




Crop Insurance in US

ARS, Oct. 17th – 19th
Seoul

*Providing peace of mind
for what lies ahead*

Prepared by:
Agricultural Reinsurance Division
Irvine, CA

 The Toa Reinsurance Company of America

Ag Re Team – Established in 2010

- **Ag Re Team Member**
 - Bin Zhang, Ph. D. SVP
 - Andrea Shi, M. Sc. VP
 - Benjamin Diamond, M.Sc. Statistical Manager
 - Nicholas Fleming, M.Sc. Risk Analyst
 - Jackie Gomez, Underwriting Assistant
 - Leslie Alariaz, Administrative Assistant
- **Well-respected agricultural reinsurance underwriting unit**
 - 20+ years of experience on the global basis
- **We currently have business in US, Canada, China, India, Thailand and South Korea.**
- **Quantitative Oriented: in-house modeling capability**
 - Efficient business development with value-added service to clients
 - Optimal portfolio via innovative reinsurance solutions

Food Security vs. National Security



@ BEGINNING



MECHANIZATION: 1930S



MECHANIZATION: 1960S

a



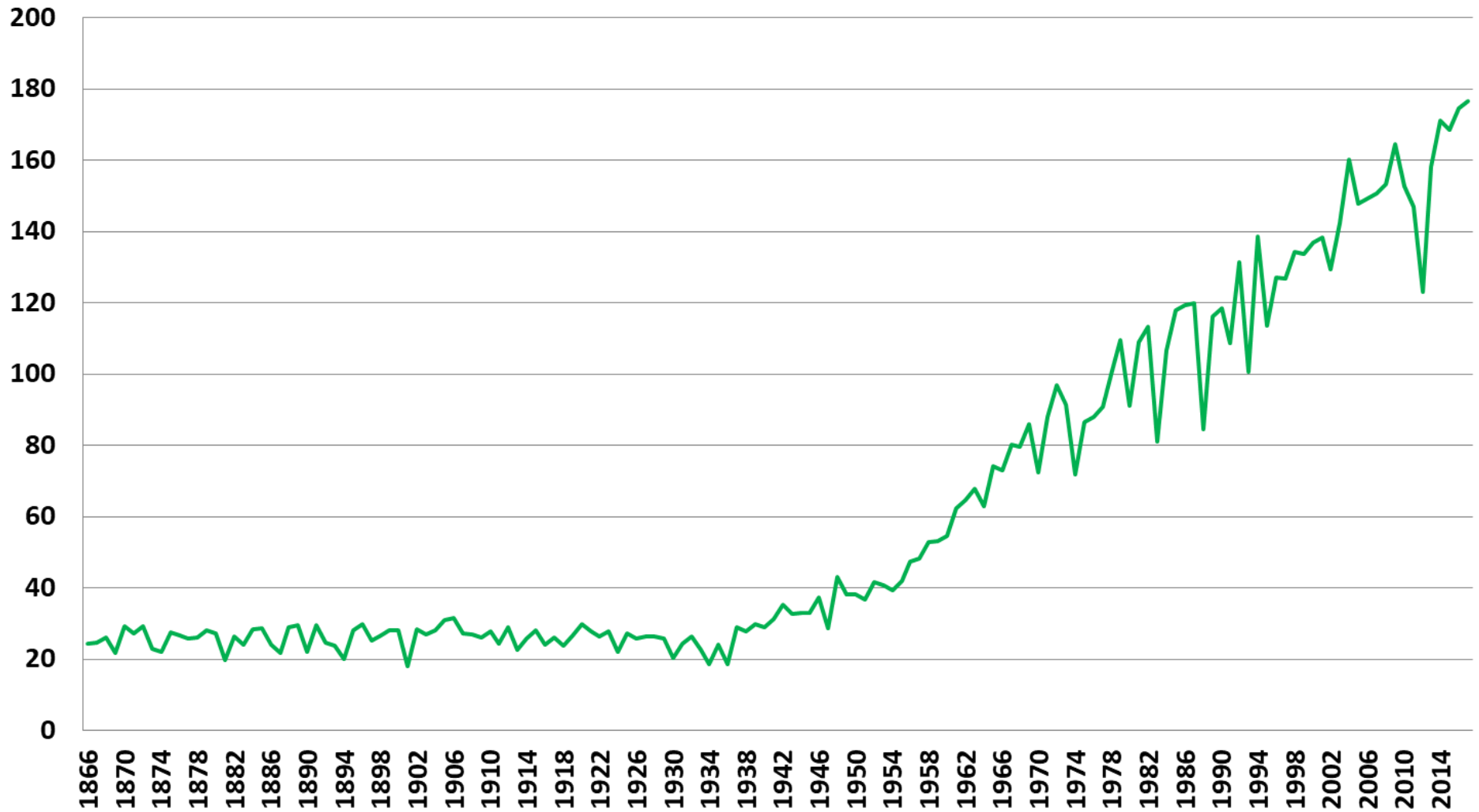
MECHANIZATION

1/26

GREEN REVOLUTION.....



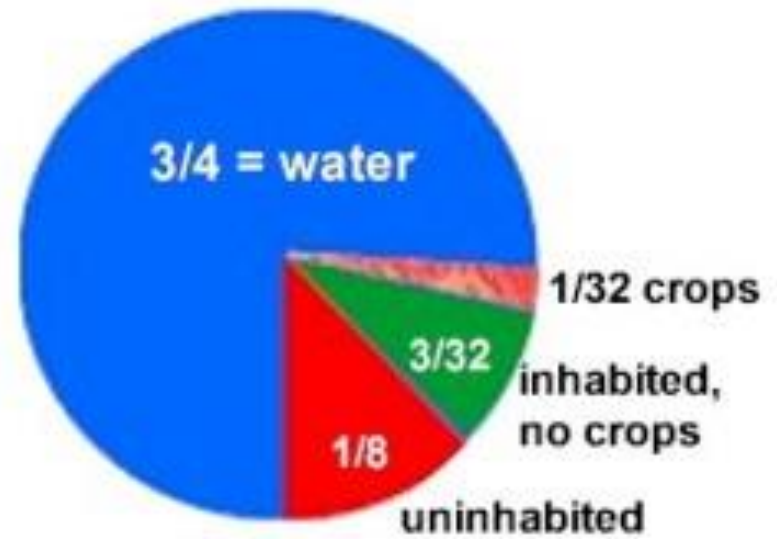
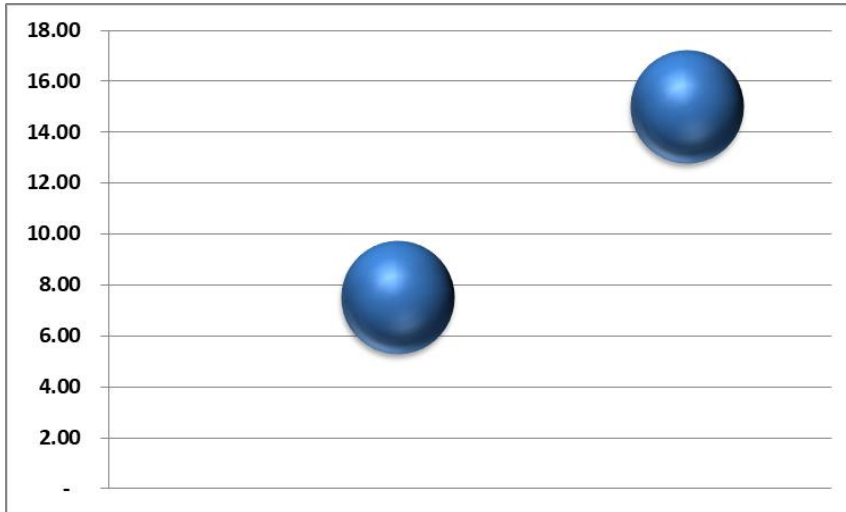
US Corn Yield (Bu/Acre)



GREEN REVOLUTION

1/155

WORLD POPULATION BY 2100



PRECISION AG



PRECISION AG



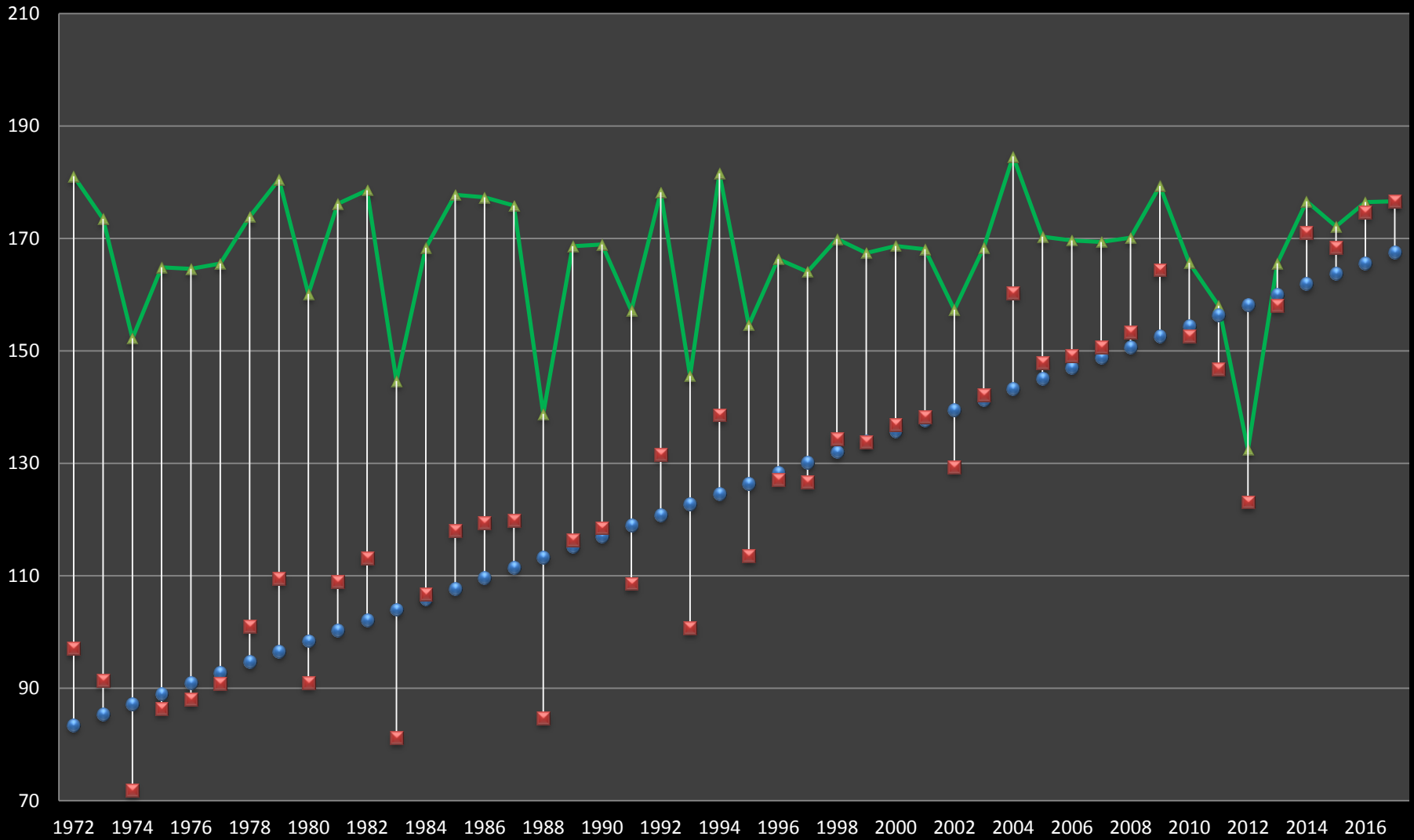
PRECISION AG

1/265

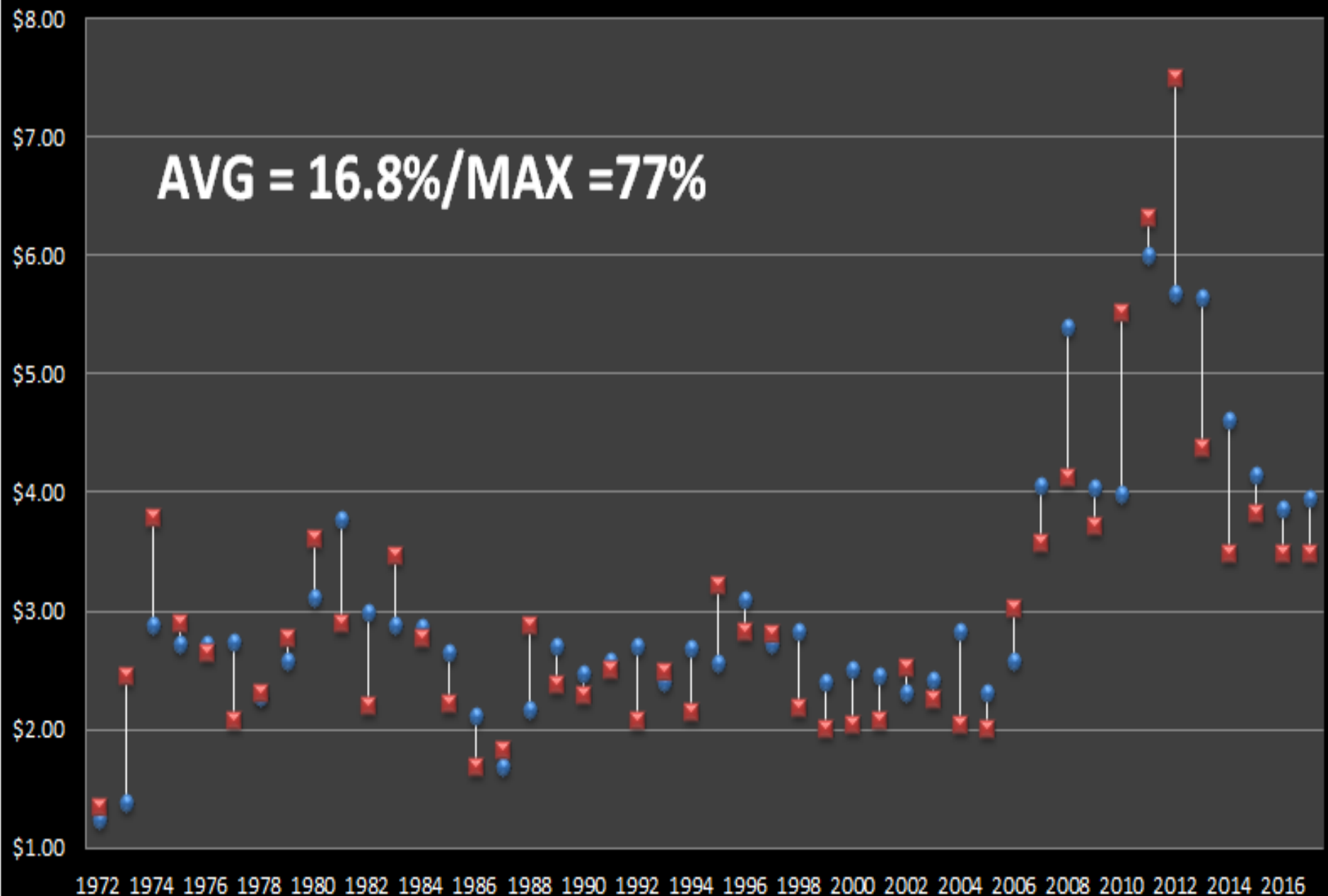
MOTHER NATURE



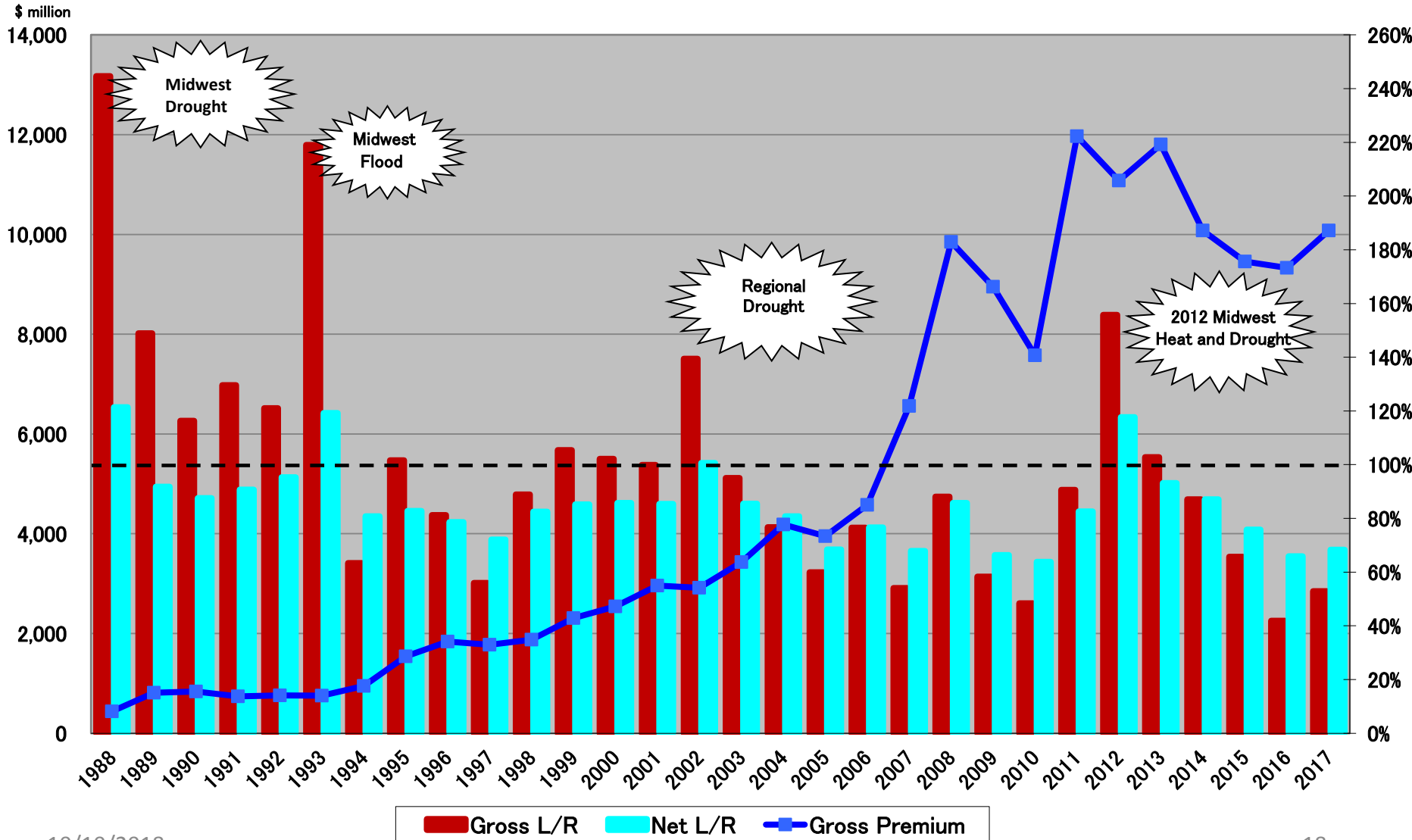
US Corn Yield Varibiliyt (\$/BU)



US MPCJ SPRING AND FALL PRICE FOR CORN (\$/BU)

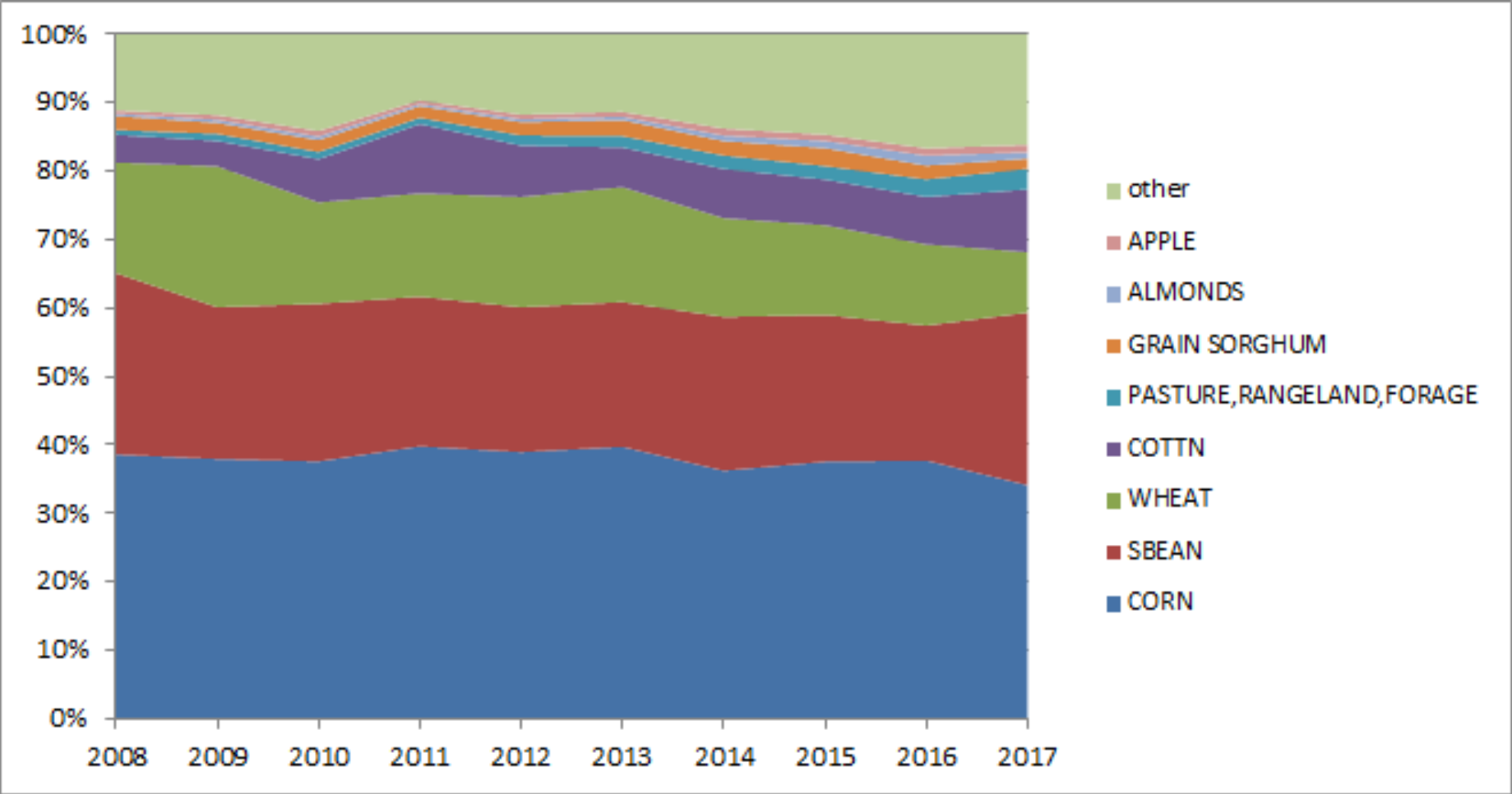


Historical UW Results: USA



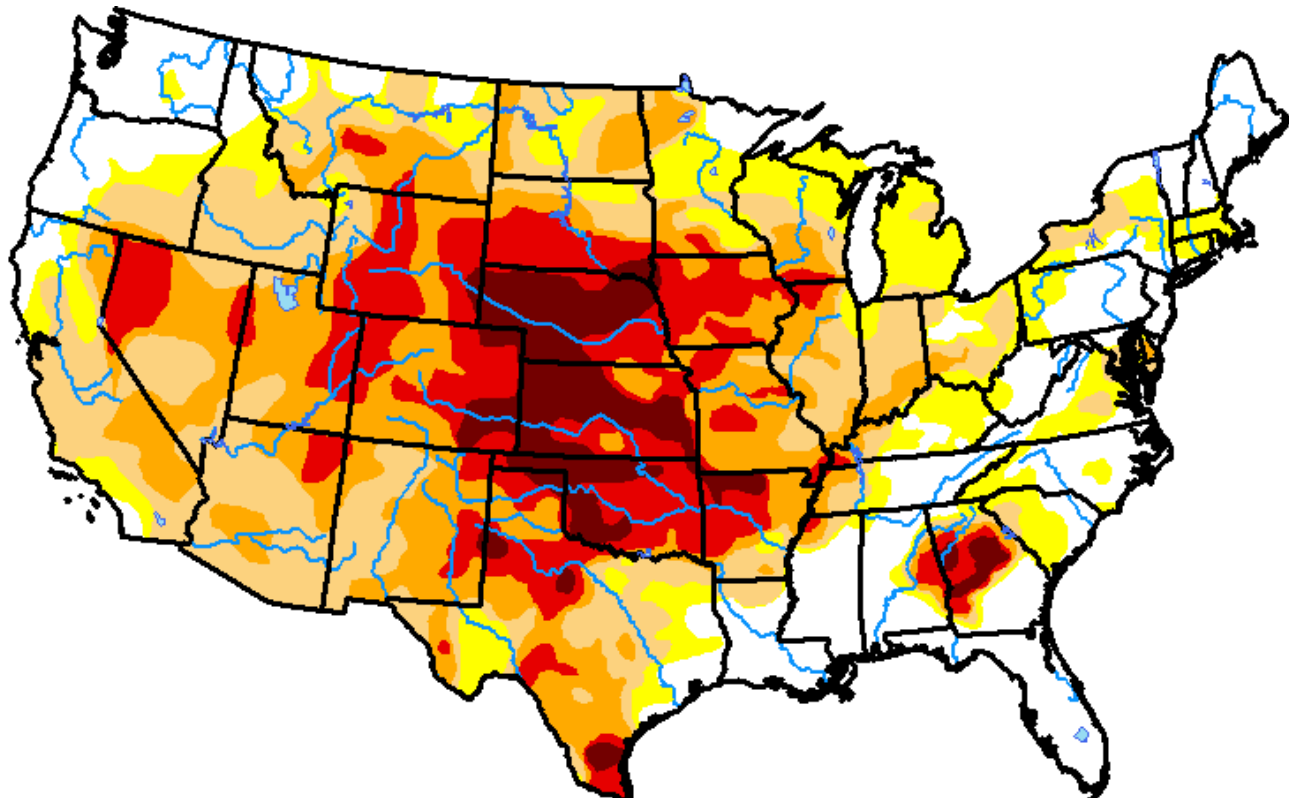


US MPCPI Premium Weight by Crop



Crop Risk = Correlated/Systemic Risk

- For Example: One drought event usually impacts large geographic area



A: Government Support



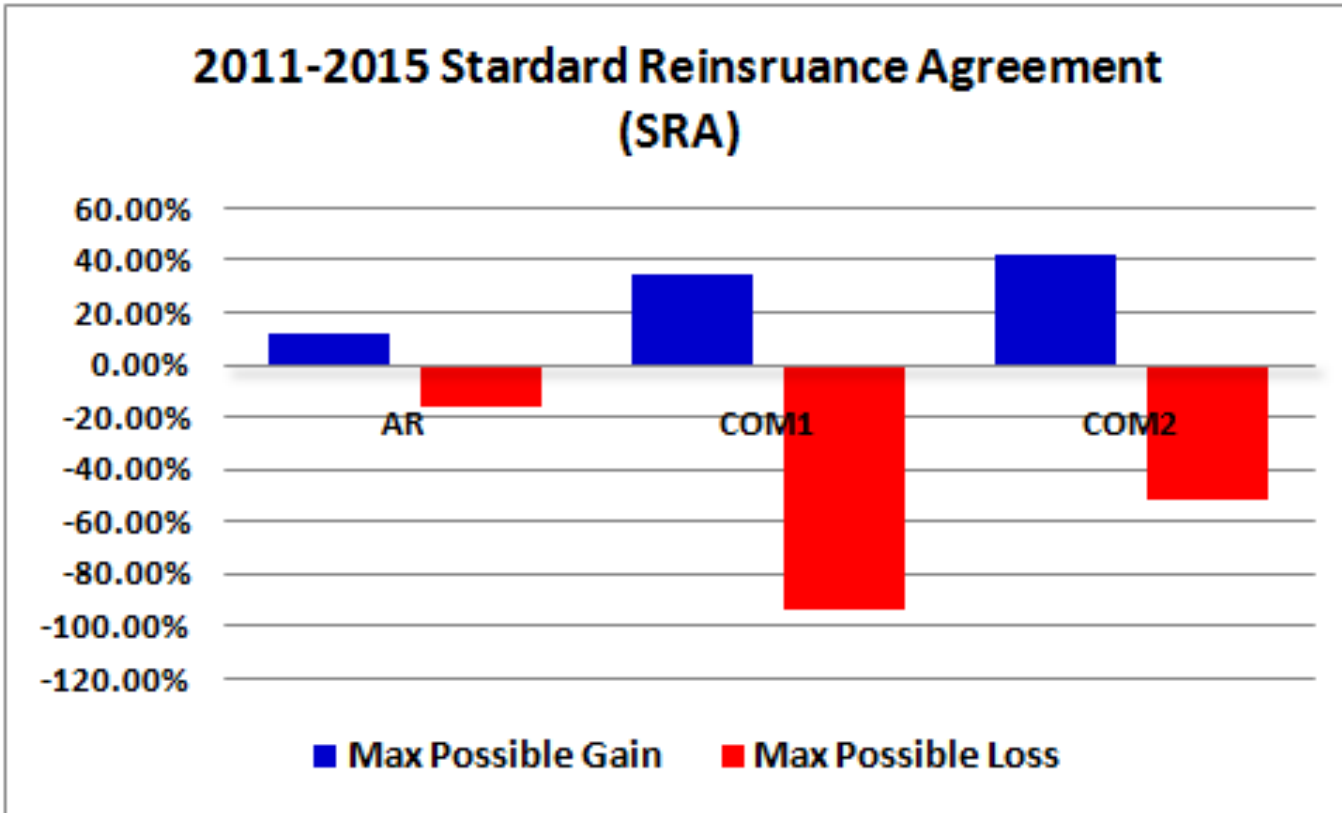
A: Public-Private Partnership



SRA



SRA Impacts



United States

Direct Cost of Federal Crop Insurance Program

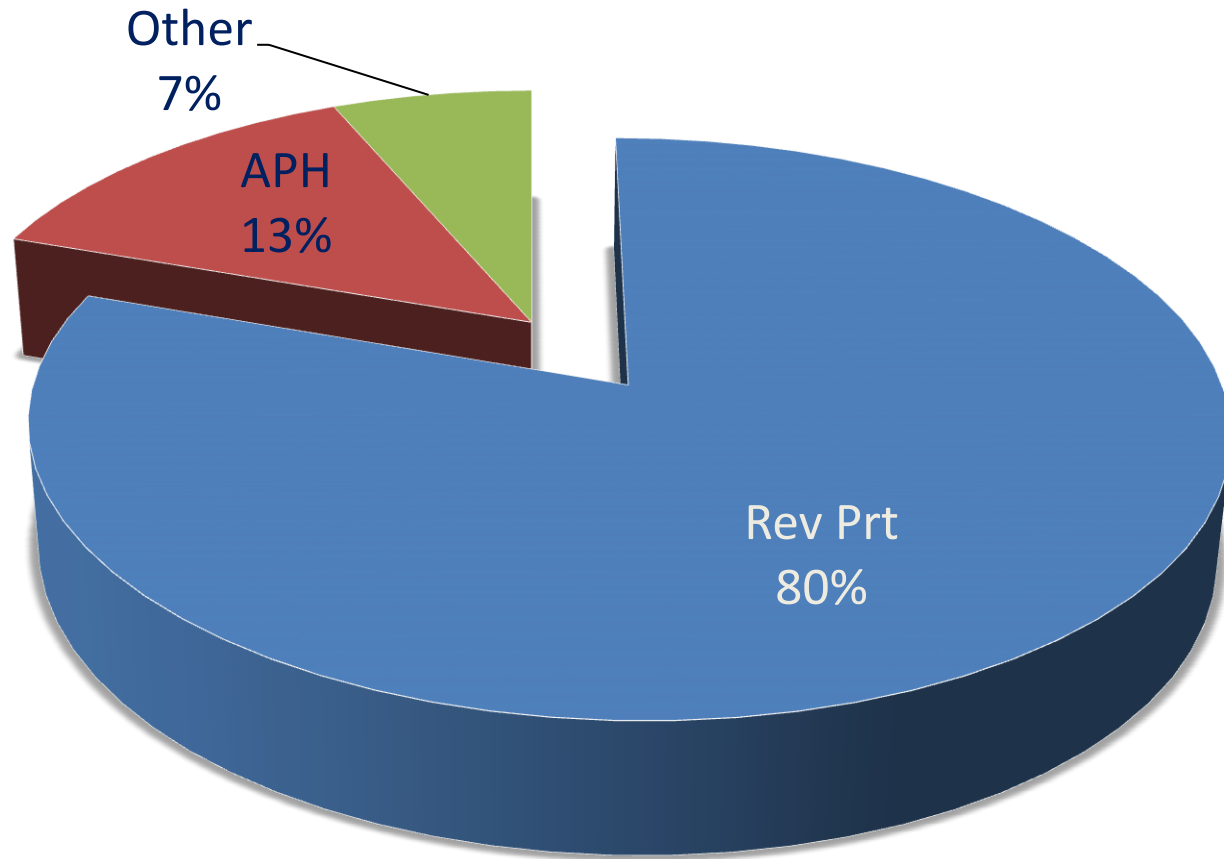
Dollars in million

Crop Year	Total Premium	Underwriting gain/(loss)	Indemnities	Premium subsidy	Program delivery costs	Total direct costs
2008	(9,867)	1,096	8,691	5,696	2,011	7,627
2009	(8,961)	2,299	5,231	5,431	1,621	5,621
2010	(7,607)	1,918	4,258	4,715	1,371	4,655
2011	(12,012)	1,705	10,879	7,478	1,363	9,413
2012	(11,152)	(1,316)	17,490	6,992	1,405	13,419
2013	(11,837)	644	12,108	7,308	1,398	9,621
2014	(10,099)	1,040	9,144	6,224	1,386	7,695
2015	(9,804)	1,816	6,339	6,102	1,434	5,887
2016	(9,346)	2,615	3,925	5,871	1,447	4,512
2017	(10,092)	2,685	5,158	6,360	1,483	5,594
Total	(100,777)	14,502	83,223	62,177	14,919	74,044

\$38B



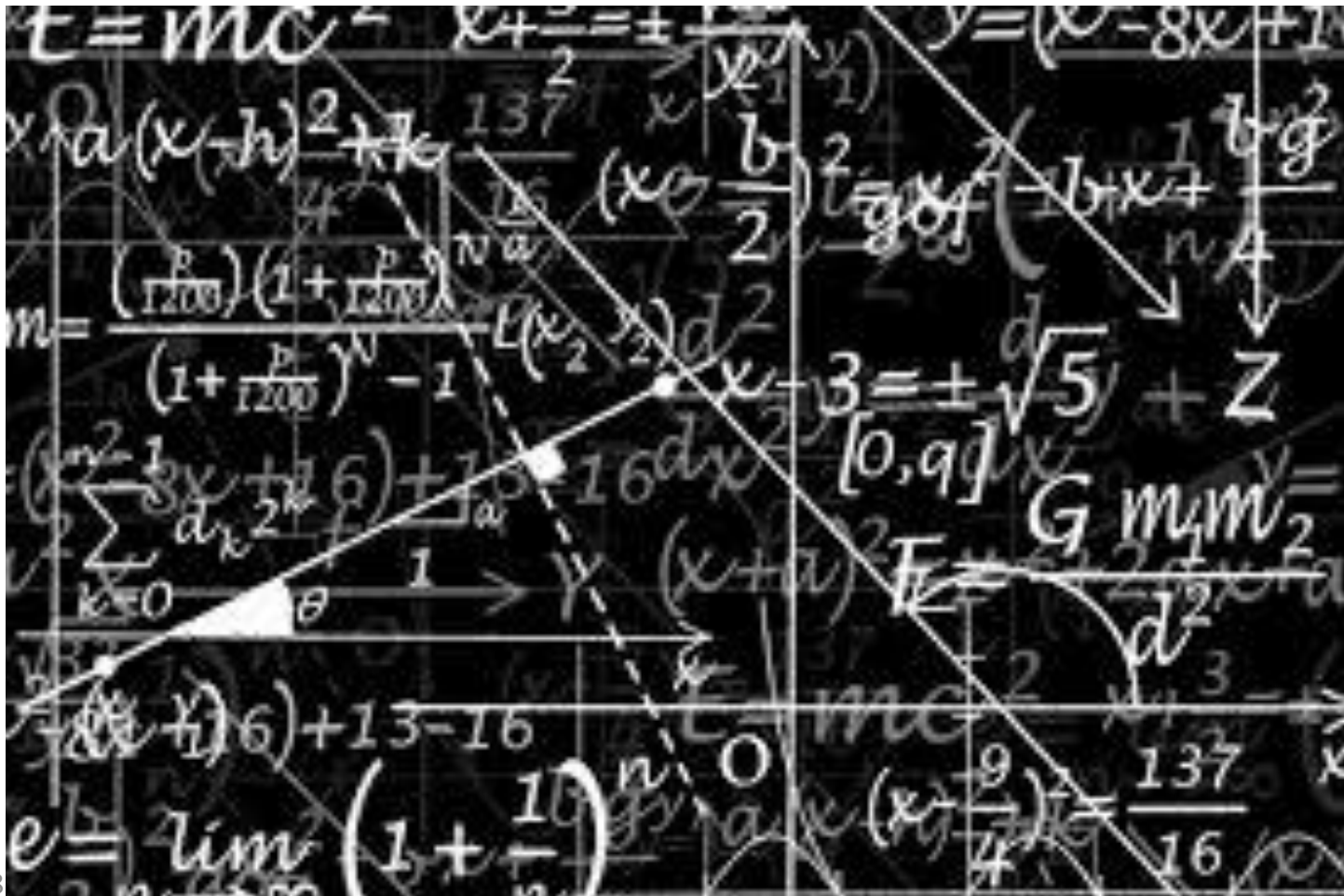
Why Revenue Protection?



Forward Contract with Short Crop Production and Crop Insurance

Average Yield	180 bu/ac	150 bu/ac	90 bu/ac
Bushels of shortfall	0	30	80
Forward contract revenue @ \$ 4.0	\$720	\$720	\$720
- Purchase of short bushels @ \$6.0	0	-180	-480
+ Crop insurance payment @ \$5.95	0	178.5	476
= Total revenue	\$720	\$719	\$716
= Total revenue without crop insurance	\$720	\$540	\$240

B: Sound Actuarial Rating



United States

- National Agricultural Statistics Service (NASS)
Crop/County Production History
 - 60+ years of county level production history
- Actual Production History data
 - Up to 10 years of policy/farm level production history
- FCIC Business Summary
 - Current premium rates by crop, plan and coverage
 - 30+ years of loss experiences
- Crop price history from Commodity Exchanges
 - 40+ years of price history for major crops.

Farm Yield: Actual Production History

- Source: Manual 13 Record Type 15 (APH)
 - Text file with data stored as fixed length records

```
Record15_amag.txt - Notepad
File Edit Format View Help
15FA052320385812200400119009300100997003C 001 00 0000004400000000000000000000370000000037001994 00000000000000
15FA052320385812200400119009300100997003C 003 00 0000004400000000000000000000390000000039001994 00000000000000
15FA052320385812200400119009300100997002C 005 00B 0000004400000000000000000000044000000004400001994 00000000000000
15FA052320385812200400119009300200997003C 002 00 00000044000000000000000000000330000000033001994 00000000000000
15FA052320385812200400119009300200997003C 004 00 00000044000000000000000000000410000000041001994 00000000000000
15FA052320385812200400119009300200997003C 006 00 00000044000000000000000000000390000000039001994 00000000000000
15FA052320385813200400112509300100997003A 001 00 00000044000000000000000000000540000000054001994 00000000000000
15FA052320385813200400112509300200997003A 002 00 00000044000000000000000000000450000000045001994 00000000000000
15FA052320385820200400112509300100997003A 001 00 00000044000000000000000000000520000000052001994 00000000000000
15FA052320385844200400119009300100997003C 001 00 00000044000000000000000000000420000000042001994 00000000000000
15FA052320386073200400119009300100997003C 001 00 00000044000000000000000000000620000000062001994 00000000000000
15FA052320386073200400119009300200997003C 003 00 00000044000000000000000000000510000000051001994 00000000000000
15FA052320386073200400119009300200997003C 002 00 00000044000000000000000000000550000000055001994 00000000000000
15FA052320386073200400119009300200997003C 004 00 00000044000000000000000000000510000000051001994 00000000000000
15FA052320386090200400112509300100997003A 001 00 00000044000000000000000000000510000000051001993A 00000049000000
15FA052320386090200400112509300100997003A 004 00B 00000044000000000000000000000440000000044001994 00000000000000
15FA052320386090200400112509300200997003A 002 00 00000044000000000000000000000470000000047001994 00000000000000
15FA052320386090200400112509300300997003A 003 00 00000044000000000000000000000430000000043001994T 00000044000000
15FA052320386090200400112509300400997003A 005 00 0000004400000000000000000000044000000004400001994 00000000000000
15FA052320386096200400112509300101997002A 010 00B 00000044000000000000000000000350000000035001994 00000000000000
15FA052320386096200400112509300102997003A 002 00 00000044000000000000000000000430000000043001993A 00000050000005
15FA052320386096200400112509300103997003A 012 00B 00000044000000000000000000000440000000044001994 00000000000000
15FA052320386096200400112509300103997003A 021 00 00000044000000000000000000000410000000041001993A 00000050000005
15FA052320386096200400112509300104997002A 014 00B 00000044000000000000000000000390000000039001994 00000000000000
15FA052320386096200400112509300105997003A 009 00 00000044000000000000000000000440000000044001993A 00000050000005
15FA052320386096200400112509300106997003A 013 00 00000044000000000000000000000450000000045001994 00000000000000
15FA052320386096200400112509300106997003A 020 00 00000044000000000000000000000430000000043001993A 00000050000005
15FA052320386096200400112509300107997003A 017 00 00000044000000000000000000000430000000043001993A 00000050000005
15FA052320386096200400112509300108997003A 018 00 00000044000000000000000000000430000000043001993A 00000050000005
15FA052320386096200400112509300109997003A 019 00 00000044000000000000000000000420000000042001993A 00000050000005
15FA052320386096200400112509300110997003A 022 00 00000044000000000000000000000430000000043001993A 00000050000005
15FA052320386096200400112509300111997002A 016 00 00000044000000000000000000000450000000045001994 00000000000000
15FA052320386096200400112509300200997003A 005 00 00000044000000000000000000000450000000045001990T 00000044000000
15FA052320386096200400112509300300997003A 006 00 00000044000000000000000000000460000000046001993A 00000050000005
15FA052320386096200400112509300400997003A 007 00 00000044000000000000000000000410000000041001994 00000000000000
15FA052320386096200400112509300500997003A 004 00 0000004400000000000000000000040000000040001993A 00000042000000
15FA052320386096200400112509300600997003A 003 00 00000044000000000000000000000420000000042001993A 00000040000000
15FA052320386096200400112509300700997003A 023 00 00000044000000000000000000000390000000039001994 00000000000000
15FA052320386107200400112509300100997003A 001 00 00000044000000000000000000000470000000047001994 00000000000000
15FA052320386113200400112509300100997003A 001 00 00000044000000000000000000000450000000045001989A 00000062000000
15FA052320386123200400112509300100997003A 001 00 00000044000000000000000000000450000000045001989A 00000062000000
15FA052320386127200400112509300100997003A 001 00 00000044000000000000000000000490000000049001993A 00000050000005
15FA052320386278200400112509300100997003A 001 00 00000044000000000000000000000420000000042001993A 00000040000000
15FA052320386406200400112503500101997003A 001 00 00000044000000000000000000000520000000052001994 00000000000000
15FA052320386406200400112503500102997003A 002 00B 00000044000000000000000000000540000000054001994 00000000000000
15FA052320386406200400112503500103997003A 003 00 00000044000000000000000000000480000000048001994 00000000000000
15FA052320386406200400112503500104997003A 004 00 00000044000000000000000000000480000000048001994 00000000000000
15FA052320386406200400112503500105997003A 005 00 00000044000000000000000000000370000000037001994 00000000000000
15FA052320386406200400112503500106997003A 006 00 00000044000000000000000000000470000000047001994 00000000000000
15FA052320386406200400112503500201997003A 007 00 00000044000000000000000000000410000000041001994 00000000000000
15FA052320386406200400112503500108997003A 008 00 0000004400000000000000000000046000000000460001994 00000000000000
```

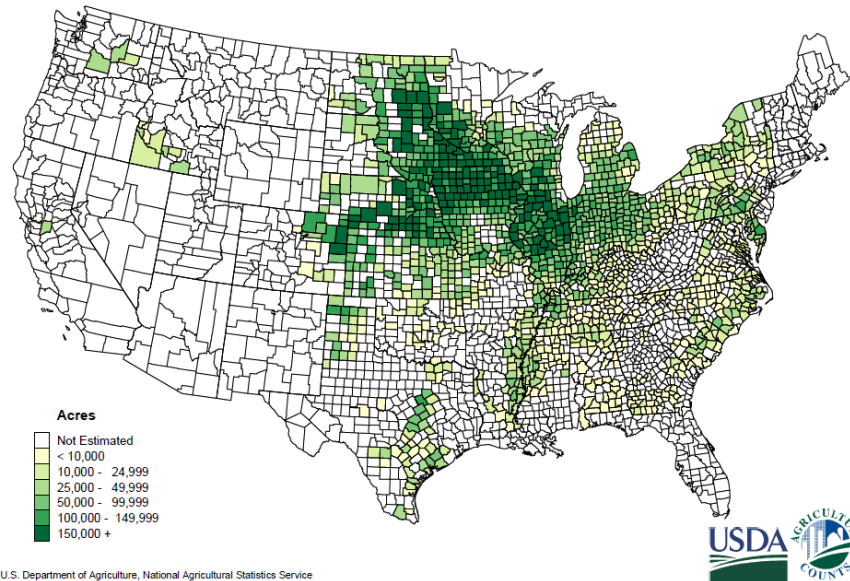
Whole Farm

**Enterprise
Unit**

**Basic
Unit**

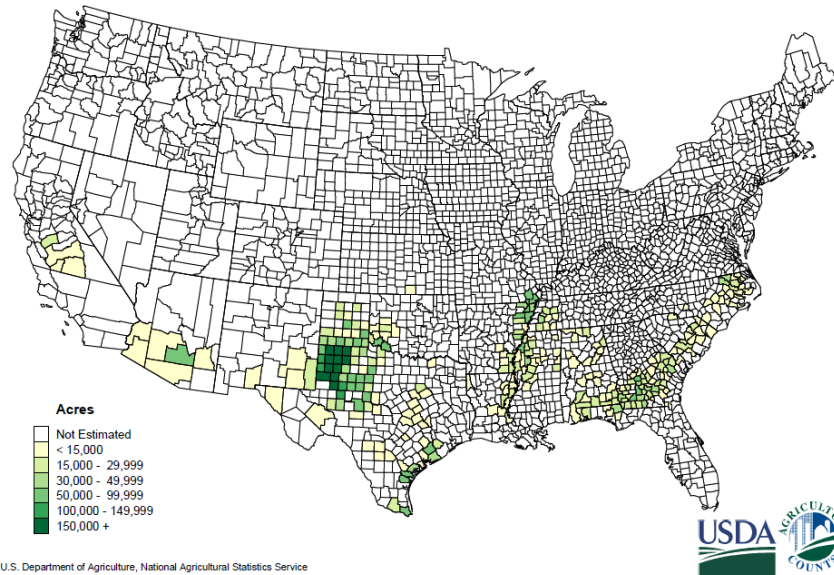
**Option
Unit**

Corn for All Purposes 2017
Planted Acres by County
for Selected States



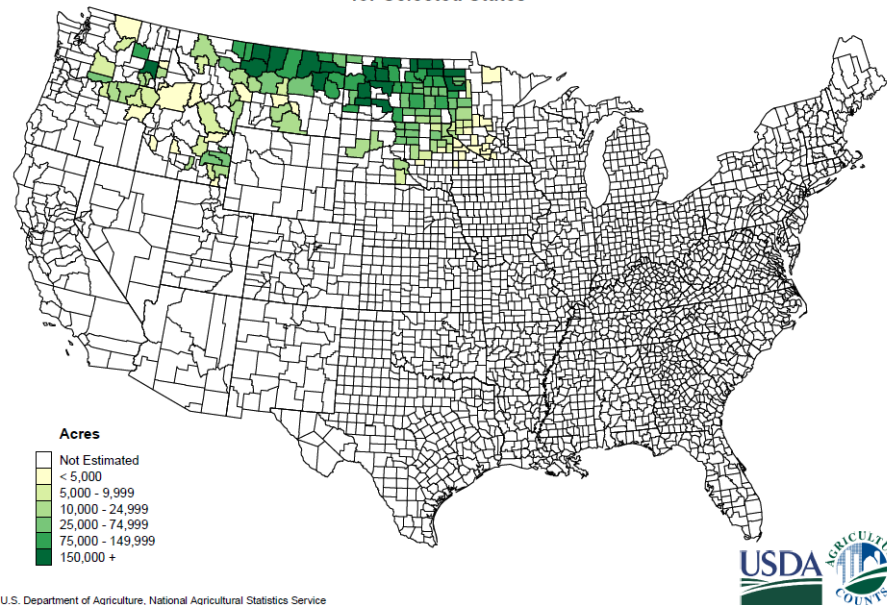
U.S. Department of Agriculture, National Agricultural Statistics Service

Upland Cotton 2016
Planted Acres by County
for Selected States



U.S. Department of Agriculture, National Agricultural Statistics Service

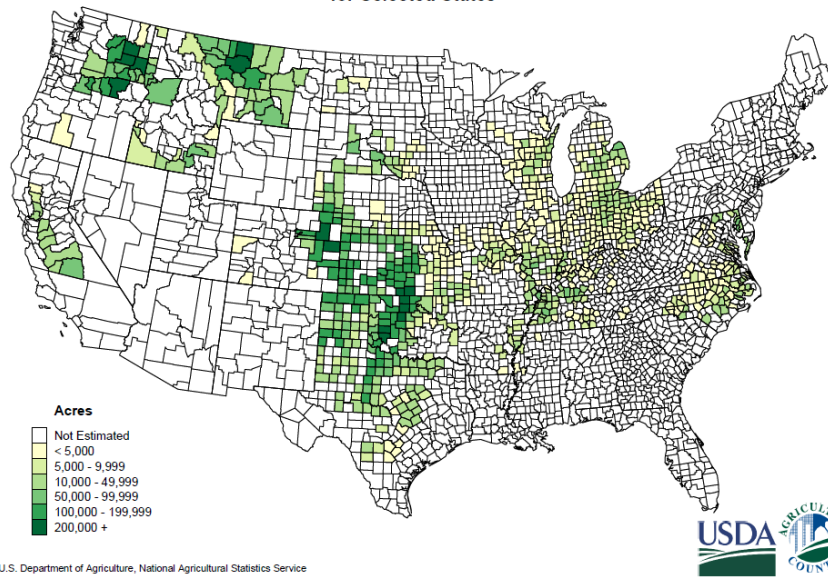
Other Spring Wheat 2017
Planted Acres by County
for Selected States



U.S. Department of Agriculture, National Agricultural Statistics Service

10/10/2018

Winter Wheat 2017
Planted Acres by County
for Selected States



U.S. Department of Agriculture, National Agricultural Statistics Service

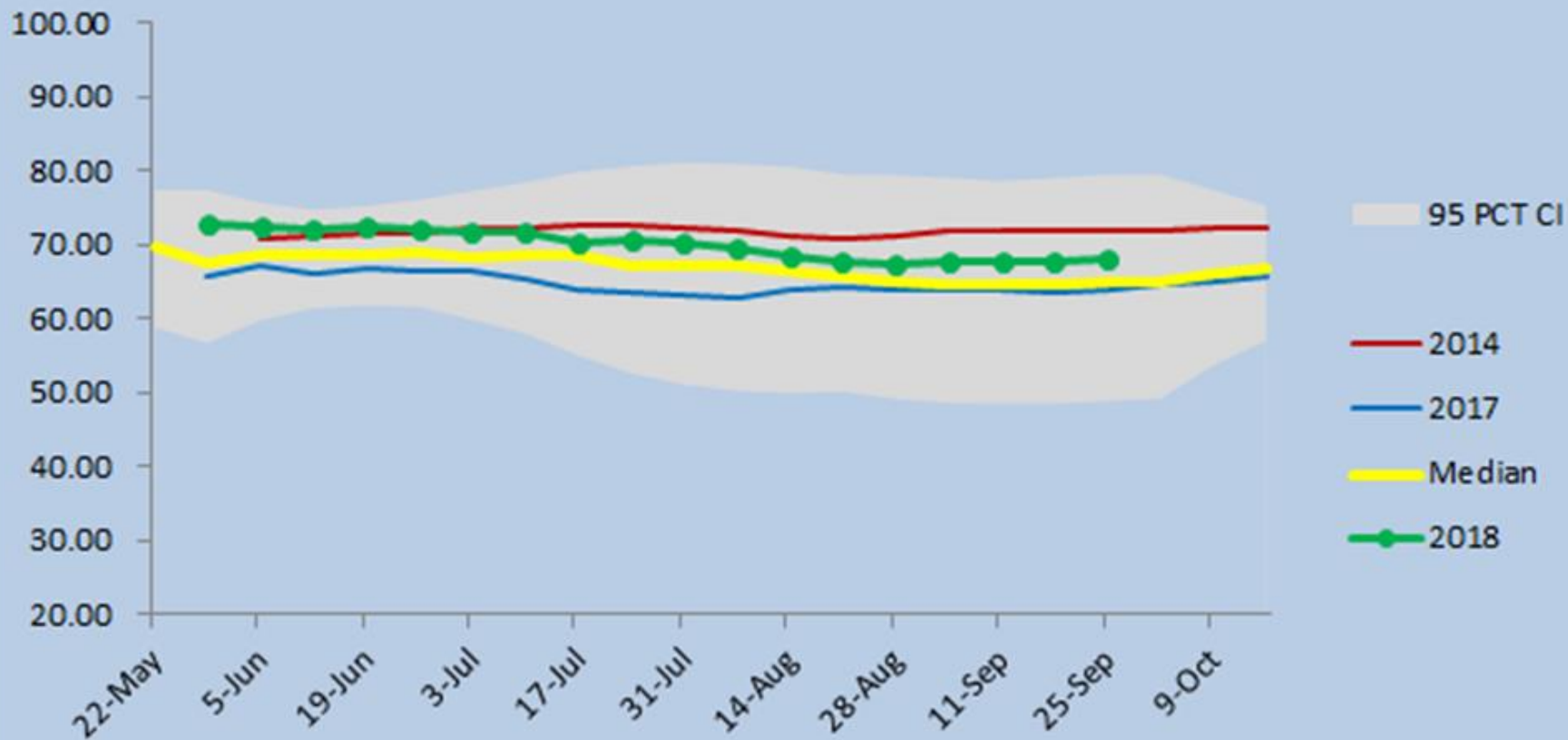
C: Sound Claim Process



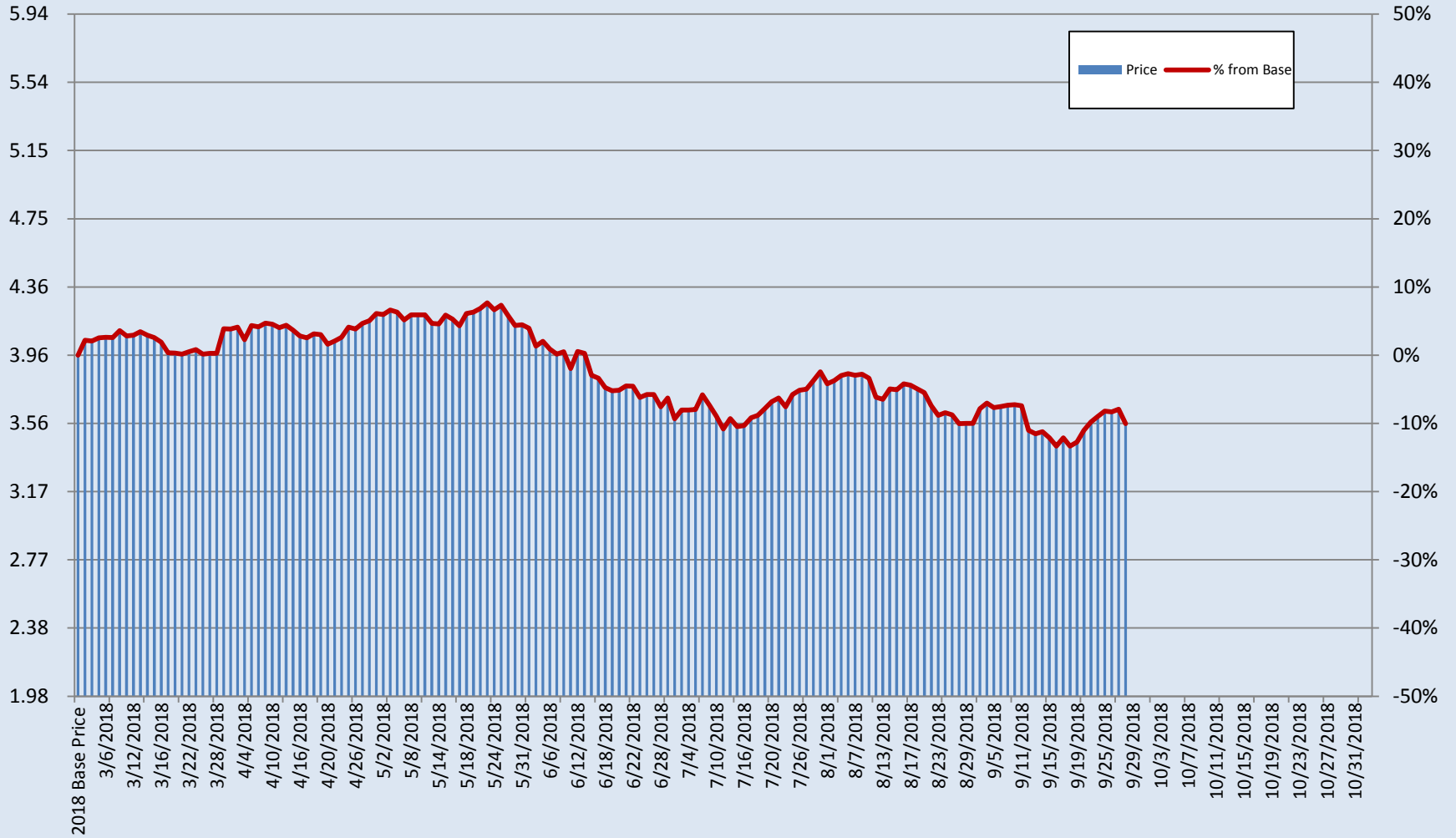
US: Farm Field Production Receipts



Crop Condition: Corn

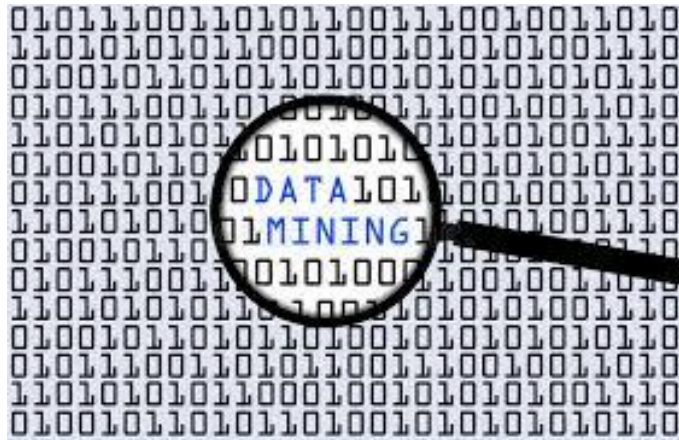


Corn MPCl Commodity Price



COMPLIANCE

vulnerability, fraud, waste, and abuse



Spot Check List: Anomalous Losses Over Time

- 14 Scenarios
- 2,000 producers
- 3,400 crop policies

Cost Avoidance for 2001-2015 Spot Check lists in Millions

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
\$48	\$112	\$81	\$71	\$140	\$27	\$85	\$73	\$89	\$112	\$46	\$91	\$70	\$54	\$61

Large claim (>\$200,000), requires different level approval by Risk Management Agency (RMA)

Future Outlook – US crop insurance

- Continue expansion into underserved markets
 - Group 3 states
 - Fruit and vegetables
 - Livestock and aquaculture
 - Organic
 - Stand along price protection
 - Whole Farm Revenue (WFR)
- Increase in farmers' coverages/guarantees
 - Trend adjusted APH
 - Addition of Group Risk coverage combined with MPCl

Future Outlook – US crop insurance

- Continued modification to rating of MPCl policies
 - Precision Ag
 - Pressure from growers' associations to lower rates
 - Reviews of price/yield for pricing revenue protection coverages
- Budgetary Concerns 2018 Farm Bill
 - 2018 Farm Bill – “Do No Harm to Crop Insurance”
 - Scrutiny of AIP gains and agents' compensation

Conclusion

