

Small Grain Variety Update

Langdon REC – 2019

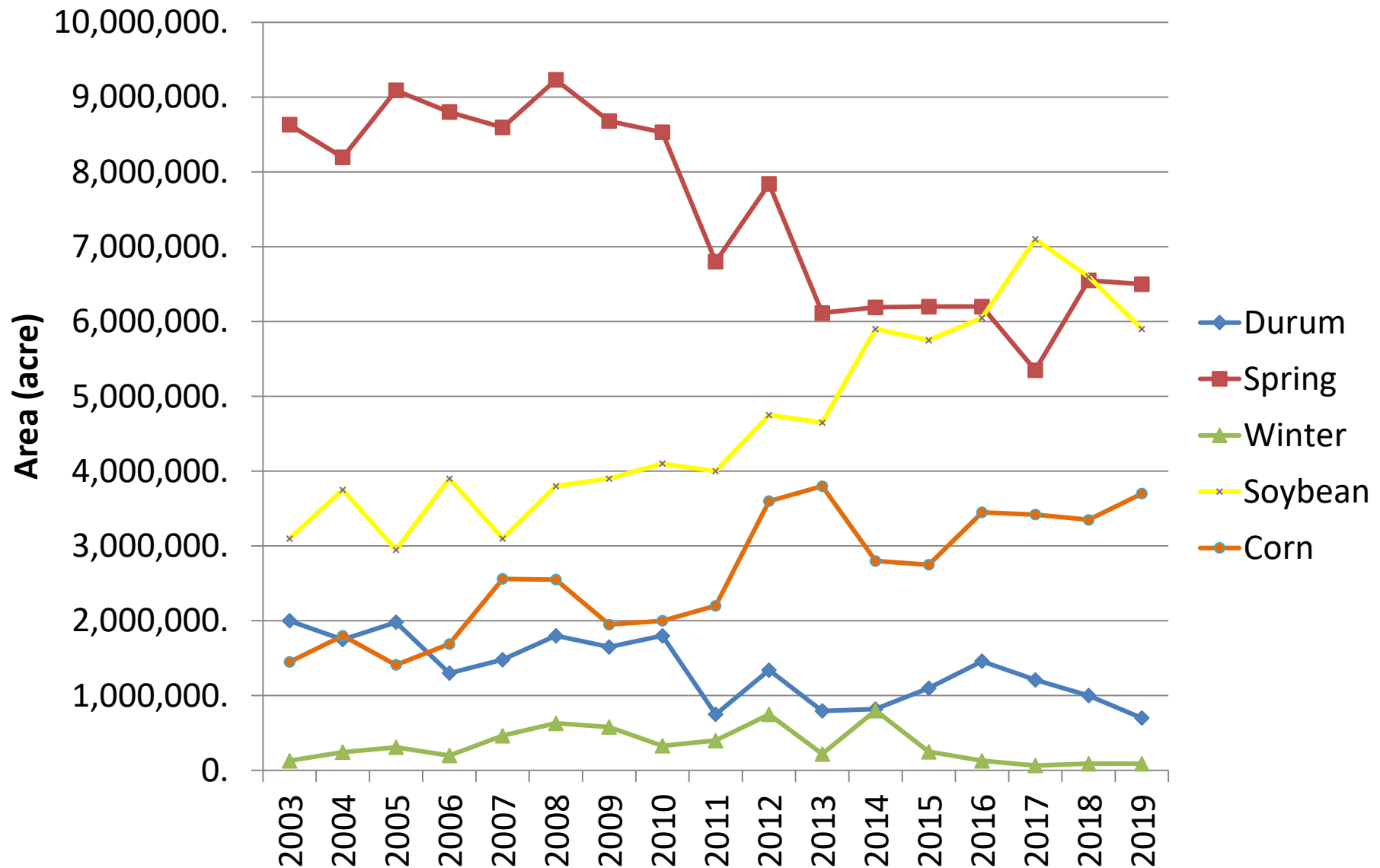
Bryan Hanson - Agronomist

Travis Hakanson - Research Specialist

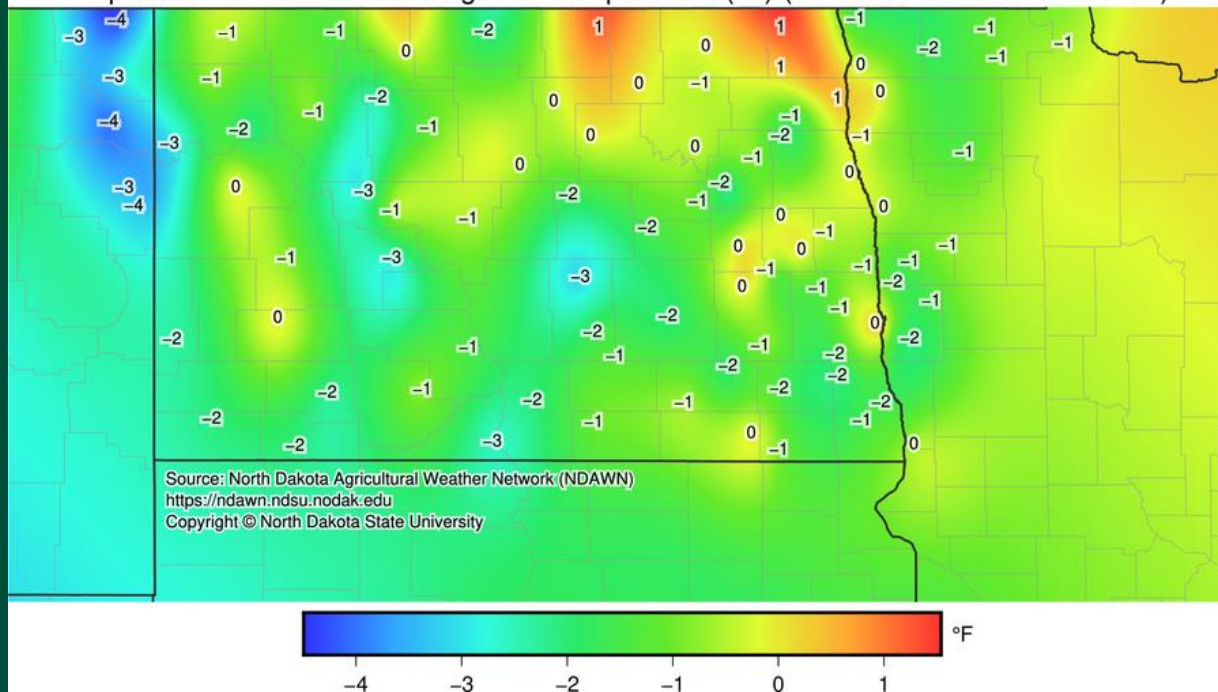
Lawrence Henry - Research Specialist



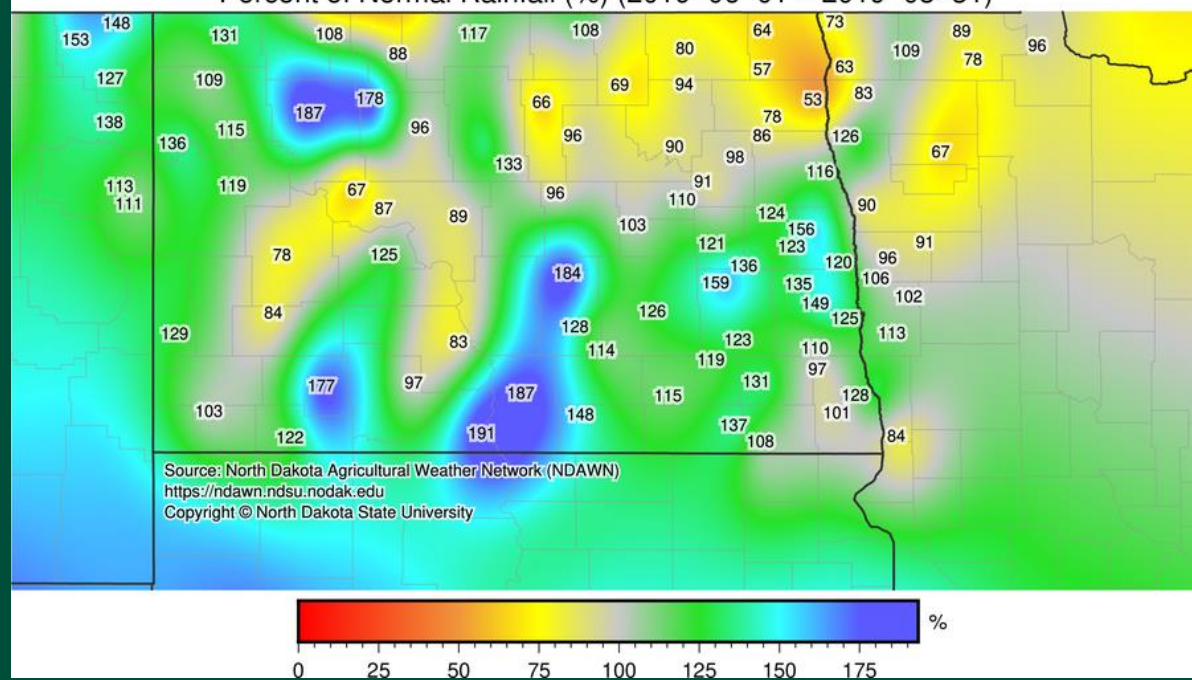
Trends in area planted in ND over the past 15 years for three classes of wheat, soybeans and corn.



Departure from Normal Average Air Temperature (°F) (2019-06-01 – 2019-08-31)



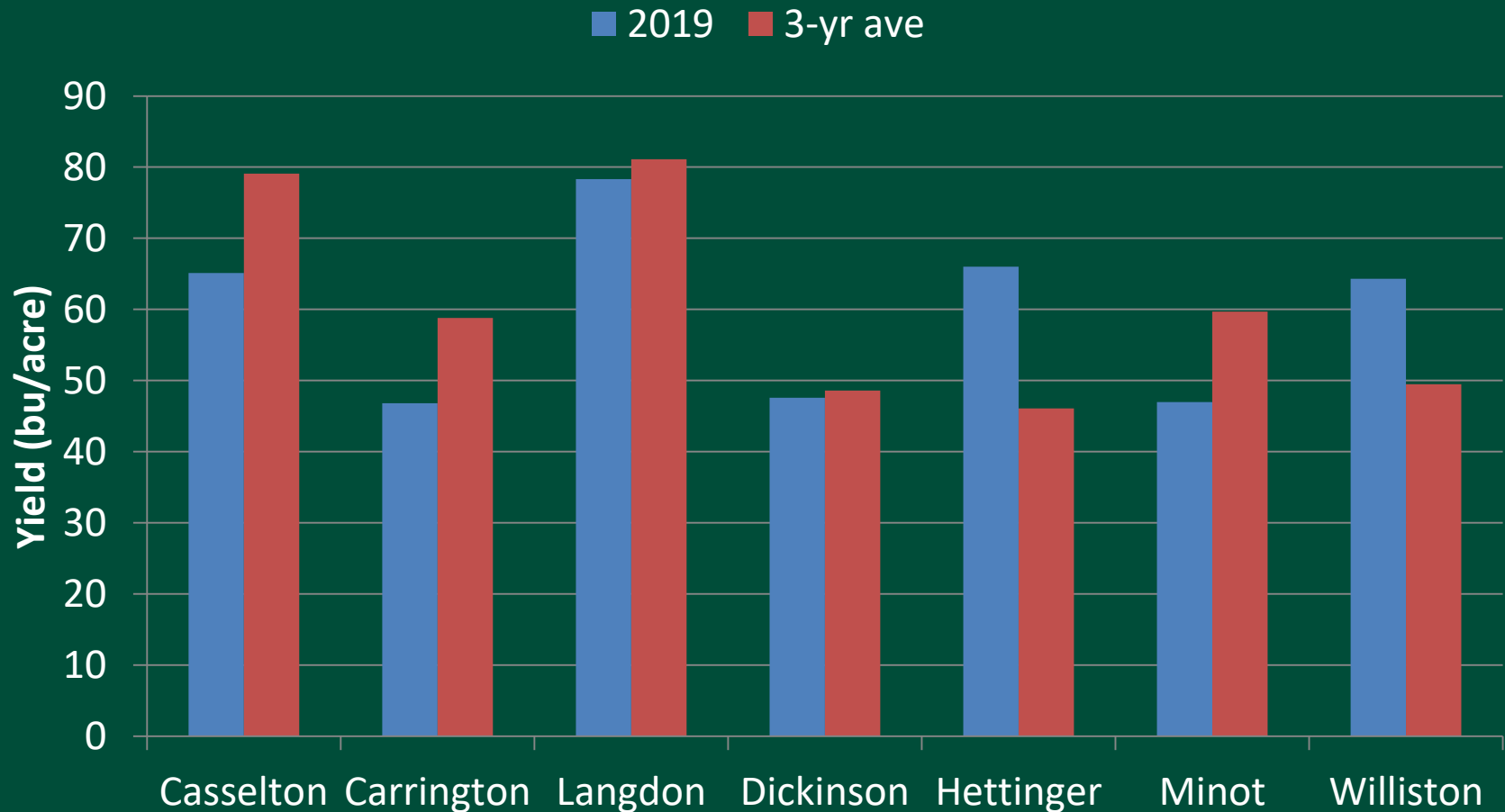
Percent of Normal Rainfall (%) (2019-06-01 – 2019-08-31)



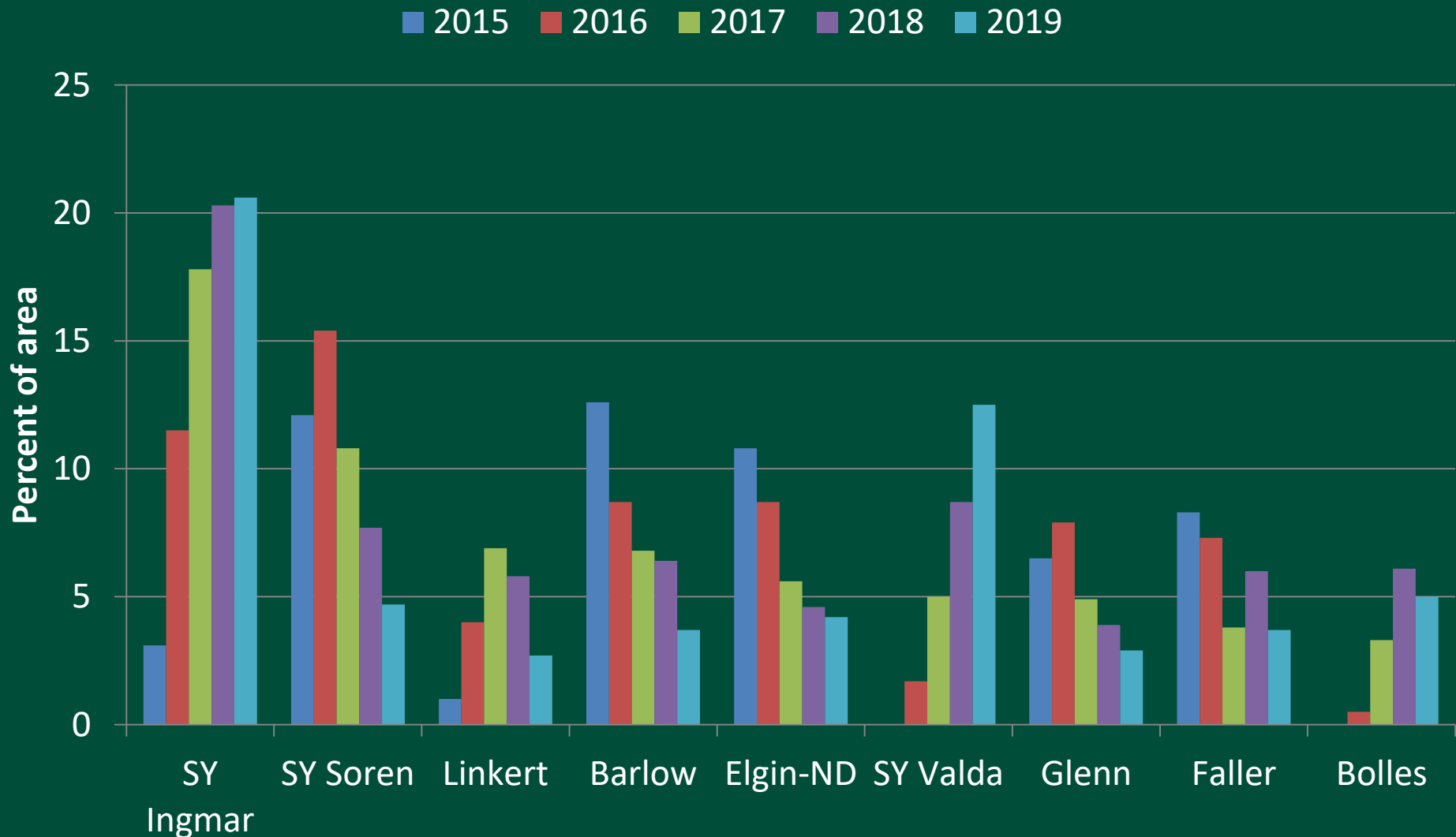
Near record yields in spite of challenging weather

- Late planting due to cool and wet spring
- Cooler than normal summer
- Issues with low falling numbers
 - Late season alpha amylase (cold stress during grain filling?)
- Very challenging harvest
 - Poor quality in some areas due to sprouting, limited areas of high DON
 - Some wheat did not get harvested

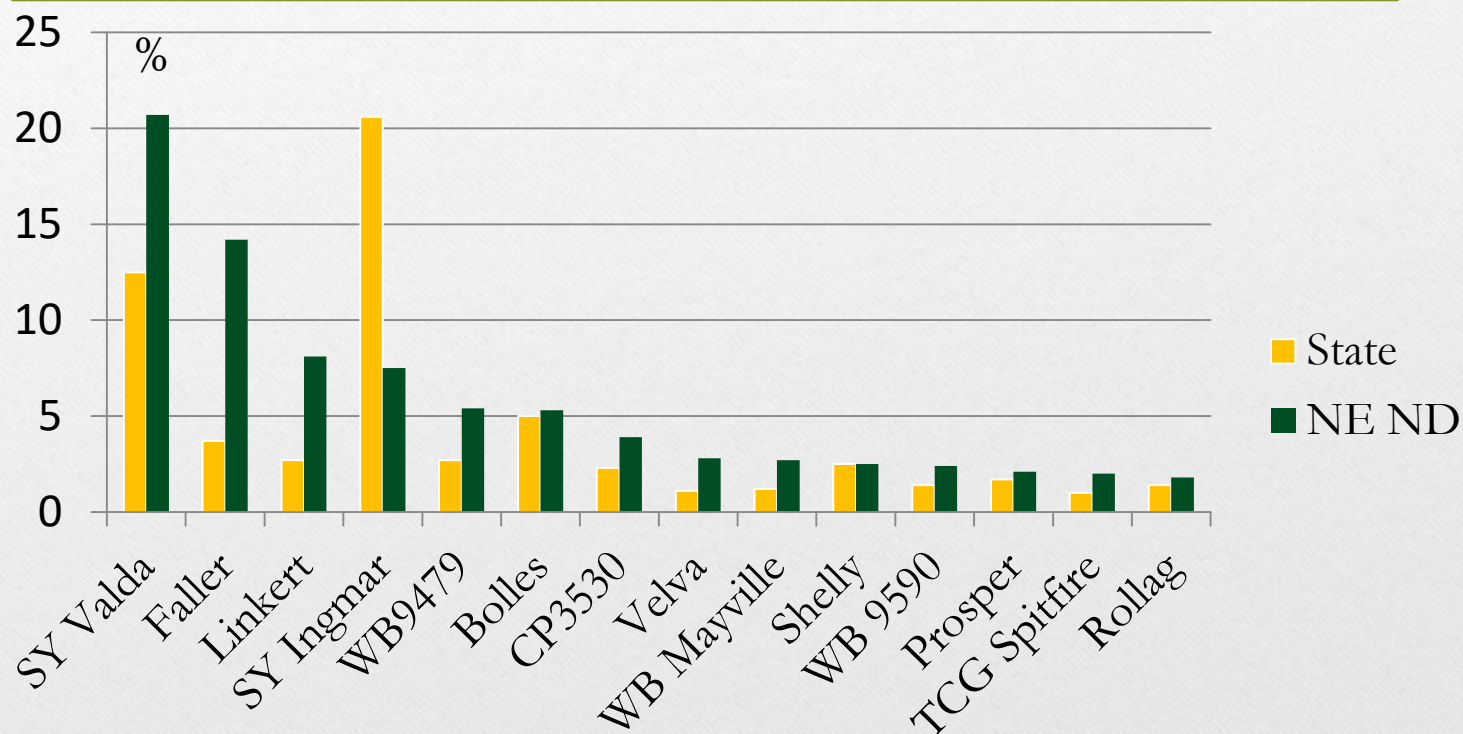
Average yields from spring wheat variety trials in various parts of the state.



Trends in HRSW variety use in ND



HRSW variety acres in 2019



Releases in 2019

Variety	Origin
MN Washburn	Minnesota
SY McCloud	Syngenta
SY Longmire	Syngenta
SY611CL2	Syngenta
CP3910	Croplan
CP3915	Croplan
CP3939	Croplan
Commander	DynaGro
Ballistic	DynaGro
TCG-Heartland	21 st Century Genetics
TCG-Stalwart	21 st Century Genetics

Varieties

NDSU

MN

Glenn
Barlow
Faller
Elgin-ND
ND VitPro
Mott*

Linkert
Bolles
Shelly
Lang-MN
MN-Washburn

*Solid/semisolid stem



Varieties

SD

Syngenta/AgriPro

Surpass
Boost



SY Soren
SY Ingmar
SY Valda
SY McCloud
SY Longmire*
SY611CL2

2020

AP Murdock

*Solid/semisolid stem

Varieties

Limagrain

LCS Breakaway
LCS Cannon
LCS Trigger
LCS Rebel

Croplan

CP 3504
CP 3530
CP 3616
CP 3888
CP3910
CP3915
CP3939

Varieties

Monsanto/Westbred

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

Meridian

MS Chevelle

MS Camaro

MS Barracuda

21st Century Genetics

TCG-Spitfire

TCG-Climax

TCG-Heartland

TCG-Stalwart*

DynaGro

Ambush

Commander

Ballistic

*Solid/semisolid stem

Leaf and Stripe rust



Scab Reaction

Glenn	4
Faller	4
Elgin-ND	4
Barlow	4
Boost	4
LCS Trigger	4
ND-VitPro	4
SY Longmire	7
SY Soren	7
TCG-Spitfire	7

1=resistant and 9=very susceptible

FHB - Scab

- FHB was problematic in small regions of the state in 2019.



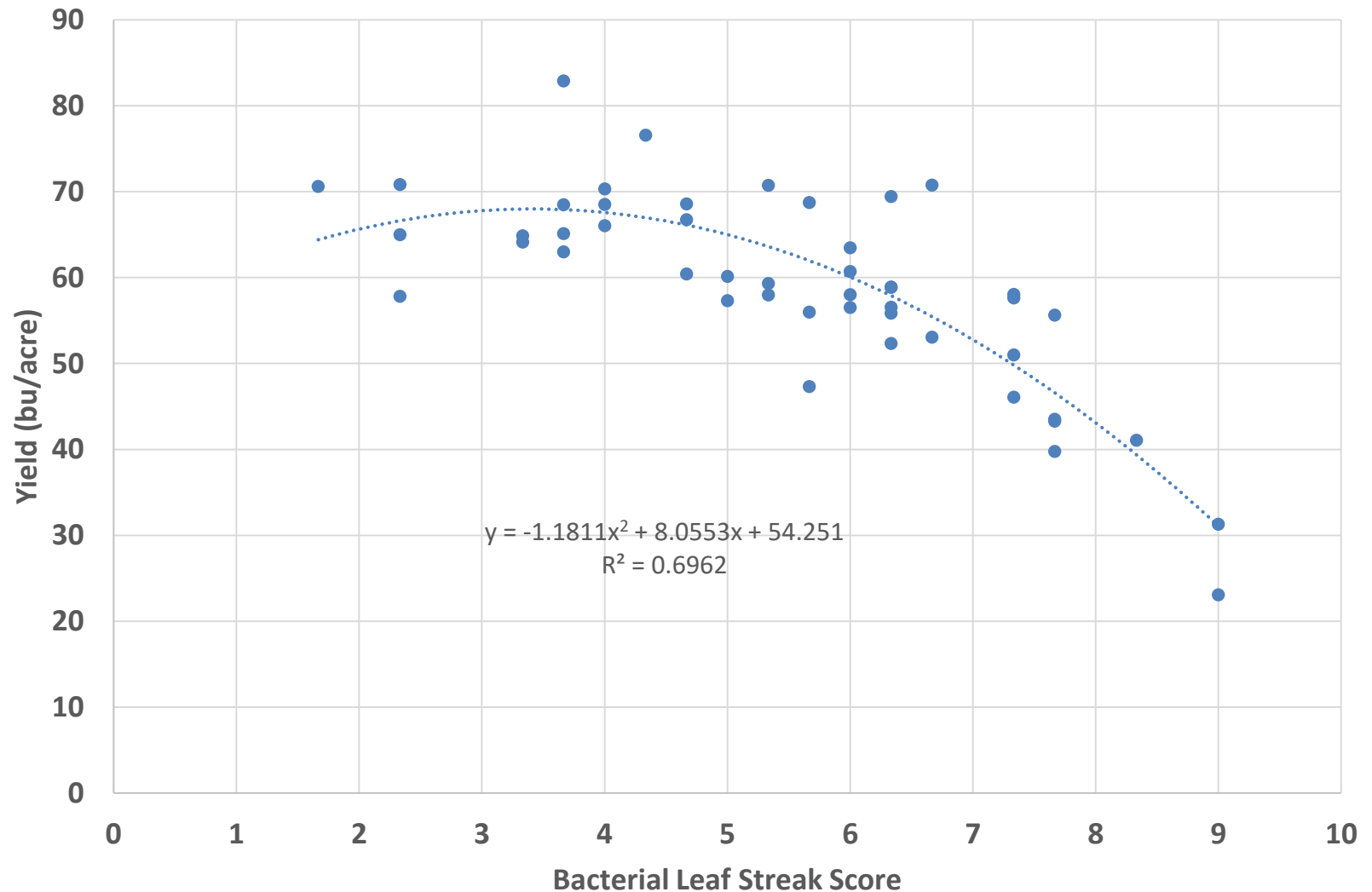
BLS ratings

Most resistant	Rating	Most susceptible	Rating
Boost	2	TCG-Stalwart	9
Lang-MN LCS Trigger ND VitPro	3	CP3910 Lanning SY Rockford,	8
Barlow Commander CP3504 Glenn Surpass	4	Bolles LCS Cannon MS Barracuda MS Chevelle Shelly SY Soren TCG-Heartland	7

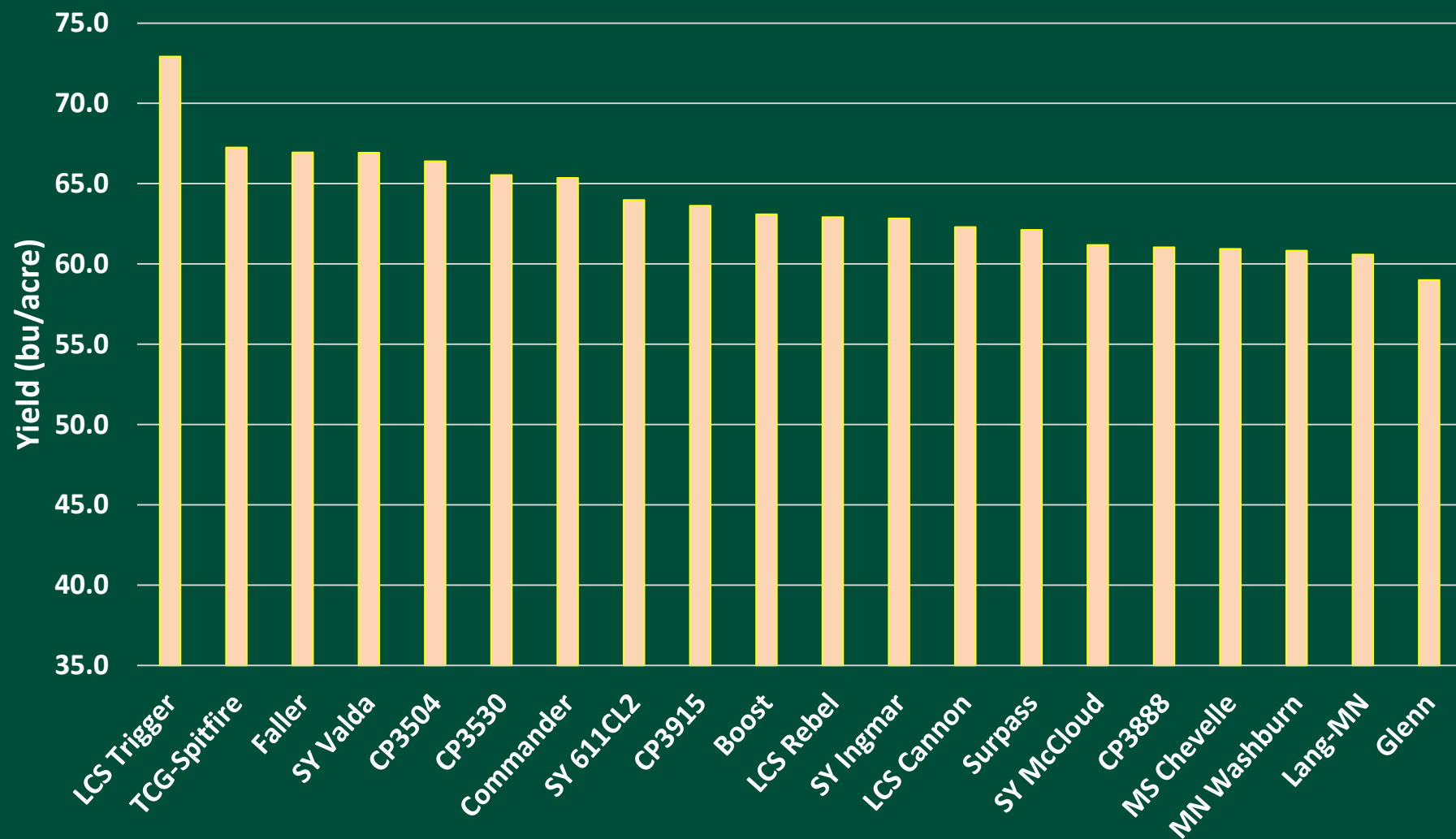


Figure 1. Symptoms of bacterial leaf streak (BLS). Photo credit: Marcia McMullen

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



Varieties with yields > mean, eastern North Dakota, 2019



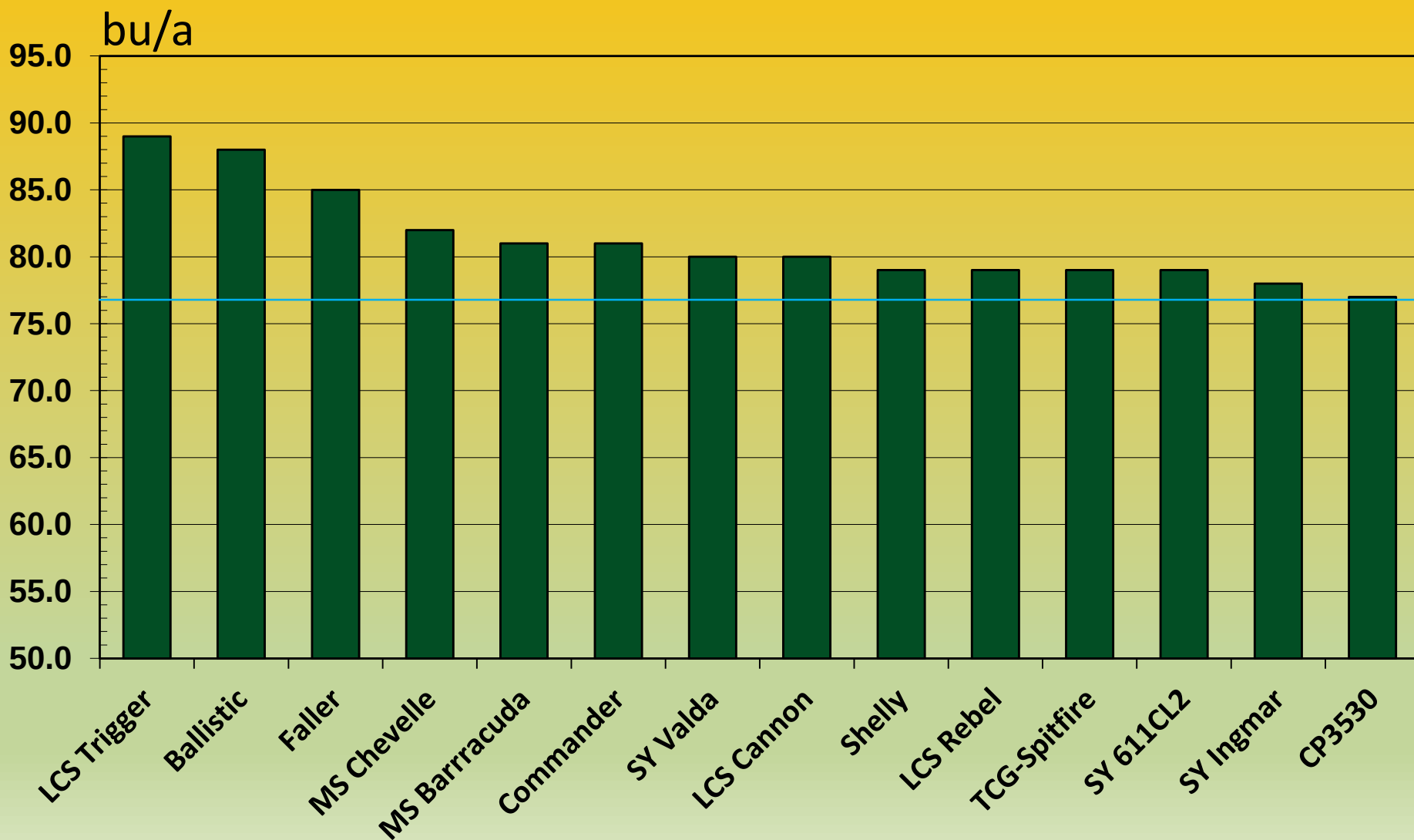
Yield and protein content of top yielding varieties at Langdon (Langdon, Cavalier, Park River, Pekin, Cando), 2019

Variety	Yield (bu/a)	Protein (%)
LCS Trigger	89	12.1
Ballistic	88	13.9
Faller	85	13.9
MS Chevelle	82	13.2
MS Barracuda	81	14.4
Commander	81	14.0
SY Valda	80	13.5
LCS Cannon	80	14.0

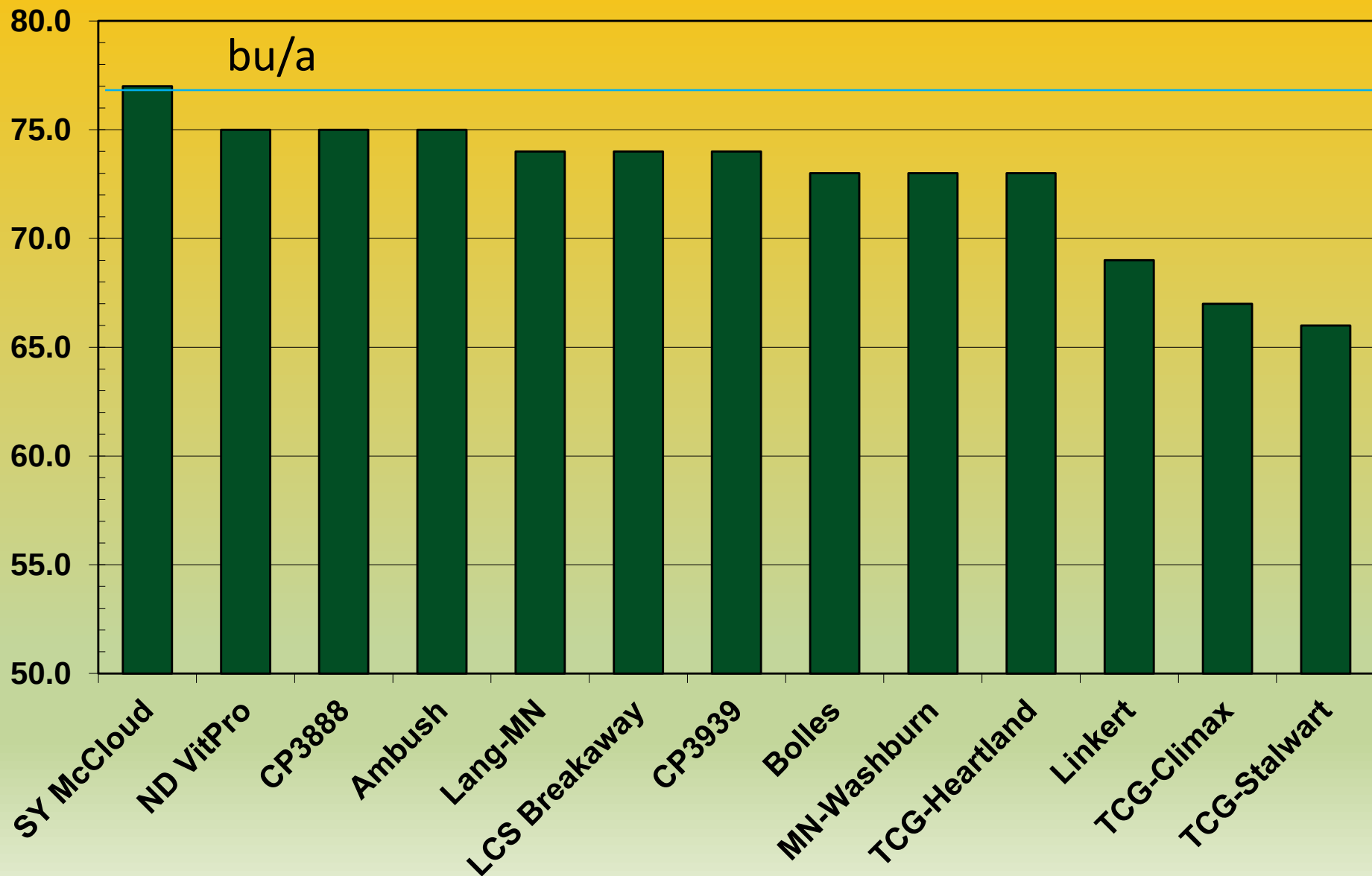
Protein and yield content of top protein varieties at Langdon (Langdon, Cavalier, Park River, Pekin, Cando), 2019

Variety	Yield (bu/a)	Protein (%)
Bolles	73	15.9
TCG-Climax	70	15.9
TCG-Stalwart	66	15.5
Lang-MN	74	15.4
Linkert	69	15.3
ND VitPro	75	15.2
CP3939	74	15.2
Ambush	75	15.0
TCG-Heartland	73	15.0

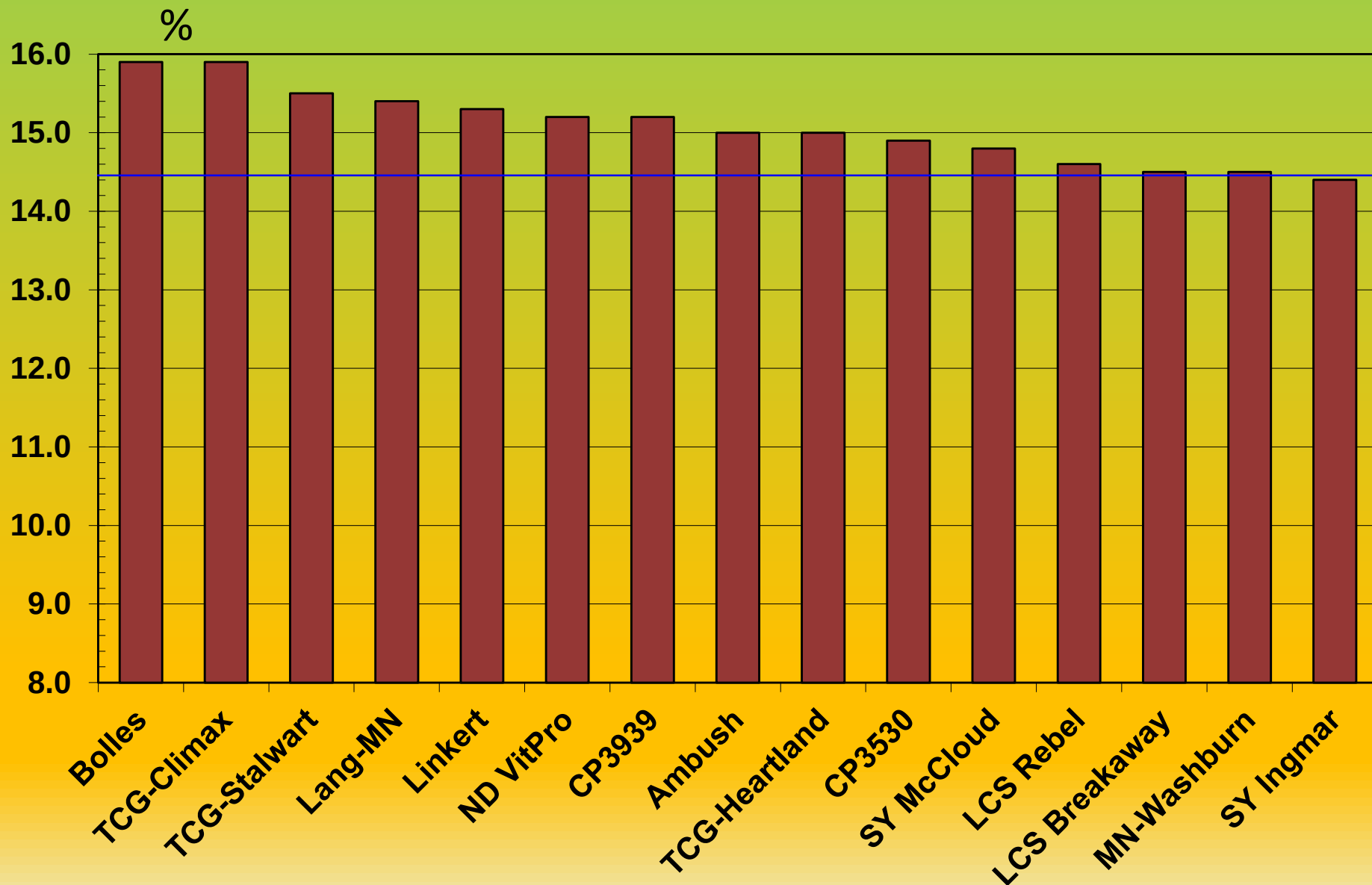
2019 HRSW 5-site Yield



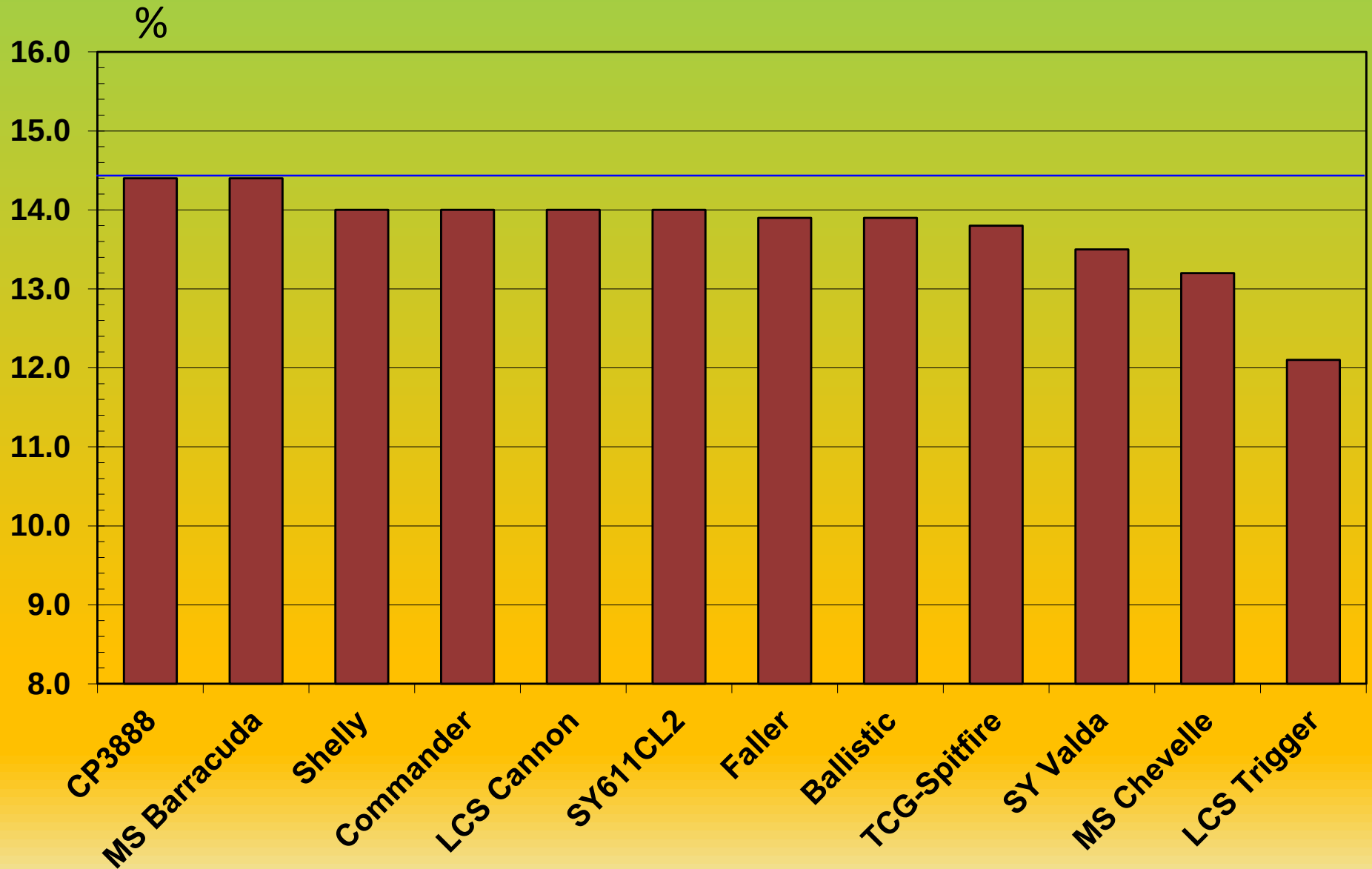
2019 HRSW 5-site Yield



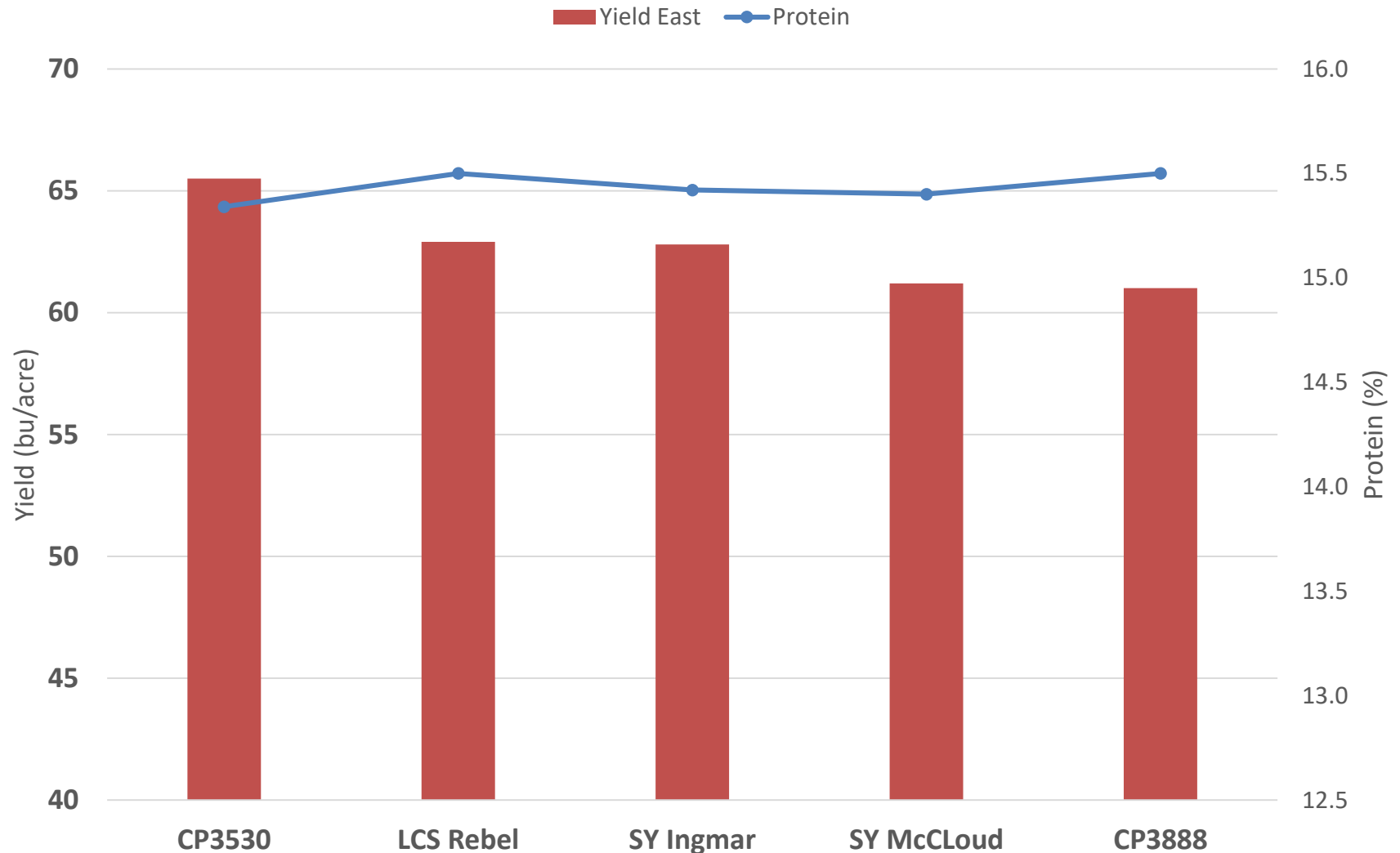
2019 HRSW 5-site Protein



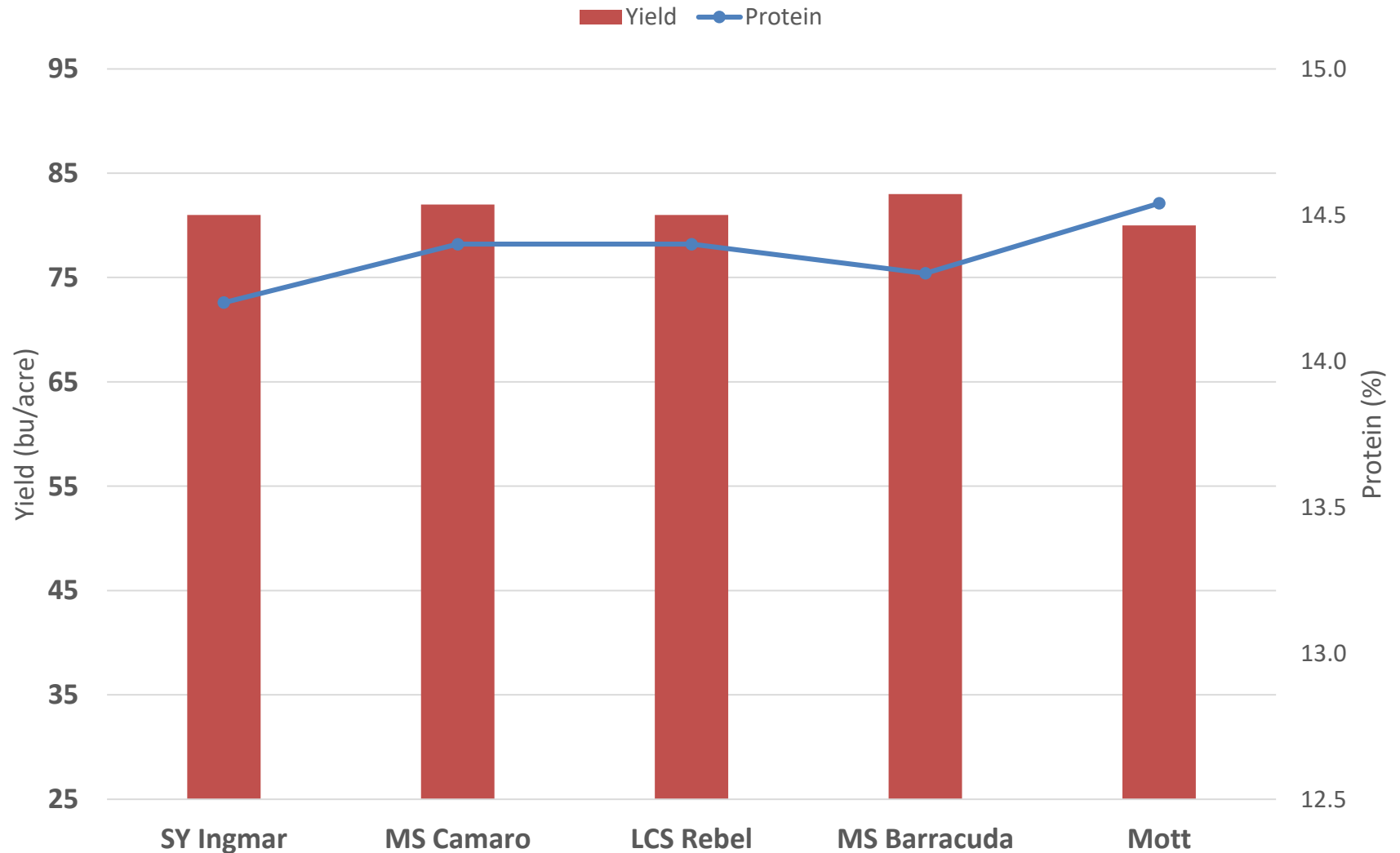
2019 HRSW 5-site Protein



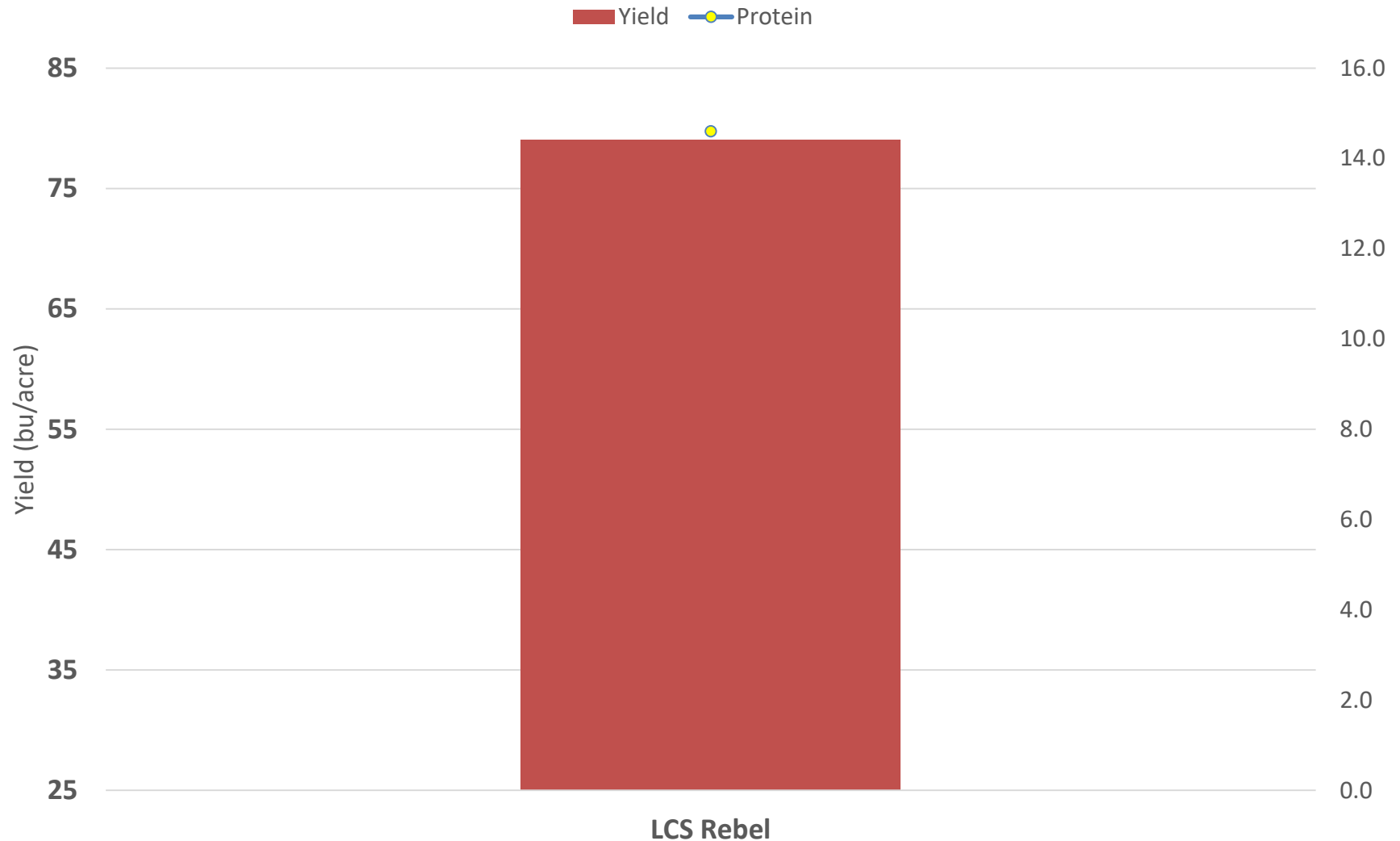
Varieties with protein and yield > mean, eastern locations means, 2019



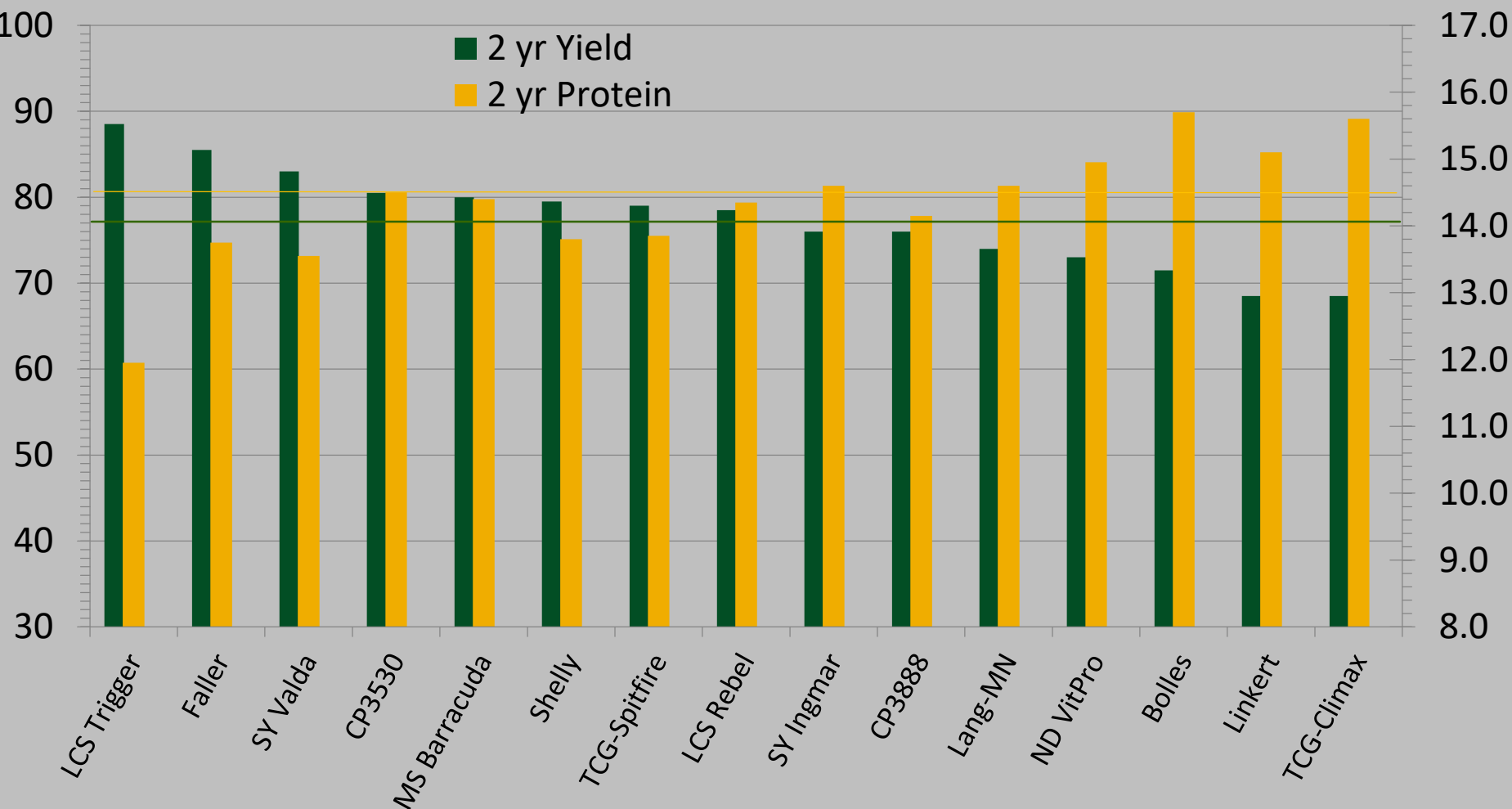
Varieties with protein and yield > mean, Langdon, 2019



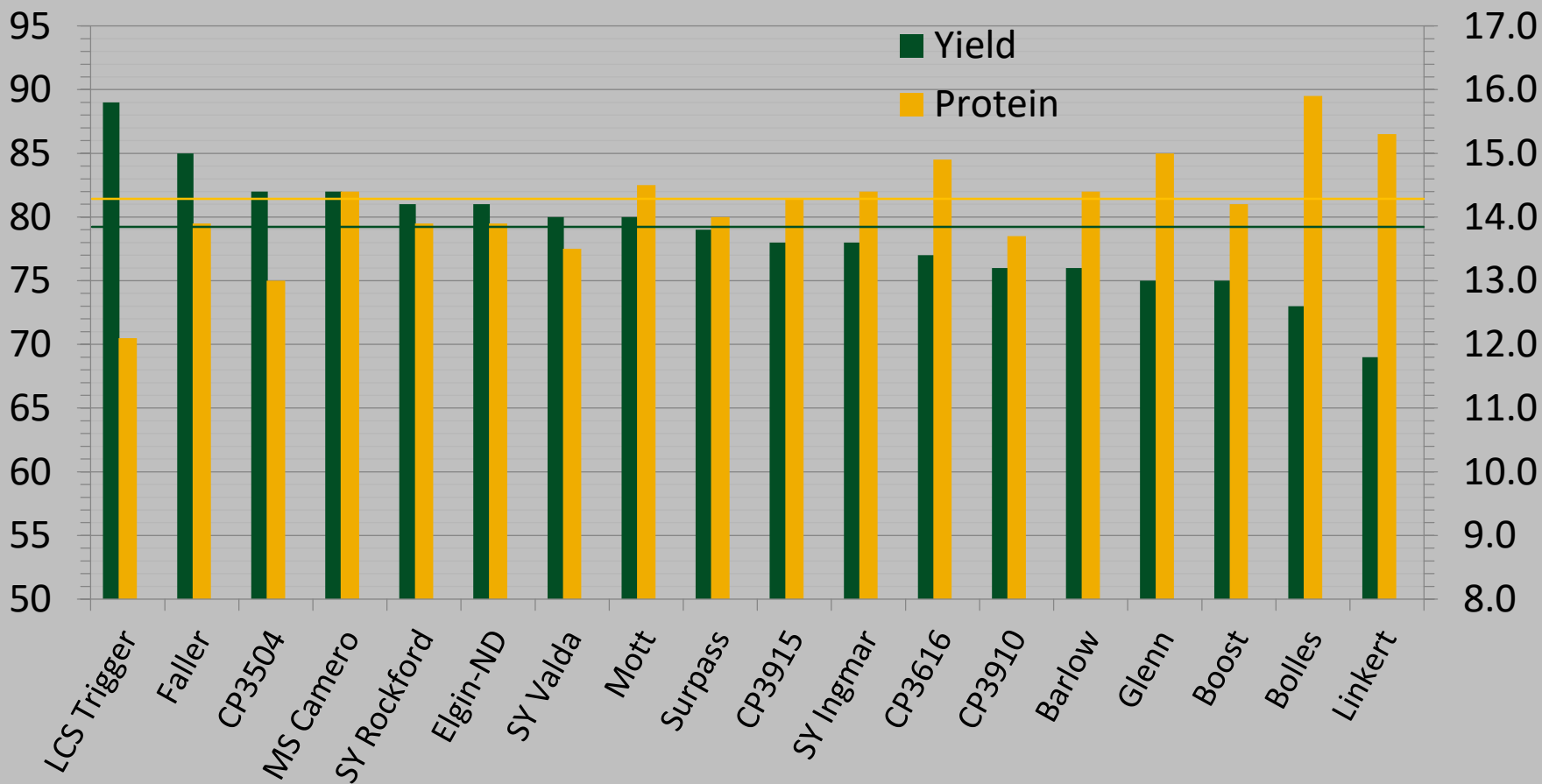
Varieties with protein and yield > mean, 5 locations means, LREC 2019



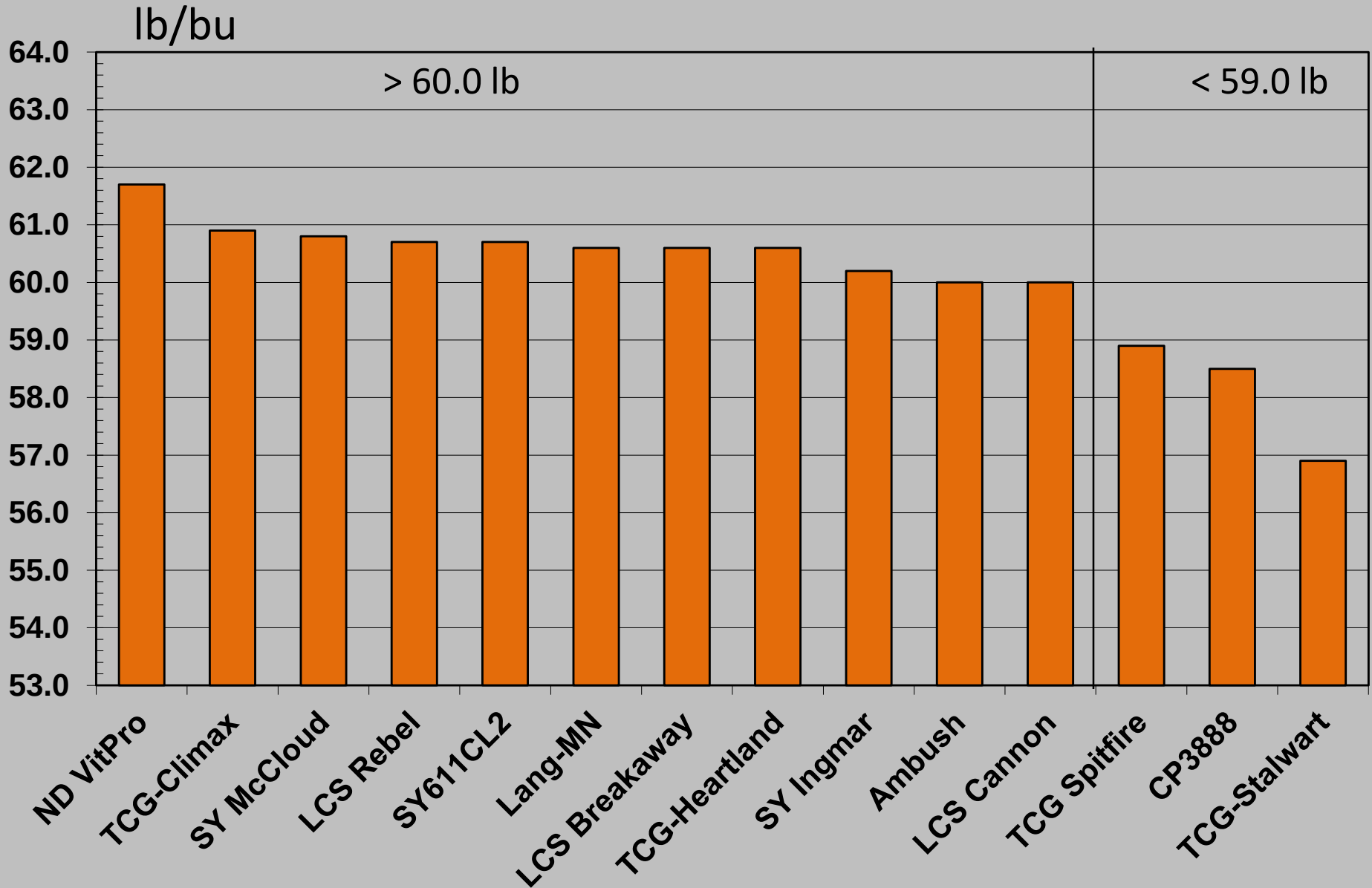
2yr (9 site) yield and protein averages for HRSW varieties at Langdon and off-station, 2018-2019.



Comparative yield of selected HRSW varieties at Langdon, 2019



2019 HRSW 5-site Test Weight



Days to Head - Langdon 2019

53-54	55	56	58	59	60-61
LCS Cannon	Barlow	SY Ingmar	Bolles	Boost	TCG-Climax
LSC Breakaway	Elgin-ND	Linkert	Shelly	TCG-Spitfire	LCS Trigger
Surpass	Glenn	SY Valda	SY Rockford		
MS Camaro	SY Soren	CP3616			
Ambush	MS Chevelle	Ballistic			
MS Barracuda	ND VitPro	TCG-Stalwart			
CP3910	LCS Rebel	Mott			
TCG-Heartland	SY McCloud	SY Longmire			
	SY611CL2	57			
	CP3888	Faller			
	CP3915	CP3530			
	CP3939	CP3504			
	Commander	MN-Washburn			

Plant Height (in) - Langdon 2019

27	28	29	30	31	32
LCS Breakaway	SY Ingmar	CP3504	Bolles	Faller	Barlow
SY Soren	Shelly	SY McCloud	CP3616	MS Chevelle	LCS Trigger
Linkert	SY611CL2	CP3888	TCG-Spitfire	Boost	33
SY Valda	MS Barracuda	LCS Cannon	Surpass	ND VitPro	Elgin-ND
MS Camaro	TCG-Heartland	CP3915	Ambush	LCS Rebel	Glenn
CP3910		MN-Washburn	CP3939	TCG-Climax	CP3530
		SY Longmire	Commander	SY Rockford	Lang-MN
			TCG-Stalwart		35
					Mott

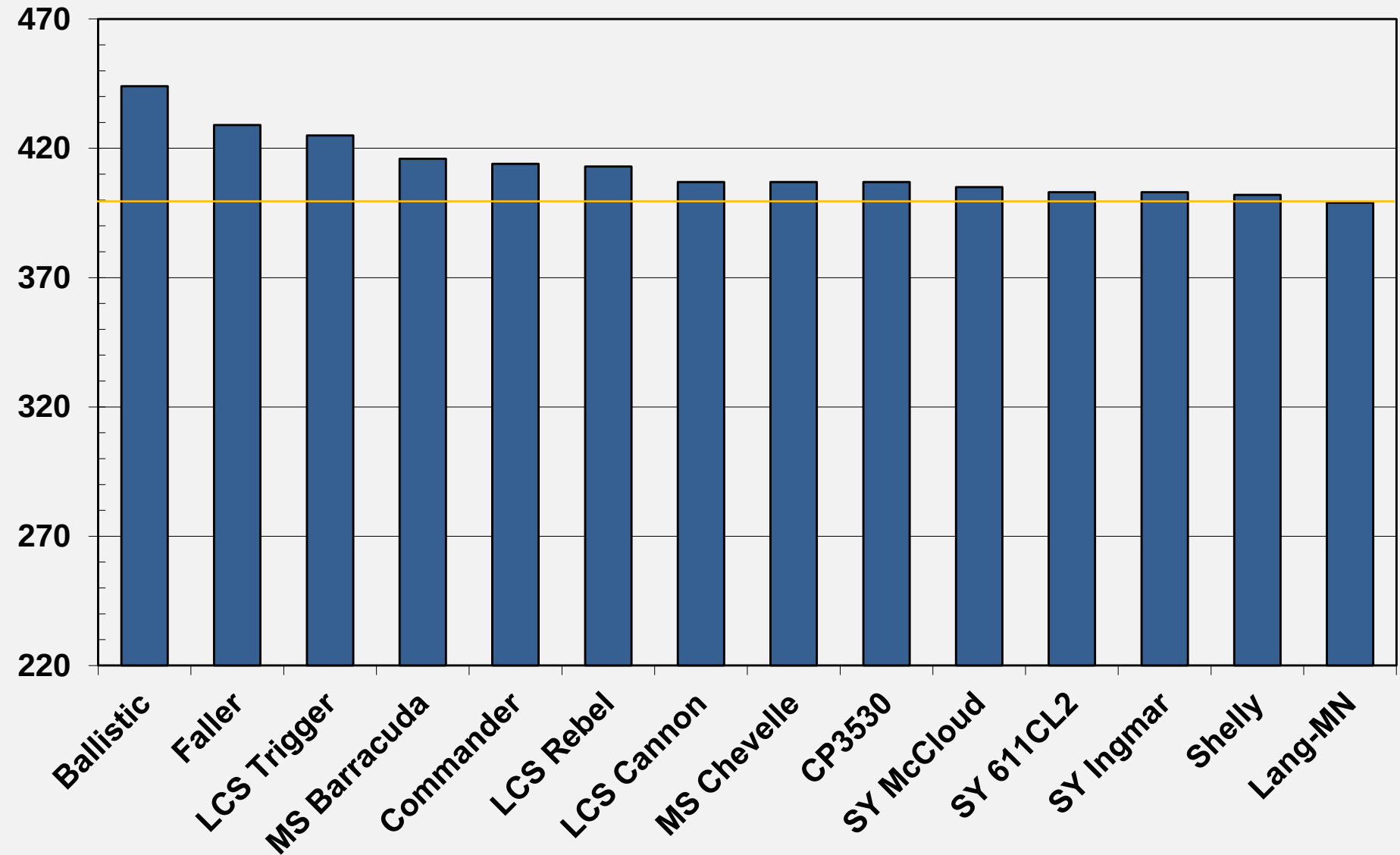
Straw Strength- Statewide

1=strongest, 9=weakest

2	3	4	5	5
Linkert	CP3504	Bolles	Ambush	SY611CL2
TCG-Climax	MN-Washburn	CP3616	Boost	SY Longmire
	Mott	CP3888	CP3530	TCG-Heartland
	MS Barracuda	CP3915	CP3910	
	ND VitPro	CP3939	Elgin-ND	6
	SY Ingmar	Glenn	Faller	Barlow
	SY Rockford	LCS Cannon	Lang-MN	Commander
	SY Soren	SY McCloud	LCS Breakaway	
		SY Valda	LCS Rebel	
		TCG-Spitfire	LCS Trigger	
		TCG-Stalwart	MS Camaro	
			MS Chevelle	
			Shelly	
			Surpass	

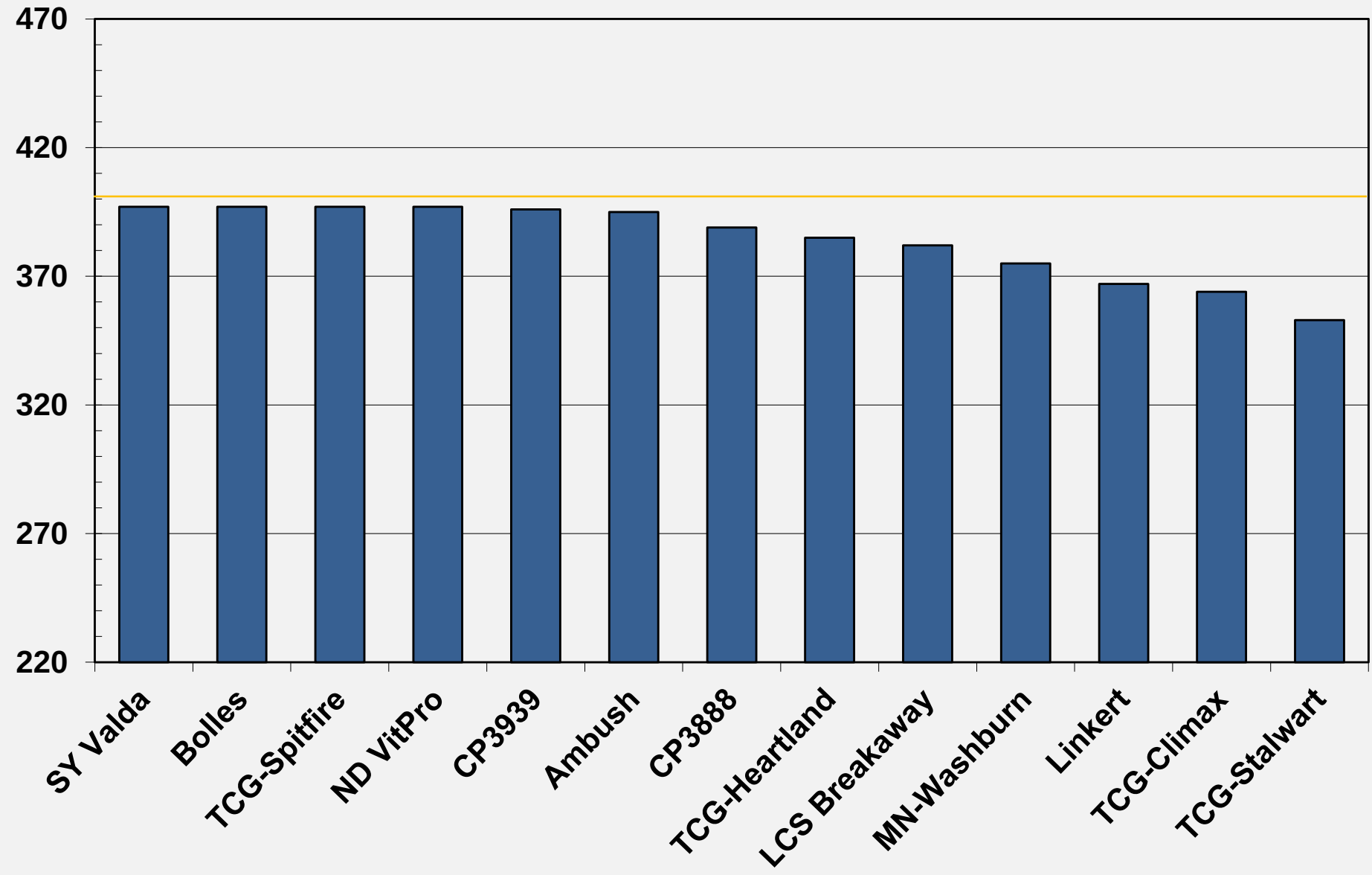
2019 HRSW 5-site - \$Return/a

Langdon Dec 9 quote. \$5.08/bu, protein discount/premium. \$0.03/fifth down to 11%. \$0.04/fifth up to 16%



2019 HRSW 5-site - \$Return/a

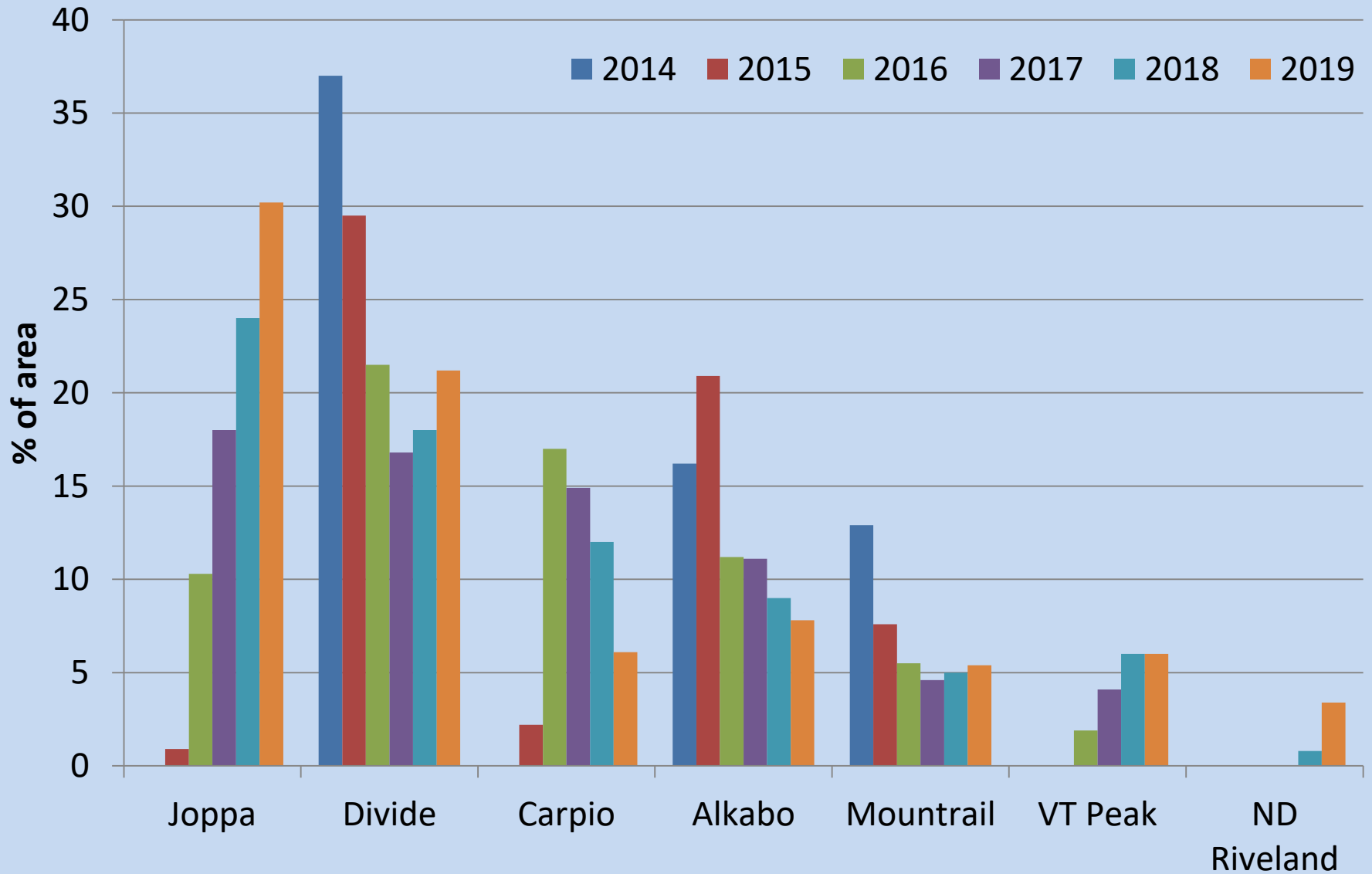
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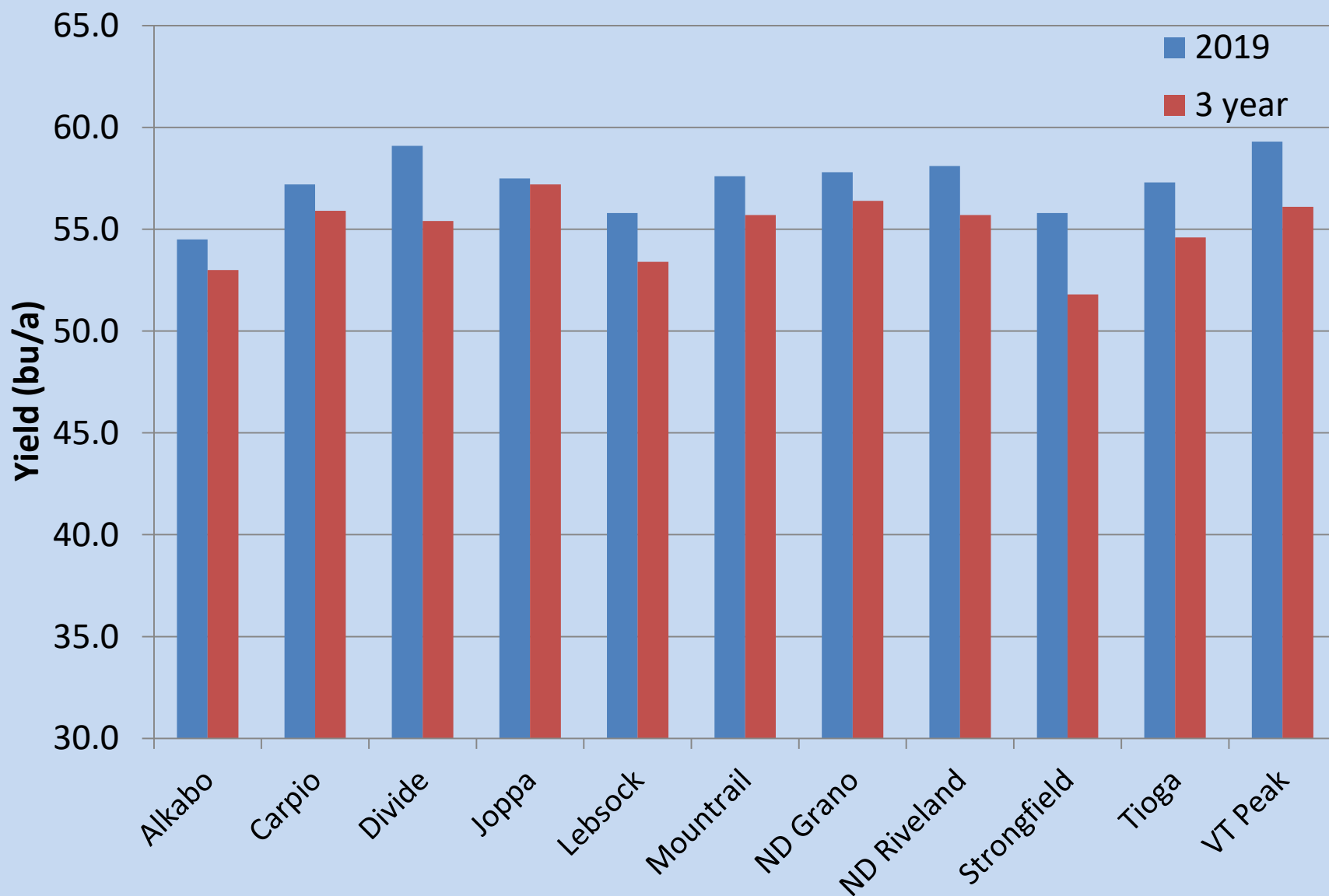
Durum



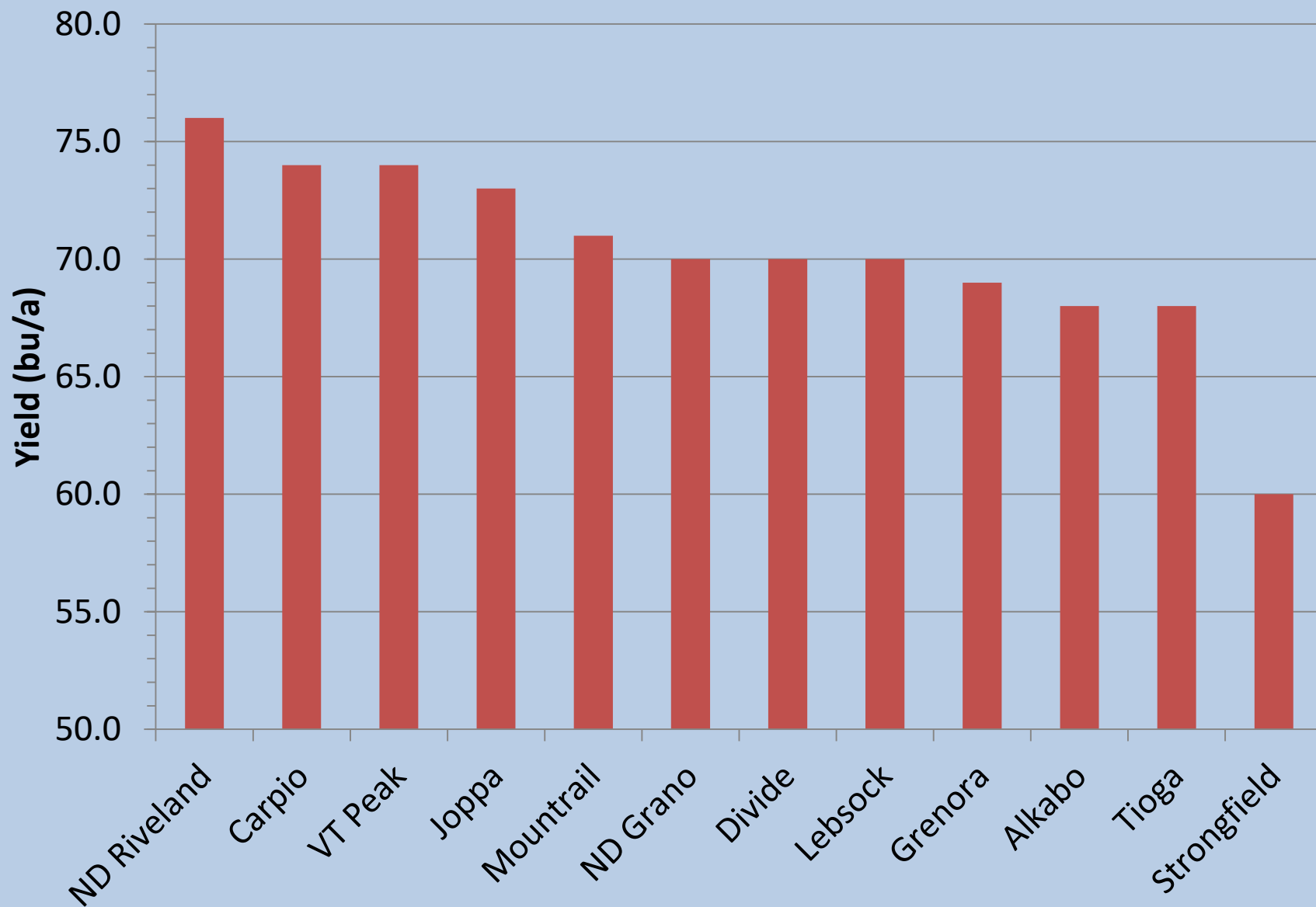
Durum varieties: % of area planted 2014-2019



Yield of durum varieties, average of six locations, 2019 and three year average.



Yield of durum varieties, 5yrs- Langdon REC



Barley



Barley Breeder Yield Trials at Osnabrock, ND

2019 Stats:

Area planted: 580,000

Average yield: 72 bu/acre

2018 Stats:

Area planted: 520,000

Average yield: 74 bu/acre

2017 stats:

Area planted: 520,000

Average yield: 63 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, CDC Meredith, and Explorer

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

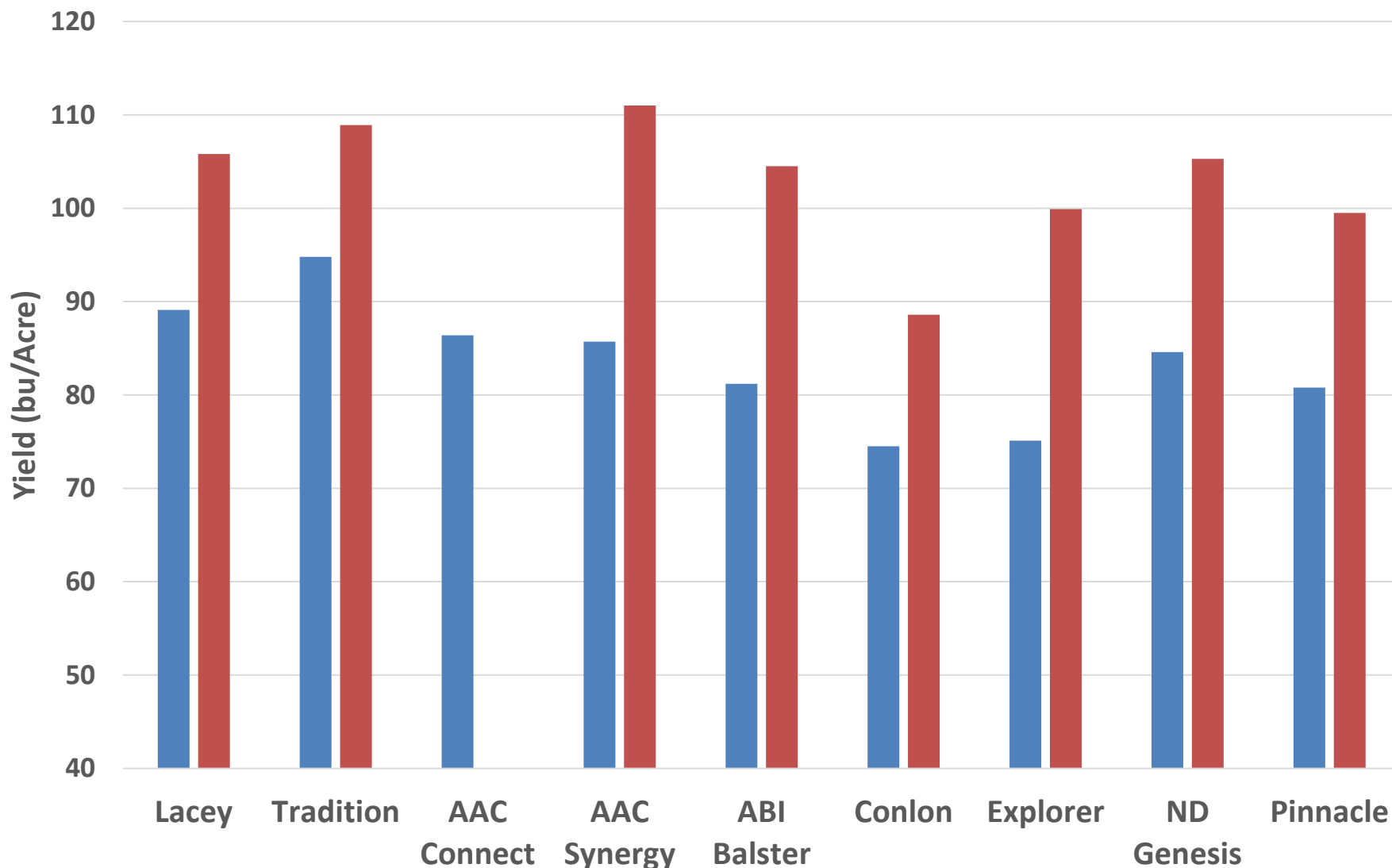
ND Genesis Yield

Seeding Rates – Langdon 2015-2016

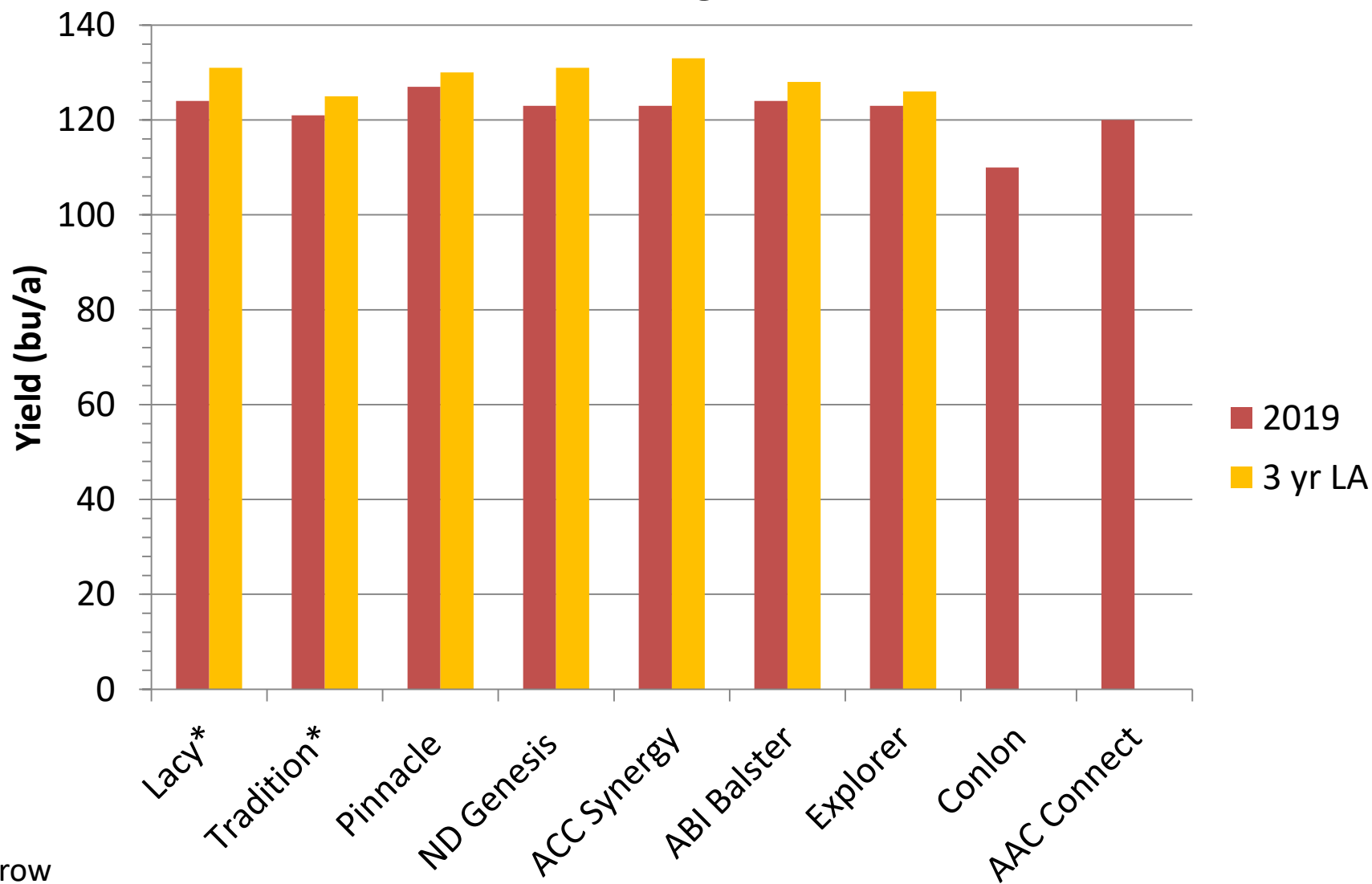
Seeding Rate million	Langdon 2015	Langdon 2016	Langdon 2 yr	LAN, MINOT CARR 6-site	LAN, MINOT CARR 11-site
0.5	115.1	103.0	109.0	101.6	93.7
0.75	120.8	107.8	114.3	108.9	99.4
1.0	122.1	108.7	115.4	108.0	99.0
1.25	125.4	104.6	115.0	108.6	100.8
1.50	125.1	107.6	116.4	108.7	
1.75	131.7	105.6	118.7	113.1	

Yield of malting barley varieties in eastern ND, 2019 and three year average.

■ 2019 ■ 3 yr



Yield of malting barley varieties 2019 and 3-yr average at Langdon



*6-row

Barley Straw Strength

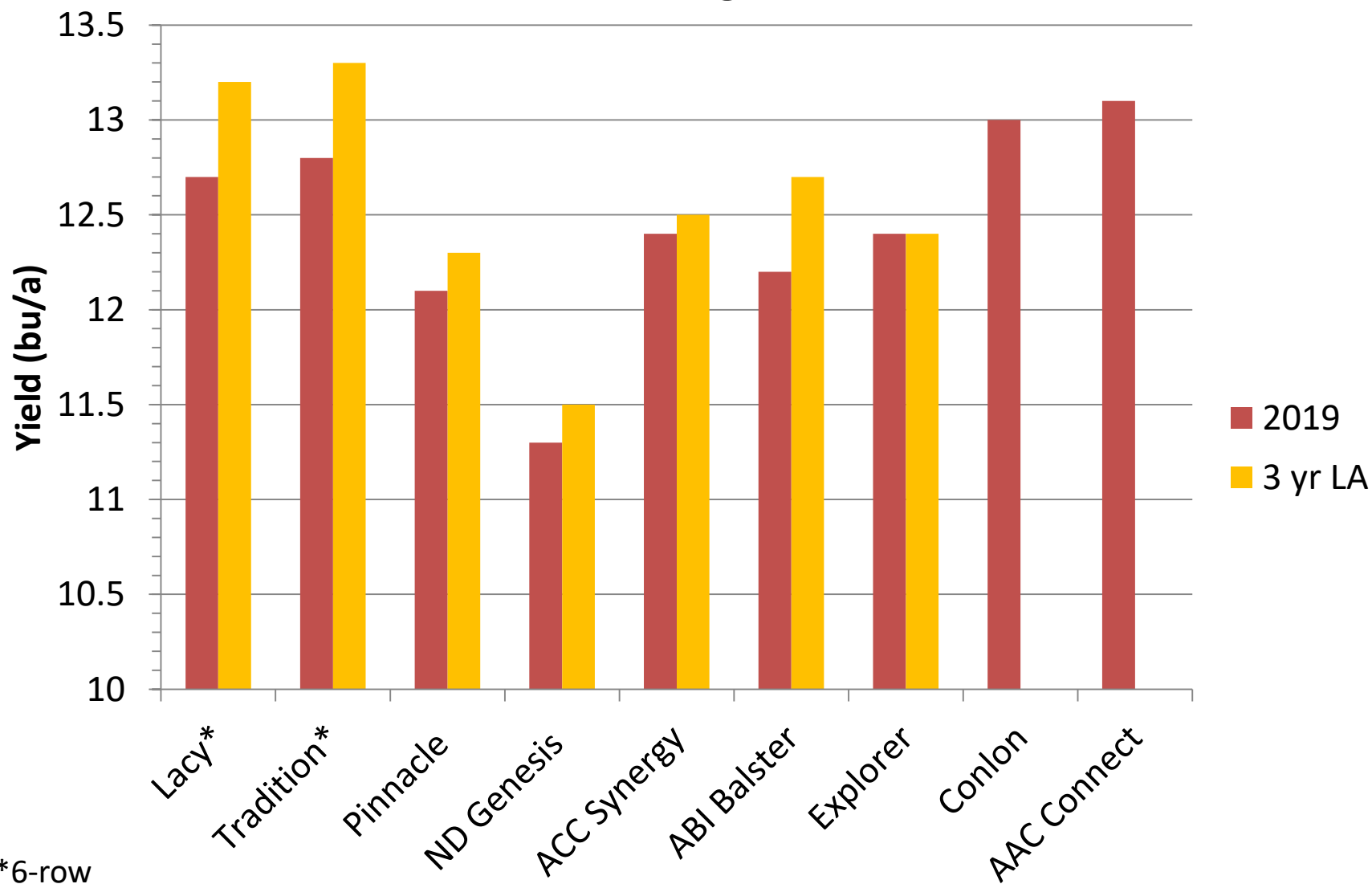
Days to Head

Six-row Varieties	Straw Strength	Days to Head
Lacey	4	55
Tradition	3	55

Straw Strength 1-9

Two-row Varieties	Straw Strength	Days to head
ND Genesis	5	57
Pinnacle	6	56
AAC Synergy	5	59
ABI Balster	6	59
Explorer	4	57
ACC Connect	3	58

Protein of malting barley varieties 2019 and 3-yr average at Langdon



*6-row



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