14. Margin Protection Insurance

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Monte Vandeveer joined the KSU Extension Farm Management team in February 2016 as the Southwest Area extension agricultural economist, based in Garden City. He grew up on a farm in south-central Kansas with wheat and cow-calf operations. He received B.S. and M.S. degrees in agricultural economics from Kansas State University and a Ph.D. in ag economics from Purdue University. Besides working for K-State Research and Extension, he also has experience working with the Economic Research Service, (USDA), the University of Nebraska-Lincoln's Extension Service, and volunteer service in Vietnam. He has a special interest in risk management, particularly crop insurance.

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Dr. Art Barnaby was raised on a diversified farm, located in Elk County, Kansas. Art received his B.S. degree from Fort Hays State University, M.S. from New Mexico State University and a Ph.D. in Agricultural Economics from Texas A&M University. Art joined the Agricultural Economics faculty in 1979. He currently holds the rank of Professor. Art conducts national extension education programs on market risk, government commodity programs, crop insurance and public policy. In 2016, Art was named one of Farm Credit's Fresh Perspectives Top 100 Honorees. In 2013, Art was 1 of 30 people who were named on Top Producer Editors' list of "Brave Thinkers: 30 Leaders Who Made a Difference" and on their list of "7 Economists, Bankers Who Challenged the Status Quo". He has authored several research projects on crop insurance issues and their impacts on farmers. His research work with the private sector was the basis for the first revenue insurance contract.

Art is a past winner of the Excellence in Extension Award presented by the National Association of Public and Land Grant Universities. He is also a three time winner of the American Agricultural Economics Association Distinguished Extension Program Award. Art was a member of the 2015 Western Agricultural Economics Association's Group Extension Project Award for the OSU-KSU 2014 Farm Bill Decision Tool and Education Program. Art is a frequent speaker at professional, farmer-producer, ag lender, and insurance industry meetings. Art's wife, Nancy, holds a B.S. degree from Fort Hays State University in Nursing. Art and Nancy have two sons and five granddaughters.

Abstract/Summary

A new form of crop insurance coverage will be available in Kansas for the 2018 corn and soybean crops. Margin Protection coverage insures against an unexpected decline in a producer's margin, defined as crop revenue (= price x yield) – operating costs. MP coverage is an area-based plan, using county yields. This session will discuss the nuts and bolts of how MP coverage works and how it might fit into a producer's risk management plans.
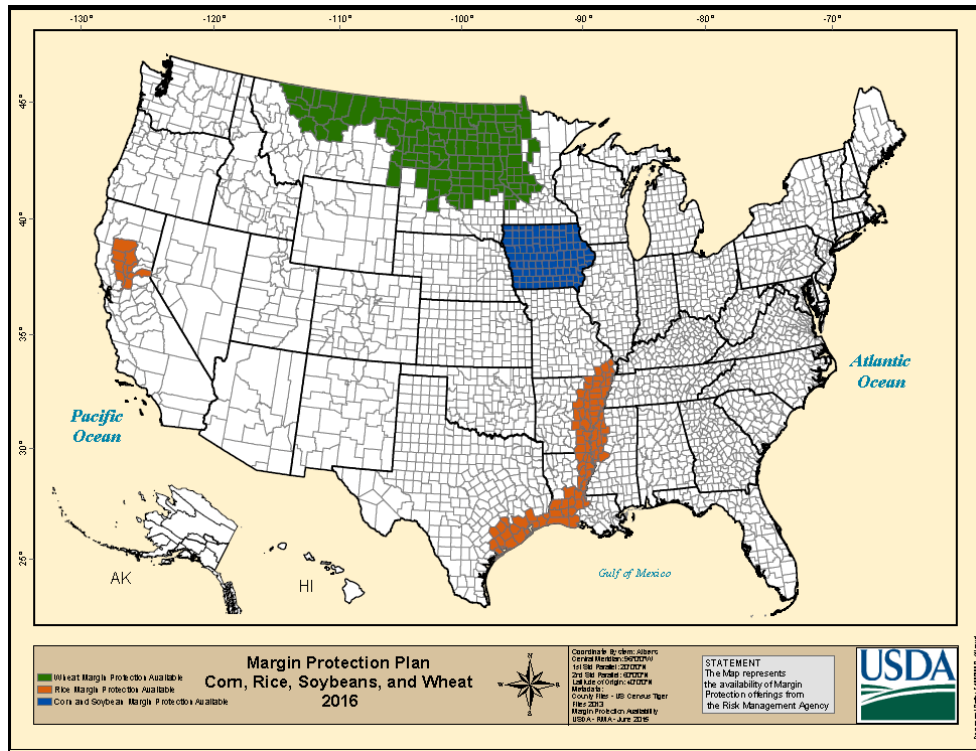
Margin Protection Plan
New insurance coverage
for corn and soybeans in Kansas in 2018

Dr. Monte Vandeveer

KSU Extension Agricultural Economist, SW Area

Margin Protection Plan: BACKGROUND

- Authorized by the 2014 Farm Bill
- RMA pilot program: stage of testing and refinement
- Sold by private insurance companies, subsidized premium
- Area-based: uses county yields
- Offered for first time in 2016
  - CORN and SOYBEANS: only available in Iowa
  - WHEAT (spring wheat areas of Northern Plains; not in KS)
  - RICE
- Major expansion for 2018 crop year
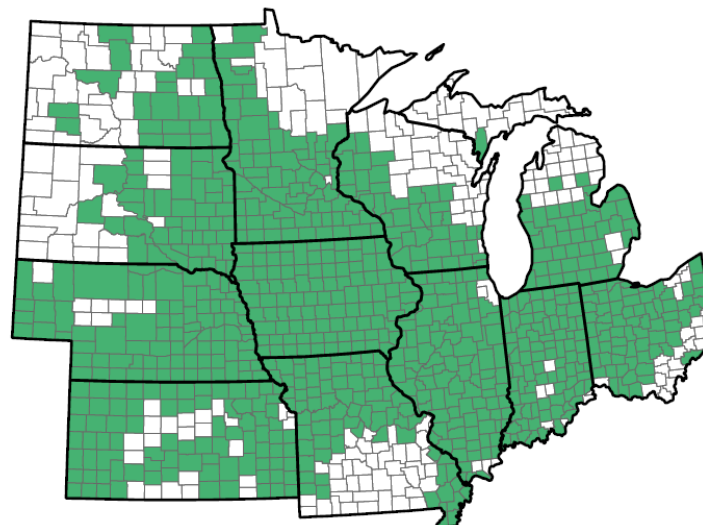 - Available for corn and soybeans in KS for most counties

Margin Protection plan availability

Initial areas MP was offered for wheat, corn, and rice in 2016

Corn Expansion in 2018

Corn Expansion Area

Soybeans Expansion in 2018

Soybeans Expansion Area
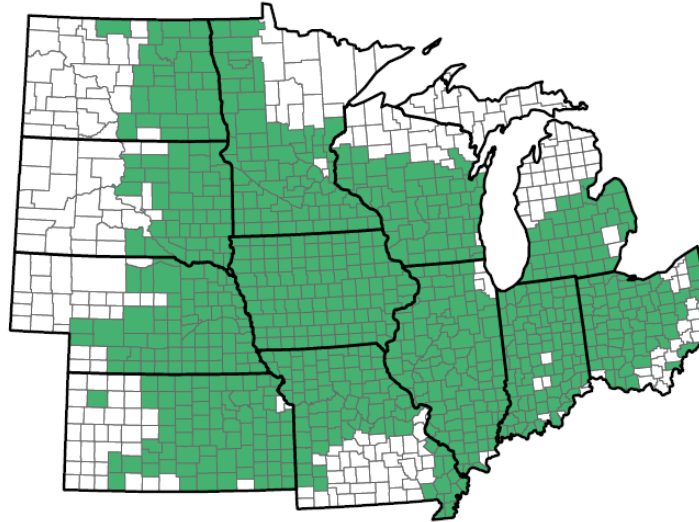
The MARGIN concept &
components of risk in crop production

- **<u>MARGIN</u>** = REVENUE − OPERATING COSTS

                    yield x price   inputs

- Yield risk: county yield

- Crop price risk: futures price

- Input cost risk: fixed and variable costs

- MP coverage intends to protect against all of these risks

What is Margin Protection?

- MP is an insurance plan that provides coverage against an **_unexpected decrease in operating margin_**

Margin = revenue − input costs

- Loss could be triggered by:
  - decline in crop price
  - decline in yield
  - increase in costs
  - some combination of these

Some MP coverage features

- Guarantee levels: 70% to 95%
  - Very low deductible is available
  - Can be used in combination with RP or YP coverage

- Protection Factors: 0.80 to 1.20
  - Indemnity & premium can be scaled up or down by 20%
  - Similar to area coverage plans (Area Yield Protection or Area Revenue Protection)

- Harvest Price Option available
  - If October (Harvest) price is higher than Projected Price, use Harvest Price in calculating Expected Margin

MP premiums

- Same subsidy rates used for AREA RISK PROTECTION
  - 70% guarantee level: 59% premium reduction
  - 75% and 80% guarantee level: 55% premium reduction
  - 85% guarantee level: 49% premium reduction
  - 90% and 95% guarantee levels: 44% premium reduction

- Scaled up or down by Protection Factor, just like indemnities
  - Protection Factor: ranges from 0.80 to 1.20

What input costs are covered?

- Diesel
- Urea (N)
- Diammonium phosphate, or DAP (P)
- Potash (K)
- Interest
- Other costs: includes seed, lubrication, herbicides, machinery

- All growers in a county are assumed to have the same input costs
  - Input use for diesel, N-P-K based on formulas related to Expected County Yield

MP is area-based

- MP does <u>not</u> use your own yield and input information

- For yield, MP uses the county yield
    - Effective coverage: how well does your yield track with the county average yield?

- Input amounts for diesel, N-P-K are a function of the county yield
    - plug your Expected County Yield into formulas to get input quantities

- How are expected revenues and costs calculated?

Yield component: county yield

- For yield, MP uses the ***county yield***

- Expected County Yield (ECY) is used to calculate expected revenue, some input quantities, and other elements of coverage prior to sign-up

- Final County Yield to calculate actual revenue when determining whether a loss has occurred (not released until following spring)

Crop prices: based on futures contracts

- CORN: December 2018 futures

- SOYBEANS: November 2018 futures

- Margin Projected Price discovery: average during Aug 15 – Sep 14, 2017

- Margin Harvest Price discovery: average during Oct 1 – 31, 2018

Expected input costs: DIESEL

- Input quantity:
  - Non-irrigated CORN: = (ECY x 0.04) + 2.5 gallons
  - Irrigated CORN: = (ECY x 0.10) + 2.5 gallons
  - Non-irrigated SOY: = (ECY x 0.10) + 2.5 gallons
  - Irrigated SOY: = (ECY x 0.30) + 2.5 gallons

  - Example non-irr corn: (140 bu/a ECY x 0.04) + 2.5 = 8.1 gallons / acre

- Input price: based on the NYMEX Ultra-Low Sulphur Diesel (ULSD) May contract
  http://www.cmegroup.com/trading/energy/refined-products/heating-oil.html

- Projected Input Price Discovery: Aug 15 – Sep 14, 2017
- Harvest Price Discovery: Apr 1 – Apr 30, 2018

Expected input costs: N (urea)

- Input quantity:
  - CORN (irr & non-irr):   = (ECY x 0.83) / .46 lbs
  - SOY (irri & non-irr):   = 0

    - Example corn: (140 bu/a ECY x 0.83) / .46 = 252.6 lbs / acre

- Input price: based on the CME UFN May swaps contract
    http://www.cmegroup.com/trading/agricultural/fertilizer-swap-futures.html

- Projected Input Price Discovery: Aug 15 – Sep 14, 2017
- Harvest Input Price Discovery: Apr 1 – Apr 30, 2018

Expected input costs: P (DAP)

- Input quantity:
  - CORN (irr & non-irr):   = (ECY x 0.35) / .46 lbs
  - SOY (irr & non-irr):   = (ECY x 0.73) / .46 lbs

    - Example corn: (140 bu/a ECY x 0.35) / .46 = 106.5 lbs / acre

- Input price: based on the CME DFL May contract
    http://www.cmegroup.com/trading/agricultural/fertilizer-swap-futures.html

- Projected Input Price Discovery: Aug 15 – Sep 14, 2017
- Harvest Input Price Discovery: Apr 1 – Apr 30, 2018

Expected input costs: K (potash)

- Input quantity:
    - CORN (irr & non-irr):   = (ECY x 0.25) / .60 lbs
    - SOY   (irr & non-irr):   = (ECY x 1.10) / .60 lbs

    - Example corn: (140 bu/a ECY x 0.25) / .60 = 58.3 lbs / acre

- Input price: based on Illinois cash price, as reported by USDA-AMS:
    http://www.ams.usda.gov/mnreports/gx_gr210.txt

- Projected Input Price Discovery: Aug 15 – Sep 14, 2017
- Harvest Input Price Discovery: not subject to price change

Expected input costs: OTHER COSTS

- Fixed amount per acre
    - CORN: $206.90 / acre
    - SOY: $111.50 / acre

- Based on university extension estimates
    - Same for all counties
    - No difference between irrigated and non-irrigated

- Not subject to price change during crop year

Expected input costs: INTEREST

- Interest rate: based on CME 30-Day Federal Funds NOV contract
    http://www.cmegroup.com/trading/interest-rates/stir/30-day-federal-fund.html

- Rate = 6.0% + Fed Funds rate
    - Fed Funds rate = 100 – Fed Funds futures quote
    - Example: Fed Funds futures quote = 98.51
                        Fed Funds rate = 100 – 98.51 = 1.49
                        MP interest rate = 6.0% + 1.49 = 7.49%

- Interest cost = **other costs** x **rate**   for six months
- Example: $267.53 x 7.49% x 6/12 = $10.02

- Projected Input Price Discovery: Aug 15 – Sep 14, 2017
- Harvest Input Price Discovery: Oct 1 – Oct 31, 2018

Example cost calculations: CORN

Non-irrigated corn
Expected County Yield = 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	-----	-----	$206.90/a
Sub-total			$267.53/a
Interest		7.49%	$10.02/a
TOTAL			$277.55/a

Example cost calculations: SOYBEANS

Non-irrigated soybeans
Expected County Yield = 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	-----	-----	$111.50/a
Sub-total			$143.29/a
Interest		7.49%	$5.37/a
TOTAL			$148.66/a

Summary of price sources and dates

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

Margin Protection timeline

Projected Price Discovery Period for crops and inputs

Harvest Price Discovery Period for diesel, N, P

Harvest Price Discovery Period for crops, interest

Final Yields released, margins calculated, losses paid

Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19

Sales closing date: Sep 30
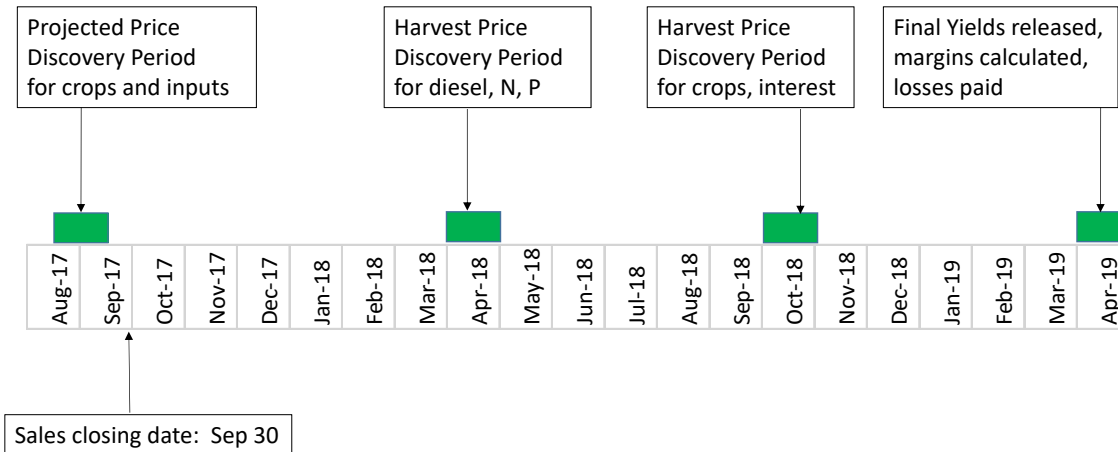
Insuring against a decline in margin

Calculate EXPECTED MARGIN and
TRIGGER MARGIN at sign-up

After harvest, calculate HARVEST MARGIN;
If HARVEST < TRIGGER, calculate any losses

EXPECTED MARGIN

Expected County Yield
x   Projected Price*
=   Expected Revenue

     Expected Revenue
-          Expected Cost
=   Expected Margin

TRIGGER MARGIN

        Expected Revenue
x   (1 – Coverage Level)
=   Margin Deductible

        Expected Margin
-     Margin Deductible
=   Trigger Margin

HARVEST MARGIN

    Final County Yield
x   Harvest Price
=   Harvest Revenue

    Harvest Revenue
-          Harvest Cost
=   Harvest Margin

CALCULATE LOSS

       Trigger Margin
-      Harvest Margin
=   Margin Loss

       Margin Loss
x   Protection Factor
=   Margin Indemnity

*Harvest Price Option uses higher of Projected Price and Harvest Price to determine Expected Revenue

Insuring against a decline in margin (no HPO)

EXPECTED MARGIN	Example:
Expected County Yield	140 bu/a
x Projected Price	x $3.60/bu
= Expected Revenue	= $504.00/a
Expected Revenue	$504.00/a
- Expected Cost	- $277.55/a
= Expected Margin	= $226.45/a

TRIGGER MARGIN	Example:
Expected Revenue	$504.00/a
x (1 – Coverage Level)	x (1 - .95)
= Margin Deductible	= $25.20/a
Expected Margin	$226.45/a
- Margin Deductible	- $ 25.20/a
= Trigger Margin	= $201.25/a

HARVEST MARGIN	Example:
Final County Yield	120 bu/a
x Harvest Price	x $3.70/bu
= Harvest Revenue	= $444.00/a
Harvest Revenue	$444.00/a
- Harvest Cost	- $280.62/a
= Harvest Margin	= $163.38/a

Margin Loss	= Trigger Margin - Harvest Margin	$201.25 - $163.38 = $37.87/a
Margin Indemnity	= Margin Loss x Protection Factor	$37.87 x 1.2 = $45.45/a

# Insuring against a decline in margin, with HPO

Harvest Price Option: use the higher of PROJECTED and HARVEST price to calculate Expected Margin, etc.

Projected Price: $3.60
Harvest Price: $3.70

EXPECTED MARGIN	Example:
Expected County Yield	140 bu/a
x max(Proj/Harv) Price	x $3.70/bu
= Expected Revenue	= $518.00/a
Expected Revenue	$518.00/a
- Expected Cost	- $277.55/a
= Expected Margin	= $240.45/a

TRIGGER MARGIN	Example:
Expected Revenue	$518.00/a
x (1 – Coverage Level)	x (1 - .95)
= Margin Deductible	= $25.90/a
Expected Margin	$240.45/a
- Margin Deductible	- $ 25.90/a
= Trigger Margin	= $214.55/a

HARVEST MARGIN	Example:
Final County Yield	120 bu/a
x Harvest Price	x $3.70/bu
= Harvest Revenue	= $444.00/a
Harvest Revenue	$444.00/a
- Harvest Cost	- $280.62/a
= Harvest Margin	= $163.38/a

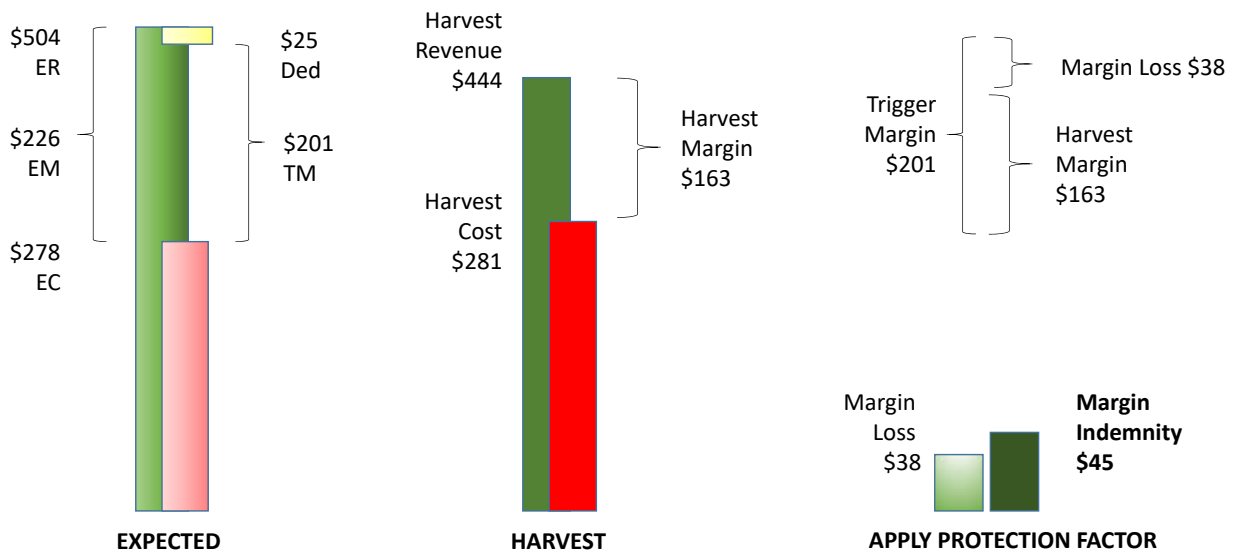|		
Margin Loss	= Trigger Margin - Harvest Margin	$214.55 - $163.38 = $51.17/a
Margin Indemnity	= Margin Loss x Protection Factor	$51.17 x 1.2 = $61.40/a

MP, graphically...

Expected Revenue: $504

Deductible: $25

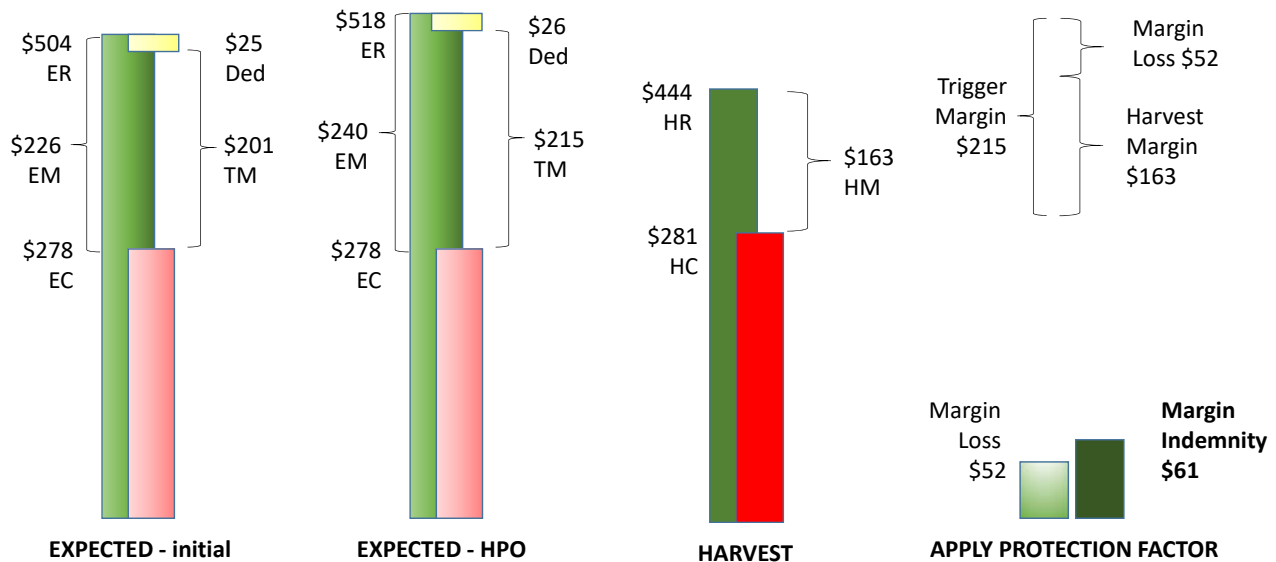Expected Margin: $226

Trigger Margin: $201

Expected Cost: $278
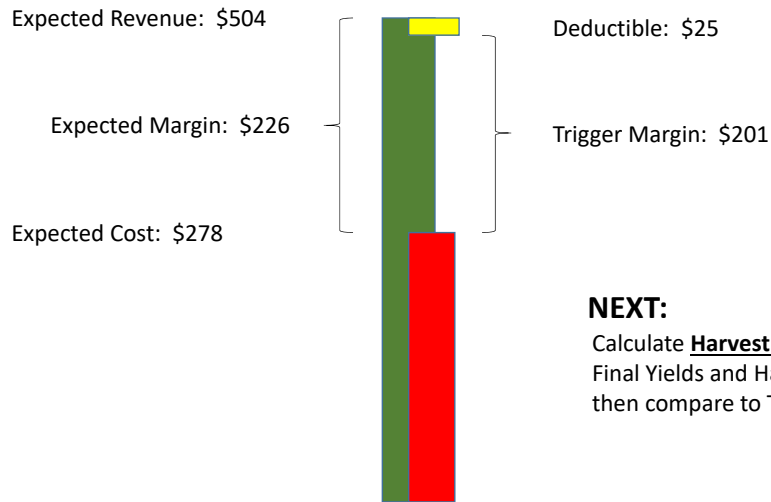
NEXT:
Calculate **Harvest Margin** using Final Yields and Harvest Prices; then compare to Trigger Margin

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MP, graphically (no HPO)...

$504 ER

$25 Ded

$226 EM

$201 TM

$278 EC

EXPECTED

Harvest Revenue $444

Harvest Margin $163

Harvest Cost $281

HARVEST

Margin Loss $38

Trigger Margin $201

Harvest Margin $163

Margin Loss $38

Margin Indemnity $45

APPLY PROTECTION FACTOR

MP, with Harvest Price Option

EXPECTED - initial

$504 ER
$226 EM
$278 EC
$25 Ded
$201 TM

EXPECTED - HPO

$518 ER
$240 EM
$278 EC
$26 Ded
$215 TM

HARVEST

$444 HR
$281 HC
$163 HM

Trigger Margin $215
Margin Loss $52
Harvest Margin $163

APPLY PROTECTION FACTOR

Margin Loss $52
Margin Indemnity $61

Can combine Margin Protection with Revenue Protection or Yield Protection ("base policy")

- Grower can still buy the traditional RP/YP policy the following spring
  - Must purchase the RP/YP and MP policies from the same Approved Insurance Provider
- RP/YP premium counts as partial credit toward the MP premium
  - "Credit is the actuarially determined value of the expected overlapping indemnities between MP and RP/YP at the time of RP/YP sales closing."
  - Check out values at: www.marginprotection.com website
- Grower receives the greater of the MP or RP/YP indemnity after harvest
  - Does not include indemnities paid for Late Planting or Prevented Planting
- Not eligible for MP if you have Supplemental Coverage Option (SCO)

Examples of MP/RP in combination

- Non-irrigated corn: Nemaha County
- Irrigated corn: Finney County

- Margin Protection (MP) premiums
- Revenue Protection (RP) premiums (2017 premiums tweaked to reflect current 2018 futures prices)
- Premium credits

Nemaha County: non-irrigated corn, MP + RP

		95%	90%	85%	80%	75%	70%
MP premiums, $/a		$62.09	$51.80	$38.84	$27.93	$22.76	$16.80
RP* premiums, $/a		**Premium credits, $/a**					
85%	$42.98	$23.27	$23.27	$21.19	$18.69	$18.36	$14.71
80%	$29.46	$18.98	$18.98	$17.29	$15.25	$15.25	$13.61
75%	$21.55	$15.41	$15.41	$14.03	$12.39	$12.38	$11.28
70%	$16.42	$12.17	$12.17	$11.09	$9.78	$9.78	$8.91
65%	$13.49	$9.19	$9.19	$8.37	$7.38	$7.38	$6.73

Assumes farm yield of 130 bu/a, Expected County Yield = 143.6 bu/a, 2018 corn price of $4.18*; RP premiums estimated using RMA Cost Estimator*, other values downloaded from MARGINPROTECTION.COM on July 26, 2017

Finney County: irrigated corn, MP + RP

	95%	90%	85%	80%	75%	70%
MP premiums, $/a	$43.89	$32.30	$21.49	$13.41	$9.02	$5.33

RP* premiums, $/a		**Premium credits, $/a**					
85%	$36.54	$11.63	$10.74	$8.42	$5.99	$4.62	$3.14
80%	$24.54	$6.88	$6.67	$5.59	$4.21	$3.34	$2.33
75%	$16.75	$3.63	$3.62	$3.20	$2.60	$1.59	$2.21
70%	$11.53	$1.64	$1.64	$1.49	$1.29	$1.18	$0.91
65%	$8.46	$0.65	$0.65	$0.59	$0.52	$0.52	$0.43

Assumes farm yield of 182 bu/a, Expected County Yield = 160.5 bu/a, 2018 corn price of $4.18*;
RP premiums estimated using RMA Cost Estimator*, other values downloaded from
MARGINPROTECTION.COM on July 26, 2017

Alternative plans to MP

SCO premiums for Nemaha Co.		
	2017	2018*
RP/YP	per-acre	per-acre
Covg.	premium	premium
85%	$0.66	$0.70
80%	$3.73	$3.94
75%	$6.34	$6.69
70%	$8.57	$9.04
65%	$10.39	$10.96

- Supplemental Coverage Option (SCO)
  - Not available if you enrolled in ARC
  - Based on county yield
  - Covers from RP/YP guarantee level up to 86%

- Area Revenue Protection (ARP), Area Yield Protection (AYP)
  - Former GRIP / GRP insurance plans
  - Based on county yields
  - Coverage high as 90% guarantees
  - Uses Protection Factor (0.80 to 1.20)
  - Not available in KS for corn and soybeans

How does MP stack up vs. other plans?

• Very low deductible available

• More frequent payouts

• Protects against rising input costs

• More expensive

• Based on county yield

• Longer coverage period

• Price changes for only a few inputs covered

For more information…

• Risk Management Agency, USDA: Margin Protection page
> www.rma.usda.gov/policies/mp/

• MarginProtection.com: price discovery, estimates for premiums, credits
> www.marginprotection.com

Questions?
      Comments?
            Thank you!

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