Current Issues in Crop-Hail Production Plan and Corn Wind & Green Snap in the North Central States: NCIS Perspective

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by Therese Stom

Who is NCIS?

• Advisory Organization
  – Supports the crop-hail insurance industry
  – Member companies report crop-hail data to NCIS
    • Database includes years from 1948 to current
  – NCIS develops crop-hail policy language
    • With input from regional and standing committees
    • Filed with state insurance departments
  – NCIS develops loss costs and rating factors
    • Existing programs and new products (e.g. Corn Wind)
    • Filed with state insurance departments
  – Research and develop loss adjustment procedures
Description/Background

Production Plan
Corn Wind and Green Snap

What is Production Plan?

• Provides protection for the deductible portion of a producer’s MPCI policy
• Loss payment is coordinated with producer’s MPCI coverage
  – Crop can potentially recover from some of the loss
  – Production Plan pays lesser of production loss or hail loss
What is Production Plan?
(cont.)

- Production Plan coverage is on a Unit basis
  - Standard hail is covered on an acre basis
- Allows producer to increase amount of insurance above his/her Approved Yield
  - Because the Approved Yield may understate the true expected yield
  - More recently, Trend Yield and Yield Exclusion were introduced to provide higher Approved Yields

What is Corn Wind and Green Snap?

- Was introduced by various companies in recent years
- NCIS developed its own version as an endorsement to Crop-Hail Policy
  - Green Snap Endorsement: Green Snap (severing or breaking of the stalk at a node above the brace roots and below ear) caused by natural wind
  - Wind Endorsement: Green Snap and/or Lodging (corn stalks which have been bent, broken or blown over) caused by natural wind
- DXS10 deductible
NCIS Filing – Production Plan

• NCIS Production Plan filing in 8 states
• NCIS first filed Production Plan in Minnesota and North Dakota in 2012
• NCIS Production Plan filing for corn, soybeans and wheat only
• NCIS filing includes modifiers 100 - 120
• Current NCIS filing minimum loss = 5%
• 2016 filing adding 0% minimum loss option
NCIS Filing – Corn Wind/Green Snap

• NCIS Corn Wind/Green Snap filing in 14 states
• NCIS first filed Corn Wind/Green Snap in Minnesota and North Dakota in 2015
• Minnesota filed loss cost
  – Green Snap: $1.20
  – Corn Wind: $1.80
• North Dakota filed loss cost
  – Green Snap: Corn FALC x 0.25
  – Corn Wind: Corn FALC x 0.50

Hail vs. Production Plan Premiums
Minnesota

Corn

Soybeans
Hail vs. Production Plan Premiums
North Dakota

Production Plan vs. Hail Loss Ratios
Production Plan Loss Costs/Rates

Minnesota Corn

North Dakota Corn

Minnesota Soybeans

North Dakota Soybeans

Corn Wind and Green Snap

Minnesota

North Dakota
Production Plan Rating

• Hail policy form factors
  – Based on loss severity distribution
  – Uses NCIS data from 1957 to the present

• Production Plan factors
  – Uses hail loss severity distribution
  – Combined with simulated producer yields

Production Plan Example

• PP Guarantee = 120 bushels
  – Approved Yield = 100 bushels
  – Modifier = 1.20

• Hail damage = 20%
  – 20% of 120 bushel guarantee = 24 bushels

• Expected yield after hail loss = 80 bushels
  – 20% loss in yield from producer’s APH

• Yield at harvest = 105 bushels
  – PP production loss = 15 bushels

• PP payment = 15 bushels
  – Pays the smaller of hail loss (24 bu) and production loss (15 bu)
  – Crop has partially recovered from hail loss
**Production Plan Rating Method**

For any Coverage Level and Modifier

- Assume that hail occurs
- Select a hail damage scenario
  - Based on the hail severity distribution
- Reduce the expected yield for any hail damage
- Create a scenario for the harvested yield
  - Consider a range of possibilities centered at the adjusted expected yield
- For each scenario
  - Calculate the hail loss, production loss, and PP indemnity
- Determine the expected PP and BASIC form indemnity
  - Use the weighted average across all scenarios
- PP factor = Expected PP payment /
  Expected payment under the BASIC plan

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**Corn Wind/Green Snap Rating**

- Significant increase in exposure volume in recent years
- Unfortunately, we still have only a few years of meaningful data
- It isn’t enough to determine a reliable loss cost
- NCIS considered whether other data could be used to supplement the analysis
Modeling of Corn Wind Loss Costs

• Investigated the use of weather data
  – Derecho Number
  – NOAA Daily Average Wind Speed
  – NOAA Hourly Wind Speed
  – NOAA Peak Wind Data

• None of these adequately explained differences in loss costs across states and counties

• Modeling approach was abandoned

Straight-Line (“Derecho”) Wind Speeds
Does not line up well with Corn Wind Loss Costs
Average of Daily Peak Wind Speeds for June
Indicates higher wind speeds in central states
Not adequate: need Peak Wind Speeds over the entire season

MPCI Corn Wind Loss Costs
Smoothed across counties; 1997 through 2013
High losses in Great Plains, low losses in East
Comparison of Company Rates

Developed based on company’s own data and competitors’ rates

<table>
<thead>
<tr>
<th>State</th>
<th>Structure</th>
<th>Corn Green Snap</th>
<th>Corn Wind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minnesota</td>
<td>Rate</td>
<td>$0.60 to $0.90</td>
<td>$1.00 to $1.30</td>
</tr>
<tr>
<td></td>
<td>Percentage²</td>
<td>30% to 35% of BASIC Hail rate</td>
<td>35% to 50% of BASIC Hail rate</td>
</tr>
<tr>
<td>North Dakota</td>
<td>Rate</td>
<td>$1.00 to $1.60</td>
<td>$1.75 to $1.95</td>
</tr>
<tr>
<td></td>
<td>Percentage²</td>
<td>25% to 30% of BASIC Hail rate</td>
<td>30% to 60% of BASIC Hail rate</td>
</tr>
</tbody>
</table>

(1): Some companies may have had rates or percentages falling outside the indicated ranges
(2): Some companies using the percentage method also filed minimum and maximum rates

Industrywide Loss Costs by State

- Any state’s loss cost can be distorted by a single bad year
- NCIS limited the impact of a single bad year on each state’s experience
  - By capping the annual loss costs for each state
    - At the 95th percentile
  - Pooling losses above the cap
    - All states combined
    - Redistribute to each state
- Results still don’t appear to be fully credible
  - High variation in loss costs across neighboring states
Loss Cost Decision Process

• Modeling approach
  – Not successful

• Compare current rates across all companies
  – But company rates are based on very limited information

• Review industrywide Loss Costs for each state
  – Still too limited to be fully reliable

• Review the Corn Wind Loss Costs from MPCI program
  – Includes many years of data
  – But the MPCI policy differs from Corn Wind coverage

• Made judgmental selection of final Loss Costs
  – Based on the information above
  – Select LCs to be reasonably consistent with nearby states

• Review again as more data becomes available
  – Investigate use of MPCI experience as a proxy

State Regulation
State Regulation

• Minnesota
  – New Bulletin in 2015
  – Much more stringent than the prior bulletin
  – Companies can deviate from the NCIS FALC/factors by 15% without actuarial justification
  – Differences beyond 15% must be actuarially justified
  – According to the Minnesota Insurance Department, the industrywide average rate change for 2015 was around 25%

• North Dakota
  – Companies must use 100% of the NCIS FALC/factors unless they can actuarially justify their own

Stated reasons for new Minnesota Bulletin

• Rates are required by statute to be not excessive, inadequate or unfairly discriminatory
• Insurers have very little information on which to base their rates (a lack of credibility)
• Industrywide data collected by NCIS is more credible than company data
• Company rates were often half of the NCIS loss costs
• Loss experience has been highly unprofitable