Review of the Rating Methodology of the APH Yield Exclusion

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(1) THE EXECUTIVE SUMMARY

The proposed (YE) option allows the producer to exclude any recorded or appraised yield for a crop for any year in which the per-planted-acre yield in the county is at least 50% below the simple average per-planted-acre yield during the previous ten consecutive years. More succinctly, the trigger for the YE option is when the county yield falls below 50% of the county T-yield, enabling a producer's actual yield for that crop in that year to be dropped from their approved APH. Two other components to the proposal include: (1) in any crop year in which the YE option is triggered for a county, any producers farming in contiguous counties are also eligible to exclude any recorded or appraised yield for the crop also and (2) separate determinations are made for both irrigated and non-irrigated acreage within a county.

The impact of the proposed YE option, by allowing a producer to exclude any recorded or appraised yield for a crop for any year in which the per-planted-acre yield in the county is at least 50% below the T-yield, will lead to a higher approved APH yield. The approved APH yield is used to establish the production guarantee for APH plans of insurance and so an increase in this approved yield results in a higher production guarantee. That is, the YE option results in an *effective* coverage level that is greater than the *nominal* coverage level. A higher production guarantee on a policy unit also leads to an increase in expected indemnities, and so premium rates should be adjusted (increase also) to remain actuarially fair. RMA's proposed approach as the submission states is that the "same premium should be charged for a given yield guarantee on a policy no matter whether the guarantee is derived from a simple average of APH yields or an average of yields with Trend Adjustment or Yield Exclusion."

The proposed methodology to adjust premium rates includes calculation of the *effective* coverage rate, and then using the existing *nominal* coverage rate differentials and applying the techniques of linear interpolation or linear extrapolation, to obtain an adjusted base premium rate for the policy unit for which the YE option is elected. Employing linear extrapolation along with the suggested caps is appropriate in the short-term due to a lack of experience data. The reviewer concurs with the submitters' Recommendations 1, 2, and 3 as being reasonable. Looking forward after implementation of the YE option, and when sufficient YE option actual experience is available, an empirical investigation of coverage level differentials and the methodology to arrive at the appropriate adjusted premium rate with the YE option should be undertaken. Thus, the reviewer also concurs with the submitters' Recommendation 4.

The rating process involves recognizing that the YE option increases the approved yield on a policy unit. Insuring a higher yield guarantee means that expected indemnities will increase and so in accordance with maintaining actuarial soundness, an adjustment will need to be made to premium rates. The proposed rating process used to adjust rates to reflect the YE option employs the relationship between the *nominal* coverage and the *effective* coverage level that results from electing the YE option. The *effective* coverage level is determined by scaling up or taking the product of the *nominal* coverage with the ratio of (YE_APH/SA_APH) where YE_APH is the average of yields in the APH database after the years that are triggered by the YE option are excluded and SA_APH is the simple average of the yields in the database inclusive of other applicable approved plugs being incorporated and also the yields the YE option drops from the series. Upon calculating

the *effective* coverage level with the YE option, the adjusted premium rate must be obtained using the existing *nominal* coverage differentials. This characteristic leads to two issues that must be managed with some additional calculations as follows: (1) Effective coverage levels that fall within the range of the *nominal* coverage levels (between 55% and 85% but not equal to one of the 5% increments), can employ *linear interpolation,* combined with the next-to-lowest and next-to-highest *nominal* coverage levels, and their respective coverage level differential, to obtain a coverage level differential for the new *effective* coverage level; and (2) Effective coverage levels that exceed the maximum *nominal* coverages levels can employ *linear extrapolation,* combined with the change in coverage of coverage level differentials between the next-to-highest and highest available *nominal* levels. In both (1) and (2) the imputed *effective* coverage level differentials would be multiplied by the base premium rate for 65% coverage, to obtain the base premium rate of the policy unit with the YE option. The proposed methodology involves one final step in arriving at premium based on the *effective* coverage level for YE option yields which involves capping the premium. The submitters believe that the rates based on linear extrapolation to *effective* coverage levels of 200% or more will need to be capped. Furthermore, the submitters recommend the RMA consider a mechanism by which additional premiums (or the marginal amount of premium) for any 5% coverage level interval such that the marginal premium cannot exceed the marginal liability as a result of the YE option. This makes intuitive sense, since a producer would not want to pay more in additional premiums (in dollars) than the additional guarantee (in dollars) they might receive as a result of the YE option, hence the recommendation of marginal premium rate caps.

In this review some potential behavioral incentives of the introduction of the YE option are established and examined. The motivation of this additional analysis stems from Recommendation 4 from the submitters and the reviewer's opinion that the ensuing higher *effective* coverage levels obtained with the YE option will bring about behavioral changes in the producers in response to these possible higher levels of effective coverage. *Producers will, in practice, most likely select the coverage level that gives them the best guarantee return per producer-paid premium as a result of the YE option.* This expectation of a behavioral response is even further motivated with the premium subsidy in play, with the YE option enabling producers to potentially reduce the producer-paid premiums (perhaps an unintended consequence of the proposal) and maintain similar coverage levels they currently have but at a lower cost to the producer. This review reveals the savvy producers who seek the coverage level that gives them the best guarantee return per producer-paid premium paid as a result of the YE option, will if they were previously utilizing the *nominal* 75% coverage level, will be better served by electing the *nominal* 70% coverage level with YE option achieving a higher APH guarantee at a lower cost. This opportunity exists for producers no matter what their current *nominal* coverage level is, with savings to be greater for the higher *nominal* coverage levels on a producer-paid premiums ($/acre) per APH Guarantee (bushels). It is this potential behavioral incentive for producers with the introduction of the YE option which underscores the need for RMA to re-evaluate the coverage level differentials and the behavioral component after sufficient YE experience has been collected.

(2) THE RESEARCH REPORT

(A) DESCRIPTION OF THE METHODOLOGY USED BY THE EXPERT REVIEWER.

This review provides a response to all of the items in C.3 from the Task Order Statement of Work for "Methodology for Establishing Rates for Yield Exclusion". Each item has been addressed within the scope of the reviewer's knowledge and expertise. The reviewer holds a Ph.D. in Agricultural and Resource Economics and has more than 18 years of post-doctoral work experience in the areas of crop insurance and risk management. He has relied upon his training in agricultural economics and econometrics, as well as his research experience in these areas, to assess and formulate responses to the items in C.4. The reviewer has also drawn upon his experiences as an Extension Specialist, which includes presenting educational programs in the areas of marketing and risk management to agricultural producers, county agents, lenders, and others. This experience has increased the reviewer's understanding about what is necessary in order for risk management tools to be effective and to be utilized by producers.

Throughout this review, responses and discussion are supported with empirical evidence wherever appropriate.

(B) A DISCUSSION REGARDING EACH OF THE ITEMS LISTED IN SECTION C.4.

1) Actuarial soundness.

(A) Are adequate, credible, and reliable rate-making data available?

Yes. The proposed methodology utilizes data that is already available and should be considered adequate, credible, and reliable to make the adjustment needed to rates to reflect the Yield Exclusion (YE) option which results in a higher approved APH yield. The proposed (YE) option allows the producer to exclude any recorded or appraised yield for a crop for any year in which the per-planted-acre yield in the county is at least 50% below the simple average per-planted-acre yield during the previous ten consecutive years. More succinctly, the trigger for the YE option is when the county yield falls below 50% of

the county T-yield, enabling a producer's actual yield for that crop in that year to be dropped from their approved APH. Two other components to the proposal include: (1) in any crop year in which the YE option triggered for a county, any producers farming in contiguous counties are also eligible to exclude any recorded or appraised yield for the crop also and (2) separate determinations are made for both irrigated and non-irrigated acreage within a county.

The impact of the proposed YE option, by allowing a producer to exclude any recorded or appraised yield for a crop for any year in which the per-planted-acre yield in the county is at least 50% below the T-yield, will lead to a higher approved APH yield. The approved APH yield is used to establish the production guarantee for APH plans of insurance and so an increase in this approved yield results in a higher production guarantee. That is, the YE option results in an *effective* coverage level that is greater than the *nominal* coverage level. A higher production guarantee on a policy unit also leads to an increase in expected indemnities, and so premium rates should be adjusted (increase also) to remain actuarially fair.

RMA's proposed approach as the submission states is that the "same premium should be charged for a given yield guarantee on a policy no matter whether the guarantee is derived from a simple average of APH yields or an average of yields with Trend Adjustment or Yield Exclusion." (Section 2.1, Pg., 4). The proposed methodology to adjust premium rates includes calculation of the *effective* coverage rate, and then using the existing *nominal* coverage rate differentials and applying the techniques of linear interpolation or linear extrapolation, to obtain an adjusted base premium rate for the policy unit for which the YE option is elected. All of the data needed to complete this calculation of adjusting the base premium rate is already known, and any concerns of whether they are adequate, credible, and reliable rate-making data available for the proposed rate adjustment are not evident rather they are the best available.

(i) Is it likely that the data will continue to be available?

Yes, all of the data needed to employ the proposed methodology will continue to be

available moving forward. However, it seems appropriate to note the proposed methodology relying on linear extrapolation with suggested caps to calculate the adjusted base premium rates, is most likely to be temporary, but necessary, due to a lack of experience data with the proposed higher approved yields with the YE option at this time. It is the reviewer's opinion, one which is also shared by the submitters (see Recommendation 4, page 8), that the ensuing higher *effective* coverage levels obtained with the YE option will possibly bring about behavioral changes in the producers in response to these possible higher effective levels of coverage. This expectation of a behavioral response is even further motivated with the premium subsidy in play, with the YE option enabling producers to potentially reduce the producer-paid portion of the total premiums (perhaps an unintended consequence of the proposal) and maintain similar coverage levels they currently have but at a lower cost to the producer. This is discussed in more detail in section (C) of this review. With this in mind, along the same lines as the submitters' Recommendation 4, when sufficient YE experience data becomes available that will capture potential behavioral changes, a re-evaluation of the methodologies should be undertaken.

To be clear, the proposed methodology of employing linear extrapolation along with the suggested premium caps is appropriate in the short-term due to a lack of experience data. The reviewer concurs with the submitters' Recommendations 1, 2, and 3 as being reasonable. Looking forward after implementation of the YE option, and when sufficient YE option actual experience is available, an empirical investigation of coverage level differentials and the methodology to arrive at the appropriate adjusted premium rate with the YE option should be undertaken due to concerns of behavioral changes induced by the YE option. Thus, the reviewer also concurs with the submitters' Recommendation 4.

(ii) Is the data vulnerable to tampering if the proposed rated methodology is approved?

No. With the trigger of the YE exclusion relying on when the county yield falls below 50% of the county T-yield there should be no concerns of vulnerability or tampering.

(B) Are the explicit and implicit assumptions used in the rating process reasonable?

Yes. The explicit and implicit assumptions used in the rating process are reasonable. The rating process involves recognizing that the YE provision gives a producer the option of increasing the approved yield on a policy unit. Insuring a higher yield guarantee means that expected indemnities will increase and so in accordance with maintaining actuarial soundness, an adjustment will need to be made to premium rates.

The proposed rating process used to adjust rates to reflect the YE option employs the relationship between the *nominal* coverage (the coverage level a producer currently has) and the *effective* coverage level that results from electing the YE option. The *effective* coverage level is determined by scaling up or taking the product of the *nominal* coverage with the ratio of (YE_APH/SA_APH) where YE_APH is the average of yields in the APH database after the years that are triggered by the YE option are excluded and SA_APH is the simple average of the yields in the database inclusive of other applicable approved plugs being incorporated and also the yields the YE option drops from the series as shown in Table 1. In this example (YE_APH/SA_APH) = (108/100) =1.08. The submission illustrates this calculation in equation (2.2) where a producer's *nominal* coverage level of 75% is scaled up to have an *effective* coverage level of 81% (=0.75*1.08). Upon calculating the *effective* coverage level with the YE option, the adjusted premium rate must be obtained using the existing *nominal* coverage differentials. Notably, (and this reviewer suggests purposely for the illustration) the increase in *effective* coverage in (2.2) in the submission did not conveniently increase by one of the 5% increments ranging from 50% to 85%. This characteristic leads to two issues that must be managed with some additional calculations as follows:

Table 1: Illustrative Example of How Yield Exclusion Can Affect APH

Year	County T-yield	60% of T-yield	Example Grower APH	APH w/60% Substitution	APH w/ Excluded Yields
			[a]		
2005	96	58	110	110	110
2006	104	62	100	100	100
2007	104	62	88	88	88
2008	104	62	118	118	118
2009	106	64	111	111	111
2010	106	64	110	110	110
2011	119	71	55	71	Excluded
2012	119	71	20	71	Excluded
2013	119	71	57	71	71
2014	119	71	153	153	153
		Approved Yield	**92**	**100**	**108**
		YE_APH / SA_APH			**1.08**

Source: "The Actual Production History Yield Exclusion: Overview of Premium Rating" downloaded from "http://www.rma.usda.gov/policies/2014/aphyeoverview.pdf" the example also appears in the submission as Table 2.1. Some additional calculations added by the reviewer.

1. *Effective* coverage levels that fall within the range of one of the *nominal* coverage levels (between 55% and 85% but not equal to one of the 5% increments), can employ ***linear interpolation***, combined with the next-to-lowest and next-to-highest *nominal* coverage levels, and their respective coverage level differential, to obtain a coverage level differential for the new *effective* coverage level. The submission shows in equation (2.3) an example of how to calculate the *effective* coverage level for 81% based on employing linear interpolation and using the 80% *nominal* coverage level differential (of 1.4) and the 85% coverage level differential (of 1.5), respectively, to calculate the *effective* coverage level for 81% which turns out to be 1.42.
2. *Effective* coverage levels that exceed the maximum *nominal* coverages levels can employ ***linear extrapolation,*** combined with the change in coverage of coverage level differentials between the next-to-highest and highest available *nominal* levels—

for most crops this will be the *nominal* levels of 80% and 85%. The submission shows in equation (2.4) an example of how to calculate the *effective* coverage level for 100% coverage based on employing linear extrapolation and using the 80% *nominal* coverage level differential (of 1.4) and the 85% coverage level differential (of 1.5), respectively, to calculate the *effective* coverage level for 100% coverage, which turns out to be 1.8.

In both 1) and 2) the imputed *effective* coverage level differentials (1.42 for 81% and 1.8 for 100%, respectively), would be multiplied by the base premium rate for 65% coverage, to obtain the base premium rate of the policy unit with the YE option.

The proposed methodology involves one final step in arriving at premium based on the *effective* coverage level for YE option yields which involves capping the premium. The submitters believe that the rates based on linear extrapolation to *effective* coverage levels of 200% or more will need to be capped. This recommendation appears reasonable. Furthermore, the submitters' recommend (see Recommendation 3) the RMA consider a mechanism by which additional premiums (or the marginal amount of premium) for any 5% coverage level interval such that the marginal premium cannot exceed the marginal liability as a result of the YE option. This makes intuitive sense, since a producer would not want to pay more in additional premiums (in dollars) than the additional guarantee (in dollars) they might receive as a result of the YE option, hence the recommendation of marginal premium rate caps.

In short, this reviewer finds the explicit and implicit assumptions used in the rating process reasonable and appropriate. As discussed elsewhere in this review this judgment is made in the context that the YE option is likely to introduce behavioral changes in insureds, and when sufficient data is available capturing this change, an empirical analysis should be undertaken to further refine rate adjustment for the YE option. The submitters agree with this judgment and make it a recommendation (see Recommendation 4). Until sufficient experience data is available the proposed approach is appropriate with the current base of historical experience and proposed premium caps.

(C) Are the technical analyses (e.g., stochastic and other simulations) technically correct? Do they provide credible, relevant results?

Yes. As explained in detail elsewhere in this review the technical analysis appropriately employs linear interpolation or linear extrapolation when justified. Linear interpolation utilizes the next-to-lowest and next-to-highest *nominal* coverage levels, and their respective coverage level differential, to calculate a coverage level differential for the YE options *effective* coverage. Linear interpolation is appropriate for coverage levels that fall within the range of one of the *nominal* coverage levels (between 55% and 85% but not equal to one of the 5% increments). Linear extrapolation, utilizes the next-to-highest and highest available *nominal* coverage levels (for most crops this will be the *nominal* levels of 80% and 85%) and their respective coverage level rate differential, to calculate a coverage level differential for the YE options *effective* coverage. The *effective* coverage rate differentials for the YE option are in turn then multiplied by the base premium rate for 65% coverage rate to obtain the base rate for the premium for YE option. This approach was carried out correctly in the submission and provides credible and relevant results.

(D) Is the data used for the analyses appropriate, reliable, and the best available?

Yes. The proposed methodology utilizes data that is already available, appropriate, reliable, and the best available to make the adjustment needed to rates to reflect the Yield Exclusion (YE) option adjustment of higher approved yield. The submitters make Recommendations 5 and 6 in an effort to preserve the actual indemnity experience in the base ratemaking process to the greatest extent possible. Furthermore, the submitters recommend the RMA to continue to adjust compiled data at the Statplan level to the 65% common coverage level. These procedural recommendations seem reasonable and are made in the spirit of having the best available data as possible on hand and avoiding losing indemnification data.

(E) Are the proposed premium rates likely to cover anticipated losses and a reasonable reserve?

The motivation of the YE option is that it enables the approved yield, which is used in in the crop insurance program to set the production guarantee for Actual Production History (APH) plans of insurance to increase in a county (and contiguous counties) that experience a severe loss to yields county wide such that the county experiences an average less than 50% of county T-yield. This approved yield is calculated as the simple average of at least 4 years and up to 10 years with various adjustments being permitted, such as the substitution of the 60 T-yield, yield cups of 90% of the previous yield, and the various yield floors based on the number of actual yields, all which lead to a higher approved yield than the simple average of actual yields. Whenever one of the approved adjustment mechanisms are applied that lead to an approved yield higher than the simple average as the submission describes in Section 1.0 (page 1), the producer pays a higher premium rate for this coverage based on the **rate yield** which is the simple average of producers actual yield history without any adjustments (i.e., plugs, cups, and floors). The submission further opines that use of the **rate yield** provides a reasonable approximation of the actuarial impacts of these adjustment mechanisms given their impact on the magnitude of the approved yields. This rationale seems reasonable and appropriate for the already available adjustment mechanisms.

The methodology adopted to accommodate the YE option recognizes that the YE option culminates in having to insure a higher yield guarantee meaning that expected indemnities will increase and so in accordance with maintaining actuarial soundness, an adjustment will need to be made to premium rates. The adjustment process that adjusts rates to reflect the YE option employs the relation between the *nominal* coverage and the *effective* coverage level that results from electing the YE option. Upon calculating the *effective* coverage level with the YE option, the adjusted premium rate must be obtained using the existing *nominal* coverage differentials. Depending on whether the *effective* coverage falls with the existing *nominal* coverage differentials 50%-85% interpolation is used and, if it falls above the maximum of 85%, linear extrapolation is used to calculate the *effective* coverage rate differential which is then multiplied by the base premium rate

for 65% coverage rate to obtain the base rate for the premium.

Importantly, the **rate yield** (the producer's simple average with all actual data and no plugs or exclusions) is unaffected by the YE option. This **rate yield** aptly measures a producer's risk relative to other producers in the county. This rate yield is used in conjunction with the reference yield (the county yield) to make "yield adjustments" such that producer's rate yields that are above the county have lower premium rates with the reverse also being true that producers' rate yields that are below the county have higher premium rates. The proposed methodology to adjust premium rates for the YE option leaves the "yield adjustment" unaffected. There is nothing about how the adjusted rates are derived to suggest that the adjusted premium rates to accommodate the YE option will not cover anticipated losses and a reasonable reserve.

(F) Is the actuarial methodology appropriate for the insured risks?

Yes. The insured risks remain the same and there are no fundamental proposed changes to the actuarial methodology. The methodology adopted recognizes that the YE option culminates in having to insure a higher yield guarantee meaning that expected indemnities will increase and so in accordance with maintaining actuarial soundness, an adjustment will need to be made to premium rates. The adjustment process that adjusts rates to reflect the YE option employs the relation between the *nominal* coverage and the *effective* coverage level that results from electing the YE option. Upon calculating the *effective* coverage level with the YE option, the adjusted premium rate must be obtained using the existing *nominal* coverage differentials. Depending on whether the *effective* coverage falls with the existing *nominal* coverage differentials 50%-85% interpolation is used and, if it falls above the maximum of 85%, linear extrapolation is used to calculate the *effective* coverage rate differential which is then multiplied by the base premium rate for 65% coverage rate to obtain the base rate for the premium. The submitters recommend that RMA consider a capping mechanism to limit the amount of premium for a 5% coverage level interval such that the marginal premium cannot exceed marginal liability. In all, these procedures with the suggested caps are the best available until the current base has the opportunity to encompass some historical experience of the YE

option.

(C) ADDITIONAL INFORMATION AT THE DISCRETION OF THE EXPERT REVIEW

Producers will, in practice, most likely select the coverage level that gives them the best guarantee return per producer-paid premium as a result of the YE option. Below, some potential behavioral incentives of the introduction of the YE option are established and examined. The motivation of this additional analysis stems from Recommendation 4 from the submitters and the reviewer's opinion stated elsewhere in this review, that the ensuing higher *effective* coverage levels obtained with the YE option will bring about behavioral changes in the producers in response to these possible higher levels of coverage. This expectation of a behavioral response is even further motivated with the premium subsidy in play, with the YE option enabling producers to potentially reduce the producer-paid premiums (perhaps an unintended consequence of the proposal) and maintain similar coverage levels they currently have but at a lower cost to the producer.

To examine some of the potential behavioral incentives of the introduction of the YE option Table 2 below combines Table 1 and Table 2 from the RMA overview entitled "The Actual Production History Yield Exclusion: Overview and Premium Rating"[1] and then calculates the producer and government paid premiums based on the current premium subsidy for basic and optional units published by RMA.[2] The first notable illustration in Table 2 is a comparison of total premiums with and without the YE option for the different coverage levels. Consider a producer without the YE option who insures at the 75% coverage level with a total premium of $59.93 per acre. With the YE option, their *effective* APH coverage level increases to 81% (the same illustrative example discussed above and in the submission) with a total premium of $73.87 per acre. That is, the additional APH guarantee of 6 bushels (81 bushels instead of 75 bushels) costs an additional $13.94 per acre or $2.32 per bushel for the higher

[1] http://www.rma.usda.gov/policies/2014/aphyeoverview.pdf
[2]http://www.rma.usda.gov/FTP/References/subsidy/subsidy.pdf

Table 2: Illustrative Example of How Yield Exclusion Can Affect APH Guarantee, Total Premium Per Acre, Producer and Government Paid Premiums, and the Producer-Paid Premium Per APH Guarantee

	APH Guarantee		Total Premium Per Acre		Producer and Government Paid Premiums					Producer Paid Premium Per APH Guarantee		Producer Savings from Reducing Nominal Coverage Level by 5% with YE
Coverage Level	APH w/60% Substitution [APH=100]	APH w/ Excluded Yields [APH=108]	Without YE	With YE	Premium Subsidy for Basic & Optional Units	Breakout of Premiums Without YE		Breakout of Premiums With YE		Without YE	With YE	
						PRODUCER	GOVERNMENT	PRODUCER	GOVERNMENT			
	bushels	*bushels*	*$/acre*	*$/acre*	*%*	*$/acre*	*$/acre*	*$/acre*	*$/acre*	*($/acre)/bu*	*($/acre)/bu*	*($/acre)/bu*
50%	50	54	$19.13	$23.19	**67%**	$6.31	$12.82	$7.65	$15.54	$0.126	$0.142	$0.017
55%	55	59	$24.26	$29.39	**64%**	$8.73	$15.53	$10.58	$18.81	$0.159	$0.178	$0.005
60%	60	65	$30.58	$38.06	**64%**	$11.01	$19.57	$13.70	$24.36	$0.183	$0.211	$0.029
65%	65	70	$38.18	$48.69	**59%**	$15.65	$22.53	$19.96	$28.73	$0.241	$0.284	$0.000
70%	70	**76**	$48.55	**$61.50**	**59%**	$19.91	$28.64	**$25.22**	$36.29	$0.284	**$0.334**	$0.024
75%	**75**	81	**$59.53**	$73.87	**55%**	**$26.79**	$32.74	$33.24	$40.63	**$0.357**	$0.410	$0.054
80%	80	86	$71.42	$87.49	**48%**	$37.14	$34.28	$45.49	$42.00	$0.464	$0.527	$0.089
85%	85	92	$84.33	$104.68	**38%**	$52.28	$32.05	$64.90	$39.78	$0.615	$0.707	--

Source: "The Actual Production History Yield Exclusion: Overview of Premium Rating" combining Table 1 & 2 with some additional calculations.
http://www.rma.usda.gov/policies/2014/aphyeoverview.pdf
http://www.rma.usda.gov/FTP/References/subsidy/subsidy.pdf

guarantee. It is noteworthy, however, that the *effective* coverage level of the *nominal* 70% coverage level with the YE option generates an APH guarantee of 76 bushels, 1 bushel more than the than *nominal* 75% coverage level without the YE option. The adjusted total premium for the *nominal* 70% coverage level with YE option which translated into an *effective* APH guarantee of 76 bushels is $61.50 per acre. This can be compared to the *nominal* 75% coverage level without the YE option with an APH guarantee of 75 bushels which is very similar $59.53 per acre or $1.57 per acre less. The difference can be explained by the 1-bushel-more *effective* guarantee associated with the *nominal* 70% coverage level with the YE option, confirming that YE option's increase of the *effective* guarantee is reflected in higher total premiums that preserve the actuarial soundness in the presence of the YE option. However, returning to the initial remark that producers will in practice most likely select the coverage level that gives them the best guarantee return per producer-paid premium as a result of the YE option means that we need to peel the onion one more layer and explore the breakout of producer-paid premiums given the presence of premium subsidies in place.

Table 2 shows for each *nominal* coverage level in increments of 5% the breakout of producer- and government-paid premiums without and with the YE option. Again, consider a producer without the YE option who insures at the 75% coverage level with a total producer-paid premium of $26.79 per acre (the subsidy level is 55% at the 75% level). Now consider if this producer decides to insure at the *nominal* 70% coverage level and utilize the YE option, the *effective* APH guarantee is 76 bushels and the producer-paid premium is $25.22 per acre (the subsidy level is 59% at the 70% level). In essence, the producer can achieve a higher APH guarantee 1 bushel (=76-75) and pay $1.57 (=$26.79-$25.22) per acre less. The producer-paid premium per APH guarantee for the *nominal* 75% coverage level is $0.357 ($/acre)/bu compared with the *nominal* 70% coverage level with the YE option which is $0.334 ($/acre/bu), a savings of $0.024 ($/acre/bu). The savvy producers who seek the coverage level that gives them the best guarantee return per producer-paid premium dollar as a result of the YE option, will if they were previously utilizing the *nominal* 75% coverage level, will be better served by electing the *nominal* 70% coverage level with YE option achieving a higher APH guarantee at a

lower cost. The final column in Table 2 reveals this opportunity exists for producers no matter what their current *nominal* coverage level is, with savings to be greater for the higher *nominal* coverage levels on a producer-paid premiums ($/acre) per APH Guarantee (bushels)—as high as $0.089 ($/acre)/bu from changing from 85% coverage level without the YE option to 80% coverage level with YE option. It is this potential behavioral incentive for producers with the introduction of the YE option which underscores the need for RMA to re-evaluate the coverage level differentials and the behavioral component after sufficient YE experience has been collected. This is consistent with Recommendation 4 made by the submitters.

(D) SHORT BIOGRAPHIES (NOT TO EXCEED ONE PAGE) FOR EACH PERSON WHO TOOK SUBSTANTIAL PART IN THE EXPERT REVIEW.

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EDUCATION

1997 Ph.D. University of California at Davis, California, USA
1994 M. Sc. University of California at Davis. California, USA
1992 B. Ag. Econ. (First Class Honors) University of New England, NSW, Australia

PROFESSIONAL EXPERIENCE

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7/2003–6/2009 Associate Professor with Tenure, Dept. of Agricultural and Resource Economics, North Carolina State University
11/1997–6/2003 Assistant Professor, Dept. of Agricultural and Resource Economics, North Carolina State University

EXPERTISE

Demand analysis, applied econometrics, trade, commodity markets, and risk management.

SCHOLARLY HONORS

American Agricultural Economics Association Award for Professional Excellence— Distinguished Extension Award: Less Than 10 Years' Experience, 2005.
American Agricultural Economics Association Award for Professional Excellence—Outstanding Ph.D. Dissertation Award (sole winner), 1998.
Food Distribution Research Society 1998 Applebaum Outstanding Ph.D. Thesis Award.
Gordon King Award for Best Ph.D. Dissertation completed in the Department of Agricultural and Resource Economics, University of California at Davis, 1997.

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