NORTHERN PLAINS
SEED GUIDE

2023

LCS

Hard Red
Spring Wheat

Limagrain

Hi everyone!

In the short time I've been on the LCS team, I've had the pleasure of meeting and strategizing with so many excellent farmers, seed dealers, ag retailers and agronomists. For those of you I haven't met (yet), I'm just a phone call or email away, and I look forward to connecting.

This hard red spring wheat guide represents cutting-edge work by our breeding team to bring you the best genetics on the market. Inside, you'll find proven performers and exciting new varieties, including our first-ever CoAXium® spring wheat. I'm here to help you find the right varieties for your wheat acres and answer questions anytime.

Nick Shores
Regional Commercial Manager

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Visit us 24/7

LimagrainCerealSeeds.com is home to the best wheat genetics in the Central Plains. Stop by anytime to find your next high-performance variety, get the most up-to-date data and contact your local seed dealer.

Bred to thrive

Agronomic, disease resistance and quality scores in this guide are based on the most recent data available at the time of publication, April 2023. Visit **LimagrainCerealSeeds.com** year-round to see the latest trial data.

Rocketing to market first

- **Very early** maturity
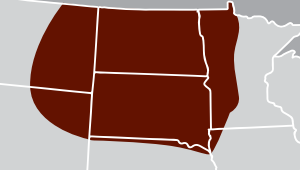- **Superior** disease package
- **Yield-protein** balance
- **Builds on success** of LCS Cannon

HARD RED SPRING WHEAT
LCS Boom

ADAPTATION

YIELD

	BU/AC ◆ LCS Boom ◇ Trial Avg.	MEAN ▶	
2022 SDSU Eastern	**44.6** / 44.8		**100%** of mean
2022 SDSU Western	**52.1** / 50.3		**104%** of mean
2021 LCS Trials	**49.0** / 44.0		**111%** of mean
2022 LCS Trials	**52.0** / 50.6		**103%** of mean

PROTEIN

	Protein % ◆ LCS Boom ◇ Trial Avg.	MEAN ▶	
2022 LCS Trials	**14.8** / 14.7		**101%** of mean
2022 SDSU State	**15.4** / 15.2		**101%** of mean

AGRONOMIC FEATURES

	LCS Boom	Bolles	SY Ingmar	Vida	WB Gunnison
Test Weight	62.1	59.3	61.5	60.7	61.8
Heading (days from planting)	58.1	59.4	59.0	59.1	62.9
Plant Height (inches)	24.6	25.3	24.3	25.9	29.6
Straw Strength	Very Good	Good	Good	Very Good	Good

All available public and private data used in compiling scores

DISEASE RESISTANCE

7–9: Susceptible | 4–6: Intermediate | 1–3: Resistant

	Score
Fusarium Head Blight	3
Bacterial Leaf Streak	4
Tan Spot	3
Stripe Rust	3
Stem Rust	3
Leaf Rust	4

All available public and private data used in compiling scores

END-USE QUALITY

Overall Quality	Baking Quality	Flour Protein	Milling Quality
Most Desirable	Desirable	Most Desirable	Desirable

Data obtained from LCS Quality Laboratory

Take your yield to new heights

Top-end yield
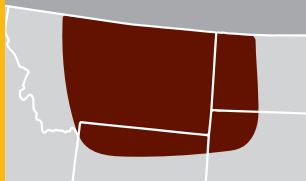
High test weight

Excellent disease package

Beautiful look

ADAPTATION

HARD RED SPRING WHEAT

LCS Ascent

YIELD

	BU/AC	◆ LCS Ascent ◇ Trial Avg.	MEAN ▶	
2022 UMN North	**91.3** 88.4			**103%** of mean
2022 UMN South	**61.7** 58.7			**105%** of mean
2-Year MSU Rain-Fed	**44.1** 42.2			**105%** of mean
2-Year MSU Irrigated	**86.5** 82.2			**105%** of mean
2022 SDSU Eastern	**45.6** 44.8			**102%** of mean
2022 SDSU Western	**52.3** 50.3			**104%** of mean

PROTEIN

	Protein %	◆ LCS Ascent ◇ Trial Avg.	MEAN ▶	
2022 NDSU State	**13.1** 13.7			**96%** of mean
2022 SDSU Eastern	**15.5** 16.0			**97%** of mean
2022 SDSU Western	**14.2** 14.6			**97%** of mean
2-Year MSU State	**14.3** 14.9			**96%** of mean
2022 UMN State	**14.6** 14.9			**98%** of mean

AGRONOMIC FEATURES

	LCS Ascent	ND Frohberg	Duclair	AP Smith	WB Gunnison
Test Weight	61.7	59.8	58.0	59.1	61.3
Heading (days from planting)	46.0	49.5	60.0	50.0	61.0
Plant Height (inches)	30.0	28.7	27.6	28.0	26.5
Straw Strength	Very Good	Average	Good	Excellent	Good

All available public and private data used in compiling scores

DISEASE RESISTANCE

	7–9: Susceptible	4–6: Intermediate	1–3: Resistant
Fusarium Head Blight		4	
Bacterial Leaf Streak		6	
Tan Spot		5	
Stripe Rust		5	
Stem Rust		4	
Leaf Rust		4	

All available public and private data used in compiling scores

END-USE QUALITY

Overall Quality	Baking Quality	Flour Protein	Milling Quality
Desirable	Acceptable	Acceptable	Desirable

Data obtained from LCS Quality Laboratory

Why not have both?

- **Yield** AND protein
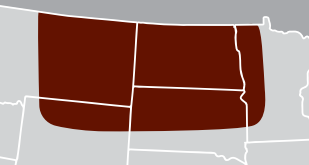- **Widely** adapted
- **Excellent** disease package
- **Exceptional** straw

HARD RED SPRING WHEAT
LCS Dual

ADAPTATION

YIELD

BU/AC	◆ LCS Dual ◇ Trial Avg.	MEAN ▶
2022 UMN North	**88.5** / 88.4	**100%** of mean
2022 UMN South	**62.6** / 58.7	**107%** of mean
2022 MSU Rain-Fed	**45.4** / 45.6	**100%** of mean
2022 MSU Irrigated	**91.3** / 82.4	**111%** of mean
2022 SDSU Eastern	**44.2** / 44.8	**99%** of mean
2022 SDSU Western	**49.9** / 50.3	**99%** of mean

PROTEIN

Protein %	◆ LCS Dual ◇ Trial Avg.	MEAN ▶
2022 NDSU State	**13.3** / 13.7	**97%** of mean
2022 SDSU Eastern	**15.6** / 16.0	**98%** of mean
2022 SDSU Western	**13.8** / 14.6	**95%** of mean
2022 MSU State	**13.9** / 14.6	**95%** of mean
2022 UMN State	**14.6** / 14.9	**98%** of mean

AGRONOMIC FEATURES

	LCS Dual	MS Ranchero	Duclair	AP Murdock	Vida
Test Weight	61.4	59.8	58.0	61.7	60.5
Heading (days from planting)	48.0	53.0	60.0	49.0	61.0
Plant Height (inches)	30.0	32.0	27.6	28.0	28.0
Straw Strength	Very Good	Average	Good	Good	Good

All available public and private data used in compiling scores

DISEASE RESISTANCE

	7-9: Susceptible	4-6: Intermediate	1-3: Resistant
Fusarium Head Blight		5	
Bacterial Leaf Streak		5	
Tan Spot		4	
Stripe Rust		4	
Stem Rust			2
Leaf Rust		4	

All available public and private data used in compiling scores

END-USE QUALITY

Overall Quality	Baking Quality	Flour Protein	Milling Quality
Acceptable	Less Desirable	Acceptable	Acceptable

Data obtained from LCS Quality Laboratory

Bin-busting yield

- **Trial-topping** yield
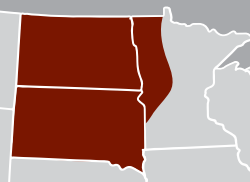- **Improved protein** over LCS Trigger
- **Very strong** straw
- **Good tolerance** to head scab

HARD RED SPRING WHEAT
LCS Buster

ADAPTATION

YIELD

	BU/AC	◆ LCS Buster ◆ Trial Avg.	MEAN ▶	
2-Year NDSU Eastern	**75.3** / 70.1			**107%** of mean
2-Year NDSU Western	**64.4** / 57.7			**112%** of mean
3-Year UMN North	**85.5** / 80.3			**106%** of mean
3-Year UMN South	**60.4** / 56.8			**106%** of mean
3-Year SDSU Eastern	**58.6** / 54.2			**108%** of mean
3-Year SDSU Western	**47.6** / 46.4			**103%** of mean

PROTEIN

	Protein %	◆ LCS Buster ◆ Trial Avg.	MEAN ▶	
2022 NDSU State	**11.8** / 13.7			**86%** of mean
3-Year SDSU Eastern	**13.8** / 15.2			**91%** of mean
3-Year SDSU Western	**14.9** / 15.5			**96%** of mean
2-Year UMN State	**12.7** / 14.8			**86%** of mean
2022 LCS Trials	**13.3** / 14.7			**90%** of mean

AGRONOMIC FEATURES

	LCS Buster	SY Ingmar	Duclair	Bolles	WB 9668
Test Weight	60.8	61.5	61.2	59.3	60.6
Heading (days from planting)	50.0	49.7	46.2	49.3	46.0
Plant Height (inches)	24.4	24.3	25.9	25.3	22.3
Straw Strength	Very Good	Very Good	Very Good	Very Good	Very Good

All available public and private data used in compiling scores

DISEASE RESISTANCE

7-9: Susceptible | 4-6: Intermediate | 1-3: Resistant

Fusarium Head Blight	3
Bacterial Leaf Streak	4
Tan Spot	3
Stripe Rust	3
Stem Rust	2
Leaf Rust	3

All available public and private data used in compiling scores

END-USE QUALITY

Overall Quality	Baking Quality	Flour Protein	Milling Quality
Acceptable	Acceptable	Less Desirable	Acceptable

Data obtained from LCS Quality Laboratory

Bring the yield ... boom!

- **Winner,** National Wheat Yield Contest for 2 years running in SD
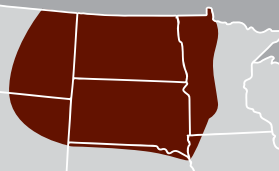- **Excellent protein** consistent
- **Very early maturity** quick emergence
- **Strong straw** and test weight

HARD RED SPRING WHEAT
LCS Cannon

ADAPTATION

YIELD

	BU/AC ◆ LCS Cannon ◇ Trial Avg.	MEAN ▶	
3-Year UMN North	80.1 / 80.3		100% of mean
3-Year UMN South	58.1 / 56.8		102% of mean
3-Year SDSU Eastern	52.6 / 54.2		97% of mean
3-Year SDSU Western	49.8 / 46.4		107% of mean
2-Year NDSU Eastern	72.6 / 70.1		104% of mean
3-Year NDSU Western	41.6 / 42.8		97% of mean

PROTEIN

	Protein % ◆ LCS Cannon ◇ Trial Avg.	MEAN ▶	
2022 NDSU State	13.9 / 13.7		101% of mean
3-Year SDSU Eastern	15.3 / 15.2		101% of mean
3-Year SDSU Western	15.3 / 15.5		99% of mean
2-Year UMN State	14.7 / 14.8		99% of mean
2022 LCS Trials	15.1 / 14.7		103% of mean

AGRONOMIC FEATURES

	LCS Cannon	SY Ingmar	Linkert	WB 9479	ND VitPro
Test Weight	60.2	59.8	58.9	59.0	59.9
Heading (days from planting)	46.8	51.0	50.3	49.6	49.5
Plant Height (inches)	28.6	28.6	27.5	27.0	30.5
Straw Strength	Very Good	Very Good	Excellent	Very Good	Very Good

All available public and private data used in compiling scores

DISEASE RESISTANCE

7–9: Susceptible | 4–6: Intermediate | 1–3: Resistant

Fusarium Head Blight	3
Bacterial Leaf Streak	5
Tan Spot	3
Stripe Rust	3
Stem Rust	3
Leaf Rust	4

All available public and private data used in compiling scores

END-USE QUALITY

Overall Quality	Baking Quality	Flour Protein	Milling Quality
Desirable	Desirable	Desirable	Acceptable

Data obtained from LCS Quality Laboratory

Blaze a trail to higher profits
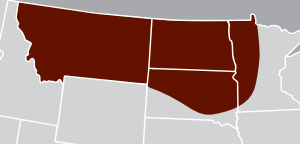
Quality check for Wheat Quality Council

Consistent protein and top-end yield

Proven Northern Plains performer

Exceptionally wide adaptation

HARD RED SPRING WHEAT

LCS Rebel

ADAPTATION

YIELD

	BU/AC ◆ LCS Rebel ◇ Trial Avg.	MEAN ▶	
3-Year NDSU Eastern	73.6 / 71.4		103% of mean
3-Year NDSU Western	44.2 / 42.8		103% of mean
2021 LCS Trials	43.6 / 44.0		99% of mean
2022 LCS Trials	50.3 / 50.6		99% of mean
3-Year SDSU Eastern	50.9 / 54.2		94% of mean
3-Year SDSU Western	46.2 / 46.4		100% of mean

PROTEIN

	Protein % ◆ LCS Rebel ◇ Trial Avg.	MEAN ▶	
2022 NDSU State	14.1 / 13.7		103% of mean
3-Year SDSU Eastern	16.1 / 15.2		106% of mean
3-Year SDSU Western	15.8 / 15.5		102% of mean
2022 LCS Trials	15.2 / 14.7		103% of mean

AGRONOMIC FEATURES

	LCS Rebel	SY Ingmar	Linkert	WB 9479	ND VitPro
Test Weight	60.0	59.8	58.9	59.0	59.9
Heading (days from planting)	48.4	51.0	50.3	49.6	49.5
Plant Height (inches)	32.0	28.6	27.5	27.0	30.5
Straw Strength	Good	Very Good	Excellent	Very Good	Very Good

All available public and private data used in compiling scores

DISEASE RESISTANCE

	7–9: Susceptible	4–6: Intermediate	1–3: Resistant
Fusarium Head Blight		4	
Bacterial Leaf Streak		3	
Tan Spot		4	
Stripe Rust		4	
Stem Rust			2
Leaf Rust		5	

All available public and private data used in compiling scores

END-USE QUALITY

Overall Quality	Baking Quality	Flour Protein	Milling Quality
Most Desirable	Desirable	Most Desirable	Most Desirable

Data obtained from LCS Quality Laboratory

For all available data, visit LimagrainCerealSeeds.com

PVP Unauthorized seed multiplication prohibited by law. U.S. Plant Variety Protection Number has been granted.

Pull the trigger on higher yields

Blockbuster yield year after yield

192% of mean yield UMN South 3-year
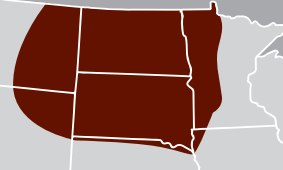
Top yielder in MN and ND state trials

Very strong straw

HARD RED SPRING WHEAT
LCS Trigger

ADAPTATION

YIELD

BU/AC	◆ LCS Trigger ◆ Trial Avg.	MEAN ▶
3-Year UMN North	87.9 / 80.3	109% of mean
3-Year UMN South	67.8 / 56.8	119% of mean
3-Year SDSU Eastern	61.5 / 54.2	113% of mean
3-Year SDSU Western	49.0 / 46.4	106% of mean
3-Year NDSU Eastern	81.2 / 71.4	114% of mean
3-Year NDSU Western	48.0 / 42.8	112% of mean

PROTEIN

Protein %	◆ LCS Trigger ◆ Trial Avg.	MEAN ▶
2022 NDSU State	11.8 / 13.7	86% of mean
3-Year SDSU Eastern	13.8 / 15.2	91% of mean
3-Year SDSU Western	15.0 / 15.5	97% of mean
2-Year UMN State	13.3 / 14.8	90% of mean
2022 LCS Trials	13.7 / 14.7	93% of mean

AGRONOMIC FEATURES

	LCS Trigger	Prosper	WB 9653	SY Valda	Shelly
Test Weight	59.3	58.8	58.3	59.1	58.9
Heading (days from planting)	55.6	52.5	50.8	50.2	53.0
Plant Height (inches)	31.6	32.2	38.5	29.4	28.8
Straw Strength	Very Good	Average	Very Good	Good	Good

All available public and private data used in compiling scores

DISEASE RESISTANCE

7-9: Susceptible | 4-6: Intermediate | 1-3: Resistant

Fusarium Head Blight	3
Bacterial Leaf Streak	2
Tan Spot	3
Stripe Rust	5
Stem Rust	2
Leaf Rust	1

All available public and private data used in compiling scores

END-USE QUALITY

Overall Quality	Baking Quality	Flour Protein	Milling Quality
Less Desirable	Less Desirable	Less Desirable	Less Desirable

Data obtained from LCS Quality Laboratory

Unauthorized seed multiplication prohibited by law. U.S. Plant Variety Protection Number has been granted.

GIVE WEEDS THE AX

LCS

DEFEND YOUR FIELDS

Go home, downy brome. Set sail, foxtail. Take a pass, barnyardgrass. CoAXium hard red spring wheat is here and ready to destroy grassy weeds.

CoAXium DRIVEN BY Aggressor®

Grow wheat, not weeds

The solution for yield-robbing weeds you've been asking for is here for spring wheat acres. Certified seed is available this season!

The CoAXium® Wheat Production System combines elite varieties and the patented non-GMO herbicide tolerance trait AXigen® with Aggressor® AX brand herbicides. This combination helps protect fields from Group 2-resistant grassy weeds that shrink yield through inter-crop competition and reduce overall crop quality.

Untreated downy brome   Treated with Aggressor AX

Stewardship delivers cleaner fields and higher yields. To prolong the utility, features and benefits of CoAXium technology, growers must:

- Sign a CoAXium grower stewardship agreement
- Use only Certified seed
- Use only labeled rates of Aggressor AX herbicides by weed species
- Prevent grassy weed escapes from going to seed
- Rotate herbicide modes of action between crop cycles
- Use CoAXium no more than two years in a row

The CoAXium hard red spring wheat LCS Hammer AX is part of the next generation of elite genetics from Limagrain Cereal Seeds. This game-changing line has been tested and retested for yield, trait tolerance, seedling vigor, disease resistance and adaptation in a wide variety of growing conditions.

Get serious about grassy weed control. Fetch your AX. LimagrainCerealSeeds.com/CoAXium

Smash grassy weeds

High-yielding
CoAXium variety

Balanced protein
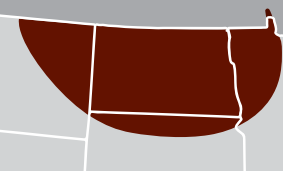and good test weight

Early
maturing

Good end-use
quality

HARD RED SPRING WHEAT
LCS Hammer AX

ADAPTATION

AGRONOMIC FEATURES

	LCS Hammer AX	Glenn	AP Smith	SY 611 CL2	Vida
Test Weight	63.0	64.1	59.6	63.0	61.2
Heading (days from planting)	47.0	47.0	59.0	48.0	59.0
Plant Height (inches)	29.0	33.0	25.8	28.0	29.6
Straw Strength	Very Good	Very Good	Very Good	Excellent	Very Good

All available public and private data used in compiling scores

YIELD

	BU/AC	◆ LCS Hammer AX	◇ Trial Avg.	MEAN ▶	
2022 SDSU Eastern	42.6 / 44.8				**95%** of mean
2022 SDSU Western	51.3 / 50.3				**102%** of mean
2022 MSU Rain-Fed	45.9 / 45.6				**101%** of mean
2022 MSU Irrigated	98.6 / 82.4				**120%** of mean
2022 NDSU Eastern	74.2 / 72.2				**103%** of mean
2022 NDSU Western	59.4 / 57.7				**103%** of mean

PROTEIN

	Protein %	◆ LCS Hammer AX	◇ Trial Avg.	MEAN ▶	
2022 NDSU State	13.4 / 13.7				**98%** of mean
2022 SDSU State	15.1 / 15.2				**99%** of mean
2022 MSU State	13.9 / 14.6				**95%** of mean

DISEASE RESISTANCE

	7–9: Susceptible	4–6: Intermediate	1–3: Resistant
Fusarium Head Blight		5	
Bacterial Leaf Streak	7		
Tan Spot		6	
Stripe Rust		5	
Stem Rust		5	
Leaf Rust		6	

All available public and private data used in compiling scores

END-USE QUALITY

Overall Quality	Baking Quality	Flour Protein	Milling Quality
Desirable	Acceptable	Acceptable	Acceptable

Data obtained from LCS Quality Laboratory

A signed Stewardship Agreement is required before purchase.

For all available data, visit LimagrainCerealSeeds.com

PVP Unauthorized seed multiplication prohibited by law. U.S. Plant Variety Protection Number has been applied for. Limited-use license agreement.

Superior wheat quality

Limagrain Cereal Seeds is the only private breeding program with a dedicated, state-of-the-art quality lab. The LCS Quality Laboratory utilizes a comprehensive set of data, compiled over multiple years, to determine the end-use quality of all wheat varieties we release. Key attributes include:

Baking quality, including loaf volume, cookie diameter and dough rheology.

Milling quality, including flour yields and protein loss from grain to flour.

Dough properties, including water absorption, gluten strength and percentage of protein content.

These characteristics are weighted and combined into a single score: baking quality (30%), dough properties (20%), milling quality (40%), test weight (5%) and Dough Properties (5%). Overall end-use quality is classified in one of four categories:

Most Desirable. Elite varieties with excellent intrinsic (kernel) qualities and a superior combination of milling, baking and dough properties.

Desirable. High-demand varieties with strong intrinsic qualities and very good to good milling, baking and dough properties.

Acceptable. One or more quality parameters may have minor flaws. Overall, these varieties are acceptable to end users.

Less Desirable. Varieties with quality parameters that are less than adequate for current end-user standards or a single critical flaw.
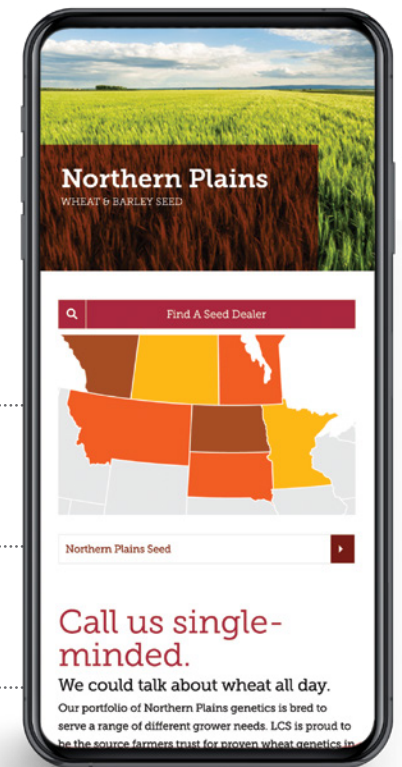
Looking for more?

See all available varieties bred for the Northern Plains online anytime, including conventional and CoAXium hard red spring wheat, hard red winter wheat and forage wheat.

Find your next blockbuster variety
LimagrainCerealSeeds.com/NP

See the most up-to-date trial results
LimagrainCerealSeeds.com/data

See the most up-to-date trial results
LimagrainCerealSeeds.com/find-a-dealer

Talk to a wheat specialist
📞 **701.715.2538**

Game-changing new wheat genetics

LCS

LCS Hammer AX

LCS Boom

LCS Ascent

LCS Dual