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RMA

2010 Annual Crops and the Federal Crop Insurance Program

Report to Congress

Executive Summary

Section 12030 of the Food, Conservation, and Energy Act of 2008 required the U.S. Secretary of Agriculture to submit to the Committee on Agriculture of the House of Representatives and the Committee on Agriculture, Nutrition, and Forestry of the Senate a report containing details about activities and administrative options of the Federal Crop Insurance Corporation and the U.S. Department of Agriculture's (USDA) Risk Management Agency (RMA) that address issues relating to:

> (1)   declining yields on the actual production histories of producers; and
> (2)   declining and variable yields for perennial crops, including pecans.

This report is focused on concerns specific to *declining yields on the actual production histories* of producers of annual crops. A separate report to Congress was submitted July 14, 2009, to address the declining yield concerns of perennial crop producers.

In 2000, section 508(g)(4) was added to the Federal Crop Insurance Act (Act) providing the following mechanism to help address declining yields: "If, for one or more of the crop years used to establish the producer's actual production history of an agricultural commodity, the producer's recorded or appraised yield of the commodity was less than 60 percent of the applicable transitional yield, as determined by the Corporation, the Corporation shall, at the election of the producer:

> (i)   exclude any of such recorded or appraised yield; and
> (ii)   replace each excluded yield with a yield equal to 60 percent of the applicable transitional yield."

In addition to the yield substitution provided by the Act, RMA also offers two other measures that can limit the decline in a producer's Actual Production History (APH). One measure, the Catastrophic Yield Adjustment, limits a producer's approved APH yield to decreases of no more than 10 percent from one year to the next. The other measure, the Yield Floor, limits a producer's approved APH yield to be not less than 70 to 80 percent of the applicable county Transitional Yield (T-Yield), which is generally based on the USDA National Agricultural Statistics Service (NASS) 10-year county average yield. The percentage is dependent on the number of years of actual yields contained in a producer's APH.

Conceptually, such adjustments may be appropriate if the low yield is not representative of the true production expectation and would leave the producer with an inappropriately low crop insurance guarantee. The practical impact of such adjustments (or of not making adjustments) depends on how prevalent and predictable are these phenomena. Any increase in crop insurance guarantees higher than what would otherwise be appropriate will eventually necessitate premium rate increases. However, higher premium rates may, in turn, lead to reduced program participation. Yet, reducing production guarantees to reflect the effects of low actual yields may be perceived as reducing the value of the crop insurance coverage.

Key questions, therefore, are:

(1) How appropriate are the current procedural yield adjustments to address these situations?
(2) How can they be improved?

In an effort to elicit new and innovative ideas to address declines in APH yields resulting from multiple years of disaster, in March 2004, RMA requested that the public submit proposals to be piloted in response to mitigating declines in a producer's crop insurance guarantee. RMA specifically sought proposals for:

(1) research and development of new and innovative approaches to mitigate declines in yield guarantees following successive years of low yields, or provide improvements to existing procedures; and/or
(2) research and development of new and innovative procedures for determination of approved APH yields.

RMA awarded two independent contracts for proposals to mitigate declines in producers' yields for further study. At the conclusion of the contracted studies, the contractors presented RMA with a total of five different approaches for consideration that would increase producers' APH yields. All five approaches were submitted to the Federal Crop Insurance Corporation (FCIC) Board of Directors (Board) and were subjected to review by five independent expert reviewers and RMA. RMA and the five independent expert reviewers identified a number of issues regarding the proposed approaches. The contracted proposals increased premium rates, potentially led to over-insurance and moral hazard, and added significant program complexity. Because of the issues raised, the Board did not authorize RMA to pursue implementation of any of the proposals.

RMA is currently piloting a Personal Transitional Yield (PTY) program for certain crops in North Dakota. The program uses a producer's overall average yield for the crop in the county to determine a T-Yield. The PTY becomes the default "applicable T-Yield" as cited in statute and thus can be used for added land, Yield Adjustment, and other T-Yield applications. This pilot program is currently undergoing an evaluation to determine how the pilot performed and, if the program were expanded nationally, whether it would significantly reduce the use of yield floors, cups, and other means to establish production guarantees. If the PTY produces an insurance guarantee that better represents the producer's true production potential, it may actually enhance participation in the crop insurance program.

Lastly, in addition to concerns regarding declining yields, a number of producers suggest that RMA's current methodologies for establishing APH yields do not properly account for yield increases due to technological advances and that the use of a 10-year production history inappropriately lowers the APH (often referred to as "yield drag"). Producers have suggested that RMA consider a mechanism to reduce or eliminate yield drag.

RMA is taking the following course for addressing the effects of catastrophically low yields for annual crops in the Federal crop insurance program:

(1) Perform a comprehensive review of the current PTY program to determine if it has performed as expected and to measure the effectiveness of PTY towards addressing declining yields. If warranted by the review, RMA would likely need the legislative authority to extend the PTY program to other crops and areas.

(2) Examine ways to address yield drag so that producers are not discouraged from providing yields that may not reflect a producer's current production practices under the current program or under PTY. RMA is currently reviewing its APH procedures to determine if a more applicable approach is available.

1. <u>Background</u>

Section 12030 of the Food, Conservation, and Energy Act of 2008 required the U.S. Secretary of Agriculture to submit to the Committee on Agriculture of the House of Representatives and the Committee on Agriculture, Nutrition, and Forestry of the Senate a report containing details about activities and administrative options of the Federal Crop Insurance Corporation and the U.S. Department of Agriculture's (USDA) Risk Management Agency (RMA) that address issues relating to:

(1) declining yields on the actual production histories of producers; and
(2) declining and variable yields for perennial crops, including pecans.

As stated in the conference report, "The Managers recognize risk management challenges faced by producers, especially with respect to declining yields in light of increases in premiums. The Managers are interested in the Department of Agriculture's activities to address these issues and options that the Department has to address these issues administratively." This report is focused on the concerns specific to annual crop producers, particularly the effects of declining yields on a producer's actual production history (APH). A separate report to Congress, sent July 14, 2009, addressed declining yields with regard to perennial crops, including pecans.

An annual crop is defined as an agricultural commodity that normally must be planted each year. Such crops include but are not limited to: corn, soybeans, wheat, barley, rice, and cotton.

The APH plan of insurance protects against the loss of production due to natural causes such as hail, fire, drought, etc. The crop insurance guarantee for APH-based plans of insurance is based on an average of the producer's individual yield history. The producer selects the amount of the average yield they wish to insure–from 50 to 75 percent[1]–in order to establish the crop insurance guarantee. If the actual yield is less than the crop insurance guarantee, the producer is paid an indemnity based on the difference. The amount of the indemnity is calculated as the product of the yield shortfall and the price election chosen by the producer. This price election is determined as the product of the expected market price (as determined by RMA) and the percentage of that price the producer wishes to insure–from 55 to 100 percent.

The APH-based plan of insurance also forms the foundation for revenue coverage in the crop insurance program, which today accounts for more than half of RMA's book of business.

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[1] For crops in some areas, coverage levels of up to 85 percent are available.

Revenue coverage not only protects against loss of production, but also against unexpected changes in commodity prices.

Objectives of the Federal Crop Insurance Program

There are three general objectives that govern the administration of the Federal crop insurance program. The first is to provide effective risk management products to producers. The second is to increase program participation by expanding availability into new crops and/or regions. The third is to maintain actuarial soundness. Critical to achieving the first two objectives is that the insurance products must provide adequate amounts of protection and the associated premium rates must be affordable, both as perceived by producers. The third objective–actuarial soundness–is required by statute. The usual measure of actuarial soundness in the insurance industry is the loss ratio, which is calculated as incurred losses divided by earned premiums. Section 506(n)(2) of the Federal Crop Insurance Act, as amended by the 2008 Farm Bill, mandates the Federal crop insurance program to operate with a projected loss ratio of no greater than 1.0, such that premium collections are sufficient to cover the indemnities paid to policyholders. [2]

Yet, there is an inherent tension among the objectives of maintaining actuarial soundness, providing affordable premium rates, offering adequate amounts of protection, and accurate price elections. Increasing the amount of protection (e.g., by providing higher guarantees), as often desired by producers, essentially means that larger indemnities will be paid. Of course, larger indemnities must lead to higher premium rates, given the statutory mandate that actuarial soundness be maintained. However, raising premium rates to maintain actuarial soundness will likely dissuade some producers from purchasing a Federal crop insurance policy and/or negatively impact coverage level choices, thereby reducing program participation and program benefits.

Not all declines in yield are the same. There are three types of declines: decline below the trend, reversion to the trend, and a persistent decline (or negative trend). Figure 1 demonstrates the

Figure 1. NASS County Average Yield (Wheat, Mitchel County, KS)
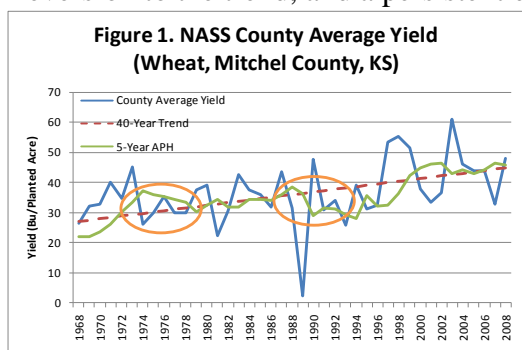
The data table for Figure 1 is located on page 18 of this report

first two types of declining yields, using the average yield for wheat for Mitchel County, KS, as reported by the USDA National Agricultural Statistics Service (NASS). The oval on the right identifies an example of a decline below the trend. In 1988, the 5-year average (APH) yield for the county was 38 bushels/acre–about equal to the long-term yield trend or what the producer can reasonably expect to grow. In 1989, there was a catastrophic drought that resulted in the lowest yield ever observed for this county. This exceptionally low yield moved the 5-year APH well below the long-term trend, or below what most producers expected to grow in the next year. This type of decline in yields is best suited to be addressed in an insurance setting. An adjustment in this context is essentially reducing the effect of a low, unrepresentative

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[2] To be specific, sec. 502(b)(6) of the Act defines the divisor in the loss ratio calculation as the sum of anticipated losses and a reasonable reserve. Similarly, sec. 508(d)(2) of the Act specifies that the premium collections shall be sufficient to cover anticipated losses and a reasonable reserve.

yield on a producer's guarantee. The yield measures that currently exist in the crop insurance program help address this, at least in part.

The oval to the left in Figure 1 shows the second type of declining yield, a reversion to the trend. The yields during the period from 1969 to 1973 were exceptionally high, resulting in an APH that was substantially above the trend or was higher than what producers could reasonably expect to grow on a continuing basis. After 1973, more typical (and lower) yields occurred, causing the APH to move (or revert) to the long-term trend. This type of decline is not well suited to be addressed in the crop insurance program. While this example represents a decline in a producer's APH, it is an adjustment towards, rather than away from, a reasonable insurance guarantee for the producer. If a yield measure were developed that would prevent this type of yield decline, it would essentially lock in a producer's best yields, resulting in unreasonably high insurance guarantees and the need for significant increases in premium rates.

Figure 2 demonstrates the final type of decline in yields–a persistent decline in yields or negative trend. This is much less common than the first two types of declines in yields. The graph shows the average wheat yield for Throckmorton County, Texas. Since about 1993, there has been an overall decline in the county yield that persisted over 16 years to 2008 (the most recent year of data available). The 5-year APH also reflects this long-term decline. This type of decline is also not well suited to be addressed in an insurance setting. If a yield measure were developed that prevented this long-term decline in a producer's APH, it would eventually result in an excessively high insurance guarantee. The producer would be virtually assured of an indemnity payment in the next year. This transforms crop insurance into an income transfer program and is actuarially unsustainable.
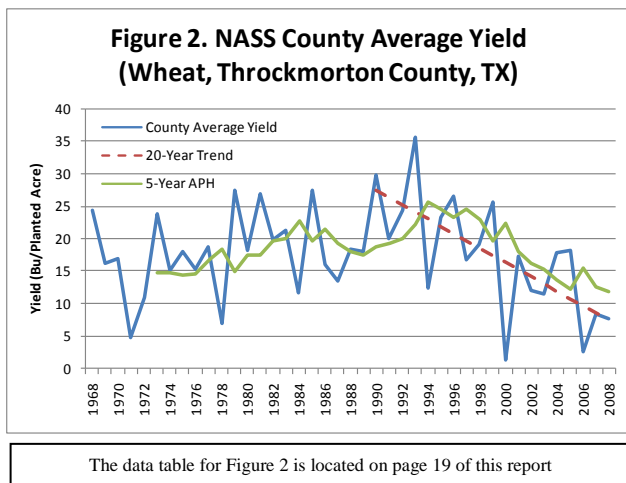
Figure 2. NASS County Average Yield (Wheat, Throckmorton County, TX)

The data table for Figure 2 is located on page 19 of this report

In summary, the goal in addressing declining yields is to help ensure, to the extent possible, that a producer's APH does not go below what he or she could be reasonably expected to produce. However, any potential measure should avoid either locking in unusually high yields or preventing the APH from reflecting a legitimate long-term decrease in yields. It is the latter part that makes addressing the issue of declining yields challenging.

Call for Proposals To Address Declining Yields

In an effort to elicit new and innovative ideas to address the declining yields issue, RMA sought solutions from the general public. In March 2004, RMA issued a request for proposals that, if accepted, would be funded by RMA for development. RMA's goal was to obtain proposals for:

(1) the development of new and innovative approaches to mitigating declines in yield guarantees following successive years of low yields and/or provide improvements to existing procedures; and

(2) research and development of new and innovative procedures for determination of approved APH yields.

RMA received 14 proposals from 9 companies. The proposals were independently read and scored by RMA. The factors considered important to establishing new approaches for mitigating the effects of low yields were:

- Less subject to decreases during years of low yields;
- Equitable across producers with differing yields;
- Generally applicable across crops and regions;
- Not susceptible to moral hazard, fraud, waste, and abuse;
- Affordable for producers;
- Feasible and cost-effective for RMA and approved insurance providers;
- Understandable; and
- Actuarially sound.

Of the 14 proposals, RMA selected to fund 2 proposals to mitigate the effects of long-term declines in approved yields. Both proposals are included in the Appendix. The proposals were:

(1) "Alternative Methods for Mitigating Declines in Approved Yields Due to Successive Years of Low Yields–Replacement Yields and Grower Determined Yields" by Agrilogic, Inc. (Agrilogic); and

(2) "Yield Indexing for Category B Crops–Indexed (Stabilized) Actual Production History" by Science Applications International Corporation (SAIC).

After approximately 2 years of research and development, the proposals were forwarded to the Federal Crop Insurance Corporation Board of Directors (FCIC Board) for consideration. The Board contracted with six independent expert reviewers, experienced as underwriters or actuaries, to review the proposals.

The proposals, and their evaluations, are discussed in more detail later in this report.

2. <u>Underwriting of Annual Crops</u>

FCIC offers multiple-peril crop insurance for annual crops to cover loss of production due to natural causes, but not losses due to a failure to follow good farming practices. The productivity of annual crops is heavily influenced by the producer's production choices. Examples include variables such as location, climate, soil, cultural practices (for example, crop; till or no-till; skip-row, which includes method and pattern; fertilization; weed control; crop thinning; pest control; insecticide; disease control; fungicide; and frost control), or other management practices. These factors are often interrelated, and many are influenced by timing and frequency.

<u>Adjustments to Historical Average Yields</u>

In some situations, the historical average yield may also be a poor predictor of future expected yields. Depending on circumstances, there are various potential adjustments to the simple average yield. They are:

- Yield Substitution;
- Yield Floor; and
- Catastrophic Yield Adjustment.

There is also a Personal Transitional Yield (PTY) pilot program that allows producers to combine yields across insured units to create a transitional yield (T-Yield) that better represents their individual productivity.

The three yield adjustments are intended to minimize the impact of unusually low yields on a producer's APH. Further discussion is provided below.

(1) The Yield Substitution was implemented in accordance with the Agricultural Risk Protection Act of 2000. The adjustment allows a producer to substitute a low actual yield with 60 percent of the county T-Yield (generally the 10-year average yield for the county).

(2) The Yield Floor provides a lower limit to a producer's APH, regardless of past losses. The Yield Floor for producers is equal to 70 to 80 percent of the county T-Yield. The percentage is dependent on the number of years of actual yields contained in a producer's APH. Yield Floors are available for annual crops with published T-Yields only. In some circumstances, a premium rate surcharge is applied.

(3) The Catastrophic Yield Adjustment provides that the year-to-year decline in a producer's APH be limited to no more than 10 percent. Increases in a producer's APH are not similarly limited. This option is available to producers that elect not to use the Yield Substitution. The Catastrophic Yield Adjustment is applicable for both annual and certain perennial crops. A 5-percent surcharge is applied for producers selecting this option. This alternative is the least used of the three yield adjustments.

A significant shortcoming of the current yield adjustments is that they are not equitable across producers. The Yield Substitution and the Yield Floor are based on the average yield for the county. This makes them less effective for the more productive producers with above-average yields and potentially overly generous for the less productive producers with below-average yields. As will be discussed later in the report, basing these measures on a personal T-Yield rather than on a county T-Yield could potentially address this inequity.

Underwriting and Risk Classification

For most annual crops, the premium rate for a given coverage level varies based on the producer's risk classification. RMA's rating function, as applied to these crops, implies that the risk of a payable loss is a decreasing function of yield, which means that the frequency and severity of payable losses are greater for producers with a below-average yield (relative to the county average) than for producers with an above-average yield. To the degree to which a producer's average yield is above the county average, the producer's premium rate is reduced and vice-versa, as illustrated in Figure 3. Thus, the average yield not only determines the insurance guarantee but also affects the premium rate paid by the producer.

Figure 3: Relationship Between an Individual's Yield and Premium Rate
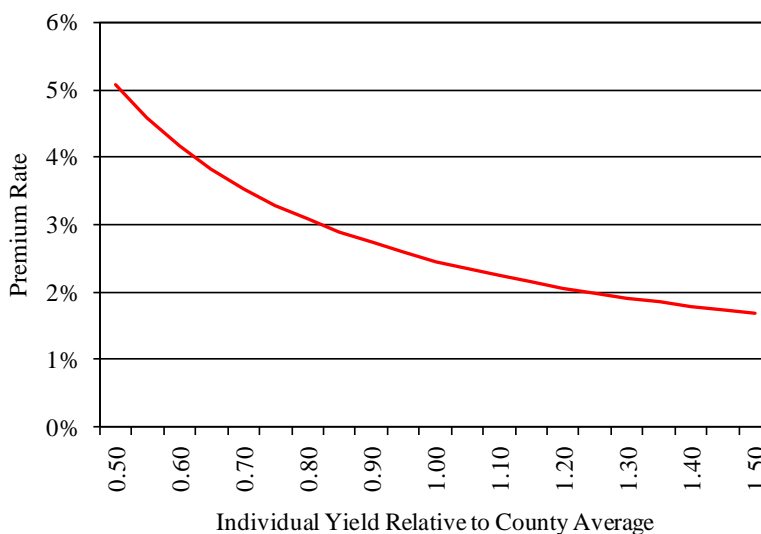
The data table for Figure 3 is located on pages 20-22 of this report

One consequence of risk classification based on yield is that when a producer experiences a period of low yields, not only does the insurance guarantee decline, but the assessed premium rate also increases. This decline in a producer's guarantee, and the corresponding increase in the premium rate, can reduce the usefulness of crop insurance for some participants. This gives rise to pressure on Congress and RMA to do something to mitigate the impact of the low yields on the crop insurance offer to affected producers.

The Yield Substitution is an attempt to address concerns about the impact of low actual yields on insurance guarantees. Because this measure increases the guarantee of affected producers and,

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therefore, generates larger program losses, premium rates are necessarily higher given the statutory requirement that the program be actuarially sound, as discussed above.[3]

An alternative to using the average county yield to determine the county T-Yield is the PTY. RMA is currently conducting a pilot program in North Dakota using a producer's own production records to determine yield adjustments due to drought, flood, or other natural disaster as an alternative method for determining a producer's insurance guarantee when fewer than 4 years of actual yields exist for a particular unit.

The PTY pilot program allows producers with at least one actual yield to use an average of actual yields from other units for missing observations instead of the county T-Yield. The guarantee for a unit with fewer than four actual observations would then be based on the producer's PTY, which is a function of the producer's yield history in other units with the same practice, type, and/or variety.

The pilot program is structured as a policy option applicable to additional coverage policies only. If the producer elects to participate in the pilot, the PTY applies to all units on a crop policy. Different units on the crop policy may have differing results with the PTY. Some units may end up with a higher guarantee and others with a lower guarantee. Producers with actual yields that are above the county T-Yield benefit from the pilot program and would select the PTY option. The PTY pilot program may increase the yield guarantee, and therefore effective coverage level, for the subset of producers that participate. Therefore, the frequency and severity of losses under the PTY will be larger than without it. A premium rate surcharge that reflects the increase in risk is added.

The PTY has been operating for 3 years, with participation in North Dakota increasing from 13 percent in 2007 to almost 19 percent in 2009. In 2009, the crops with the highest PTY participation were corn, dry beans, and canola. For the crops eligible for PTY, the loss ratio in 2009 was approximately 71 percent for producers participating in the pilot (See Table 1). For producers not participating in the pilot, the loss ratio in 2009 was approximately 62 percent.

Table 1   North Dakota PTY Experience, 2007-2009

Year	Participation	Premium	Liability	Indemnity	Loss Ratio	Crops With Highest Participation
2007	13.34%	$109,241,713	$630,326,332	$51,111,075	.47	Canola, Corn & Dry Beans
2008	18.04%	$293,690,828	$1,564,392,969	$122,781,379	.42	Corn, Dry Peas & Dry Beans
2009	18.54%	$204,899,872	$1,148,290,728	$145,880,430	.71	Corn, Dry Beans & Canola

The PTY could become the default "applicable T-Yield" as cited in statute and thus would be used for added land, yield adjustments, and other T-Yield applications. The PTY allows

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[3] Section 506(n)(2) of the Federal Crop Insurance Act, as amended by the 2008 Farm Bill, requires the Federal crop insurance program to operate with a loss ratio of no greater than 1.0 (i.e., premiums collected must approximately equal indemnities paid). The immediate implication of this requirement is that as indemnities increase, so too must premium rates increase if actuarial soundness is to be maintained.

producers to use more of their yield history, reducing the need for yield adjustments, yield floors, or yield limitations. The PTY improves equity across producers as it ensures that more productive producers may use their own yields to establish their guarantee rather than having to rely on the county average yield (T-Yield). Because of this, the PTY may be one method for addressing or improving adjustments for declining yields in the future.

3. RMA Contracted for Alternatives To Mitigate the Effect of Declining Yields

RMA received 14 proposals from 9 companies for addressing declining yields. RMA entered into development contracts for two of the proposals that best met the evaluation criteria. The two proposals were "Alternative Methods for Mitigating Declines in Approved Yield Due to Successive Years of Low Yields–Replacement Yields and Grower Determined Yields" by Agrilogic and "Yield Indexing for Category B Crops–Indexed (Stabilized) Actual Production History" by SAIC.

The proposals were then presented to the FCIC Board. The FCIC Board then forwarded the proposals for review by an external group of experts with backgrounds in actuarial science, economics, and underwriting. The proposals, and the reviews of the proposals, are presented in detail in this section.

Replacement Yields and Grower-Determined Yields Proposal

The proposal entitled "Alternative Methods for Mitigating Declines in Approved Yield Due to Successive Years of Low Yields–Replacement Yields and Grower Determined Yields" by Agrilogic presents alternative versions of the Yield Adjustment currently available to producers. They are:

- Coverage Level Plug–this proposed method replaces low actual yields with a yield equal to the producer's average yield multiplied by coverage level. For example, assume a producer's average yield is 43 bushels per acre and the producer selects a 75-percent coverage level. If the producer experiences a low yield, it could be replaced with a yield of 32 bushels per acre (43 x .75 = 32).

- Average Yield Plug–this proposed method replaces low actual yields with a yield equal to the producer's average yield. For example, suppose a producer's average yield is 43 bushels per acre. If the producer experiences a low yield, it could be replaced with a yield of 43 bushels per acre.

- Average Yield Hybrid Plug–this alternative is a combination of the Coverage Level Plug and the Average Yield method. The proposal replaces a low actual yield with the average yield if it falls below the coverage level multiplied by the average yield. For example, assume the average yield is 43 bushels per acre and the producer selects a 75-percent coverage level. If the producer has a yield that is below the average yield times the coverage level (43 x .75 = 32), the producer could replace the low yield with the average yield (43 bushels per acre).

- Grower-Determined Yield–this method allows producers to select an approved yield within given parameters in exchange for a higher premium rate to account for the increased risk of loss. The proposal disregards the current replacement procedures and simply allows the producer to select his/her approved APH yield, as long as it is less than 120 percent of the average yield and less than the highest single actual yield in the producer's yield history. For example, assume the average yield is 43 bushels per acre and the actual yield for a given year is zero. The producer could replace the zero yield

with a selected percentage (e.g., 120 percent) of the producer's average yield. In this instance, the producer could substitute 52 bushels per acre (43 x 1.20 = 51.6). Once again, the producer's premium rate would increase in proportion to the increase in the producer's guarantee.

There were a number of issues identified by RMA and the expert reviewers regarding these proposed alternative yield measures. A major concern is that all of the Alternative Yield Measures (AYM) proposed may result in providing producers with coverage that exceeds their expected yields. It was determined that the probability of over-insuring individual producers became excessive–especially at higher coverage levels and on higher risk land. Over-insurance can reduce a producer's incentive to mitigate losses (moral hazard). In a related point, RMA's current premium rates are based on the current system of yield adjustment measures. The introduction of a more generous set of measures would require adjustments to the current base premium rates and increase premium costs for producers.

The additional premium rate charged for the proposed AYM measures would make them less attractive to producers. The premium rates for the AYM proposals would be similar to the rates charged for higher levels of coverage. In other words, the AYM proposals do not offer any new options to producers. However, the AYM proposals provide a way for producers to increase their guarantee without increasing their coverage level and lowering their subsidy rate. Given the concerns expressed by the expert reviewers and RMA, the FCIC Board did not pursue implementation of these proposed yield adjustments.

Indexed Actual Production History
The proposal entitled "Yield Indexing for Category B Crops–Stabilized Actual Production History (I-APH)," by SAIC, adjusts (or indexes) a producer's yield according to its historical relationship to the NASS average yield for the county.

The producer's yields for every year in which production and acres have been certified are averaged. County yields for the corresponding years in which the producer reported production are also averaged. For instance, if the producer's average yield is 145 bushels per acre and the county average for the same years is 135 bushels per acre, the producer's yield index is 1.07 (145/135 = 1.074).

A yield index greater than 1.0 indicates the producer has, on average, experienced yields that have been greater than the county average, and a yield index of less than 1.0 indicates the producer has experienced lower yields than the county average. This index is then applied to a long-term yield trend that is based on at least 20 years of historical NASS county average yields. For example, suppose the expected yield for a county (based on the yield trend) is 137 bushels per acre and the producer has a yield index of 1.07. Then the expected yield for the producer would be 146.6 bushels per acre (137 x 1.07 = 146.6).

The expert reviewers and RMA identified a number of concerns with this method for determining producers' yields. One concern is that NASS does not publish county yield data for each practice, type, or variety for a large number of States and crops, requiring that the I-APH yield trends be based, in part, on pooling data from a group of counties. This makes the yield

trends track less well with the experience of individual producers in each county, potentially creating inappropriate or excessive insurance guarantees.

Another issue is that the proposed I-APH and the current APH methods will generally produce different yield guarantees. This creates an opportunity for producers to choose the higher of the two guarantees. A simulation analysis estimated that this "coverage switching" would increase expected loss ratios by 5 to 9 percent. This implies that premium rates for both the I-APH and current APH coverage would need to increase in proportion to the expected increase in loss ratios, making the program less attractive to producers.

The availability of current data is problematic. Data for the most recent year's county average yield is often not available from NASS at the time producers would be calculating their indexed yields. For example, when calculating an indexed yield for the 2011 crop year, the most recent year of NASS county yield data that is generally available would be from the 2009 crop year. This leaves a lag year (2010 crop year in the example) where the producer does not have a county yield with which to be compared. This would mean the producer's 2009 crop year actual yield would be used in both the determination of the producer's average yield and the county average yield. This lag year adjustment can bias the yield guarantee by more than 10 percent. It provides an upward bias for producers with below-average yields and vice versa.

Finally, the I-APH is complicated and would be difficult for producers to understand. For example, if a producer has an average yield in a particular year while the overall county has an exceptionally high yield, the producer would end up with a lower guarantee the following year under the I-APH approach. To the degree the county yields do not represent an individual's experience, the I-APH approach can cause a producer's insurance guarantee to move in unexpected or counter-intuitive ways.

At the same time, the I-APH approach presents a significant administrative and computer system burden for approved insurance providers (AIP), as they would be required to redesign their systems, and very few producers, agents, and AIP employees would be able to understand or explain how the I-APH works.

Given the concerns expressed by expert reviewers and RMA, the FCIC Board did not pursue implementation of I-APH.

4. **RMA Recommendations**

Section 12030 of the 2008 Farm Bill directed the Secretary to deliver to Congress a report on options for addressing the effects of declining and variable yields for perennial and annual crops in the Federal crop insurance program. Congress was particularly interested in the administrative options open to RMA for addressing these issues.

RMA believes that many of the current adjustments to address the varying yield decline issues offer considerable benefits, although room exists for improvements. RMA continues to review the APH procedures to determine the most effective, yet actuarially sound manner in which changes could be made to address not only declining yields, but also yield increases that would better recognize technology advances without unduly over-insuring a producer's yield.

Continuing steps RMA is pursuing:

(1) Perform a comprehensive review of the current PTY program to determine if it has performed as expected. Assess producer, agent, and approved insurance provider views of the program and determine whether implementing a PTY approach on a national basis would have a positive effect on the crop insurance program, including the effectiveness in addressing declining yields. If warranted by the review, the PTY program could be extended to other crops and areas.
(2) Examine ways to address yield drag to better reflect advances in technology and farming practices to the extent they have generally increased productivity over time.

RMA's objective is to maintain actuarially sound insurance rates, provide affordable premium rates to insured producers, and offer adequate amounts of coverage. Increasing the amount of coverage (higher guarantees) is often preferred by producers and generally means larger indemnities. Because RMA is, by statute, mandated to maintain actuarial soundness, larger indemnities lead to higher premium rates. By raising premium rates to maintain actuarial soundness, some producers may be reluctant to purchase crop insurance or purchase higher levels of coverage.

Any change to the current, legislatively provided Yield Substitution would also increase program costs. Additionally, RMA believes the most meaningful change that would assist in addressing a decline in a producer's yield will require something other than the current Yield Substitution. The following approaches may have the most short-term potential for addressing declining yields in a viable manner:

(1) Allow producers to use a percentage of their own production history, based on the number of actual records in their database, for Yield Substitution (consistent with the current PTY pilot program) in place of the current adjustments based on county average yields. Basing a Yield Substitution on T-Yields derived from county average yields may not be equitable, as yields may vary significantly across producers in a county. For example, producers with expected yields well above the county average arguably receive inadequate benefit from a county-based catastrophic adjustment. Conversely, producers with expected yields well below the county average arguably receive excessive benefit. In addition, basing the amount of the Yield Adjustment on

the number of years of actual records a producer provides (the more years of records, the higher the adjustment) will discourage some producers from creating schemes to lose prior years' records with low yields, will increase yield stability, and ultimately will, in and of itself, provide some relief from declines in yields. That is, the more years of history a producer provides, the less influence that any one year has on the overall average.

(2) Use a trending procedure to more accurately determine actual expected yields, which will reflect the effects of crop yield trends. As yield trends have been positive through time, the typical effect would be to increase APH yields resulting in changes in the premiums, liability, and indemnities. RMA is investigating the use of trending to adjust a producer's APH. The effect on premium, liability, and indemnities has yet to be determined, but one can likely surmise that premium, liability, and indemnities will increase.

In order to provide a Yield Adjustment based on a producer's own yields, rather than a county average yield, it would be necessary for a legislative change to provide RMA flexibility to base such adjustment on something other than the current 60 percent of the T-yield. Simply increasing the percentage to something higher than 60 percent of the T-yield does not address the fact that this form, like the current 60 percent, is less effective for more productive producers with above-average yields and potentially overly generous for less productive producers with below-average yields.

Appendix

Alternative Methods for Mitigating Declines in Approved Yields Due to Successive Years of Low Yields–Replacement Yields and Grower Determined Yields" by Agrilogic, Inc. (Agrilogic)

Yield Indexing for Category B Crops–Indexed (Stabilized) Actual Production History" by Science Applications International Corporation (SAIC).

Submitted Proposals

Please write to the Risk Management Agency for copies of Appendix 1

Appendix 2

Figure 1 Data Table. NASS County Average Yield
(Wheat, Mitchel County, KS)

Year	County Average Yield	40-Year Trend	5-Year APH
1968	26.4	27.2	22.1
1969	32.4	27.6	22.0
1970	32.8	28.0	23.5
1971	40.2	28.5	26.1
1972	34.7	28.9	30.3
1973	45.4	29.4	33.3
1974	26.1	29.8	37.1
1975	30.0	30.3	35.8
1976	35.5	30.7	35.3
1977	30.0	31.2	34.3
1978	29.8	31.6	33.4
1979	37.6	32.1	30.3
1980	39.2	32.5	32.6
1981	22.4	32.9	34.5
1982	30.6	33.4	31.8
1983	42.8	33.8	32.0
1984	37.6	34.3	34.5
1985	36.1	34.7	34.5
1986	32.0	35.2	33.9
1987	43.7	35.6	35.8
1988	31.6	36.1	38.4
1989	2.4	36.5	36.2
1990	47.7	37.0	29.1
1991	30.9	37.4	31.4
1992	34.2	37.8	31.2
1993	25.7	38.3	29.3
1994	39.1	38.7	28.2
1995	31.3	39.2	35.5
1996	32.5	39.6	32.3
1997	53.6	40.1	32.6
1998	55.4	40.5	36.4
1999	51.6	41.0	42.4
2000	37.9	41.4	44.9
2001	33.6	41.9	46.2
2002	36.6	42.3	46.4
2003	61.1	42.7	43.0
2004	46.2	43.2	44.2
2005	44.0	43.6	43.1
2006	44.1	44.1	44.3
2007	33.0	44.5	46.4
2008	48.0	45.0	45.7

Figure 2 Data Table. NASS County Average Yield
(Wheat, Throckmorton County, TX)

Year	Yield Per Net Seeded Acre	County Average Yield	20-Year Trend	5-Year APH
1968		24.4		
1969		16.3		
1970		17.0		
1971		4.9		
1972		11.0		
1973	24	24.0		14.7
1974	15.1	15.1		14.6
1975	18.1	18.1		14.4
1976	15.4	15.4		14.6
1977	18.7	18.7		16.7
1978	7.1	7.1		18.3
1979	27.4	27.4		14.9
1980	18.3	18.3		17.4
1981	26.9	26.9		17.4
1982	20	20.0		19.7
1983	21.3	21.3		19.9
1984	11.8	11.8		22.8
1985	27.4	27.4		19.6
1986	16.2	16.2		21.5
1987	13.6	13.6		19.3
1988	18.5	18.5		18.1
1989	18.1	18.1		17.5
1990	29.9	29.9	27.4	18.8
1991		20.0	26.3	19.3
1992		24.4	25.2	20.0
1993		35.7	24.1	22.2
1994		12.5	23.0	25.6
1995		23.4	21.9	24.5
1996		26.7	20.8	23.2
1997		16.7	19.7	24.5
1998		19.2	18.6	23.0
1999		25.6	17.5	19.7
2000		1.4	16.4	22.3
2001		17.4	15.3	17.9
2002		12.2	14.2	16.1
2003		11.6	13.1	15.2
2004		17.9	11.9	13.6
2005		18.3	10.8	12.1
2006		2.7	9.7	15.5
2007		8.4	8.6	12.5
2008		7.8	7.5	11.8

Figure 3 Data Table. Relationship Between an Individual's Yield and Premium Rate

Individual Yield Relative to County Average	Premium Rate
0.50	5.2%
0.51	5.1%
0.52	5.0%
0.53	4.9%
0.54	4.8%
0.55	4.7%
0.56	4.6%
0.57	4.5%
0.58	4.4%
0.59	4.3%
0.60	4.2%
0.61	4.1%
0.62	4.1%
0.63	4.0%
0.64	3.9%
0.65	3.9%
0.66	3.8%
0.67	3.7%
0.68	3.7%
0.69	3.6%
0.70	3.6%
0.71	3.5%
0.72	3.5%
0.73	3.4%
0.74	3.4%
0.75	3.3%
0.76	3.3%
0.77	3.2%
0.78	3.2%
0.79	3.1%
0.80	3.1%
0.81	3.1%
0.82	3.0%
0.83	3.0%
0.84	2.9%
0.85	2.9%
0.86	2.9%
0.87	2.8%

0.88	2.8%
Individual Yield Relative to County Average	**Premium Rate**
0.90	2.8%
0.91	2.7%
0.92	2.7%
0.93	2.7%
0.94	2.6%
0.95	2.6%
0.96	2.6%
0.97	2.6%
0.98	2.5%
0.99	2.5%
1.00	2.5%
1.01	2.5%
1.02	2.5%
1.03	2.4%
1.04	2.4%
1.05	2.4%
1.06	2.4%
1.07	2.4%
1.08	2.3%
1.09	2.3%
1.10	2.3%
1.11	2.3%
1.12	2.3%
1.13	2.2%
1.14	2.2%
1.15	2.2%
1.16	2.2%
1.17	2.2%
1.18	2.2%
1.19	2.2%
1.20	2.1%
1.21	2.1%
1.22	2.1%
1.23	2.1%
1.24	2.1%
1.25	2.1%
1.26	2.1%
1.27	2.0%
1.28	2.0%
1.29	2.0%

Figure 3 Data Table. Relationship Between an Individual's Yield and Premium Rate

Individual Yield Relative to County Average	Premium Rate
1.30	2.0%
1.31	2.0%
1.32	2.0%
1.33	2.0%
1.34	2.0%
1.35	2.0%
1.36	1.9%
1.37	1.9%
1.38	1.9%
1.39	1.9%
1.40	1.9%
1.41	1.9%
1.42	1.9%
1.43	1.9%
1.44	1.9%
1.45	1.9%
1.46	1.9%
1.47	1.8%
1.48	1.8%
1.49	1.8%
1.50	1.8%