



## Forecast Performance of RMA Expected Yields: Comparison of Yield Projection Methods

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Building upon the analyses discussed in the *farmdoc daily* articles of [January 27, 2026](#) and [April 1, 2026](#), this study finds that the current method used by RMA (Risk Management Agency) provided the least accurate projection of actual RMA county yields across the five crops and four projection methods examined in this study. The 5-year moving average excluding the minimum value provided the most accurate projection in general and especially for dryland corn, soybeans, and wheat. Consistent with this finding, payments by 95% Enhanced Coverage Option with Revenue Protection (ECO 95% RP) insurance were highest for corn, soybeans, and wheat using county yield projections from the 5-year moving average excluding the minimum.

### Data and Procedures

Projection performance of actual county yields reported by RMA is assessed for the 2015-2024 crop years. These crop years postdate the county yields used by RMA to rate the initial 2015 crop year offering of SCO (Supplemental Coverage Option) insurance. To create a set of counties with a long history of producing a crop, this study included only counties that (1) had RMA actual yields for all years since 1991, the first year in the RMA county yield dataset; and (2) had RMA reported insured acres for 2024. US counties in this study total 1520, 1318, 1096, 349, and 80 for, respectively, dryland corn, soybeans, wheat, and cotton, and irrigated rice.

Four yield projection methods are compared:

1. **Ordinary Least Squares (OLS) regression** fits observed data by minimizing the squared difference of fitted from observed values. Economists commonly use OLS to analyze and predict.

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2. **RMA** uses regression analysis adjusted to capture changes in yield growth rates over time. RMA county data set begins with the 1991 crop year.
3. **5-year Olympic moving average** is used by the ARC (Agriculture Revenue Coverage) commodity program. This average is calculated after removing the lowest and highest values.
4. **5-year moving average excluding minimum yield.** A rationale for removing only the minimum yield is the well-established observation that low yields deviate further from average yield more than high yields.

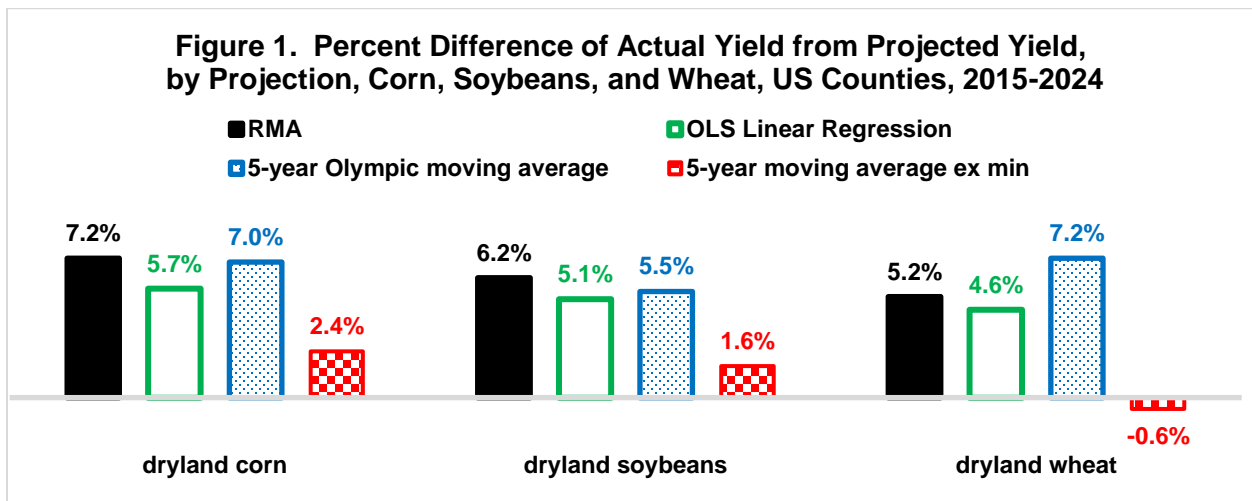
RMA does not release county yield updates until June. Therefore, the two moving averages are calculated using a 1-year lag. For example, a 5-year moving average yield projection for the 2024 crop year uses the actual yields reported by RMA for a county for the 2018-2022 crop years.

Regression and moving average methods both incorporate yield trends into their yield projections. Yield trends are a prominent feature of crop yields over the study period.

Percent difference of actual from projected yield and ECO 95% RP insurance payment were calculated for each county and crop year in the study. Average percent yield difference and average payment over 2015-2024 were calculated for each county and crop. Each county's average was then weighted by the county's share of total insured 2024 crop year acres for the counties in this analysis for a given crop. The US weighted averages are discussed in this article.

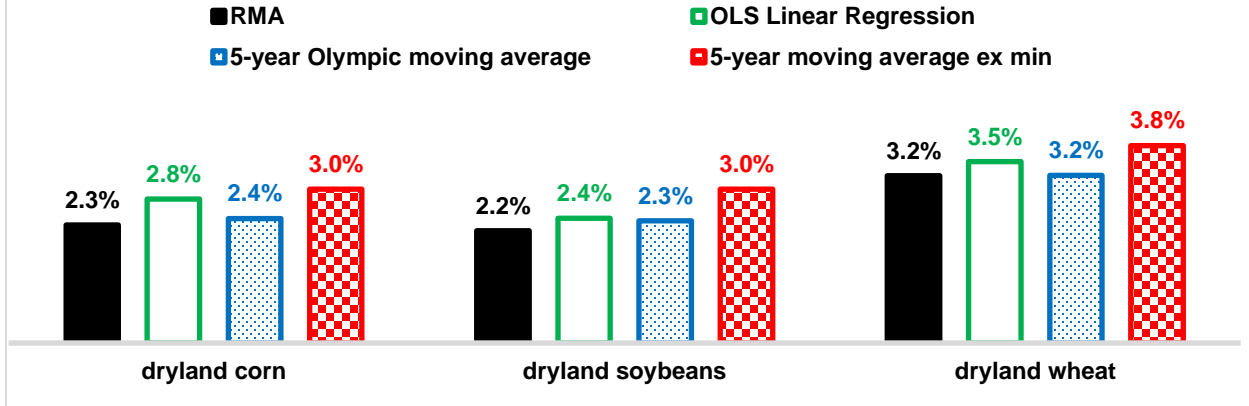
### Dryland Corn, Soybeans, and Wheat

Over 2015-2024, the 5-year moving average excluding the minimum yield on average provided the most accurate forecast of actual county yields for dryland corn, soybeans, and wheat (see Figure 1). Accuracy was measured as:  $(\text{actual RMA yield} / (\text{projected yield})) \text{ minus } 100\%$ . OLS linear regression had the next most accurate county yield projection on average. Both projection methods had smaller average percent differences than RMA projected yields.



The 5-year moving average excluding the minimum also resulted in the highest per acre payment by ECO 95% RP insurance for corn, soybeans, and wheat (see Figure 2 and Data Note 1). This finding was expected because yields projected by the other three methods were notably higher on average than actual yields over 2015-2024 (see Figure 1). The higher is projected vs. actual yield, the lower is the likelihood and size of payments, other factors the same. OLS linear regression had the second highest average payment for each crop, consistent with its ranking on yield projection accuracy.

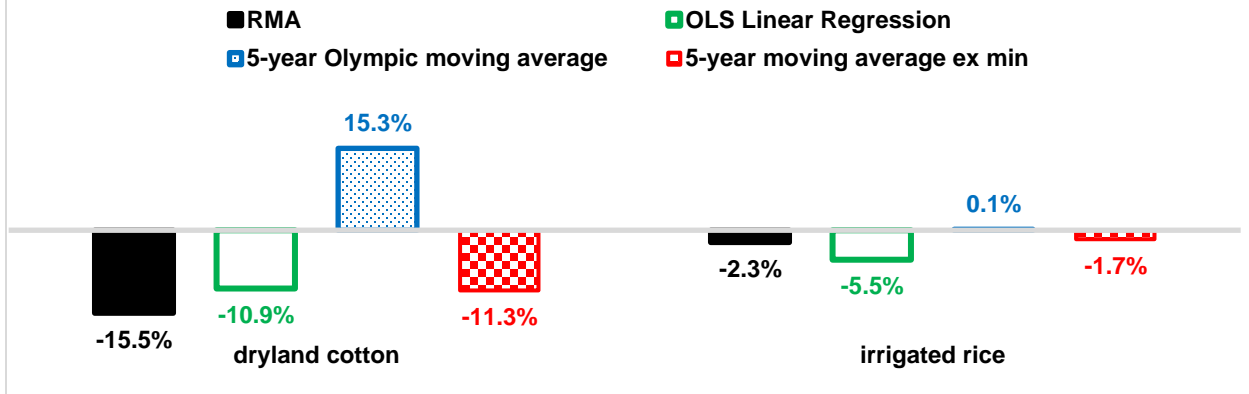
**Figure 2. Average County ECO 95% RP Per Acre Payment, by Projection, Corn, Soybeans, and Wheat, US Counties, 2015-2024**



### Dryland Cotton and Irrigated Rice

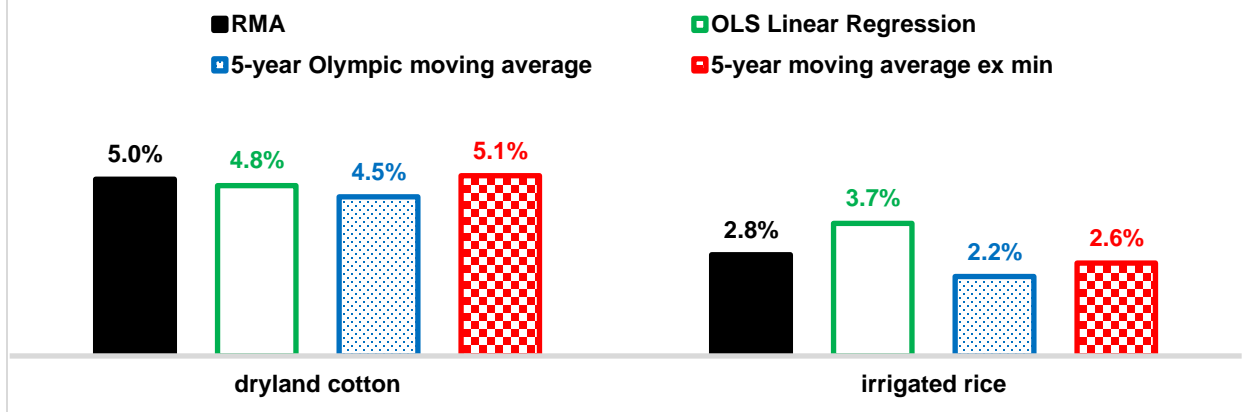
For cotton and rice county yields, performance of the different projection methods varied. OLS linear regression projections were the most accurate on average for cotton county yields but least accurate for rice (see Figure 3). The 5-year Olympic moving average projections were the most accurate on average for rice county yields but essentially tied with RMA for the least accurate for cotton. The average of the absolute values of the percent differences for the two crops is lowest for the 5-year moving average excluding the minimum (6.5%  $((11.2\%+1.7\%)/2)$  vs. 7.7%, 8.2%, and 8.9% for the Olympic average, OLS, and RMA). Absolute value converts negative values to positive values, allowing the magnitude of the percent differences in this case to be compared regardless of their sign,

**Figure 3. Percent Difference of Actual Yield from Projected Yield, by Projection, Cotton and Rice, US Counties, 2015-2024**



Unsurprisingly given the results from the yield prediction analysis, average per acre payments by ECO 95% RP insurance is also not consistent across cotton and rice (see Figure 4). For example, the 5-year moving average excluding the minimum provides the highest average county payment for cotton, but OLS linear regression provides the highest average county payment for rice.

**Figure 4. Average County ECO 95% RP Per Acre Payment, by Projection, Cotton and Rice, US Counties, 2015-2024**



## Discussion

Accurate projection of future county yields is important for crop insurance to fairly remunerate losses across crops and to minimize its impact on planted acres (see *farmdoc daily* of [March 11, 2026](#)).

RMA's projected county yields accurately fit 1997-2014 actual county yields used to rate SCO for its initial offering in 2015 (see addendum below). However, accuracy declined notably for 2015-2024 county yields. Among the four projection methods examined in this study, RMA projected yields were not the most accurate projection of 2015-2024 county yields for any of the five crops in this study. They were often the least accurate.

The 5-year moving average excluding the minimum yield provided in general the most accurate projection of 2015-2024 county yields. Its accuracy was especially notable for dryland corn, soybeans, and wheat. For 1997-2014 yields, its accuracy was, in general, close to that of RMA's projected yields (see addendum below).

Because the 5-year moving average excluding the minimum yield provided the most accurate projection of actual yields while the other three methods projected county yields above actual yields on average, the 5-year moving average excluding the minimum yield resulted in the highest average payment per acre by ECO 95% RP for dryland corn, soybeans, and wheat.

Given its county yield projection performance, the 5-year moving average excluding the minimum value also may be an appropriate replacement for the 5-year Olympic moving average method currently used for the ARC commodity program.

**Data Note 1:** RP insurance losses / payments are calculated: [(RMA actual (i.e. harvest) yield times RMA harvest price) divided by (RMA projected yield times higher of projected or harvest insurance price)] minus 100%. ECO 95% RP covers area (usually county) RP losses between 5% and 14%. Insurance prices are from RMA's price discovery database. Prices are by state. States in the analysis for wheat had insurance prices for only one type of wheat. For corn, soybeans, and cotton; Texas is the only state with multiple prices / sale closing dates. Texas multiple prices were averaged.

## References

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**Addendum: Historical Performance of RMA and 5-Year Moving Average Ex. Min**

This historical performance analysis starts with the 1997 crop year. Given the need to lag the moving average by one year, the 5-year moving average for 1997 is calculated using RMA actual yields for the 1991 through 1995 crop years. The historical analysis period ends with the 2014 crop year.

Two findings stand out. First, RMA projected yields were a more accurate prediction of actual yields prior to 2015 than since 2015, especially for corn, soybeans, and wheat. This finding was expected since RMA chooses regression equations to have a good fit for pre-2015 yields. However, as Table 1 illustrates, good historical fits do not guarantee good forecast performance.

The second finding is that absolute value of the percent differences averaged nearly the same for the two projections during 1997-2014 (1.4% vs. 1.5%, respectively). Thus, for 1997-2014, performance of the 5-year moving average excluding the minimum is similar in general to performance of RMA projected yields. In addition, the 5-year moving average excluding the minimum had more similar performance across the two periods, and especially for corn, soybeans, and wheat.

**Table 1. Percent Difference of Actual Yield from Projected Yield, by Crop and Projection, US Counties, 1997-2014 vs. 2015-2024**

Projection	period	dryland corn	dryland soybeans	dryland wheat	dryland cotton	irrigated rice
RMA	1997-2014	1.3%	-0.4%	1.8%	-1.5%	2.1%
RMA	2015-2024	7.2%	6.2%	5.2%	-15.5%	-2.3%
5-year moving average excluding min	1997-2014	0.9%	-1.0%	-1.0%	-0.1%	4.5%
5-year moving average excluding min	2015-2024	2.4%	1.6%	-0.6%	-11.3%	-1.7%