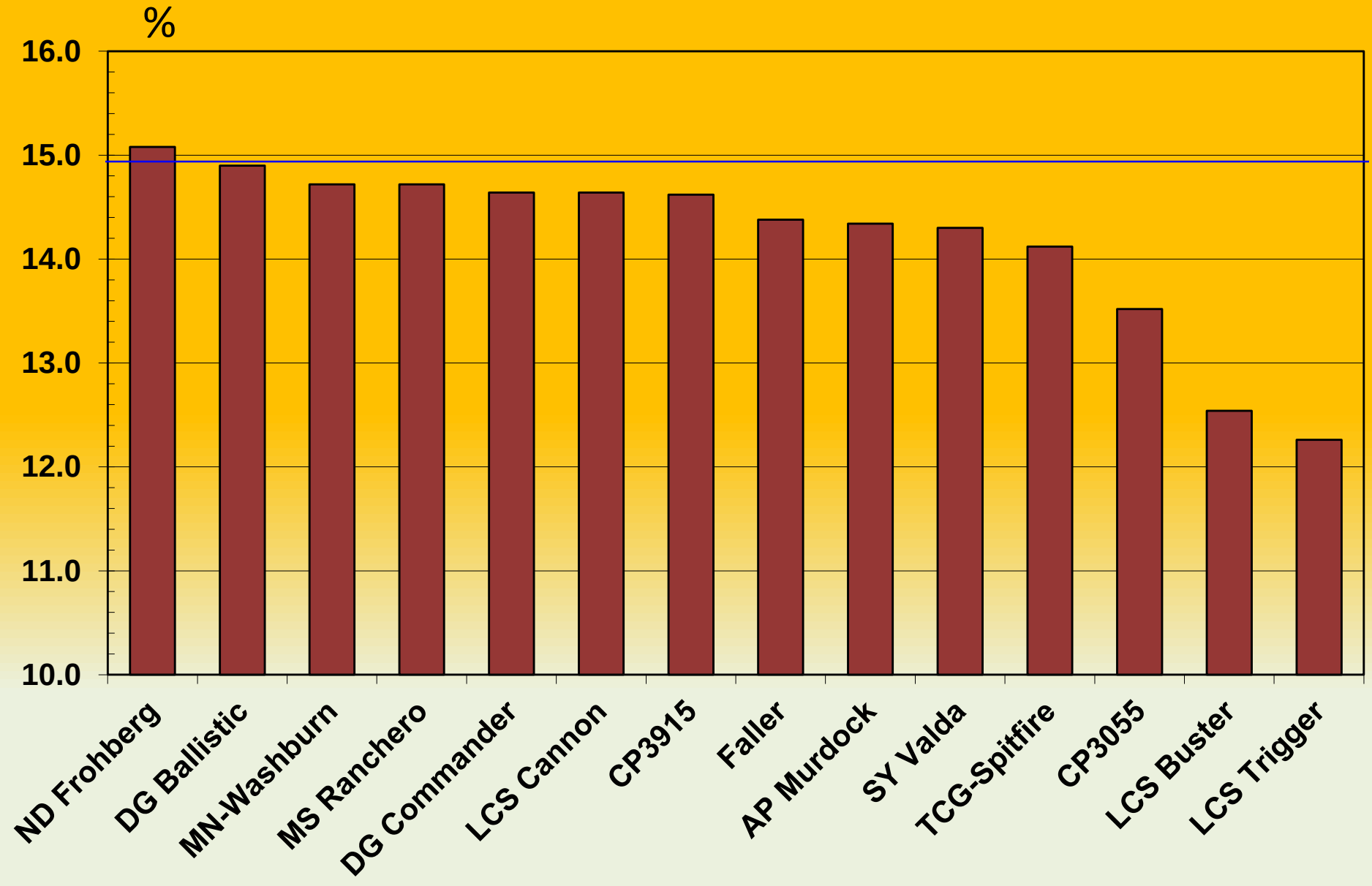
2020 HRSW 5-site Yield



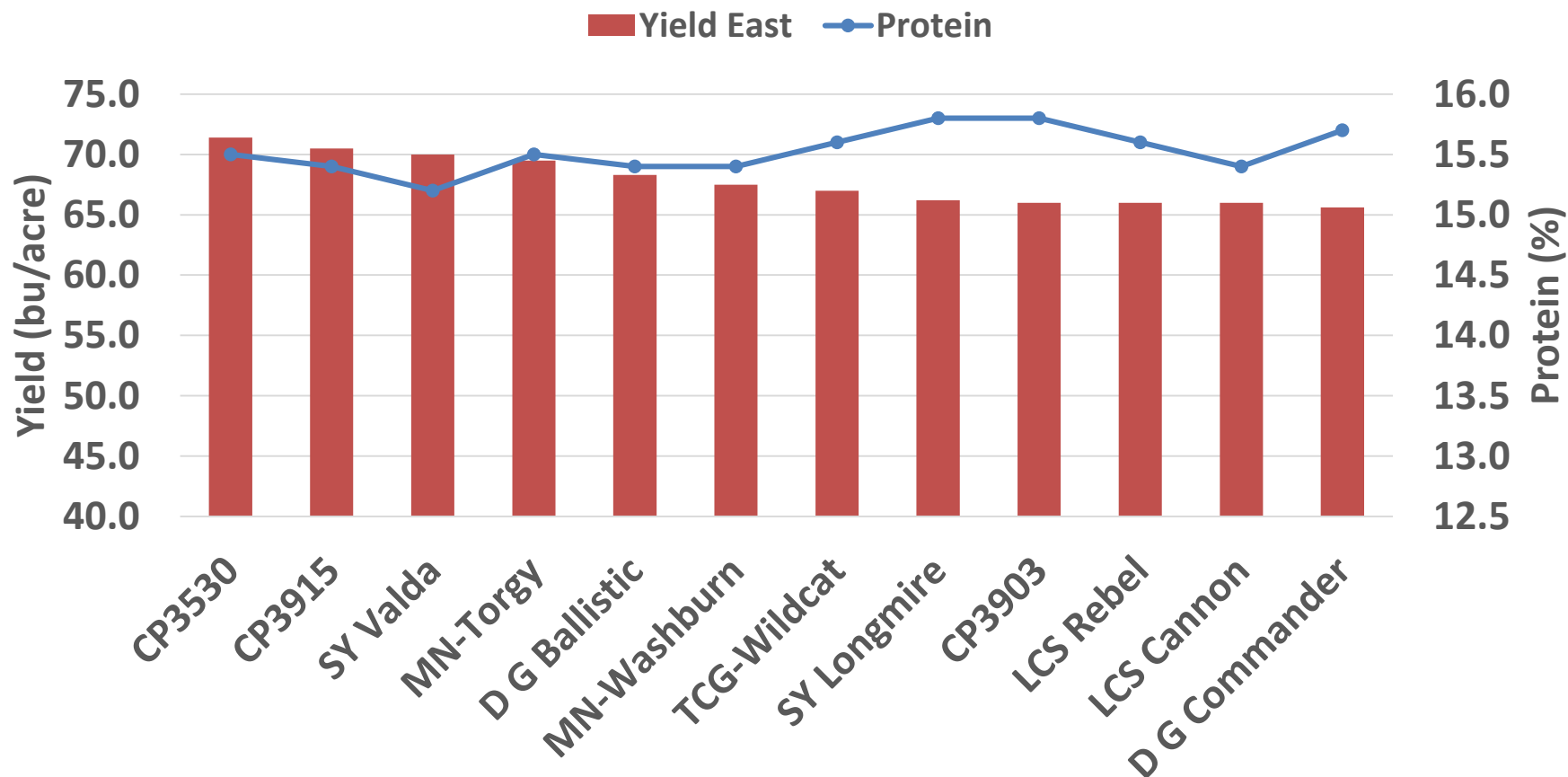
2020 HRSW 5-site Protein



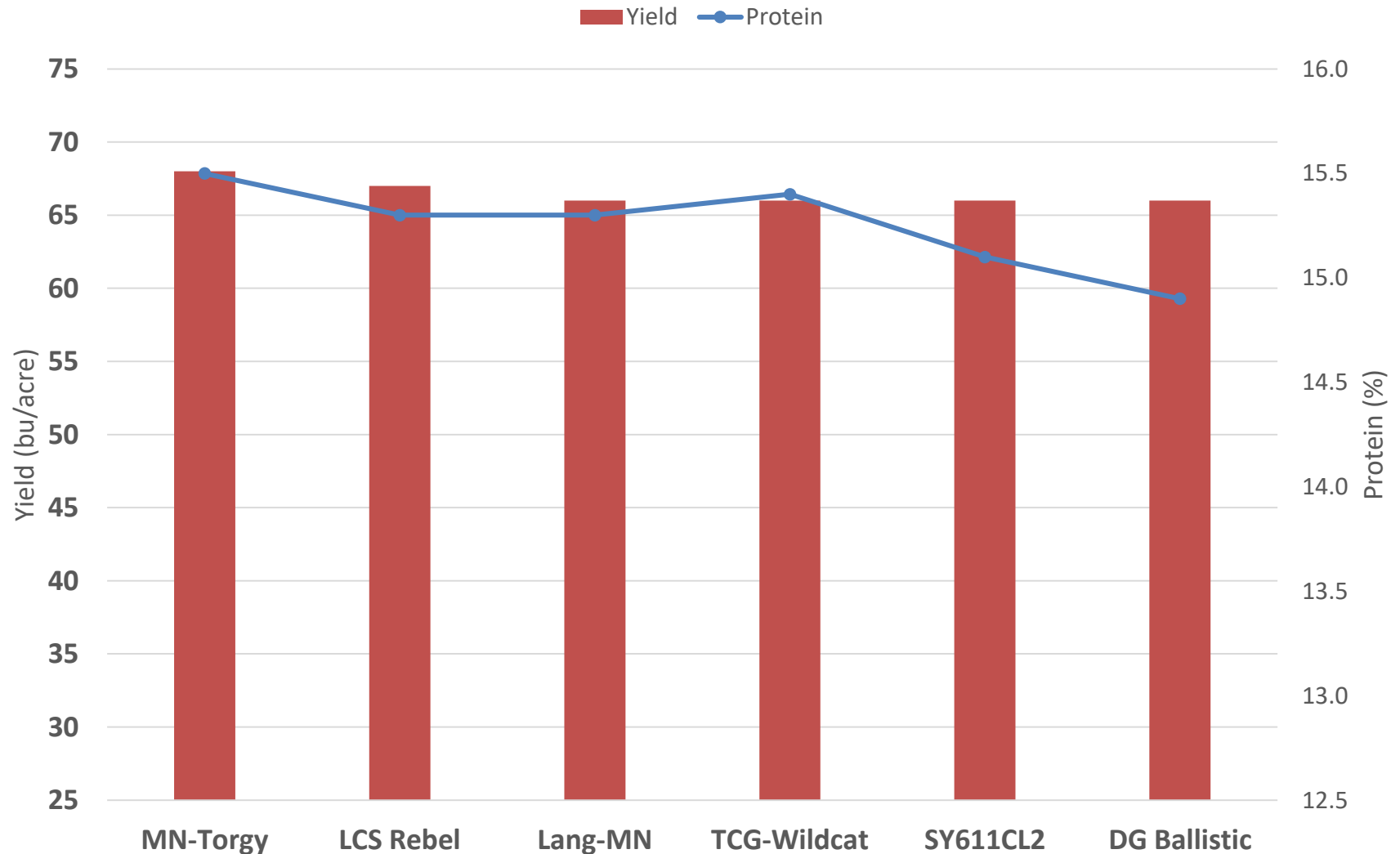
2020 HRSW 5-site Protein



Varieties with above average yield and protein, eastern locations means, 2020

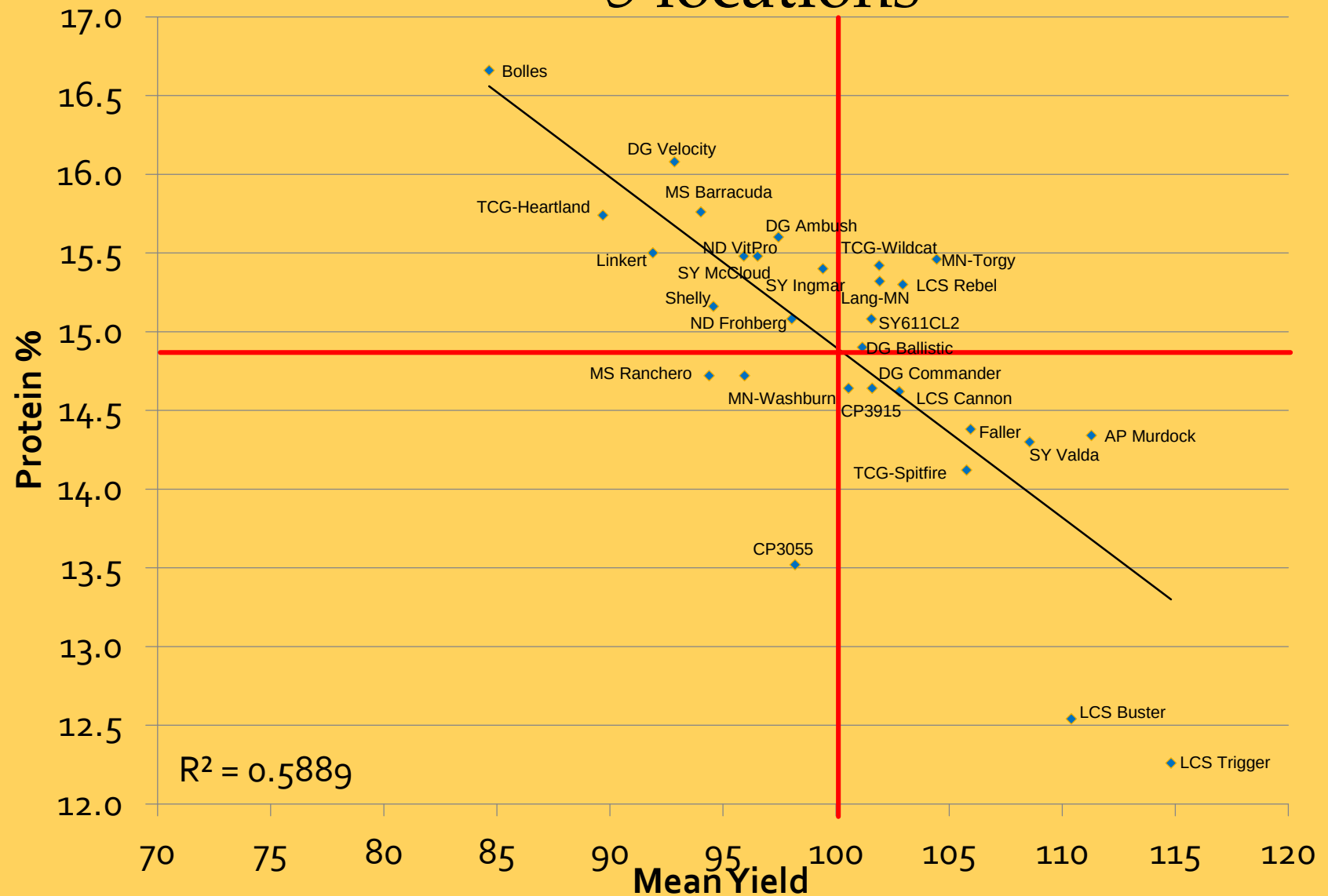


Varieties with protein and yield > mean, 5 site locations, LREC 2020

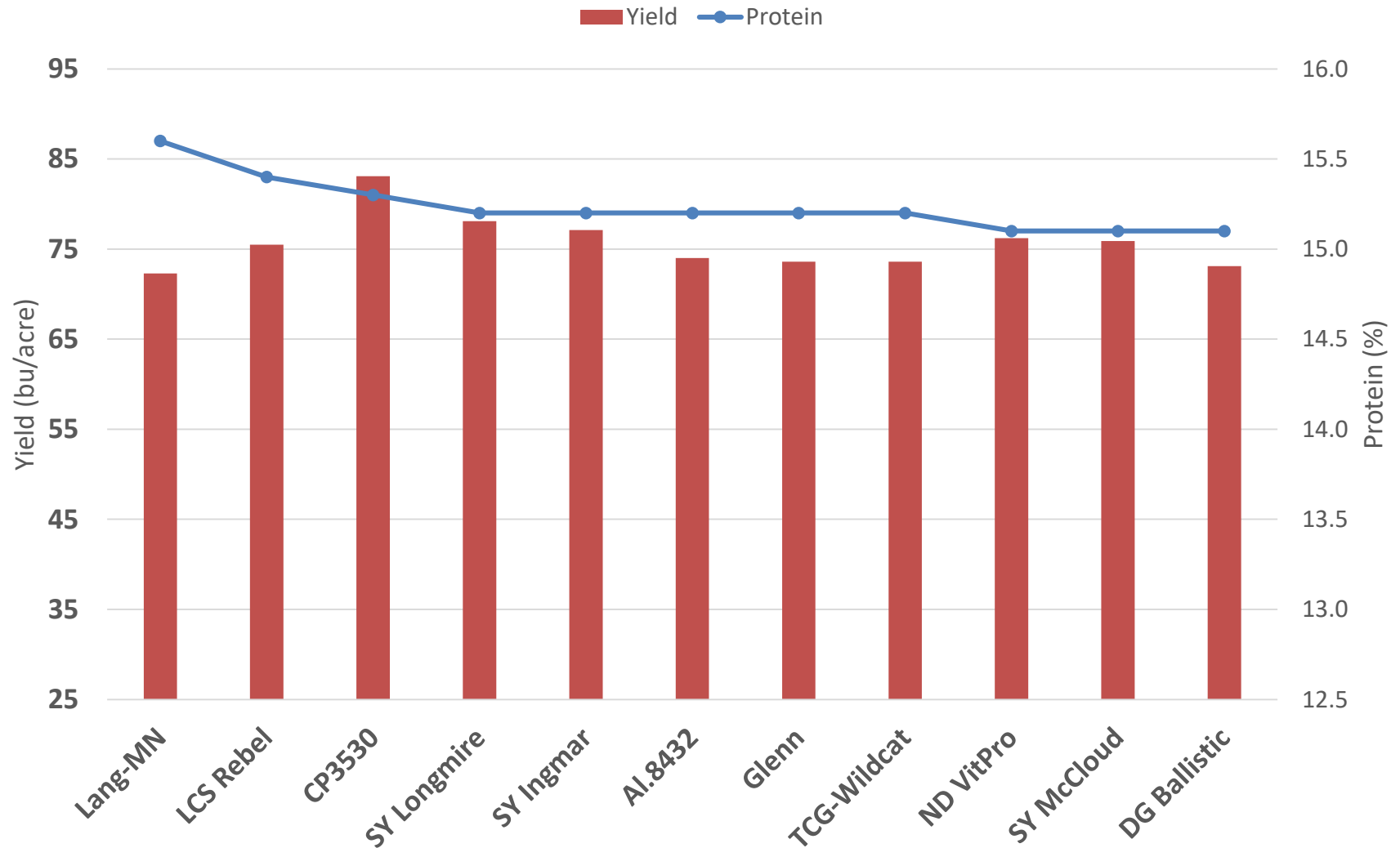


Langdon 2020 Yield and Protein

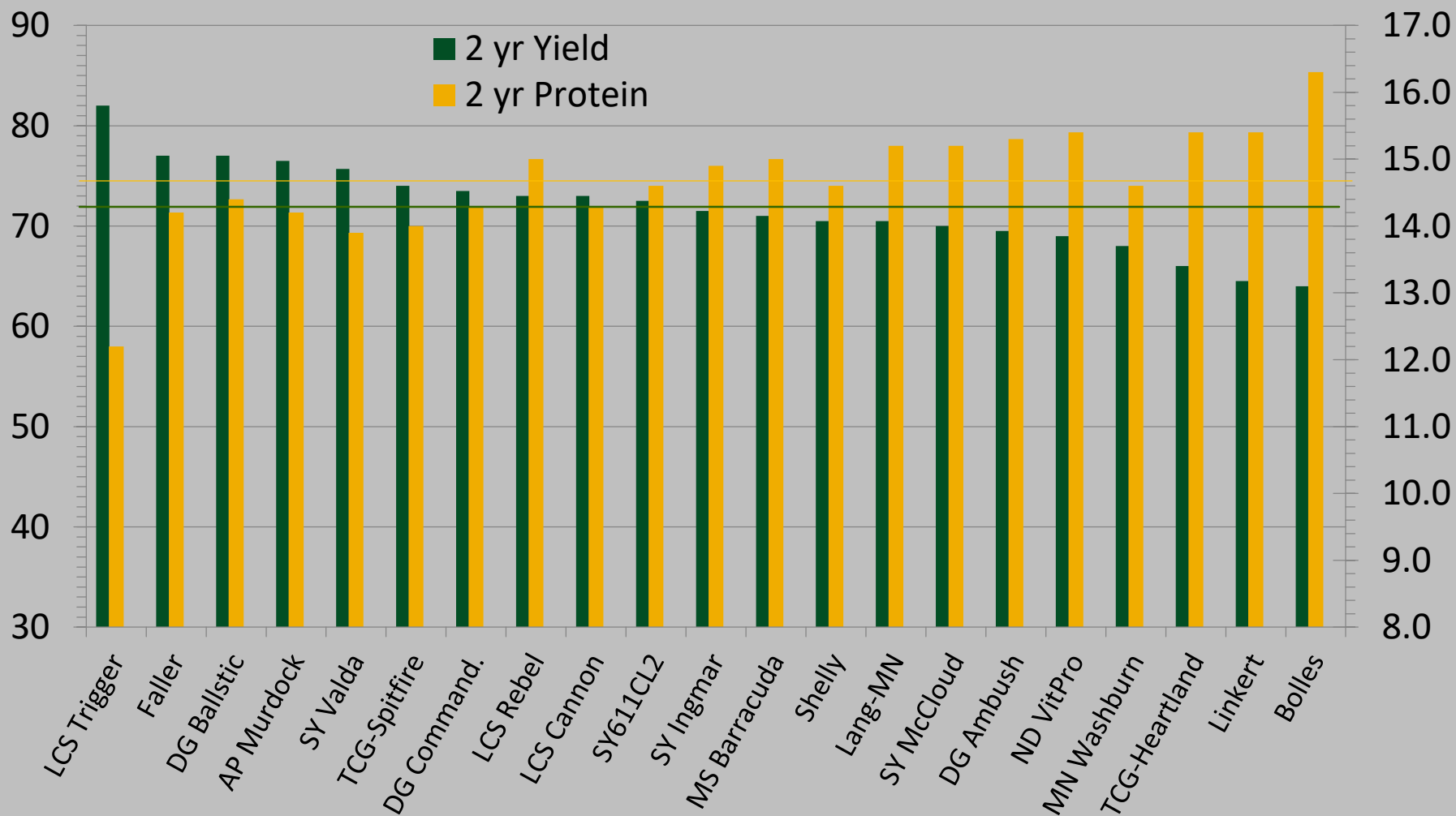
5 locations



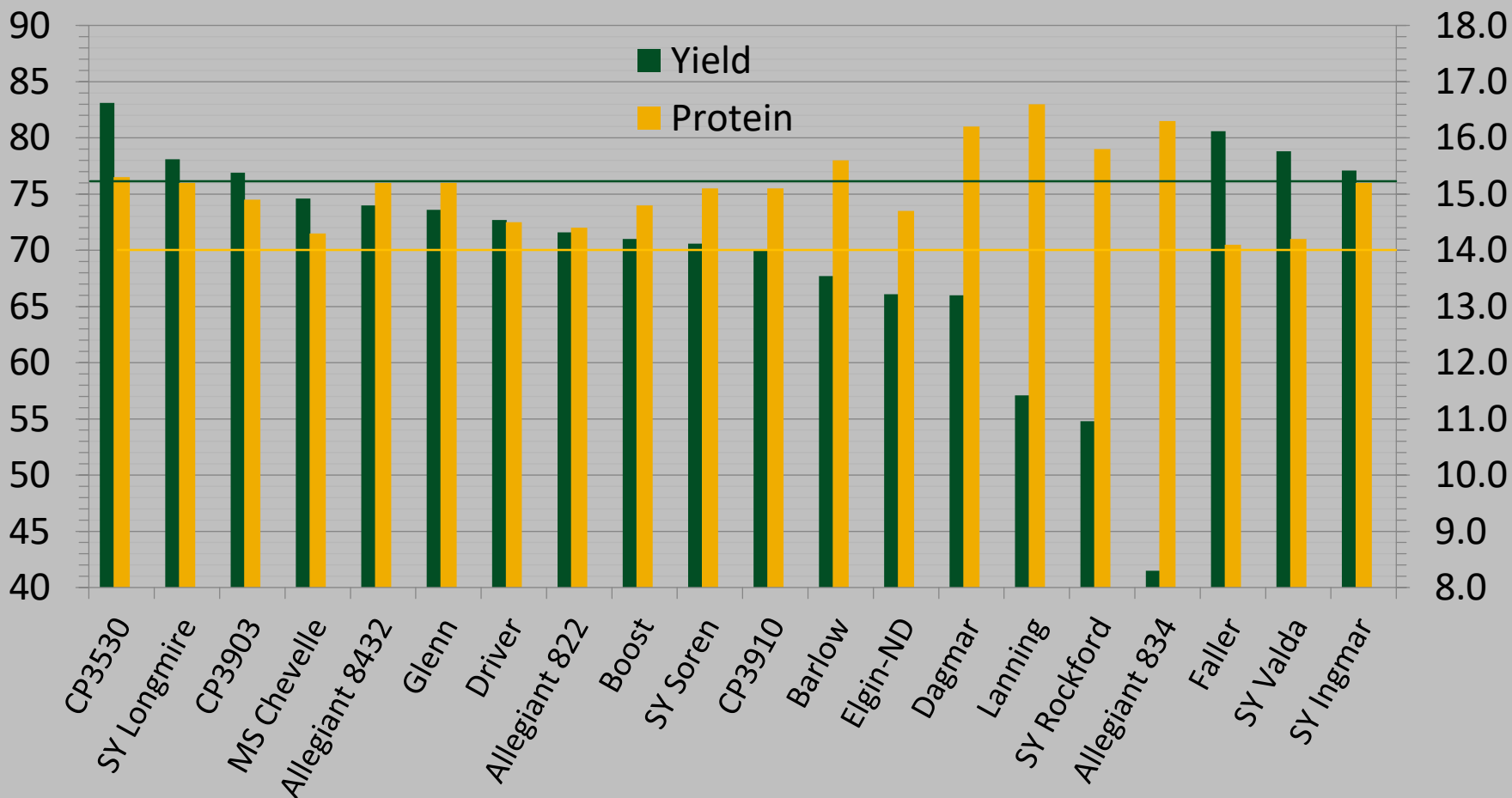
Varieties with protein and yield > mean, Langdon REC 2020



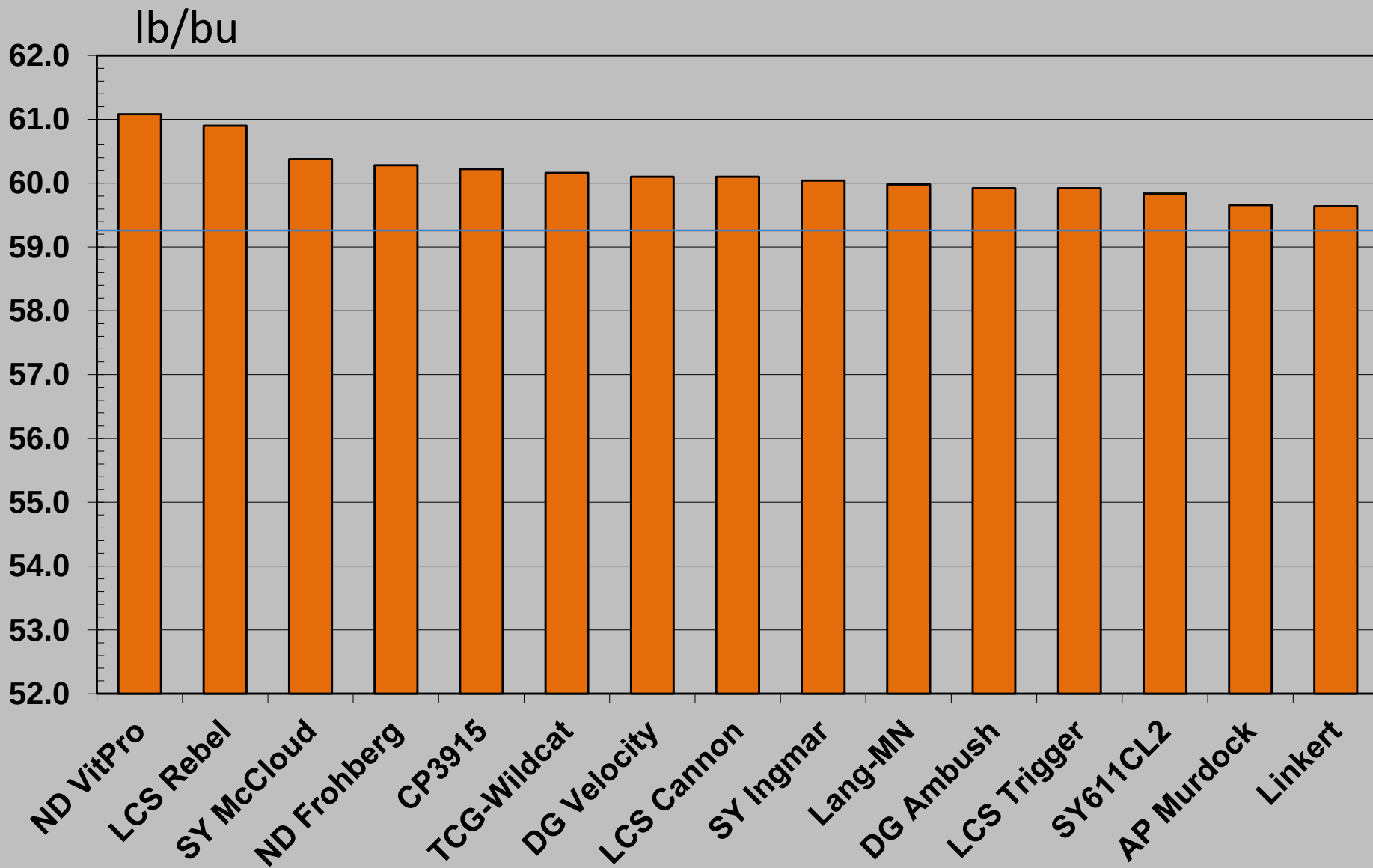
2yr (10 site) yield and protein averages for HRSW varieties at Langdon and off-station, 2019-2020.



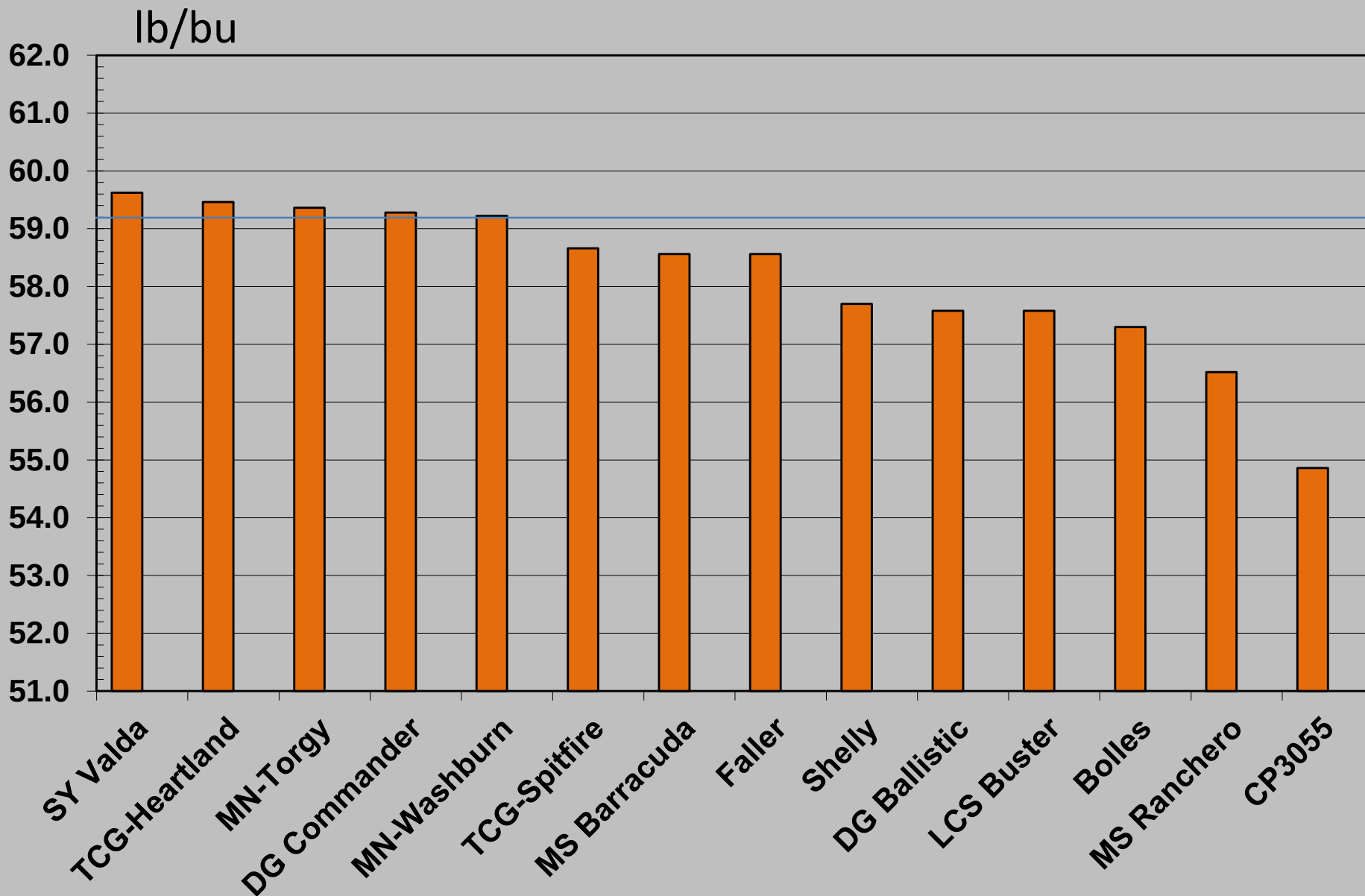
Comparative yield of selected HRSW varieties at Langdon, 2020



2020 HRSW 5-site Test Weight



2020 HRSW 5-site Test Weight



Days to Head - Langdon 2020

43	46	47	48	49	50
LCS Cannon	DG Commander	SY McCloud	Shelly	MN-Torgy	TCG-Spitfire
44	Dagmar	ND Frohberg	Allegiant 834	SY Rockford	Bolles
MS Barracuda	CP3915	SY 611CL2	Faller	MN-Washburn	Lang-MN
45	DG Ambush	SY Ingmar	Boost	Lanning	51
CP3910	TCG-Heartland	SY Valda	Driver		MS Ranchero
Glenn	ND VitPro	AP Murdock	CP3530		53
MS Chevelle	CP3903	DG Velocity			CP3055
Barlow	SY Soren	Linkert			LCS Buster
LCS Rebel	Allegiant 822	DG Ballistic			LCS Trigger
Elgin-ND	SY Longmire	TCG-Wildcat			

Plant Height (in) - Langdon 2020

28	31	32	33	34	35
Allegiant 834	Shelly	CP3910	TCG-Spitfire	MN-Torgy	CP3055
29	SY Longmire	SY Valda	Bolles	Faller	LCS Rebel
Linkert	Allegiant 822	DG Ambush	SY McCloud	CP3903	Boost
MS Barracuda	AP Murdock	CP3915		DG Ballistic	Lang-MN
30	SY Ingmar	Lanning		MS Ranchero	LCS Buster
LCS Cannon	TCG-Heartland	Allegiant 8432		Driver	LCS Trigger
SY Soren	MS Chevelle	SY Rockford		Barlow	ND Frohberg
SY 611CL2	MN-Washburn	TCG-Wildcat		ND VitPro	Glenn
	DG Velocity	Dagmar			36
	DG Commander				CP3530
					Elgin-ND

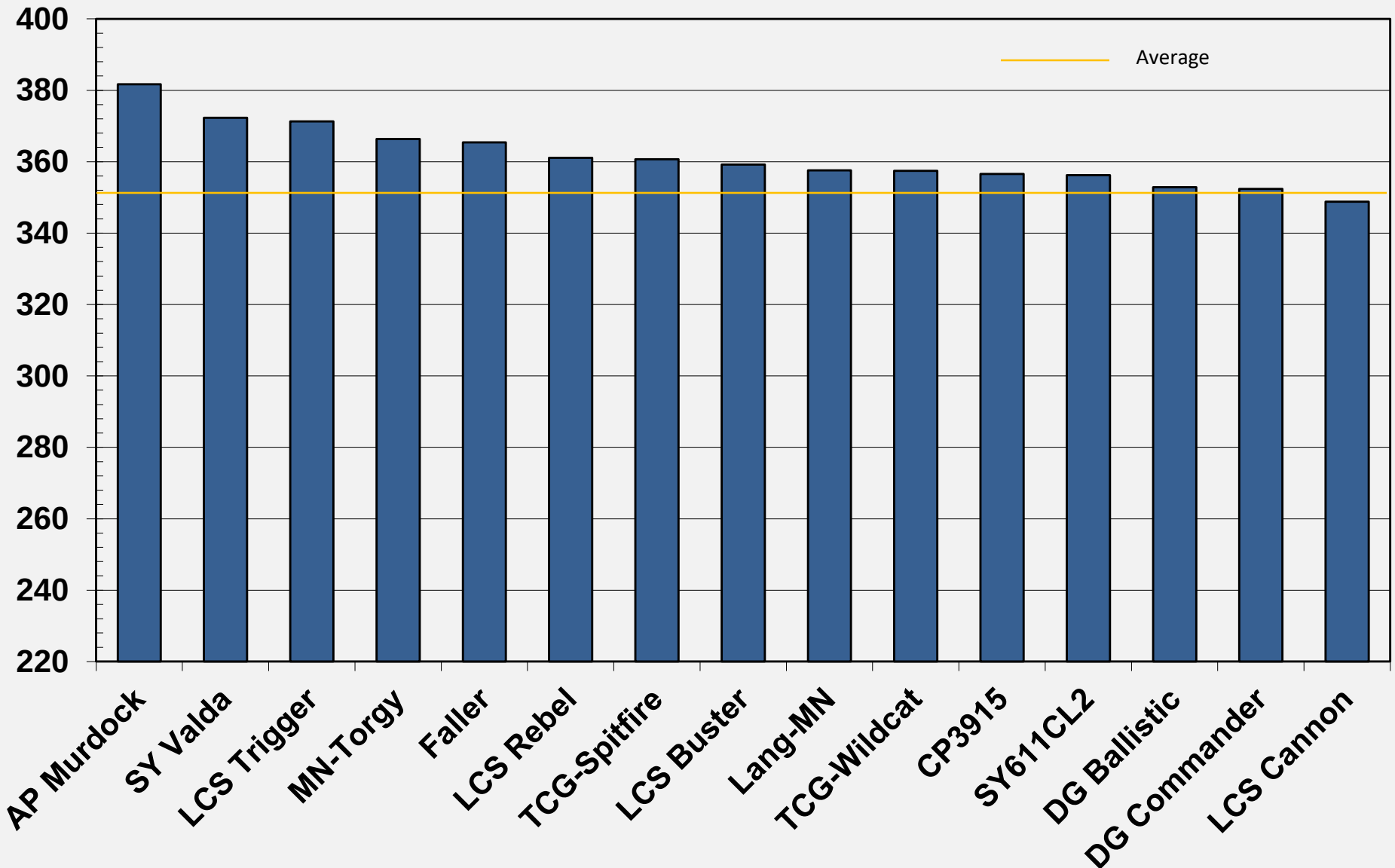
Straw Strength- Statewide

1=strongest, 9=weakest

2	3	4	5	6
CP3930	DG Ballistic	AP Murdock	DG Ambush	Barlow
Linkert	DG Commander	Bolles	Boost	Dagmar
	DG Velocity	CP3915	CP3530	LCS Buster
	Driver	Glenn	CP3910	LCS Rebel
	MN-Torgy	Lanning	Elgin-ND	
	MN-Washburn	LCS Cannon	Lang-MN	
	ND VitPro	MS Barracuda	LCS Trigger	
	SY Ingmar	ND Frohberg	MS Chevelle	
	SY Soren	Shelly	MS Ranchero	
	TCG-Heartland	SY Longmire	SY611CL2	
	TCG-Wildcat	SY McCloud	Faller	
	TCG-Spitfire	SY Rockford		
		SY Valda		

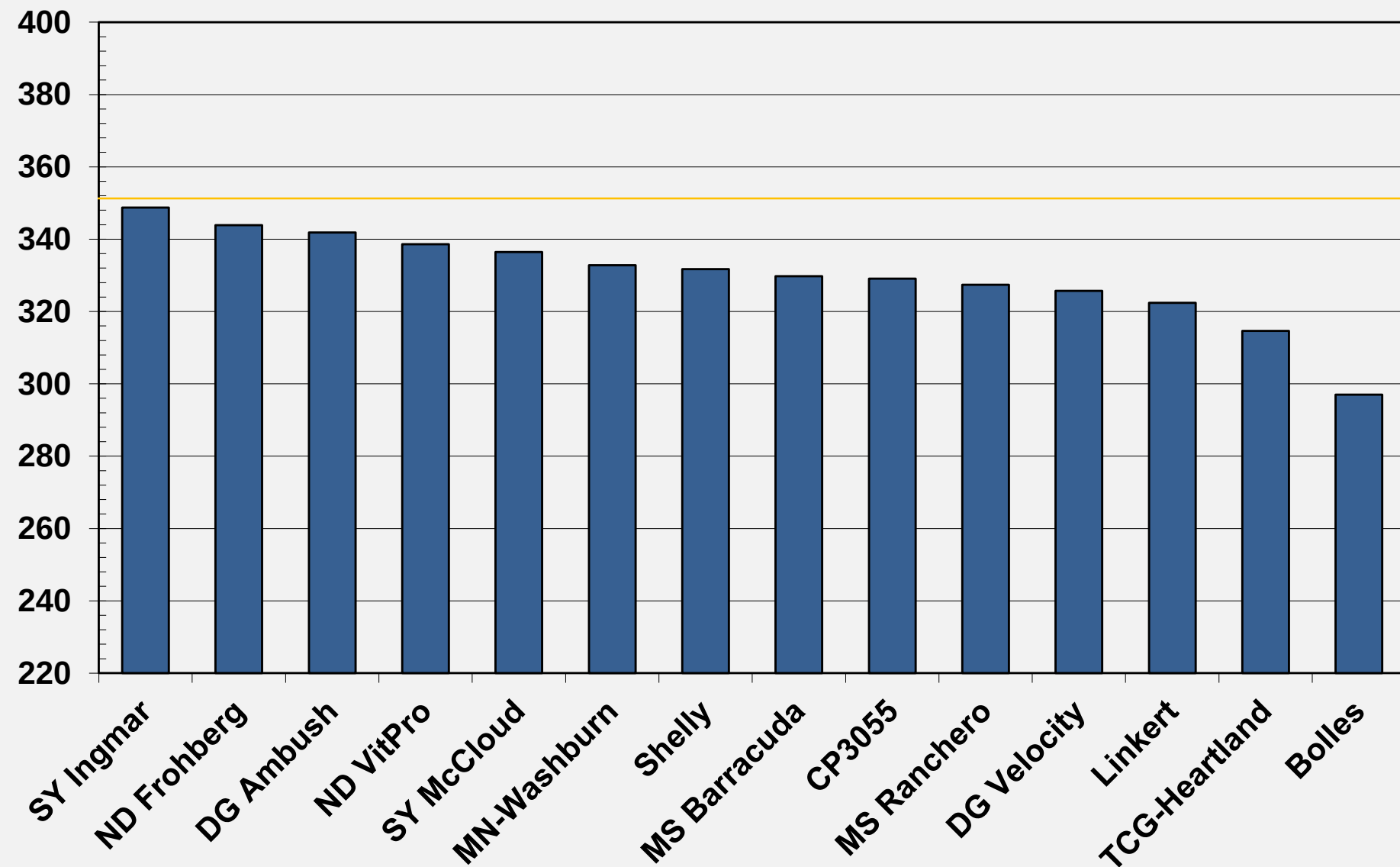
2020 HRSW 5-site - \$Return/a

Langdon Nov. 30 quote. \$5.23/bu, protein discount/premium. \$0.03/fifth down to 11%. \$0.03/fifth up to 15%



2020 HRSW 5-site - \$Return/a

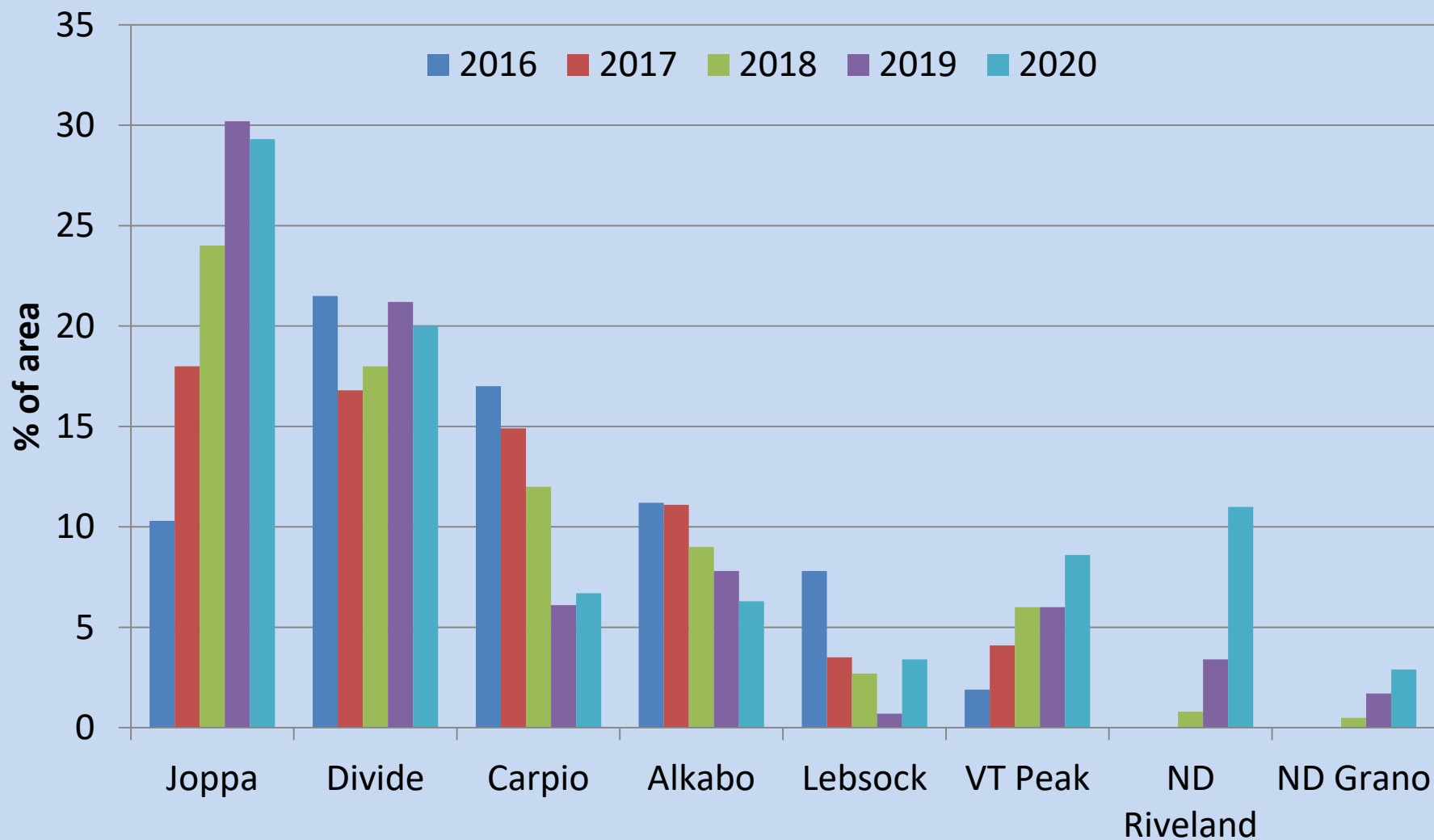
Langdon Nov. 30 quote. \$5.23/bu, protein discount/premium. \$0.03/fifth down to 11%. \$0.03/fifth up to 15%



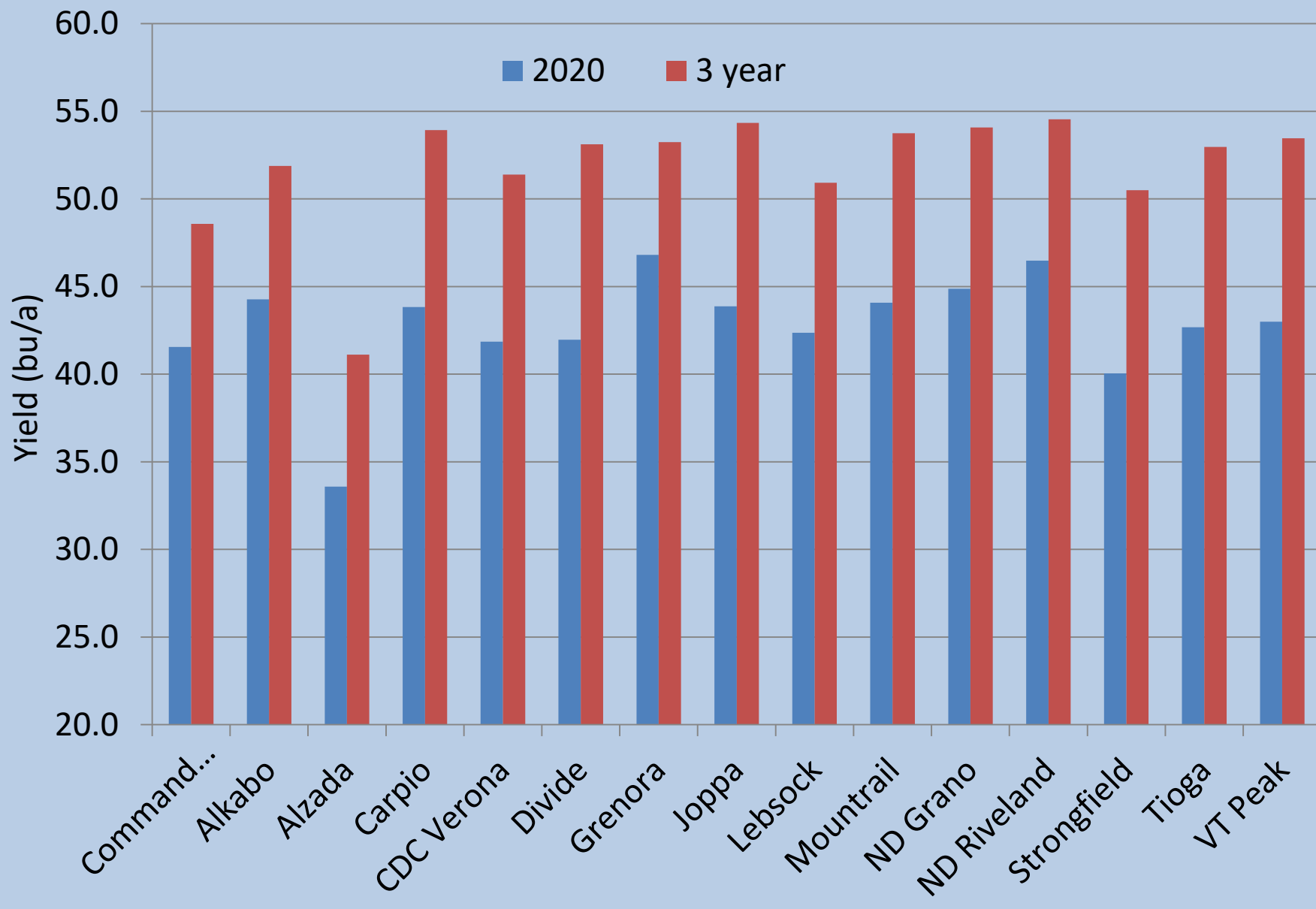
Durum



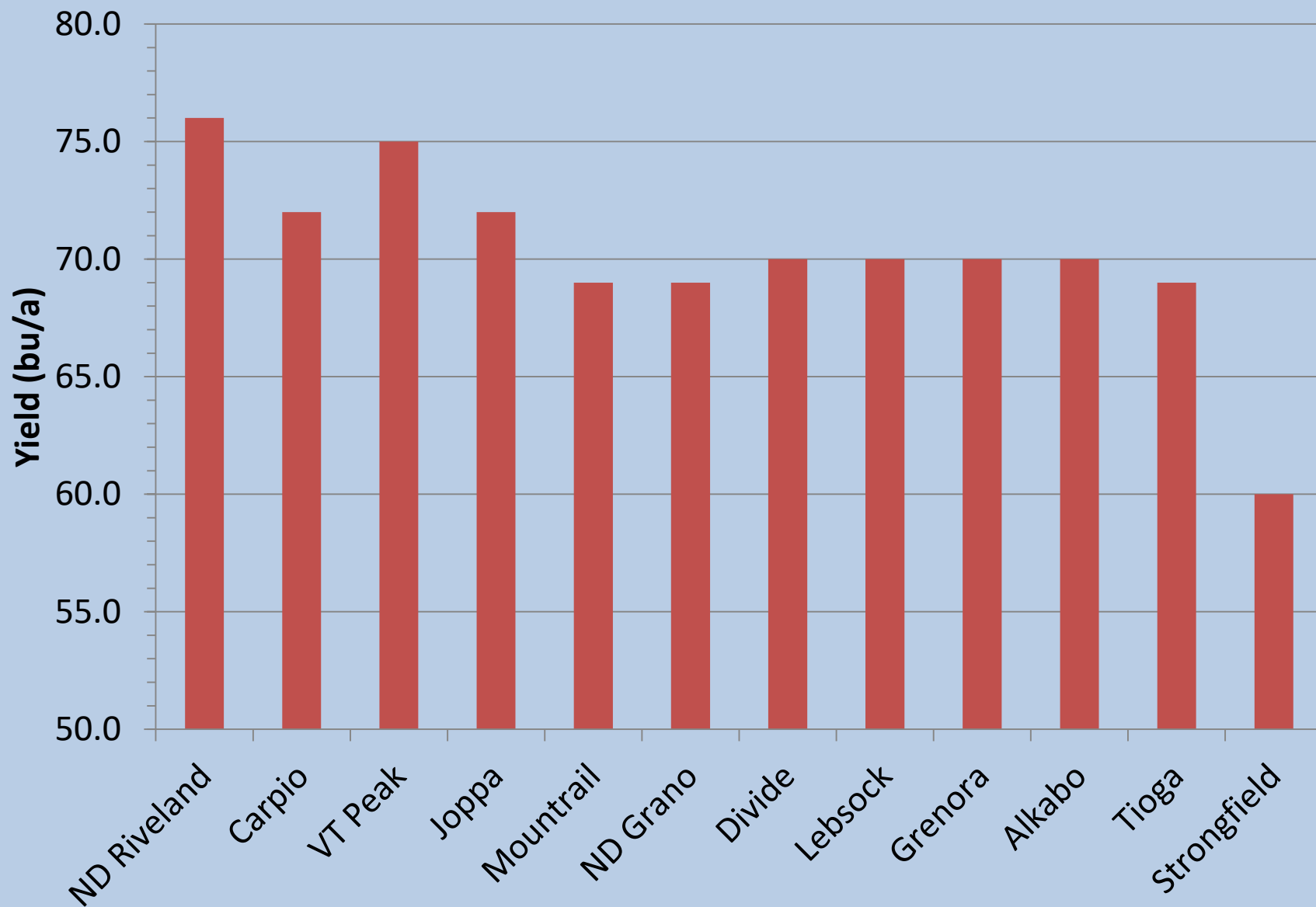
Durum varieties: % of area planted 2016-2020



Yield of durum varieties, average of six locations, 2020 and three year average.



Yield of durum varieties, 5yrs- Langdon REC



Effect of durum genotype and fungicide treatment on disease develop and agronomic traits, Langdon, 2020. Trial was conducted under mist irrigation.

Genotype	Yield (bu/acre)		DON (ppm)	
	No Fung	Fung	No Fung	Fung
Divide	68.1	81.8	6.1	2.1
ND Grano	71.6	91.1	10.0	5.5
Joppa	74.6	85.2	8.1	8.3
Mountrail	70.3	78.5	8.8	3.4
ND Riveland	80.2	92.8	8.4	1.8
MEAN	73.0	85.9	8.2	4.2
LSD .05	4.2		2.5	

Fungicide treatment: 6.5 fl oz of Prosaro at Feekes 10.51.

Barley variety update

2020 Stats:

Area planted: 530,000

Yield: 63 bu/acre

2019 Stats:

Area planted: 580,000

Average yield: 72 bu/acre

2018 stats:

Area planted: 470,000

Average yield: 74 bu/acre



Barley Industry switching to Two-row

- Efficiencies in brewing technology coupled with increase in craft brewing
 - Two-rowed 2% > malt and higher extract - more beer
- 80% of acres in 2019 was two-row
 - 2015 - 65% was six-row
 - 2005 - 80% was six-row
- Main varieties being contracted are:
 - AAC Synergy, ND Genesis, Pinnacle, Explorer, CDC Bow, AAC Connect

Historical Disadvantages of Two-rowed Barley Compared to Six-rowed Barley

- Inherently lower yielding than six-rowed barley under favorable growing condition.
- Weaker straw than six-rowed barley
- More susceptible to foliar diseases.
- Malt is lower in enzymatic activity

Inherent Advantages of Two-rowed Barley Compared to Six-rowed Barley

- Often lower in grain protein.
- Plumper kernels under drought conditions.
- Often lower in deoxynivalenol (DON).

2-Row Barley

- AMBA – No 6-row testing
- State VT – Limited 6-row testing
- Risky to grow
- ND Genesis and ACC Synergy stay green longer
- More susceptible to sprouting even with heavy dew
- Less susceptible to shatter than 6-row
 - Explorer has more stem breakage than ND Genesis or ACC Synergy
- Growers have successfully straight harvest ND Genesis, Pinnacle and ACC Synergy.

6-Row Barley

- 6-row breeding program will focus on pet food market
- Protein doesn't matter
- DON less stringent, <5 ppm
- Work on semi-dwarf trait – producers use more N
- Market \$1 < 2-row malting

ND Genesis Yield

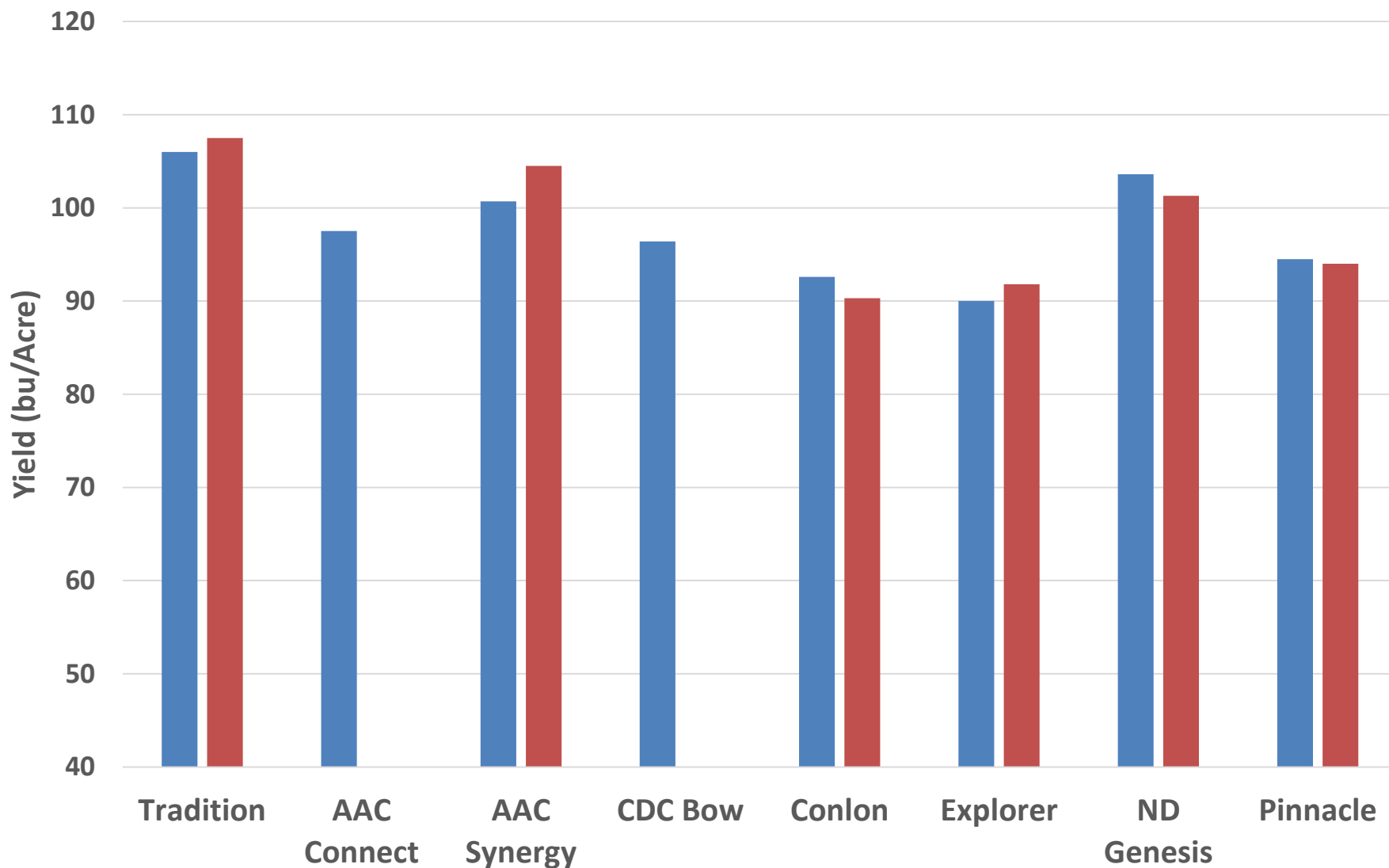
Seeding Rates – Langdon 2015-2016

Seeding Rate million	Langdon 2015	Langdon 2016	Langdon 2 yr	LAN, MINOT CARR 6-site	LAN, MINOT CARR 11-site
0.5	115.1	103.0	109.0	101.6	93.7
0.75	120.8	107.8	114.3	108.9	99.4
1.0	122.1	108.7	115.4	108.0	99.0
1.25	125.4	104.6	115.0	108.6	100.8
1.50	125.1	107.6	116.4	108.7	
1.75	131.7	105.6	118.7	113.1	

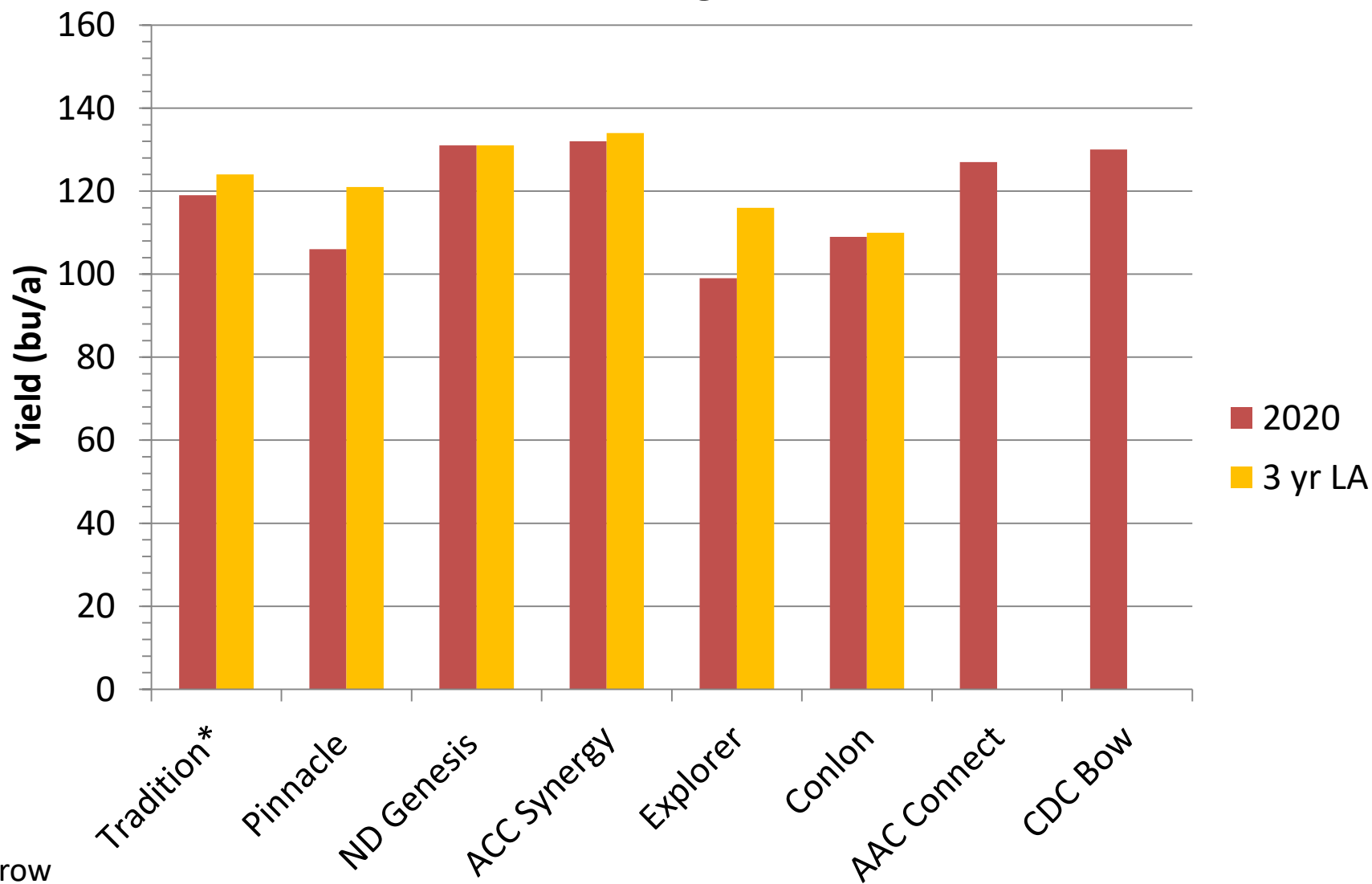
Seeding Rate of 1.0 million PLS/a recommended

Yield of malting barley varieties in eastern ND, 2020 and three year average.

■ 2020 ■ 3 yr



Yield of malting barley varieties 2020 and 3-yr average at Langdon



*6-row

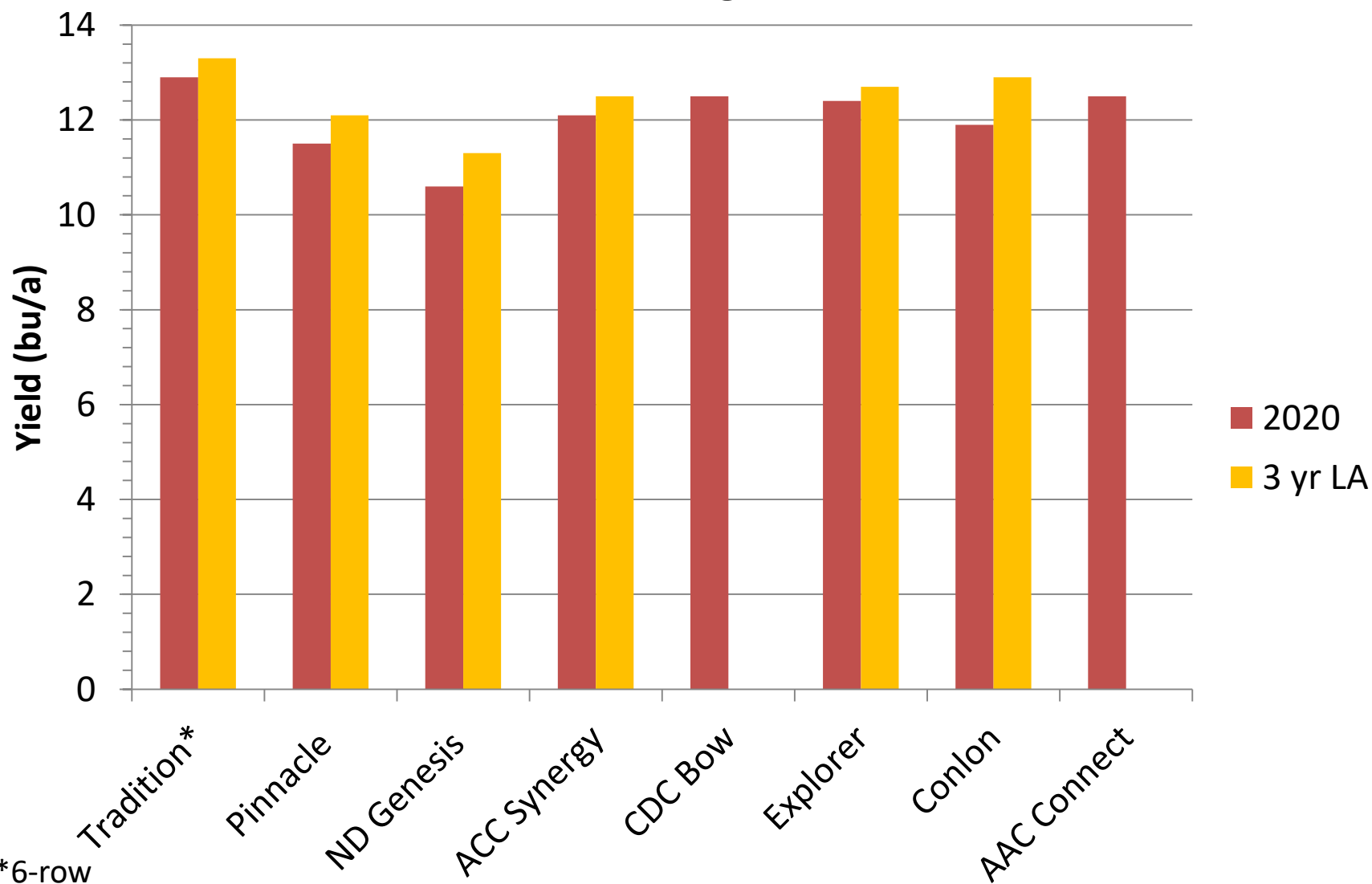
Barley Straw Strength – Days to Head



Six-row Varieties	Straw Strength	Days to Head
Tradition	3	58
Two-row Varieties	Straw Strength	Days to head
ND Genesis	5	61
Pinnacle	6	60
Conlon	7	57
AAC Synergy	5	63
CDC Bow	3	64
Explorer	4	61
ACC Connect	3	62

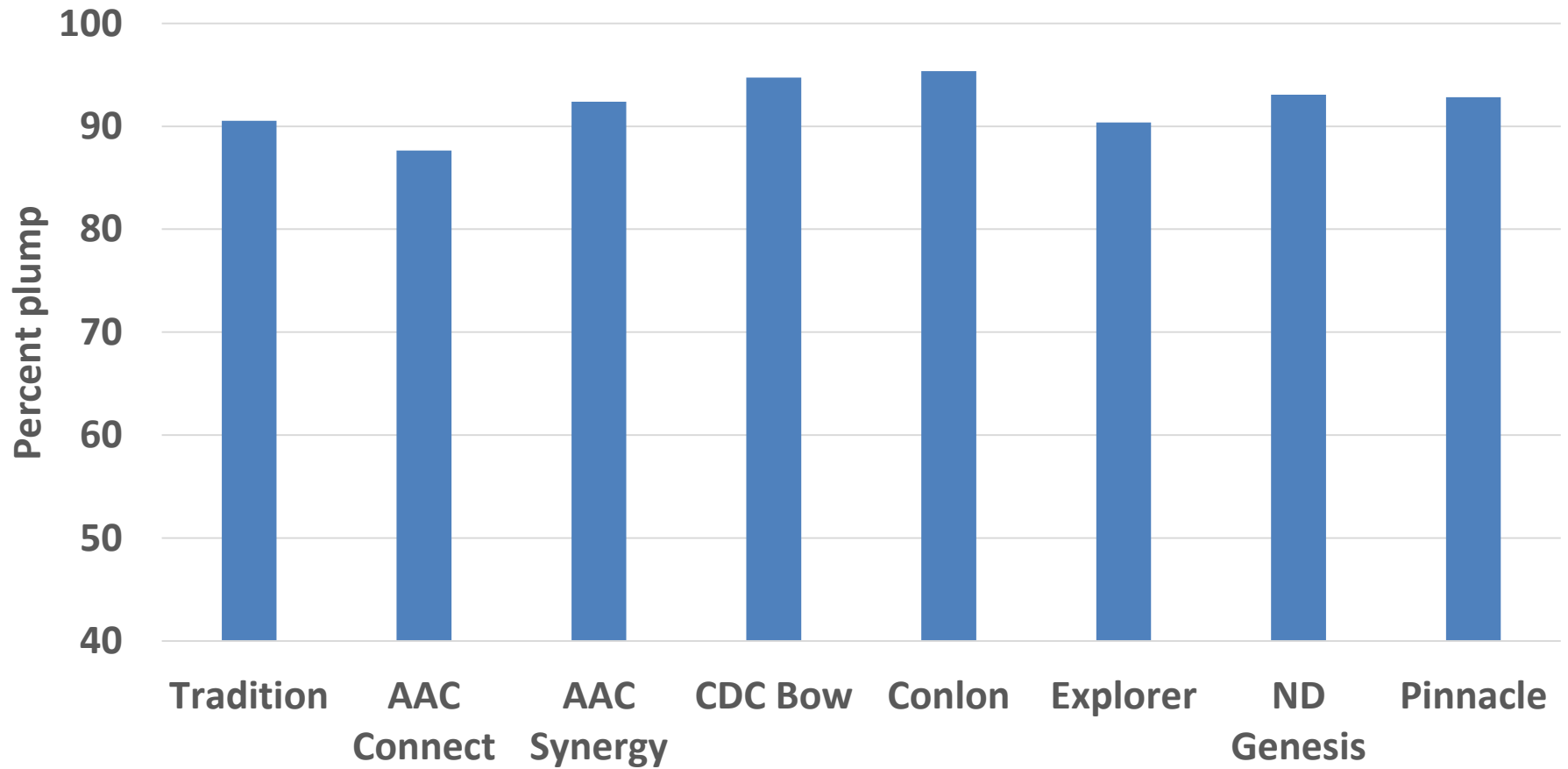
Straw Strength 1-9

Protein of malting barley varieties 2020 and 3-yr average at Langdon



*6-row

Percent plump of malting barley varieties, seven locations in ND, 2020





Search: [NDSU Langdon Research Extension Center](#)
[NDSU Variety Trials](#)
Presentation is on website