### Margin Protection (MP)

**Insurance Plan Code**: 16 Margin Protection

**Commodity Code**
- 0011 Wheat
- 0018 Rice
- 0041 Corn
- 0081 Soybeans

### Calculations

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Record Number</th>
<th>Field Number</th>
<th>Field Format</th>
<th>Field Rounding</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollar Amount of Insurance</td>
<td>Internal</td>
<td>999999999.99</td>
<td>2 decimal places</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected Margin Amount</td>
<td>ADM</td>
<td>999999.9999</td>
<td>None</td>
<td>Expected Margin Amount. Edit with ADM Price, &quot;A00810&quot;.</td>
<td></td>
</tr>
<tr>
<td>Coverage Level Percent</td>
<td>P14</td>
<td>49</td>
<td>9.999</td>
<td>2 decimal places</td>
<td>Coverage Level Percent in 5% increments as selected for MP.</td>
</tr>
<tr>
<td>Approved Yield</td>
<td>P11</td>
<td>42</td>
<td>999999999.99</td>
<td>None</td>
<td>Approved Yield.</td>
</tr>
<tr>
<td>Projected Price</td>
<td>ADM</td>
<td>999999.9999</td>
<td>None</td>
<td>Projected Price. Edit with ADM Price, &quot;A00810&quot;.</td>
<td></td>
</tr>
</tbody>
</table>

### Section 1: Dollar Amount of Insurance

\[
\text{Dollar Amount of Insurance} = \text{Round}((\text{Expected Margin Amount} \times \text{Coverage Level Percent}) + (\text{Approved Yield} \times 0.85 \times \text{Projected Price}), 2)
\]

### Section 2: Liability Calculation

\[
\text{Total Guarantee Amount} = \text{Dollar Amount of Insurance} \times \text{Reported Acreage}
\]

\[
\text{Liability Amount} = \text{Total Guarantee Amount} \times \text{Insured Share Percent}
\]

### Section 3: Total Premium, Subsidy, and Producer Premium Calculation

\[
\text{Preliminary Total Premium Amount} = \text{Reported Acreage} \times \text{Base Rate} \times \text{Insured Share Percent}
\]

\[
\text{Base Rate} = \text{Margin Protection Premium Amount Per Acre. Edit with ADM Area Risk Rate, "A01005".}
\]

\[
\text{Total Premium Amount} = \text{Preliminary Total Premium Amount}
\]

\[
\text{Subsidy Amount} = \text{Total Premium Amount} \times \text{Subsidy Percent}
\]

\[
\text{Subsidy Percent} = \text{Producer Premium Amount} \times \text{Subsidy Percent}
\]

\[
\text{Producer Premium Amount} = \text{Total Premium Amount} - \text{Subsidy Amount}
\]

Base Rate is Margin Protection Premium Amount Per Acre. Edit with ADM Area Risk Rate, "A01005".

If this record qualifies for Beginning Farmer and Rancher or Native Sod, see Section 4 for Subsidy calculations.

Edit with ADM Subsidy Percent, "A00070".

Sections 3 and 4 will be used if base (companion) record does not have qualifying information for MP Net Premium.
### Margin Protection (MP)

#### Insurance Plan Code
16 Margin Protection

#### Commodity Code
- 0011 Wheat
- 0018 Rice
- 0041 Corn
- 0081 Soybeans

### Calculations

#### Field Name | Record Number | Field Number | Field Format | Field Rounding | Rules
--- | --- | --- | --- | --- | ---
Base Subsidy Amount | Total Premium Amount * Subsidy Percent | Base Subsidy Amount | Internal | 9999999999 | Round to whole number | Cupped by the standard rule of $1 if applicable.
Subsidy Percent | ADM | 9.999 | None | Edit with ADM Subsidy Percent, "A00070".
BFR Subsidy Amount | Total Premium Amount * 0.10 * (1 - CC Subsidy Reduction Percent) | BFR Subsidy Amount | Internal | 9999999999 | Round to whole number | Beginning Farmer Rancher Subsidy Amount. If Applicable; else 0.10 (10%).
Native Sod Subsidy Amount | Total Premium Amount * 0.50 | Native Sod Subsidy Amount | Internal | 9999999999 | Round to whole number | If Applicable; else 0.50 (50%). For CAT coverage, Native Sod Subsidy Amount is always 0.
CC Subsidy Reduction Amount | Base Subsidy Amount * CC Subsidy Reduction Percent | CC Subsidy Reduction Amount | P11 | 108 | 9999999999 | Round to whole number | CC Subsidy Reduction Amount. If Applicable; else 0.
CC Subsidy Reduction Percent | P11 | 76 | 9.999 | None | If Applicable; else 0.
Subsidy Amount | Base Subsidy Amount + BFR Subsidy Amount - Native Sod Subsidy Amount - CC Subsidy Reduction Amount | Subsidy Amount | P11 | 90 | 9999999999 | Round to whole number | Subsidy Amount cannot exceed Total Premium Amount. Subsidy Amount will be cupped at $0.
Producer Premium Amount | Total Premium Amount - Subsidy Amount | Producer Premium Amount | P11 | 93 | 9999999999 | Round to whole number | MP policy has an associated base (companion) policy. Use Sections 3 and 4 when base (companion) record does not have qualifying information for MP Net Premium.

### Section 5: Premium Credit for MP Policies with Base Policy

- **Simple Average Annual Yield** = \( \frac{\sum \text{Average Annual Yield(s)}}{N} \)
- **Average Annual Yield**
- **N**

**Rules**
- Sum all average annual yields in the APH database for a type/practice unit divide by the number of yields. Step 5 of Parameter Example Exhibit P15-6.
- APH average annual yields for each year in the APH database. Step 3 of Parameter Example Exhibit P15-6.
- Count of the yields in the APH database.
<table>
<thead>
<tr>
<th>Calculations</th>
<th>Field Name</th>
<th>Record Number</th>
<th>Field Number</th>
<th>Field Format</th>
<th>Field Rounding</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Average County Yield</td>
<td>Simple Average County Yield</td>
<td>Internal</td>
<td>999999999.99</td>
<td>Round to 2 decimals.</td>
<td>Sum (county) yields for the same years that yields are reported for the unit and divide by the number of yields. Step 8 of Parameter Example Exhibit P15-6.</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Internal</td>
<td>99999</td>
<td>Whole Number</td>
<td>Count of the yields in the APH database.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Margin Protection (MP)**

<table>
<thead>
<tr>
<th>Insurance Plan Code</th>
<th>Commodity Code</th>
<th>Field Name</th>
<th>Record Number</th>
<th>Field Format</th>
<th>Rounding</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 Margin Protection</td>
<td>0011 Wheat</td>
<td>County Yield Deviation(i) = Yield(i) - Average County Yield</td>
<td>Internal</td>
<td>999999.99</td>
<td>Round to 2 decimals.</td>
<td>Step 9 of Parameter Example Exhibit P15-6.</td>
</tr>
<tr>
<td></td>
<td>0018 Rice</td>
<td>Unit Yield Deviation(i) = Unit Yield(i) - Average Unit Yield</td>
<td>Internal</td>
<td>999999.99</td>
<td>Round to 2 decimals.</td>
<td>Step 6 of Parameter Example Exhibit P15-6.</td>
</tr>
<tr>
<td></td>
<td>0041 Corn</td>
<td>Cross Product(i) = County Yield Deviation(i) * Unit Yield Deviation(i)</td>
<td>Internal</td>
<td>999999.9999</td>
<td>Round to 4 decimals</td>
<td>Step 10 of Parameter Example Exhibit P15-6.</td>
</tr>
<tr>
<td></td>
<td>0081 Soybeans</td>
<td>Squared County Deviation(i) = County Yield Deviation(i) * County Yield Deviation(i)</td>
<td>Internal</td>
<td>999999.9999</td>
<td>Round to 4 decimals</td>
<td>Step 11 of Parameter Example Exhibit P15-6.</td>
</tr>
</tbody>
</table>

\[ \text{Beta} = \frac{\sum \text{Cross Product}(i)}{\sum \text{Squared County Deviation}(i)} \]

*Beta* is calculated if calculated Beta < 0.3 or if N < 4, set Beta = 0.3. If calculated Beta > 1.6, set Beta = 1.6. Step 13 of Parameter Example Exhibit P15-6. Note: The sum of the cross product (\(\sum \text{Cross Product}(i)\)) and the sum of the squared county deviation (\(\sum \text{Squared County Deviation}(i)\)) should be rounded to 2 decimals before performing the beta calculation. When there are zero (0) yield years with an approved actual yield type for MP then the Beta, Alpha, Sigma are NOT calculated for the MP P11 and the MP P11 is treated as a standalone MP P11. Credit will = 1.

\[ \text{Alpha} = \text{Average Unit Yield} - \text{Beta} \times \text{Average County Yield} \]

*Alpha* is calculated if calculated Beta < 0.3 or if N < 4, set Alpha = 0. Step 14 of Parameter Example Exhibit P15-6.

\[ \text{Squared Yield Deviation}(i) = [\text{Unit Yield} - \text{Alpha} - \text{Beta} \times \text{Yield}(i)]^2 \]

*Squared Yield Deviation(i)* is calculated if calculated Beta < 0.3 or if N < 4, set Beta = 0. Steps 16 and 17 of Parameter Example Exhibit P15-6.

\[ \text{Sigma} = \left(\frac{\sum \text{Squared Yield Deviation}(i)}{(N-2)}\right)^{1/2} \]

*Sigma* is calculated if calculated Beta < 0.3 or if N < 4, set Beta = 0. Steps 16 and 17 of Parameter Example Exhibit P15-6.

**Trigger Margin Calculation:**

\[ \text{Simulated Trigger Margin} = \text{Expected Margin} \times \text{Coverage Level Percent} \]

\[ \text{Expected Margin} = \text{ADM} \]

Expected Margin found in the ADM Price, "A00810".

**Simulated MP Losses Calculation:**

\[ \text{MP Liability Amount} = \text{Liability Amount} / \text{Insured Share Percent} \]

MP Liability Amount is the amount without Insured Share Percent for use in the determination of MP Gross Indemnity.
### Calculations

**Margin Protection (MP)**

<table>
<thead>
<tr>
<th>Calculations</th>
<th>Field Name</th>
<th>Record Number</th>
<th>Field Number</th>
<th>Field Format</th>
<th>Rounding</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Margin Draw (t,j) = Detrended Yield(t) * Commodity Price Draw Quantity ((t,j)) - Input Cost Draw Quantity ((t,j))</td>
<td>Margin Draw</td>
<td>Internal</td>
<td>999999999.99</td>
<td>Round to 2 decimals.</td>
<td>Do not make calculations if Detrended Yields = 0, skip to next value. Detrended Yield found in the ADM Historical Yield Trend, &quot;A01115&quot;.</td>
<td></td>
</tr>
<tr>
<td>Detrended Yield ((t,j)) = Commodity Price Draw Quantity ((t,j)) / Commodity Price Draw Quantity ((t,j))</td>
<td>Detrended Yield</td>
<td>ADM</td>
<td>999999999.99</td>
<td>None</td>
<td>Commodity Price Draw Quantity found in the ADM Draw Data, &quot;A00615&quot;.</td>
<td></td>
</tr>
<tr>
<td>Commodity Price Draw Quantity ((t,j)) = Input Cost Draw Quantity ((t,j)) / Input Cost Draw Quantity ((t,j))</td>
<td>Commodity Price Draw Quantity</td>
<td>ADM</td>
<td>999999999.99</td>
<td>None</td>
<td>Input Cost Draw Quantity found in the ADM Draw Data, &quot;A00615&quot;.</td>
<td></td>
</tr>
<tr>
<td>Input Cost Draw Quantity ((t,j)) = Counter * Commodity Price Draw Quantity ((t,j))</td>
<td>Input Cost Draw Quantity</td>
<td>ADM</td>
<td>9999.999999</td>
<td>None</td>
<td>Counter is set = 0 to begin the simulation. Do not increment counter when any County Detrended Yield = 0.</td>
<td></td>
</tr>
</tbody>
</table>

**Counter** = Counter + 1

MP Gross Indemnity Draw \((t,j)\) = MIN(MAX(Trigger Margin - Margin Draw \((t,j)\), 0), MP Liability Amount)

MP Gross Indemnity = MP Gross Indemnity + MP Gross Indemnity Draw \((t,j)\)

**Simulated Farm Yield Calculation:**

Farm Yield Draw \((t,j)\) = MAX(Alpha + Beta * Detrended Yield \((t)\) + Sigma * Farm Deviation Quantity \((j)\), 0)

Farm Revenue Draw \((t,j)\) = Farm Yield Draw \((t,j)\) * Commodity Price Draw Quantity \((t,j)\)
### Calculations

<table>
<thead>
<tr>
<th>Field Name</th>
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<th>Field Format</th>
<th>Field Rounding</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage Level</td>
<td>P14</td>
<td>49</td>
<td>9.9999</td>
<td>2 decimal places</td>
<td><strong>Note</strong>: this is the Coverage Level for Base (Companion) Policy.</td>
</tr>
<tr>
<td>YP Indemnity Draw(t,j)</td>
<td>Internal</td>
<td>99999999.99</td>
<td>2 decimal places</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP Guarantee Draw(t,j)</td>
<td>Internal</td>
<td>99999999.99</td>
<td>2 decimal places</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP Indemnity Draw(t,j)</td>
<td>Internal</td>
<td>99999999.99</td>
<td>2 decimal places</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPHPE Indemnity Draw(t,j)</td>
<td>Internal</td>
<td>99999999.99</td>
<td>2 decimal places</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Simulated Indemnities for Base (Companion) Policy Calculation:**

- YP Net Indemnity Draw(t,j) = \( \text{MAX}(\text{MP Gross Indemnity Draw}(t,j) - \text{YP Indemnity Draw}(t,j)) \)
- RP Net Indemnity Draw(t,j) = \( \text{MAX}(\text{MP Gross Indemnity Draw}(t,j) - \text{RP Indemnity Draw}(t,j)) \)
- RPHPE Net Indemnity Draw(t,j) = \( \text{MAX}(\text{MP Gross Indemnity Draw}(t,j) - \text{RPHPE Indemnity Draw}(t,j)) \)

**Net Indemnities:**

- YP Net Indemnity Draw(t,j) = \( \text{YP Indemnity Draw}(t,j) \)
- RP Net Indemnity Draw(t,j) = \( \text{RP Indemnity Draw}(t,j) \)
- RPHPE Net Indemnity Draw(t,j) = \( \text{RPHPE Indemnity Draw}(t,j) \)

**Summed Net Indemnities:**

- Summed YP Net Indemnity = \( \sum(\text{YP Net Indemnity Draw}(t,j)) \)
- Summed RP Net Indemnity = \( \sum(\text{RP Net Indemnity Draw}(t,j)) \)
- Summed RPHPE Net Indemnity = \( \sum(\text{RPHPE Net Indemnity Draw}(t,j)) \)

**Gross Premium and Net Premium Per Acre on a 100% share basis:**

- Gross Premium = \( \text{Round}(\text{Summed Gross Indemnity} / \text{Counter},2) \)
- YP Net Premium Per Acre = \( \text{Round}(\text{Summed YP Net Indemnity} / \text{Counter},2) \)
- RP Net Premium Per Acre = \( \text{Round}(\text{Summed RP Net Indemnity} / \text{Counter},2) \)
- RPHPE Net Premium Per Acre = \( \text{Round}(\text{Summed RPHPE Net Indemnity} / \text{Counter},2) \)
### Margin Protection (MP)

**Insurance Plan Code**: 16 Margin Protection

**Commodity Code**
- 0011 Wheat
- 0018 Rice
- 0041 Corn
- 0081 Soybeans

#### Calculations

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Record Number</th>
<th>Field Number</th>
<th>Field Format</th>
<th>Field Rounding</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>YP Base Policy Credit</td>
<td>Internal</td>
<td>99999999.99</td>
<td>2 decimal places</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RP Base Policy Credit</td>
<td>Internal</td>
<td>99999999.99</td>
<td>2 decimal places</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPHPE Base Policy Credit</td>
<td>Internal</td>
<td>99999999.99</td>
<td>2 decimal places</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MP Net Premium</td>
<td>Internal</td>
<td>99999999.99</td>
<td>2 decimal places</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Base Rate</td>
<td>ADM</td>
<td>999999.9999</td>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Base (Companion) Policy Credit and MP Net Premium**

- **YP Base Policy Credit** = Gross Premium - YP Net Premium Per Acre
- **RP Base Policy Credit** = Gross Premium - RP Net Premium Per Acre
- **RPHPE Base Policy Credit** = Gross Premium - RPHPE Net Premium Per Acre
- **MP Net Premium** = Base Rate - (YP Base Policy Credit, RP Base Policy Credit, or RPHPE Base Policy Credit)

**Section 6: Total Premium, Subsidy, and Producer Premium Calculation for MP Policies with Base (Companion) Policy**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Record Number</th>
<th>Field Number</th>
<th>Field Format</th>
<th>Field Rounding</th>
<th>Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Total Premium Amount</td>
<td>Internal</td>
<td>9999999999</td>
<td>Round to whole number.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Premium Amount</td>
<td>P11</td>
<td>92</td>
<td>9999999999</td>
<td>Round to whole number.</td>
<td></td>
</tr>
<tr>
<td>Subsidy Amount</td>
<td>P11</td>
<td>90</td>
<td>9999999999</td>
<td>Round to whole number.</td>
<td></td>
</tr>
<tr>
<td>Producer Premium Amount</td>
<td>P11</td>
<td>93</td>
<td>9999999999</td>
<td>Round to whole number.</td>
<td></td>
</tr>
</tbody>
</table>

If this record qualifies for Beginning Farmer and Rancher or Native Sod, see Section 4 for subsidy calculations.

Edit with ADM Subsidy Percent, "A00070".