Summary of Yield Exclusion Rating Methodology, Contracted Review, External Reviews, Response to External Reviews, and Changes for 2016

(June 2015)

Background:

As required by the 2014 Farm Bill, RMA implemented the Yield Exclusion (YE) option for several of the primary insured crops for 2015. This option will be expanded to other crops for 2016. The YE allows growers the option to exclude certain yields from their Actual Production History (APH), effectively increasing their level of coverage. The yields that may be excluded are from years where the county yield is less than 50 percent of the preceding 10-year average, or when this occurs in an adjacent county.

For 2015, RMA developed a methodology for determining the additional premium rate needed to account for the increased coverage from the use YE. This methodology is the based on the approach that has been used for the several years for APH Trend Adjustment (TA), which increases a grower's level of coverage in a similar manner to YE.

RMA contracted for a review of the YE rating methodology, which was completed in December of 2014. Based on the results of that review, RMA implemented the methodology for the 2015 crop year. In January of 2015, the YE rating methodology and contracted review were sent out to five external reviewers and to National Crop Insurance Services (NCIS). Those reviews have been considered, and responded to, by the contractor that did the first review.

What follows is a brief overview of the YE rating methodology, a summary of the contracted review, a summary of the external reviews, a summary of the responses by the contractor to the external reviews, and RMA's evaluation of all material.

Overview of the YE Rating Methodology:

The rating methodology for YE is based on the concept of charging the same premium for the same yield guarantee. Suppose a grower has an APH (or expected yield) of 100 bushels, and selects 75% coverage. The yield guarantee would be 75 bushels (100 x 75%). Then suppose that, by the use of YE, the grower's APH increases to 115 bushels. In this case, the grower can choose a reduced coverage level of 65% and still end up with the same yield guarantee of 75 bushels as before (115 x 65%). The rating methodology charges the same premium for the 75 bushel guarantee (effectively 75% coverage) as the grower would have paid before. This is based on the premise that a 75 bushel guarantee is a 75 bushel guarantee – no matter what mechanism was used to get to that level of coverage.

It is expected that YE will generally produce effective coverage levels that do not line up exactly with the 5-percent coverage increments offered in the crop insurance program. In those cases, the rating methodology develops a rate based on the nearby coverage levels through ***interpolation***. For example, if the effective coverage level for a grower is 72%, then the premium rate is based on an interpolation, or a sort of weighted average, between the 70% and 75% rates.

There will be cases where the effect of YE is large enough that the effective coverage level exceeds 85%, or even 100%. In these cases the interpolation approach no longer works because RMA does not have

premium rates established beyond 85% percent. What is used instead is an ***extrapolation***. A straight-line trend is established from the 80% and 85% coverage levels, and then is extended out to the effective coverage level. Since RMA does not have historical experience for coverage levels beyond 85%, not much is known about the risks and producer behavior that may occur at these high levels of coverage. A straight-line extrapolation was considered as the midpoint in the range of potential outcomes.

Summary of Contracted Review:

The contracted review was generally supportive of RMA's proposed YE rating methodology. It had several recommendations, which were:

- That RMA should follow its proposed methodology for determining effective coverage levels.
- That RMA should follow it proposed methodology for determining premium rates based on those effective coverage levels.
- That RMA establish a premium rate cap such that the additional premium charged does not exceed the increase in the amount of insurance provided (liability) – this was implemented for the 2015 crop year.
- That RMA re-evaluate the coverage level differentials and the behavioral effects of effective coverage exceeding 85% after two years of YE experience has been collected, in order to refine current actuarial procedures.

RMA implemented the first 3 recommendations for the 2015 crop year. The remaining recommendation cannot be undertaken until some experience data has been accumulated.

Summary of External Reviews and Contractor Response:

The reviewers are generally supportive of the interpolation approach used for effective coverage levels up to 85%. However, 4 of the 5 reviewers and NCIS are critical of the straight-line extrapolation approach used for effective coverage beyond 85%. One reviewer finds the extrapolation approach to be reasonable. The reviewers' concerns, and contractor responses, are summarized by category below:

<u>Rate of Loss Beyond 85% Coverage</u>

Reviewer Comments: The reviewers developed models of how the rate of loss may increase, based on assumed yield distributions. Two of the reviewers and NCIS conclude that the extrapolation may generally understate premium rates. Another two reviewers conclude that the extrapolation may understate rates in some cases and overstate in others, with one of them pointing out that the understatement is more likely in low risk areas and overstatement is more likely in high risk areas. One reviewer felt that the extrapolation was reasonable.

Contractor Response: The contractor points out that the true yield distribution is unobservable, and therefore any potential errors are unknown. If the errors are unknown, then there is no way to correct for them in a way that unambiguously improves premium rates. It should also be pointed out that coverage level factors for coverage levels from 50% to 85%, derived from RMA historical loss data, are generally not consistent with the yield distributions assumed by the reviewers. If the yield distributions do not fit historical loss data for coverage levels below 85%, then it brings up the question of how

reliable they are for coverage beyond 85%, and whether they provide a credible basis for revising premium rates in advance of obtaining actual loss data.

The contractors also point out that low-rate areas, where some reviewers suggest that YE rates are more likely to be understated, are the very areas where YE will tend to have the least impact on effective coverage levels. A low-rate area tends to have less yield variability, making few (if any) years eligible for exclusion under YE.

In the higher-rate areas, yields are more variable and more years qualify for exclusion – with a correspondingly larger impact on effective coverage levels. But it is in these same higher-risk areas where some reviewers suggest that current extrapolation method will tend to, if anything, overstate YE premium rates.

If the yield distributions used by the reviewers were accepted as correct, it would suggest that the current extrapolation method is most effective in the same higher-risk areas where YE is most likely to be used and to have the most impact.

Moral Hazard and Adverse Selection

Reviewer Comments: A couple of reviewers and NCIS express concern that effective coverage levels beyond 85%, and especially 100%, may invite moral hazard, which should be accounted for in the premium rates. Moral hazard refers to the decreased incentive growers may have to care for their crops as the level of their insurance coverage increases. Adverse selection refers to the potential for higher-risk growers to select YE at a greater rate than other growers, harming actuarial performance.

Contractor Response: This is a valid concern, but RMA already applies a proportional load to account for moral hazard and adverse selection. As the effective coverage level increases, the amount of the load (in absolute terms) similarly increases. There is a question as to whether the load should increase disproportionately for effective coverage levels beyond 85 percent, but this question cannot be addressed until loss data is accumulated. Without that data there is no basis for revising the load.

With regard to adverse selection specifically, YE will be available to all growers in a county regardless of their individual level of risk. If YE is triggered due to a disaster year, then it is likely that a large-scale systemic event (i.e. drought) has occurred. Such an event tends to affect all growers, regardless of their inherent risk. Because of the general applicability of YE, it is not readily apparent that YE presents an increased risk of adverse selection.

Other Issues

Out of all of the reviews, NCIS was the most expansive, raising questions about YE and premium rates that are beyond the scope of what the other reviewers addressed. These questions include:

- Whether RMA has “properly identified the primary and contiguous counties” for YE
- Whether RMA’s current rating methodology (outside of YE) “is appropriate across the entire population [of insured growers]”
- Whether the rating methodology for YE was sufficiently tested
- Whether the rating methodology for YE is properly programmed into RMA’s cost estimator
- What is the “impact of Yield Exclusion on the program as a whole”

- What is the “impact of the Yield Exclusion on the financial risk of the Approved Insurance Providers”
- What options are there to protect AIPs from that financial risk

Changes for 2016

For 2016, RMA is making two revisions in response to the comments received by the contractors and reviewers.

First, RMA is updating the coverage level factors for the major crops using recently-accumulated loss data. The coverage level factors form the basis for the extrapolation used for YE premium rates and therefore will have a direct effect. The amount of accumulated loss data is now sufficient to allow the coverage level factors to be determined by level of risk, rather than at a national level as was done previously. This generally results increases in YE rates in lower-risk areas and smaller changes elsewhere. This incidentally address, at least in part, some of the concern expressed by reviewers about YE rates in low risk areas.

Second, RMA is adding an uncertainty load of 5 percent that begins to phase in at effective coverage levels over 85 percent and is fully phased in at coverage levels of 100 percent or higher. The uncertainty load addresses that fact that there is no data about producer behavior at very high levels of coverage, therefore uncertainty. As data on producer behavior at higher coverage levels is accumulated, the premium rates for YE will be revised to reflect that data and the uncertainty load will be phased out.