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Highlights of 2014 U.S. Crop Insurance



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As a courtesy to those interested, we have prepared year-end 2014 market share reports for multiple peril crop insurance (MPCI)¹ and private/hail by state and Approved Insurance Provider (AIP).² Within this document we discuss aspects of these market share reports as well as highlights from the 2014 U.S. crop insurance industry.

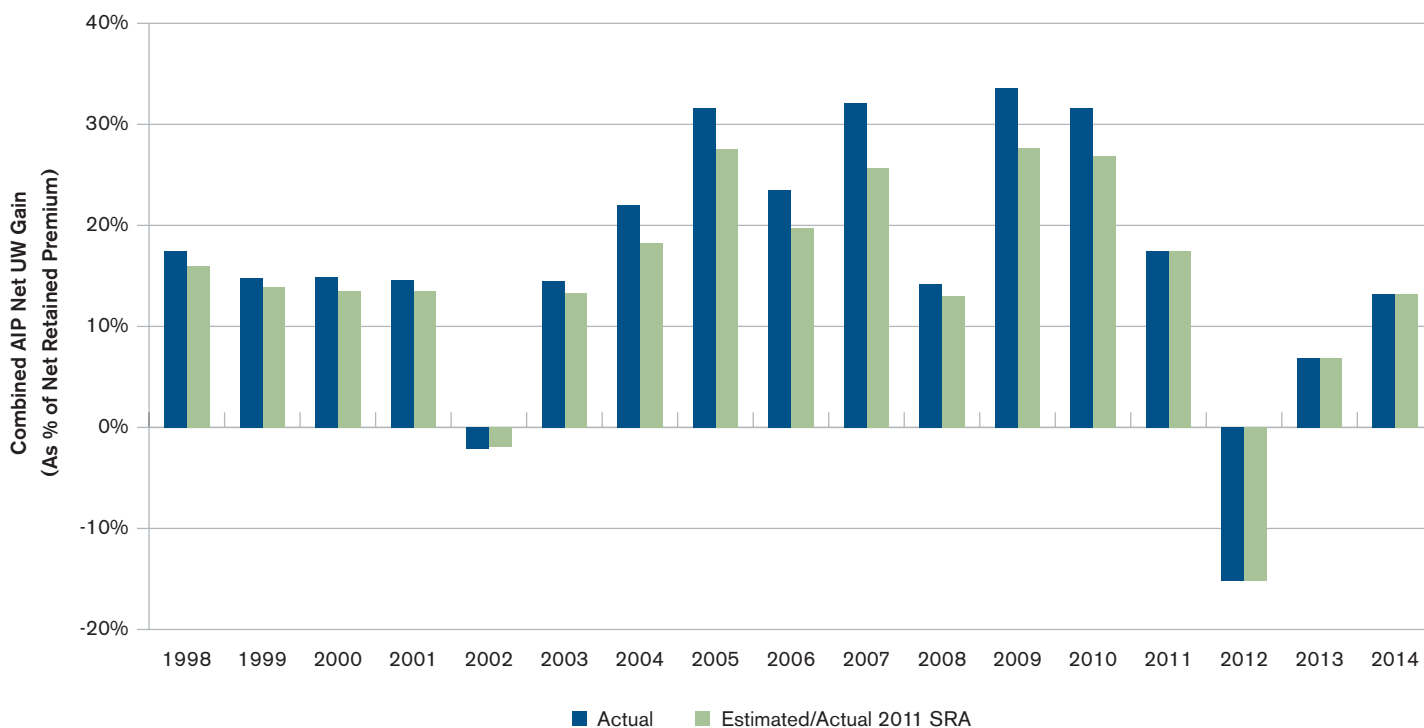
This report is broken into the following discussion sections:

1. 2014 MPCI aggregate results
2. 2014 MPCI results by state
3. MPCI 2015 and beyond
4. 2014 private/hail summary results
5. Concluding remarks

2014 MPCI aggregate results

Following two years of higher loss ratios (115% in 2012 and 93% in 2013), the MPCI industry's 2014 net of standard reinsurance agreement (SRA) loss ratio³ is 87%. The chart in Figure 1 displays the net (of SRA) underwriting gain percentages⁴ for the industry since 1998 by reinsurance year.

FIGURE 1: UNDERWRITING GAIN PERCENTAGES NET OF SRA SINCE 1998



Source: U.S. Department of Agriculture Risk Management Agency Reinsurance Reports, as of July 2015.

1 View this report: <http://www.milliman.com/uploadedFiles/insight/2015/2015-MPCI-Market-Share.pdf>.
 2 View this report: <http://www.milliman.com/uploadedFiles/insight/2015/2015-Private-Hail-Crop-Insurance.pdf>.
 3 Net Loss Ratio = (Net Retained Premium – Net Underwriting Gain) / Net Retained Premium.
 4 Net Underwriting Gain Percentage = Net Underwriting Gain / Net Retained Premium.

Since the 2011 SRA was introduced, the net (of SRA) underwriting gain percentage has averaged 6% (13% excluding the 2012 drought year). The gross loss ratio has averaged 110% between the 2011 and 2014 reinsurance years (94% excluding 2012). The table in Figure 2 displays the gross loss ratios and associated net underwriting gain percentages under the three different SRAs (using simple averages).

FIGURE 2: GROSS LOSS RATIOS AND NET UNDERWRITING GAIN PERCENTAGES

SRA YEARS	GROSS LOSS RATIO	ACTUAL NET UW GAIN PERCENTAGE	NET UW GAIN PERCENTAGE ADJUSTED TO 2011 SRA
1998 – 2004	101%	14%	12%
2005 – 2010	65%	28%	23%
2011 – 2014	110%	6%	6%
Total	91%	17%	15%

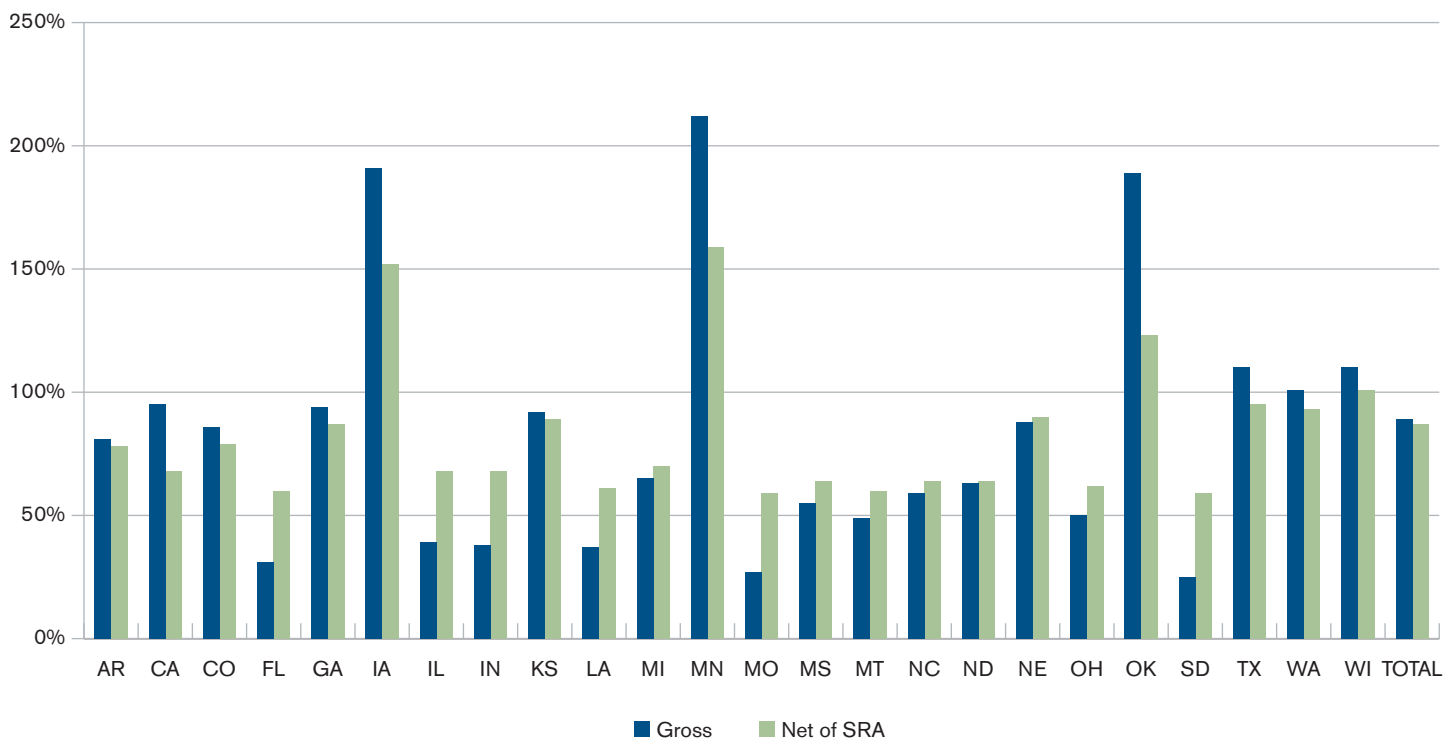
Source: U.S. Department of Agriculture Risk Management Agency Reinsurance Reports, as of July 2015, and analysis by Milliman.

We estimated the net (of SRA) underwriting gain percentages for the prior two SRAs using the 2011 SRA parameters. This shows a decrease in the net underwriting gain percentage of 2% for the 1998 SRA and 5% for the 2005 SRA.

2014 MPCl results by state

The chart in Figure 3 displays reinsurance year 2014 MPCl gross and net (of SRA) loss ratios by state.

FIGURE 3: GROSS AND NET (OF SRA) LOSS RATIOS BY STATE



Source: U.S. Department of Agriculture Risk Management Agency Reinsurance Reports, as of July 2015.

Iowa, Minnesota, and Oklahoma suffered gross loss ratios above 150%. While Iowa's and Oklahoma's gross loss ratios were similar, Iowa has a net (of SRA) loss ratio of 152% compared with 123% for Oklahoma. This is due to more premium placed in the assigned risk fund for Oklahoma and the differences in underwriting loss sharing between Group 1 (SG1) and Group 2 (SG2) states. The table in Figure 4 displays the impact of the different underwriting gain/loss sharing for the SG1 states compared with the SG2 SRA parameters.

FIGURE 4: IMPACT OF GAIN/LOSS SHARING

STATE	SG1 ACTUAL NET LOSS RATIOS (%)	ESTIMATED "AS IF" SG2 NET LOSS RATIOS (%)	COMMERCIAL FUND NET RETAINED PREMIUM (\$ MILLIONS)	ESTIMATED INCREASE IN UW GAIN (\$ MILLIONS)
Iowa	152	132	653	131
Illinois	68	60	590	47
Indiana	68	60	319	27
Minnesota	159	135	605	145
Nebraska	90	87	502	16
Total			2,669	365

Source: U.S. Department of Agriculture Risk Management Agency Reinsurance Reports, as of July 2015, and analysis by Milliman.

Overall, if these SG1 states would have the same SRA parameters as SG2 states, there would have been approximately an additional \$365 million in underwriting gain for the industry. This would have decreased the 2014 MPCCI net (of SRA) loss ratio from 87% to 82% (or increased the net underwriting gain percentage by 5%).

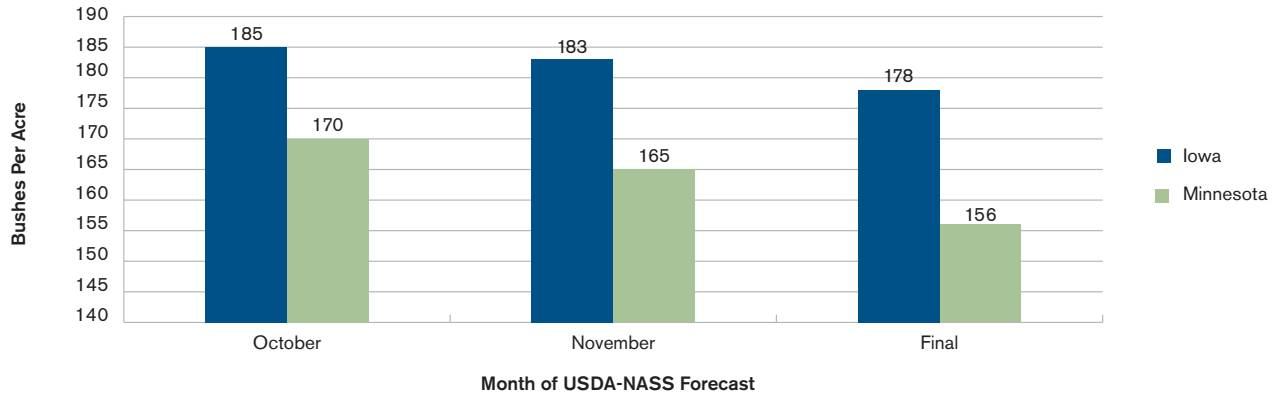
Iowa and Minnesota

The high loss ratios in Iowa and Minnesota in 2014 were caused by combinations of the following:

- Low commodity (corn and soybean) prices
- Relatively low yields
- Recent upticks in coverage level selections
- Leveraging the effect of the actual production history (APH) trend adjustment (TA) option
- Recent rate decreases
- Lower price volatility factors use to price revenue products

Difficulties in forecasting ultimate loss ratios for these states were caused by the change in U.S. Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) yield forecasts. The yields forecasted by NASS for Iowa and Minnesota dropped each month as more information became available. The chart in Figure 5 compares the 2014 NASS-forecasted corn yields from October and November to the final yield estimates.

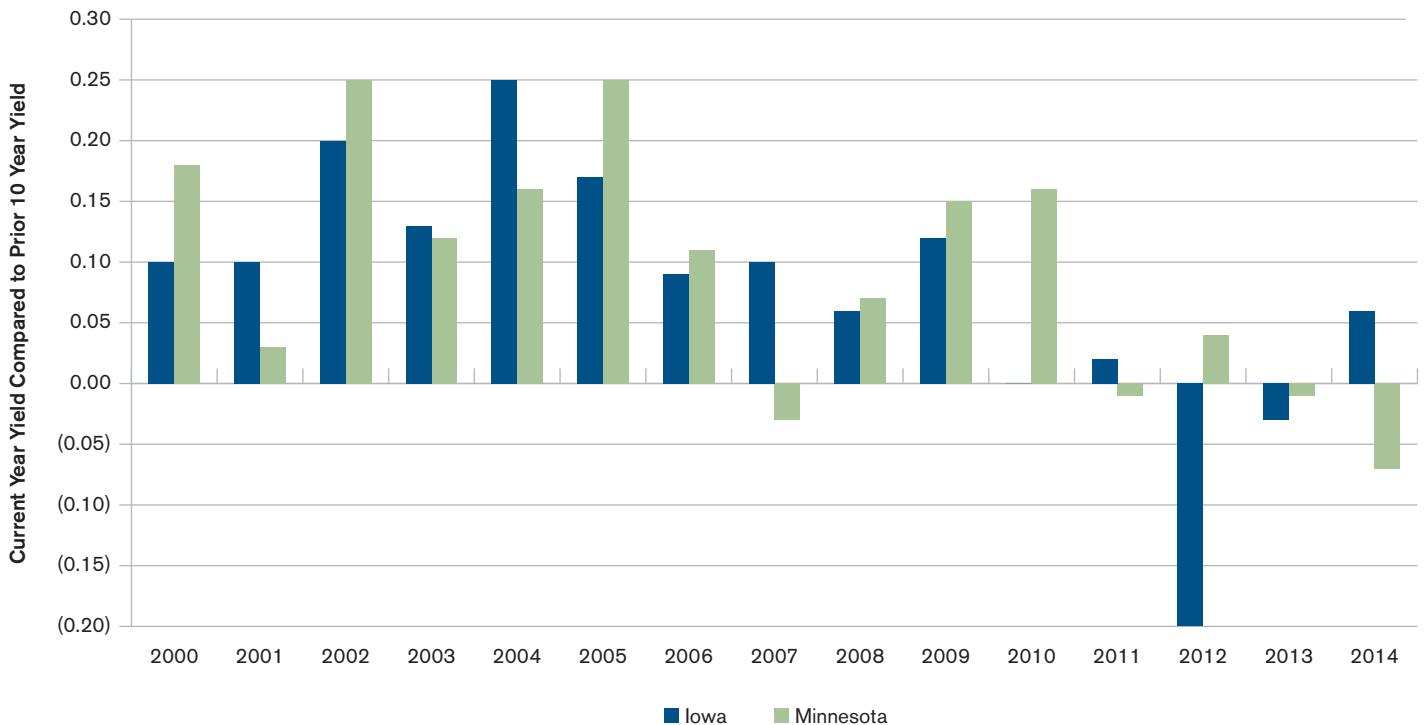
FIGURE 5: USDA-NASS CORN YIELD FORECAST, 2014, IOWA AND MINNESOTA



Source: USDA-NASS.

The chart in Figure 6 compares the current year corn yields with the previous 10-year average corn yield for Iowa and Minnesota.

FIGURE 6: CURRENT YEAR CORN YIELDS VS. PRIOR 10-YEAR AVERAGES, IOWA AND MINNESOTA

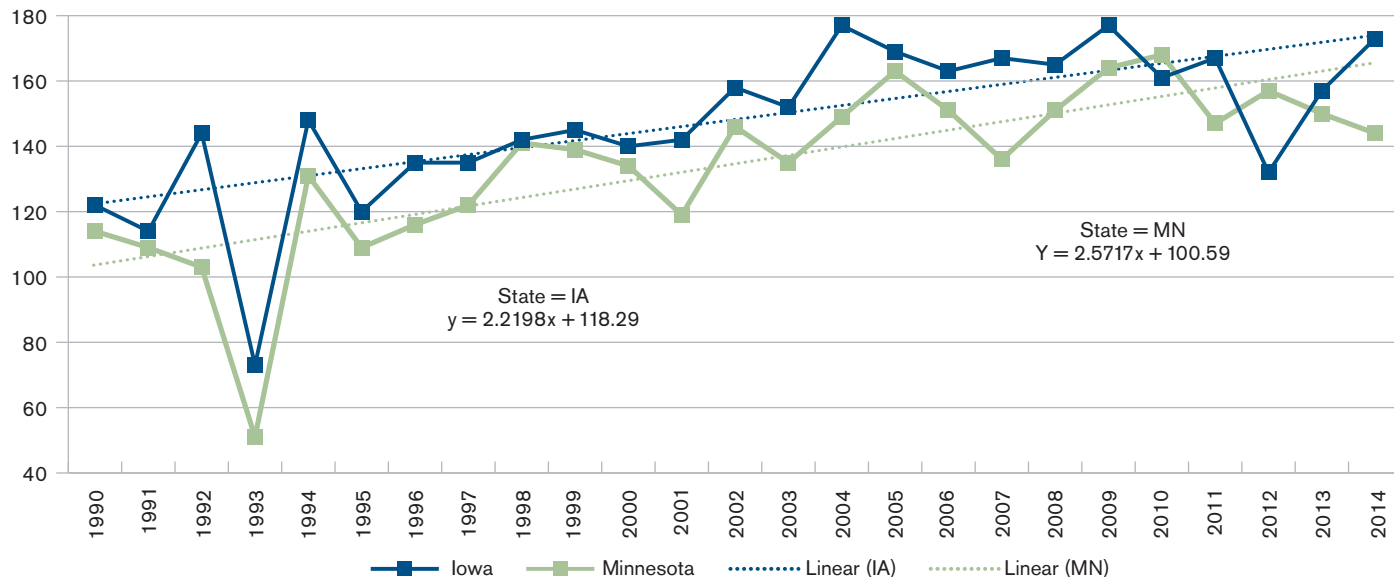


Source: USDA-NASS (production divided by planted acreage).

The Iowa corn yield for 2014 was 6% higher than the previous 10-year average. However, northwestern Iowa agricultural districts experienced significantly lower yields, which contributed to the relatively high loss ratio for Iowa corn in 2014. Minnesota's corn yield for 2014 was 7% lower than the average of the prior 10 years.

The Iowa and Minnesota statewide corn yields since 1990 are shown graphically on the chart in Figure 7.

FIGURE 7: CORN YIELDS SINCE 1990, IOWA AND MINNESOTA

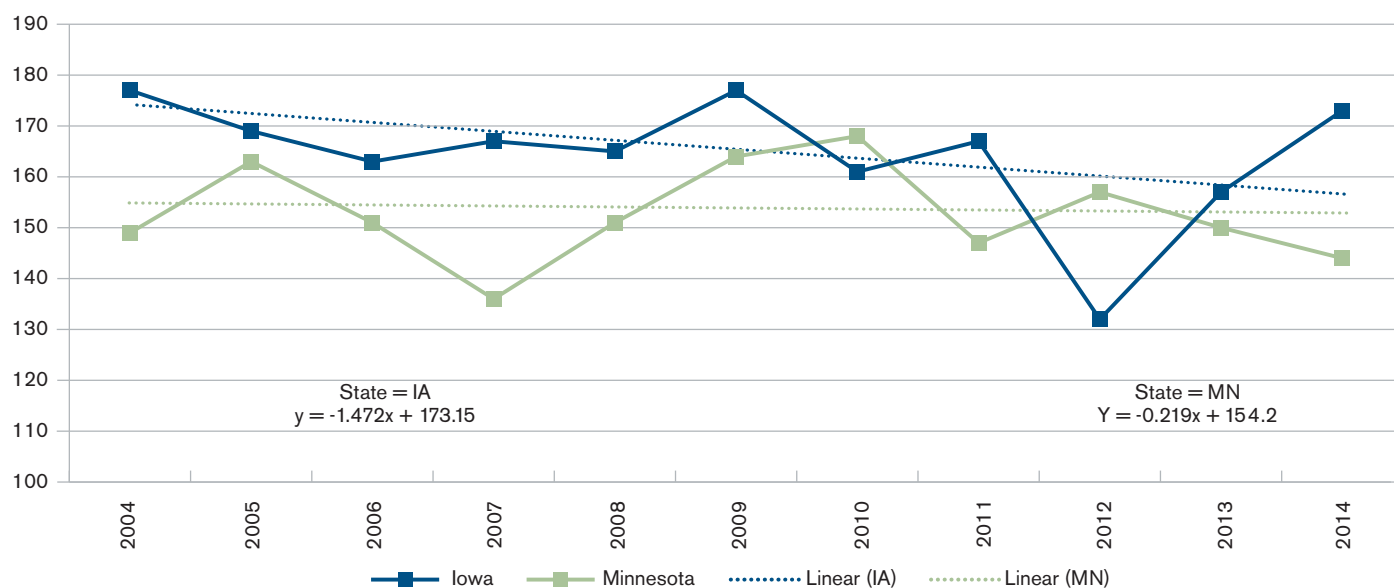


Source: USDA-NASS (production divided by planted acreage).

We compare the historical yield trend with the additional yields provided by the APH TA option. We fit a linear regression to the yields for these years (1990 to 2014) and found this is similar to the additional approved yields using the APH TA option.

However, if we only look at yields between 2004 and 2014 to fit a linear regression, we get the results displayed in the chart in Figure 8.

FIGURE 8: LINEAR REGRESSION, 2004-2014, IOWA AND MINNESOTA CORN YIELDS



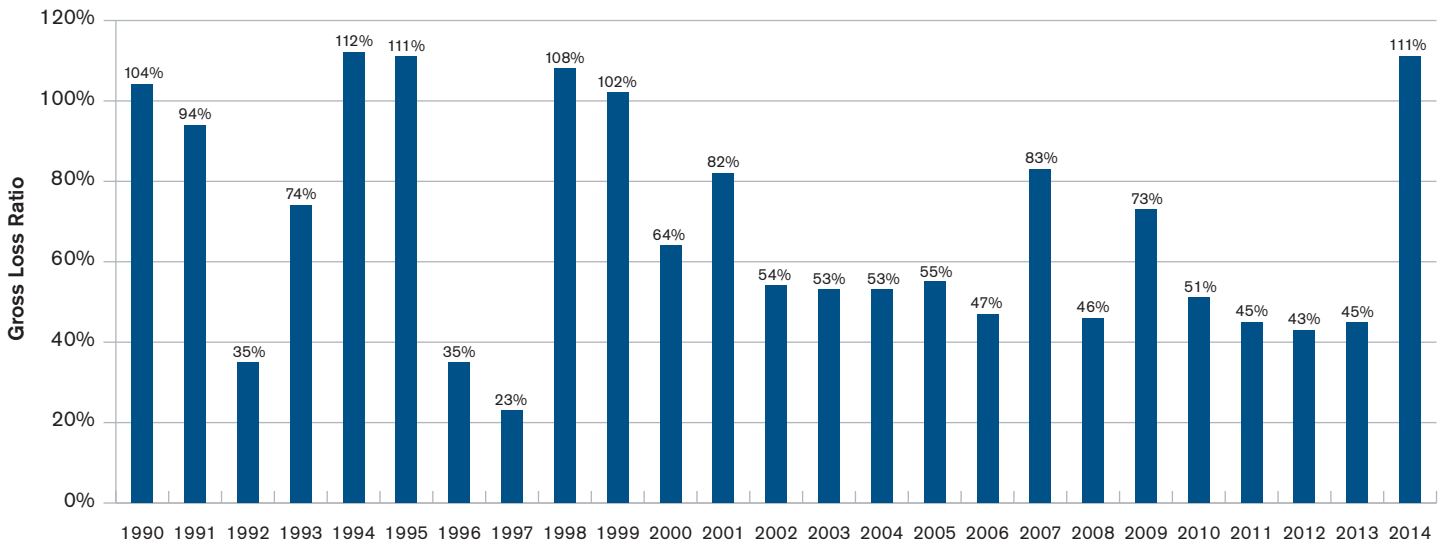
Source: USDA-NASS (production divided by planted acreage).

There is a negative yield trend in both Iowa and Minnesota over these years (although the relatively high yields in 2004 and low yields in 2012 contribute to the negative trend). The TA option allows insureds to increase their approved yields above their historical averages. We estimate that approved yields can be increased by 6% to 12% (or more) using TA. Because the actual yields in more recent years have not increased at a rate similar to the previous years, the TA option has a leveraging effect on loss ratios—especially when prices are low.

California drought

California experienced a gross loss ratio of 111% in reinsurance year 2014, the first time it suffered a loss ratio above 100% since 1999. The chart in Figure 9 displays the gross MPCII loss ratios for California from 1990 to 2014.

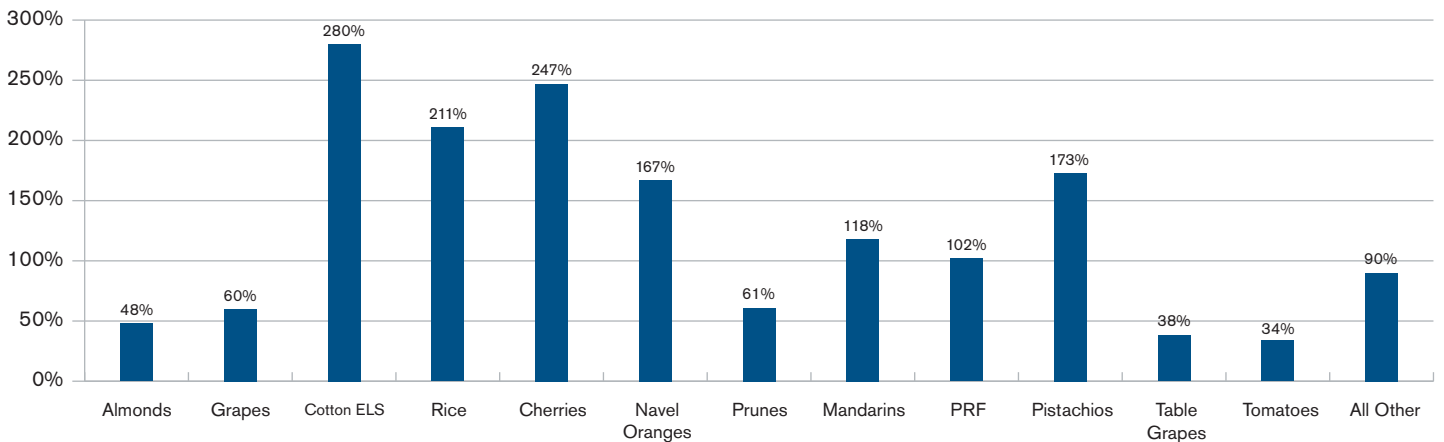
FIGURE 9: GROSS MPCII LOSS RATIOS, 1990-2014, CALIFORNIA



Source: U.S. Department of Agriculture Risk Management Agency Summary of Business, as of July 2015.

Due to the on-going drought, access to water varied significantly by region and water district. Both rice and cotton acreage did not have enough water to plant, which caused substantial prevented planting indemnities. The 2014 loss ratios varied substantially by crop as illustrated in the chart in Figure 10.

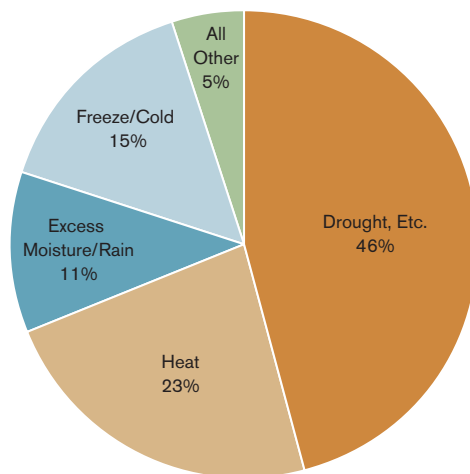
FIGURE 10: CALIFORNIA 2014 LOSS RATIOS BY CROP



Source: U.S. Department of Agriculture Risk Management Agency Summary of Business, as of July 2015.

The chart in Figure 11 displays the 2014 indemnities by primary cause of loss in California. Interestingly, excess moisture or rain caused 11% of the indemnities. This was primarily with almonds (poor pollination) and with cherries (rain during harvest causes cherries to split). Freezing or cold temperatures also caused 15% of losses, primarily in citrus crops.

FIGURE 11: 2014 INDEMNITIES BY CAUSE OF LOSS, CALIFORNIA



Source: U.S. Department of Agriculture Risk Management Agency Cause of Loss, as of July 2015.

MPCI 2015 and beyond

During the early months of 2015, the southern plains states welcomed rain, which eased the drought conditions that had gripped the region for several years. Unfortunately, too much rain fell, which caused flooding in Texas and poor winter wheat harvesting conditions. The projected corn price for Midwestern states was set at \$4.15, a 10% decline from 2014. The projected price of soybeans is 14% lower than in 2014. This will cause the overall premium volume to be lower in 2015 compared with recent years. Commodity prices have since declined roughly 5-10% as of the date of this report (absent a large spike, up to \$4.50, in corn prices, after NASS reported lower corn acreage planted in 2015 in June).

The new area risk products promulgated by the 2014 Farm Bill—Supplemental Coverage Option (SCO) and Stacked Income Protection Plan (STAX)—were introduced with modest fanfare. SCO provides area-based risk coverage between 86% and the underlying MPCI coverage level. As of October 5, 2015, only approximately 14,000 SCO policies were earning premium compared with 1.2 million policies overall. The cotton equivalent, STAX, has shown significantly more interest, with 8,100 policies earning premium compared with 36,000 other insurance plans for cotton. This is not surprising because:

- Over 90% of soybean and corn farmers elected Agriculture Risk Coverage (ARC) which does not allow for SCO insurance
- Cotton growers historically select lower coverage levels than corn and soybean growers
- STAX has a 90% attachment point compared with 86% for SCO
- STAX has a subsidy percentage of 80% compared with 65% for SCO

The APH Yield Exclusion (YE) was also introduced in 2015. YE effectively increases a grower's approved yield by excluding yields in the approved yield calculation when a county's overall yield in a year is lower than 50% of the average of the county's previous 10 years. The beneficiaries of this option will primarily be nonirrigated units in semiarid regions. Approved yields significantly higher than standard APH—including the Yield Adjustment (YA) option, 60% of a county's T-yield—are possible using the YE.

New insurance programs and policies are again being rolled out for 2016. These include:

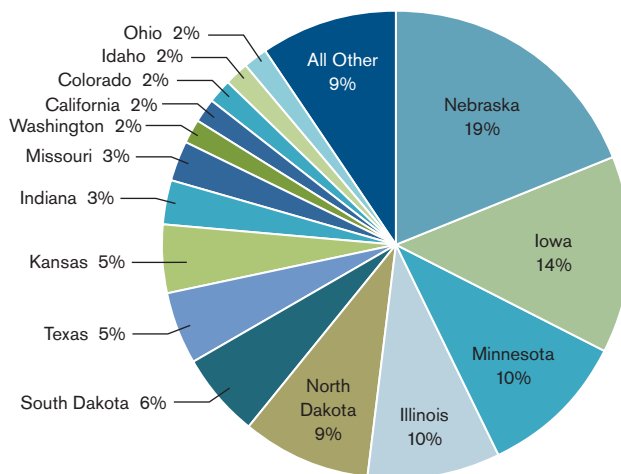
- APH Yield Exclusion and SCO coverage for fruit and nut producers
- Margin Protection

Margin Protection (MP) is an area-based product that is similar to the current policies but includes a provision for input costs as well. Input costs that are subject to change are defined as diesel, fertilizer, and interest. Detailed information about the guarantees and rating of these products were not available at this time.

2014 private/hail summary results

For the first time, the National Association of Insurance Commissioners (NAIC) required insurance companies to publish private crop results on a separate line item in the Annual Statement, page 14. Milliman has published a market share report based on these results.⁵ Overall, the direct loss ratio was 128.6% with total premium of \$969 million for calendar-year 2014. The chart in Figure 12 displays the premium distribution by state.

FIGURE 12: 2014 PRIVATE CROP PREMIUM DISTRIBUTION BY STATE

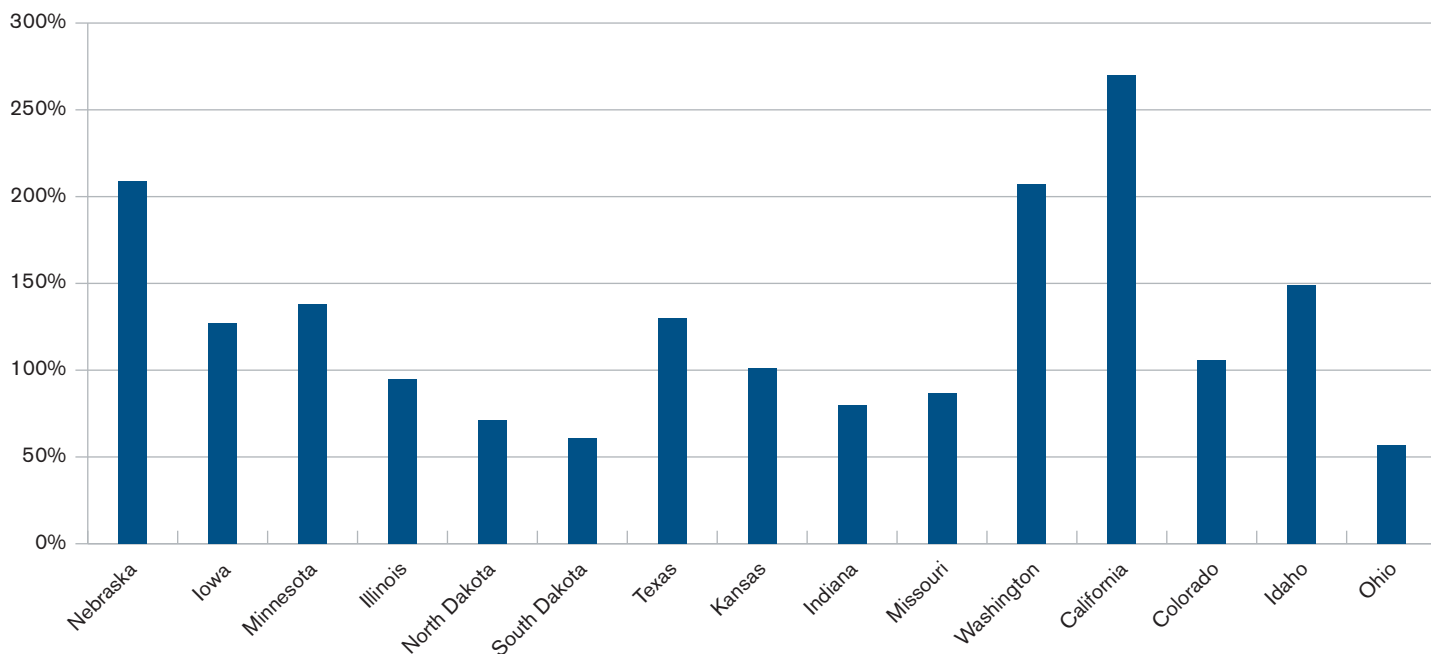


Source: NAIC publicly filed Annual Statements; SNL Financial LC.

Nebraska was the largest private/hail state with \$184 million direct earned premium. Overall, the five largest states (Nebraska, Iowa, Minnesota, Illinois, and North Dakota) account for almost 60% of private/hail crop insurance direct earned premium. The chart in Figure 13 shows the published direct incurred loss ratios by state. Areas of Nebraska suffered major hail damage in June that caused significant losses. However, many other states experienced loss ratios above 100% as well. It should be noted that private policies providing additional coverage above the approved yield from MPCl policies using the TA or YE option may be double-counting the yield trend and providing excessive coverage.

5 View this report: <http://www.milliman.com/uploadedFiles/insight/2015/2015-Private-Hail-Crop-Insurance.pdf>.

FIGURE 13: PUBLISHED DIRECT PRIVATE CROP INCURRED LOSS RATIOS BY STATE



Source: NAIC publicly filed Annual Statements; SNL Financial LC.

Concluding remarks

The 2014 year was a challenging one, as several states that had historically been profitable suffered high loss ratios. Additional policies and products released by the USDA's Risk Management Agency (RMA) continue to provide higher guarantees to growers and utilize area risk principles. From a reserving or cash flow standpoint, these policies will pay out little until mid-April, when county-level yields and revenues are published by RMA. They will need to be accounted for in the reserve-setting process. The changes to provide higher approved yields will cause more frequent and shallow loss payouts. From an actuarial perspective, the increase in yield guarantees shifts the yield distribution which causes greater indemnities, especially in a low price scenario. A small change in the underlying yield and/or price distributions can make a significant impact on the overall indicated loss costs.



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