Overview of ACRE (Average Crop Revenue Election)

• Farmers who choose ACRE
  – Must do so for all program crops
  – Must do so for remainder of farm bill (2012 crop)
  – Lose eligibility for countercyclical payments
  – Must give up 20% of direct payments
  – Have a 30% lower loan rate
  – Get a state revenue guarantee based on 2007/08 prices and 2004 – 2008 yields
North Dakota Planted Acreage

Early 1980s
Early 1990s
Early 2000s
2008

Million
Share of Acreage by Crop

- HRSW
- Soybeans
- Corn
- Durum
- Barley
- Sunflower
- Canola

- Early 1980s
- Early 1990s
- Early 2000s
- 2008
ACRE Commodities

- Wheat, corn, grain sorghum, barley, oats, upland cotton, rice, soybeans, other oilseeds, peanuts, dry peas, lentils, small chickpeas, and large chickpeas
- About 90% of North Dakota planted to these crops
2008 Share of Acreage by Crop

- Wheat: 40%
- Soybeans: 15%
- Corn: 10%
- Oilseeds: 10%
- Barley: 5%
ACRE’s State Revenue Guarantee

- Revenue = Price X Yield
  - Yield is state yield per planted acre
  - Price is NASS season average price (marketing year price)
- ACRE Guarantee: 90% of the product of
  - Olympic average of state yield previous five years
  - Average of NASS price past two years
- ACRE can pay out due to low state yield or low price
Legend
COUNTIES
Corn
0. - 9700
9700 - 23300
23300- 55000
55000 - 109000
109000- 285000
Corn Acres in 2008
Soybean Acres in 2008

Legend
COUNTIES
acres SOYBEANS / none
0 - 18000
18000 - 68000
68000 - 125000
125000 - 290000
290000 - 440000

Legend
COUNTIES
acres SOYBEANS / none
0 - 18000
18000 - 68000
68000 - 125000
125000 - 290000
290000 - 440000
North Dakota Wheat Yields Per Planted Acre

Actual Yield
North Dakota Wheat Yields Per Planted Acre

Actual Yield vs. Historical Average (bu/ac)
North Dakota Wheat Yields Per Planted Acre and ACRE Yield "Guarantee"
North Dakota Wheat Yield Payout (% of ACRE Yield Guarantee)

- Payout
- Maximum payment

- bu/ac
Value of Yield Guarantee

• Average payout = 3.5% of guarantee
• At $5.00 per bushel price
  – Average payout = $3.96 per acre
  – About 12 cents per expected bushel per planted acre.
North Dakota Corn Yields Per Planted Acre and ACRE Yield "Guarantee"
North Dakota Corn Yield Payout (% of ACRE Yield Guarantee)

Maximum payment
Value of Corn Yield Guarantee

- Average payout = 2.5% of guarantee
- At $4.00 per bushel price
  - Average payout = $6.05 per acre
  - About 7 cents per expected bushel per planted acre.
North Dakota Soybean Yields Per Planted Acre

Actual Yield

bu/ac


Actual Yield
North Dakota Soybean Yields Per Planted Acre and ACRE Yield "Guarantee"
North Dakota Soybean Yield Payout
(% of ACRE Yield Guarantee)
Value of Soybean Yield Guarantee

• Average payout = 6.0% of guarantee
• At $8.00 per bushel price
  – Average payout = $6.44 per acre
  – About 20 cents per expected bushel per planted acre.
North Dakota Barley Yields Per Planted Acre

bu/ac

Actual Yield

North Dakota Barley Yields Per Planted Acre

bu/ac

Actual Yield
Historical Average
Value of Barley Yield Guarantee

• Average payout = 3.5 % of guarantee
• At $5.00 per bushel price
  – Average payout = $6.30 per acre
  – About 12 cents per expected bushel per planted acre.
Value of an ACRE "Yield Guarantee"
of Direct Payments

<table>
<thead>
<tr>
<th></th>
<th>Wheat</th>
<th>Corn</th>
<th>Soybeans</th>
<th>Barley</th>
</tr>
</thead>
<tbody>
<tr>
<td>$/acre</td>
<td>4.00</td>
<td>6.00</td>
<td>6.50</td>
<td>6.30</td>
</tr>
</tbody>
</table>
First Findings

• Yield portion of ACRE has value

• 20% of direct payments less than the “cost” of yield portion

• Could entice some farmers to sign up.

• But what about the price portion?
Estimated 2009 ACRE Price Guarantee

<table>
<thead>
<tr>
<th>Crop</th>
<th>ACRE Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>4.00</td>
</tr>
<tr>
<td>Soybeans</td>
<td>10.00</td>
</tr>
<tr>
<td>Wheat</td>
<td>7.00</td>
</tr>
<tr>
<td>Barley</td>
<td>4.50</td>
</tr>
</tbody>
</table>
Second Conclusion

• ACRE price guarantees much higher than CCP guarantees

• Higher guarantee increases likelihood of a payout

• How likely is it that price will trigger a payout under the two programs?
  – Need to look at 2009/10 projected season average prices
CBOT Corn Futures:
Projected Marketing Year Price = $4.03
Price Volatility

• We know that 2009/10 corn prices will not equal $4.03/bu

• Obtain market-estimated volatility from option premia
  – An at-the-money put option on Dec corn costs 50 cents per bushel
  – Price volatility = 33%
Market Estimate of the Distribution of Corn Prices in 2009/10

Average = $4.03

50% chance

$/bu

50% chance
Calculating the Chances of a Payout from Farm Programs

90% of ACRE Price

ACRE put option worth 32 cents per planted bushel

44% chance
Calculating the Chances of a Payout from Farm Programs

CCP Trigger Price

6% chance

CCP put option worth 5.4 cents per base bushel
What if Market Conditions Collapse

• Suppose projected corn prices drop by 35% to $2.62

• The ACRE price for 2009 largely locked in

• Maximum 10% annual drop in guarantee in 2010 and beyond
Distribution of Corn Prices in 2009/10 with a 35% Market Collapse

- LDP + CCP put option worth 20.1 cents per bushel
- ACRE put option worth $1.10 per bushel
- ACRE price guarantee

CCP Trigger Price

$/bu
If Market Conditions Collapse

• Advantage to ACRE price guarantee even greater

• Limit on downward movement keeps ACRE advantage of price protection

• Eventually must be concerned with cap on payments and payment limitations
Value of Price Guarantee from ACRE and CCP at Futures-Indicated Price Levels

- **Corn**
  - ACRE: $0.10
  - CCP: $0.05

- **Soybeans**
  - ACRE: $0.80
  - CCP: $0.00

- **Wheat**
  - ACRE: $0.60
  - CCP: $0.00

- **Barley**
  - ACRE: $0.30
  - CCP: $0.00
Value of Price Guarantee from ACRE and CCP with 35% Drop in Futures Prices

- **Corn**: $1.00
- **Soybeans**: $3.00
- **Wheat**: $2.00
- **Barley**: $1.00

**ACRE** vs. **CCP**
But ACRE Guarantees Revenue

• Cannot simply add up the value of the yield guarantee and the value of the price guarantee
  
  – Would understate value of ACRE guarantee because of double deductible

  – Would overstate value of ACRE guarantee if prices and yields move opposite each other
Total Expected LDP + CCP Payments and ACRE Payments:
Average Price at Futures-Indicated Levels

- Wheat
- Corn
- Soybeans

$million$
Total Expected LDP + CCP Payments and ACRE Payments:
Average Price at 35% Lower Level

<table>
<thead>
<tr>
<th>Crop</th>
<th>LDP+CCP</th>
<th>ACRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>100</td>
<td>400</td>
</tr>
<tr>
<td>Corn</td>
<td>50</td>
<td>250</td>
</tr>
<tr>
<td>Soybeans</td>
<td>100</td>
<td>250</td>
</tr>
</tbody>
</table>
Total Expected Payments from Traditional Programs and ACRE:
Average Price at Futures-Indicated Levels

- Wheat
- Corn
- Soybeans

- Traditional
- ACRE
Total Expected Payments from Traditional Programs and ACRE: Average Price at 35% Lower Level

- Wheat
- Corn
- Soybeans

<table>
<thead>
<tr>
<th></th>
<th>Traditional</th>
<th>ACRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>$200 million</td>
<td>$550 million</td>
</tr>
<tr>
<td>Corn</td>
<td>$100 million</td>
<td>$300 million</td>
</tr>
<tr>
<td>Soybeans</td>
<td>$50 million</td>
<td>$250 million</td>
</tr>
</tbody>
</table>

Legend:
- Traditional
- ACRE
Summary of Findings

• ACRE unambiguously provides more average support than current farm programs
• The difference in farm support grows as market price drops
• Reasonably good chance that actual ACRE payment will be lower than loss in direct payment because prices will be high
Reasons for Not Choosing ACRE

• Lack of yield history
  – FSA could fix this by simply substituting county average yields

• State yields do not track my yields
  – ACRE does not substitute for crop insurance, it substitutes for CCPs and part of DPs

• Why not use the 20% of direct payments and buy more crop insurance rather than ACRE?
Additional Benefit from Buying Up in Crop Insurance for Cass County Wheat Producer

<table>
<thead>
<tr>
<th>Range</th>
<th>Benefit ($/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 to 70</td>
<td>4.50</td>
</tr>
<tr>
<td>70 to 75</td>
<td>5.00</td>
</tr>
<tr>
<td>75 to 80</td>
<td>6.00</td>
</tr>
<tr>
<td>80 to 85</td>
<td>7.00</td>
</tr>
</tbody>
</table>
Additional Producer Premium from Buying Up in Crop Insurance for Cass County Wheat Producer

<table>
<thead>
<tr>
<th>Range</th>
<th>$/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 to 70</td>
<td>0.00</td>
</tr>
<tr>
<td>70 to 75</td>
<td>1.00</td>
</tr>
<tr>
<td>75 to 80</td>
<td>5.00</td>
</tr>
<tr>
<td>80 to 85</td>
<td>7.00</td>
</tr>
</tbody>
</table>
Return per Additional Dollar Paid for Increased Crop Insurance Coverage

<table>
<thead>
<tr>
<th>Coverage Level</th>
<th>Return per Additional Dollar</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 to 70</td>
<td>2.5</td>
</tr>
<tr>
<td>70 to 75</td>
<td>1.5</td>
</tr>
<tr>
<td>75 to 80</td>
<td>1.0</td>
</tr>
<tr>
<td>80 to 85</td>
<td>0.9</td>
</tr>
</tbody>
</table>
A Comparison of Return per Additional Dollar Paid for ACRE and Crop Insurance

- 65 to 70
- 70 to 75
- 75 to 80
- 80 to 85

Crop Insurance
ACRE