



Sustainability Challenges for Rice

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Head of Transformation and Business Development

RiceTec is the only seed company focused on rice

- RiceTec founded in US - 1988
- Mercosur expansion - 1996
- India expansion - 2010

RiceTec has led the way in transforming the rice seed industry for more than 30 years.

- First hybrid cross created - 1988
- First hybrid released - 2000
- First herbicide tolerant trait released - 2003

RiceTec has partnered with rice growers for generations.

OUR VISION

Sustainable rice agriculture that creates more value for farmers, consumers, and the planet

OUR MISSION

To lead innovation for sustainable rice agriculture



With operations around the world, RiceTec services a global customer base

UNITED STATES

Global Headquarters & Research - Alvin, TX
Production - Alvin, Danbury, Eagle Lake, El Campo, TX
US Commercial, Research - Jonesboro, AR
Research Station - Lajas, Puerto Rico

MERCOSUR

Commercial and Research - Santa Maria, Brazil; Treinta Y Tres, Uruguay

INDIA

Commercial and Research - Delhi
Research Station - Hyderabad

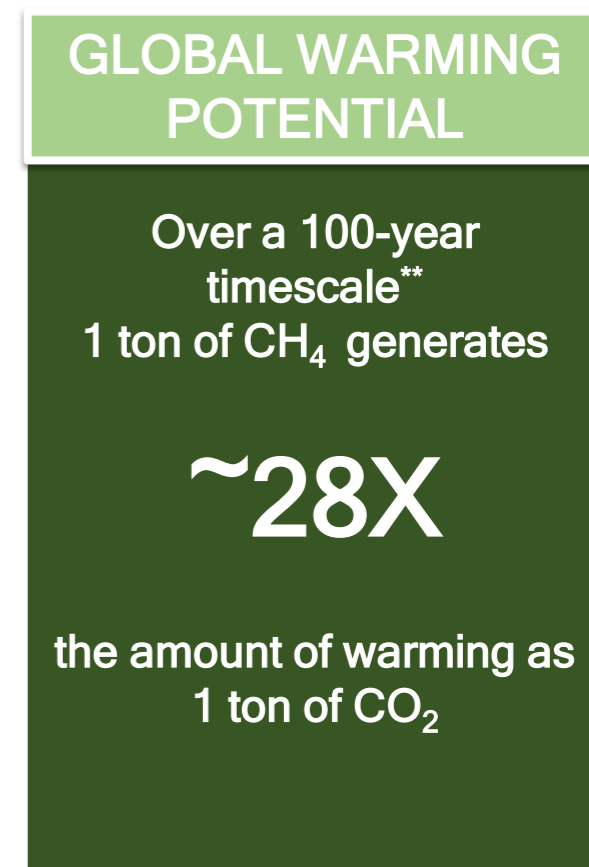
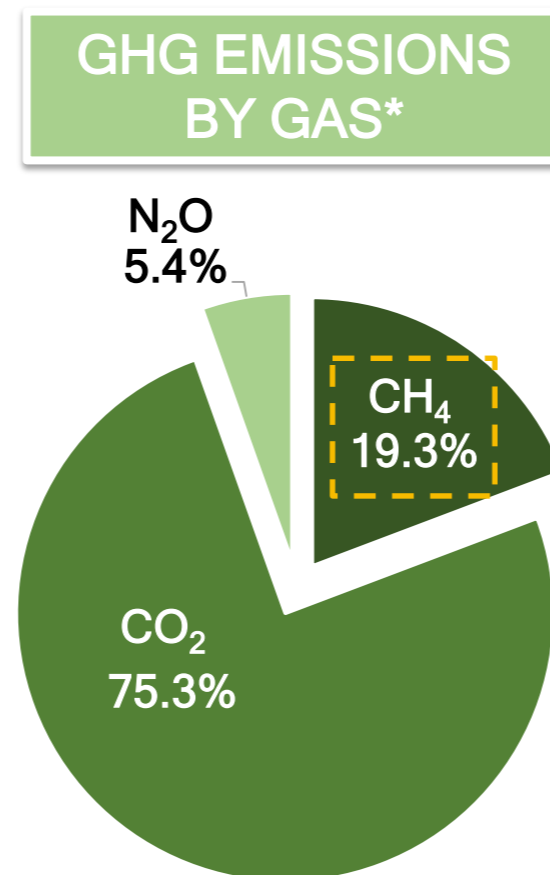
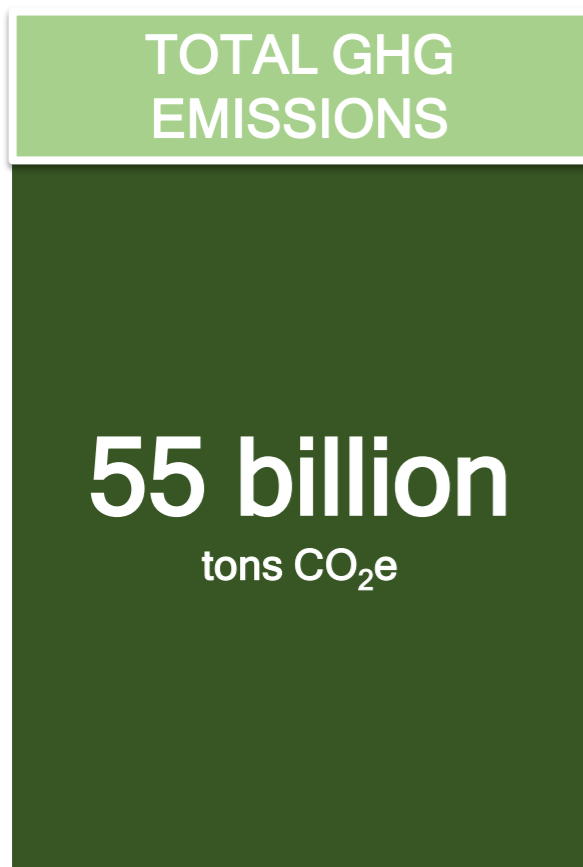


RiceTec Operations: United States, Mercosur, India



Export Countries: Spain, Italy, Colombia, Angola, Belize, Mexico, Ecuador, Peru, Paraguay, Bangladesh, Vietnam

Methane is a much stronger GHG gas than CO₂ due to its warming potential and thus has a higher impact

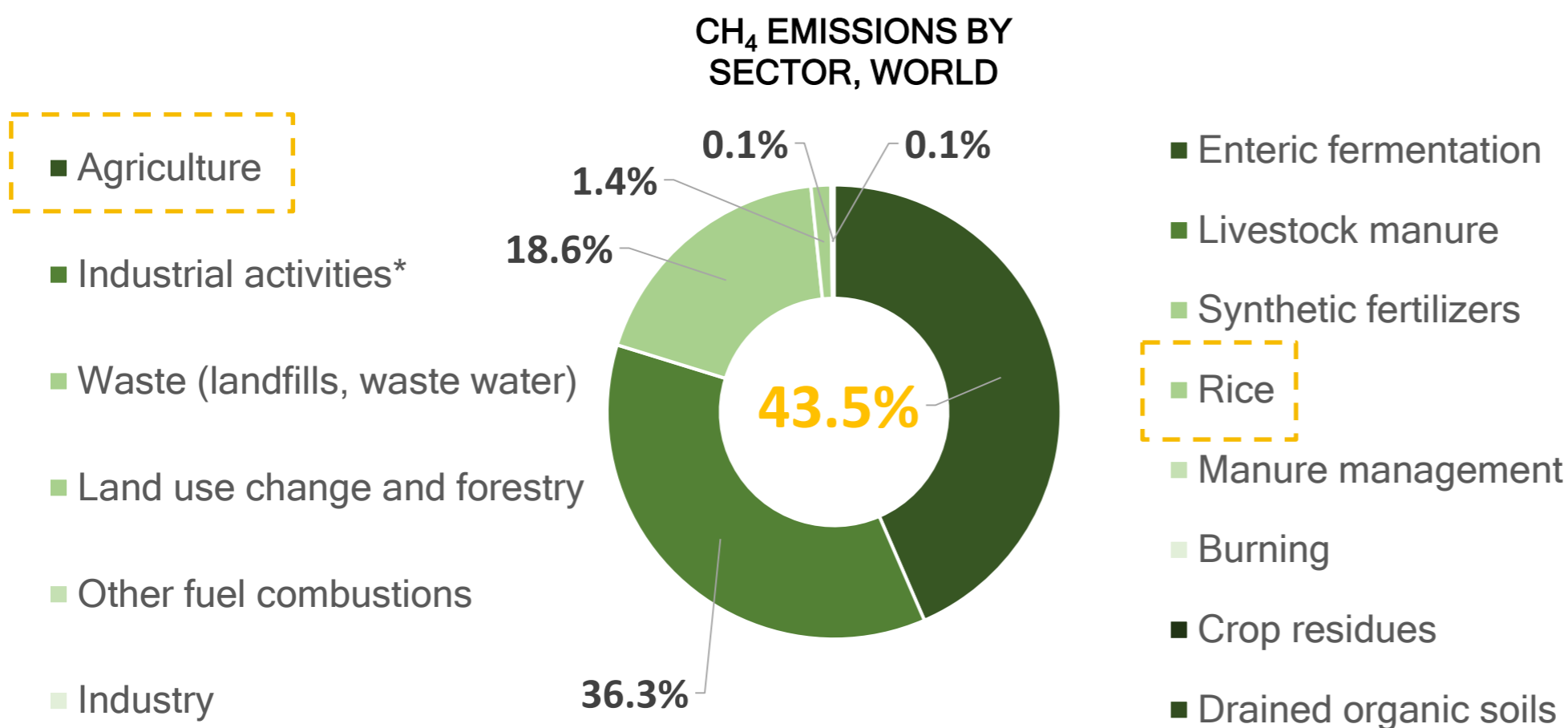


*Measured in tons of CO₂e

**20 years ~80 times more heat than CO₂

Source: Our World Data | Climate Portal

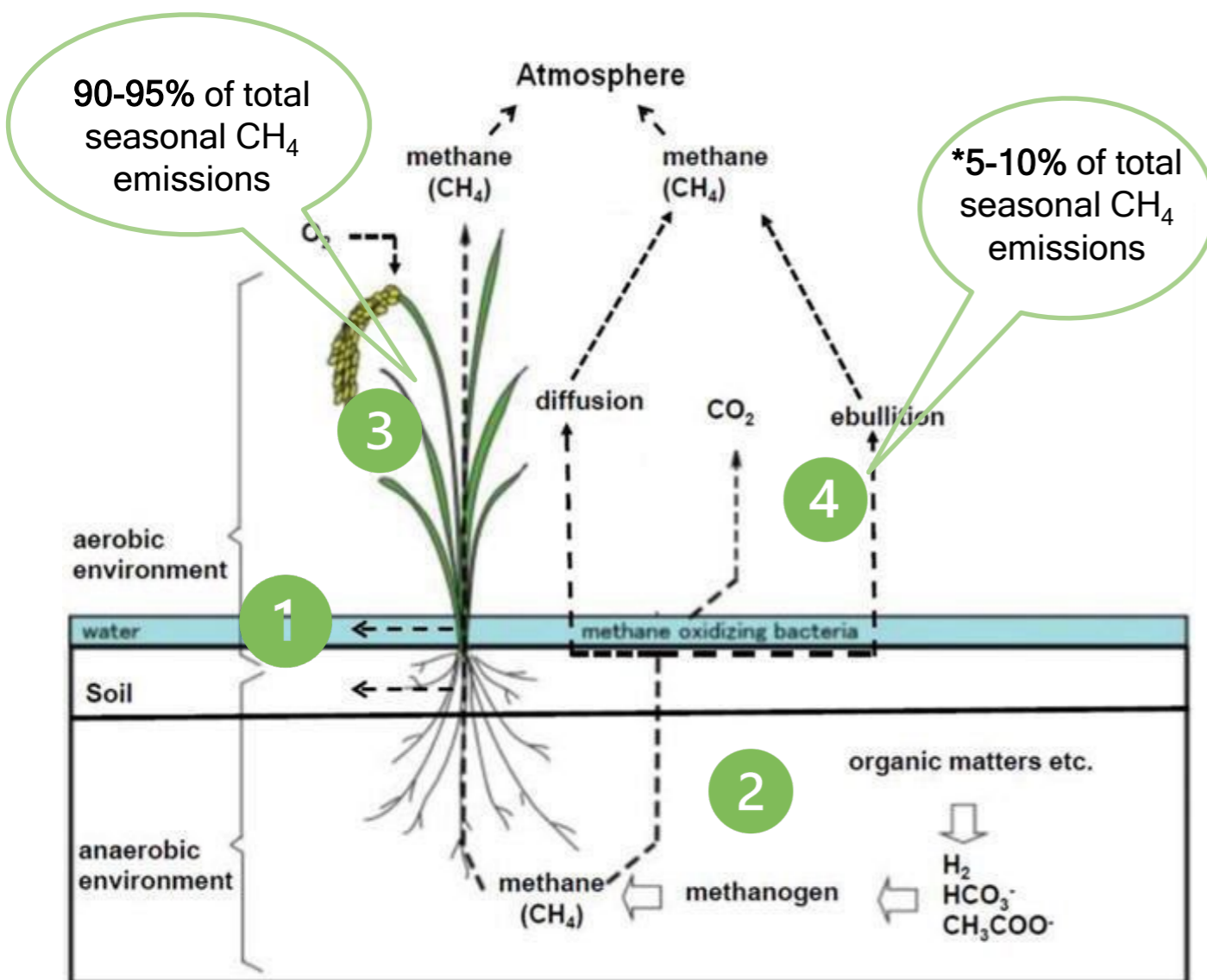
Rice agriculture makes a significant contribution to total methane emission worldwide



Rice is responsible for 10% of the CH₄ emissions in agriculture or ~4% of the global CH₄ emissions

*Includes unintentional gas leaks from fracking and more traditional oil and gas extraction and transportation

Water management practices significantly influence and drive methane production



- 1 Oxygen can't reach the soil when water is on the field
- 2 Lack of oxygen causes anaerobic fermentation, producing methane
- 3 Methane exits the soil and enters the atmosphere
- 4 Remaining methane rises soil or moves through the soil and the water above it

Water usage in rice can be reduced with direct seeded rice (DSR)

US: DSR

Europe: DSR

South America: DSR

Africa: Transplanted

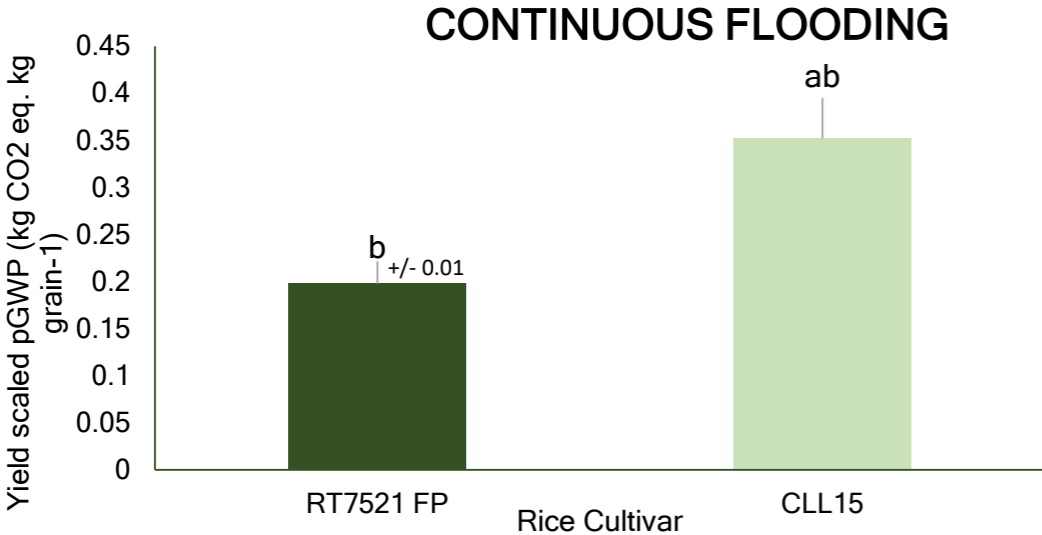
SEA: Transplanted



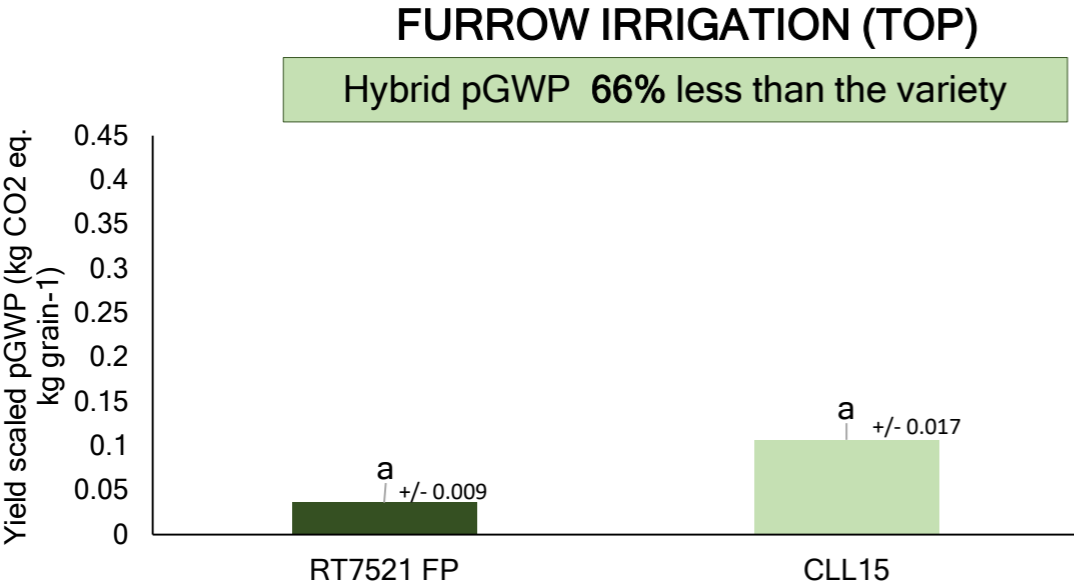
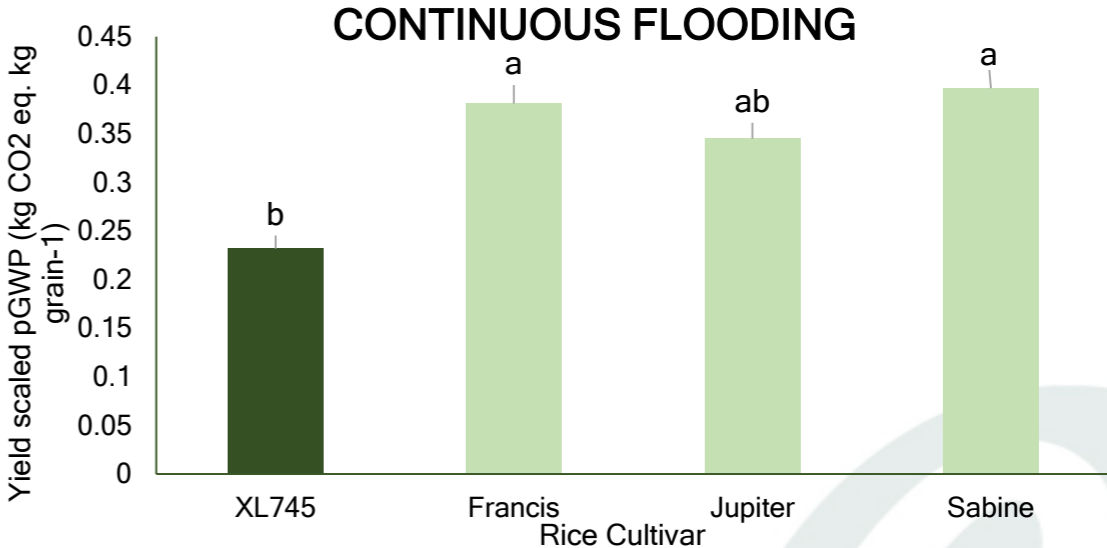
DSR - rice seeds are directly sown into the field without first raising seedlings in a nursery

Transplanted Rice: rice seedlings are grown in a nursery and then transplanted by hand or using machines into a flooded field

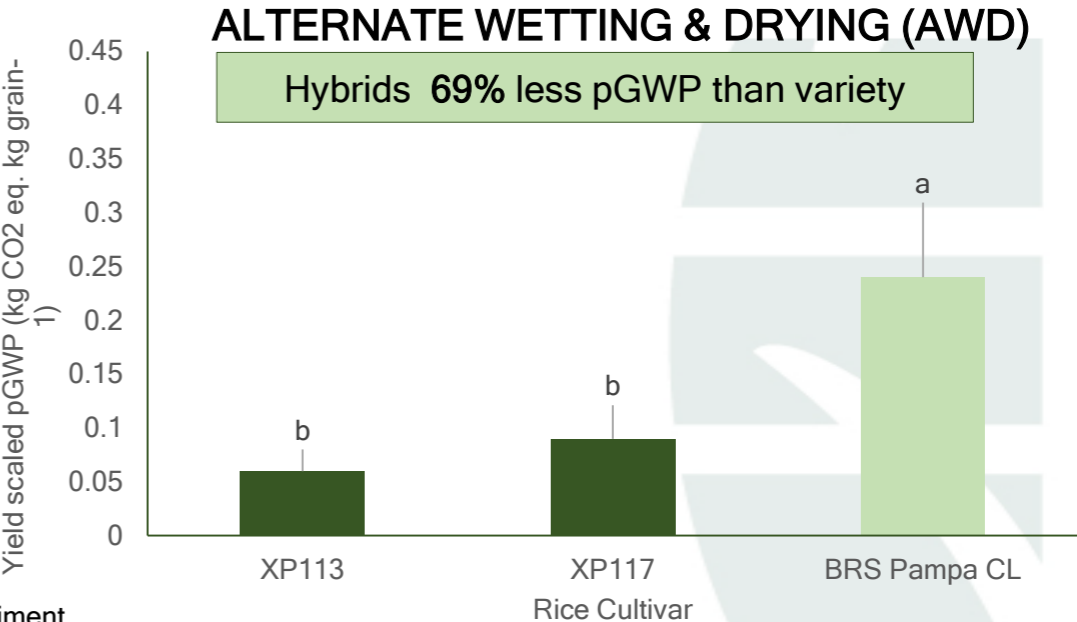
Change in water management practices and use of hybrids can help avoid methane production



The pGWP of hybrids is 44% less than that of varieties



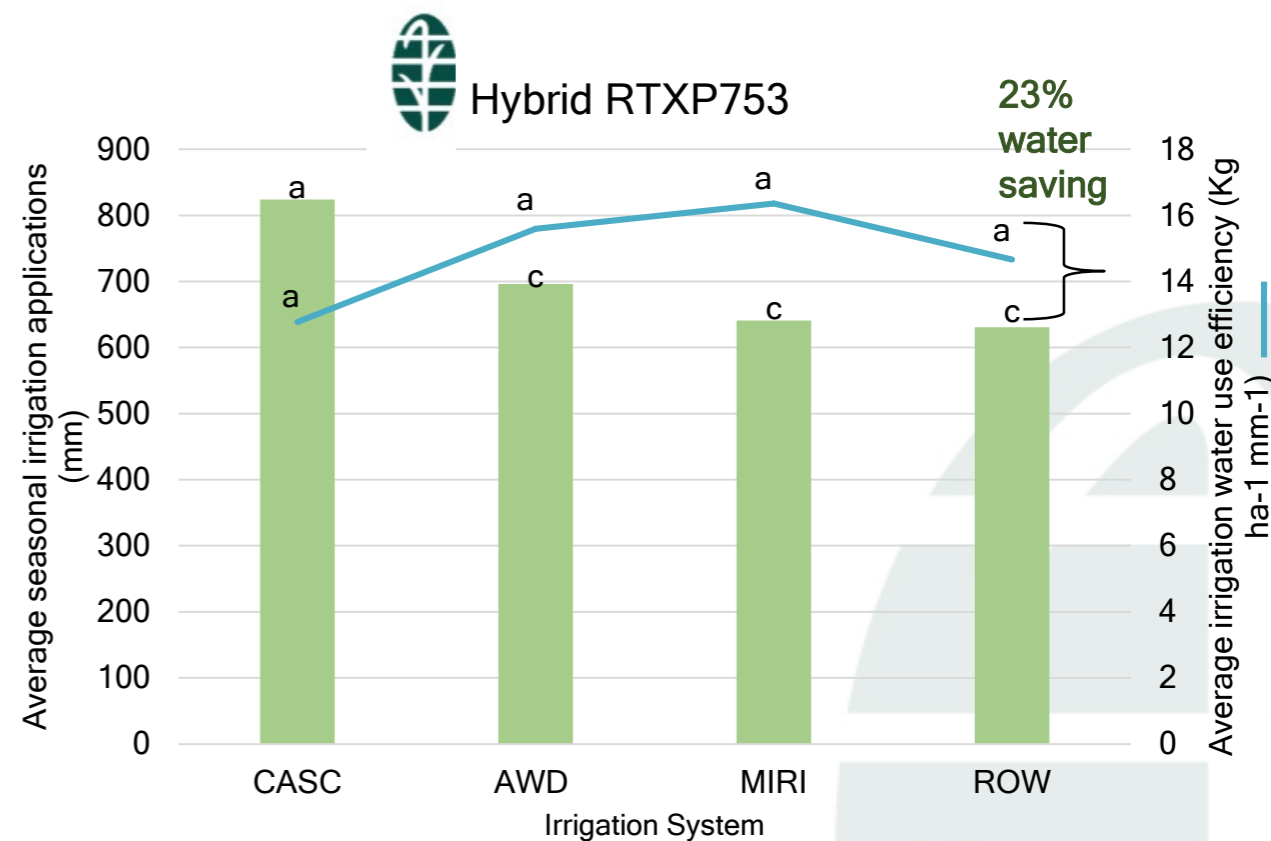
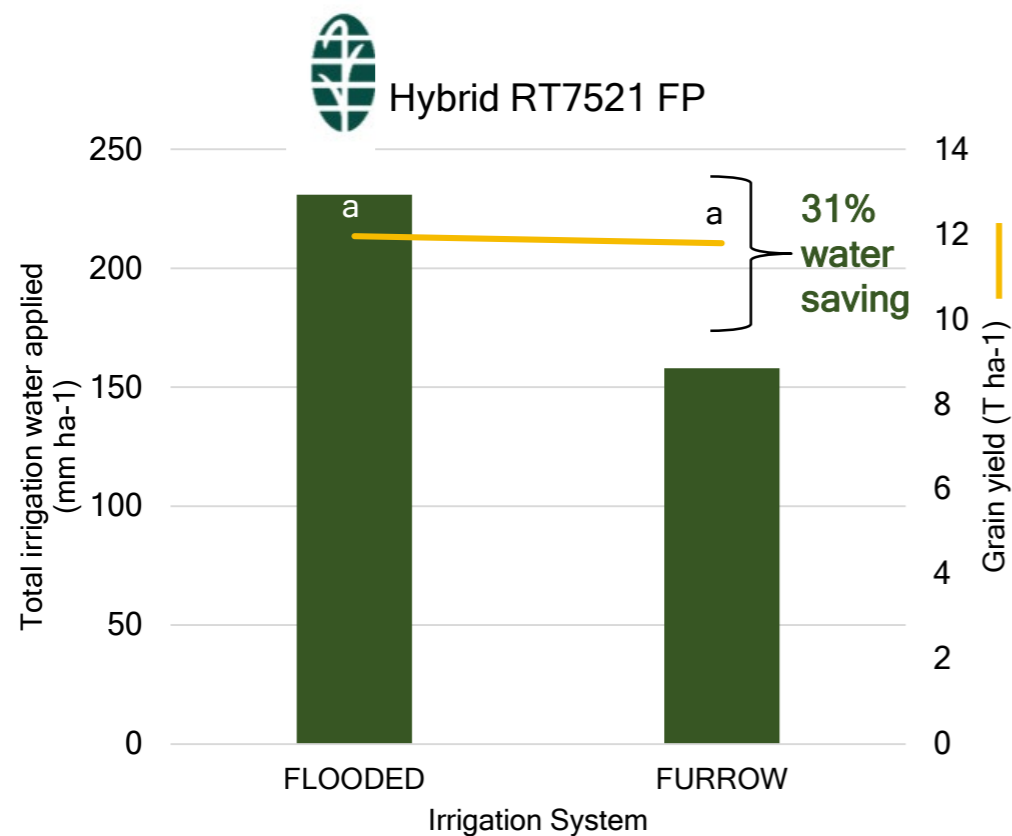
Hybrid pGWP 66% less than the variety



Hybrids 69% less pGWP than variety

Source C1 & 3: USDA-ARS and Univ. of Arkansas, Harrisburg, AR, Adviento-Borbe, 2022 et al. Ongoing experiment
 C2: University of Arkansas, Stuttgart, AR, 2012. Simmonds et al, 2015 | C4: EMBRAPA, RS, Brazil. 2021-2022. Bueno Scivittaro, 2022.

Hybrid rice can be grown profitably using less water than with continuous flooding systems



CASC (Continuous flood cascade distribution),
 AWD (MIRI plus alternate wetting-drying flood management),
 MIRI (Multiple-inlet rice flood irrigation),
 ROW (Furrow-irrigated with end-blocking)

Our offering for carbon and certification will allow growers to select their preferred sustainability program



The carbon space drives higher income opportunities for farmers through sustainable farming programs

WITH CHALLENGE COMES OPPORTUNITY

There is a lot of “carbon” noise in the market

RiceTec is piloting a US and India carbon program, building it incrementally to benefit from learnings

We are partnering to align our expertise in rice with other's expertise in carbon

RiceTec is farmer focused, returning the value of methane reduction to the farmers

