

Marketing, Hedging, and Crop Insurance

Integrating Risk Management Tools

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Outline

- ① Brief History of Crop Insurance
- ② Overview of Typical Crop Insurance Offerings
- ③ Pre-Harvest Marketing Strategies with Crop Insurance
- ④ Summary

Chapter Highlights

Key Takeaways

- ▶ Purchasing crop insurance provides protection against **catastrophic loss** in the event of crop failure, and/or significant price decline between planting and harvest
- ▶ How much protection crop insurance alone provides varies based on **pre-harvest price movements**
- ▶ Crop insurance alone does not provide an optimal marketing plan for some scenarios of price movement planting-harvest

Brief History of Crop Insurance

Federal Farm Support Programs: Historical Context

- ▶ Currently, crop insurance dominates the landscape of federally sponsored farm programs for risk management
- ▶ History of market interventions and price supports in the United States is long and varied
- ▶ Understanding the economic and political motivations for the transition is important

Transition From

- ▶ Price supports
- ▶ Ad hoc disaster payments

Transition To

- ▶ Federally subsidized crop insurance

Why Move Away from Price Supports?

Problems with Price Supports

- ▶ Distort markets by creating **inefficiency in production decisions**
- ▶ Generate ill will with trading partners
- ▶ Subsidize too much production
- ▶ Lower world prices to the detriment of farmers in other countries

Problems with Ad Hoc Disaster Payments

- ▶ Not predictable in **timing** of when needed
- ▶ Not predictable in **size** of the need

Both created an appetite among lawmakers for a program whose cost was more predictable.

Why Crop Insurance Requires Federal Involvement

Challenge 1: Private Market Limitations

Insurance markets can exist in the private sector when:

- ▶ Insured losses are relatively small (compared to premium collected)
- ▶ Losses are predictable from year-to-year

Crop Insurance is Neither!

- ▶ Losses are typically **highly correlated**
- ▶ When there is a crop failure, most farmers in the affected region experience a loss
- ▶ Hard for private insurance companies to ensure liquidity for widespread failures
- ▶ Without a federal backstop, private market cannot offer crop insurance

Early Crop Insurance Programs: 1930s–1980s

Challenge 2: Insufficient Farmer Participation

- ▶ Early federal crop insurance programs did not attract sufficient usage
- ▶ This did not prevent passage of additional ad hoc disaster payments

The Problem

If taxpayers have to pay for:

- ① Administration of the crop insurance program, **AND**
- ② Ad hoc disaster payments from time-to-time

Then the program is:

- ▶ Not meeting its purpose
- ▶ Wasting taxpayer money by paying for two solutions

Key Legislative Reforms

Federal Crop Insurance Act of 1980

Made purchase of crop insurance coverage **mandatory** for farmers to receive other program payments

Crop Insurance Reform Act of 1994

- ▶ Mandatory coverage requirement was **removed**
- ▶ Replaced with **premium subsidies**

Result

Congress increased subsidy rates to levels where farmers voluntarily purchase enough coverage to reduce the need for frequent disaster payments

Current Status

Federal subsidies for crop insurance average **62%** of the premium cost

Overview of Typical Crop Insurance Offerings

Yield Protection and Area Yield Protection

Yield Protection

- ▶ Guarantees against a loss of production less than a percent of **Actual Production History (APH)**
- ▶ Indemnities paid when production falls below the APH
- ▶ Payments based on that production year's **projected price**
 - ▷ For corn and soybeans: average of new crop futures settlement prices during February

Area Yield Protection

- ▶ Similar to Yield Protection
- ▶ Yield guarantee based on **county yields**, not the individual producer's APH

Revenue Protection and Area Revenue Protection

Revenue Protection

- Guarantees against loss of revenue below:

$$\text{APH} \times \max(\text{Projected Price}, \text{Harvest Price})$$

- **Projected Price:** New crop futures price in February
- **Harvest Price:** New crop futures price at harvest
- Gained popularity because farmers are concerned with **revenue loss**, not just yield loss

Area Revenue Protection

- Similar to Revenue Protection
- Revenue guarantee calculated against the **county APH** rather than producer's APH

Revenue Protection with Harvest Price Exclusion

Key Difference from Standard Revenue Protection

- ▶ Same as Revenue Protection, **except:**
- ▶ Policy does **NOT** guarantee based on the Harvest Price
- ▶ Revenue is calculated based on:

Projected Price \times APH

Implication

Provides less upside protection if harvest prices rise above projected prices

Summary: Crop Insurance Types

Insurance Type	Basis	Price Guarantee
Yield Protection	Individual APH	Projected Price
Area Yield Protection	County APH	Projected Price
Revenue Protection	Individual APH	Max(Projected, Harvest)
Area Revenue Protection	County APH	Max(Projected, Harvest)
RP w/ Harvest Exclusion	Individual APH	Projected Price Only

Pre-Harvest Mar- keting Strategies with ~~Crop Insurance~~

Marketing Insured Bushels

Current State of U.S. Crop Insurance

Roughly **90%** of U.S. cropland is insured in the Federal Crop Insurance program

Critical Warning: Marketing Uninsured Bushels

Marketing uninsured bushels is very risky in the event of a crop failure!

Example:

- ▶ Forward contract to deliver 1,000 bushels at \$5.00/bu
- ▶ Yield losses result in only 500 bushels produced
- ▶ Cannot meet delivery obligation
- ▶ Must buy out the contract at potentially **high spot prices**

Why Revenue Protection Enables Marketing

Revenue Protection Guarantee

With Revenue Protection, you are guaranteed:

$$\text{Coverage \%} \times \text{APH} \times \max(\text{Base Price}, \text{Harvest Price})$$

Benefit for Marketing

This revenue guarantee ensures you can at least **buy out your forward contract** in the event of a crop failure

Revenue Protection provides a floor that supports pre-harvest marketing decisions

When Prices Fall After Base Price is Set

The Hedging Perspective

From a hedging perspective, the marketing decision is **trivial** if prices fall after the base price is set:

- ▶ You already have revenue protected at:
Coverage Level \times APH \times Base Price
- ▶ You are already hedged against price declines

Important Note

If you take a bullish or bearish position when already protected, you are a **speculator** at that point—not a hedger

When Prices Rise After Base Price is Set

The Interesting Marketing Question

When price rises after the Base Price is set (first of March):

- ▶ Producer is exposed to price uncertainty to both upside and downside
- ▶ However, with Revenue Protection, revenue is guaranteed at the harvest price
- ▶ *Unless* price falls below the Base Price

Key Decision

Should a producer lock in a high price that has risen above the Base Price?

Marketing Scenario Setup

Assumptions

- ▶ Base Price: \$5.00
- ▶ BreakEven Price: \$4.90
- ▶ Base Price > BreakEven (favorable)
- ▶ July Dec Corn Futures: \$5.35
- ▶ Substantial rise above Base Price

Policy Parameters

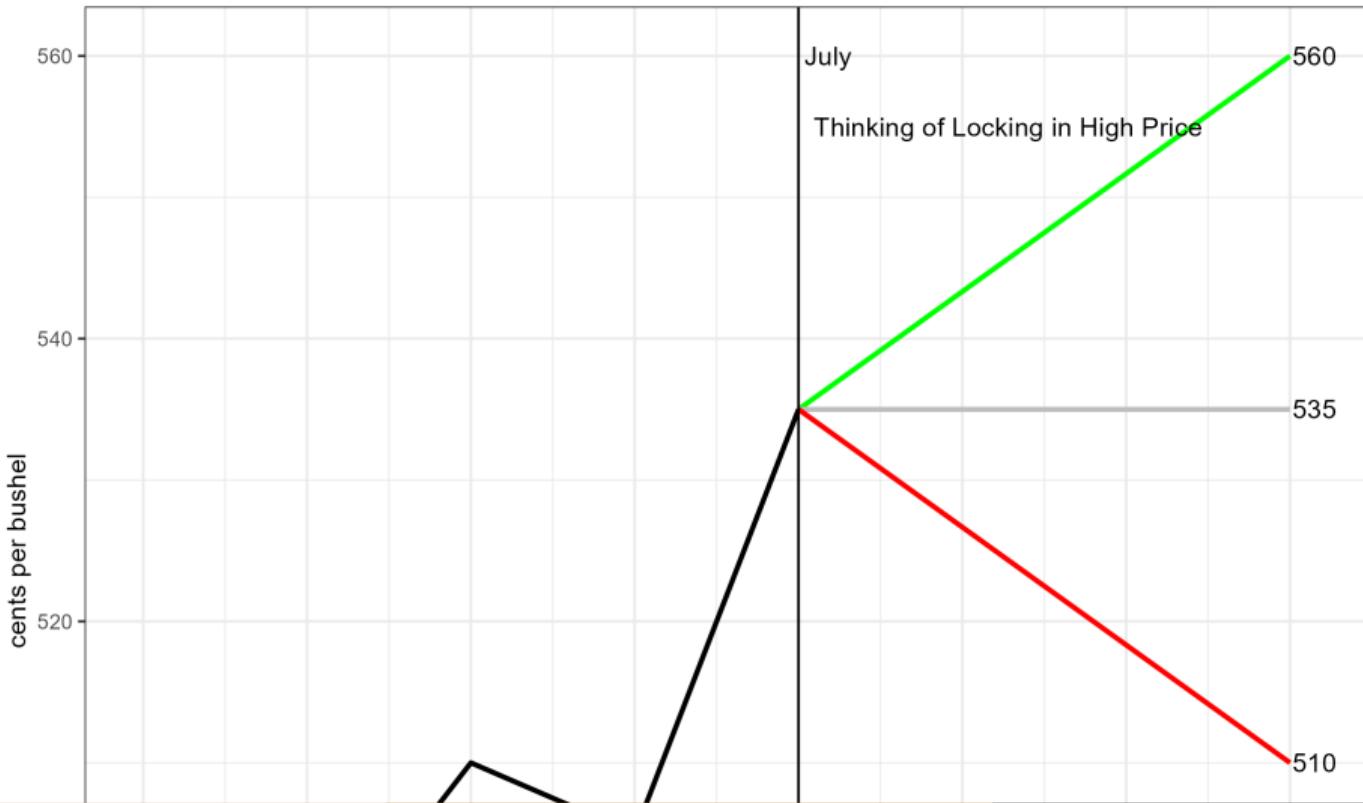
- ▶ APH: 200 bushels/acre
- ▶ Coverage Level: 85%
- ▶ Revenue Protection policy

Question

Should a producer lock in the \$5.35 price in July?

Price Scenarios: July to October

Marketing Scenario, Prices Rise Above Breakeven and Base



Marketing Choices to Analyze

Price Scenarios (July → October)

- ① Price rises to **\$5.60**
- ② Price stays flat at **\$5.35**
- ③ Price falls to **\$5.10**

Marketing Strategies

- ▶ Selling futures
- ▶ Contracting for harvest delivery (assume zero basis)

Yield Scenarios

- ▶ 100% of APH (200 bu/acre)
- ▶ 80% of APH (160 bu/acre)

Interactive Analysis Tool

Explore the Marketing Scenarios

You can explore the moving parts yourself using the interactive Google Sheets tool:

[https://docs.google.com/spreadsheets/d/
1rbne8odUljxIuiYP3IRiWyzaQDs83-mj0kuaaDWxb3w/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1rbne8odUljxIuiYP3IRiWyzaQDs83-mj0kuaaDWxb3w/edit?usp=sharing)

What You Can Analyze

- ▶ Different price scenarios
- ▶ Different yield outcomes
- ▶ Impact of marketing decisions on final revenue
- ▶ Interaction between crop insurance and marketing strategies

Summary

Key Takeaways

- ① **Crop insurance** is now the dominant federal farm program for risk management (62% premium subsidy)
- ② Federal involvement is necessary because crop losses are **highly correlated**—private markets cannot provide adequate liquidity
- ③ **Revenue Protection** (most popular) guarantees:
$$\text{APH} \times \max(\text{Projected Price}, \text{Harvest Price})$$

- ④ Marketing **insured bushels** is safer—Revenue Protection provides a floor to buy out contracts if needed
- ⑤ Pre-harvest marketing becomes interesting when prices **rise above** the Base Price

Questions for Discussion

- ① Why can't private insurance companies offer crop insurance without federal support?
- ② What is the key difference between Yield Protection and Revenue Protection?
- ③ When does crop insurance alone fail to provide an optimal marketing plan?
- ④ Why is marketing uninsured bushels particularly risky?