



Crop Insurance: MPCI, Hail and Asia

Casualty Actuarial Reinsurance Seminar
2017 – Washington DC

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Overview of Presentation

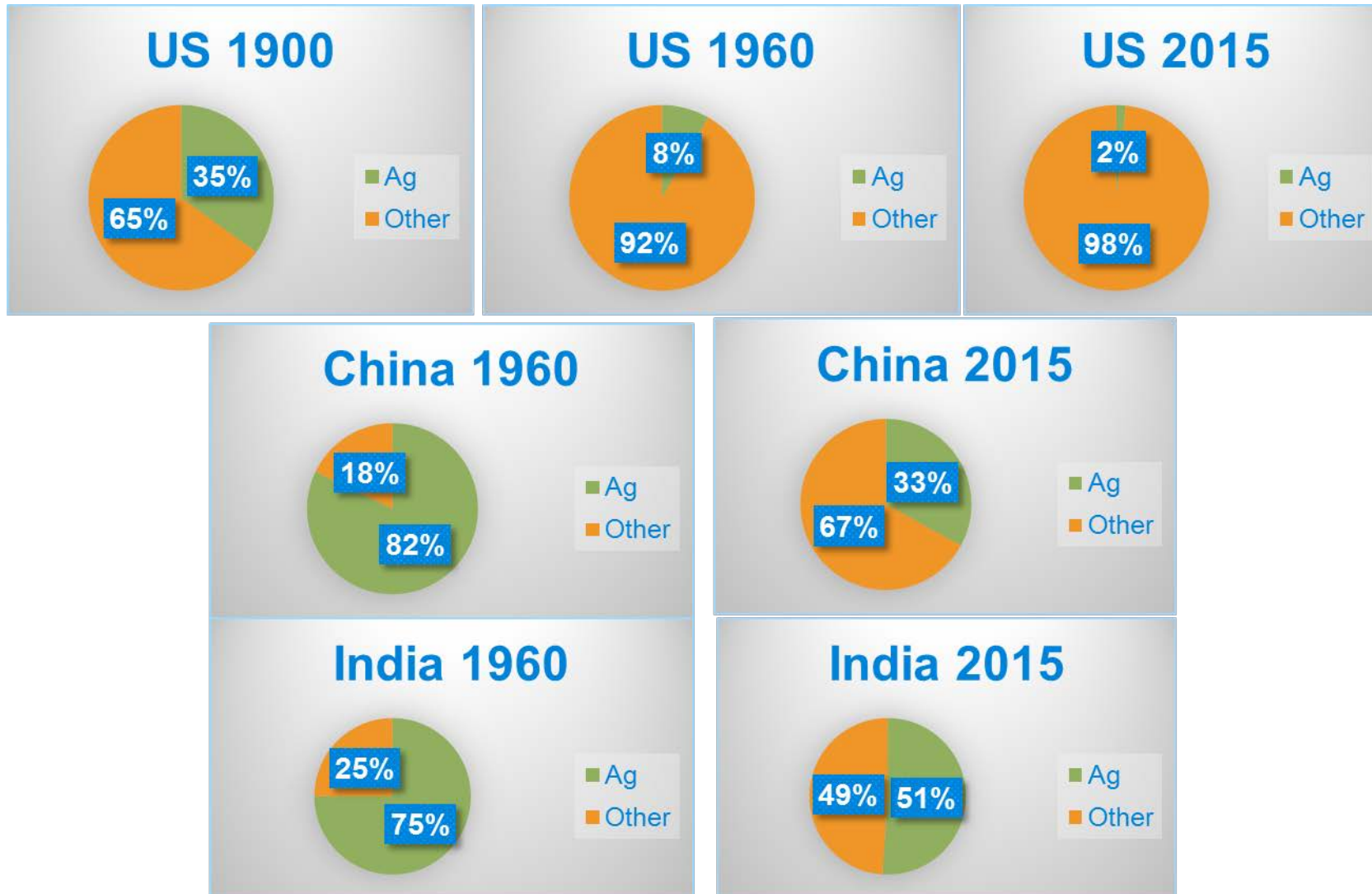
- World Agricultural Insurance Market
- US MPCCI Results
- US Private/Hail Discussion
 - Traditional hail policies
 - Production Plan Policy
 - Other policies
- Future outlook of Agricultural (crop) insurance

World Agricultural Insurance Market

Country	~2005 estimated premium in \$B	~2016 estimated premium in \$B
USA	\$4.00	\$10.00
China	\$0.10	\$8.00
India	\$0.10	\$4.50
Japan	\$1.00	\$1.50
Canada	\$0.80	\$1.10
Spain	\$0.60	\$0.80
South Korea	\$0.10	\$0.30
Brazil	\$0.15	\$0.30
Germany	\$0.20	\$0.30
Argentina	\$0.10	\$0.20
Australia	\$0.10	\$0.20
Worldwide (Estimated)	\$15 to \$20	\$30 to \$35

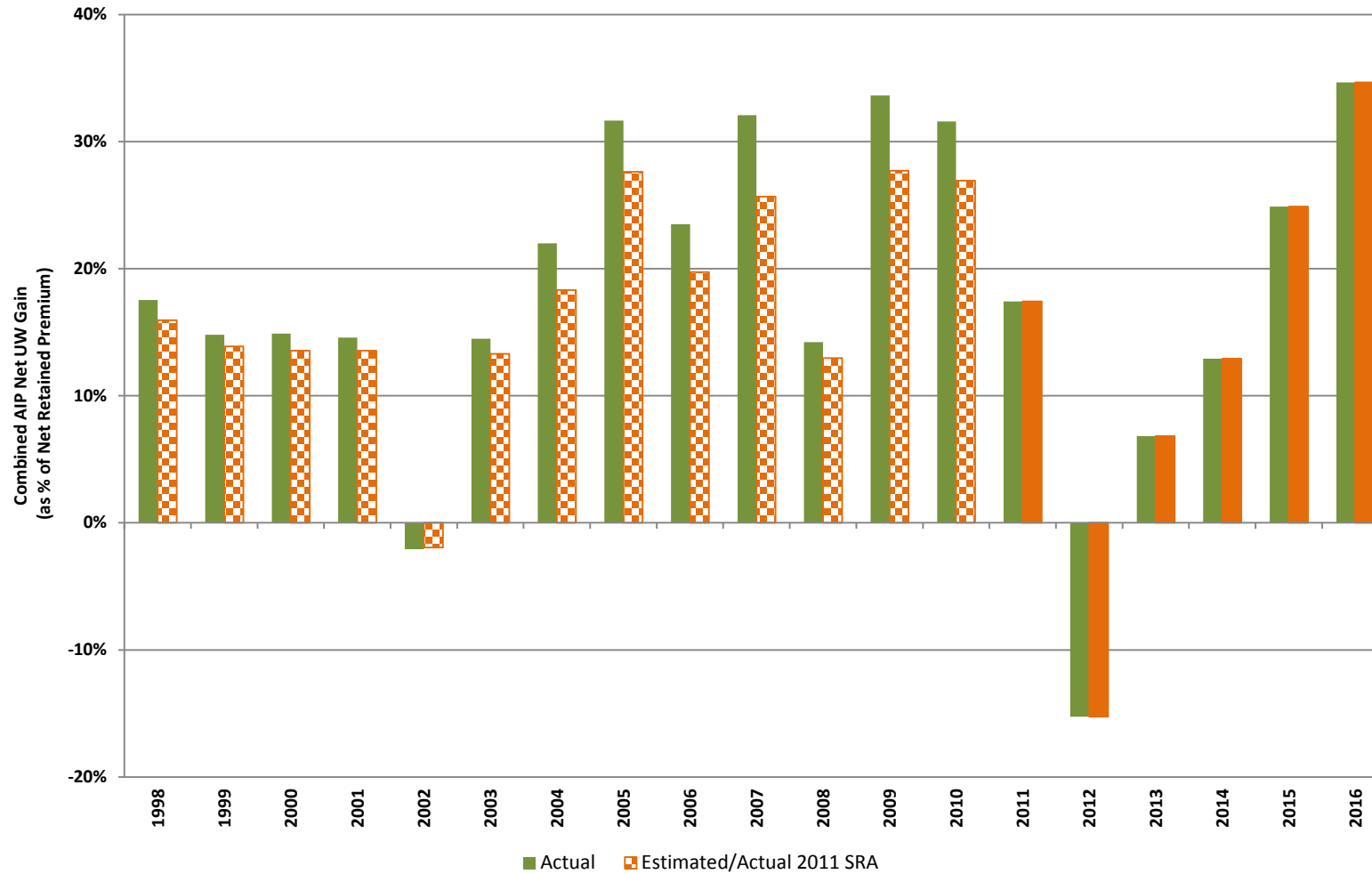
Note: "In-field" insurance. Does not cover transport, processing, distribution, liability, etc.

Percentage of Workers in Agriculture



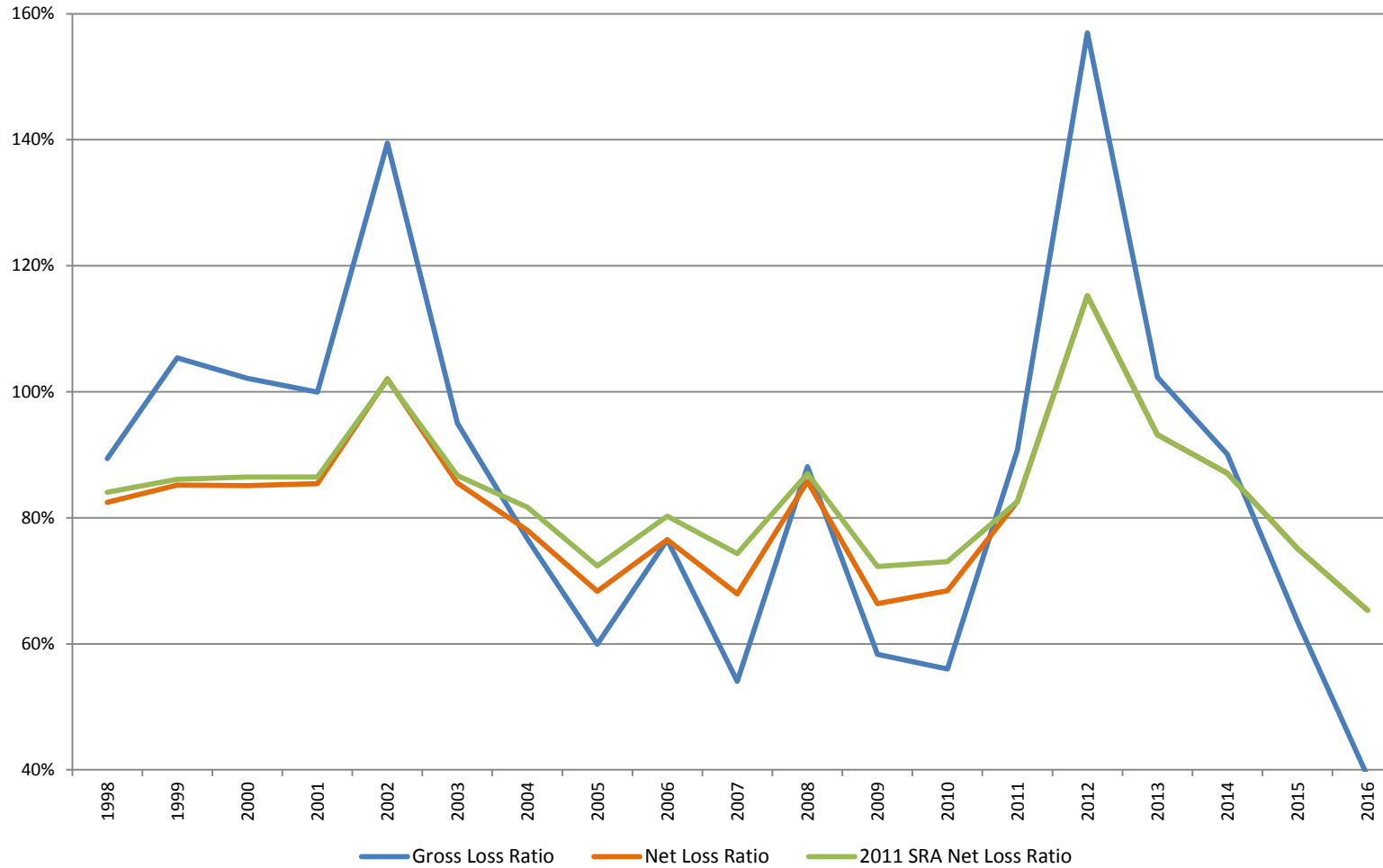
UNITED STATES FEDERAL MPCI DISCUSSION

MPCI Underwriting Gain Results



Source: RMA – Reinsurance Reports as of May 15, 2017; 2016 not final

MPCI Loss Ratios



Source: RMA – Reinsurance Reports as of May 15, 2017; 2011 SRA prior estimated; 2016 not final
Net loss ratios = 1 – Net Underwriting Gain %

MPCI Rankings by State

Ranking	2016 State	Insured Liability	1993 State	Insured Liability
1	IA	\$ 10.96	IA	\$ 1.52
2	CA	\$ 10.00	MN	\$ 1.03
3	IL	\$ 9.38	IL	\$ 1.00
4	MN	\$ 7.52	TX	\$ 0.91
5	NE	\$ 6.76	NE	\$ 0.79
6	ND	\$ 5.00	ND	\$ 0.78
7	IN	\$ 4.48	KS	\$ 0.52
8	TX	\$ 4.36	NC	\$ 0.51
9	SD	\$ 4.22	CA	\$ 0.47
10	KS	\$ 4.13	GA	\$ 0.41
11	WA	\$ 3.01	IN	\$ 0.37
12	MO	\$ 2.97	SD	\$ 0.29
13	OH	\$ 2.97	MT	\$ 0.28
14	FL	\$ 2.89	OH	\$ 0.19
15	WI	\$ 2.26	WI	\$ 0.18
16	MI	\$ 1.79	AL	\$ 0.18
17	NC	\$ 1.61	WA	\$ 0.17
18	AR	\$ 1.57	FL	\$ 0.16
19	KY	\$ 1.40	MO	\$ 0.16
20	GA	\$ 1.31	OK	\$ 0.15
	All Other	\$ 11.87	All Other	\$ 1.29
	Total	\$ 100.45	Total	\$ 11.35

Ranking	2016 State	Gross Premium	1993 State	Gross Premium
1	TX	\$ 0.89	TX	\$ 0.11
2	ND	\$ 0.85	ND	\$ 0.06
3	SD	\$ 0.68	IA	\$ 0.06
4	IL	\$ 0.63	MN	\$ 0.06
5	KS	\$ 0.60	IL	\$ 0.04
6	IA	\$ 0.60	NE	\$ 0.04
7	MN	\$ 0.56	KS	\$ 0.04
8	NE	\$ 0.51	CA	\$ 0.03
9	CA	\$ 0.48	GA	\$ 0.03
10	MO	\$ 0.36	SD	\$ 0.03
11	IN	\$ 0.34	MT	\$ 0.02
12	OH	\$ 0.24	NC	\$ 0.02
13	WI	\$ 0.22	IN	\$ 0.02
14	NC	\$ 0.18	AL	\$ 0.01
15	OK	\$ 0.18	MO	\$ 0.01
16	MI	\$ 0.17	OK	\$ 0.01
17	CO	\$ 0.17	WI	\$ 0.01
18	MT	\$ 0.16	FL	\$ 0.01
19	WA	\$ 0.15	MI	\$ 0.01
20	GA	\$ 0.15	LA	\$ 0.01
	All Other	\$ 1.23	All Other	\$ 0.09
	Total	\$ 9.31	Total	\$ 0.76

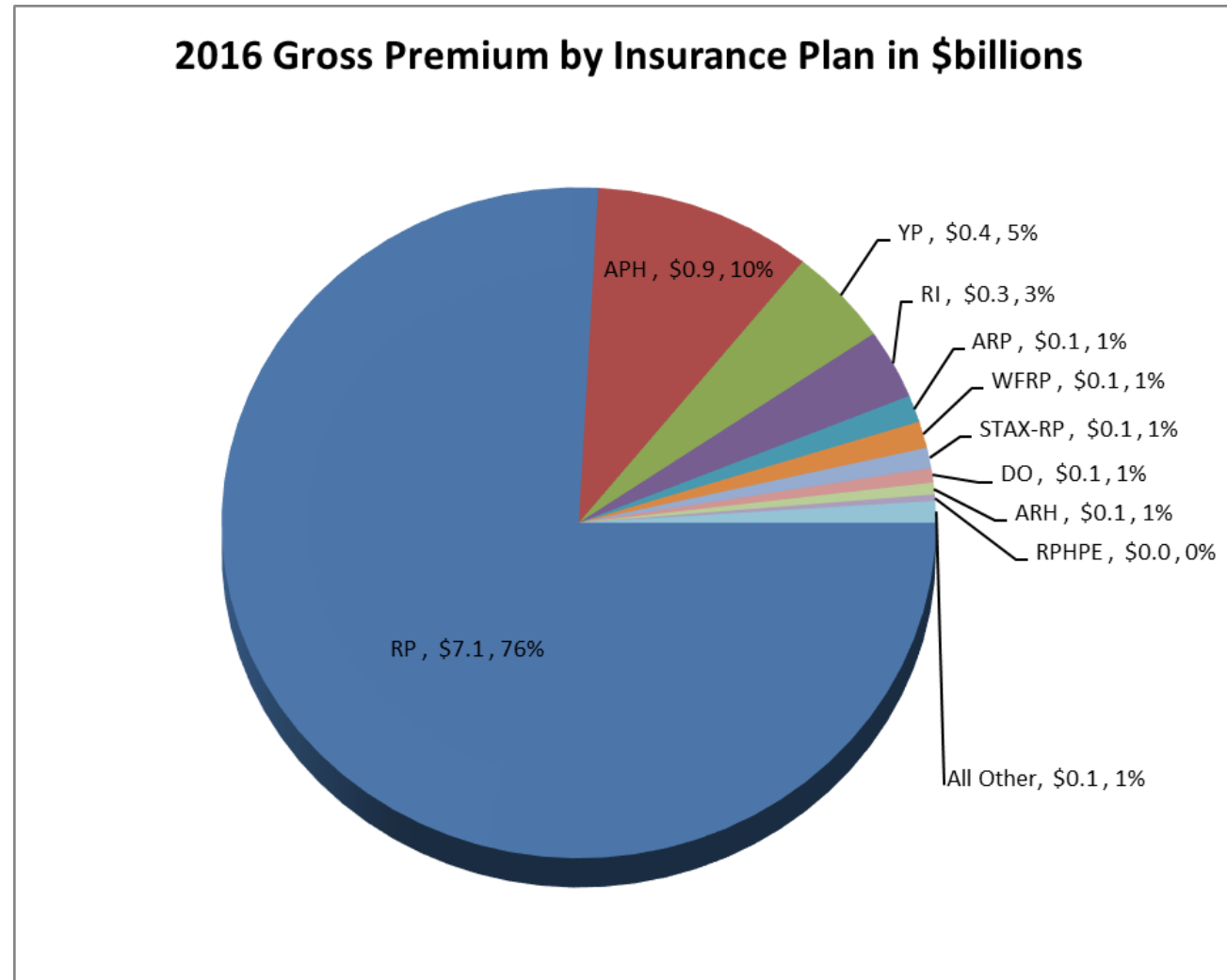
Source: RMA – Summary of Business as of May 15, 2017; Amounts in billions

MPCI Rankings by Crop

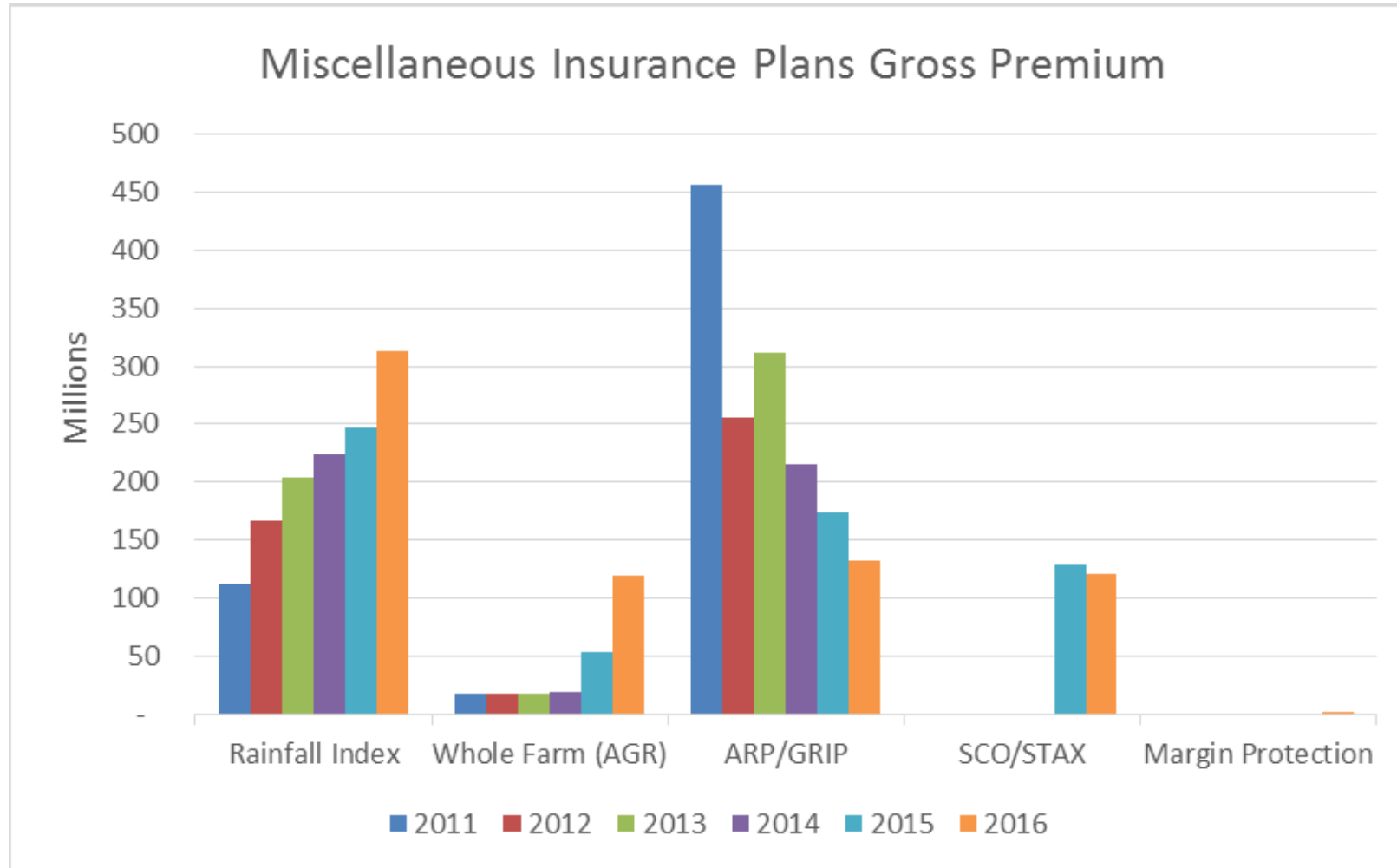
Ranking	2016 Crop	2016 Gross Premium	1993 Crop	1993 Gross Premium
1	Corn	\$ 3.53	corn	\$ 0.18
2	Soybeans	\$ 1.85	wheat	\$ 0.15
3	Wheat	\$ 1.11	cotton	\$ 0.11
4	Cotton	\$ 0.65	soybeans	\$ 0.09
5	PRF	\$ 0.28	peanuts	\$ 0.04
6	Grain Sorghum	\$ 0.19	tobacco	\$ 0.02
7	Almonds	\$ 0.14	grain sorghum	\$ 0.02
8	WFRP	\$ 0.12	dry beans	\$ 0.02
9	Apples	\$ 0.12	barley	\$ 0.01
10	Rice	\$ 0.09	potatoes	\$ 0.01
	All Other	\$ 1.25	All Other	\$ 0.10
	Total	\$ 9.32	Total	\$ 0.76

Source: RMA – Summary of Business as of May 15, 2017; Amounts in billions

MPCI Gross Premium by Insurance Plan



MPCI Gross Premium Growth

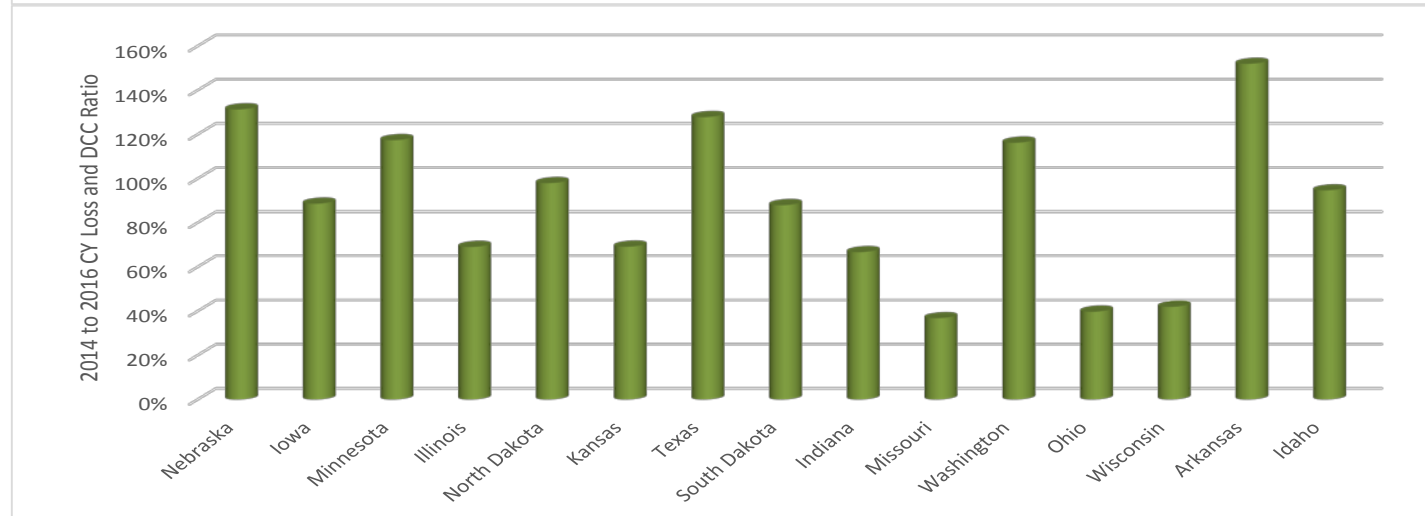
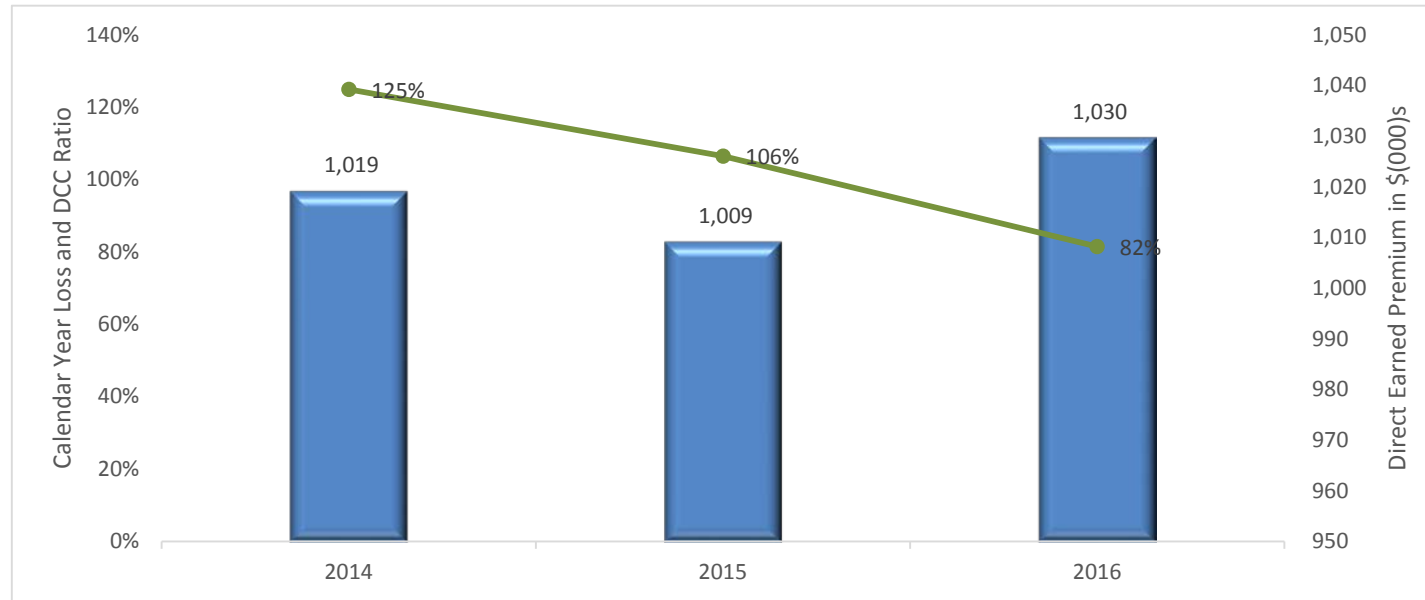


WHAT THE HAIL???

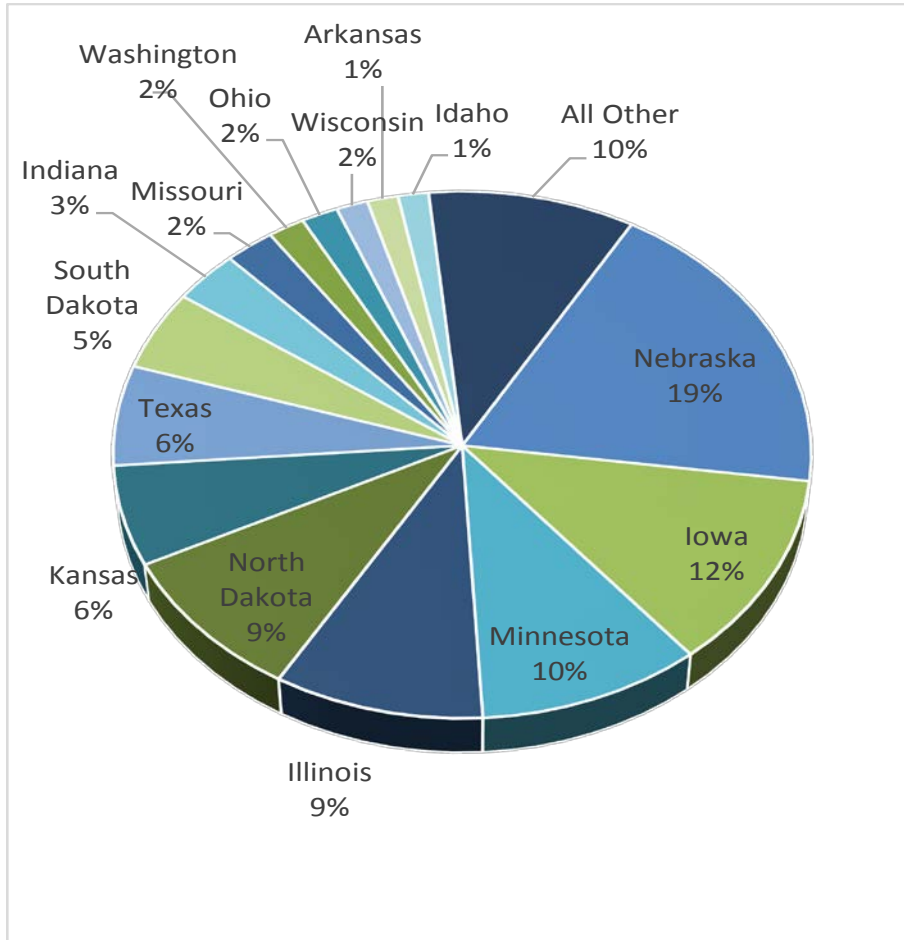
Federal vs. Private Crop Insurance

- Federal
 - Premium subsidy to encourage participation
 - Rates administered by RMA, no rate competition between AIPs
 - Insured on a unit or farm level basis
 - Named peril coverage; typically only “in the field”
 - Designed to be an all encompassing risk management tool
 - Most payments after harvest
- Private/Hail
 - No subsidy provided
 - Rates may be regulated by states; competition between AIPs
 - Hail typically insured on an acre basis
 - Named perils (hail, fire, freeze, transport, storage)
 - Designed to fill gaps from MPCCI
 - Payments made quickly after peril (although some plans pay after harvest)

What The Hail???



What The Hail???



Private Crop Hail Ranking	Private Crop Hail State	Private Crop Hail Premium	MPCI Ranking	MPCI Premium	Private to MPCI ratio
1	Nebraska	\$ 194	8	\$ 508	38%
2	Iowa	\$ 122	6	\$ 597	20%
3	Minnesota	\$ 104	7	\$ 558	19%
4	Illinois	\$ 97	4	\$ 626	16%
5	North Dakota	\$ 94	2	\$ 853	11%
6	Kansas	\$ 63	5	\$ 603	11%
7	Texas	\$ 63	1	\$ 889	7%
8	South Dakota	\$ 50	3	\$ 675	7%
9	Indiana	\$ 33	11	\$ 342	10%
10	Missouri	\$ 25	10	\$ 357	7%
11	Washington	\$ 18	19	\$ 150	12%
12	Ohio	\$ 18	12	\$ 238	8%
13	Wisconsin	\$ 16	13	\$ 217	7%
14	Arkansas	\$ 15	23	\$ 123	12%
15	Idaho	\$ 15	27	\$ 71	21%
16	All Other	\$ 102		\$ 2,506	4%
Total		\$ 1,030		\$ 9,313	11%

Private / Hail Insurance Policies

Traditional Hail Policies

- Liability per acre coverage
- Payout quickly after occurrence
- Replant, wind, green snap, transport, fire coverage

Production Plans Policies

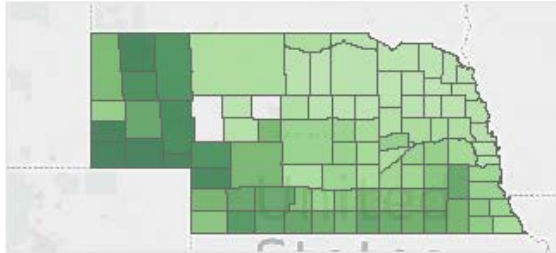
- Indemnity is a function of hail and MPCCI losses

Additional Price/Coverage Policies

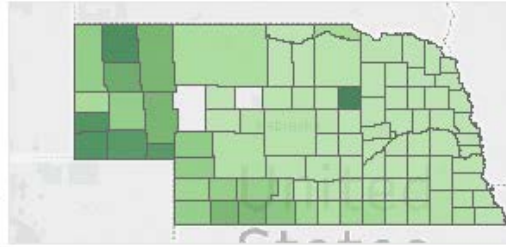
- Provides additional price or yield coverage
- Some products based on futures market similar to MPCCI

Hail Changes in Exposures

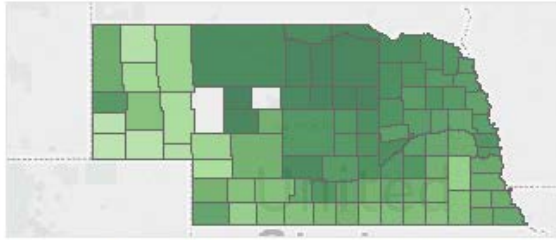
1970 Wheat



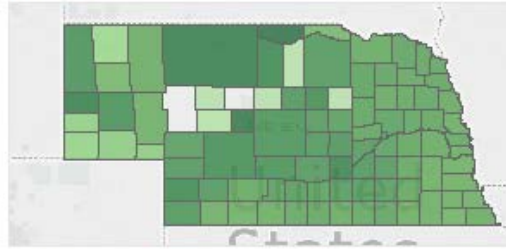
2012 Wheat



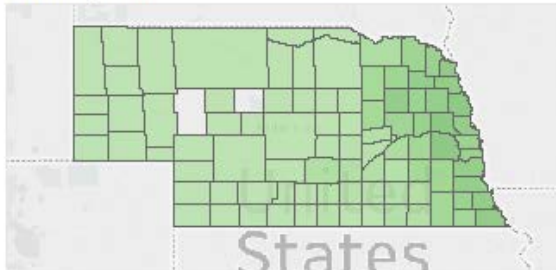
1970 Corn



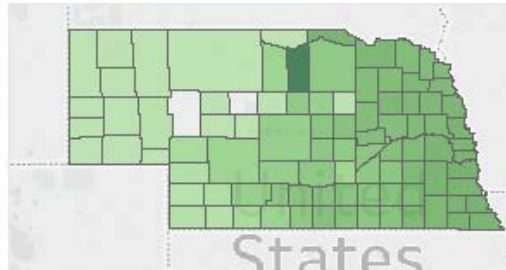
2012 Corn



1970 Soybean

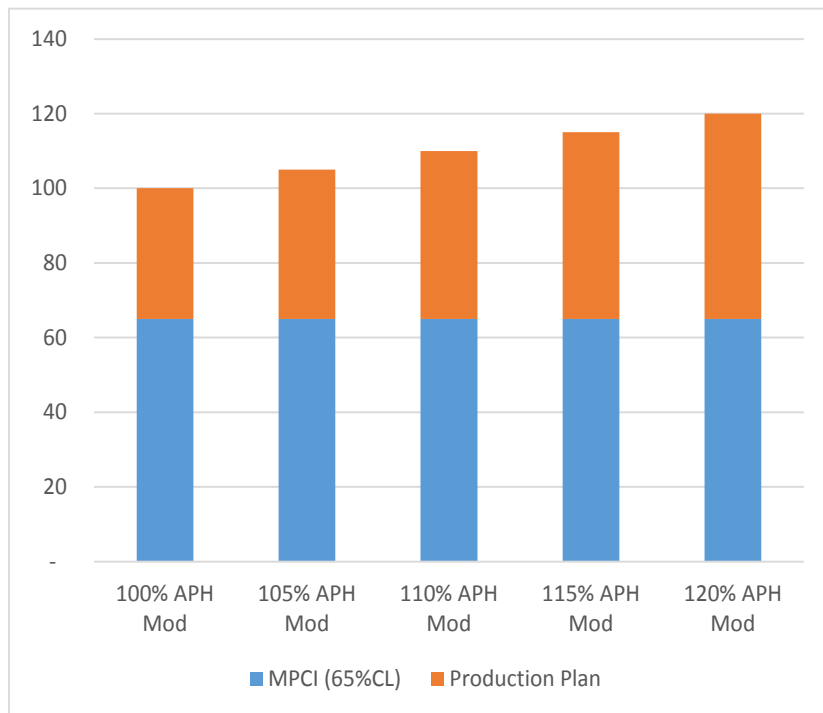


2012 Soybean



Production Plan Policy Overview

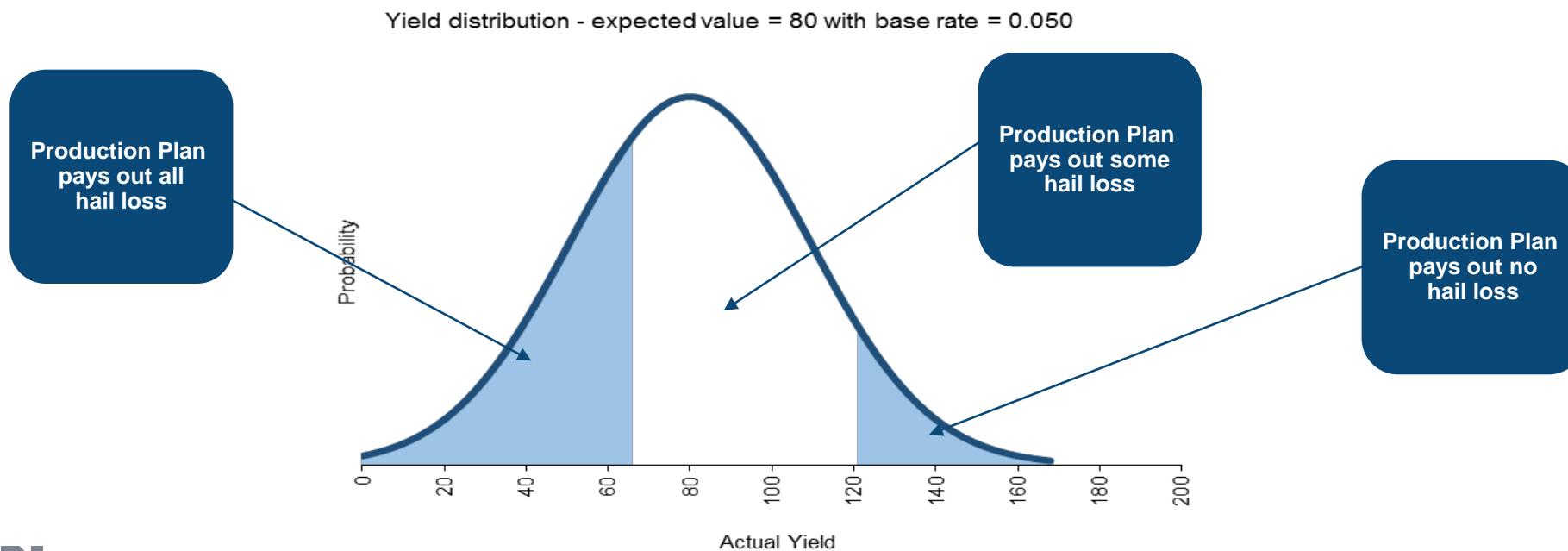
- Designed to provide gap coverage between hail and MPCCI policy (for reduced premium)
- Only pays out with hail event; claims settled after harvest and actual yield is known.



	100% APH Mod	105% APH Mod	110% APH Mod	115% APH Mod	120% APH Mod
MPCCI (65%CL)	65	65	65	65	65
Production Plan	35	40	45	50	55
Hail Loss 1	25%	25%	25%	25%	25%
Actual Yield1	80	80	80	80	80
Prod Plan Loss1	20	25	28	29	30
Hail Loss 2	25%	25%	25%	25%	25%
Actual Yield2	65	65	65	65	65
Prod Plan Loss2	25	26	28	29	30
Hail Loss 3	25%	25%	25%	25%	25%
Actual Yield3	110	110	110	110	110
Prod Plan Loss3	-	-	0	5	10

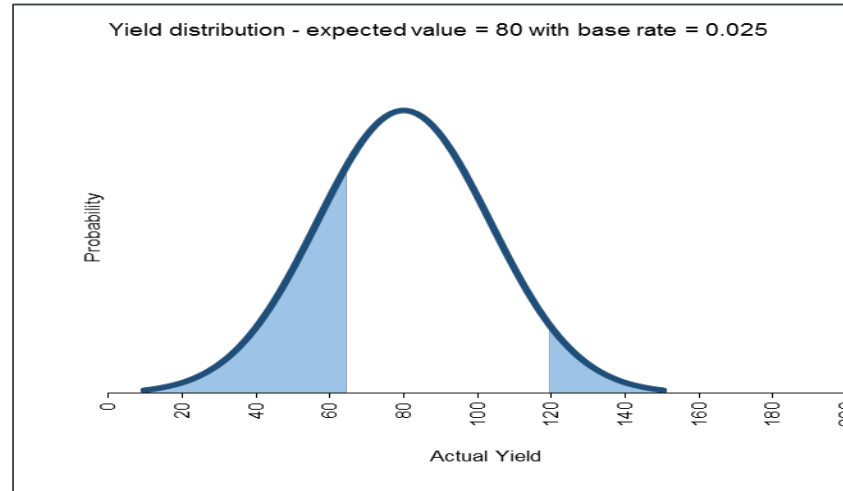
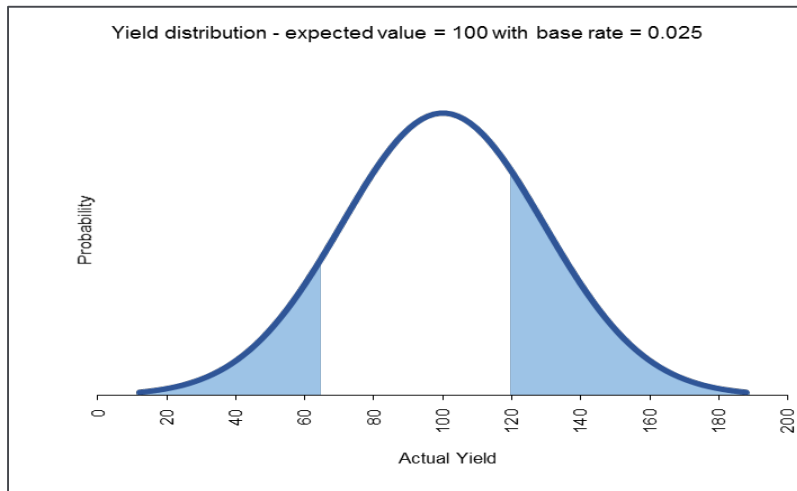
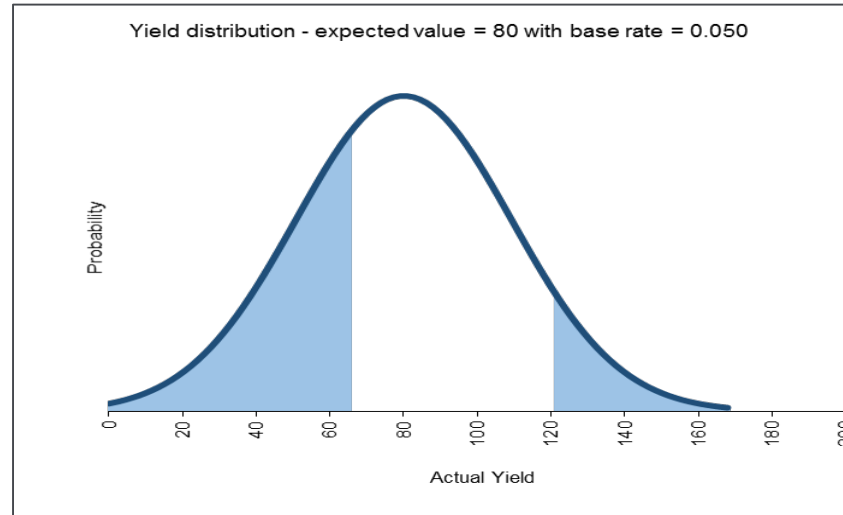
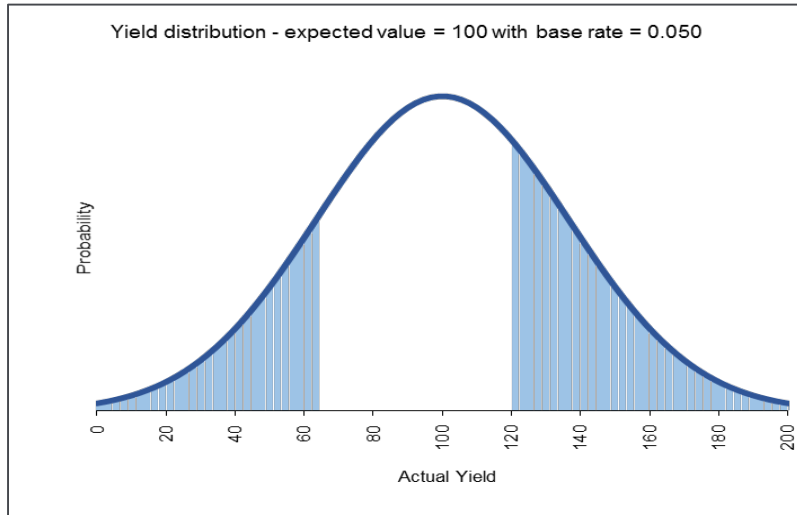
Production Plan Policy Rating Considerations

- Hail severity curve
- Yield curve after a hail event
- Different units (hail is acre based vs. MPCU units)
- Yield Trend (in loss costs and in Approved Yield)



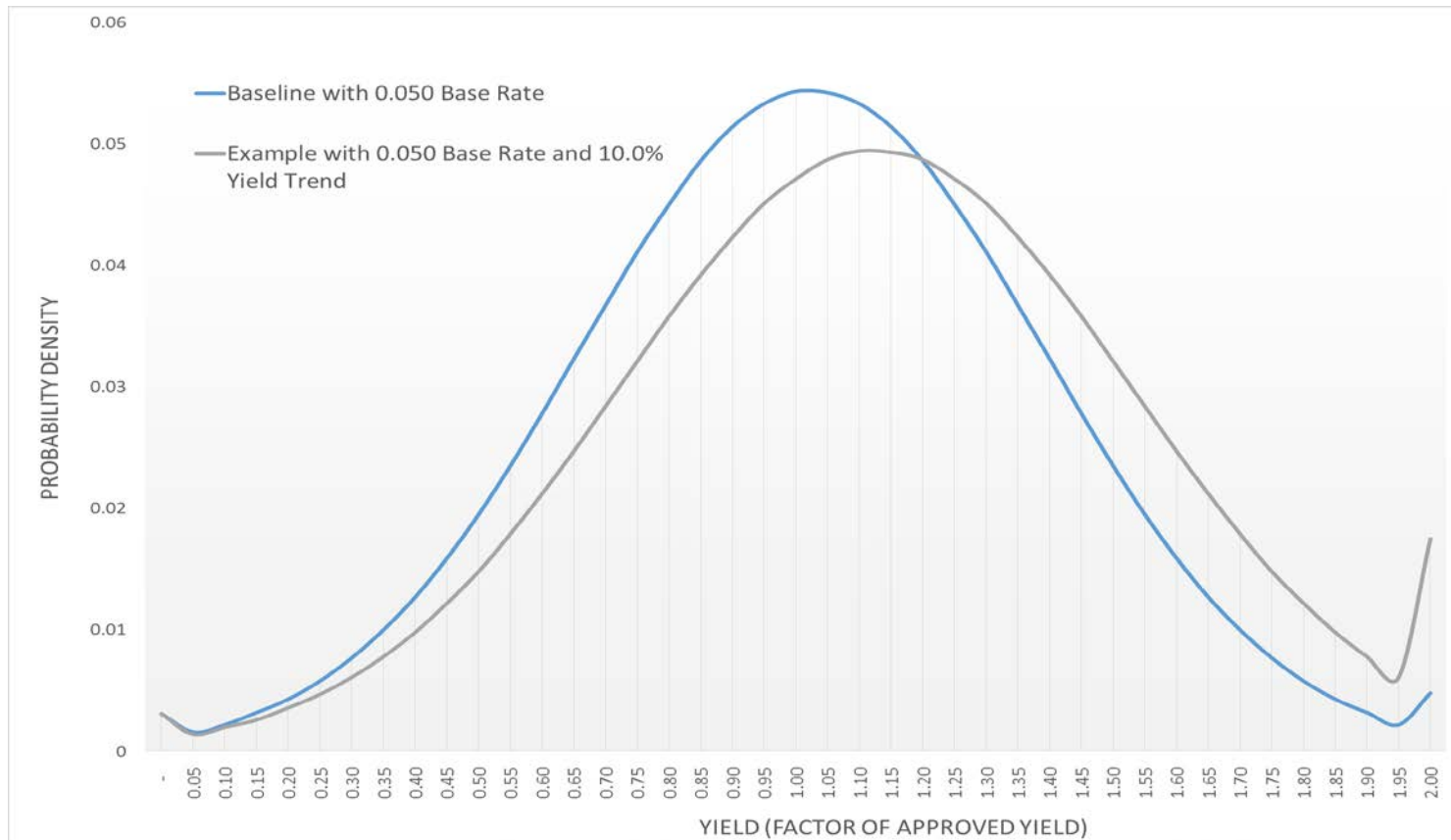
Production Plan Policy Rating Considerations

- Base YP loss costs can have counterintuitive impact



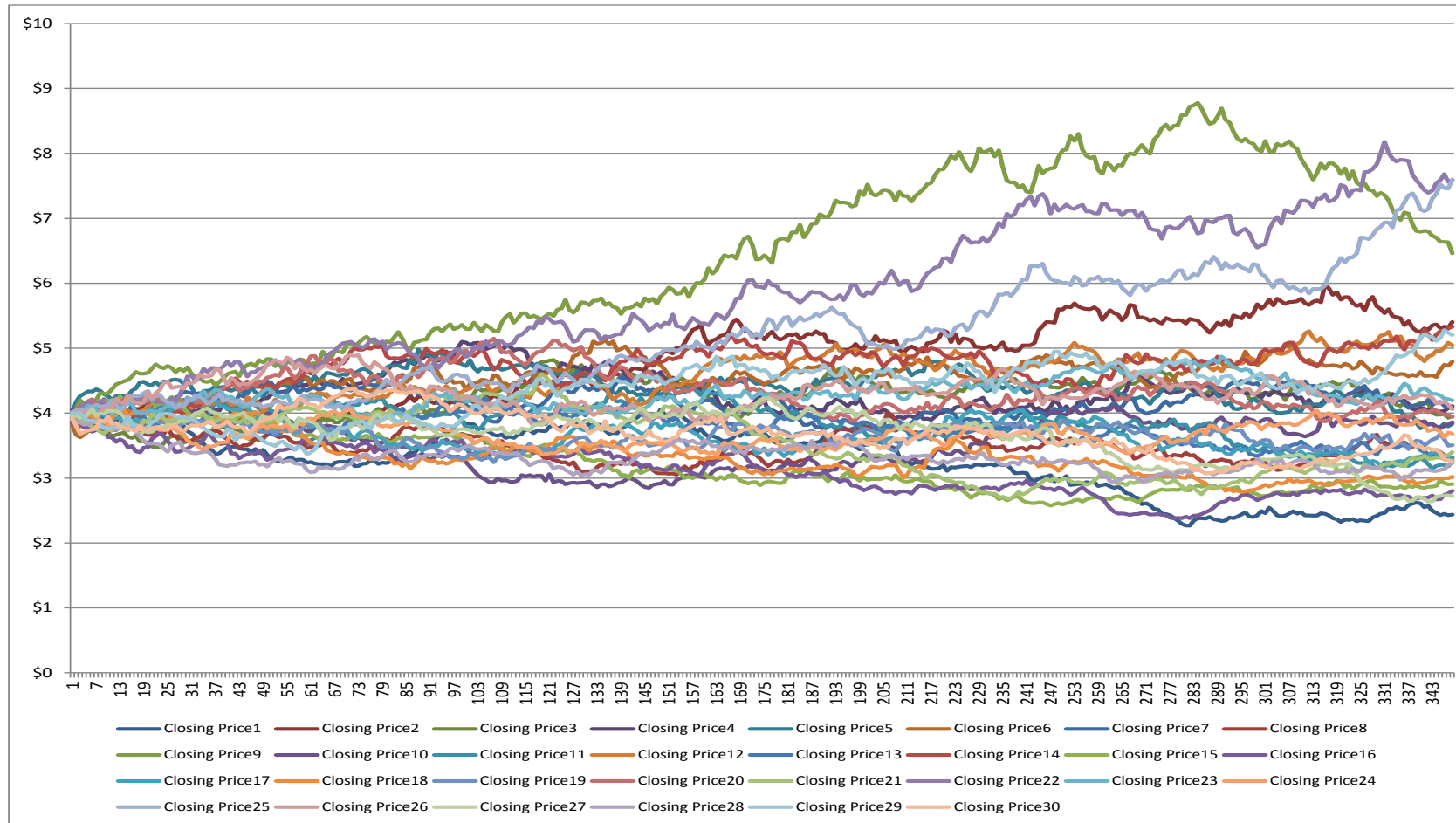
Private Policy Rating Considerations

- Yield trend can have considerable impact on loss costs – especially on gap coverage



Additional Price Policy Rating Considerations

- Price yield correlations and price volatility
- Systemic annual risk



FUTURE OUTLOOK AGRICULTURAL (CROP) INSURANCE

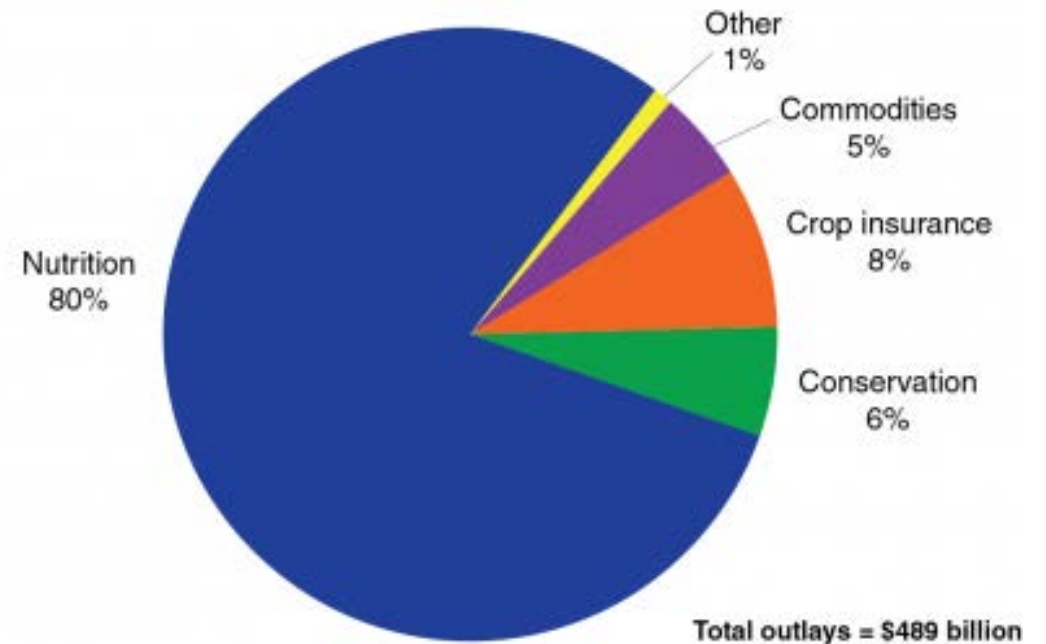
Future Outlook – Agricultural Insurance (Non-US)

- Continued increase in governmental support
- Movement from index policies to actual loss policies where index policies exist
 - Movement to larger farming operations
- Introduction of revenue policies (China and Japan)
- Large untapped market in developing countries
 - Need policy development and governmental support
 - Need capacity (reinsurance) and expertise

Future Outlook - U.S. Crop Insurance

- Farm Bill 2018 (?)
 - US Agriculture Secretary Sonny Perdue reorganizes USDA (trade focus)
 - Low margins for row crops and dairy in recent years?
 - Subsidies?
 - Harvest price option?
 - Possible change in Livestock cap for crop insurance?
- SRA renegotiation (??)

Projected outlays under the 2014 Farm Act, 2014-2018



Source: USDA Economic Research Service using data from Congressional Budget Office, Cost Estimates for the Agricultural Act of 2014, Jan 2014.

Questions





Thank you

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