DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

FRYAR PRICE RISK MANAGEMENT CENTER OF EXCELLENCE

UNIVERSITY OF ARKANSAS
Dale Bumpers College of Agricultural, Food & Life Sciences

Risk Management Strategies for Rice in 2024

Dr. Hunter Biram
Assistant Professor, Agricultural Economics and Agribusiness
A-State Agribusiness Conference
Jonesboro, AR
February 7, 2024

Challenges and Opportunities for U.S. Organic Rice

UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE

- Researchers from the University of Arkansas Division of Agriculture, Texas A&M, and The University of California Cooperative Extension Service are conducting a rice producer survey with the objective of understanding the drivers of adoption of organic rice production.
- The overarching goal of this USDA-supported project is to generate information about the market challenges and opportunities for U.S. organic rice, which can be used to develop that segment of the market and create more opportunities for U.S. rice farmers.
- The survey targets all rice producers (conventional and organic) and asks general questions about production and marketing practices and basic socioeconomic characteristics.
- You can access the survey using the QR code below. We are also contacting rice farmers via phone.

Your participation is highly valued and appreciated !!!

DIVISION OF AGRICULTURE
RESEARCH & EXTENSION
University of Arkansas System

Roadmap

1. What is the key risk to manage in rice?
   - Measure relative yield risk among competing crops

2. Price Loss Coverage (PLC)
   - Historical performance
   - Price Escalator

3. Optimal Crop Insurance Coverage
   - Revenue Protection
   - Decision Tool

4. Area Crop Insurance Considerations
   - Supplemental Coverage Option
   - Enhanced Coverage Option
   - Margin Protection

Risks in Rice Production and Marketing

- Primary risks faced by rice producers
  1. Production (Yield)
  2. Marketing (Price)

- Which risk is greater?

- How can we determine which risk to pay more attention to?

Analyzing Relative Yield Risk

- Analyze relative yield risk using a measure which allows us to compare variation in each crop's yield to each average yield across the state

- A higher number means it is more risky to grow a competing crop

- A lower number means it is less risky to grow a competing crop

Analyzing Relative Yield Risk

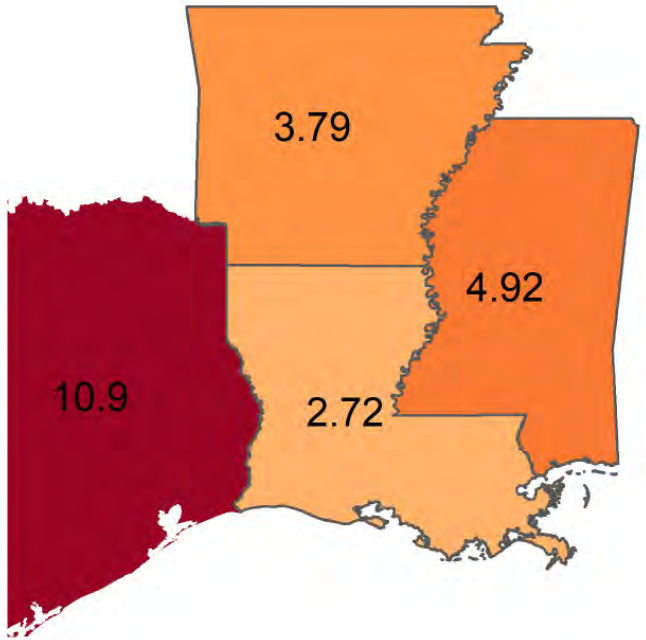
- Construct this measure for major crops grown in Arkansas
  - Long Grain Rice
  - Soybeans
  - Corn
  - Cotton

- Compare the values of each crop to LG rice

- **How much production risk is present in each crop compared to rice production?**

Soybean Yield Risk Compared to Rice Yield Risk

Ratio of the CV for Soybean Yield to the CV for Corn Yield (2007-2022)
(Coefficient of Variation is the ratio of Standard Deviation to Mean)



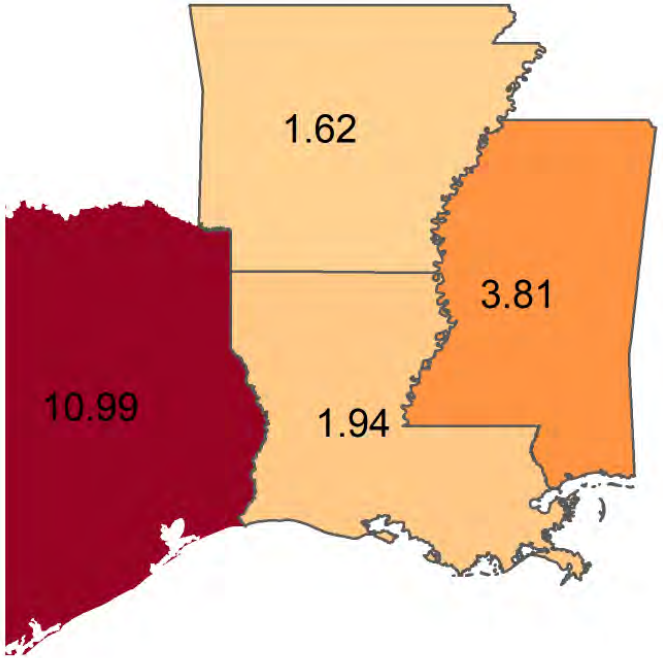
Source: USDA-NASS (2023)

Author: Hunter D. Biram

- This tells us that soybeans are nearly 4 times more risky to produce than LG rice in Arkansas.
- Soybeans are not “bad” to grow, just more risky.

Corn Yield Risk Compared to Rice Yield Risk

Ratio of the CV for Corn Yield to the CV for Corn Yield (2007-2022)
(Coefficient of Variation is the ratio of Standard Deviation to Mean)



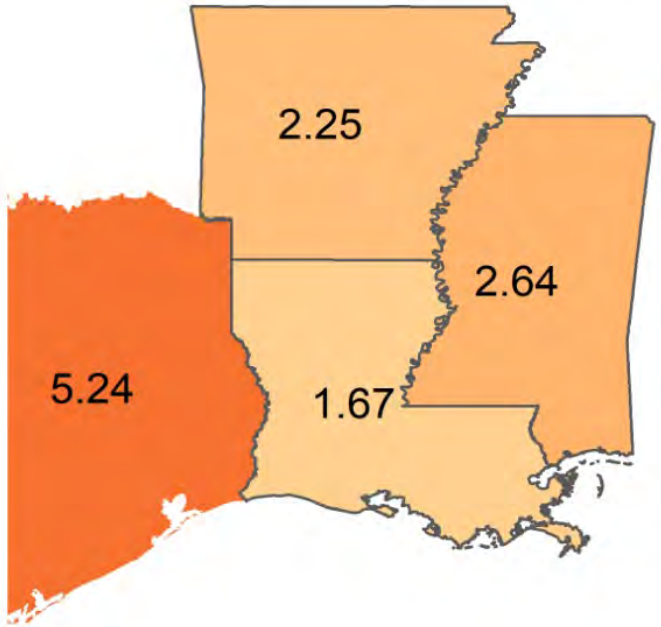
Source: USDA-NASS (2023)

Author: Hunter D. Biram

- This tells us that corn is nearly 2 times more risky to produce than LG rice in Arkansas.
- Corn is not “bad” to grow, just more risky.

Cotton Yield Risk Compared to Rice Yield Risk

Ratio of the CV for Cotton Yield to the CV for Corn Yield (2007-2022)
(Coefficient of Variation is the ratio of Standard Deviation to Mean)



Source: USDA-NASS (2023)

Author: Hunter D. Biram

- This tells us that cotton is more than 2 times more risky to produce than LG rice in Arkansas.
- Cotton is not “bad” to grow, just more risky.

So, what did we learn?

1. Rice has the lowest relative production (yield) risk among soybeans, corn, and cotton.

2. Yield risk is likely not the key risk to manage.

➢ **How can we manage price risk?**

MANAGING PRICE RISK IN RICE USING PLC

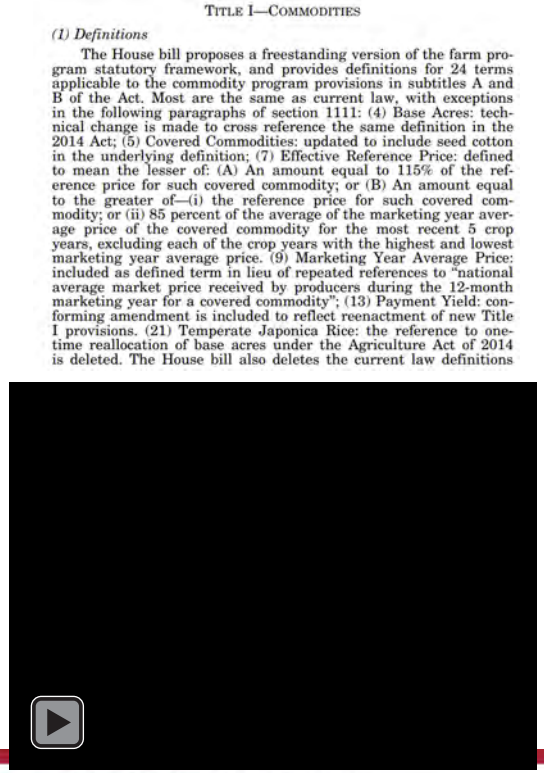
Price Loss Coverage (PLC)

- PLC only provides risk protection against price volatility
- The key variable used in this calculation is the Reference Price, which is set by statute (i.e. federal law)
- Formally, PLC payments are calculated using:

MAX[Effective Reference Price – MAX(MYA,Loan Rate),0] x 0.85 x Payment Yield

- Payment Yield is specific to each farm

PLC Price Escalator



TITLE I—COMMODITIES

(1) Definitions

The House bill proposes a freestanding version of the farm program statutory framework, and provides definitions for 24 terms applicable to the commodity program provisions in subtitles A and B of the Act. Most are the same as current law, with exceptions in the following paragraphs of section 1111: (4) Base Acres: technical change is made to cross reference the same definition in the 2014 Act; (5) Covered Commodities: updated to include seed cotton in the underlying definition; (7) Effective Reference Price: defined to mean the lesser of: (A) An amount equal to 115% of the reference price for such covered commodity; or (B) An amount equal to the greater of—(i) the reference price for such covered commodity; or (ii) 85 percent of the average of the marketing year average price of the covered commodity for the most recent 5 crop years, excluding each of the crop years with the highest and lowest marketing year average price. (9) Marketing Year Average Price: included as defined term in lieu of repeated references to "national average market price received by producers during the 12-month marketing year for a covered commodity"; (13) Payment Yield: conforming amendment is included to reflect reenactment of new Title I provisions. (21) Temperate Japonica Rice: the reference to one-time reallocation of base acres under the Agriculture Act of 2014 is deleted. The House bill also deletes the current law definitions

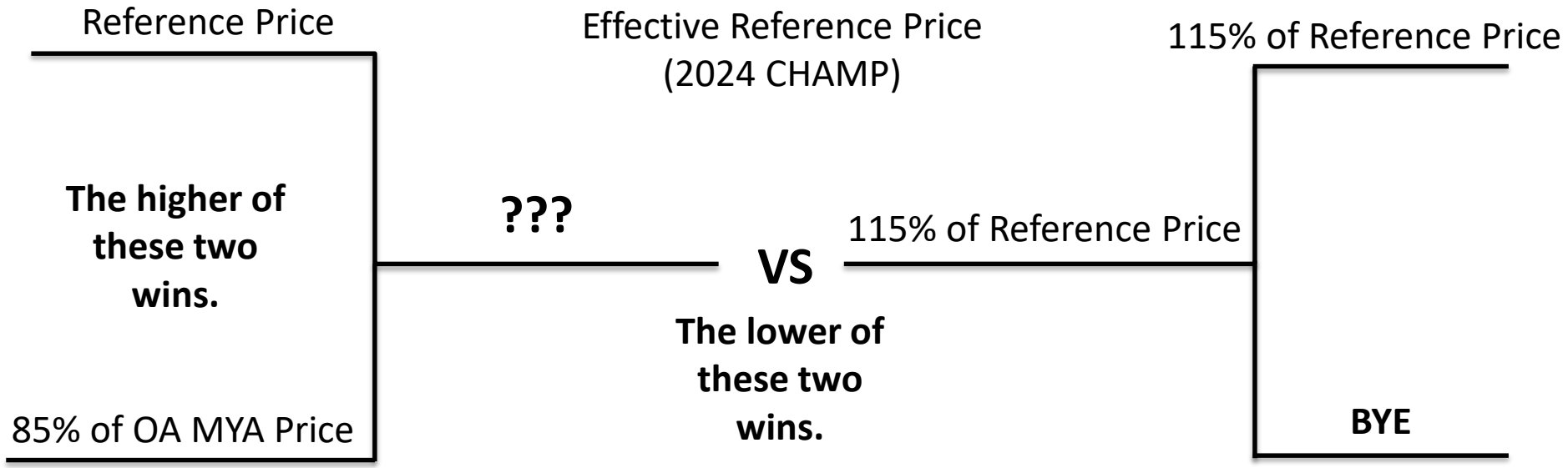
- **Effective Reference Price** will be the lesser of:
  A. 115% of Reference Price
  B. The greater of:
     a. Reference Price
     b. 85% of Olympic Average Price

March Madness

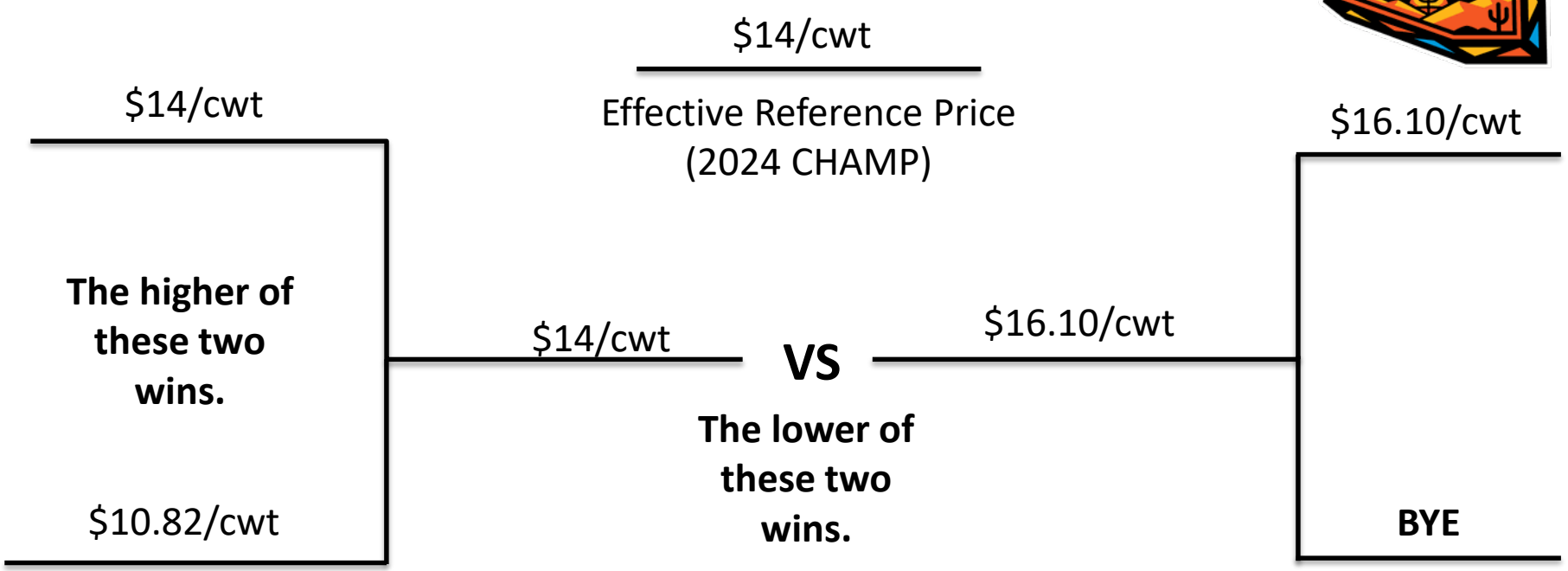
- March 15th deadline to make a decision on ARC/PLC

- I will use a bracket to help us understand how the PLC Price Escalator works.

March Madness



EXAMPLE - Rice



EXAMPLE - Corn

$4.01/bushel

Effective Reference Price
(2024 CHAMP)

$3.70/bushel

The higher of these two wins.

$4.01/bushel

$4.01/bushel

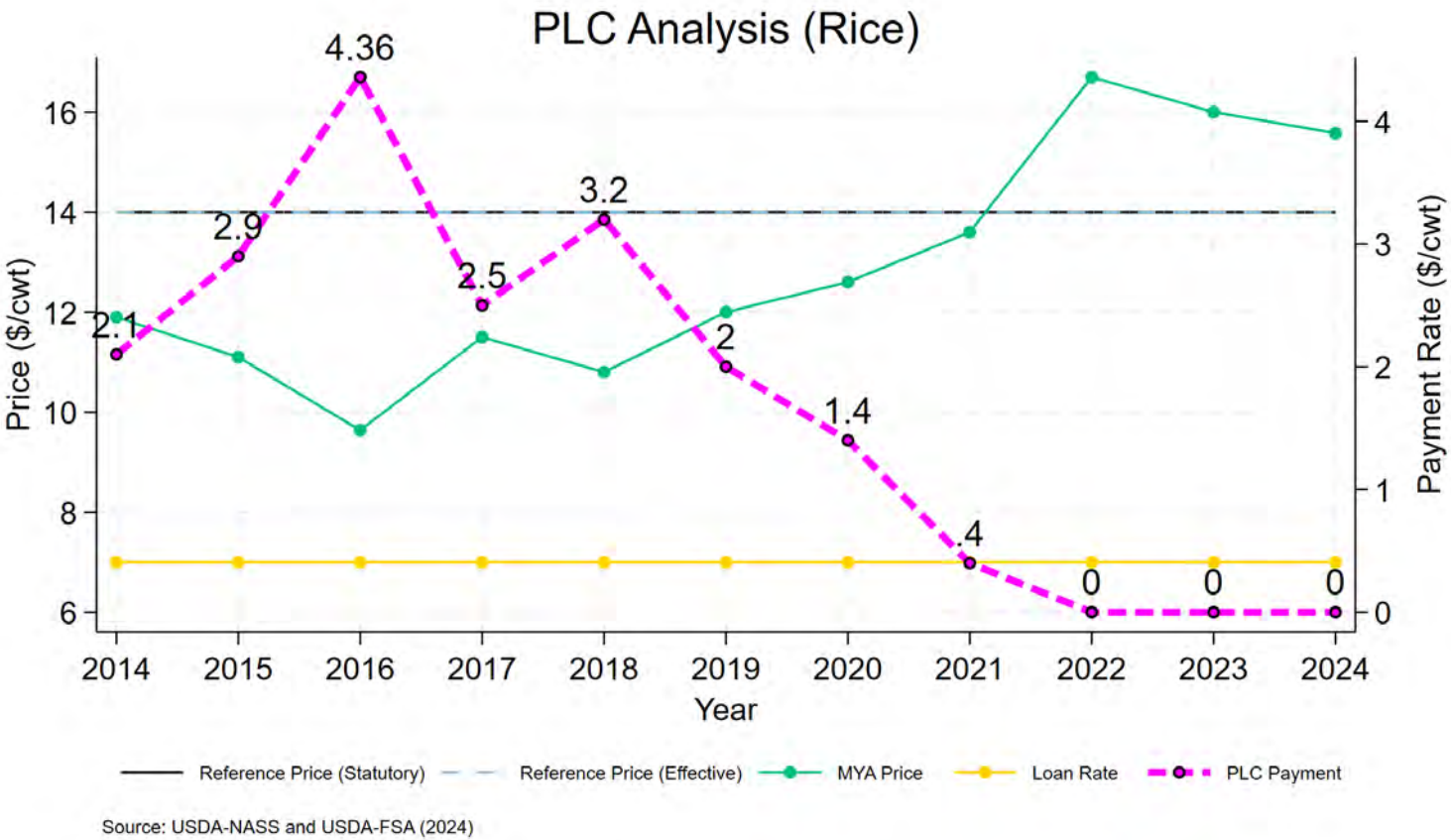
VS

$4.26/bushel

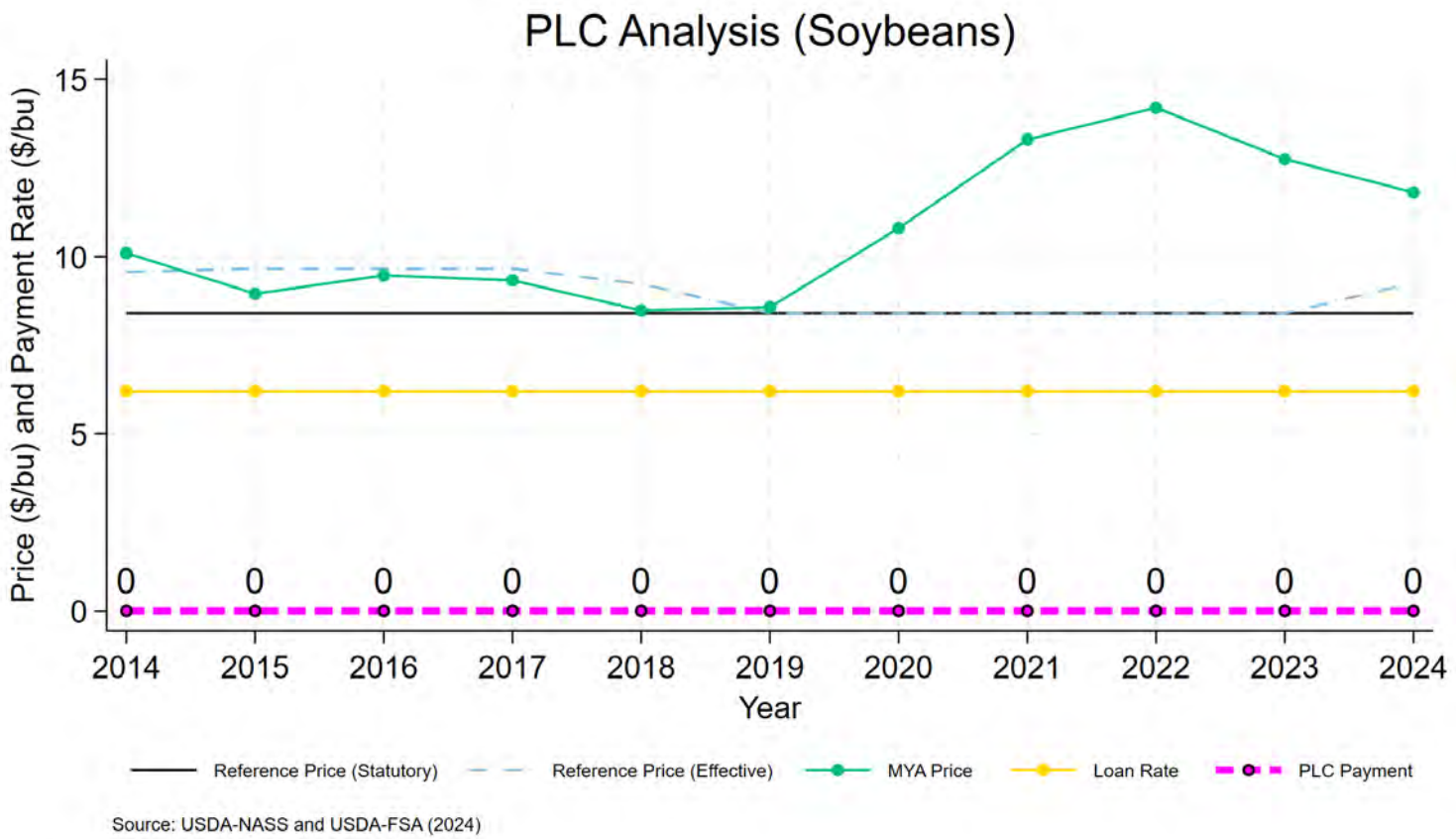
The lower of these two wins.

$4.26/bushel

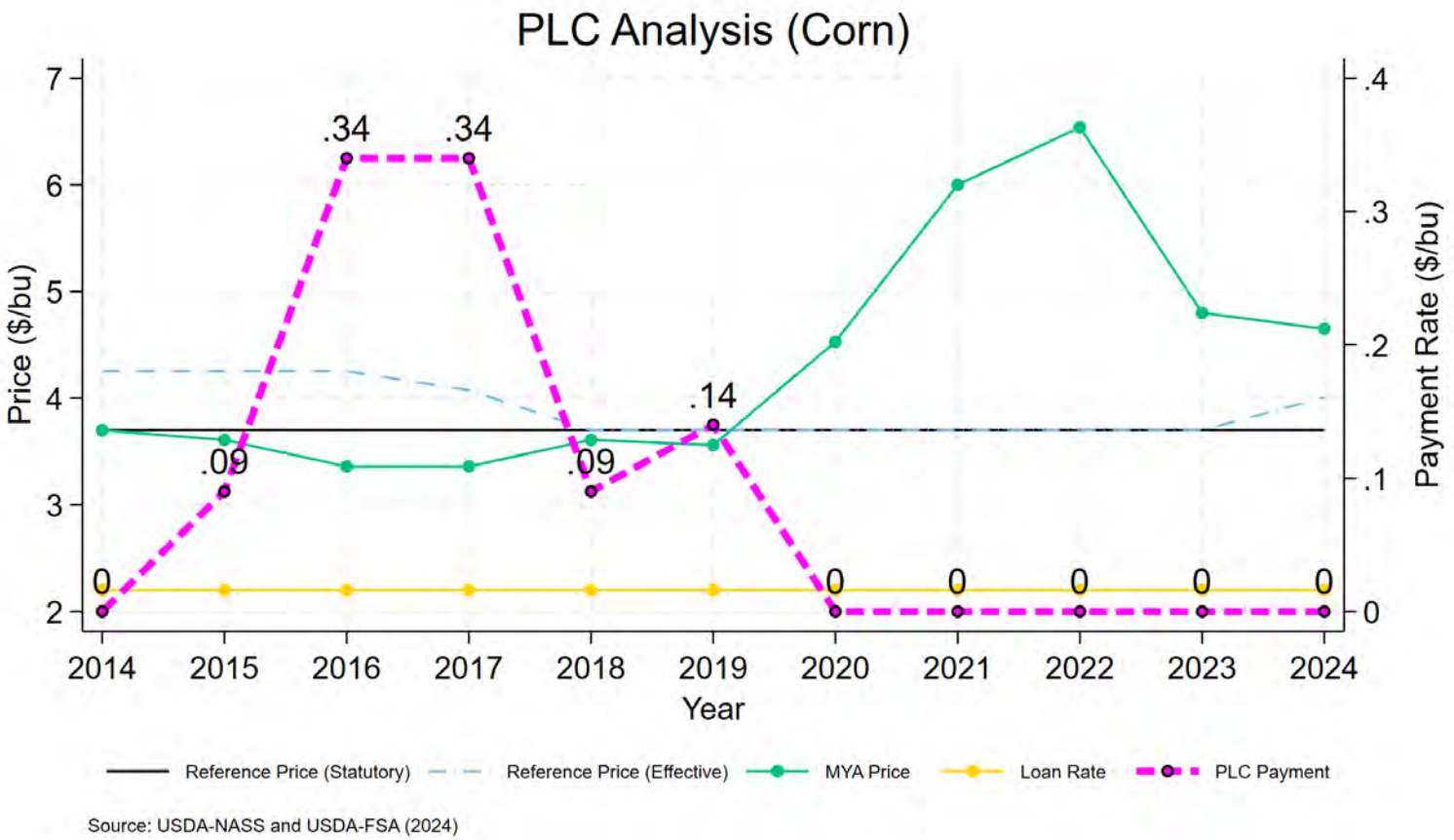
BYE



Source: USDA-NASS and USDA-FSA (2024)



Source: USDA-NASS and USDA-FSA (2024)


PLC Analysis (Corn)
Price ($/bu)
Payment Rate ($/bu)
Year
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
.34
.34
.09
.09
.14
0
0
0
0
0
0
Reference Price (Statutory)
Reference Price (Effective)
MYA Price
Loan Rate
PLC Payment
Source: USDA-NASS and USDA-FSA (2024)

MANAGING PRICE RISK IN RICE USING REVENUE PROTECTION CROP INSURANCE

Revenue Protection Crop Insurance

- RP
- Trigger: Price and APH Farm Yield
- Producer gets to “roll the dice” on price twice
- More risk protection so more expensive than YP

Revenue Protection Example

- Rice (Basic Units)
- Craighead County, AR
- Chosen coverage level: 80%
- Actual Production History (APH): 72 cwt/ac
- Projected Price (RMA): $15.50/cwt
- Revenue Guarantee: $892.80/ac
- Realized harvest yield: 55 cwt/ac
- RMA harvest price: $15.00/cwt
- RMA harvest revenue: $825.00/ac
- Indemnity: ($892.80/ac – $825.00/ac) = $67.80/ac
- Producer Premium: $45.00/ac
- Indemnity net of premium = $67.80/ac - $45.00/ac = $22.80/ac

Crop Insurance Decision-Maker (BETA)

- Online, interactive decision tool

- Designed to help farmers make a well-informed decision as to their crop insurance coverage

Crop Insurance Decision-Maker (BETA)

- Inputs
  1. State
  2. County
  3. Crop
  4. Irrigation Practice
  5. Insurable Unit Structure

- Outputs
  - Expected net revenues for three different crop insurance products, all eight coverage levels, and one scenario where no insurance is purchased

What are the outputs based on?

What are the outputs based on?

- We perform a simulation of prices and yields:
  1. Farm Yield
  2. County Yield
  3. Cash Price
  4. Futures Price
  5. Marketing-Year Average Price

What do these outcomes look like at harvest?

What are the outputs based on?

- We “simulate” harvest in 2023 10,000 times.

- “If we had Groundhog Day at harvest 10,000 times, but the yields and prices were different, what would farm revenue, on the average, look like?”

What are the outputs based on?

Iteration number	Farm Yield	County Yield	Cash Price	Futures Price
1	72.66	75.13	16.63	15.96
2	70.01	74.76	16.07	16.00
3	55.78	75.03	16.69	16.21
…	…	…	…	…
10000	42.72	72.68	15.81	15.78

Crop Insurance Decision-Maker 2023 (Beta Version)

State: Arkansas

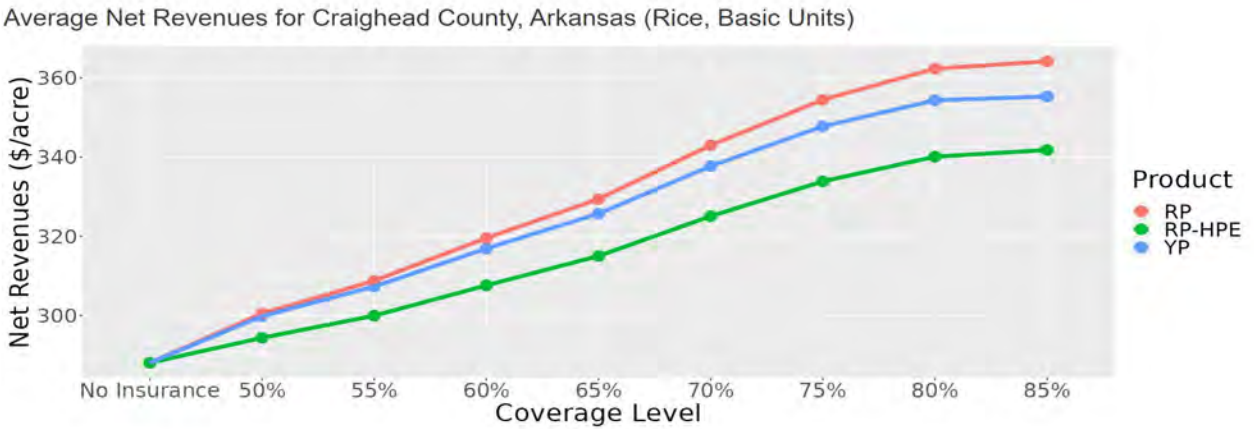
County: Craighead

Crop: Rice

Irrigation Practice: Irrigated

Units: Basic

FSA Program: PLC



State	County	Crop	Practice	Projected Price (RMA)	Price Units	County Yield (NASS)	County Yield (RMA)	Yield Units
Arkansas	Craighead	Rice	Irrigated	16.9	$/cwt	72	72	cwt/acre

MANAGING PRICE RISK IN RICE USING AREA CROP INSURANCE

What is area crop insurance?

- Area crop insurance guarantees are based on a trigger that covers area beyond your farm.
  - e.g. county yield, grid cell, etc.
  - ARC-CO is an area risk management product

- Some examples include:
  - Supplemental Coverage Option (SCO)
  - Enhanced Coverage Option (ECO)
  - Stacked Income Protection (STAX)
  - Margin Protection (MP)

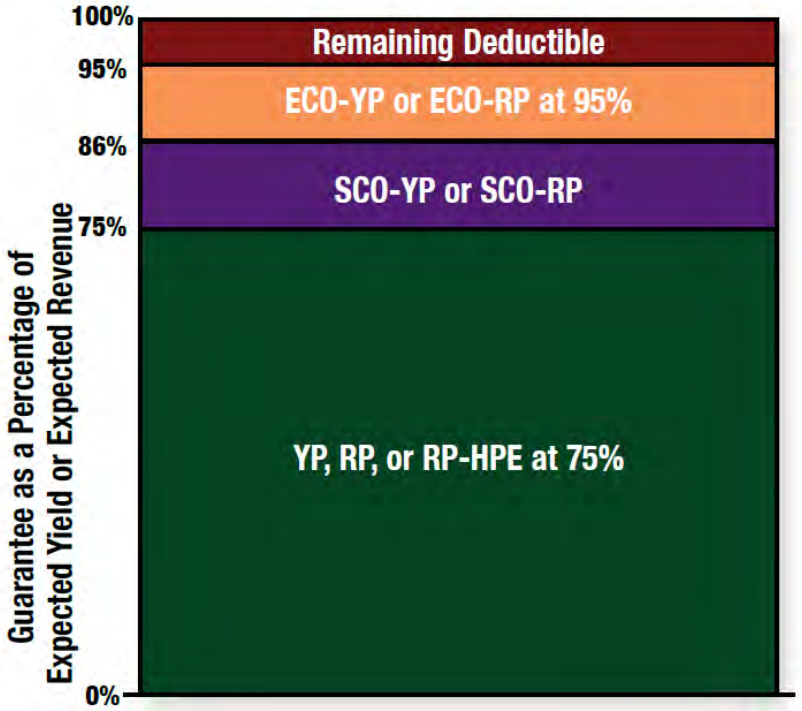
Supplemental Coverage Option (SCO)

- SCO is an area product that must be purchased along with an underlying individual policy (YP or RP)
- Coverage level of 86%
- Provides coverage down to the underlying individual coverage level
- Example: If you have 75% RP, you could purchase SCO-RP and could receive up to 11% of your expected revenue (i.e., 86% - 75% = 11%).
- **CANNOT PURCHASE IF YOU HAVE THE SAME ACRES IN ARC-CO**

Enhanced Coverage Option (ECO)

- ECO is an area product that must be purchased along with an underlying individual policy (YP or RP)
- Coverage levels of 90% and 95%
- Provides coverage down to 86% of expected level
- Example: If you have RP, you could purchase ECO-RP at 95% and could receive up to 9% of your expected revenue
  - i.e., 95% - 86% = 9%

Figure 1. The Jointness of Individual and Area Products using 75% individual insurance coverage, SCO, and 95% ECO coverage as examples



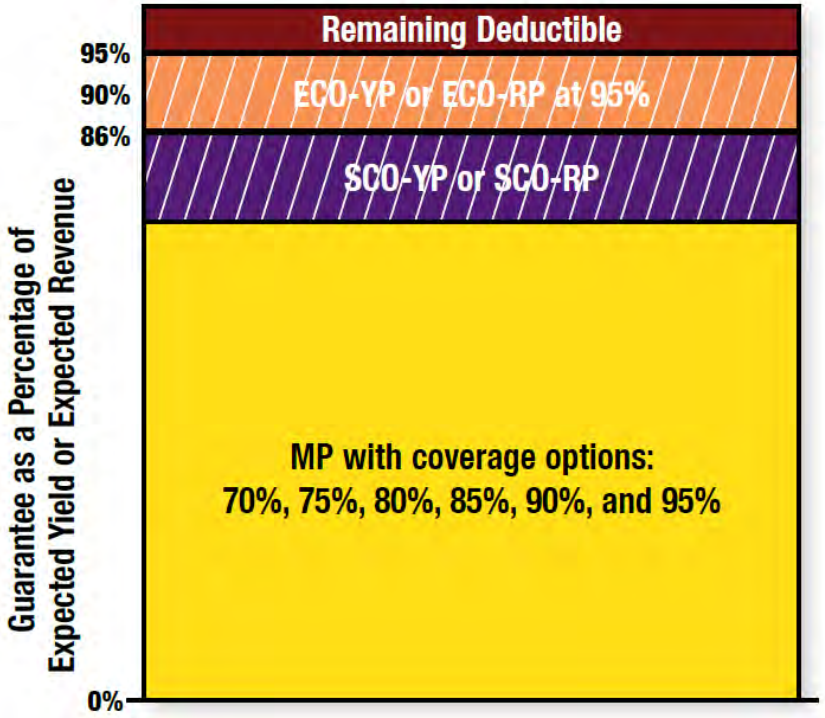
UA Fact Sheet

Margin Protection Insurance

- Privately developed by Watts and Associates
  - Available for rice, soybeans, and corn
- Insures a **portion** of an **expected margin**
- **Cannot enroll with SCO/ECO or ARC-CO**
- Fact sheet and podcast available online:

MP Fact Sheet

Figure 3. Examples of potential overlap between ECO, SCO, and MP.
Areas with hashmarks indicate areas of overlap between ECO/SCO and MP which illustrates the reason these products cannot be used jointly.



Margin Protection Payment Estimator (2024 Crop Year)

State: Arkansas

County: Lawrence

Crop: Rice

Crop Type: Long Grain

Irrigation Practice: Irrigated

Harvest Price Option: YES

Harvest County Yield: 163

Harvest Futures Price: 6.80

Urea Price ($/st): 353.41

DAP Price ($/st): 485.68

Potash Price ($/st): 492.8

State	County	Crop Name	Coverage Level	Expected Margin ($/ac)	Expected Revenue ($/ac)	Margin Deductible ($/ac)	Trigger Margin	Cost not subject to price change ($/ac)	Cost subject to price change ($/ac)	Interest Cost ($/ac)	Harvest Cost ($/ac)	Realized Margin ($/ac)	Margin Loss ($/ac)	Producer Premium ($/ac)	Net Indemnity ($/ac)
Arkansas	Lawrence	Rice	70%	822.87	1198.74	359.62	463.25	155.13	194.82	18.69	368.64	739.76	0	0.26	-0.26
Arkansas	Lawrence	Rice	75%	822.87	1198.74	299.68	523.18	155.13	194.82	18.69	368.64	739.76	0	0.28	-0.28
Arkansas	Lawrence	Rice	80%	822.87	1198.74	239.75	583.12	155.13	194.82	18.69	368.64	739.76	0	0.58	-0.58
Arkansas	Lawrence	Rice	85%	822.87	1198.74	179.81	643.06	155.13	194.82	18.69	368.64	739.76	0	2.36	-2.36
Arkansas	Lawrence	Rice	90%	822.87	1198.74	119.87	703	155.13	194.82	18.69	368.64	739.76	0	7.03	-7.03
Arkansas	Lawrence	Rice	95%	822.87	1198.74	59.94	762.93	155.13	194.82	18.69	368.64	739.76	23.17	15.93	7.24

DISCLAIMER: This decision aid is for educational purposes only and may not reflect actual indemnity payments.

NOTE: All input prices, except for Potash, used in the setting of margin guarantees and margin losses are based on futures contracts from CME. The potash price comes from the static price published by the USDA-AMS Illinois Production Cost Report. The futures contract for DAP is the DAP FOB NOLA futures contract (DFN). The futures contract used for Urea is the Urea (Granular) FOB US Gulf futures contract (UFV). The futures contract for Diesel is the NY Harbor Ultra Low Sulfur Diesel futures contract, or Heating Oil futures (HO). The futures contract for the interest rate is the 30-Day Fed Funds futures (ZQ). Additionally, the commodity futures price used for each crop is the harvest-month futures contract. The harvest-month contract for corn, soybeans, spring wheat, and rice is December Corn (ZCZ), November Soybeans (ZSX), Hard Red Spring Wheat (MGEX: MWU) , and, November Rough Rice (ZRX) , respectively. If you would like to visit the links provided without leaving the payment estimator, right click on a link and choose to open the link in a new window or tab.

FACT SHEET: Click here for a fact sheet providing examples of how Margin Protection indemnitites are triggered.

SALES CLOSING DATES

RICE: Feb. 28th

CORN: Sep. 30th

SOYBEANS: Sep. 30th

MP Payment Estimator

MANAGING PRICE RISK IN RICE USING PLC + CROP INSURANCE

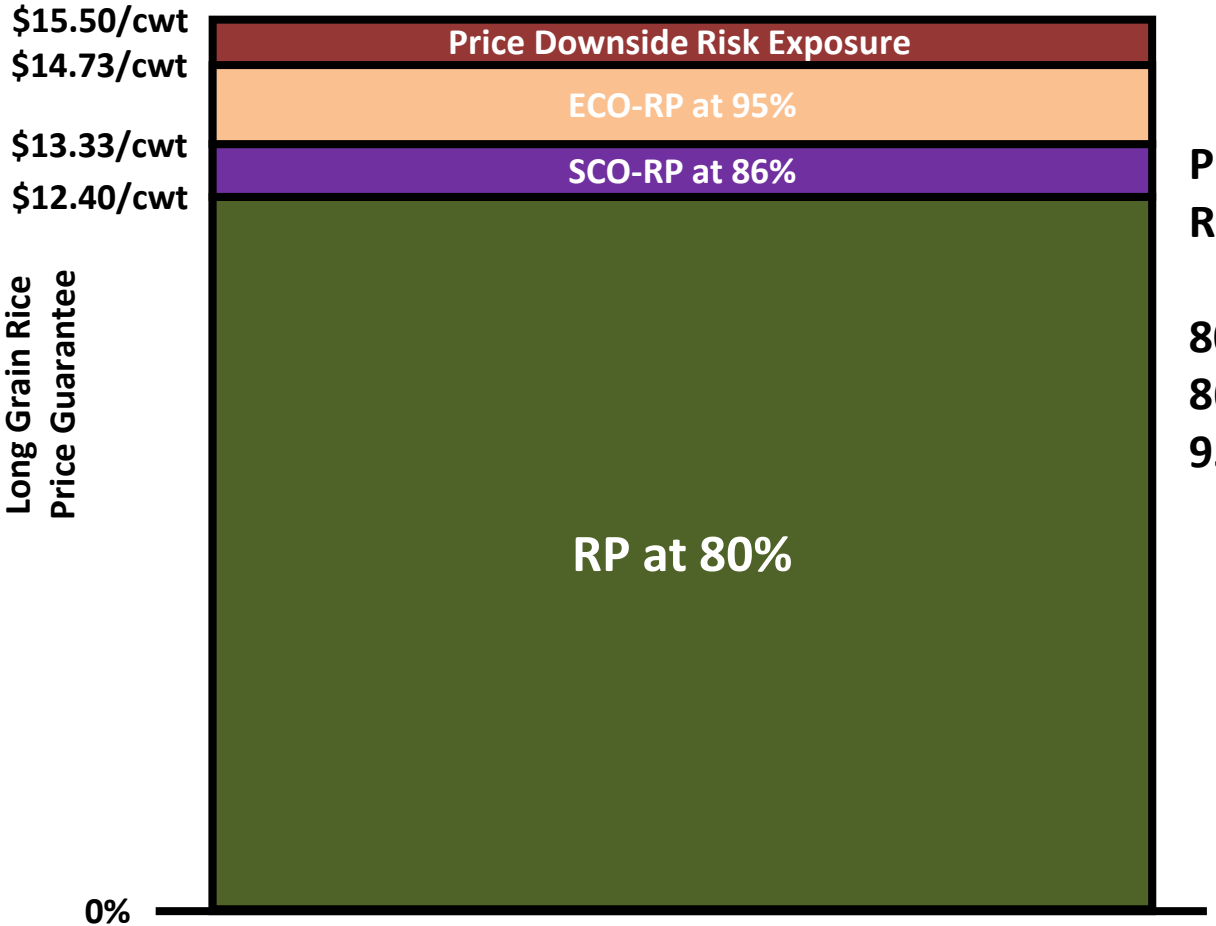
The Jointness of FSA and RMA Programs

Strategy	RP	SCO	ECO	PLC	ARC
1				X	
2					X
3	X			X	
4	X				X
5	X	X		X	
6	X	X	X	X	
7	X		X		X

The Best Strategy: Number 6

- Strategy 6: RP + SCO + ECO + PLC
- Assuming harvest yields are the same or lower than Actual Production History (APH) yield.

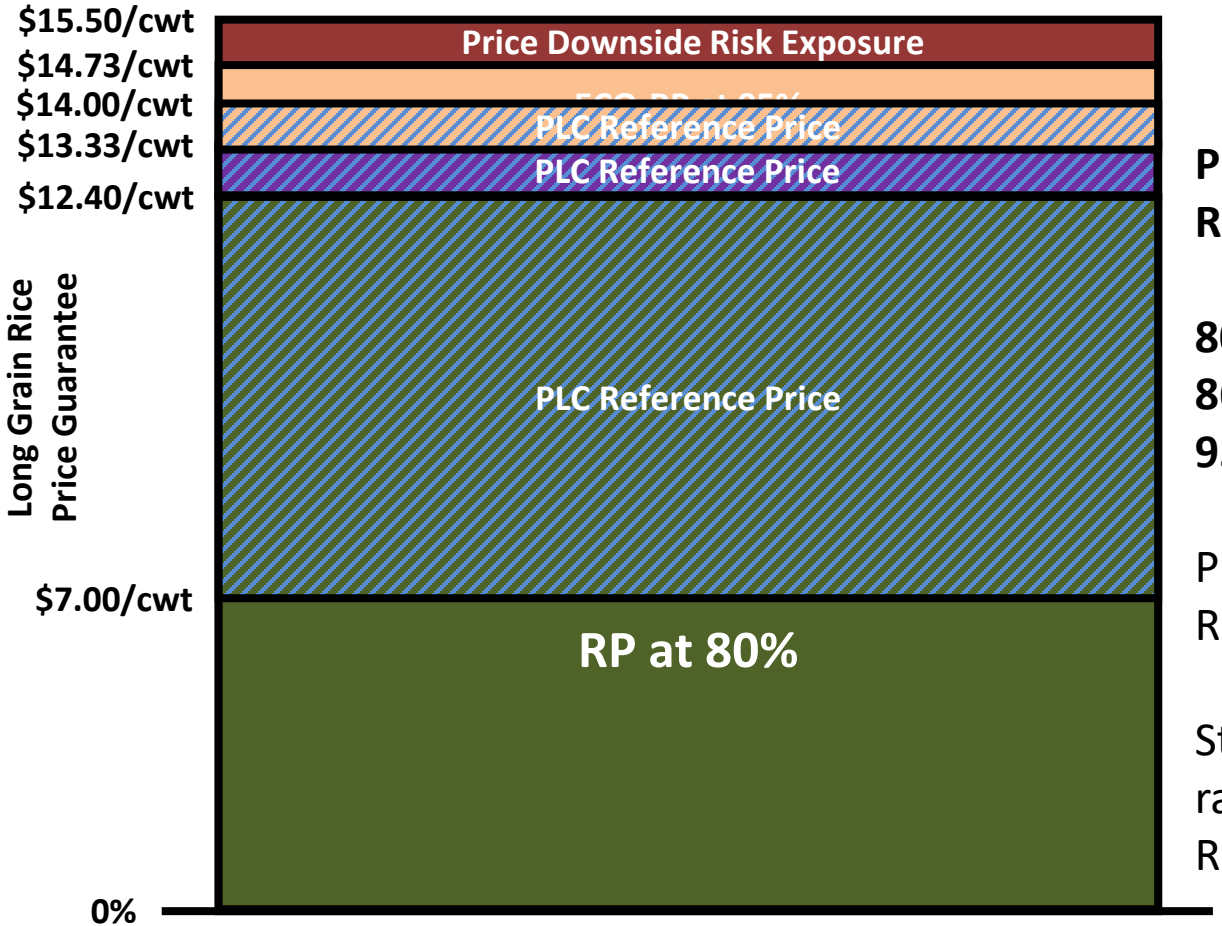
- Underlying strategy 6 is an optimal RP crop insurance coverage level.
  - Varies by county



Key prices for LG Rice

PLC Reference Price: $14.00/cwt
RMA Projected Price: $15.50/cwt

80% of RMA PP: $12.40/cwt
86% of RMA PP: $13.33/cwt
95% of RMA PP: $14.73/cwt



Key prices for LG Rice

PLC Reference Price: $14.00/cwt
RMA Projected Price: $15.50/cwt

80% of RMA PP: $12.40/cwt
86% of RMA PP: $13.33/cwt
95% of RMA PP: $14.73/cwt

PLC Reference Price is at 90% of RMA Projected Price.

Still face a maximum payment rate of $7.00/cwt which is 45% of RMA Projected Price.

Want to learn more about federal crop insurance as a risk management tool?

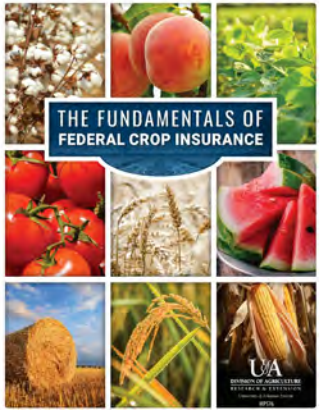
Federal Crop Insurance Workshops

- Receive information and training on yield and revenue insurance, managing financial risk with crop insurance, and how to buy insurance (i.e., forms, etc.)

- Workbooks will be provided to registrants.

Date and Location

- February 20th, Monticello, AR



SCAN THE QR CODE and REGISTER HERE

Thank you! Questions?

Dr. Hunter Biram
Email: hdbiram@uark.edu
Phone: (501) 671-2168

ARCropRisk.com

Fryar Center Website