

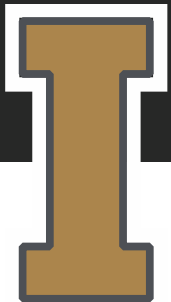
VARIETY TRIAL RESULTS AND 2016 CROPPING YEAR CHALLENGES

Dr. Kurtis Schroeder

Cropping Systems Agronomist & Pathologist

University of Idaho, Moscow

January 23, 2017



NORTH IDAHO VARIETY TESTING

- Test new releases and advanced breeding lines **for their relative performance in Idaho's diverse climates**
- Accelerate the adoption of improved varieties by increasing the visibility and exposure
- Increase economic returns and maintain competitiveness of Idaho producers
- Provide objective and statistically sound evaluations of variety performance



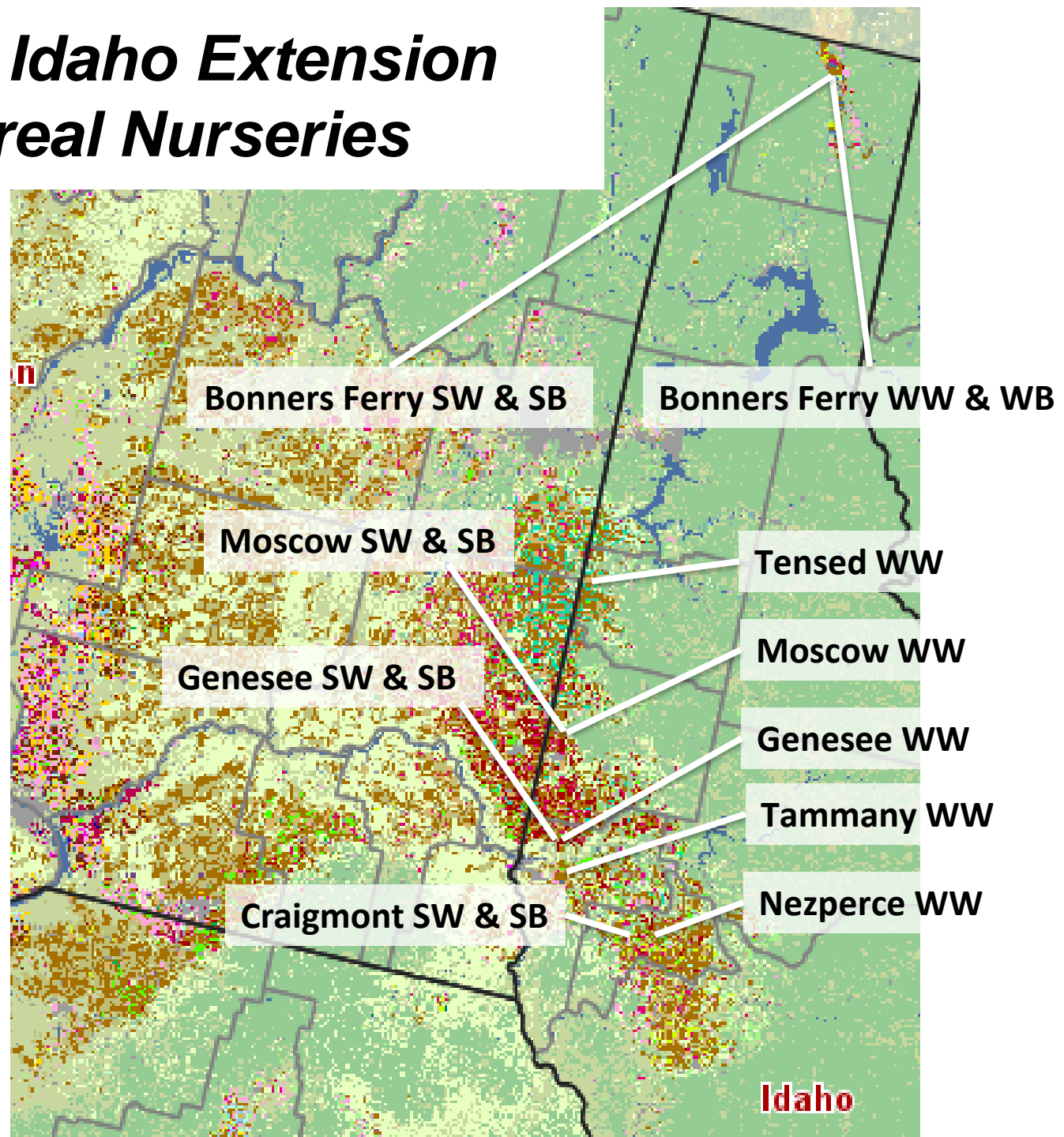
North Idaho Extension Cereal Nurseries

Winter wheat

- 4 conv. tillage
- 2 direct seeded

Spring wheat and barley

- 2 conv. tillage
- 2 direct seeded



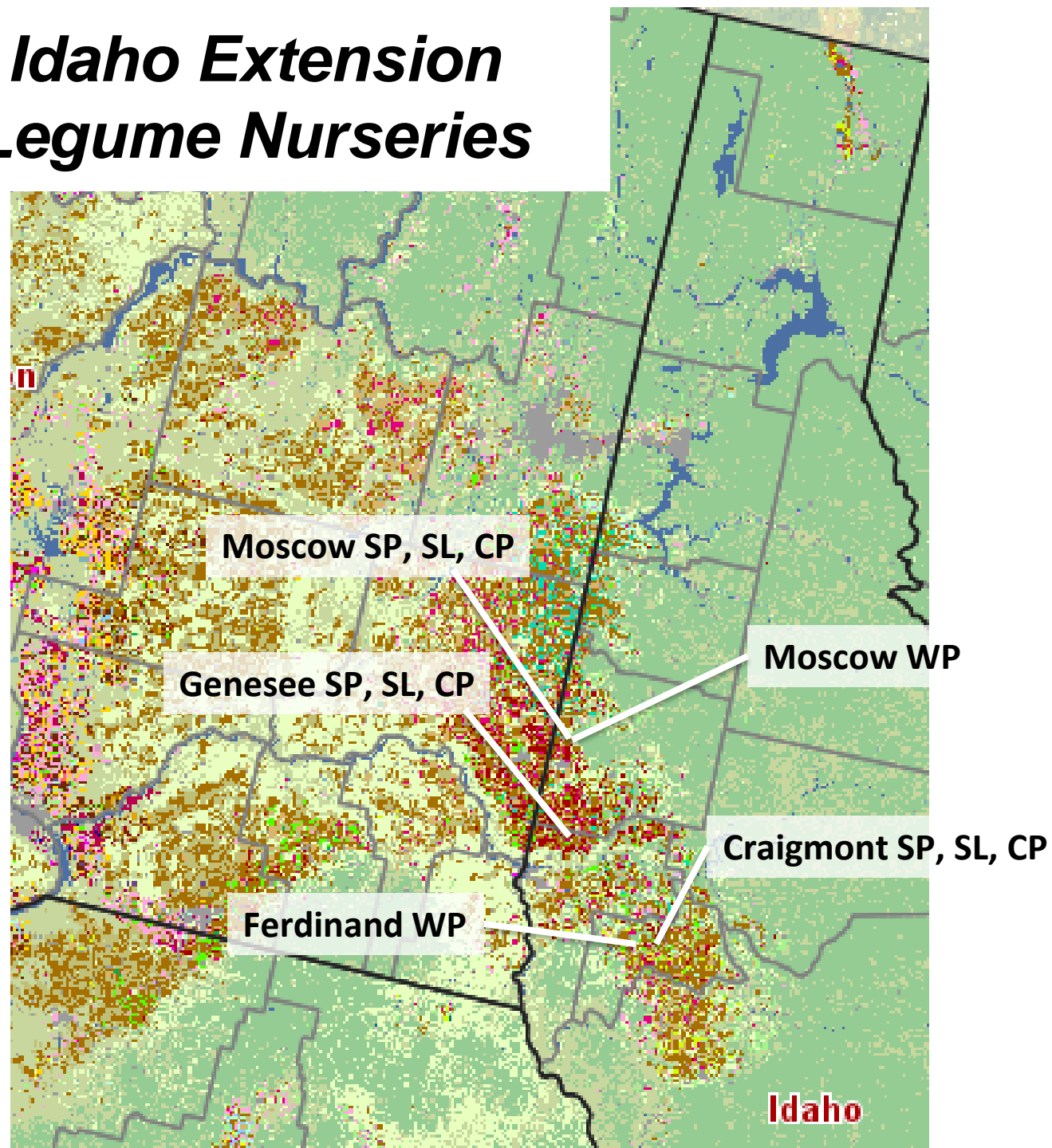
North Idaho Extension Grain Legume Nurseries

Winter pea

- 1 conv. tillage
- 1 direct seeded

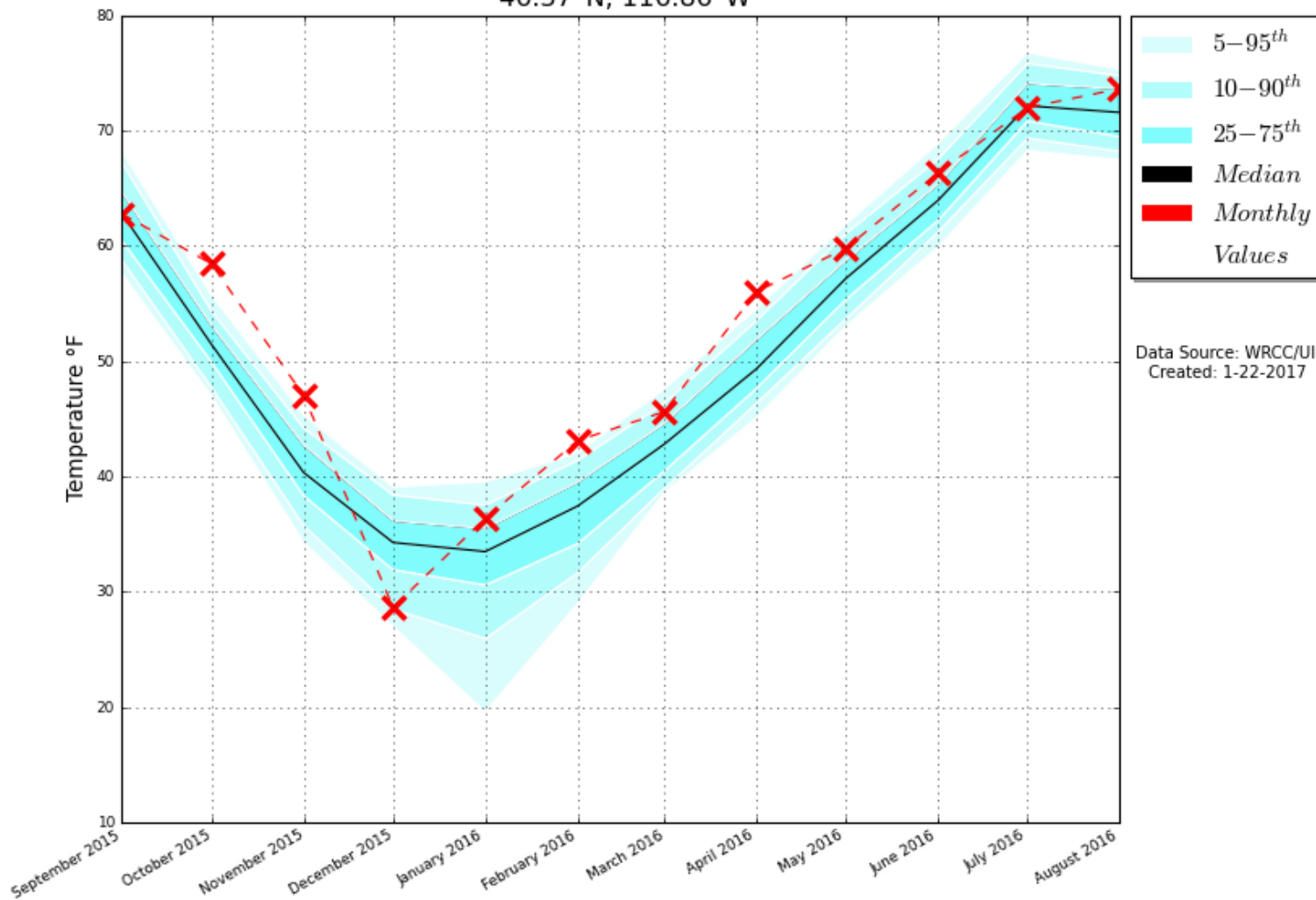
Spring legumes

- 2 conv. tillage
- 1 direct seeded

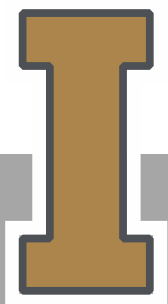


2015-2016 TEMPERATURES AT LEWISTON

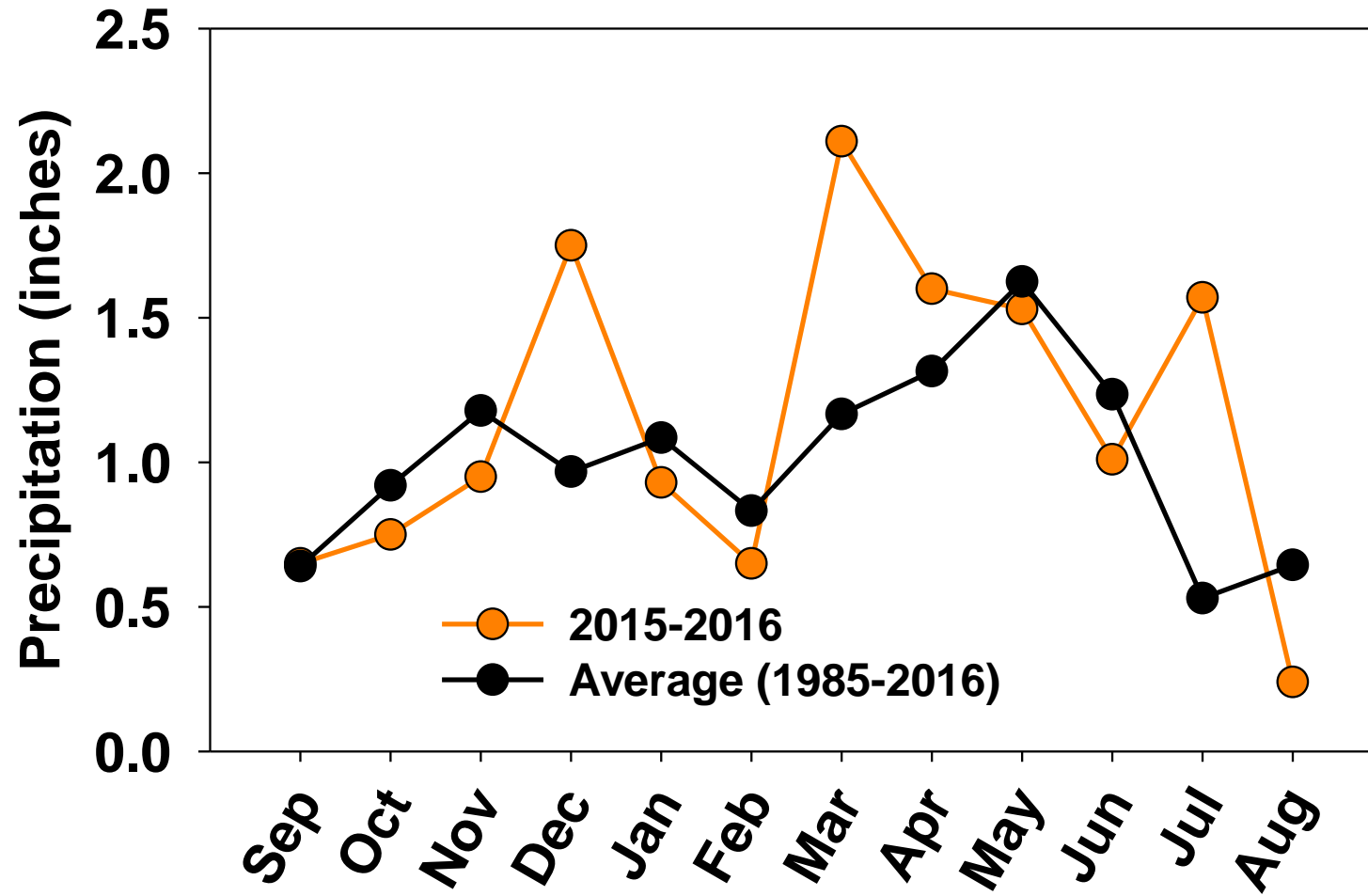
Mean Temperature, 12-Months Ending in August, 2016
46.37°N, 116.86°W



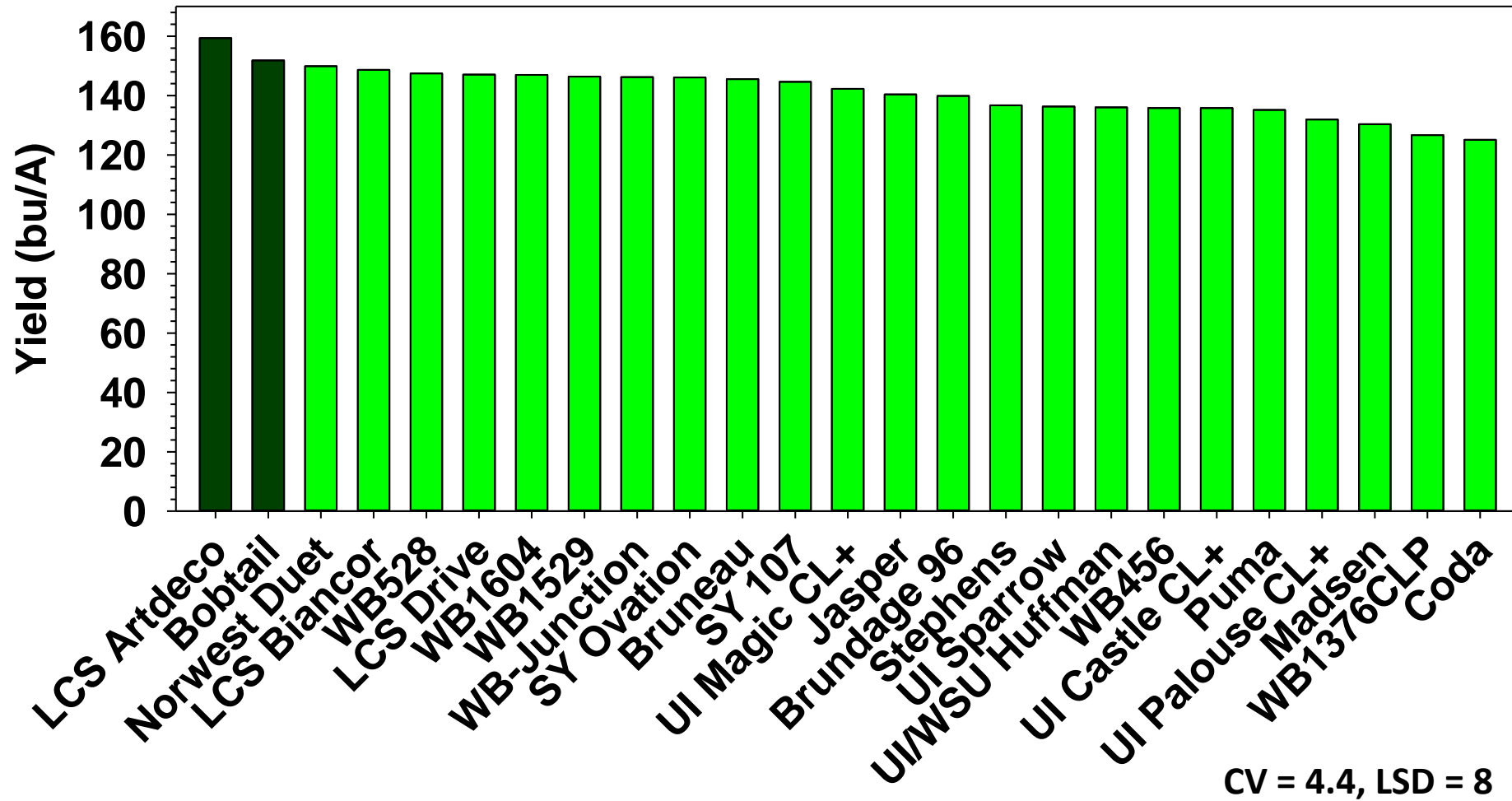
Data Source: WRCC/UI
Created: 1-22-2017



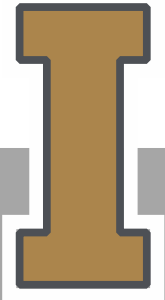
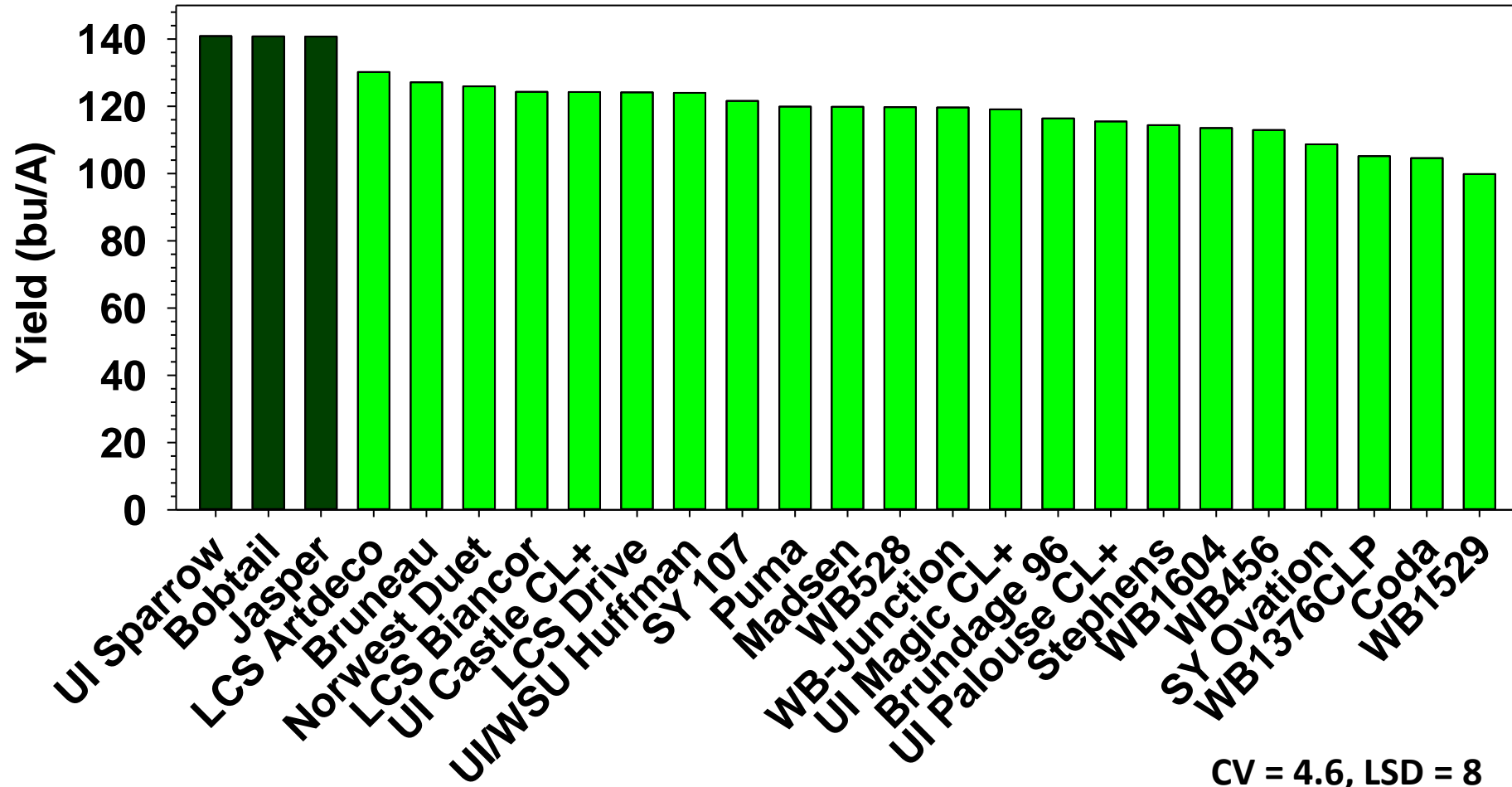
2015-2016 PRECIPITATION AT LEWISTON



LEWISTON SOFT WHITE WINTER WHEAT



GENESEE SOFT WHITE WINTER WHEAT



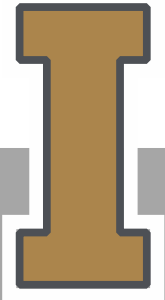
3-YEAR AVERAGE YIELDS (SWWW)

Lewiston	
Variety	Yield (bu/A)
LCS Artdeco	114
LCS Drive	107
Puma	107
Bobtail	106
WB1529	106
WB-Junction	106

CV = 5.9, LSD = 5

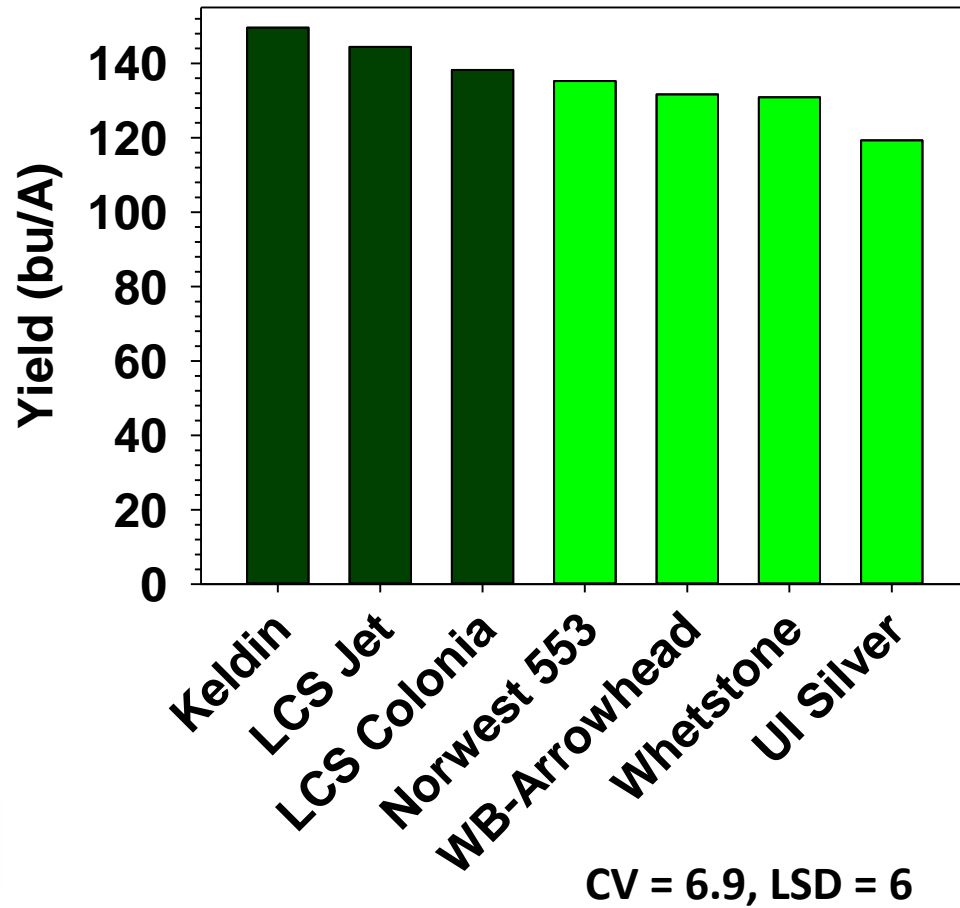
Genesee	
Variety	Yield (bu/A)
LCS Artdeco	112
LCS Drive	108
UI Sparrow	107
Bobtail	107
LCS Biancor	106
WB-Junction	106

CV = 6.8, LSD = 6

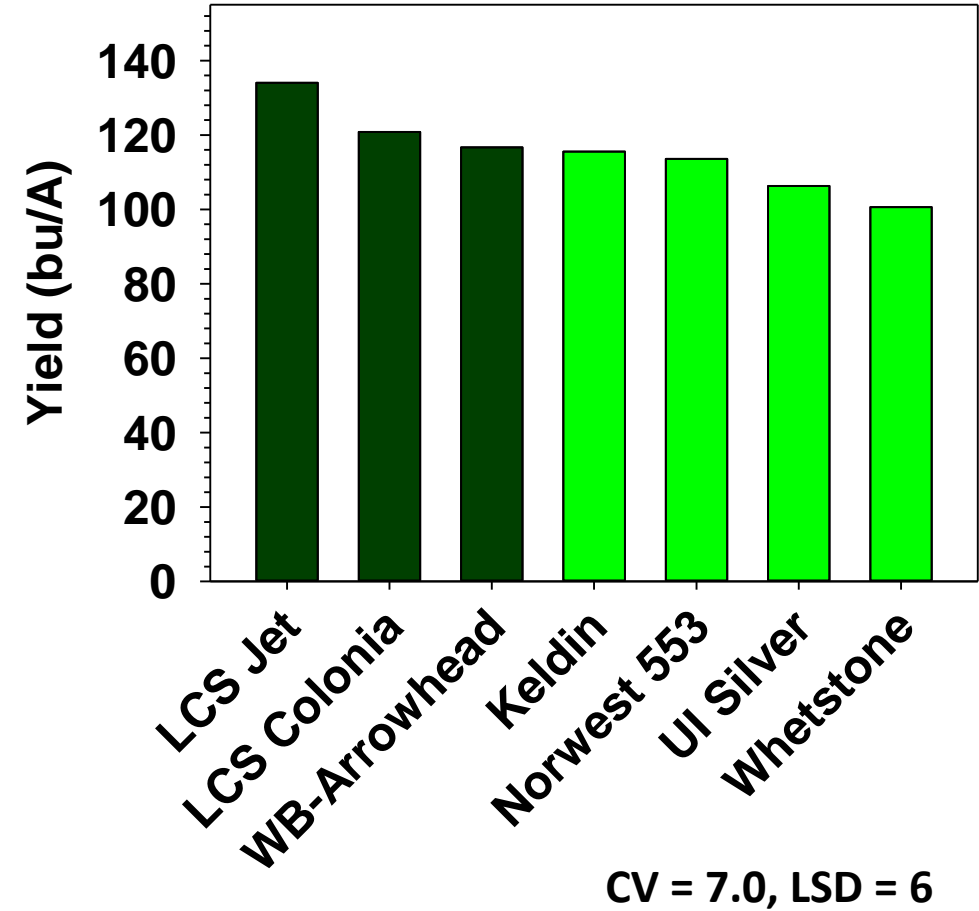


HARD WINTER WHEAT

Lewiston



Genesee



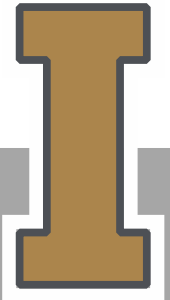
HARD WINTER WHEAT

Variety	North Idaho Average Yield (bu/A)	Protein (%)
LCS Jet	134	11.6
LCS Colonia	126	11.3
Norwest 553	118	12.1
Keldin	118	11.5
WB-Arrowhead	114	11.9
UI Silver	113	11.6
Whetstone	104	12.5



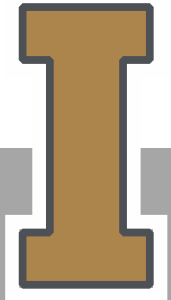
NEW WHITE WINTER WHEAT VARIETIES

- **Norwest Duet (LOR-092)**
 - #1 in 2016 and 2-year ave.
 - Very good winter hardiness
 - Excellent stripe rust resistance
 - C-stripe resistant
 - Tall (6 in. above average)
- **Norwest Tandem (LOR-334)**
 - Excellent stripe rust resistance
 - Average winter hardiness



NEW WHITE WINTER WHEAT VARIETIES

- **LCS Drive (LWW12-7105)**
 - Good 3-year average
 - Very good stripe rust resistance
 - C-stripe resistance
 - Barley yellow dwarf resistance
- **UI Sparrow (IDO1108DH)**
 - Top yielding at Genesee, not adapted for Lewiston
 - Excellent winter hardiness
 - Good resistance to stripe rust, snow mold, eye spot
 - Immune to dwarf bunt



2-GENE CLEARFIELD SWWW

UI Magic CL+



Early, short
High yield

UI Castle CL+

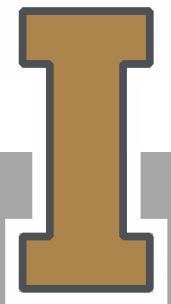


High yield
Good stripe rust res.

UI Palouse CL+

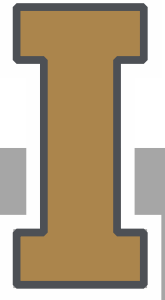


Short
C-stripe tolerance



UI 2-GENE SWWW – 2016 PERFORMANCE (ID)

Variety	Regional Ave. (bu/A)	Bonnors Ferry	Genesee	Lewiston	Moscow	Nezperce	Tensed
LCS Artdeco	135 (109%)	134	130	159	120	113	155
UI/WSU Huffman	128 (103%)	136	124	136	112	113	147
UI Castle CL+	124 (100%)	127 ✓	124 ✓	136	117 ✓	109 ✓	132
Stephens	120 (97%)	115	114	137	113	108	134
UI Magic CL+	120 (96%)	108	119	142 ✓	114	96	139 ✓
UI Palouse CL+	119 (96%)	116	116	132	117 ✓	103	130
WB 1376 CLP	108 (87%)	111	105	127	95	94	116

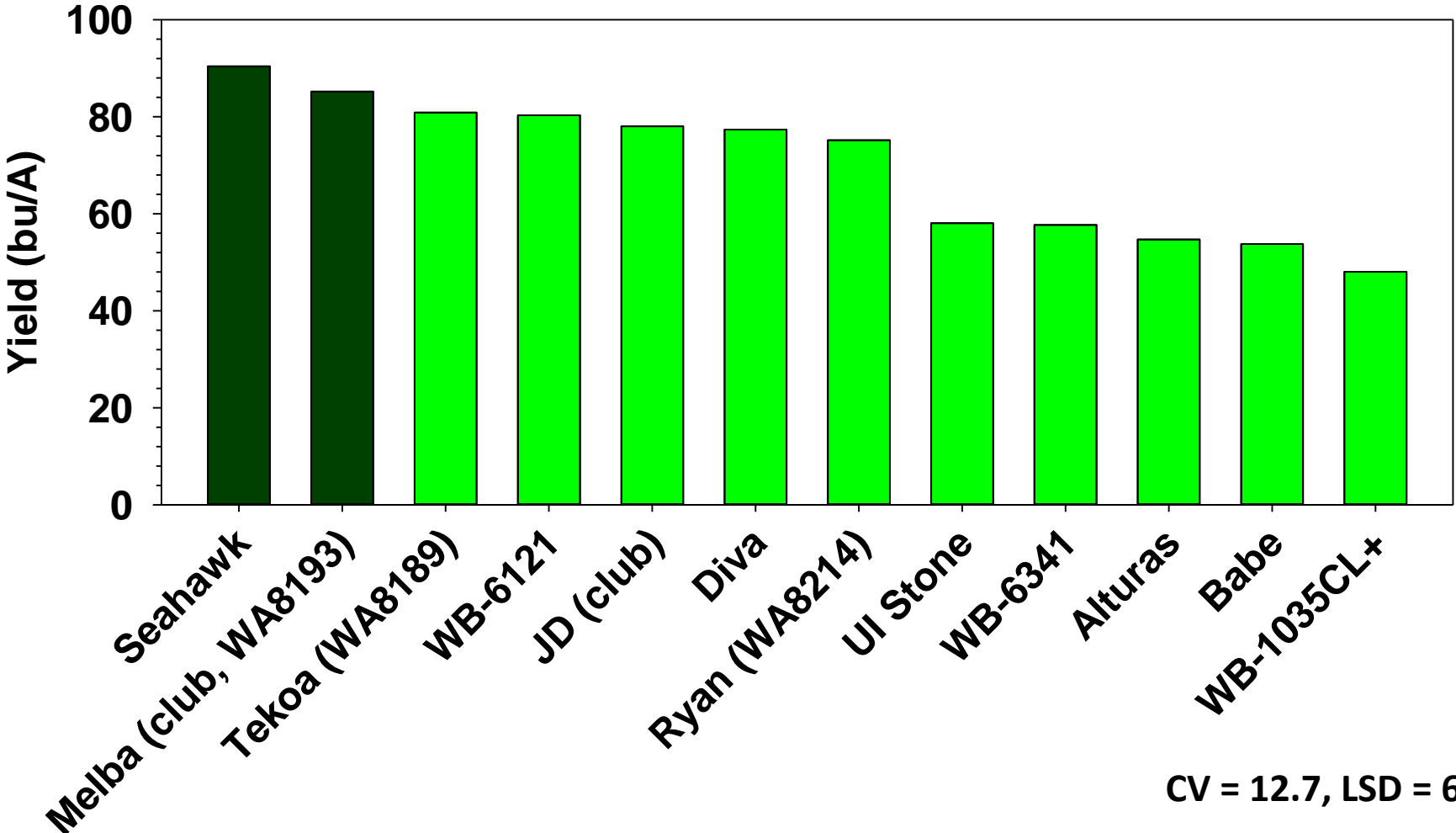


NEW HARD WINTER WHEAT VARIETIES

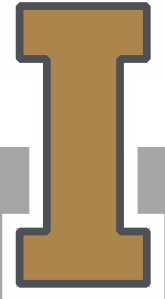
- **LCS Jet (NSA10-7208)** – Hard red
 - Excellent yield potential (10+ bu/A over closest variety)
 - Good protein
 - Excellent winter hardiness
 - Strong straw, shorter than Keldin
 - Good stripe rust resistance
 - C-stripe tolerance



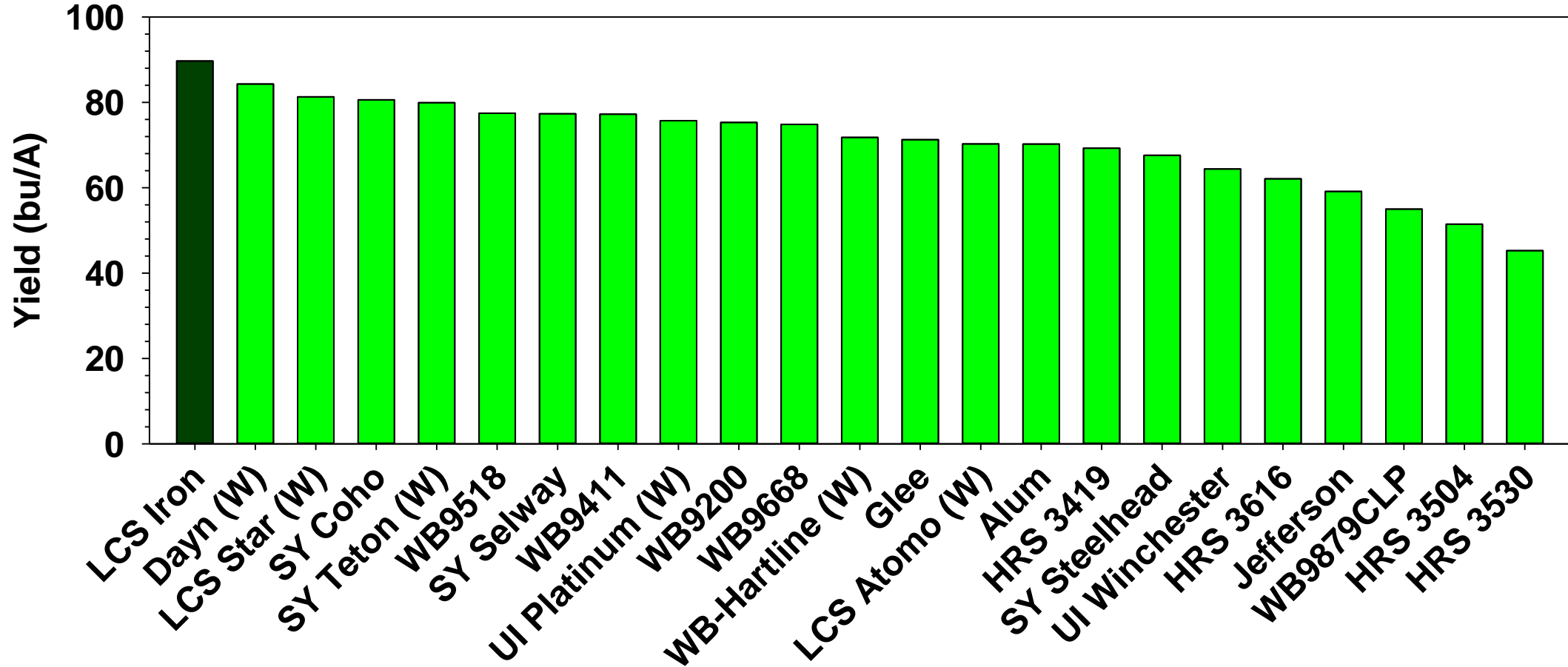
GENESEE SOFT WHITE SPRING WHEAT



CV = 12.7, LSD = 6



GENESEE HARD SPRING WHEAT



CV = 10.9, LSD = 5



GENESEE HARD SPRING WHEAT

Variety	Protein (%)
Alum	11.7
Dayn (W)	11.0
Glee	11.5
HRS3419	11.1
HRS3504	11.7
HRS3530	11.3
HRS3616	12.1
Jefferson	11.3
LCS Atomo (W)	10.6
LCS Iron	11.5
LCS Star (W)	10.9
SY Coho	11.4

Variety	Protein (%)
SY Selway	11.5
SY Steelhead	12.4
SY Teton (W)	10.7
UI Platinum (W)	10.6
UI Winchester	11.3
WB9200	12.4
WB9411	11.7
WB9518	11.8
WB9668	12.8
WB9879CLP	12.3
WB-Hartline	10.8

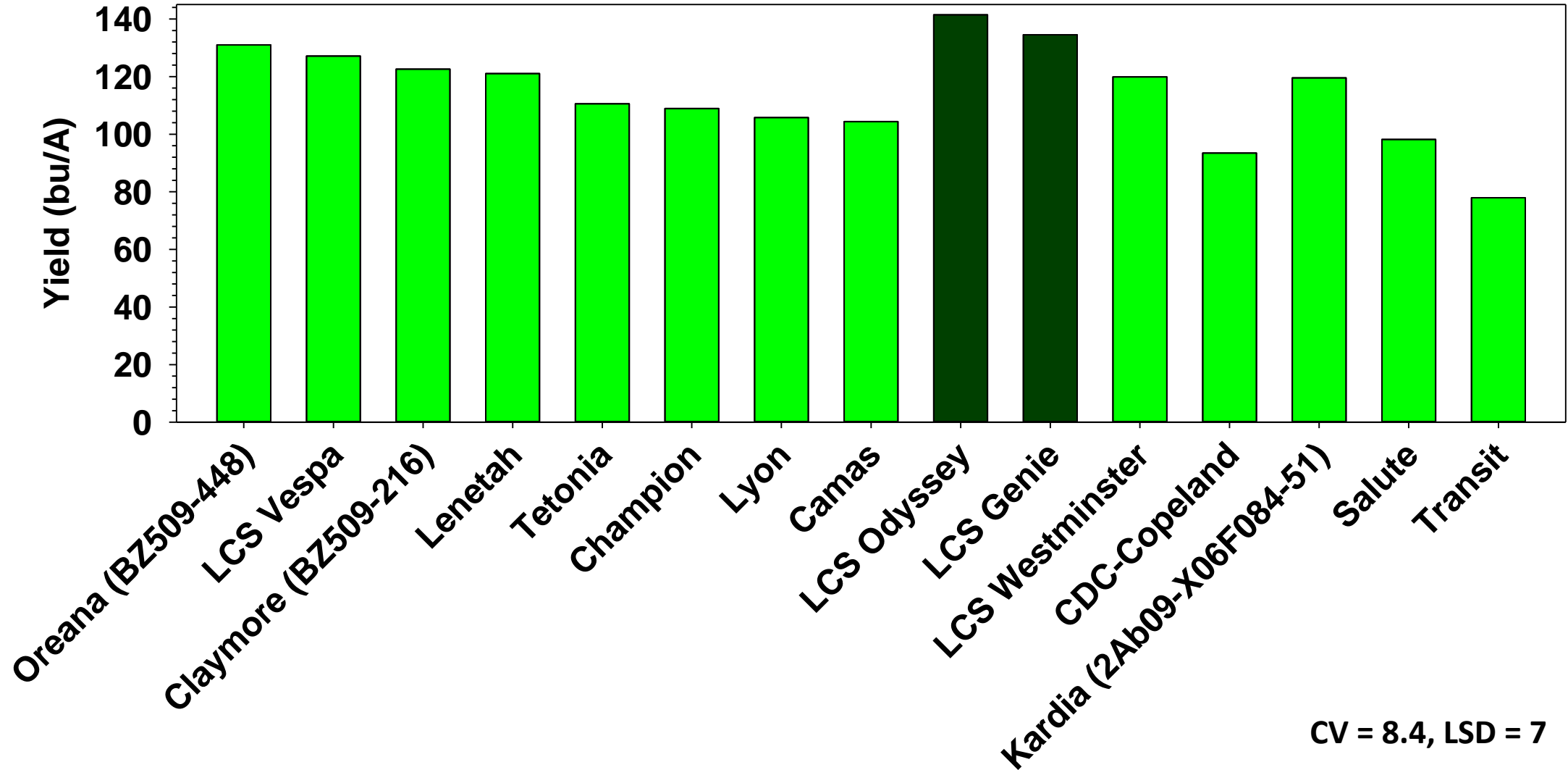


GENESEE SPRING BARLEY

Feed

Malt

Food



NEW SPRING BARLEY FEED VARIETIES

- **Oreanna** (BZ509-448)
 - Highland Specialty Grain
 - Well adapted to northern Idaho (top 3-year ave. at Genesee)
 - High tillering variety
 - Resistance to barley stripe rust
 - Shorter than Champion
- **Claymore** (BZ509-216)
 - Highland Specialty Grain
 - High yield potential (#1 in north Idaho in 2015, excellent 3-year ave)
 - Fewer tillers than Champion
 - Taller, but very good straw strength



NEW SPRING BARLEY VARIETIES

- **Kardia** (2Ab09-X06F084-51) – food barley (USDA)
 - 2-row, hulled
 - High β -glucan (> Salute)
 - Good yield potential in north Idaho (9 bu/A higher than Salute at Genesee)
- **Havener** (09WA-265.5) – food barley (WSU)
 - 2-row, hull-less
 - High β -glucan



GENESEE SPRING CHICKPEA & PEA

Chickpea

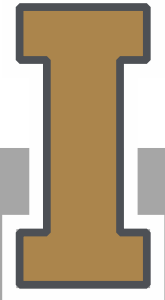
Variety	Yield (lb/A)
BillyBeans	3806
CDC Frontier	3626
CDC Orion	3526
Bronic	3487
Sawyer	3401
Nash	3255
Sierra	3085

CV = 6.4, LSD = 339

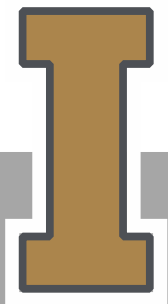
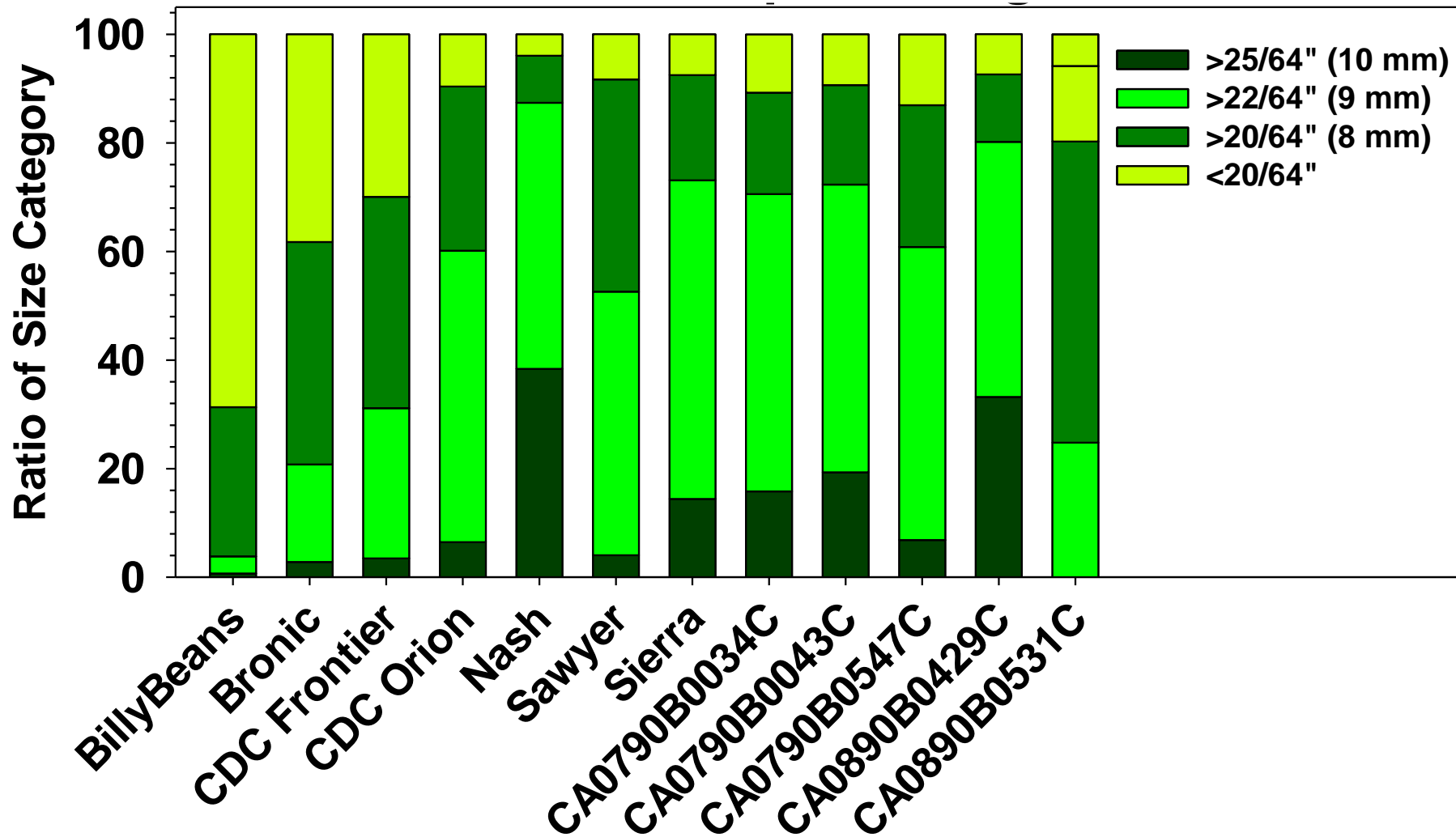
Pea

Variety	Yield (lb/A)
Hampton	4275
Greenwood	3485
Ginny	3450
Ariel	3318
Columbian	3230
Aragorn	3118
Banner	2849

CV = 9.1, LSD = 457



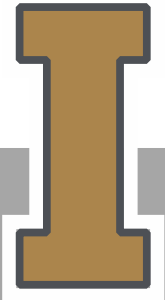
CHICKPEA SIZING



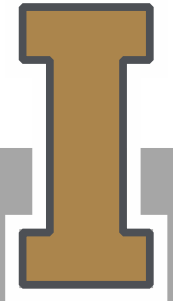
GENESEE SPRING LENTIL

Variety	Market Class	Yield (lb/A)
Morena	Pardina	1370
Crimson	Turkish red	1354
Avondale	Richlea	1352
Pardina	Pardina	1304
Merrit	Laird	1270
LC1460NZ05FG	French green	844
Eston	Eston	783
Richlea	Richlea	776
LC1460NZ06FG	French green	713

CV = 20.8, LSD = 315

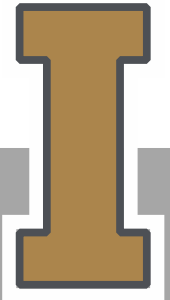


FALLING NUMBERS

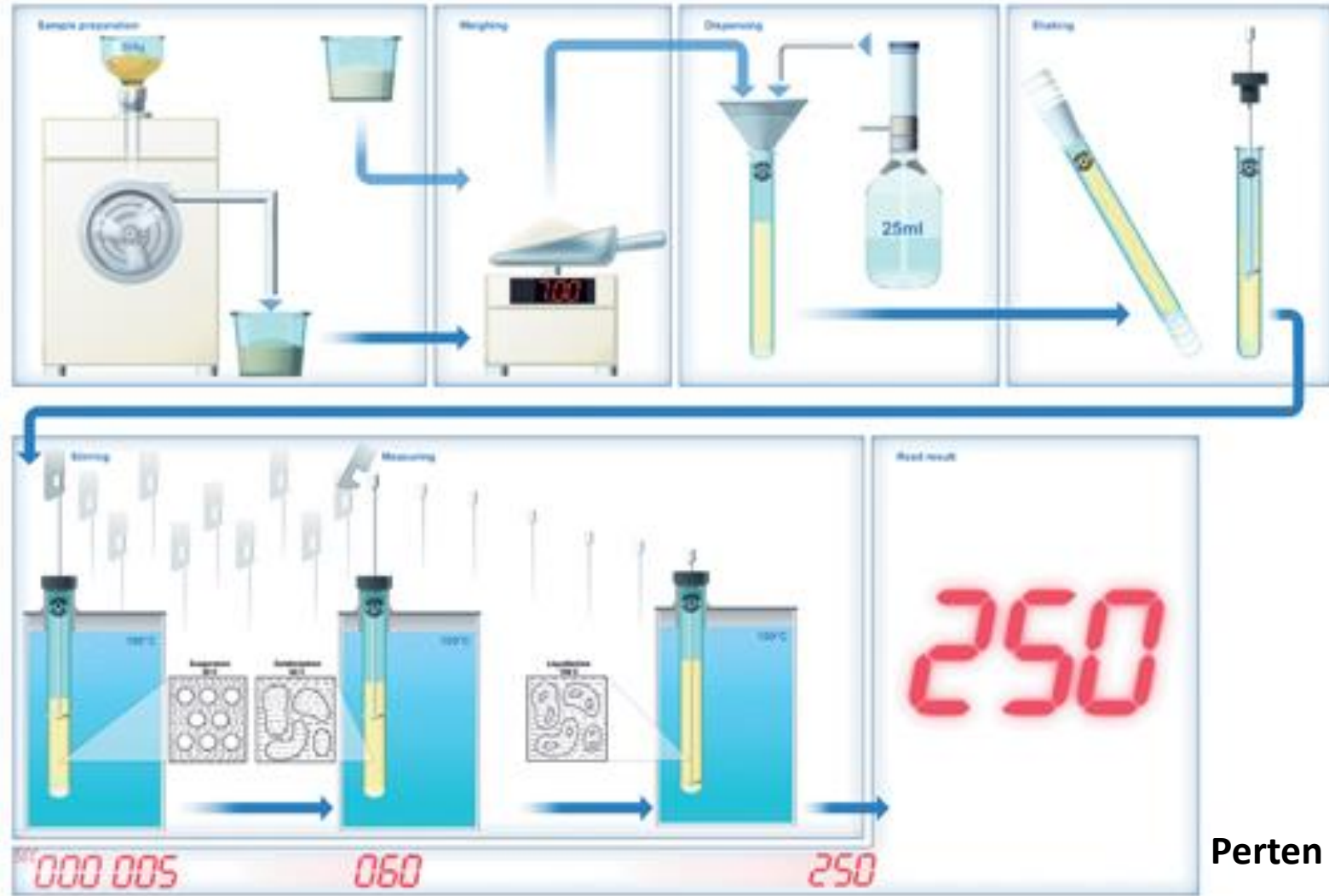


WHAT ARE FALLING NUMBERS?

- A measurement of flour quality
- Indirect measurement of alpha-amylase activity
- Process where starch in flour is gelatinized by rapid heating in boiling water bath
- Measurement is the time in seconds for a plunger to fall through the gelatinized starch mixture
- 300 seconds is the standard



MEASURING FALLING NUMBERS?



Perten Instruments



FALLING NUMBERS

- Pre-harvest sprout
 - Germination initiates prior to harvest
 - Wet conditions at harvest
 - Increased hydrolytic enzyme activity
 - Soft white varieties more susceptible
- Late maturity alpha-amylase (LMA)
 - Large temperature increase or decrease
 - 26 to 30 days after pollen shed
 - Both soft white and hard wheat affected



CIMMYT



VARIABILITY IN FALLING NUMBERS

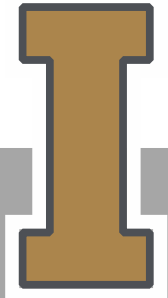
- Micro-environment differences within a field
- Sampling error in collecting small grain sample (truck or bin)
- Variability in the testing procedure



2016 GRAIN SAMPLES (LEWISTON)

Variety	FN
UI Sparrow	433
Puma	419
WB1376CLP	419
WB-456	415
LCS Biancor	414
UI Castle CL+	392
UI-WSU Huffman	391
LCS Artdeco	383
SY 107	378
Stephens	378
SY Ovation	377
WB-1529	372
WB-528	363

Variety	FN
Bobtail	363
LCS Drive	356
WB-1604	347
Madsen	340
Jasper	316
WB-Junction	290
Coda	282
Norwest Duet	199
UI Palouse CL+	197
Brundage 96	175
Bruneau	166
UI Magic CL+	153



2016 GRAIN SAMPLES (LEWISTON)

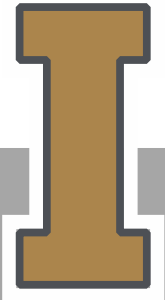
Variety	FN
Keldin	480
Whetstone	461
UI Silver	456
LCS Jet	455
WB-Arrowhead	453
Norwest 553	447
LCS Colonia	412



2016 GRAIN SAMPLES (GENESEE)

Variety	FN
WB-456	467
Coda	457
WB1376CLP	448
LCS Biancor	420
UI Castle CL+	411
Norwest Duet	411
Stephens	410
UI-WSU Huffman	405
WB-1529	402
LCS Artdeco	394
Bruneau	394
Puma	394
Madsen	393

Variety	FN
WB-528	393
SY 107	389
UI Magic CL+	386
UI Sparrow	381
LCS Drive	375
WB-1604	373
Bobtail	371
WB-Junction	367
Jasper	323
Brundage 96	317
SY Ovation	280
UI Palouse CL+	264



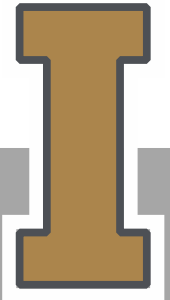
2016 GRAIN SAMPLES (GENESEEE)

Variety	FN
Whetstone	428
UI Silver	412
LCS Jet	397
Keldin	380
WB-Arrowhead	374
LCS Colonia	352
Norwest 553	264



FUTURE OF FALLING NUMBERS

- Upcoming 'Falling Numbers Summit'
- Collaborative research effort
 - USDA-ARS
 - Washington State University
 - University of Idaho
 - Oregon State University
- <http://steberlab.org/project7599.php>



STRIPE RUST

- Favored by cool, wet weather
- In 2015-16, disease levels were usually moderate in northern Idaho with some fields containing susceptible varieties experiencing high pressure



Photos courtesy of WSU



2017 STRIPE RUST FORECAST

- Dr. Xianming Chen, USDA-ARS, Pullman
- Model to forecast stripe rust based on winter temperatures
- Low disease severity
- Highly susceptible varieties – 6% yield loss
- Model does not account for snow cover
- Will have better estimation once wheat breaks dormancy
- Updated forecast expected in March



ACKNOWLEDGEMENTS

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- Aspen Welker
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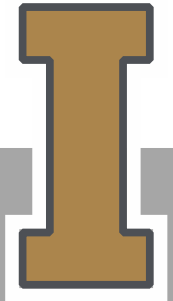
- Roy Patten
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- Doug Finkelnburg
- Ken Hart
- Kathleen Painter

Falling numbers:

- Andrew Ross, OSU



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