



U.S. Department of Agriculture



Office of Inspector General
Southeast Region

Audit Report

Cotton Crop Insurance Premium Rates

Report No. 05601-7-At
February 2005



UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF INSPECTOR GENERAL



Washington D.C. 20250

DATE: February 10, 2005

REPLY TO
ATTN OF: 05601-7-At

SUBJECT: Cotton Crop Insurance Premium Rates

TO: Ross J. Davidson, Jr.
Administrator
Risk Management Agency

ATTN: Michael Hand
Deputy Administrator
Risk Compliance

This report presents the results of our audit of the Risk Management Agency's (RMA) process to determine premium rates for cotton. Because we found that the actual production history (APH) automated ratemaking process for cotton is used for other major crops, we included a review of historical losses for cotton, corn, soybeans, and wheat.

The crop insurance program continues to suffer billion dollar losses and does not ensure equity in the premiums charged among producers of major crops. From 1975 to 2003, cotton and wheat premiums have not been sufficient to cover indemnities resulting in net program losses totaling over \$1.2 billion and \$1.6 billion, respectively. Corn, however, has netted a surplus of \$1.4 billion. Additionally, RMA did not establish formal written policy and procedures for the ratemaking process, nor require supporting documentation for factors used in the ratemaking formula. An informal undocumented methodology has been used annually since 2000 to determine whether base rates should be recomputed.

BACKGROUND

Since the 1930's, many producers have been able to transfer part of the risk of loss production to the Federal Government through subsidized crop insurance. Major legislation enacted in 1980 and 1994 restructured the crop insurance program. The 1980 legislation enlisted, for the first time, private insurance companies to sell, service, and share the risk of Federal insurance policies. Subsequently, in 1994, the Federal Crop Insurance Reform and Department of Agriculture Reorganization Act revised the program to offer farmers two primary levels of insurance coverage, catastrophic and buyup. Catastrophic insurance is designed to provide producers with protection against extreme crop losses for a small processing fee. Buyup insurance provides protection against more typical and small crop losses in exchange for a producer-paid premium. The Government

subsidizes the total premium for catastrophic insurance and a portion of the premium for buyup insurance. The Agricultural Risk Protection Act, enacted in June 2000, is another major legislation in the history of crop insurance. Among the major program changes, RMA increased subsidy levels as a means of making crop insurance more affordable.

Created under the Federal Agriculture Improvement and Reform Act, the U.S. Department of Agriculture's RMA has administered the crop insurance program since 1996. Producers who purchase buyup crop insurance must choose both the coverage level (the production of the crop to be insured) and the unit price (such as, per bushel) at which any loss is calculated. Crop insurance provides producers coverage against all natural causes of loss. Drought, however, has historically accounted for about two-thirds of the indemnities.

In recent years, RMA introduced a new risk management tool called revenue insurance. As a result, producers may now select from a variety of plans that are either revenue based or traditional yield based crop insurance. For crop year (CY) 2003 traditional yield based APH, crop revenue and revenue assurance made up 92 percent of the crop insurance plans sold nationwide. APH insurance plans pay an indemnity if a producer's yield on a given farm unit falls below the production guarantee. Each revenue insurance plan determines revenue coverage differently. Crop revenue provides revenue protection based on a guaranteed price and yield expectation, while crop assurance provides coverage to the producer by insuring a dollar amount of expected revenue. Approximately 1.1 million buyup insurance policies were written in CY 2003, with \$1.4 billion in farmer paid premiums and \$1.8 billion in premium subsidies. Indemnities paid to farmers for the same period totaled almost \$3.2 billion.

RMA uses an automated ratemaking process to compute target (base) rates that vary by crop, location, farm, and farmer. Base rates for APH, crop revenue and revenue assurance insurance plans use this automated ratemaking process. Risk factors such as loss history and prevented planting are also considered in computing rates. To set premium rates, RMA calculates the base rate for each crop in each county for the producers who buy insurance at the 65-percent coverage level and whose normal production level is about equal to the average production in the county. From the base rate, RMA makes adjustments to establish rates for other coverage levels and for those farmers whose production levels are higher or lower than the county's average.

Premium subsidies are received through appropriations. In addition to RMA's general fund, RMA also has a revolving fund known as the Insurance Fund, which is used to pay for crop program losses and other expenses, including reinsured company expenses. In fiscal year 2003, RMA received about \$2.7 billion in appropriations for the Insurance Fund.

OBJECTIVES

Our original objectives were to evaluate RMA's policies and procedures to determine cotton crop insurance premium rates, and assess whether those practices result in rates adequate to pay expected

losses and build a reasonable reserve. We also looked at historical losses for cotton and other major crops that use the APH automated ratemaking process.

SCOPE AND METHODOLOGY

Our audit covered RMA's methodology and automated process for determining rates. The fieldwork was performed during December 2003 to April 2004, and included visits to the RMA National Office in Washington, D.C., and the RMA Actuarial Division and SI International (a contractor) in Kansas City, Missouri. We interviewed RMA and contractor personnel and evaluated operating procedures, as described by officials, for the ratemaking process. We examined actuary reports published by Milliman and Robertson, Inc., that analyzed the actuarial soundness of RMA's APH ratemaking and other documentation pertaining to the development of base premium rates. We also examined laws, regulations and financial data, and reviewed studies and reports on premium rates and related matters. We documented a flowchart to help us understand the process.

We conducted the review in accordance with generally accepted government auditing standards.

RESULTS

The crop insurance program continues to suffer billion dollar losses and does not ensure equity in the premiums charged among producers of major crops. From 1975 to 2003, the crop insurance program has paid out indemnities totaling \$33 billion of which \$23 billion (70 percent) was paid on four major crops: corn, cotton, wheat, and soybeans. The same four crops contributed 73 percent of the program's premiums (producer premiums plus premium subsidies). However, within this group of major crops, cotton and wheat premiums have not been sufficient to cover indemnities; resulting in net program losses totaling over \$1.2 billion and \$1.6 billion, respectively. Soybean premiums and indemnities have almost broken even. The corn program, however, has netted a surplus of \$1.4 billion. (See attachment 1.)

In order to address the significant losses and inequities, RMA should improve its quality control over the ratemaking process. For example, RMA does not adequately oversee functions performed by the contractor who developed the automated ratemaking system and continues to operate it to produce target (base) rates for RMA. This condition exists, in part, because RMA has not documented the detailed procedures needed to carry out the ratemaking process. During the performance of its duties, the contractor makes undocumented decisions on the data's validity based on verbal guidance provided by RMA at least 5 years ago. Also, if an anomaly occurs during the automated ratemaking process, the contractor contacts RMA, who in turn instructs the contractor on what data to change. Once again, RMA is providing verbal guidance to the contractor without documenting the decision. The Standards for Internal Control in the Federal Government states that management is responsible for developing the detailed policies, procedures, and practices to fit their agency operations, and to ensure that internal control is built into and is an integral part of operations. The standards also state that internal control events

need to be clearly documented, and the documentation should be readily available for examination.

In addition, documentation does not currently exist for assumptions made in the early 1990's to determine the value for the disaster reserve factor. The disaster reserve factor is used to calculate amounts to be included in premiums for building a reasonable reserve for catastrophic events. RMA officials stated that there is no documentation to support the factor's value as originally established at .88 and the agency has not performed a review to determine whether the value is still valid. The cotton program has suffered program losses totaling over \$1.2 billion since 1975, with \$1.06 billion of the losses occurring since 1990. Apparently the disaster reserve value, as currently established for the cotton program, is not achieving its stated purpose. Legislation requires RMA to set premium rates that are adequate to cover anticipated losses and build a reasonable reserve for all insurance plans. The same value is applied to all major crops, regardless of performance history. If the reserve factor is not set appropriately, then the margin of protection against future losses is decreased.

In addition, RMA has not established a formal written policy to periodically review crop insurance premium rates. Officials described an informal undocumented methodology used annually since 2000 to determine whether crop insurance base rates should be recomputed. Historically, base rates have been computed every third year for major crops such as cotton. However, cotton base rates were last computed for CY 2000. During 2004, officials began using a new review methodology and determined that base cotton rates would not be computed again until CY 2005. Cotton suffered losses higher than the mandated loss ratio of 1.075 for each of the CY's since 2000, yet premium rates have been decreased, unchanged or increased only moderately. (See table 1.)

Table 1

Crop Year	Established Loss Ratio for Crop Program	Actual Loss Ratio for Cotton	Established Loss Ratio Met	Range of Percentage Change Made to Cotton Premium Rate^{1/}
2003	1.075	1.17	No	0 to 3.5
2002	1.075	1.26	No	-10 to 10
2001	1.075	1.47	No	-10 to 9
2000	1.075	1.57	No	-50 to 11

^{1/}Premium rates are established on a county-by-county basis.

RECOMMENDATION NO. 1:

Review ratemaking decisions for the past 5 years for corn, cotton, wheat, and soybeans. Based on the results of the review, implement changes needed to reduce the inequity of premiums among producers.

AGENCY RESPONSE:

In its January 25, 2005, response, RMA stated:

RMA concurs with this recommendation. This recommendation is consistent with RMA's current strategy and practice to adjust premium rates for major insured commodities to appropriate levels, reflecting recent loss experience and other rate methodology improvements or enhancements. However, RMA does not agree with the recommendation's assumption that there are premium rate inequities across crops. The premium rates for each crop are based on that crop's own loss experience and are independent of rates for other crops.

The review of rates consists of two steps. The first step is to update premium rates in light of recent loss experience. RMA completed a nation-wide revision of premium rates for corn, soybeans, and wheat for the 2004 crop year and cotton for the 2005 crop year. This resulted in higher target premium rates for crops and areas where losses have been above average. In other crops and areas, such as corn in the Midwestern grain belt, small losses have led to decreases in premium rates.

The second step of the review consists of analyzing past loss performance in light of the revised premium rates. The historical net indemnities (indemnity minus premium) quoted in the audit report do not reflect the effect of subsequent premium rate increases, and therefore, may not give an accurate indication of the current state of the crop insurance program.

RMA will perform an analysis where the historical net indemnities are adjusted to reflect the current level of premium rates. This will provide a more accurate indication of the current state of the crop insurance program.

This analysis will be applied to the major crops mentioned in the audit report – corn, cotton, wheat, and soybeans. RMA will [] complete this analysis by March 15, 2005.

RMA requests management decision for this recommendation.

OIG POSITION:

We accept RMA’s management decision. For acceptance of final action, RMA needs to provide to the Office of the Chief Financial Officer, Planning and Accountability Division (OCFO-PAD), a copy of the completed analysis where historical net indemnities have been adjusted to reflect the current level of premium rates for corn, cotton, wheat, and soybeans. A copy of this completed analysis should also be forwarded to the Office of Inspector General (OIG).

Estimated Completion Date: March 15, 2005

RECOMMENDATION NO. 2:

Review the disaster reserve factor and document support for the value.

AGENCY RESPONSE:

In its January 25, 2005, response, RMA stated:

*RMA concurs with this recommendation. * * **

* * * * *

Therefore, RMA will contract with an actuarial firm to review, update, and document the disaster reserve factor. The estimated cost of this contract is \$150,000. The needed time for contract completion is estimated to be one year with an anticipated deliverable by October 30, 2005.

RMA requests management decision for this recommendation.

OIG POSITION:

We accept RMA’s management decision. For acceptance of final action, RMA needs to provide OCFO-PAD a copy of the contractor’s report on the disaster reserve factor. Also, please forward to OIG a copy of the contractor’s report.

Estimated Completion Date: October 30, 2005

RECOMMENDATION NO. 3:

Establish formal written policy and procedures for the crop insurance ratemaking process. Ensure that the procedures incorporate critical control points and supervisory oversight in the

process, and require supporting documentation for periodic review of established rates, ratemaking formula factors, and management decisions.

AGENCY RESPONSE:

In its January 25, 2005, response, RMA stated:

*RMA concurs with this recommendation. RMA will establish more detailed and formal written policies and procedures for the crop insurance ratemaking process. * * * RMA will formally develop and incorporate into its ratemaking process the required documentation by October 30, 2005. An initial draft will be provided, when available, prior to October 30, 2005.*

RMA requests management decision for this recommendation.

OIG POSITION:

We accept RMA's management decision. For acceptance of final action, RMA needs to provide OCFO-PAD a copy of the final policies and procedures documenting its crop insurance ratemaking process. Also, please provide to OIG a copy of the initial draft policies and procedures for our review and comment.

Estimated Completion Date: October 30, 2005

We have accepted management decisions on all recommendations. In accordance with Departmental Regulation 1720-1, final action needs to be completed within 1 year of the date of this report to preclude being listed in the Department's Performance and Accountability Report. Follow your internal agency procedures in forwarding final action correspondence to OCFO-PAD.

We appreciate the assistance and cooperation of your staff.

/S/
ROBERT W. YOUNG
Assistant Inspector General
for Audit

Attachments

YEAR	CORN	SOYBEANS	WHEAT	COTTON
1975	\$(2,714,951)	\$4,084,505	\$11,382,311	\$(6,692,517)
1976	(36,616,934)	(805,054)	1,536,297	(11,553,245)
1977	(26,063,046)	6,495,502	(12,709,007)	3,078,080
1978	22,917,779	6,275,783	11,547,799	(672,779)
1979	23,373,154	8,302,583	427,306	(3,528,921)
1980	(6,243,574)	(21,389,853)	(82,104,772)	(10,097,426)
1981	37,739,836	(77,729,922)	2,150,768	(2,207,065)
1982	33,939,745	(114,674,301)	10,902,626	(21,064,636)
1983	(69,625,859)	(108,267,802)	6,626,524	(15,409,538)
1984	11,105,634	(90,922,262)	(44,180,295)	(23,046,052)
1985	43,362,200	(66,509,500)	(132,577,199)	8,943,675
1986	17,361,607	(75,407,288)	(48,808,897)	(40,718,238)
1987	32,758,165	(24,253,264)	(1,771,707)	14,902,756
1988	(207,471,562)	(77,082,972)	(223,186,492)	5,519,986
1989	23,038,820	3,648,867	(178,954,407)	(74,131,005)
1990	96,945,366	18,966,432	20,312,606	(21,728,184)
1991	(35,950,386)	(2,720,766)	(54,921,599)	(89,477,952)
1992	37,692,769	36,859,100	(54,641,954)	(197,680,050)
1993	(419,507,878)	(138,237,625)	(96,152,739)	(4,559,012)
1994	216,447,681	82,897,893	(29,524,141)	46,734,483
1995	22,691,686	66,530,329	(1,105,387)	(25,710,394)
1996	190,832,732	155,439,700	(136,719,366)	(28,202,964)
1997	308,670,389	192,267,430	66,726,658	81,022,450
1998	178,556,938	112,679,280	113,280,965	(156,977,133)
1999	239,280,507	88,611,963	(183,199,725)	(96,723,949)
2000	337,193,134	58,985,444	(104,625,817)	(211,810,722)
2001	299,836,576	186,364,539	(192,455,604)	(209,829,942)
2002	(350,180,157)	6,263,601	(439,338,100)	(82,872,094)
2003	397,328,485	(274,803,230)	143,839,926	(58,676,914)
TOTALS:	\$1,416,698,856	\$(38,130,888)	\$(1,628,243,422)	\$(1,233,169,302)
Average Loss Ratio	.83	1.01	1.33	1.33

Title: Major crop losses since 1975 (amounts above represent total premiums minus total indemnities, and ratios represent total indemnities divided by total premiums).

Over the past 29 years, the corn program has suffered losses in 9 years, soybeans in 13 years, wheat in 18 years, and cotton in 23 years.



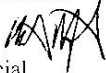
United States
Department of
Agriculture

January 25, 2005

Risk
Management
Agency

TO: Robert W. Young
Assistant Inspector General for Audit
Office of Inspector General

1400 Independence
Avenue, SW
Stop 0806
Washington, DC
20250-0806

FROM: Michael Hand 
Audit Liaison Official

SUBJECT: OIG Draft Audit Report 05601-7-At, Cotton Premium Rates

Outlined below is the Risk Management Agency's (RMA) response to the subject report.

GENERAL COMMENT

As noted in the subject report base rates for major crops generally have been recomputed every third year. However, cotton has not strictly adhered to this schedule in recent years, because of both factors internal and external to RMA as discussed below.

RMA updated cotton premium rates for the 1998 crop year as part of its normal three-year rating timetable. Hence, the next update of cotton rates would have occurred in the 2001 crop year had RMA adhered to its normal rating schedule. However, there was growing concern that some cotton premium rates were excessive and thereby discouraging program participation. In addition, section 106 of the Agricultural Risk Protection Act of 2000 (H.R. 2559) mandated that RMA review its premium rate determination methodologies and make adjustments as appropriate. Pages 67-68 of Senate Report 105-212 (accompanying S. 2159 Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriation Bill, 1999) specifically directed RMA to review cotton premium rates using independent experts. In response to this Congressional directive, RMA engaged independent experts to review its cotton premium rates for the 2000 crop year. Hence, the last cotton rate review was conducted one year ahead of schedule.

The review by independent experts found cotton premium rates to be generally consistent with those for comparable crops. In some counties, however, the review determined that cotton rates might be excessive and thereby discouraging participation by lower risk producers. This phenomenon is known as adverse selection and refers to a situation whereby growers with a lower risk of loss are continuously priced out of the program as premium rates are raised to reflect the consistently poor loss experience of higher risk participants.



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As a result, 2000 cotton premium rates for selected counties were lowered by RMA in accordance with the results of the independent experts' review through the utilization of an alternative rating methodology. In the remaining counties, cotton premium rates were moved up or down within a ten percentage point range as loss experience warranted. As can be seen in Table 1 of the Audit Report, the loss ratio for cotton declined steadily from 2000 to 2003.

Under normal circumstances, cotton premium rates would have been reviewed in 2004 to return the crop to its regular rating cycle. However, RMA was undergoing a major realignment of its rate structure for the major crops. This realignment involved revising the adjustment factors used to determine premium rates for the various coverage levels. The realignment was required to harmonize the rate between RMA's two major revenue plans, Crop Revenue Coverage (CRC) and Revenue Assurance (RA). Because this revision involved increasing the adjustment for some coverage levels and lowering for others, RMA determined that it should be done in conjunction with a review of rates. To do otherwise would result in numerous situations whereby premium rates were initially raised (or lowered) due to the revision of coverage factors and then lowered (or raised) the subsequent year due to the normal updating of rates. This "roller-coaster effect" on rates is at odds with RMA's objective of maintaining rate stability and led to rate reviews and coverage level adjustments being performed concurrently.

The realignment of coverage level factors is resource-intensive and can only be performed for a limited number of crops per year. Corn, soybeans, and wheat were the first crops to be updated for the 2004 crop year, since they were the major crops for which both CRC and RA were available. Cotton and several other major program crops are being updated for the 2005 crop year. The cotton rate revisions for the 2005 crop year also reflect RMA's evaluation of the rate reductions that occurred in selected counties in the 2000 crop year, with appropriate adjustment made accordingly.

RECOMMENDATION NO. 1:

Review ratemaking decisions for the past 5 years for corn, cotton, wheat, and soybeans. Based on the results of the review, implement changes needed to reduce the inequity of premiums among producers.

RMA Response:

RMA concurs with this recommendation. This recommendation is consistent with RMA's current strategy and practice to adjust premium rates for major insured commodities to appropriate levels, reflecting program loss experience and other rate methodology improvements or enhancements. However, RMA does not agree with the recommendation's assumption that there are premium rate inequities across crops. The premium rates for each crop are based on that crop's own loss experience and are independent of rates for other crops.

The review of rates consists of two steps. The first step is to update premium rates in light of recent loss experience. RMA completed a nation-wide revision of premium rates for corn, soybeans, and wheat for the 2004 crop year and cotton for the 2005 crop year. This resulted in higher target premium rates for crops and areas where losses have been above average. In other crops and areas, such as corn in the Midwestern grain belt, small losses have led to decreases in premium rates.

The second step of the review consists of analyzing past loss performance in light of the revised premium rates. The historical net indemnities (indemnity minus premium) quoted in the Audit Report do not reflect the effect of subsequent premium rate increases and therefore may not give an accurate indication of the current state of the crop insurance program.

RMA will perform an analysis where the historical net indemnities are adjusted to reflect the current level of premium rates. This will provide a more accurate indication of the current state of the crop insurance program.

This analysis will be applied to the major crops mentioned in the audit report—corn, cotton, wheat, and soybeans. RMA will complete this analysis by March 15, 2005.

RMA requests management decision for this recommendation.

RECOMMENDATION NO. 2:

Review the disaster reserve factor and document support for the value.

RMA Response:

RMA concurs with this recommendation. The disaster reserve factor is a program-wide adjustment to premium rates that is based on national crop insurance losses for all crops. It is intended to build a reasonable reserve for the crop insurance program as a whole such that the expected loss ratio is not greater, over the long-term, than the legislated goal of a 1.075 loss ratio.

The disaster reserve factor is not designed, or intended, to build a reserve on a crop-by-crop basis. The random nature of crop losses often results in some crops being net contributors to the reserve during some period of time and others not. Instead, the disaster reserve factor is intended to build, on average, a reasonable reserve across all of the crops in the crop insurance program. Thus the actuarial performance of one crop alone, such as cotton, does not provide the basis for evaluating the sufficiency of the disaster reserve factor. That the program-wide loss ratio has averaged only 0.93 over the past ten years would in fact argue that the current value of the disaster reserve factor is reasonably adequate.

However, the crop insurance program has changed significantly since the disaster reserve factor was last updated. The program now includes a greater variety of crops, geographical regions, and insurance products. The crop insurance program has additional years of loss

experience to draw upon as well. In light of this, it is appropriate to review the disaster reserve factor.

Therefore, RMA will contract with an actuarial firm to review, update, and document the disaster reserve factor. The estimated cost of this contract is \$150,000. The needed time for contract completion is estimated to be one year with an anticipated deliverable by October 30, 2005.

RMA requests management decision for this recommendation.

RECOMMENDATION NO. 3:

Establish formal written policy and procedures for the crop insurance ratemaking process. Ensure that the procedures incorporate critical control points and supervisory oversight in the process, and require supporting documentation for periodic review of established rates, ratemaking formula factors, and management decisions.

RMA Response:

RMA concurs with this recommendation. RMA will establish more detailed and formal written policies and procedures for the crop insurance ratemaking process. RMA has relied primarily on the annual Rate Methodology Memorandum drafted by RMA Research and Development and approved by the RMA Administrator as the authorizing document for annual ratemaking. RMA also developed automated systems over the past decade that capture and maintain ratemaking activities and actions taken. During OIG interviews, it became clear that additional written documentation is necessary to comply with OIG audit standards. RMA will formally develop and incorporate into its ratemaking process the required documentation by October 30, 2005. An initial draft will be provided, when available, prior to October 30, 2005.

RMA requests management decision for this recommendation.

TECHNICAL CORRECTION

A statement contained within the subject draft report describing revenue plans is not accurate. The statement is "Crop revenue provides revenue protection based on a guaranteed price and yield expectation, while crop assurance provides coverage to the producer by insuring a dollar amount of expected revenue", (p.2 of the report).

There are two major revenue plans; Crop Revenue Coverage (CRC) and Revenue Assurance (RA). RA has two versions – with and without the harvest price option (HPO). CRC and RA (with the HPO) offer the same coverage. They both offer a revenue guarantee that can increase at harvest time if the price of the insured commodity increases.

There is also a version of RA that does not include the harvest price option. In this plan, the revenue guarantee does not increase at harvest time.

For all revenue plans, the expected price and yield are used to establish the initial revenue guarantee.

Should you have any questions or require additional information, please contact Alan Sneeringer at (202) 720-8813.

Informational copies of this report have been distributed to:

Administrator, RMA (5)

ATTN: Agency Liaison Officer

Government Accountability Office (1)

Office of Management and Budget (1)

Office of the Chief Financial Officer (1)

Director, Planning and Accountability Division