USDA
United States Department of Agriculture

OFFICE OF INSPECTOR GENERAL

RMA: Rainfall and Vegetation Index Pilot Program - Pasture, Rangeland, Forage



05601-0003-31

April 2015

RMA: Rainfall and Vegetation Index Pilot Program – Pasture, Rangeland, Forage

Audit Report 05601-0003-31

What Were OIG's Objectives

Our primary objective was to evaluate RMA's methodology for setting county base values for the PRF program covered under the Rainfall and Vegetation Index Pilot. We also evaluated the controls over setting county base values and policy provisions that pertain to the intended use of acreage for PRF.

What OIG Reviewed

We reviewed the results of an RMA contractor's review of the PRF program. We also non-statistically selected 10 subject-matter experts from 7 of the 29 States offering PRF.

What OIG Recommends

We recommended that RMA modify the PRF program's payment methodology to account for the material difference that irrigation practice makes in rainfall's impact on forage yields.

OIG reviewed how RMA administers its PRF insurance program to determine if the level of protection for irrigated and non-irrigated crops is reasonable.

What OIG Found

The Risk Management Agency (RMA) administers the Federal crop insurance program and helps insure producers against crop failures due to crop diseases, hurricanes, and other risks. Beginning in crop year 2007, RMA offered a rainfall and vegetation index plan of insurance for pasture, rangeland, forage (PRF) as a pilot program to provide insurance protection for forage produced for grazing or harvested for hay.

The Office of Inspector General's (OIG) review found that RMA insures irrigated forage producers as if a reduction in rainfall affects their yields to the same extent as non-irrigated forage producers. However, based on interviews of subject-matter experts in 7 of the 29 States offering PRF, irrigated yields are not nearly as dependent on rainfall as non-irrigated yields and, thus, do not incur the same level of loss. When RMA and its contractor designed the PRF program, they did not differentiate coverage based on irrigated and non-irrigated practice. As a result, irrigated producers are able to receive indemnities in excess of lost hay production value. For crop years 2010 through 2013, indemnities issued in the 7 States on land with an intended use of haying accounted for over $142 million of the over $183 million in total indemnities issued for forage under PRF. We are unable to determine how much of the over $142 million was issued on irrigated land using RMA's data because RMA did not record irrigation practice for these crop years.

RMA has stated that it plans to incorporate a separate pricing scheme for irrigated and non-irrigated practices in 2016, which will reflect the risk and loss to the producer. RMA generally agreed with our recommendation.

United States Department of Agriculture
Office of Inspector General
Washington, D.C. 20250

DATE: April 16, 2015

AUDIT NUMBER: 05601-0003-31

TO: Brandon C. Willis
Administrator
Risk Management Agency

ATTN: Heather L. Manzano
Deputy Administrator for Compliance

FROM: Gil H. Harden
Assistant Inspector General for Audit

SUBJECT: RMA: Rainfall and Vegetation Index Pilot Program – Pasture, Rangeland, Forage

This report presents the results of the subject audit. Your written response to the official draft report, dated April 6, 2015, is included, in its entirety at the end of this report. Your response and the Office of Inspector General's position are incorporated into the relevant sections of the report. Based on your written response, we are accepting your management decision for the audit recommendation in the report and no further response to this office is necessary.

In accordance with Departmental Regulation 1720-1, final action needs to be taken within 1 year of management decision to prevent being listed in the Department's annual Agency Financial Report. Please follow your internal agency procedures in forwarding final action correspondence to the Office of the Chief Financial Officer.

We appreciate the courtesies and cooperation extended to us by members of your staff during our audit fieldwork and subsequent discussions. This report contains publically available information and will be posted in its entirety to our website (http://www.usda.gov/oig) in the near future.

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Background and Objectives

Background

The Department of Agriculture's (USDA) Risk Management Agency (RMA) administers the Federal crop insurance program, and helps insure producers against crop failures due to crop diseases, hurricanes, and other risks. Federal crop insurance is available solely through private companies, known as approved insurance providers (AIP), that market and service crop insurance policies and process claims for loss. AIPs directly insure producers and their crops, and RMA then reinsures the AIPs against a portion of the losses they may suffer.

Beginning in crop year[1] 2007, RMA offered a rainfall and vegetation index plan of insurance for pasture, rangeland, forage (PRF) as a pilot program that provides insurance protection for forage produced for grazing or harvested for hay. Producers do not need to file a claim or submit any documentation for a loss under PRF. The PRF program also does not require a suitability or feasibility determination, history of production, or onsite inspection as part of the underwriting process. Instead, for much of the United States, the program is based on a rainfall index, while for a smaller portion of the western United States, it is based on a vegetation index. PRF insures producers based on either the average rainfall or the average satellite-derived "vegetative greenness" value in their geographic area, instead of the specific conditions experienced at the producer's individual farm. Indemnities are paid based on the difference between the "trigger grid index"[2] and the actual grid index experienced.

The rainfall index is based on weather data collected and maintained by the National Oceanic and Atmospheric Administration's (NOAA) Climate Prediction Center. The index reflects how much precipitation is received relative to the long-term average for a specified area and timeframe. The vegetation index is based on the U.S. Geological Survey's Earth Resources Observation and Science normalized difference vegetation index data (NDVI), derived from satellites observing long-term changes in the greenness of the Earth's vegetation since 1989. Producers receive an indemnity payment when the final grid index (i.e., the rainfall or the "vegetative greenness" value in their area) falls below their selected "trigger grid index."

An individual producer's level of protection per acre is determined by the county-base value for his or her intended use (haying or grazing) multiplied by the coverage level (between 70 percent and 90 percent) and the productivity factor[3] (between 60 percent and 150 percent) selected by the producer by the established sales closing date. RMA establishes PRF county-base values for forage using the 3-year average of the "All Hay Yield/Value" for each State, published by National Agricultural Statistics Service (NASS), which includes a blended yield of irrigated and non-irrigated production. This base value is applied to all counties within the State. Prior to

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[1] "Crop year" means the period of time within which the insured crop is normally grown, regardless of whether or not it is actually grown, and is designated by the calendar year in which the insured crop is normally harvested.
[2] "Trigger grid index" is a number derived by multiplying the coverage level selected by the producer by the expected grid index for rainfall or "vegetative greenness."
[3] "Productivity factor" is a percentage factor selected by producers that allows them to individualize their coverage based on the productivity of the acreage of the insured crop.

2008, NASS published separate irrigated and non-irrigated production data in only three States: Colorado, Montana, and Wyoming. After 2008, NASS discontinued publishing separate irrigated and non-irrigated yields for hay for these States as part of its effort to save resources.

Payments are made after rainfall or vegetative greenness data are collected for each 2- or 3-month index interval and provided to RMA and AIPs. RMA annually publishes actuarial documents for this program by August 31.

RMA employed a contractor to develop the PRF pilot program and produce the rainfall and vegetation indices upon which the insurance products are based. This contractor has developed a computer system that downloads rainfall data from NOAA, and vegetation data from the U.S. Geological Survey. The system then converts these data into the indices used by AIPs to calculate indemnities for all producers insured under the PRF pilot program.

On September 11, 2014, we issued an interim report[4] identifying problems with the amount of insurance being offered to non-irrigated forage producers under the PRF program. We found that, in Colorado and New Mexico, RMA insured non-irrigated hay producers at the same level as irrigated hay producers, even though irrigated land is capable of producing much more hay. Therefore, non-irrigated producers received indemnities substantially in excess of the value of their lost hay production. We recommended that RMA establish county-base values by irrigated and non-irrigated practices, or revise PRF coverage to account for the substantial differences between the production capabilities of irrigated and non-irrigated hay land. Management decision was reached as RMA agreed to lower the amount of insurance available for non-irrigated hay land in a number of western States for crop year 2015; RMA also plans to incorporate separate prices for irrigated and non-irrigated practices in crop year 2016.

In 2014, RMA employed another contractor to evaluate the PRF pilot program. This contractor issued its final summary report on October 1, 2014. In the report, the contractor echoed OIG's concerns regarding irrigation and its effects on the program. The contractor recommended that RMA revise its methodology for calculating the county-base value for hay in States with a high percentage of irrigation. This is similar to the actions recommended by OIG in its interim report.

Objectives

Our primary objective was to evaluate RMA's methodology for setting county base values for PRF covered under the Rainfall and Vegetation Index Pilot. We also evaluated the controls over setting county-base values and policy provisions that pertain to the intended use of acreage for PRF.

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[4] Audit Report 05601-0003-31(1), *RMA: Rainfall and Vegetation Index Pilot Program – Pasture, Rangeland, Forage – Interim Report,* September 2014.

Section 1: Improvements Are Needed to the PRF Program

Finding 1: RMA Provides Excessive Coverage to Irrigated Forage Producers Under the PRF Program

RMA insures irrigated forage producers as if a reduction in rainfall affects the producers' yields to the same extent as non-irrigated forage producers. However, based on interviews of subject matter experts in 7 of the 29 States offering PRF, irrigated producers' yields are not nearly as dependent on rainfall as non-irrigated producers and, thus, do not incur the same level of loss.[5] When RMA and its contractor designed the PRF program, they did not differentiate coverage based on irrigated and non-irrigated practice. As a result, irrigated producers are able to receive indemnities in excess of lost hay production value. For crop years 2010 through 2013, indemnities issued on land in the 7 States with an intended use of haying accounted for over $142 million of the over $183 million in total indemnities issued for forage under PRF. We are unable to determine how much of the over $142 million was issued on irrigated land using RMA's data because RMA did not record irrigation practice for these crop years; therefore, we questioned the entire amount [see Exhibit A].

The PRF program is designed to give forage and livestock producers the ability to buy insurance protection for losses of forage produced for grazing or harvested for hay.

We interviewed 10 subject-matter experts comprised of University Extension Service personnel from 7 States across the central and western United States. In those interviews, 8 of the 10 subject matter experts agreed that, while there is an impact on irrigated hay yield from a lack of rainfall, this impact is materially less severe than the negative impact or reduction on the hay yield on non-irrigated land. The other two subject matter experts did not believe that a lack of growing season rainfall would impact irrigated forage yield. Because non-irrigated hay is not grown in their geographical region, they were unable to quantify the potential difference in effect that a lack of rainfall has on irrigated hay yields versus non-irrigated hay yields.

In 2014, RMA employed a contractor to evaluate the PRF pilot program. This contractor issued its final summary report on October 1, 2014. In the report, the contractor expressed reservations about PRF coverage for acres with access to continuous irrigation water. These reservations stemmed from its determination that irrigated acres were not subject to the same risk of production losses due to lack of precipitation as non-irrigated acres. It recommended the exclusion of those acres intended for hay production that have continuous irrigation water available. If a separate practice for irrigated acres was established, it emphasized that the county-base value should reflect incremental pumping costs and not the extra costs of hay purchases.

As part of its work, the contractor hired two university professors to compile a research paper on the use of precipitation as a proxy for forage production. The research paper found several

[5] We interviewed subject-matter experts in seven States: California, Colorado, Kansas, Montana, Nebraska, New Mexico, and Texas. These States were non-statistically selected primarily based on their total PRF indemnity payments for crop years 2010 through 2013, and the prevalence of irrigation within each State.

studies from multiple locations and institutions exhibiting a strong correlation between precipitation and forage production. Furthermore, the paper concluded that annual forage can be adequately predicted by rainfall from just a few key months, though doing so is more difficult in areas where there is less overlap between growing season temperature and precipitation. However, we noted that the paper made no reference to irrigation practice. Therefore, we contacted the two professors in order to determine the applicability of their conclusions to irrigated hay land. Both professors stated that their research was focused on non-irrigated land and that precipitation does not significantly matter with forage production on irrigated hay land. Neither professor was able to identify any research on the correlation between irrigation, a lack of precipitation, and the impact on forage production.

The contractor's final summary report also included research on the relationship of the NDVI and forage production. The research concluded that there is a solid relationship between forage production and NDVI values. However, the report noted that the insurance of irrigated acres based on NDVI grid images would be inappropriate, as the condition of the irrigated acres is unlikely to correlate with the grid average upon which indemnities are based.

To further understand this point, we contacted the professor responsible for the NDVI research paper that was part of the contractor's report. This professor concurred that the NDVI values for irrigated alfalfa forage would be similar under both normal conditions and drought-like conditions, simply because the land is irrigated. He went on to explain that, under dry conditions, if an NDVI grid contained both irrigated and non-irrigated acres, the more strongly impacted NDVI value of the non-irrigated acres would drag down the overall grid average. However, we note that indemnity payments to producers with irrigated acres would not be based on their actual NDVI values, but on the overall grid average which would have been lowered due to non-irrigated acres.

We note that on November 17, 2011, RMA issued an informational memorandum removing PRF coverage for hay land in California beginning in crop year 2012. The reasons cited for this change included that most, if not all, perennial hay land in California is normally grown under irrigation where the variability in precipitation levels does not significantly impact vegetation growth. Based on our fieldwork, we believe that this conclusion—that precipitation does not significantly impact irrigated hay land's vegetation growth—is largely applicable to all irrigated hay land. Accordingly, PRF's coverage of irrigated hay land should be modified to account for the material difference that irrigation practice makes on forage yield.

In its final response to OIG's September 11, 2014, interim report, RMA referenced the contractor's findings on irrigated and non-irrigated forage. RMA stated that it plans to incorporate a separate pricing scheme for irrigated and non-irrigated practices in 2016, which will reflect the risk and loss to the producer.

Recommendation 1

Modify the pasture, rangeland, forage program's payment methodology to account for the material difference that irrigation practice has on the impact of rainfall on forage yield.

Agency Response

RMA plans to incorporate a separate pricing methodology for irrigated and non-irrigated hay in 2016. A third party contracted evaluation, in place prior to the OIG Audit, recommended this change including an irrigated practice and price will reflect the additional costs of irrigation to the hay crop. This updated pricing methodology was presented to the Federal Crop Insurance Corporation Board of Directors (Board) in February 2015 which sent the pricing methodology to contracted expert review prior to anticipated Board final consideration in May 2015. If the Board determines the pricing methodology is appropriate and acts to approve, RMA will update the pricing changes for the 2016 crop year.

OIG Position

We accept management decision for this recommendation.

Scope and Methodology

We conducted our audit of PRF at the RMA office in Kansas City, Missouri. We also interviewed representatives of a contractor hired by RMA to conduct an evaluation of the PRF program, as well as several subject-matter experts regarding forage production.

Our audit covered PRF activity for crop years 2010 through 2013. During this period, indemnity payments totaled over $597 million, with over $183 million being issued for land with an intended use of haying.

We non-statistically selected 10 subject-matter experts comprised of University Extension Service personnel from 7 of the 29 States that currently offer PRF coverage. These 7 States were selected primarily based on their total PRF indemnity payments for crop years 2010 through 2013, and the prevalence of irrigation within each State. Indemnity payments of over $142 million were issued for land with an intended use of haying in these 7 States.

To accomplish our objectives, we performed the following audit procedures:

- reviewed applicable laws, regulations, and agency procedures concerning the administration of the Federal crop insurance programs, specifically those provisions pertaining to the PRF program;
- interviewed officials at RMA's Product Management Division in Kansas City, Missouri, to gain an understanding of the PRF program and its implementation;
- interviewed representatives of the RMA contractor tasked with evaluating the PRF program to determine the basis and methodology used in reaching several of the conclusions contained in the final summary report;
- interviewed sampled subject matter experts to obtain independent opinions on the impact of precipitation shortfalls on irrigated hay production, and how that effect compares to the impact on non-irrigated hay production; and
- assessed the reliability of information systems by comparing specific data within RMA's policyholder database and insurance documents maintained by the AIPs.

We conducted fieldwork between May 2014 and January 2015.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Abbreviations

AIP ....Approved Insurance Provider
NASS ....National Agricultural Statistics Service
NDVI......................................Normalized Difference Vegetation Index
NOAA ....National Oceanic and Atmospheric Administration
OIG ....Office of Inspector General
PRF ....Pasture, Rangeland, Forage
RMA ....Risk Management Agency
USDA.....................................Department of Agriculture

Exhibit A: Summary of Monetary Results

Exhibit A summarizes the monetary results for our audit report by finding and recommendation number.

Finding	Recommendation	Description	Amount	Category
1	1	Total indemnities paid to producers with an intended use of hay	$133,998,920[6]	Questioned Costs, No Recovery
Total			**$133,998,920**	

[6] A total amount of $142,289,234 in indemnities was issued for acres with an intended use of haying for crop years 2010 through 2013. We are unable to determine how much of the over $142 million was issued on irrigated land using RMA's data because RMA did not record irrigation practice for these crop years; therefore, we questioned the entire amount. However, $8,290,314 of this amount was already questioned in the interim report for this audit, Audit Report 05601-0003-31(1).

Exhibit B: Interim Report

Audit Report 05601-0003-31(1), *RMA: Rainfall and Vegetation Index Pilot Program – Pasture, Rangeland, Forage – Interim Report*, September 2014, available at www.usda.gov/oig.

USDA'S
RISK MANAGEMENT AGENCY
RESPONSE TO AUDIT REPORT

United States Department of Agriculture

Farm and Foreign Agricultural Services
Risk Management Agency

April 6, 2015

TO: Gil H. Harden
Assistant Inspector General for Audit
Office of Inspector General

FROM: Heather Manzano **/S/ Heather Manzano**
Audit Liaison Official

SUBJECT: Office of Inspector General Audit 05601-003-31, Draft Report 2, Rainfall and Vegetation Index Pilot – Pasture, Rangeland, Forage

RMA requests Management Decision for Recommendation 1 for OIG Audit 05601-003-31, Draft Report 2, Rainfall and Vegetation Index Pilot – Pasture, Rangeland, Forage.

RECOMMENDATION NO 1:
Modify the pasture, rangeland, forage (PRF) program's payment methodology to account for the material difference that irrigation practice has on the impact of rainfall on forage yield.

RMA RESPONSE:
RMA plans to incorporate a separate pricing methodology for irrigated and non-irrigated hay in 2016. A third party contracted evaluation, in place prior to the OIG Audit, recommended this change including an irrigated practice and price will reflect the additional costs of irrigation to the hay crop. This updated pricing methodology was presented to the Federal Crop Insurance Corporation Board of Directors (Board) in February 2015 who sent the pricing methodology to contracted expert review prior to anticipated Board final consideration in May 2015. If the Board determines the pricing methodology is appropriate and acts to approve, RMA will update the pricing changes for the 2016 crop year.

Should you have any questions or would like additional information concerning this matter, please contact Nicole Smith Lees at (202) 260-8085.

Deputy Administrator for Compliance
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