Crop Insurance: Managing Risk in Agriculture

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GOALS TODAY

• Provide a basic overview of crop insurance alternatives for major crops in Lee county – cotton, soybeans, tobacco, wheat etc.
• Provide a brief description of how these different insurance alternatives work
• Present some strategies to consider when choosing among the different insurance products

Introduction

• Crop insurance is one of the most important tool for managing risk in U.S. agriculture
• USDA-Risk Management Agency (RMA) introduced a number of different insurance products over the years
• Farmers have a several alternatives to choose from
Introduction

- Why is the choice of crop insurance product important?
- Each producer face different kinds/levels of risk depending on their own situation
- Not properly addressing production risks has financial consequences
  - Affects your bottomline

Profit = (output price x output) – (input price x input)

- Negative risks affect ability to:
  - Pay bills
  - Meet farm business goals
  - Maintain lifestyle

Crop insurance is one strategy to manage production and/or price risk
  - Yield-based and revenue-based plans
- Not costless – weigh premium (cost) with the expected risk reduction (benefits)
  - Assess your own situation
Introduction

- Need to find most appropriate crop insurance product(s) to properly address their own risk situation
- Information on the different products and how to evaluate them is valuable

Crop Insurance Alternatives

- **Farm level Products**
  - Actual Production History (APH)
  - Catastrophic Coverage (CAT)
  - Crop Revenue Coverage (CRC)
  - Revenue Assurance (RA-BP/HP)
  - Indexed Income Protection (IIP)
  - Adjusted Gross Revenue – Lite (AGR-Lite)
- **County level Products**
  - Group Risk Plan (GRP)
  - Group Risk Income Plan (GRIP BP/HP)

Crop Insurance Alternatives

- **Farm level Products**
  - Yield-based Insurance
  - APH
  - Revenue-based Insurance
  - Without guarantee increase
    - RA-BP (base price option) and IIP
  - With guarantee increase
    - RA-HP (harvest price option) and CRC
  - Multi-crop – AGR-Lite
Crop Insurance Alternatives

- County level Products
  - County Yield-based
    - GRP
  - County Revenue-based
    - GRP-BP option
    - GRP-HP option

Crop Insurance Alternatives

- For Revenue-based Products (not AGR-lite):
  - Base Price – price before planting (i.e., corn BP is Feb. ave. closing price for CBOT Dec. futures contract)
  - Harvest Price – price at harvest (i.e., corn HP is Nov. ave. closing price for CBOT Dec futures contract)

Crop Insurance Alternatives

- For Revenue-based Products:
  - Products with guarantee increase allows revenue guarantee to be calculated using HP if HP > BP
  - Actual price received by producers NOT used in calculating your actual revenue
Livestock Insurance Options

- Livestock Risk Protection (LRP)
  - Feeder Cattle
  - Fed Cattle
  - Swine
- Designed to insure against declining prices
  - Available at different coverage levels and insurance periods

Crop Insurance Alternatives

- Corn - APH, CRC, RA, IIP, GRP, GRIP
- Soybeans - APH, CRC, RA, IIP, GRP, GRIP
- Wheat – APH, CRC, GRP, GRIP
- Cotton – APH, CRC, GRP, GRIP
- Tobacco – APH
- Livestock – LRP, AGR-Lite
- Vegetables (some) – APH, AGR-Lite

How Does It Work? APH Policy

- Insures farm-level yields
- Yield coverage – 50% to 85% of APH yield
- Price coverage – 60-100% of RMA price
- Unit coverage – Basic and Optional units
- Premiums – depends on county, unit, APH yield, yield and price coverage
How Does It Work? APH Example

- APH Yield Guarantee:
  
<table>
<thead>
<tr>
<th>Approved APH Yield</th>
<th>140 bu/ac</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage Level</td>
<td>70%</td>
</tr>
<tr>
<td>Yield Guarantee</td>
<td>98 bu/ac</td>
</tr>
</tbody>
</table>
  
  \[(140 \text{ bu/ac} \times 0.7)\]

- APH Indemnity Payment
  
  | Yield Guarantee | 98 bu/ac |
  | Price Election (100%) | $2.00/bu |
  | Actual Yield       | 88 bu/ac (88 < 98) |
  | Indemnity*         | $20/ac    |
  
  \[*(98 - 88) \times 2 = 20\]

How Does It Work? RA-BP and IIP

- Insures farm-level revenue
- Rev. coverage – 50% to 85% (IIP up to 75%)
- Price coverage – Base Price
- Unit coverage – Basic, optional, enterprise, whole farm units; IIP -- enterprise
- Premiums – depends on county, unit, APH yield, coverage level
How Does It Work? RA-BP and IIP

- A note on IIP – same as the Income Protection Plan (IP) except that IIP is indexed to the county
- APH yield in IIP used to calculate guarantee is different from actual APH yield (may be higher or lower)
- But the mechanism for payment is same with IP (and the example that follows)

How Does It Work? RA-BP/IIP Example

- Revenue Guarantee:
  - Approved APH Yield: 140 bu/ac
  - Coverage Level: 70%
  - Base Price: $2.00
  - Revenue Guarantee: $196

  (140 x 2.00 x 0.7)

  Note: IIP is indexed to county yield and may be lower or higher than actual APH yield. But same payment principle as in the example.

How Does It Work? RA-BP/IIP Example

- RA-BP/IIP Indemnity Payment
  - Revenue Guarantee: $196
    - Harvest Price: $1.90/bu (HP < BP)**
  - Actual Yield: 88 bu/ac
  - Actual Revenue: $167.20 (88 x 1.90)
  - Indemnity*: $28.80/ac

  *(196 - 167.20) = $28.80

**If HP = 2.50 (HP>BP), No indemnity! Actual revenue (2.5 x 88 = 220) > revenue guarantee (196)
How Does It Work? RA-HP & CRC

- Insures farm-level revenue
- Rev. coverage – 50% to 85%
- Price coverage – BP or HP (Allows guarantee to increase if HP > BP at harvest)
- Unit coverage – Basic, optional, enterprise; in RA-HP – plus whole farm
- Premiums – depends on county, unit, APH yield, coverage level

pack promise

How Does It Work? RA-HP/CRC Example

- Revenue Guarantee:
  
  | Approved APH Yield | 140 bu/ac |
  | Coverage Level     | 70%      |
  | Base Price         | $2.00    |
  | Revenue Guarantee* | $196     |

  *(140 x 2.00 x 0.7)*

  *If HP > BP, then use HP to calculate revenue guarantee. If HP = 2.50, revenue guarantee = 245

pack promise

How Does It Work? RA-HP/CRC Example

- RA-HP/CRC Indemnity Payment (Case 1)

  Revenue Guarantee $196
  Harvest Price $1.90/bu (HP < BP)**
  Actual Yield 88 bu/ac
  Actual Revenue 167.20 (88 x 1.90)
  Indemnity* $28.80/ac

  *(196 - 167.20) = $28.80
  **If HP < BP, then payment with RA-HP/CRC same as RA-BP/IIP
How Does It Work? RA-HP/CRC Example

• RA-HP/CRC Indemnity Payment (Case 2)

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue Guarantee</td>
<td>$196</td>
</tr>
<tr>
<td>Harvest Price</td>
<td>$2.50/bu (HP &gt; BP)**</td>
</tr>
<tr>
<td>Actual Yield</td>
<td>88 bu/ac</td>
</tr>
<tr>
<td>Actual Revenue</td>
<td>$220 (68 x 2.50)</td>
</tr>
<tr>
<td>Indemnity*</td>
<td>$25/ac</td>
</tr>
</tbody>
</table>

*{(245 - 220)} = $25
**Since HP>BP, then recalculate revenue guarantee = 245
(140 x 2.50 x 0.7). In RA-BP/IIP, no indemnity.

How Does It Work? AGR-Lite

• Whole-farm revenue protection plan
  – Insures adjusted gross revenue of whole farm
    (multiple crops/livestock) rather than
    individual crops
• Most farm-raised crops, animals, and
  animal products covered
• Can stand alone or with other insurance
  plans (APH)
  – Get discount if combined with APH

How Does It Work? AGR-Lite Example

• Liability and Revenue Guarantee

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage level (65%, 75%, 80%)</td>
<td>80%</td>
</tr>
<tr>
<td>Payment Rate (75%/90%)</td>
<td>75%</td>
</tr>
<tr>
<td>Approved Adj. Gross Revenue</td>
<td>$100,000</td>
</tr>
<tr>
<td>Liability (100,00 x 0.8 x 0.75)</td>
<td>$60,000</td>
</tr>
<tr>
<td>Revenue Guarantee (100,000 x .8)</td>
<td>$80,000</td>
</tr>
</tbody>
</table>
How Does It Work? AGR-Lite

Example

- Indemnity Payment

<table>
<thead>
<tr>
<th>Actual Revenue for the year</th>
<th>$70,000 (&lt; $80,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss Below Guarantee</td>
<td>$10,000</td>
</tr>
<tr>
<td>Indemnity Payment ($10,000 x 0.75)</td>
<td>$7,500</td>
</tr>
</tbody>
</table>

How Does It Work? AGR-Lite

- Uses producer’s 5-year historical farm average revenue as reported on IRS tax form (Schedule F) and annual farm report
- Have liability limits and other eligibility requirements
  - Lots of paperwork!
  - Mar. 17 – Sales Closing Date

How Does It Work? GRP

- Based on county-level yields
  - Can have low individual yield and not get a payment
- Coverage level – 70% to 90%
- Protection level – % of $ max. value set by RMA for the county (60% to 150%)
- GRP premiums depend on county, coverage and protection level
How Does It Work? GRP Example

- **GRP Guarantee:**
  - Expected County Yield: 140 bu/ac
  - Coverage Level: 70%
  - County Yield Guarantee: 98 bu/ac

- **GRP Indemnity Payment**
  - County Yield Guarantee: 98 bu/ac
  - Protection level (100%): $256 (256 x 1.0 = 256)*
  - Actual County Yield: 88 bu/ac (88 < 98)
  - Indemnity**: $26.12/ac

  **Note:** $256 is set by RMA for the county.

  ****$256 x [(98 - 88)/98] = $26.12 (protection level x percent shortfall)

- **Notes on GRP Payments:**
  - Dependent on county yield reported by NASS
  - Released in March of the year following harvest – thus payments will take longer to receive
  - Less paperwork – no yield reports (only acreage reports) and no unit structures to worry about
How Does It Work? GRIP

- Based on county-level revenues
  - Can have low individual revenue and not get a payment
  - Use "base" price and "harvest" price
- Coverage level – 70% to 90%
- Protection level – % of $ max. value set by RMA for the county (60% to 150%)
- GRP premiums depend on county, coverage and protection level

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How Does It Work? GRIP Example

- GRIP Guarantee:
  - Expected County Yield: 140 bu/ac
  - Base Price: $2.00
  - Coverage Level: 70%
  - County Revenue Guarantee: $196/ac
  \[(140 \text{ bu/ac} \times $2.00 \times 0.7)\]

- GRIP Indemnity Payment
  - County Revenue Guarantee: $196
  - Protection level (100%): $300
  - Actual County Yield: 88 bu/ac
  - Harvest price: $1.90
  - Actual County Revenue: $167.20 (<$196)
  - Indemnity**: $26.12/ac
  \[**300 \times [(196 - 167.20)/196] = 44.08\]
  (protection level x percent shortfall)
How Does It Work? GRIP Example

- Notes on GRIP Payments:
  - Have “harvest” price option (to increase guarantee if HP > BP)
  - BP and HP used in calculations, NOT based on actual prices received by producers
- Set by RMA based on CBOT prices
- Also rely on NASS county estimates, thus payments can take awhile

How Does it Work? Premium Costs Across Products

- Group products are typically less expensive than others
- Revenue products with HP options are typically more expensive
- APH product and revenue products without HP option somewhere in the middle

How Does it Work? Premium Cost Example

- Corn in Bertie County, NC (2007), non-irrigated, optional unit, 140 bu/ac APH, 70% Coverage Level

<table>
<thead>
<tr>
<th>Product</th>
<th>Est. Premium ($/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APH</td>
<td>10.89</td>
</tr>
<tr>
<td>CRC</td>
<td>17.80</td>
</tr>
<tr>
<td>RA-HP</td>
<td>14.96</td>
</tr>
<tr>
<td>RA-BP</td>
<td>12.63</td>
</tr>
<tr>
<td>HP</td>
<td>7.32</td>
</tr>
<tr>
<td>GRP</td>
<td>2.18</td>
</tr>
<tr>
<td>GRIP</td>
<td>7.32</td>
</tr>
</tbody>
</table>
Strategies and Recommendations

• Issues to keep in mind when choosing the right crop insurance product for you:
  – Year-to-year yield variability
  – Cash flow requirements
  – Cash Reserves
  – Subsidized premium

<table>
<thead>
<tr>
<th>Coverage Level %</th>
<th>50</th>
<th>55</th>
<th>60</th>
<th>65</th>
<th>70</th>
<th>75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium Subsidy</td>
<td>39</td>
<td>36</td>
<td>36</td>
<td>41</td>
<td>41</td>
<td>46</td>
</tr>
<tr>
<td>Your Premium Share %</td>
<td>33</td>
<td>33</td>
<td>36</td>
<td>41</td>
<td>41</td>
<td>46</td>
</tr>
</tbody>
</table>

Strategies and Recommendations

• Evaluate the different products based on the “Risk-Return” Framework

• Returns (over time):
  – Which product gives the highest net payments (net of premiums)?
  – Which product pays out more often?
  – Which product has the lowest premiums?

Strategies and Recommendations

• Risks (over time):
  – How do the different products change the likelihood of a profit shortfall?
  – What is the probability of receiving below breakeven revenues for the different products?

• After using Risk-Return framework, look at policy details and consider the following product-specific recommendations
Strategies and Recommendations

- APH Policy
  - Only protects yield losses, need to protect price declines with hedging/forward contracts
  - Use as much optional units as you can (more flexible)
  - Consider getting at least CAT
    - For producers with fairly stable production
    - Its essentially free!

Strategies and Recommendations

- RA-BP and IIP
  - Provides yield and price protection
  - May not be for aggressive users of forward contracts (can eliminate risk protection from insurance)
  - Not advisable in a volatile market (with a high chance of price upswings)
  - For IIP, consider how your farm yields relate to county yields

Strategies and Recommendations

- RA-HP and CRC
  - Provides yield and price protection
  - For aggressive users of forward contracts or futures (HP option tempers hedging losses)
  - Better suited for a volatile market (with a high chance of price upswings)
  - Typically more expensive (lowers returns but provides good risk protection)
Strategies and Recommendations

- GRP and GRIP
  - County-level yield/revenue protection
  - Good for farms that track county yields fairly well (i.e. no farm yields significantly below county in the past, no high risk ground)
  - Less expensive but payments come later
  - For producers in a strong financial position (one bad hit won’t terminate business)
  - Combine with hail/fire insurance for indiv. coverage

- AGR-Lite
  - Revenue protection for multiple crops
  - For diverse operations
  - For producers with good records
  - For producers that can sell crop at prices higher than price elections/BP/HP.

- Contact your insurance agent for more details about the policies
- Effectively communicate your risk management goals to your agent!
Additional resources

- USDA-RMA Website (http://www.rma.usda.gov)
  - Fact Sheets; Premium Calculators
  - Official Announcements
- USDA-RMA Raleigh Regional Office
  - Information pertaining to North Carolina
- NC State Crop Insurance Website
  - Go to the NCSU Ag. and Resource Econ. Extension website: http://www.ag-econ.ncsu.edu/extension.htm
  - I will put my presentations & extension materials here

More Questions?

- Contact me:
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