

Margin Protection Crop Insurance Coverage Comes to Kansas

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A new form of crop insurance coverage is coming to Kansas for the 2018 corn and soybean crops. USDA's Risk Management Agency approved an expansion of the Margin Protection plan of coverage for several additional states, including Kansas. The "margin" being protected here is defined as crop revenue minus operating costs. This means that MP intends to protect against not only a decline in crop price or yield (same as current revenue coverage), but also from an increase in operating costs. MP coverage is a pilot program that was first available in 2016 for corn and soybeans in Iowa, for spring wheat in the northern Plains, and for rice in the Mississippi valley and Gulf Coast areas, plus a few counties in California.

MP coverage is an area-based plan which uses county-level estimates of yields and input use to calculate expected crop revenue, operating costs, and the resulting margin. It does not use individual farm yields or input usage. While it intends to reflect the general experience of most producers in a county, it may not exactly match the results of any particular individual.

Margin Protection insurance coverage for corn and soybeans actually begins in the fall prior to planting the following spring. Specifically, the Projected Price Discovery Period for both crops and inputs runs from August 15 to September 14, with the Sales Closing Date coming on September 30. Once the price discovery period concludes on September 14, expected revenue, costs, and margin can be determined.

MP works by calculating an expected margin (= expected county yield x projected price – expected costs) at sign-up time and then calculating a "trigger margin" by subtracting a margin deductible from the expected margin. A margin loss occurs when the harvest margin (= harvest price x final county yield – harvest costs) falls below the trigger margin.

Margin Protection coverage ranges from 70% to 95% of the expected margin – or said another way, deductibles go from 30% to 5%. These low deductibles are another feature of MP coverage which may appeal to some producers. The deductible is calculated by multiplying the expected revenue by the deductible percentage, and that amount is subtracted from the expected margin to get the trigger margin.

For example, with an expected corn yield of 130 bushels per acre and an expected corn price of \$4.00 per bushel, expected revenue is $\$4.00/\text{bu} \times 130 \text{ bu}/\text{a} = \$520/\text{a}$. Using the 95% coverage level, the deductible is $\$520/\text{a} \times 5\% = \$26/\text{a}$. Assuming expected costs of \$280/acre, the expected margin per acre is $\$520 - \$280 = \$240$. Subtract the \$26 deductible to get the trigger margin: $\$240 - \$26 = \$214$ per acre. An indemnity payment is made when the harvest margin falls below this trigger level.



The indemnity is calculated as the margin loss times the Protection Factor. The Protection Factor ranges in value from 0.80 to 1.20, meaning that the margin loss can be scaled up or down by as much as 20% to calculate the final indemnity amount. The Protection Factor may be familiar to some as a feature also available with other county-based insurance products such as Area Risk Protection Insurance (ARPI).

The county yields used for MP coverage are the same ones used in the ARPI insurance plans. An Expected County Yield will be announced prior to sign-up for purposes of calculating the expected revenues and related parameters. The Final County Yield, used to calculate harvest revenue, is usually not announced by USDA until early the following year, so loss determination for MP will be somewhat delayed, compared to individual crop insurance plans.

The Expected County Yield is also used to determine input quantities. Formulas have been developed to estimate input use as a function of yield for several inputs: diesel, urea, diammonium phosphate (DAP), potash, and interest. Urea, DAP, and potash represent the familiar macro nutrients of N, P, and K found in many fertilizer formulations. Table 1 shows the formulas and parameter values used to calculate input amounts. For example, consider a non-irrigated corn yield of 140 bu/a. Plugging this value into the formulas results in the following input quantities: 8.1 gallons of diesel, 252.6 lbs of urea, 106.5 lbs of DAP, and 58.3 lbs of potash on a per-acre basis. These quantities are combined with the average futures prices of these inputs during the price discovery period to calculate this part of expected costs.

The second component of expected costs is a fixed amount that covers all other inputs not subject to changing prices. This component includes costs like seed, herbicides and other chemicals, machinery, lubrication, etc. For corn in 2018, this amount is set at \$206.90/acre, and for soybeans it is \$111.50/acre. These amounts are the same for all counties and practices, and they are not subject to change during the later Harvest Price discovery period.

Interest is the third component of expected costs. Interest is calculated as 6% + the 30-day Fed Funds rate, applied to all the other operating costs mentioned earlier, and assumed to be outstanding for 6 months. Tables 2 and 3 show examples of expected cost calculations for corn and soybeans, respectively.

Table 4 shows the sources of the input prices used to calculate costs, as well as the price discovery periods. The diesel price is based on the May diesel contract at the New York Mercantile Exchange, urea and DAP prices are based on May futures swaps contracts at the Chicago Mercantile Exchange, and the potash price is based on cash prices reported by USDA's Agricultural Marketing Service for central Illinois. The interest rate is based on the CME 30-day Fed Funds November contract.

Table 4 also shows similar information for the corn and soybean prices. The crop prices are based on the same futures contracts used in the traditional Revenue Protection (RP) and Yield Protection (YP)



crop insurance plans, although the Projected Price discovery periods are earlier for MP coverage. The Harvest Price discovery period is October, just like in RP.

Table 4 also provides a summary of the periods for which changes in input prices are covered under Margin Protection. Price changes for diesel, urea, and DAP are covered from the fall of 2017 to planting time in April 2018. Changes in interest rates are covered from the fall 2017 all the way through harvest in the fall of 2018. Changes in potash prices are not considered.

MP coverage is available either with or without a Harvest Price Option feature. Without HPO, the coverage calculates the expected margin after the Projected Price discovery period in the preceding fall, and the resulting trigger margin remains unchanged through the rest of the coverage period. With the HPO feature, the higher of the Projected and Harvest prices is used to calculate expected revenue, the expected margin, the deductible, and the trigger margin. A higher Harvest Price thus results in a higher trigger margin.

Margin Protection can be combined with the traditional RP or YP coverage used by most corn and soybean growers in Kansas. The RP or YP policy bought in the spring, prior to planting, is referred to as the base policy in this arrangement. Purchase of a base policy will result in a premium credit for MP coverage, to reflect the situation that an indemnity from one of these policies can offset an indemnity from the other. The credit is the actuarially determined value of the expected overlapping indemnities between MP and RP/YP at the time of RP/YP closing.

Regarding indemnity payments, any payment due under the base policy will be made first, with any remaining MP payment occurring later (the following spring), after final area yields are announced. If the MP indemnity is larger than the base policy indemnity, the base policy indemnity will be subtracted from the MP indemnity. That is, the amount of MP indemnity paid will be the difference between the MP indemnity and the base policy indemnity, but not to exceed the total liability under MP. If the MP indemnity is smaller than the indemnity for the base policy, then no additional indemnity will be paid under the MP coverage.

Figures 1 and 2 show the expanded areas of availability for MP for the 2018 crop years. For both corn and soybeans, MP coverage will be available over most of the Midwest. In Kansas, some counties in central Kansas will not have MP available for corn, while for soybeans most of western Kansas will have no MP coverage available.

The Risk Management Agency has provided a wide range of resources to explain MP coverage on its website. Links to fact sheets, policy documents, and other supporting information are available at <https://www.rma.usda.gov/policies/mp/>. In addition, growers can find additional information www.marginprotection.com.



Table 1: Formulas for calculating input amounts for Margin Protection coverage

Crop	Urea	DAP	Potash	Diesel
Corn, irrigated	$(\text{ECY} \times .83) / .46$	$(\text{ECY} \times .35) / .46$	$(\text{ECY} \times .25) / .6$	$(\text{ECY} \times .10) + 2.5$
Corn, non-irrigated	$(\text{ECY} \times .83) / .46$	$(\text{ECY} \times .35) / .46$	$(\text{ECY} \times .25) / .6$	$(\text{ECY} \times .04) + 2.5$
Soybeans, irrigated	0	$(\text{ECY} \times .73) / .46$	$(\text{ECY} \times 1.1) / .6$	$(\text{ECY} \times .30) + 2.5$
Soybeans, non-irrigated	0	$(\text{ECY} \times .73) / .46$	$(\text{ECY} \times 1.1) / .6$	$(\text{ECY} \times .10) + 2.5$

Notes: ECY = Expected County Yield. Formulas for urea, DAP, and potash show pounds per acre. Formulas for diesel show gallons per acre.

Table 2: Example input cost calculations for non-irrigated corn yield of 140 bu/a

Input	Quantity	Price	Cost
Diesel	8.1 gal	\$1.507 /gal	\$12.20/a
Urea	252.6 lbs	\$175.00 /ton	\$22.10/a
DAP	106.5 lbs	\$315.00 /ton	\$16.78/a
Potash	58.3 lbs	\$327.25 /ton	\$9.54/a
Other costs	-----	-----	<u>\$206.90/a</u>
Sub-total			\$267.53/a
Interest		7.49%	<u>\$10.02/a</u>
TOTAL			\$277.55/a

Table 3: Example input cost calculations for non-irrigated soybean yield of 40 bu/a

Input	Quantity	Price	Cost
Diesel	6.5 gal	\$1.507 /gal	\$ 9.79/a
Urea	-----	-----	-----
DAP	63.5 lbs	\$315.00 /ton	\$ 10.00/a
Potash	73.3 lbs	\$327.25 /ton	\$ 12.00/a
Other costs	-----	-----	<u>\$111.50/a</u>
Sub-total			\$143.29/a
Interest		7.49%	<u>\$ 5.37/a</u>
TOTAL			\$148.66/a



Table 4: Futures contracts or reports used for price discovery and price discovery periods

Item	Contract	Projected Price Discovery Period	Harvest Price Discovery Period
Diesel	NYMEX ULS Diesel May 2018 contract	Aug 15 – Sep 14, 2017	Apr 1 – 30, 2018
N (urea)	CME UFN May 2018 contract	Aug 15 – Sep 14, 2017	Apr 1 – 30, 2018
P (DAP)	CME DFL May 2018 contract	Aug 15 – Sep 14, 2017	Apr 1 – 30, 2018
K (potash)	USDA AMS reported cash prices, Illinois	Aug 15 – Sep 14, 2017	No price changes
Interest	CME 30-day Federal Funds Nov 2018 contract	Aug 15 – Sep 14, 2017	Oct 1 – 31, 2018
Corn	CBOT Dec 2018 futures	Aug 15 – Sep 14, 2017	Oct 1 – 31, 2018
Soybeans	CBOT Nov 2018 futures	Aug 15 – Sep 14, 2017	Oct 1 – 31, 2018

Figure 1: Counties where Margin Protection coverage will be available for corn in 2018

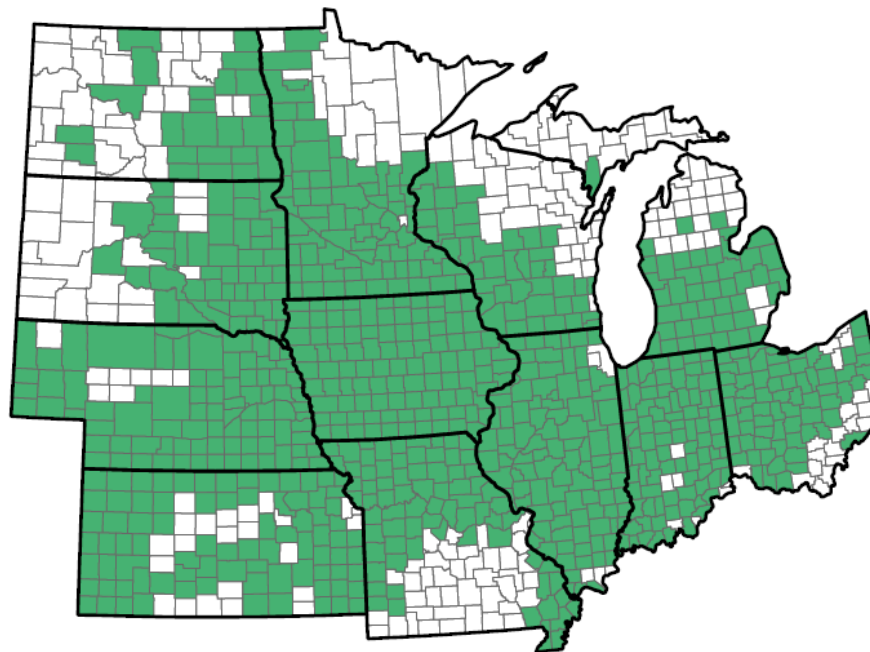
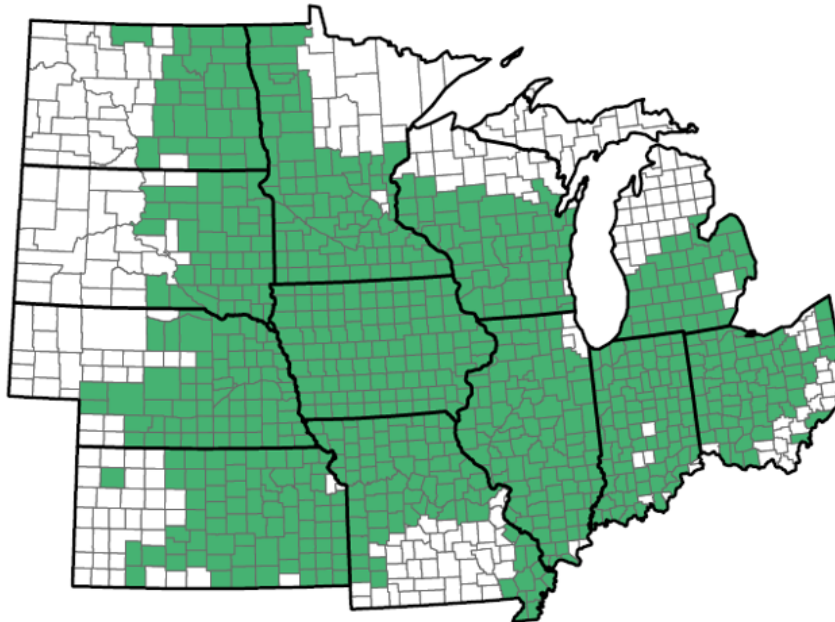


Figure 2: Counties where Margin Protection coverage will be available for soybeans in 2018



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