2021 Spring Wheat Variety Selection for Yield and Quality

Complete data tables at
https://www.maes.umn.edu/publications/field-crop-trials/2020trials

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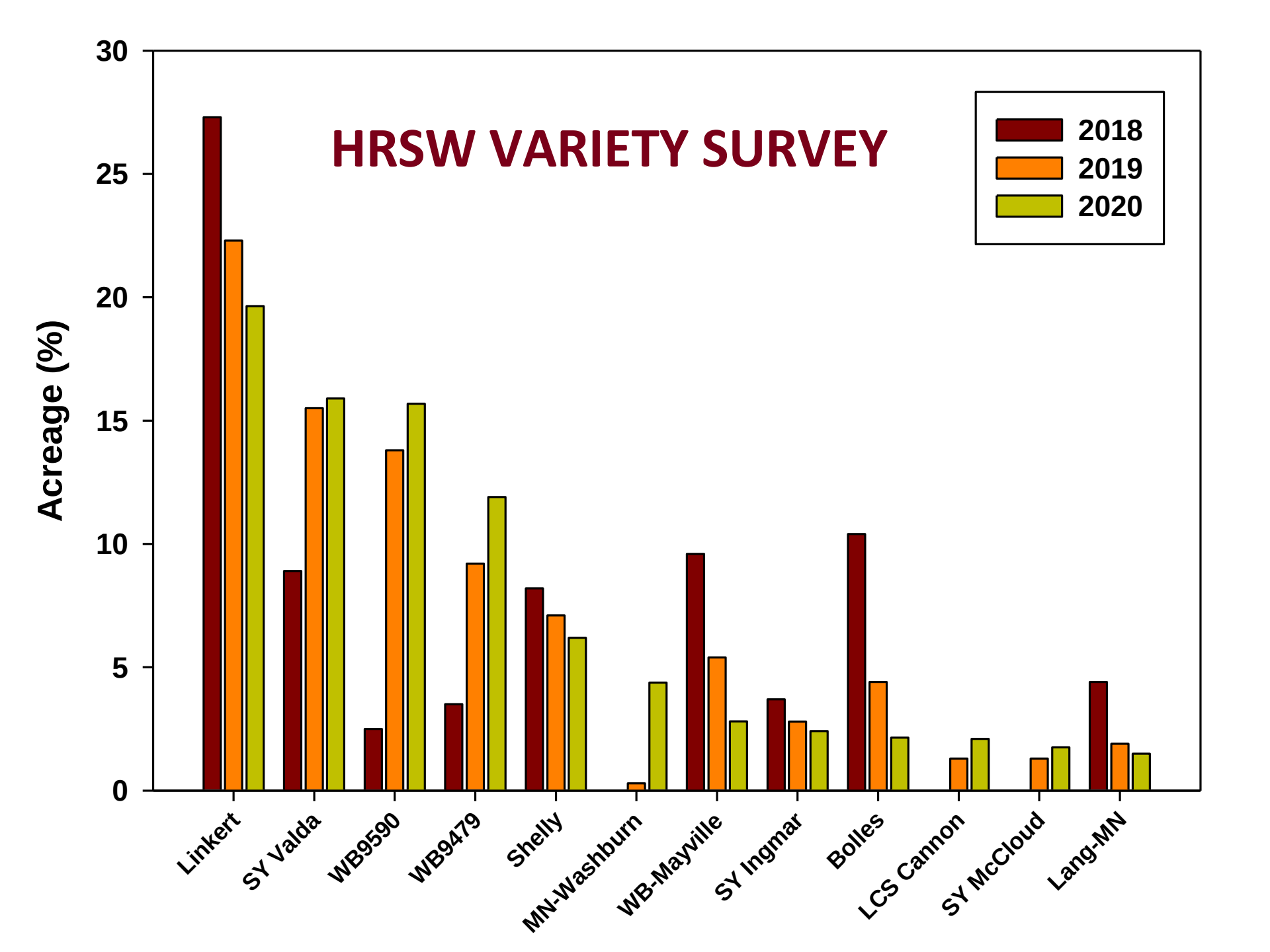
RECENT U OF M RELEASES

Variety	Year of Release	2020 MN Acreage (%)
Linkert	2013	19.6
Bolles	2015	2.1
Shelly	2016	6.2
Lang-MN	2017	1.5
MN-Washburn	2019	4.4
MN-Torgy	2020	0.6


HRSW VARIETY SURVEY
2018
2019
2020
Acreage (%)
30
25
20
15
10
5
0
Linkert
SY Valda
WB9590
WB9479
Shelly
MN-Washburn
WB-Mayville
SY Ingmar
Bolles
LCS Cannon
SY McCloud
Lang-MN

THE NEWEST STUFF (2020)

Variety	Breeder/Agent	Legal Status
AP Murdock	AgriPro/Syngenta	PVP (94) (pending)
CP3055	CROPLAN	PVP (94) (pending)
Driver	SDSU	PVP (94) (pending)
Dyna-Gro Velocity	Dyna-Gro	PVP (94)
LCS Buster	Limagrain Cereal Seeds	PVP (94) (pending)
MN-Torgy	MN	PVP (94) (pending)
MS Ranchero	Meridian Seeds	PVP (94) (pending)
ND Frohberg	NDSU	PVP (94) (pending)
TCG-Wildcat	21st Century Genetics	Patent pending

Yield (bu/A, Northern MN Locs.)

Variety	2020	2 Yr	3 Yr
LCS Trigger	88	89	91
LCS Buster	87	–	–
AP Murdock	81	83	–
MS Ranchero	80	–	–
WB9590	80	–	–
SY Valda	79	81	86
Dyna-Gro Ballistic	79	82	85
Prosper	80	80	85
Driver	78	–	–
Shelly	76	80	83
MN-Torgy	78	79	82
TCG-Wildcat	77	–	–
TCG-Spitfire	76	78	82
LCS Cannon	73	78	82
LCS Rebel	76	78	81
CP3055	76	–	–
SY 611 CL2	75	78	–
Dyna-Gro Commander	74	78	–
CP3915	73	77	–

Variety	2020	2 Yr	3 Yr
CP3910	71	77	–
MS Chevelle	73	76	81
Dyna-Gro Ambush	77	76	80
CP3530	75	77	80
Lang-MN	75	76	79
WB9479	74	–	–
MS Barracuda	70	74	79
SY Ingmar	73	75	78
TCG-Heartland	73	73	–
MN-Washburn	68	73	78
SY McCloud	72	73	77
CP3903	71	–	–
ND Frohberg	70	–	–
SY Longmire	68	73	–
Bolles	69	71	74
WB-Mayville	67	70	74
Rollag	69	70	73
Dyna-Gro Velocity	68	70	–
Linkert	67	69	73

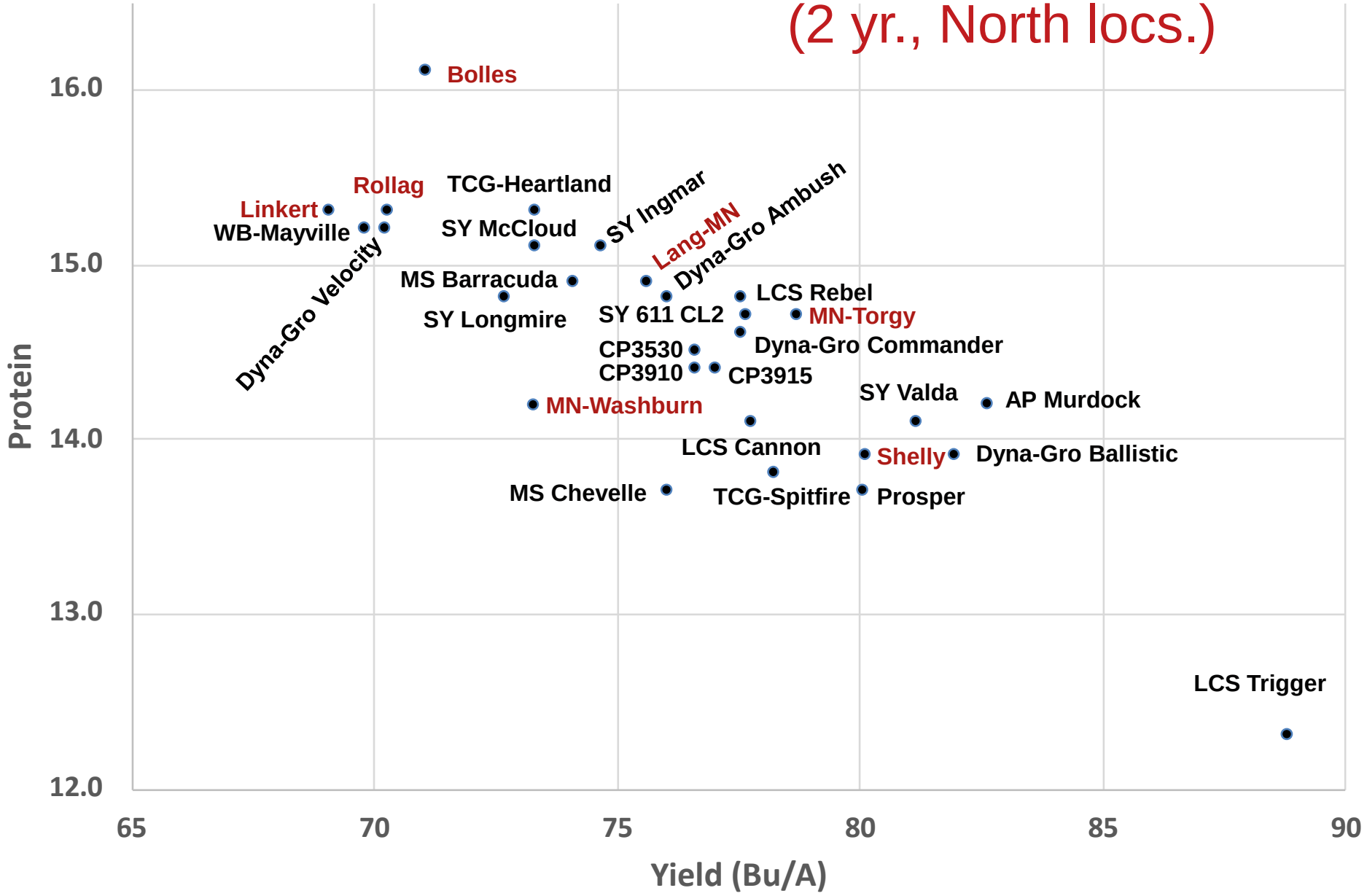
2019-2020 Releases are **bolded**

Protein (2020) & Baking Quality

Variety	Protein	Baking Qual.	Variety	Protein	Baking Qual.
Bolles	16.7	1	CP3530	15.2	3
WB9479	16.0	–	**ND Frohberg**	15.1	–
Dyna-Gro Velocity	15.9	–	**Dyna-Gro Commander**	15.0	–
TCG-Heartland	15.8	–	**CP3915**	14.9	–
Rollag	15.7	6	**CP3910**	14.9	–
WB-Mayville	15.7	2	**AP Murdock**	14.7	–
Linkert	15.7	1	SY Valda	14.7	6
SY McCloud	15.6	3	**MS Ranchero**	14.7	–
SY Ingmar	15.5	2	**Driver**	14.7	–
WB9590	15.5	–	**MN-Washburn**	14.7	3
TCG-Wildcat	15.4	–	LCS Cannon	14.6	4
SY Longmire	15.3	–	Shelly	14.3	5
MS Barracuda	15.3	4	Prosper	14.3	5
Lang-MN	15.3	3	MS Chevelle	14.2	5
SY 611 CL2	15.2	–	TCG-Spitfire	14.2	2
CP3903	15.2	–	Dyna-Gro Ballistic	14.1	5
Dyna-Gro Ambush	15.2	2	**CP3055**	13.1	–
LCS Rebel	15.2	3	LCS Trigger	12.8	7
MN-Torgy	15.2	4	**LCS Buster**	12.7	–

2019-2020 Releases are **bolded**

Protein vs. Grain Yield (2 yr., North locs.)



Linkert	2		LCS Cannon	4
CP3910	3		**MN-Torgy**	4
Dyna-Gro Velocity	3		**SY 611 CL2**	4
MN-Washburn	3		SY Ingmar	4
MS Barracuda	3		**SY Longmire**	4
Rollag	3		**SY McCloud**	4
TCG-Heartland	3		**CP3903**	4.5
TCG-Spitfire	3		**MS Ranchero**	5
TCG-Wildcat	3		**ND Frohberg**	4.5
WB-Mayville	3		**AP Murdock**	5
WB9479	3		CP3530	5
WB9590	3		Dyna-Gro Ballistic	5
CP3055	3.5		**LCS Buster**	5
Bolles	4		LCS Trigger	5
CP3915	4		MS Chevelle	5
Driver	4		Shelly	5
Dyna-Gro Ambush	4		SY Valda	5
Dyna-Gro Commander	4		LCS Rebel	6
Lang-MN	4		Prosper	6

STRAW STRENGTH

Varieties with 2 and 3 are strong

Varieties with 4 and 5 are classical HRSW and sufficient most years.

2019-2020 Releases are **bolded**

FHB

Lang-MN	3		**CP3903**	4.5
LCS Trigger	3		Dyna-Gro Ballistic	4.5
Rollag	3		**Dyna-Gro Commander**	5
Driver	3.5		**SY McCloud**	5
ND Frohberg	3.5		MS Barracuda	5
MN-Torgy	4		LCS Cannon	5
MS Ranchero	4		TCG-Spitfire	5
LCS Buster	4		MS Chevelle	5
MN-Washburn	4		Linkert	5
SY 611 CL2	4		**CP3055**	5.5
LCS Rebel	4		**Dyna-Gro Velocity**	6
Shelly	4		**CP3910**	6
Dyna-Gro Ambush	4		**AP Murdock**	7
Bolles	4		**TCG-Wildcat**	7
CP3530	4		**SY Longmire**	7
SY Valda	4		**TCG-Heartland**	7
SY Ingmar	4		WB9479	7
Prosper	4		WB9590	7
CP3915	4.5		WB-Mayville	8

- Caramba & Prosaro are reducing damage by ~70%; Miravis Ace is slightly better
- Optimum timing is still Feekes 10.51 (beginning of anthesis) but window has been opened up to F10.51 + 5 days)

2019-2020 Releases are **bolded**

Bacterial Leaf Streak (BLS)

CP3915	2		Bolles	4
LCS Trigger	2		CP3530	4
CP3903	2.5		Prosper	4
ND Frohberg	3		**SY McCloud**	5
MN-Torgy	3		**TCG-Heartland**	5
MN-Washburn	3		LCS Cannon	5
SY Longmire	3		Dyna-Gro Ambush	5
Dyna-Gro Ballistic	3		Linkert	5
Lang-MN	3		**Dyna-Gro Velocity**	6
LCS Rebel	3		**CP3910**	6
TCG-Spitfire	3		WB9479	6
SY Valda	3		WB9590	6
SY Ingmar	3		Shelly	6
Driver	3.5		MS Chevelle	6
LCS Buster	4		**MS Ranchero**	6.5
CP3055	4		**TCG-Wildcat**	6.5
AP Murdock	4		MS Barracuda	7
Dyna-Gro Commander	4		WB-Mayville	7
SY 611 CL2	4		Rollag	7

- No other control options
- Varieties rated 2-3 have shown minimal damage, but there is variation due to environment

2019-2020 Releases are **bolded**

Preharvest Sprouting (PHS)

AP Murdock	1		**SY McCloud***	2
Bolles	1		SY Valda	2
CP3530	1		**TCG-Heartland**	2
CP3915	1		WB9479	2
Dyna-Gro Commander	1		WB9590	2
Lang-MN	1		**CP3055**	2.5
Linkert	1		**CP3903**	2.5
MN-Torgy	1		**Driver**	2.5
MN-Washburn	1		Dyna-Gro Ambush*	3
Prosper	1		Dyna-Gro Ballistic*	3
Rollag	1		LCS Cannon*	3
Shelly	1		MS Barracuda	3
TCG-Wildcat	1		TCG-Spitfire*	3
CP3910*	2		WB-Mayville*	3
Dyna-Gro Velocity	2		MS Chevelle	4
LCS Trigger	2		**MS Ranchero**	4
SY 611 CL2*	2		**ND Frohberg**	4
SY Ingmar	2		**LCS Buster**	5
SY Longmire*	2		LCS Rebel	5

- Many locations suffered damage due to PHS and/or Low Falling Number
- Ratings of 1-2 considered most resistant, 3 and higher more susceptible
- Susceptibility to PHS correlates with Low Falling Number

* These varieties had lower than expected falling numbers based on their rating.

2019-2020 Releases are **bolded**

PICKS

(nothing >5 FHB or BLS; >2 PHS)

VARIETY	PLUSES	MINUSES
Dyna-Gro Commander	Yield (south)	FHB (5)
Lang-MN (0.7X)	Balanced, BLS, FHB	Lodging (less likely at lower seed rate)
LCS Trigger	Yield	Protein, Quality, Ldg (5)
Linkert	Straw Strength	FHB (5)
MN-Torgy	Yield, BLS, FHB	
MN-Washburn	Balanced, BLS, FHB	
SY Ingmar	Balanced, BLS, FHB	
SY Valda	Yield, BLS, FHB	Quality, Ldg (5)

Variety Candidate MN15005-4

MN15005-4 (pedigree Prosper/MN08301-6//Norden) is under seed increase in California during 2020-2021. It has a good combination of yield and protein and has straw strength comparable to Linkert which is the main reason for its 5-yr. reign as the most popular variety in MN.

			Grain Yield					Straw	Test Wt	Protein	Baking		Leaf	Stripe	Bacterial	
	Release	% of MN	(% of mean)			HD	HT	Str.	(lbs/bu)	(%)	Quality	PHS	Rust	Rust	Leaf Str.	Scab
Variety	Yr.	Acreage	2020	2 Yr	3 Yr	d	in.	1–9	2020	2020	1–9	1–9	1–9	1–9	1–9	1–9
SY Valda	2015	15.9	104	106	107	57.6	27.5	5	60.2	14.7	6	2	1	2	3	4
MN15005-4	**–**	**–**	**104**	**104**	**104**	**59.3**	**26.0**	**2.5**	**59.7**	**14.9**	**5**	**2**	**2**	**–**	**5**	**5**
MN-Torgy	2020	–	104	104	104	57.6	27.8	4	60.0	15.2	4	1	3	–	3	4
Shelly	2016	6.2	103	104	104	58.5	26.3	5	59.5	14.3	5	1	3	1	6	4
LCS Cannon	2018	2.1	102	104	104	53.3	26.7	4	60.8	14.6	4	3*	3	–	5	5
Lang-MN	2018	1.5	99	100	100	58.6	28.9	4	60.3	15.3	3	1	1	–	3	3
SY Ingmar	2014	2.4	96	97	98	58.5	27.9	4	60.0	15.5	2	2	2	2	3	4
MN-Washburn	2019	4.4	93	97	98	59.0	27.2	3	59.7	14.7	3	1	1	2	3	4
SY McCloud	2019	1.8	95	95	96	56.4	28.3	4	60.9	15.6	3	2*	3	–	5	5
WB-Mayville	2011	2.8	93	95	95	56.0	25.5	3	60.2	15.7	2	3*	3	3	7	8
Bolles	2015	2.2	94	94	93	59.5	30.0	4	58.9	16.7	1	1	2	1	4	4
Linkert	2013	19.6	91	91	91	57.1	26.4	2	60.3	15.7	1	1	3	1	5	5
WB9590	2017	15.7	105	–	–	55.7	25.3	3	59.9	15.5	–	2	6	–	6	7
WB9479	2017	11.9	96	–	–	56.1	25.3	3	60.4	16.0	–	2	6	–	6	7

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  - Minnesota Wheat Research & Promotion Council
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  - U.S. Wheat & Barley Scab Initiative
  - USDA-NIFA WheatCAP
- University of Minnesota
  - Minnesota Agricultural Experiment Station
  - MN Small Grains Initiative

Complete data tables at
https://www.maes.umn.edu/publications/field-crop-trials/2020trials

Wheat Variety and Sourdough Product Analysis for Anti-Nutrient Levels Related to Digestibility

Project Partners:

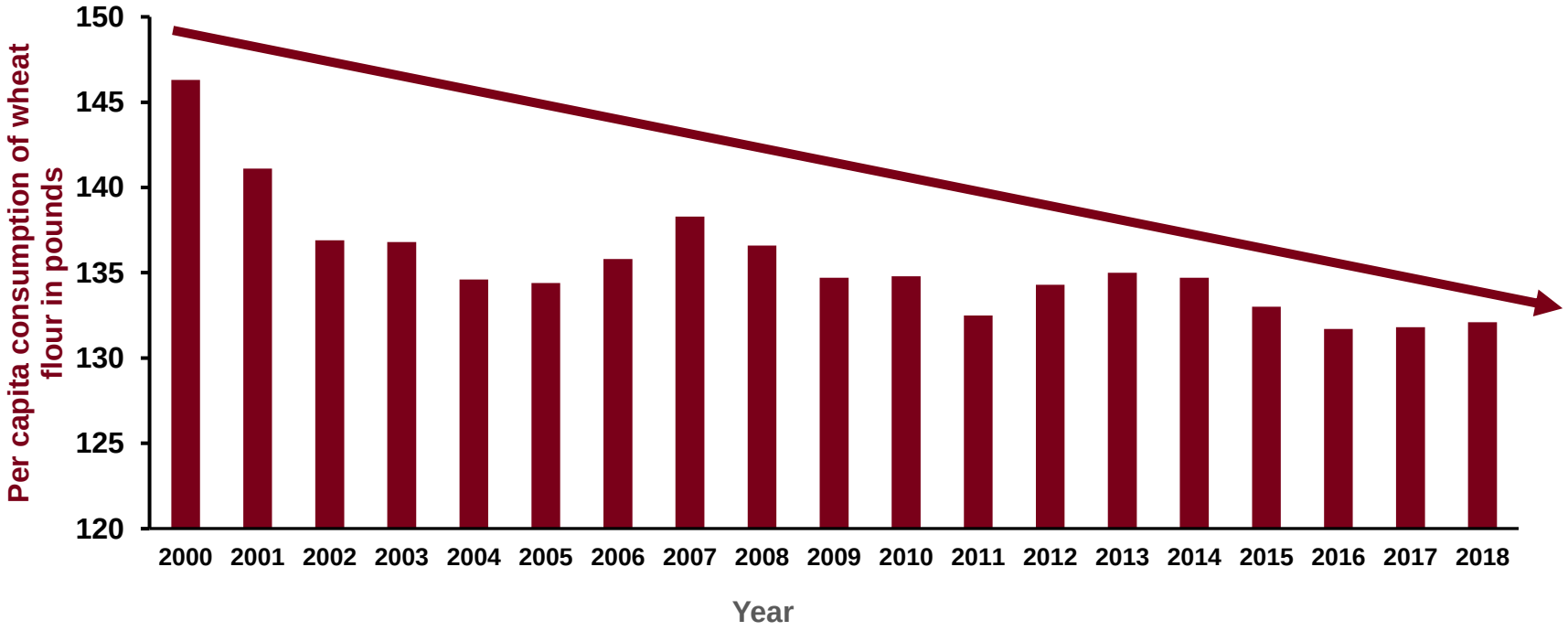
DEPARTMENT OF AGRICULTURE

MINNESOTA WHEAT
RESEARCH & PROMOTION COUNCIL

UNIVERSITY OF MINNESOTA

Agricultural Utilization Research Institute
auri

Per Capita Wheat Consumption in the U.S.



Source: US Department of Agriculture; Economic Research Service: Conducted by the Economic Research Service; US Department of Agriculture Survey period: 2000 to 2018

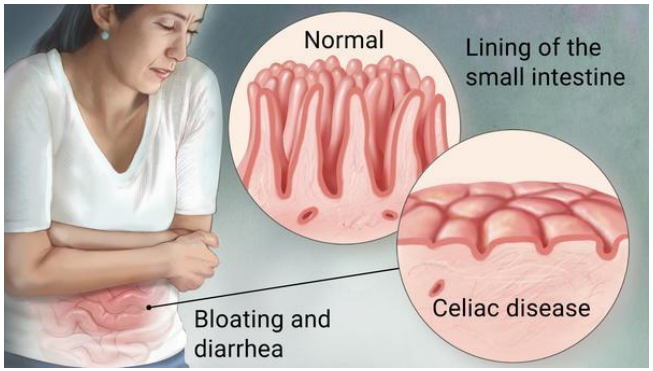
Why the Decline in Wheat Consumption?

Avoidance of Gluten and/or Wheat

- Gluten is a protein found in the grain of wheat, rye, and barley

- **Celiac disease**
  - Celiac disease is an immune disease in which people can't eat gluten because it will damage their small intestine
  - ~1% of Americans have celiac.
- **Wheat Allergy**
- **Non allergy-non-celiac wheat sensitivity**

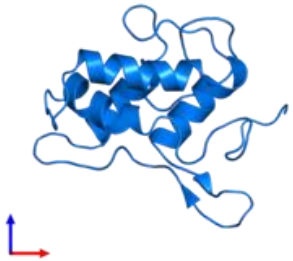
https://www.drperlmutter.com/yes-gluten-sensitivity-is-very-real/



https://support.google.com/websearch/answer/2364942?p=medical_conditions&hl=en

Possible Causes of Non Allergy-non-Celiac Wheat Sensitivity?

- FODMAPS -Fermentable Oligo-, Di- and Monosaccharides and Polyols
  - Fructose, lactose, fructo- and galactooligosaccharides (fructans, and galactans)
  - Polyols (such as sorbitol, mannitol, xylitol and maltitol)
- ATI - Amylase Trypsin inhibitors



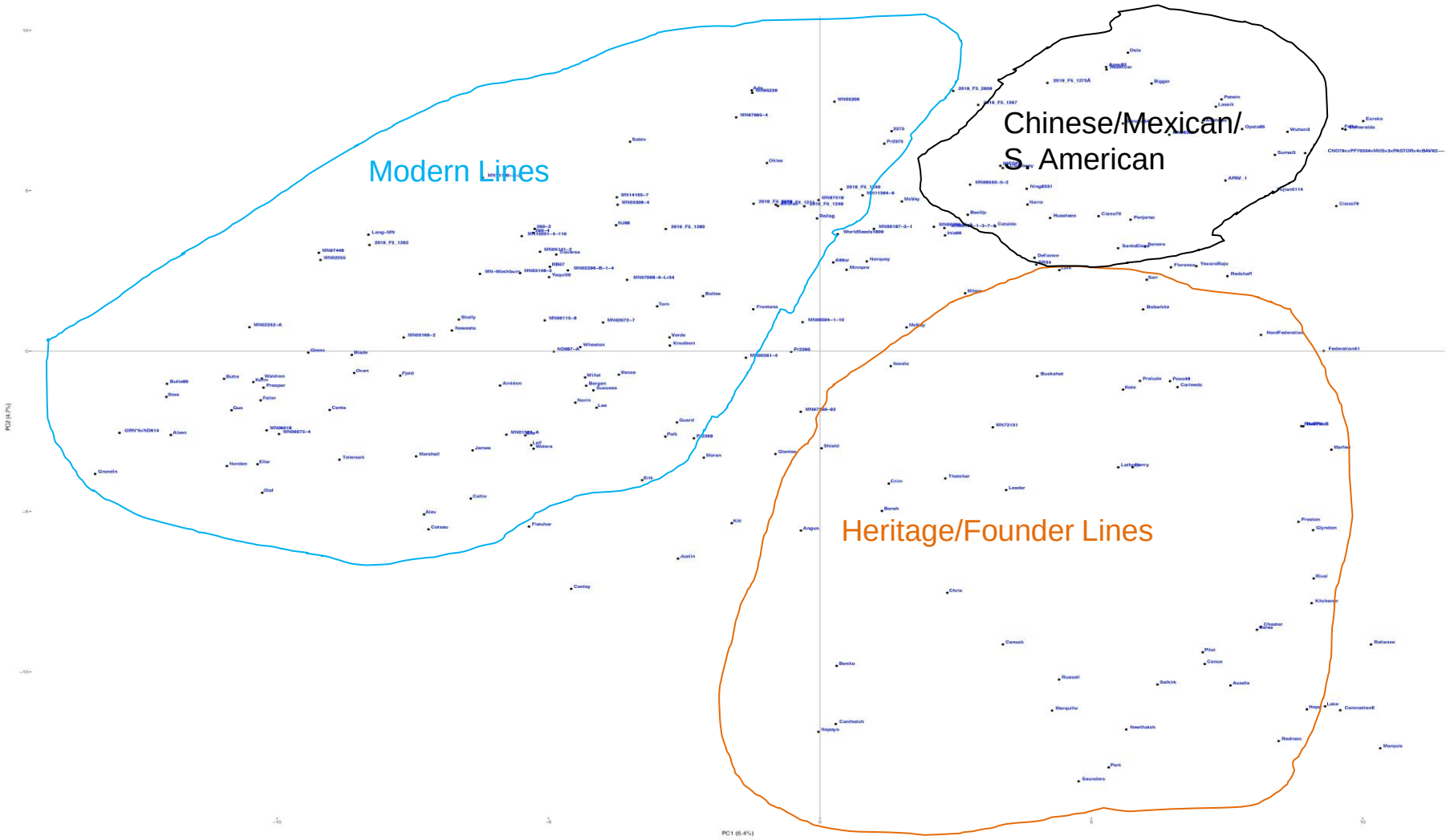
https://enjoylifefoods.com/blogs/content/about-fodmap-friendly-living-enjoy-life-products

Specific Objectives

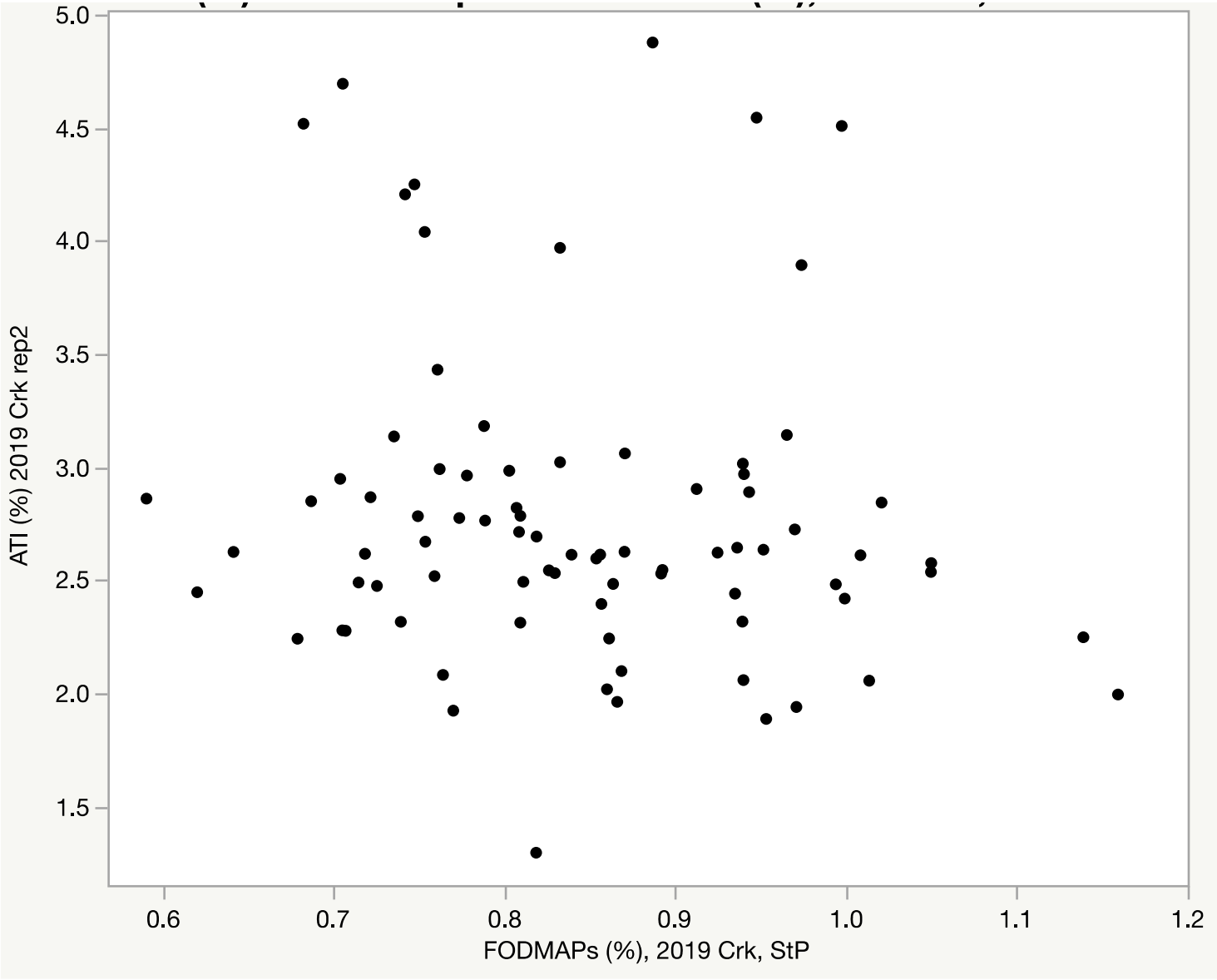
- Characterize variation and identify genetic markers for **FODMAPs** and **ATI** activity in ancient, heritage and modern wheat varieties
- Explore the use of fermentation as a technique to reduce FODMAPs and ATI activity in wheat food products
- Establish a pathway to implement research outcomes to industry.

Genetic Diversity of 190 FODMAP bread wheat panel lines

- Excludes durums, emmers, and synthetic hexaploids



FODMAP & ATI Levels in 111 Wheat Varieties



Preliminary findings summary

- Genetically diverse set of wheat lines being analyzed
- Wide differences in FODMAPs and ATIs
- No identifiable patterns regarding FODMAP or ATI levels vs. year of release, but ATI is correlated with protein content
- No genomic region is responsible for a large portion of the genetic variation for these traits

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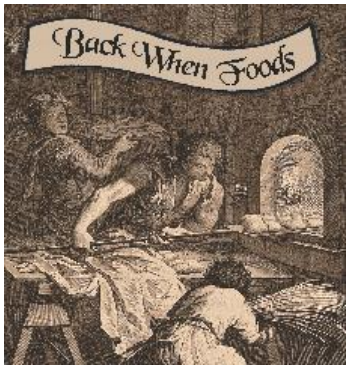

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