

Chalk and Rice Experiment Station Update



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2023 UCCE Rice Grower Meetings

Chalk

- Opaque area of grain
 1. Genetics
 - Variety
 2. Environment
 - High heat - increased packing rate of starch granules (amyloplasts) occurs during grain filling which causes air spaces in the endosperm of the kernels to form.
 - T. Siebenmorgen
- $\leq 73^{\circ}\text{F}$ nighttime air temp @ grain filling begin to see increased chalk
- $\leq 75^{\circ}\text{F}$ nighttime air temp @ grain fill expect a chalky year





Chalk also leads to decreased milling b/c chalky areas tend to be weaker and more prone to breakage than translucent rice kernels.



Immature kernels can also be considered chalky when mixed with mature translucent grains when rice is harvested too early.

Grades, Grade Requirements, and Grade Designations

Grade	Maximum limits of -											Color requirements ¹	Minimum milling requirements ⁵	
	Seeds, heat damaged, and paddy kernels (singly or combined)		Red rice and damaged kernels (singly or combined) (percent)	Chalky kernels ^{1 2}		Broken kernels				Other types ⁴				
	Total (number in 500 grams)	Heat damaged kernels and objectionable seeds (number in 500 grams)		In long grain rice (percent)	In medium or short grain rice (percent)	Total (percent)	Removed by a 5 plate ³ (percent)	Removed by a 6 plate ³ (percent)	Through a 6 sieve ³ (percent)	Whole kernels (percent)	Whole and broken kernels (percent)			
U.S. No. 1	2	1	0.5	1.0	0-2	2.0	4.0	0.04	0.1	0.1		1.0	White or creamy	Well Milled.
U.S. No. 2	4	2	1.5	2.0	2-4	4.0	7.0	0.06	0.2	0.2		2.0	Slightly gray	Well Milled.
U.S. No. 3	7	5	2.5	4.0	4-6	6.0	15.0	0.1	0.8	0.5		3.0	Light gray	Reasonably well milled.
U.S. No. 4	20	15	4.0	6.0		8.0	25.0	0.4	1.0	0.7		5.0	Gray or slightly rosy	Reasonably well milled.
U.S. No. 5	30	25	⁵ 6.0	10.0		10.0	35.0	0.7	3.0	1.0	10.0		Dark gray or rosy	Reasonably well milled.
U.S. No. 6	75	75	⁶ 15.0	15.0		15.0	50.0	1.0	4.0	2.0	10.0		Dark gray or rosy	Reasonably well milled.

U.S. Sample grade:

500g sample
USDA 1 < 10g
USDA 2 < 20g



Chalky Kernels

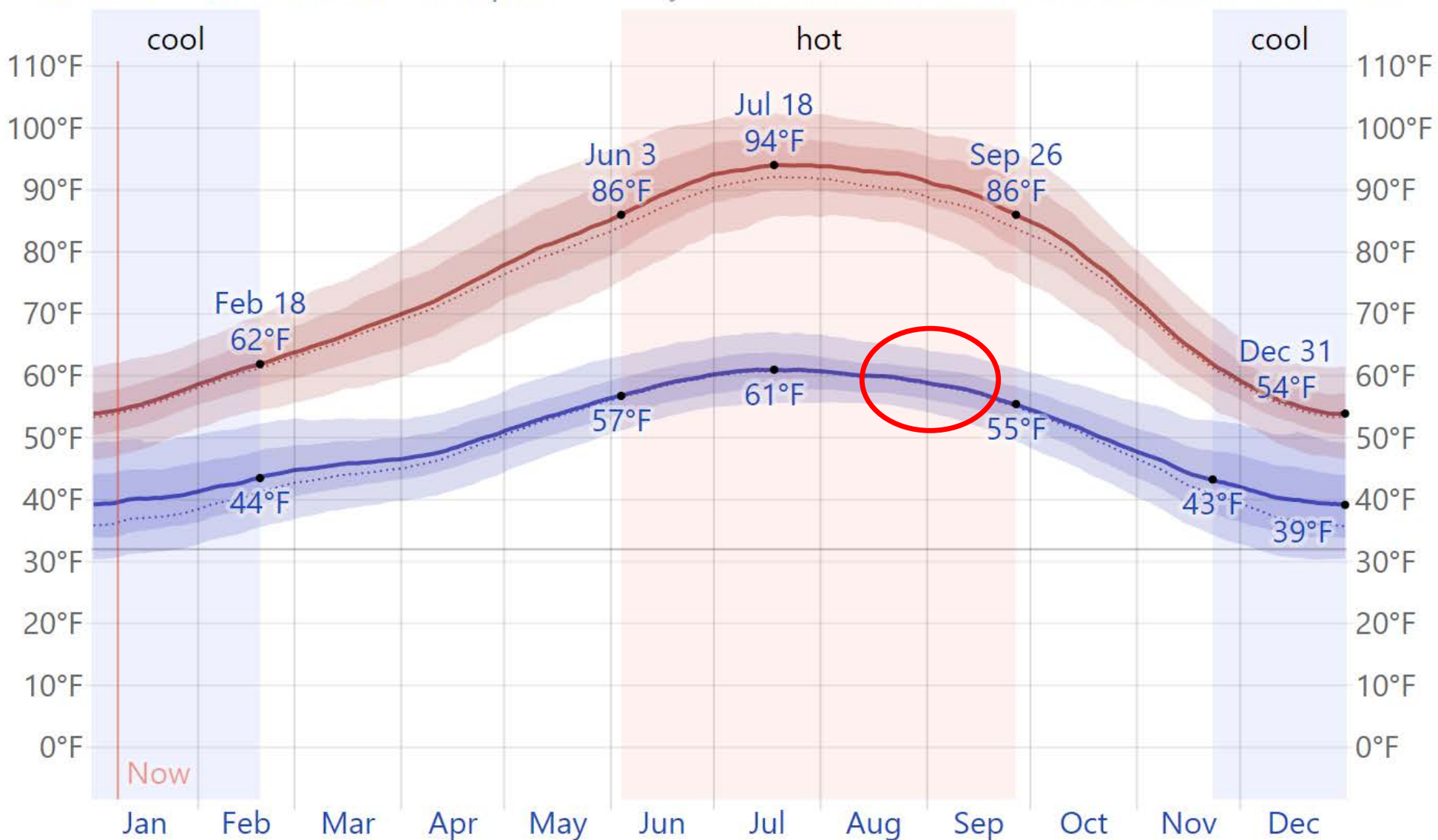
The endosperm of non-glutinous milled rice may contain regions that appear opaque or chalky; an undesirable condition for processors due to the potential for increased breakage and reduced milled rice recovery.

Chalkiness in rice is caused by many factors, such as harvesting at too high a moisture level, weather conditions, and kernel immaturity.

Due to its impact on milled rice quality, the rice standards identify "chalky kernels" as a grade determining factor; thereby limiting the amount that may be present within the established grade levels. The standards define chalky kernels as being: whole or broken kernels of rice which, in cross-section, contain an opaque white or "chalk-like" area that encompasses one-half or more of the exposed portion.

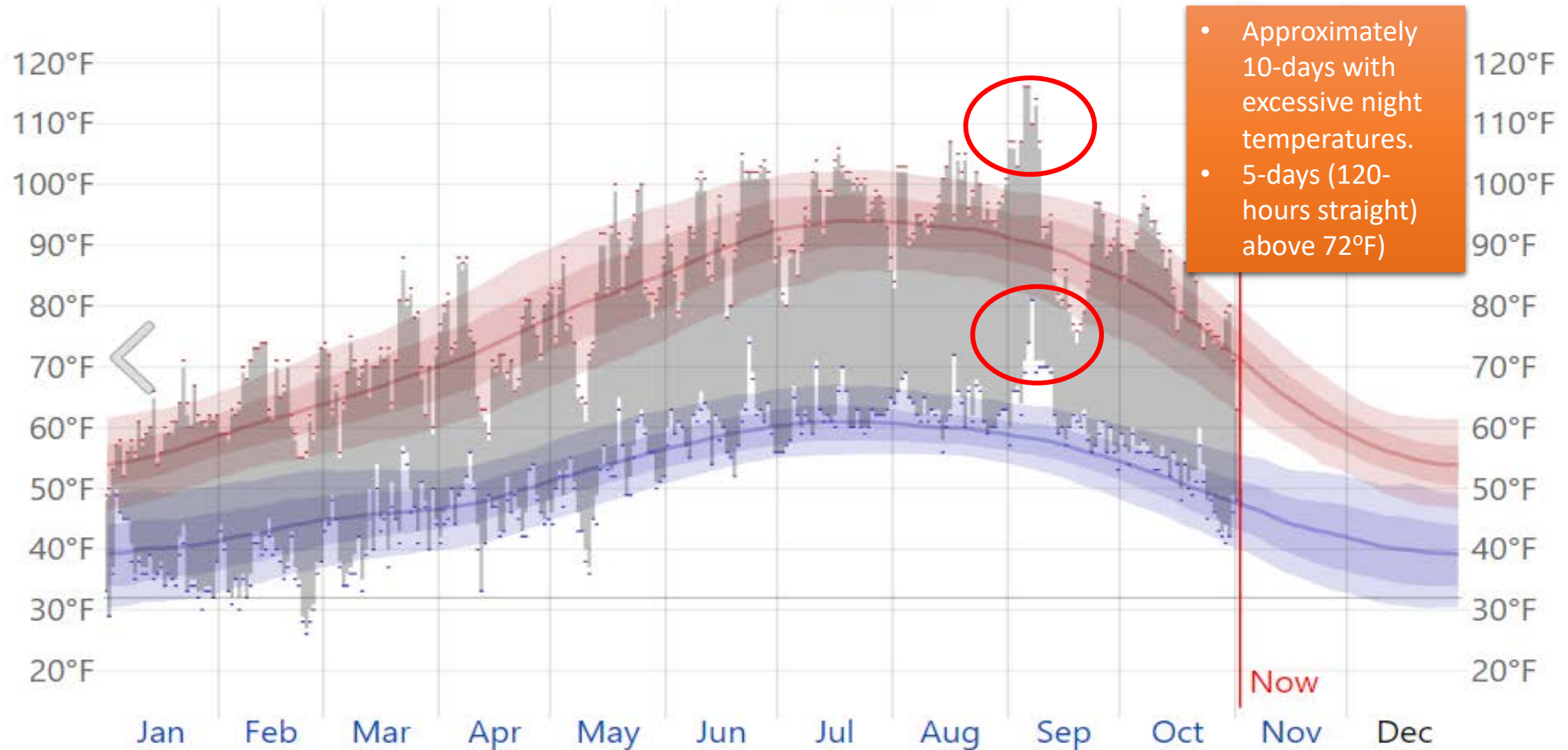
Average High and Low Temperature at Sacramento International Airport

[Link](#) [Download](#) [Compare](#) History: [2023](#) [2022](#) [2021](#) [2020](#) [2019](#) [2018](#) [2017](#) [2016](#) [2015](#)



The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.

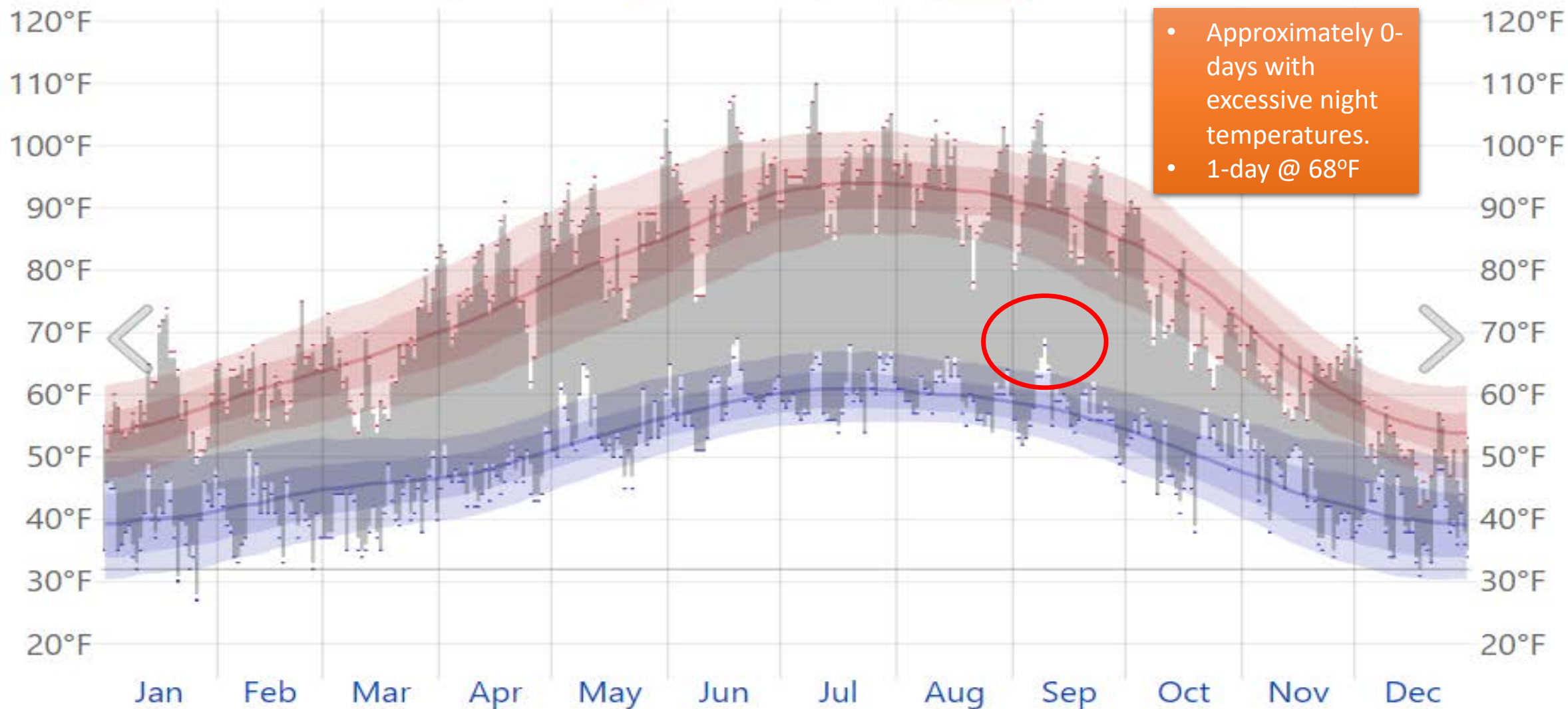
Sacramento International Airport Temperature History 2022

[Link](#)[Download](#)[Compare](#)[Averages](#)[History:](#)[2022](#)[2021](#)[2020](#)[2019](#)[2018](#)[2017](#)[2016](#)[2015](#)[2014](#)

The daily range of reported temperatures (gray bars) and 24-hour highs (red ticks) and lows (blue ticks), placed over the daily average high (faint red line) and low (faint blue line) temperature, with 25th to 75th and 10th to 90th percentile bands.

Sacramento International Airport Temperature History 2021

[Link](#) [Download](#) [Compare](#) [Averages](#) History: 2022 **2021** 2020 2019 2018 2017 2016 2015 2014



The daily range of reported temperatures (gray bars) and 24-hour highs (red ticks) and lows (blue ticks), placed over the daily average high (faint red line) and low (faint blue line) temperature, with 25th to 75th and 10th to 90th percentile bands.

2023 Available Foundation Seed

Diversify varieties to reduce risk (quality, disease pressure, yield, lodging etc.)

Stagger planting and use varieties with varying maturities to reduce risk associated with harvest "log jams"

- M-211



Long grain:

- L-207, L-208, CT-202, CJ-201, A-202

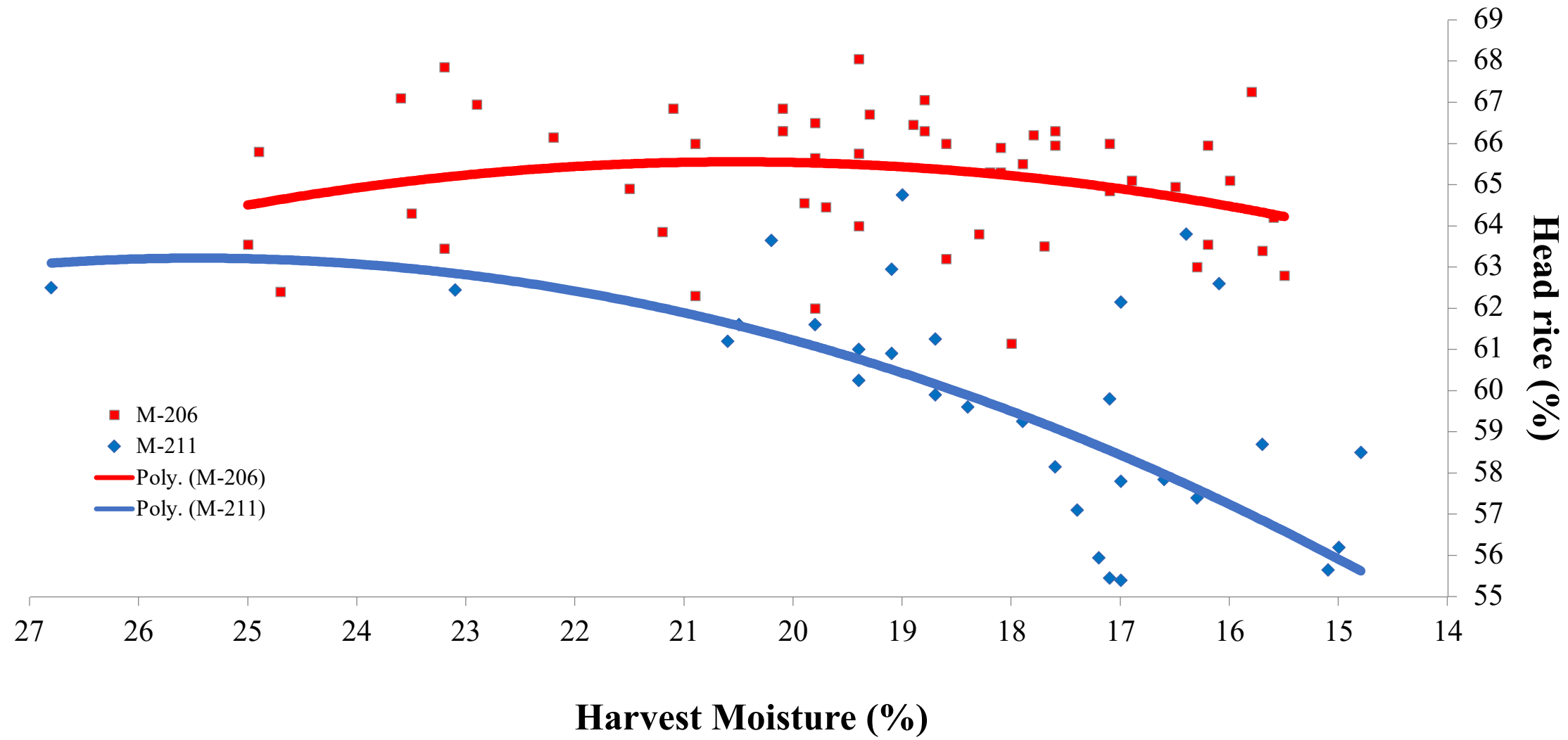
Medium grain:

- M-105, M-206, M-209, M-210, M-211, ~~M-401~~

Short grain:

- S-102, S-202
- Calmochi: CM-101, CM-203
- Calhikari: CH-203, CH-202, CH-203

Effect of harvest grain moisture on head rice yield of M-211 and M-206



Rice Experiment Station Team

Dustin Harrell
Director

Emily Schaff
Executive Asst.

Teresa De Leon
Medium Grain

Nirmal Sharma
Long Grain

Frank Maulana
Short Grain

Gretchen
Zaunbrecher
Dir. Genetics Lab



Far West rice



LSU
UC / RES 4



Univ. Illinois
Noble Research Inst.



K State
Noble/LSU



ULL / TTU / TAMU
13 years LSU



The mission of the California Cooperative Rice Research Foundation

Our primary mission of CCRRF at the California Rice Experiment Station (RES) is development of improved rice varieties of all grain and market types to sustain high and stable grain yield and quality with minimum environmental impact for the benefit of California rice growers.

[Read More](#)

RES Rice Varieties



1

2

3

**M-211**
2020**L-208**
2020**S-202**
2019**M-210**
2018**Calaroma-201**
2018

Interactive Map of Rice Trials and Current Rice Data for 2022

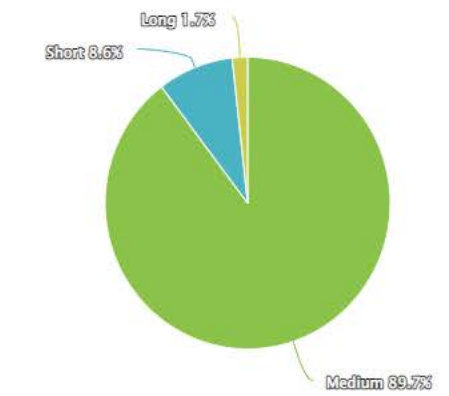
Rice Variety Trials by CA Locations



Estimated Rice Acreage Totals

Grain Type	Year	CA Est. Acres	% Acres
Medium	2021	365,000	89.7%
Short		35,000	8.6%
Long		7,000	1.7%
Total		407,000	
Medium	2019	445,000	90.4%
Short		40,000	8.1%
Long		7,000	1.4%
Total		492,000	

Estimated Rice Acreage by Grain Type



Rice Production and Trends of CCRRF Varieties

Rice Production of CCRRF Varieties
from 2012-2021

View Production Data

Trend in CA Acreage of Small, Medium,
and Large Grain Varieties

View Trend Data

RES Rice Variety Profile

Performance | Grain Attributes | Paddy, Brown and Milled Grains

Centennial Video

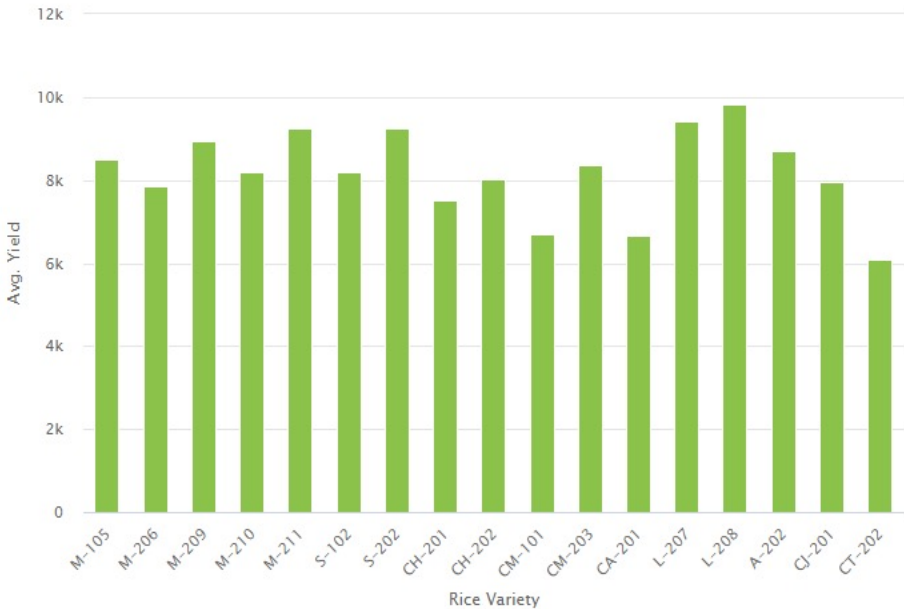




Rice Variety Trials By California Locations

Location: Butte North

Rice Variety Trials by CA Locations



Foundation Seed Reporting

- August and November reporting
 - Developing new online “log-in” portal/website system for reporting and billing for Foundation Seed.



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August Seed Sale Report

(Complete and [Return](#) one signed copy to CCRRF by October 21st, 2022)

Variety	Certified Class of Seed (2021 CCIA Approved Amount)			Registered used for Certified Production	Offered for Sale	Seed Sold	Planted for self	Sent to Mill	Sellers Name if not self
	Registered	Certified	CWT	CWT	CWT	CWT	CWT	CWT	
Ex.M-205	x		2500	50	2450	2000	350	100	FRC

Comments _____

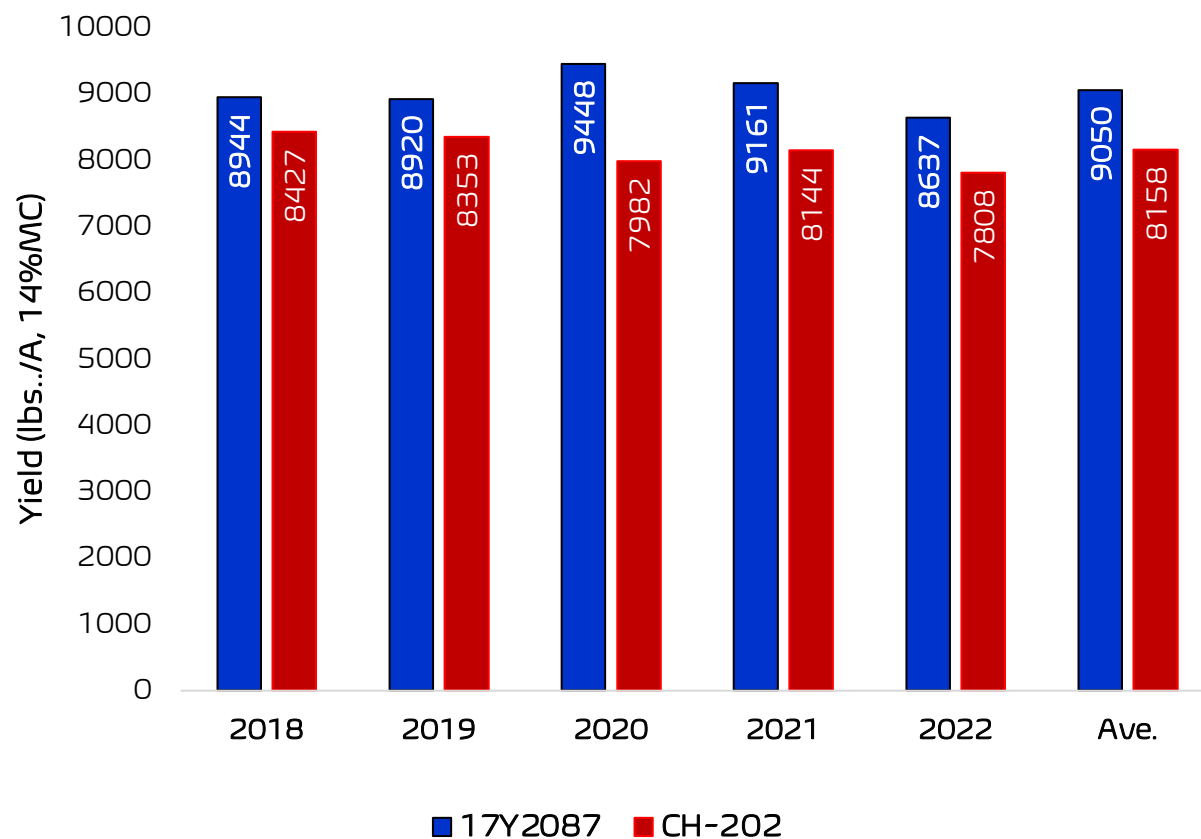
I submit this information, to the best of my knowledge, as a complete and accurate estimate of my seed production of CCRRF varieties.

Company Name: _____ Signature: _____ Date: _____

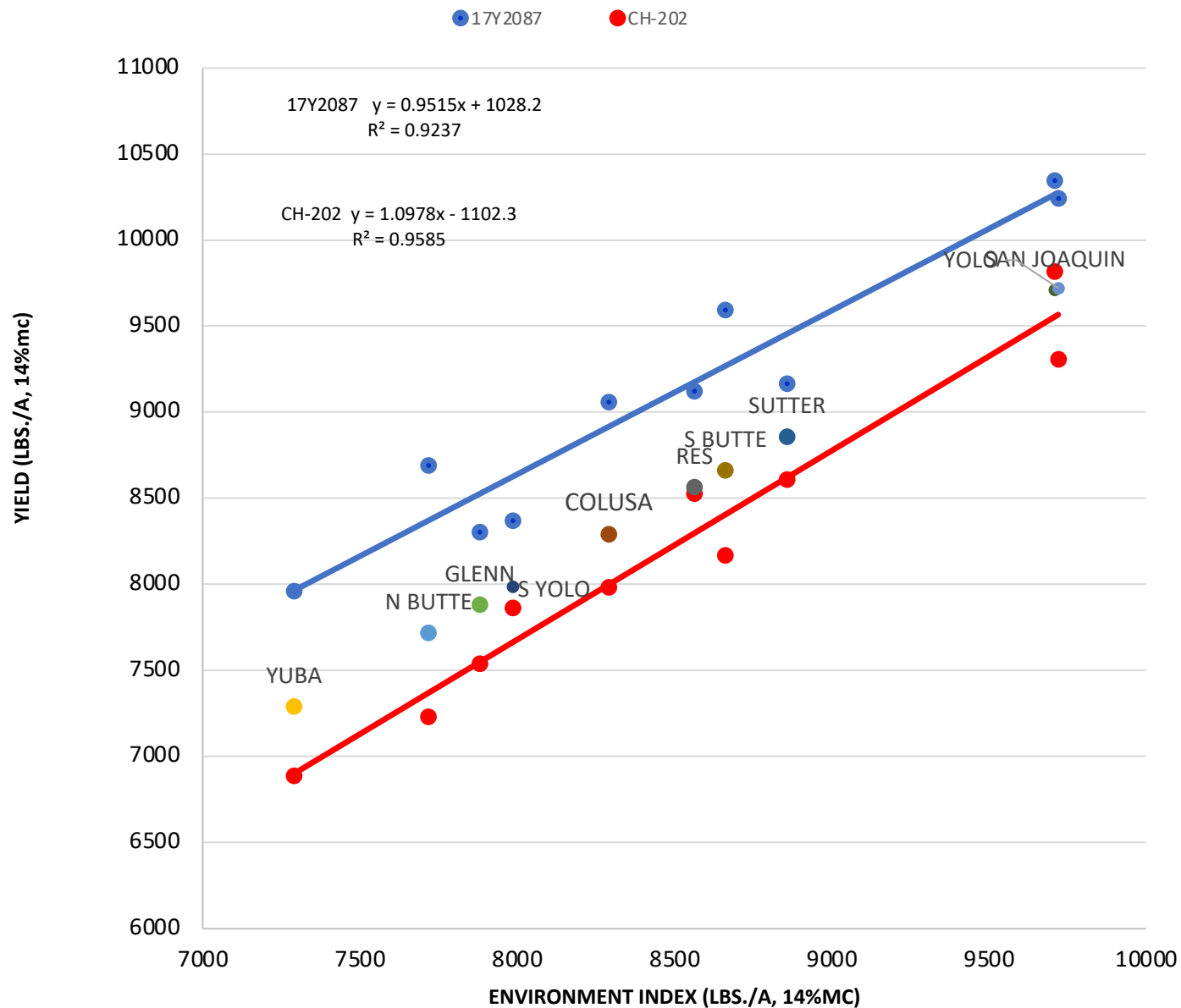
Address: _____ Telephone: _____ Email: _____

17Y2087, A Premium Quality Short Grain CH-203

Pedigree: 10Y2049/CH-202/4/Kosh*2/S-101//Kosh/S-101/3/Hitome



- Improved yield w/o sacrificing quality
- Non-pubescent



	CH-202	17Y2087	SOURCE
<i>Agronomics</i>			
% Head Rice/Total @ 18-20%MC	65/ 71	66/ 72	Milling Tests
Seedling Vigor (1-5)	4.8	4.8	SW Tests
Days to 50% Heading	87	89	SW Tests
Height (cm)	90	91	SW Tests
Lodging (%)	66	33	SW Tests
Panicle Blanking, SJ (%)	2	2	San Joaquin

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Field Day August 30, 2023