Bringing Voluntary Agricultural Carbon Credits to Environmental Markets

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Intermittent Flood Management to Increase Rainfall Capture & Reduce Over-Pumping

Avg. In-season rainfall ~10 to 14 inches

Pumping Cycle: ~ 5 to 8 d
Pringle (1994)
How Much Water Does Rice Need?

Rice ET + Soil Percolation = \(~14\) to \(25\) A-in/A

- **Coutour Levees**: \(44\) A-in/A
- **Straight Levee (SL)**: \(38\) A-in/A
- **SL + Side Inlet**: \(31\) A-in/A
- **Zero Grade**: \(20\) A-in/A
- **Seasonal Rainfall**: \(9\) A-in/A

\(~20\)-in excess
\(~12\)-in excess
\(~6\)-in excess

2004-2009 Water Use Data: YMD.ORG
Greenhouse gas emissions in rice

“WHY ME”

GWP of rice relative to other crops expressed in CO$_2$ eq

Linquist et al., 2012
We don't see the economics changing at the field level for production agriculture to make Environmental Trading work by itself.

Not enough money under any reasonable, sustainable, publicly traded carbon market to pay for "all the fingers in the pie".

We do see the markets as a real solution.

How do we move the needle toward cost of conservation included in the food supply chain.

1 bu. Per acre
The Grant Part

• Goal: Form a Farmer-Driven, Market-Based Sustainable AG Co-Op to market GHG offsets

• And........

• Develop an Environmental Stewardship Branding Program.
Funding Provided by Conservation Innovation Grant Program
Project success

• Great farmer group support

• Natures stewards ACR Outstanding Environmental Leadership Award

• LLC legally formed to serve as prototype

• 35,000 acres of across 4 states

• Advancement in record keeping solutions
NATURE’S STEWARDS
Success

- We had 4,000,000 bushel of green grown, sustainable, documented bushels of rice in storage
- We now have 2,500,000 bushel and are trying to find buyer at a premium
- These met the CARB requirements for documentation
- CARB pulled the money for verification and the cost for verification exceeds carbon payment
- We are going to the voluntary market
Future

• Development of a sustainability scoring method

• Reducing significantly the record and reporting burden

• ACR Rice 2.0

• Industry survey
Crop calendar results based on MODIS NDVI data from 2013 and 2014. Method uses 8 day NDVI time series trend to identify start of growth and end of growth. Emergence is defined as the initiation of green up, start of season indicates the beginning of crop development and end of season indicates harvest.
Radarsat SAR Imagery (10 miles NW of Stuttgart)
Mapping changes in flooding and crop growth

Radarsat 2 HH time series.
Green indicates flooding/increase in double bounce (water and vegetation)
Bright red areas showed decreases in backscatter likely due to drainage.

Radarsat 2 HV time series.
Blue regions indicate growth (volume scattering).
Thank You
from your friends at the
White River Irrigation District

White River Irrigation District
Bringing Water For Agriculture to the Grand Prairie
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