



Louisiana Rice Research Update

2023 USA Rice Outlook Conference
Indian Wells, California
December 6-8, 2023

H. Rouse Caffey Rice Research Station

- **Six Major Research Focus Areas**
 - Breeding
 - Dr. Adam Famoso
 - Dr. Brijesh Angira
 - Dr. Harry Utomo
 - Quantitative Genetics – Dr. Roberto Fritsche Neto
 - Pathology – Dr. Felipe Dalla Lana
 - Agronomy – Dr. Manoch Kongchum
 - Entomology – Dr. Blake Wilson
 - Weed Science – Dr. Connor Webster

Conventional Breeding Update

- **Avant**

- Trenasse//Cocodrie/Jefferson/3/Ahrent/Cocodrie//Cocodrie/LaGrue
- Good milling, slightly less than Cheniere
- Increased chalk compared to Cheniere
- Very Early, 1 week earlier than Cheniere in days to heading
- Excellent yields in 2023 commercial release



- **LA20-2166**

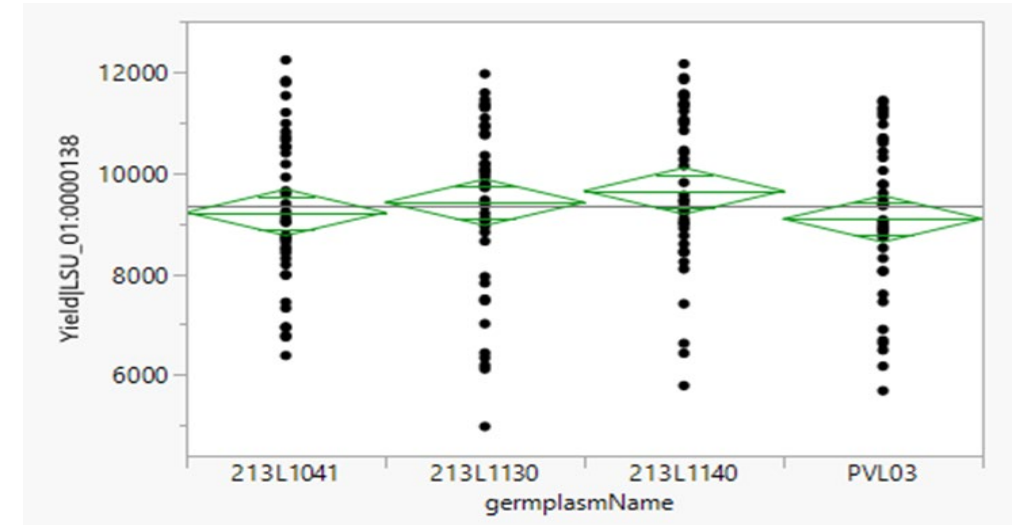
- Jazzman line
- Improved yield over Jazzman and CLJ01 (>800lb/A increase in 2023)
- Stable performance over years and locations
- Good grain appearance, milling, and aroma
- Strong blast resistance
- Plan to be released as 'Fitzgerald' for commercial launch in 2025



Breeding Update - Provisia

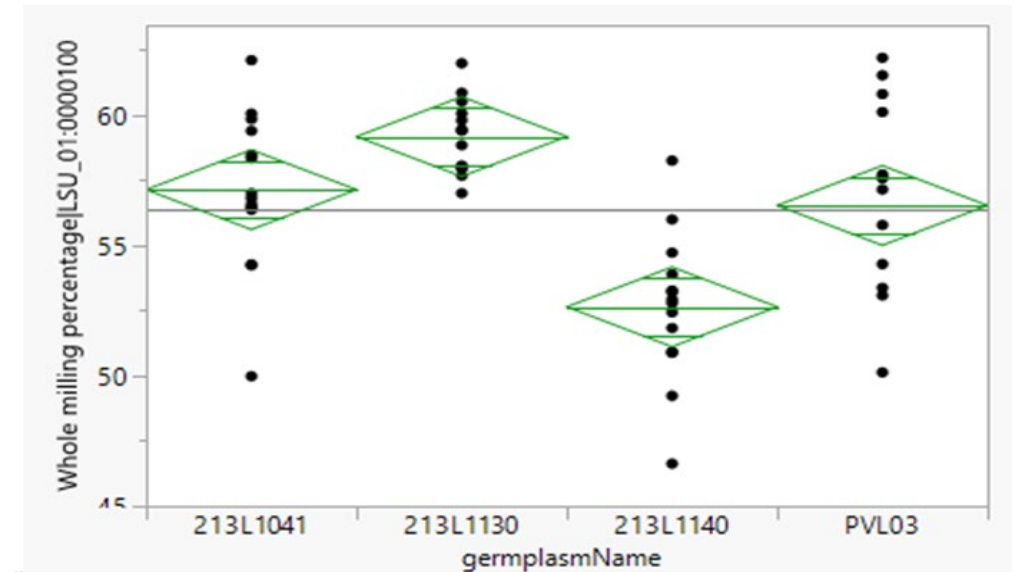
- **PVL03**

- Most widely grown variety in 2023
- Consistent yields and excellent milling
- Improved disease resistance (Pita blast gene)



- **Experimental Lines**

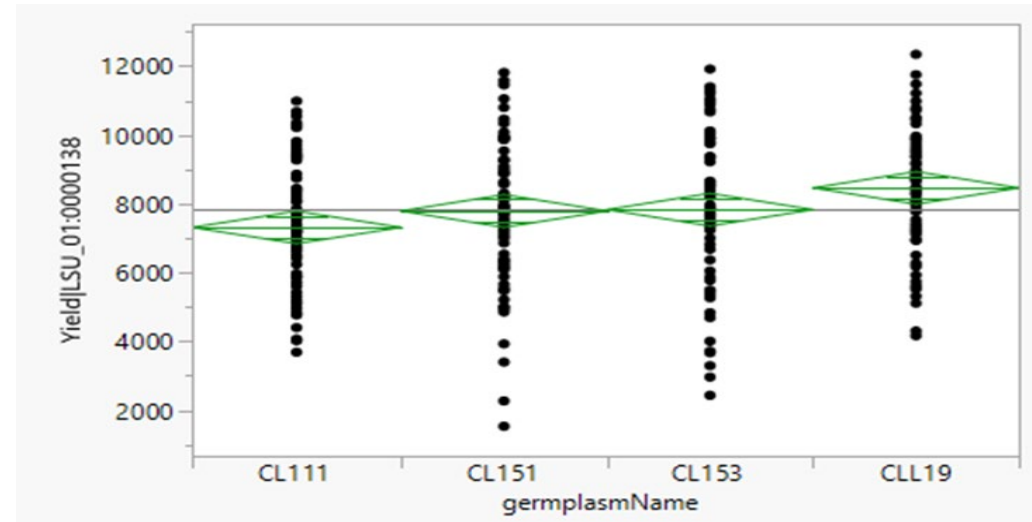
- Two lines (213L1130 & 213L1140) beginning to be purified and increased
- Both show increased yield potential (~3-5%) over PVL03
- Excellent blast resistance in both
- Likely one will be released for 2026 commercial launch



Breeding Update - Clearfield

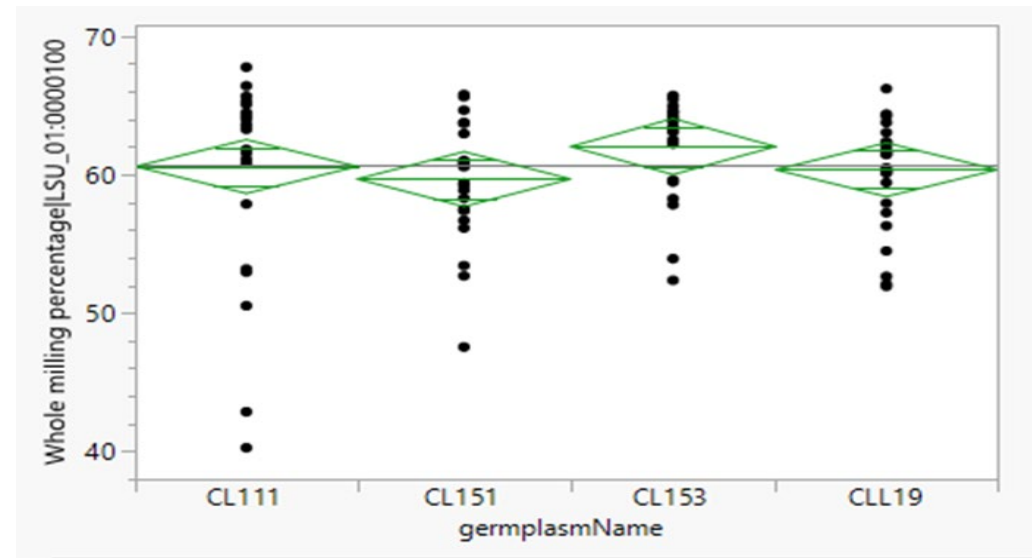
- **CLL19**

- In multi-location testing since 2018
- Excellent and stable yield across years and locations
- Early heading, blast resistant, no lodging
- Multiple seed production fields averaging over 9,700 lb/A
- Very good ratoon yields, average 4,000 lb/Ac in seed field
- 7-8 days earlier than CLL16 and similar to CL 111
- Commercial launch in 2024



- **LA20-2150**

- High amylose type
- Very good yield potential, highest among high amylose types
- Good milling, blast resistance, standability
- Potential release for 2024



Breeding Update - Low GI, High Protein

- New advanced lines of rice with specific health benefits
 - 3 promising new advanced lines
 - Major health benefits
 - Diabetes- friendly
 - Help manage obesity
 - More nutritious source of carbs



Low GI High Protein rice is being marketed as “Parish Rice”

Line	Grain	Yield	Milling	Protein	GI
LGR20191	Long	7488	62/72	11.1	45
LGR20204	Long	8154	63/71	12.3	41
LGR20312	Long	8209	61/70	12.0	46



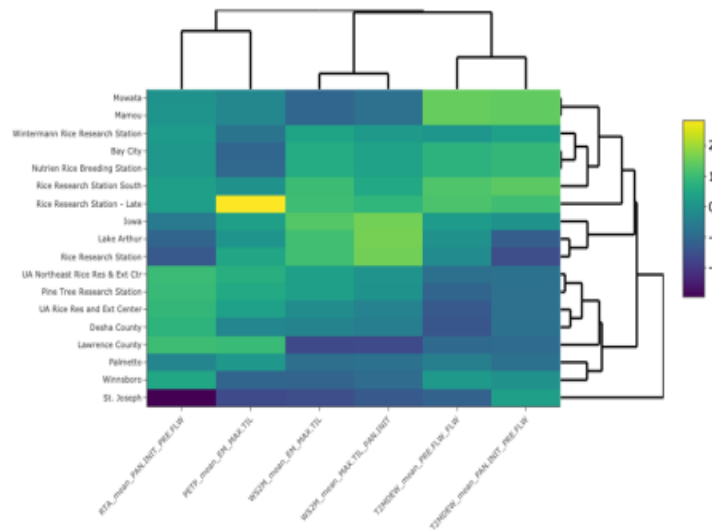
Taste testing in Peru by integrating this rice into five major Peruvian menus (8/23)

Quantitative Genetics Program

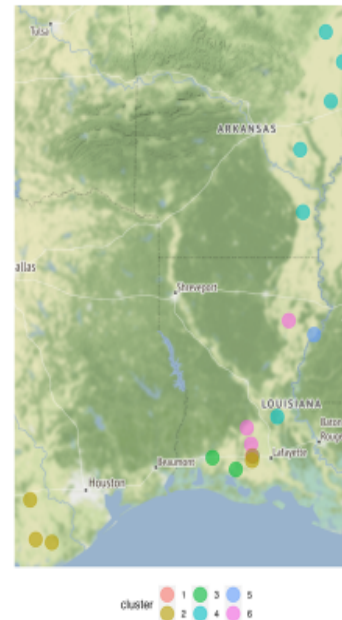
- Expand Prediction-Based Modeling
- Optimize Breeding Framework
- Breeding Analytical Pipelines

Predictions using historical weather data

- 18 locations – Pre-Commercial
- 10 years of weather data - NASA
- During rice growing season
- Adjust to rice response
- 2 years of yield data
- Predictions:
 - Linear mixed models
 - Artificial Intelligence



Predictions using historical weather data



CONSEQUENCES:

- Better allocate trails in advance, matching the demand
- Borrow information from other regions
- Support the rice breeding program to recommend/identify the best variety for each location
- Reduce costs and increase precision

Pathology Update

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1

Field history



2

Variety
resistance
and seed



3

Management



4

Weather



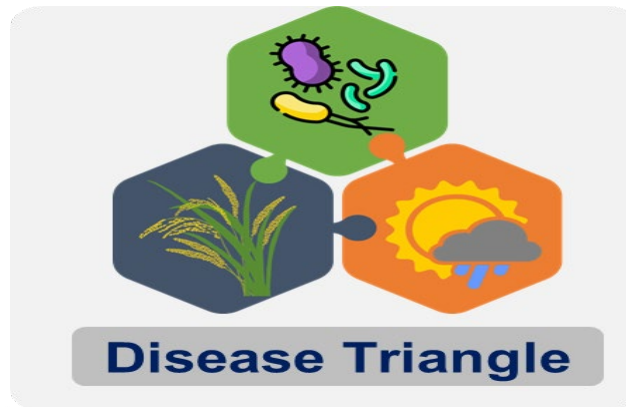
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Disease
intensity



6

Yield
expectation
and market

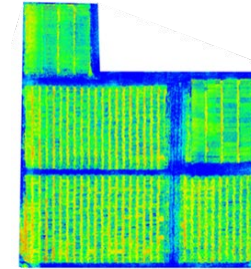


Pathology Update

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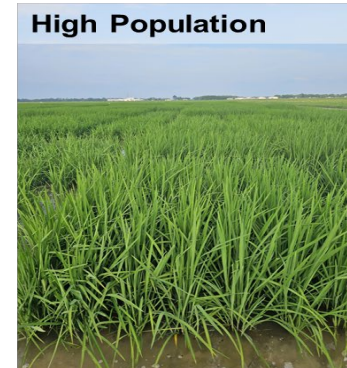
- **Host Resistance**

- Phenotype (R, MR, MS, S)
- Discovery of new genetic resistance sources
- New phenotyping methods
- Yield tolerance



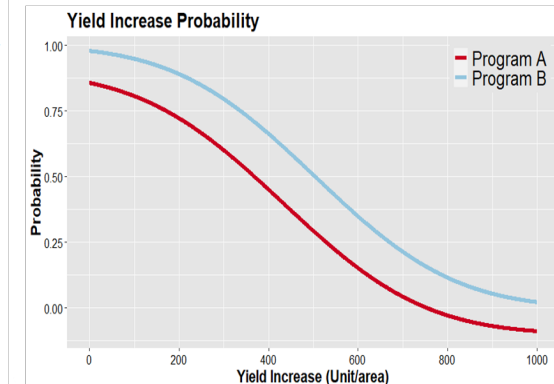
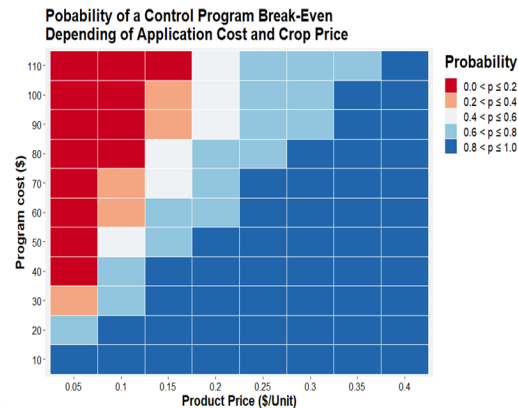
- **Integrated Pest Management**

- Fungicide panel with all labeled fungicides
- Sheath Blight IPM (Variety x Fungicide)
- Plant density
- Yield loss
- Fungicide Resistance



- **Epidemiology**

- Risk assessment / forecasting models (Weather + Variety + Management)
- Management thresholds
- Spatial and temporal analysis
- Research synthesis
- Decision support system

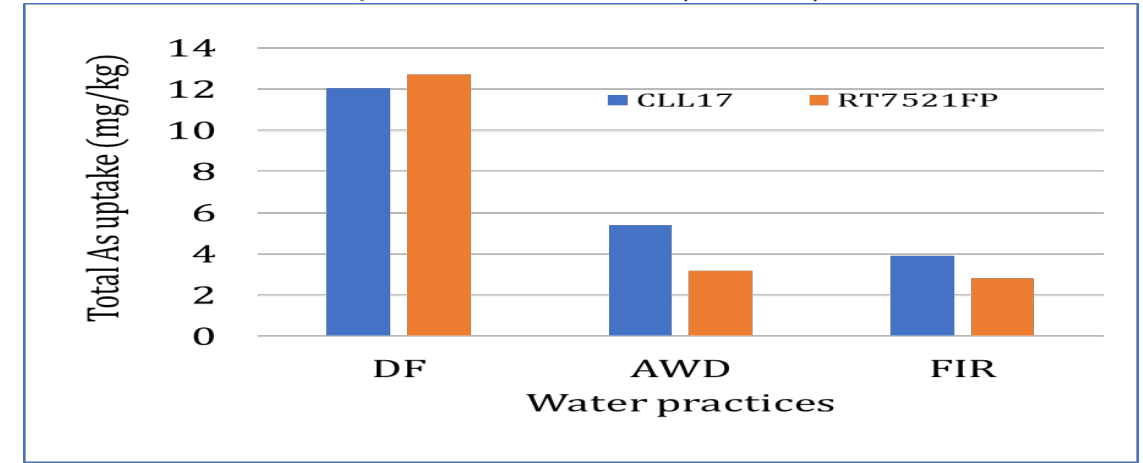


Agronomy Update

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- **New variety agronomics testing**
 - Support breeding programs
 - Agronomic packages
 - Optimal N rates
 - Optimal seeding rates
 - Variety Testing
- **Stubble management for ratoon crop**
- **On-farm climate-smart practices**
- **Water management practices**
- **Arsenic uptake**
- **Mitigation of greenhouse gas emissions**

Evaluation effect of water management practices on arsenic uptake in milled rice (total As)



Evaluation of water practices and N application methods on CH₄ and N₂O emissions

Water practice	N application	CH ₄ (kg/ha)	N ₂ O (g/ha)	GWP* (kg CO ₂ -eq)/ha
Delayed flood	Single preflood	136	81	3,822
	2-Split application	132	74	3,716
AWD	Single preflood	32	1,365	1,258
	2-Split application	31	938	1,117
Furrow Irrigation	Single b/f irrigation	23	4,640	1,874
	3-Split application	18	1,463	892

*CH₄ = 28, N₂O = 265 (IPCC 2013)

Entomology Update

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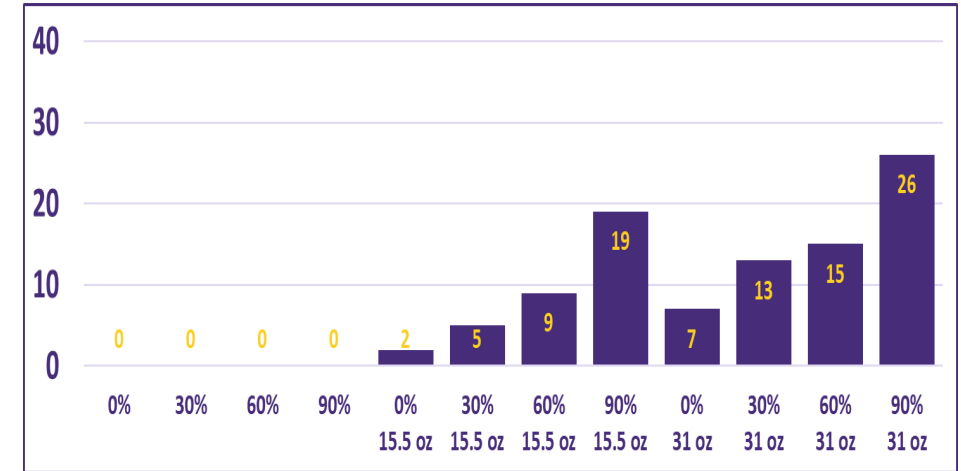
- Insecticidal seed treatments
- Foliar insecticides
- Insect resistant varieties
- Row rice pest management
- Invasive apple snails
 - Federal funding received (\approx \$500k) for management research in rice and crawfish



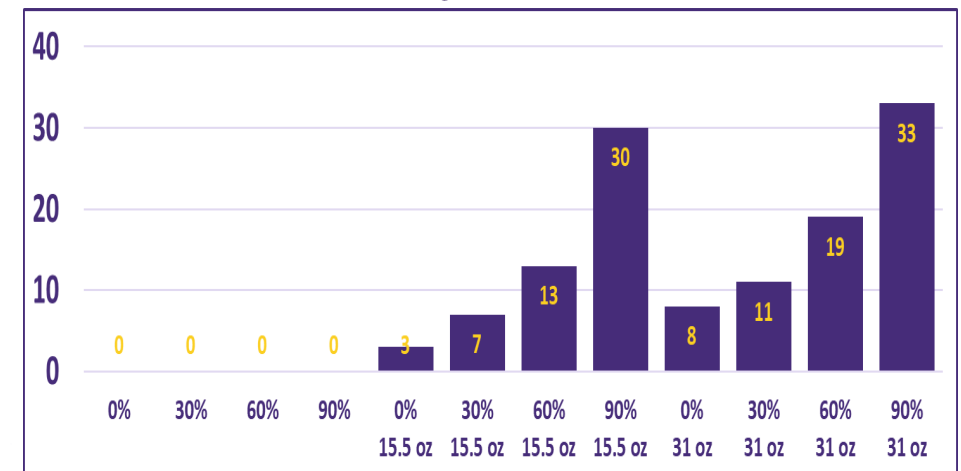
Weed Science Update

- **Evaluation of 4 experimental herbicides**
 - Tetflupyrolimet
 - Oxflorfen in Roxy RPS
 - Adama PPO
 - Generic Command – Albaugh
- **Advanced Provisia rice lines tolerance**
- **Simulated overcast weather patterns and Provisia injury**
- **Simulated Newpath/Preface carryover**
- **Control of Fimbristylis – Pre and Post**
- **Preflood herbicide coated fertilizer efficacy**
- **Rinde herbicide programs in Clearfield & Provisia rice**

Shade 7 Days Before Provisia



Shade 7 Days After Provisia



H. Rouse Caffey Rice Research Station Field Day June 25, 2024

