AGEC 429: AGRICULTURAL POLICY

LECTURE 12: GENERAL POLICY
INSTRUMENTS IV
Part IV: Revenue Stabilization
(Crop Insurance)

General Format for Discussion:

1. What is it and how does it work?

2. What are the market effects (output market, input market, cross-market)

3. Who gains and who loses from the policy?
1. WHAT IS IT AND HOW DOES IT WORK?

- Crop insurance is a __________________ that producers purchase to protect against the loss of their crops due to natural disasters such as hail, drought, freezes, floods, fire, insects, disease, and wildlife, or the loss of revenue due to declines in price.

- Rather than support farm prices or revenue, crop insurance helps eliminate wide swings in ______________ from year to year as a result of natural disasters and other production and price risks.

![Figure 1. Percent of Corn Acres Planted Covered by Crop Insurance](image-url)

**Figure 1. Percent of Corn Acres Planted Covered by Crop Insurance**

Includes Revenue Protection, Yield Protection and Area Revenue Protection Plans
1. WHAT IS IT AND HOW DOES IT WORK?

- Crop insurance is a risk management tool that producers purchase to protect against the loss of their crops due to natural disasters such as hail, drought, freezes, floods, fire, insects, disease, and wildlife, or the loss of revenue due to declines in price.

- Rather than support farm prices or revenue, crop insurance helps eliminate wide swings in farm revenue from year to year as a result of natural disasters and other production and price risks.

- Here’s how it works

- And why we have crop insurance
Crop Insurance: What Is It and How Does It Work? (continued)

- Federal government subsidizes crop insurance in three ways:
  1. **Farmers only pay a portion of the premiums.** The government pays the remainder. The portion paid by the government declines as the level of coverage chosen by a farmer increases:

<table>
<thead>
<tr>
<th>Crop Insurance Coverage Level:</th>
<th>50%</th>
<th>55%</th>
<th>60%</th>
<th>65%</th>
<th>70%</th>
<th>75%</th>
<th>80%</th>
<th>85%</th>
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<tbody>
<tr>
<td><strong>Premium Subsidy:</strong></td>
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<tr>
<td>Basic Unit</td>
<td>67%</td>
<td>64%</td>
<td>64%</td>
<td>59%</td>
<td>59%</td>
<td>55%</td>
<td>48%</td>
<td>38%</td>
</tr>
<tr>
<td>Enterprise Unit</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
<td>77%</td>
<td>68%</td>
<td>53%</td>
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</table>

- The average subsidy has grown from less than 20% in the 1980s to nearly 80% in recent years.

![Crop Insurance](image)

Figure 1. Average Share of Crop Insurance Premiums Paid by Farmers, (5 year Olympic moving average), U.S., 1990-2015 Crop Years

Source: Collins and Bulut, “Crop Insurance and the Future Farm Safety Net.”
• Problems with Crop Insurance:

- Exists when individuals are encouraged to take more risks because they don’t bear full consequences for their actions. Basically saying people may take greater risks and, thus, suffer greater losses because they have the security of crop insurance. People may even purposely suffer a loss so they can collect benefits. For example, farmers faced with low prices may collect insurance benefits because they chose not to pay the cost for adequate pesticide so they suffer greater loss from pests than if they did not have the security of crop insurance. They could even set fire to a field in order to collect benefits.

• Federal government subsidizes crop insurance in three ways:
  (1) **Farmers only pay a portion of the premiums.** The government pays the remainder. The portion paid by the government declines as the level of coverage chosen by a farmer increases:

  (2) **Insurance companies are given a subsidy for administration and operations expenses.**

  (3) **The federal government “reinsures” the crop insurance companies.** That is, they insure the crop insurance companies themselves by absorbing some of their losses when their indemnities (payout) exceed total premiums.
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Thus, both the crop insurance costs of farmers and private insurance companies are federally subsidized and regulated. BUT the insurance is sold and serviced by the private crop insurance companies.
Problems with Crop Insurance:

- Exits when individuals are encouraged to take more risks because they don’t bear full consequences for their actions. Basically saying people may take greater risks and, thus, suffer greater losses because they have the security of crop insurance. People may even purposely suffer a loss so they can collect benefits. For example, farmers faced with low prices may collect insurance benefits because they chose not to pay the cost for adequate pesticide so they suffer greater loss from pests than if they did not have the security of crop insurance. They could even set fire to a field in order to collect benefits.
Problems with Crop Insurance (continued):

- This problem arises when farmers know more about the production risks they face than do insurance companies and use that information to decide whether to insure. As a result, the farmer selects coverage levels or plans of insurance knowing that an indemnity (payment) is highly likely and that the premium rate the farmer pays does not reflect that expectation.

- Often occurs when a new crop insurance plan does not fully appreciate all the risks that the plan is intended to cover - for example, that a portion of the farmer’s land tends to flood in most years or tends to have low fertility.

- can be detrimental to the crop insurance program because it increases crop losses and the cost of the program.
2. WHAT ARE THE MARKET EFFECTS OF CROP INSURANCE?

- Producers face _____________ in two ways:
  1. Production is subject to random shifts from what farmers expect at the beginning of each season from .... either unexpected (above average) good conditions (good rainfall, low insect infestation, etc.) which increase yields and shift the supply curve to the right ($S_H$) of the expected supply curve ($S_0$) ...
  2. or unexpected (below average) bad conditions (plant disease, pests, drought, etc.) which reduce yields and shift the supply curve to the left ($S_L$).

The consequence is price and production ___________ because prices and production can vary widely from expected levels.
Producers face _______ in two ways:

(2) Demand is also subject to random shifts from what farmers expect at the beginning of each season from .... either unexpected (above average) good conditions (economic growth, increasing population, high prices of substitute goods,, etc.) which shift the demand curve to the right ($D_H$) of the expected demand curve ($D_0$) ...

or unexpected (below average) bad conditions (low income, reduced prices of substitute goods, etc.) which shift the demand curve to the left ($D_L$).

The consequence again is price and production _______ because prices and production can vary widely from expected levels.
Producers face BOTH supply and demand _________ at the same time!

As a consequence, prices and production can vary even more widely than expected each year creating even more uncertainty.

The government provides farmers many crop insurance products at varying prices (premiums) for them to choose among to reduce uncertainty as much as they want in a way that is best for them.

Crop insurance helps take some of the uncertainty out of farming by guaranteeing farmers revenue when conditions are bad (supply reduction and/or demand decline).

Farmers are mostly concerned with__________ _____________.

What are the Market Effect of Crop Insurance (continued)
Example 1: Revenue Protection Crop Insurance (with increased price)

* Insures the farmer against a drop in revenue.
* In this case, the drop comes from a ________________.

**How does it work?**

1. $P_0 = $ Price guarantee
   $Q_0 = $ guaranteed yield ($Y_0$)
   * acreage ($A_0$)

2. $R_0 = $ guaranteed revenue
   $= P_0 \times Q_0$
   So supply curve kinked at $P_0$ like PLC

3. Supply drops to $S_L$ because of low yields (for example, drought)

4. Revenue guarantee increases because price increased to $P_H$
   which is the new guaranteed price.
   $R_H = P_H \times Q_0$

5. Actual revenue is:
   $R_A = P_H \times Q_L$

6. Payment to farmer (indemnity)
   $I = $ Revenue guarantee minus actual revenue
   $I = R_H - R_A$
Example 2: Revenue Protection Crop Insurance (with lower price)

What are the Market Effect of Crop Insurance (continued)

Insures the farmer against a ____________ AND _________ from expected levels.

How does it work?

1. $P_0 =$ Price guarantee
   $Q_0 =$ guaranteed yield ($Y_0$) * acreage ($A_0$)
   So supply curve kinked at $P_0$ like PLC

2. $R_0 =$ guaranteed revenue
   $= P_0 \times Q_0$

3. Supply drops to $S_L$ because of low yields (for example, drought)

4. This time demand drops to $D_L$
   so that price is lower than the guarantee at $P_L$.

5. Revenue guarantee does not decline because the price is guaranteed to be at least $P_0$ and production at $Q_0$

6. Actual revenue this time is:
   $R_A = P_L \times Q_L$

7. Payment to farmer (indemnity)
   $I =$ Revenue guarantee minus actual revenue
   $I = R_0 - R_A$
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<th>Variables</th>
<th>INSTRUMENTS</th>
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<td>PRICE SUPPORT</td>
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**Assume the supported commodity is a feedgrain**

* Assuming that demand is inelastic. ** Research indicates that because crop insurance reduces production risk, producers tend to produce more since the risk of producing more is less.
3. WHO GAINS AND WHO LOSES FROM THE POLICY?

Welfare effects of crop insurance subsidies.

Note that the demand for crop insurance is less than the supply of crop insurance at all premium (price) levels.

In general, crop insurance is too risky and costly for insurance companies to be willing to insure crops without government subsidies.

CHANGE IN:

CS (Producers)  ___________

+ PS (Insurance Companies) ___________

= Subtotal

- Gov’t Cost ___________

= Net Society Effects (NSE)
Summary of Welfare Effects of Crop Insurance

1. Crop insurance would not be a viable product without government subsidies due to the high risk associated with crop losses.

2. Private crop insurance companies gain as well as commodity producers. Income is transferred to both from taxpayers.

3. The greater the production risk (the greater the market price and revenue variability) and the more acres covered by crop insurance, the greater the cost (the DWL) to society.

4. Whether a crop insurance program is worth the cost depends on whether society values reduced market price, variability, increased and more stable food supplies, and greater stability in the farm sector more than the loss of national welfare and the opportunity cost of the use of government funds for crop insurance.