

Crop Insurance Program Models

Introduction.

The Federal Crop Insurance Corporation (FCIC) operates under the authority of the Federal Crop Insurance Act (the “Act”), as amended through June 23, 1998. FCIC was established by legislation (52 Stat. 72) in 1938 to provide farmers protection against low yields. The Act was substantially amended in October 1980. At that time, FCIC was directed to utilize private sector insurance agents and companies to deliver the program and to act as a reinsurer to those same companies. The amendment also encouraged producer participation by lowering producer premiums with substantial government subsidies.

Additionally, the 1980 amendment authorized FCIC to expand its crop insurance programs, as well as to develop other risk management tools for America’s agricultural sector. This expansion created the need for FCIC to develop additional crop production risk management program models because the traditional individual yield-based approach was not always appropriate for some expansion crops. As a result of these changes, the insured acres in 1981 were 47.7 million acres, nearly double the 1980 acres. Today there are more than 181.75 million acres insured. Also, the inventory of insured crops has expanded. Between 1981 and 1994, RMA developed insurance programs for 38 additional “speciality” crops.

More changes came with the 1994 Crop Insurance Reform Act. FCIC was authorized to develop additional crop programs and explore new risk management concepts. In 1995, the Risk Management Agency (RMA) was created, partially in recognition that an entire array of risk management tools was needed for America’s farmers to manage the risk inherent in agricultural activities and production. Thereafter, RMA embarked on a mission to expand the inventory of insurable crops. This presented three significant program development challenges. One was the large number of speciality crops, 300 by some estimates. Second, most crops required a customized insurance program due to their unique production and marketing characteristics. Third, unique regional attributes have often required additional development considerations.

Since 1994, RMA has developed 15 new programs. In 1999, RMA offered some form of a risk management program for over 100 crops. This product inventory provides an insurance offer for nearly 85 percent of the commercial value of all crops grown in the United States.

The biggest obstacle in risk management program development for some of the “specialty” crops is the availability of data for risk assessment and actuarial studies. Part of the current research and development effort is directed toward exploring new alternatives and initiatives regarding crop insurance program models.

In this era of change and innovation, one of the tasks faced by RMA is how to organize and classify the array of risk management tools available, and to develop standard definitions,

major challenge requiring different models and methodologies for different crops.

These data are used to identify and evaluate specific and unique risk characteristics for each crop, growing region, and commodity market, and the associated risks involved. Following evaluation of the data, a risk management program insurance model (or hybridization of models) is chosen based upon the common characteristics that allow the RMA to estimate the probability of loss with a reasonable degree of certainty coupled with grower or processor desires regarding coverage levels, etc. In other words, a “best fit” is developed between a program that delivers to producers the protection they want, and at a cost that both they and the RMA can afford.

RMA’s risk management program models contain the basic concepts and elements necessary for a crop insurance program. Basic concepts are the “how to . . .” issues for each program. These include:

- # How to establish the guarantee;
- # Measure crop production;
- # Calculate losses;
- # Develop rates;
- # Identify insured and uninsured perils; and,
- # Define the policy period.

Program elements consist of “parts” that detail the “how to . . .” concepts. “Parts” are the policy provisions, loss standards, rating methodology, underwriting standards, and others.

Every one of the components above could potentially be used as an organizational schema for categorizing models, i.e. price and/or rate setting methodologies, multiple vs. named peril coverage, production to count and indemnity payment methodologies, and/or the nature of the guarantee.

Organizational Schema.

A crop insurance offer is composed of four basic items: the guarantee, or the premise of protection, the premium paid for that protection, the process by which loss is measured and the indemnity paid, and finally the liability to the insurer (i.e., the framework for setting rates, etc.).

It has been proposed by the RMA to organize the various risk management tools available in its product inventory on the basis of both the guarantee and the indemnity. This targets upon what basis the “front end” (guarantee) of the policy as well as the “back end” (indemnities) are handled and processed. From a marketing perspective, such a schema makes sense as the insured can readily understand the essential concept of what protection they are buying and how that protection will be delivered (i.e. how they will be paid) in the event of loss.

The guarantees available from RMA’s suite of risk management products focus on three

protection against the vagaries of nature when an entire area suffers loss, as well as the more traditional random events that can cause loss on an individual basis.

Existing Product Inventory.

To make working with crop insurance program models systematic and understandable, the RMA's Research and Evaluation Division has developed the following inventory of current crop insurance program models:

1. **Yield Guarantee** products
 - a. **Individual (APH)**
 - b. **Group (GRP)**
 - c. **Mixed ("Fixed Yield")**

2. **Revenue Guarantee** products
 - a. **Individual (AGR, CRC, IP, RA)**
 - b. **Group (GRIP)**
 - c. **Mixed ("Fixed Revenue")**

3. **Asset Guarantee** products
 - a. **Individual**
 - b. **Mixed ("Perennials Replant & Renovate")**

The following table provides a matrix showing possible options when choosing which model a crop insurance program fits into:

RMA Insurance Plans

Plan	Guarantee Basis	Indemnity Basis	Example(s)
Yield Guarantees			
A. Individual Yield	Individual	Individual	APH, GYC, peanuts, non-quota tobacco
B. Group Yield	Group	Group	GRP
C. Fixed Yield	Group	Individual	Hybrid corn & hybrid sorghum seed
Revenue Guarantees			
A. Individual Revenue	Individual	Individual	AGR, CRC, IP, RA
B. Group Revenue	Group	Group	GRIP
C. Fixed Revenue	Group	Individual	Fresh market vegetables
Asset Guarantees			
A. Inventory	Individual	Individual	Nursery, raisins, FL citrus
B. Perennials R & R	Group	Individual	Trees, forage seeding
C. (none)	Group	Group	

Yield Guarantees

This group of crop insurance models guarantees yield to the insured producer. The guarantee is a percentage of the yield calculated from historic yields (individual or group). Indemnities result from a shortfall of the guaranteed yield in the crop year insured. This yield shortfall is multiplied by an indemnity price selected by the insured before the insurance period begins. Within this group, there are three models: **Individual**, **Group**, and **Fixed**.

Defining Attribute: The current individual harvested yield for the insured year is compared to the expected individual yield. The expected individual yield is based on the historic average of the insured's crop production and acreage from previous years. The insured either provides records of these historic production and acreage figures or a proxy yield is provided for him/her based on a standard methodology (see following discussion). Because this model is based on the producer's "actual production history", it is often referred to as such, or as an **APH** program, model or policy.

Guarantee: The insured's yield for the crop year insured will exceed a certain percentage of the insured's individual expected yield. This individual expected yield is the insured's historic average yield. This historic average yield is figured from the insured's continuous previous years of production and acreage.

This expected individual yield is calculated for each basic and optional unit from the insured's information about the planted acreage and harvested production of previous years (known as the insured's yield database). The yield database is at least the last four years production information and expands each year until there are ten years or records.

When less than four year's records are provided, proxy yields are added to the database for the missing years. Proxy yields are transitional yields ("T" yields) established by RMA. The "T" yield for barley, corn, cotton, ELS cotton, grain sorghum, oats, rice, and wheat is the yield established by the Farm Service Agency. For other crops the "T" yield is established by RMA by reference to another crop, or map location. Beginning in 1998, "T" Yields based on FSA FSN Program Yields have been discontinued. For 1998 and succeeding crop years, all "T" Yields have been published on the County Actuarial Table. The value of the "T" yield entered into the yield database depends on the number of actual records in the database. When no records are provided, the "T" yield is 65 percent of the proxy yield. When one year's record is provided, the "T" yield is 80 percent of the proxy yield. When two years of records are provided, the "T" yield is 90 percent of the proxy yield. When three years of records are provided, the "T" yield is 100 percent of the proxy yield.

The **Individual Yield** Model provides a production guarantee for each insurance unit. The production guarantee is calculated by using the coverage level selected by the insured before the risk period. The insured may select any 5 percent increment coverage level between 50 and 75 percent and that selection applies to all units of the county/crop combination on the policy. The unit guarantee is the individual expected yield (historic average yield) multiplied by the coverage level, multiplied by the acres insured, multiplied by the insured's share. The complement of coverage level is the deductible that is self-insured by the producer. Figure one

Total Guarantee Corn -1998	
Individual Expected Yield	128bushels/acre
Coverage Level	50 percent
Acreage	100 acres
Formula	
Individual Expected Yield x Coverage Level x acres = Total Guarantee	
Example	
128bushel/acre x .50 x 100 acres = 6,400 bushels	

Figure 1 - Example of Unit Guarantee

Liability: Guarantee times a certain percentage of RMA maximum price times share.

The liability is the dollar amount that the insurance company will pay to the insured when there is zero yield. For each insurance period the guarantee is calculated by multiplying the per acre guarantee by the insured acres. The guarantee is then multiplied by the indemnity price (xx percent of the RMA maximum price) and then by the insured's share in the insured acres to get the liability.

The insured acres are defined in the crop insurance policy. There are few limitations to the insurable land, thus nearly all acreage for commercial production is insurable. The largest limitation of insured acreage is the timely planting for the full guarantee. The guarantee is reduced for acreage that is late planted (as defined within the policy provisions).

The indemnity price is any value selected by the insured between 60 and 100 percent of the RMA maximum price election. RMA establishes a maximum price election several months before the insurance period for each crop.

Final liability is calculated using the insured's share in the crop at the time insurance begins. Share refers to the percentage division of the harvested crop between the tenant and landlord. Insured's who are owner-operators of the insured acreage would have a 100 percent insurance interest. Figure two gives an example of a liability calculation.

Liability Corn -1998	
Total Guarantee	6400 bushels

Basis for rate making: Historic insurance experience distributed by yield spans.

For APH crops, the individual expected yield (historic average yield) of each insured is compared to yield spans to determine the appropriate rate for the insured. An example of the yield spans is shown in the following extract (Figure 3) from the 1998 Dallas County Iowa Corn Actuarial Document.

For “grower yield certification” (GYC) crops, there are no rate classes as described above. Instead, the producer certifies his/her yield, which is the basis of the assigned rate. In all other respects, GYC crops are identical to APH crops and follow the tenets of this discussion.

Perils: Indefinite in time and broad.

The perils insured are not typical insurance perils because they represent yield limiting events that have extended duration with no defined beginning. For instance, drought, an insured peril, could start at planting (beginning of insurance period) and continue until harvest (end of the insurance period). The policy provisions list perils that are covered and those that are not

Acres required to be covered: All crop acreage of which the insured has a share in the county.

Producers must insure their entire share of the crop acreage in the chosen county/crop combination. This policy condition prohibits any producer from excluding insurance on selected acreage within a farm or entire farm locations. Without this condition, an insured producer might insure acreage only where there was a chance of loss.

Units: Insurance units of a crop are divided by county and sharing entity. They may be further divided by section, type or practice depending on the crop.

An insurance unit of a crop, commonly known as a “unit”, is the acreage of the insured crop in the county taken into consideration when determining the guarantee, premium, and indemnity for the acreage. A basic unit is one determined by entity. One hundred percent share in the crop would be one basic unit. Land shared with a landlord/tenant would be a basic unit. (For example: a tenant with two landlords insuring one crop in one county would have two basic units.) If the land of a basic unit was in multiple sections, an optional unit may be possible for each section. Units by type or practice may be available on some crops. The resulting units of this possible further division are called optional units. A slightly higher premium is charged when producers divide their policy into optional units.

How the expected yield is set: Individual yield history with a minimum of four years of records building to 5-10, depending on the crop.

A minimum of four years of acceptable production records are required of each producer to calculate the expected yield. If the insured provides less than four years of acceptable production records, a system of proxy or transitional yields are used to provide the expected yield (see previous discussion). After four consecutive years of acceptable production records are provided, the expected yield is a simple or weighted average of each year yield, depending on the crop. When the number of years of consecutive acceptable production records reaches five or ten (depending on the crop) the acceptable production records will be drawn from the most recent five or ten consecutive years.

Exclusions: Losses caused by the insured, perils not listed in the policy, high-risk land, and excluded practices.

Examples of excluded practices are:

- ! Losses caused by negligence, mismanagement, or wrongdoing of the insured, a member of the insured’s family or household, the insured’s tenants, and/or the

- ! Losses caused by the failure or breakdown of the insured's irrigation equipment or facilities;
- ! Losses caused by the insured's failure to carry out good irrigation practices;
- ! Losses caused when the insured planted in land that had not had a crop planted or harvested in at least one of the three previous crop years;
- ! Losses caused when the insured planted in land that was strip mined, unless there was a RMA approved written agreement between the insurance provider and the insured to insure such land;
- ! Losses caused when the insured failed to replant when it was practical to replant;
- ! Losses caused when the insured planted the crop with another crop unless this was an approved practice as stated in the crop policy provisions;
- ! Losses derived from acreage where the insured did not have adequate facilities and/or water to carry out a good irrigated practice at the time of insurance attachment and only an irrigated practice is insured as stated in the crop policy provisions;
- ! Losses derived from high risk land in the case when the insured signed the option to exclude such land from insurance prior to the sales closing date of the crop being insured;
- ! Losses derived from hail and fire as causes of damage when the farmer elected to exclude these events as causes of loss on the crop insurance policy and covers them with an equal or greater amount of (private sector) hail and fire insurance.

How the claims are calculated: Yield shortfall multiplied by indemnity price.

Indemnities are paid when the harvested and appraised production falls short of the unit guarantee. Harvested and mature appraised production is adjusted for moisture and quality. Moisture is adjusted to the percent listed in the crop provisions. The quantity of production is lowered for grain that is near sample grade due to insured causes. The indemnity amount is the

Indemnity Corn 1998	
Unit Guarantee	6400 bushels
Production to Count	5680 bushels
RMA Established Market Price (indemnity Price)	\$2.60/bushel
Share	100 percent
Formula	
(Unit Guarantee - Production to Count) x Indemnity Price = Unit Indemnity	
Example	
(6400 bushels - 5680 bushel) x \$2.60/bushel = \$1,872	

Figure 4 - Indemnity Example

Product Examples: Examples of risk management tools which are based on the Individual Yield Model are APH crops (i.e. wheat, corn, cotton, soybeans, etc.), GYC crops (the same as APH but with no yield spans), peanuts, non-quota tobacco, etc.

Historic (pre 1980) **Mixed Yield Model**

Defining Attribute: Individual yield guarantees were offered to producers based on the location of the insured acreage and crop. The insurance offer was determined by locating the risk area of the acreage within the county on a map. The major element in determining the insurance offer was the soil's production capability. Additional considerations such as susceptibility to flooding or drought, the insured's actual loss experience and other related attributes also affected the offer.

Guarantee: The Individual's current yield will exceed a certain percentage of the area's average yield.

The producer selected the guarantee level of the insurance by selecting any value between 50, 65 and 75 percent of the area's average historic yield. The value selected was listed as the coverage level in the insurance documents. The complement of coverage level was the deductible that was self insured by the producer.

Liability: Guarantee times a certain percentage of the RMA maximum price.

The liability was calculated the same way as in the **Individual Yield** model. However, the percentage the insured producer could choose normally was limited to three prices. These

introduced into a county was used to make the rate determinations. New county programs were usually tied to the experience of the surrounding county crop programs. The underwriters usually started with a county average, and go up and down from that average. An example extract of the resulting FCI-35 is shown in Figure 5.

FORM FCI-35		UNITED STATES DEPARTMENT OF AGRICULTURE FEDERAL CROP INSURANCE CORPORATION COUNTY ACTUARIAL TABLE 1980 AND SUCCEEDING CROP YEARS				
CROP: Corn		STATE: Iowa 19				
PRACTICE:		COUNTY: Dallas 049				
CLASSIFICATION	PRODUCTION GUARANTEE PER ACRE [1]			PRICE ELECTION PER BU [2]		
	LEVEL 1	LEVEL 2	LEVEL 3	\$1.70	\$2.00	\$2.25
				PREMIUM RATE PER ACRE		
	(BU)	(BU)	(BU)	(DOLLAR)	(DOLLAR)	(DOLLAR)
1	32.0			2.70	3.20	3.60
2	35.0			2.30	2.70	3.00
3	39.0			2.30	2.70	3.00
4	44.0			2.30	2.70	3.00
5	49.0			2.30	2.70	3.00
6	56.0			2.30	2.70	3.00
7	65.0			2.70	3.20	3.60
1		41.0		4.30	5.00	5.60
2		46.0		3.70	4.30	4.80
3		51.0		3.70	4.30	4.80
4		57.0		3.70	4.30	4.80
5		64.0		3.70	4.30	4.80
6		73.0		3.70	4.30	4.80
7		84.0		4.30	5.00	5.60
1			47.0	5.90	6.90	7.80
2			53.0	5.10	6.00	6.70
3			59.0	5.10	6.00	6.70
4			66.0	5.10	6.00	6.70
5			74.0	5.10	6.00	6.70
6			84.0	5.10	6.00	6.70
7			97.0	5.90	6.90	7.80

Figure 5 - Extract of 1980 Dallas County, Iowa Actuarial Table for Corn

Perils: Indefinite in time and broad.

occurring after the beginning of planting.

Typical uninsured perils were intentional acts of the insured that reduce yield. Examples were neglect, mismanagement, failure to follow good farming practices, etc.

Acreage required to be covered: All crop acreage which the insured had a share in the county. This is the same as for the **Individual Yield** guarantee model.

Units: Units of a crop were divided by county and sharing entity. They could be further divided by section, type or practice depending on the crop.

A unit was the acreage of the insured crop in the county taken into consideration when determining the guarantee, premium, and indemnity for the acreage. A basic unit was one determined by entity. One hundred percent share in the crop would be one basic unit. Land shared with a landlord/tenant would be a basic unit. (For example: a tenant with two landlords insuring one crop in one county would have two basic units.) If the land of a basic unit was in multiple sections, an optional unit could be possible for each section. Optional units by type or practice could be available on some crops.

How the expected yield was set: Set by the RMA for specific map locations.

The RMA took a county's previous ten year's production and acreage data for the county to calculate the county average yield. The county average was then adjusted by map area within the county by the RSO field underwriters based on land characteristics, insurance experience, etc.

Exclusions: Losses caused by the farmer, perils not listed in the policy, high-risk land, excluded practices. This is the same as the **Individual Yield** model.

How the claims were calculated: Yield shortfall multiplied by indemnity price. (The indemnity is calculated the same way as in the **Individual Yield** model).

Product examples: (None existing in 1999. Corn, wheat, soybeans, etc. prior to 1980).

Note: This model was discontinued because of changes in RMA policy dictated by changes in the Act. Before 1980, RMA had the authority to not offer insurance or to adjust rates, reduce guarantees, etc. to adjust the insurance offer (if an offer was made at all) to one that was actuarially supportable. Since 1980, crop insurance has become the primary risk management tool available to all producers of approved crops. As such, the thesis is it should be universally available to all producers. Rates, guarantees, etc. can not be adjusted to "fit" the situation below

group is defined as all those producers of the same crop in a given *area*, or all those in a given *county*).

Introduction: The GRP is a dramatic departure from traditional approaches to crop insurance because it uses an index of the expected county yield as the basis for protection. The premise of GRP is that when the National Agricultural Statistics Services (NASS) county yield for a crop is low, most farmers growing that crop in that county will also have low yields. When the yield for the insured crop in the county falls below the level chosen by the insured, the insured receives an indemnity.

GRP is not a product for every producer. It is an alternative to the individual farm level coverage provided by APH, with less paperwork and in some counties, less cost. The only paperwork required from the insured is an acreage report due shortly after the normal planting period. GRP might be a good choice for managing the risk of producers who: 1) have individual farm yields that move in the same direction as county yields; 2) determine that the cost of insuring crops with APH exceeds their perceived risks; or 3) cannot or do not want to furnish individual yield records to establish APH guarantees.

Coverage Choices: The insured must choose the crop and county to be covered by GRP. The coverage will apply to the insured's share of all insurable acreage of the crop in the county. RMA offers GRP coverage for eight crops (corn, cotton, forage, grain sorghum, peanuts, rangeland, soybeans, and wheat) in selected counties of 36 states. The availability of GRP is limited because RMA only offers GRP coverage for crops and counties that have more than 30 years of county acreage and yield data from NASS.

GRP insureds must choose one coverage level and amount of protection for each insured crop and county. There are five coverage levels, 70%, 75%, 80%, 85%, and 90% available for all crops. In addition, a catastrophic (CAT) level of coverage is available for all GRP forage and rangeland counties at the 65% coverage level. The choice of coverage level establishes the premium rate for protection, and is multiplied by the expected county yield to establish the "trigger" yield for indemnities. Expected county yields are established by RMA from over 30 years of NASS county yields and are adjusted for yield trends caused by new technology, improved farming practices, and other factors affecting yield.

GRP insureds must select a dollar amount of protection. The choice is any whole dollar amount between 60% and 100% (55% in the case of CAT) of the maximum dollar amount of protection offered by RMA. The maximum dollar amount of protection is 150% (125% in the case of rangeland) of the expected county revenue (GRP expected county yield times the RMA established price). The amount of protection per acre is used to calculate the amount of

county yield after the NASS estimated county yield is received and adjusted by RMA to the same basis as the GRP offer. The amount of indemnity is the percentage shortfall of the county yield from the trigger yield, multiplied by the amount of protection for the policy. The RMA established APH price for the crop is plugged into the indemnity calculation with the group expected yield when making the offer of insurance to develop the rating scenario.

The formula for determining the percentage shortfall is the trigger yield minus the county yield, divided by the trigger yield.

TABLE 1

* GROUP RISK PLAN (GRP) *				
* Level	Dollar Protection	Subsidy	Fee	*
*NOTE: CAT IS AVAILABLE ONLY FOR FORAGE & RANGELAND *				
* 65%	*55%	*100%	* Administrative	*
* 70%	* 60 to 100%	* Limited	* Administrative	*
* 75%	*60 to 100%	* Limited	* Administrative	*
* 80%	*60 to <95%	* Limited	* Administrative	*
*	* 95 to 100%	* Full	* Additional	*
* 85%	* 60 to <90%	* Limited	* Administrative	*
*	* 90 to 100%	* Full	* Additional	*
* 90%	* 60 to <85%	* Limited	* Administrative	*
*	* 85 to 100%	* Full	* Additional	*

Subsidies: The subsidy amount of Additional Coverage choices with Limited Subsidy equals the

Liability: A percentage of the RMA maximum protection per acre.

As stated above, the insured selects an amount of protection per acre between 60 and 100 percent of the maximum amount of protection established by RMA.

An example of the liability is shown in Figure 7.

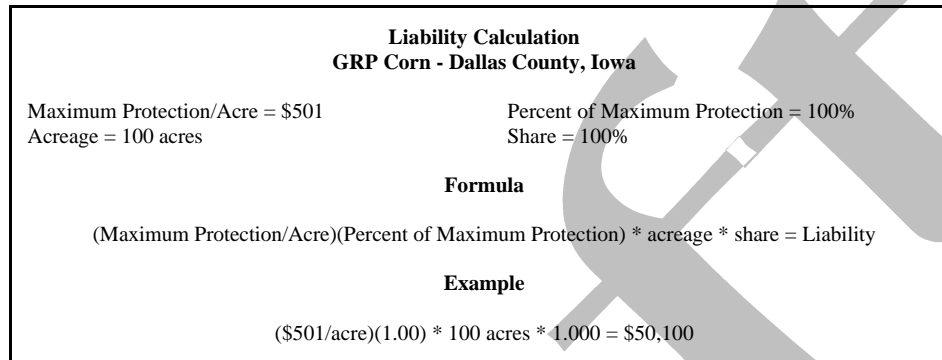


Figure 7 - Liability Calculation

Premium: An example of the premium calculation is shown in figure 8.

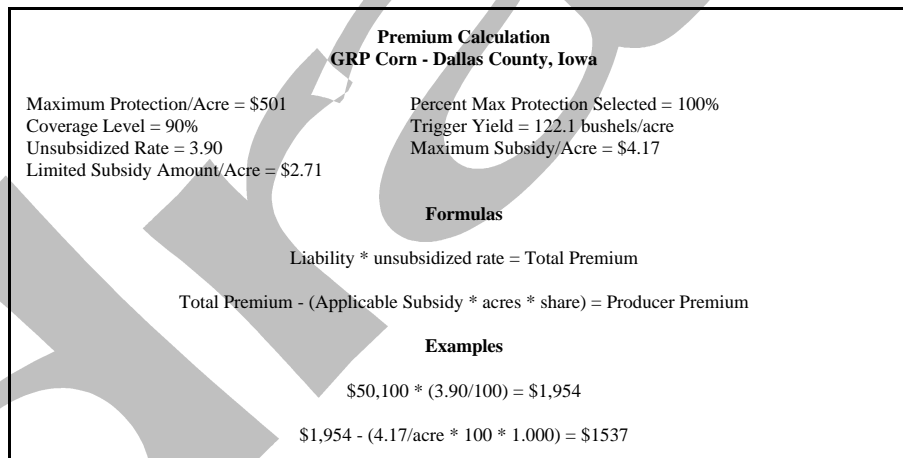


Figure 8 - Premium Calculation

Perils: Indefinite in time and broad.

How the expected yield is set: Historic county yield data. As stated previously, 30 years of NASS historic yields are used to develop the expected yield for the county.

Exclusions: None.

How the claims are calculated: The payment that the insured receives is calculated as shown in Figure 11.

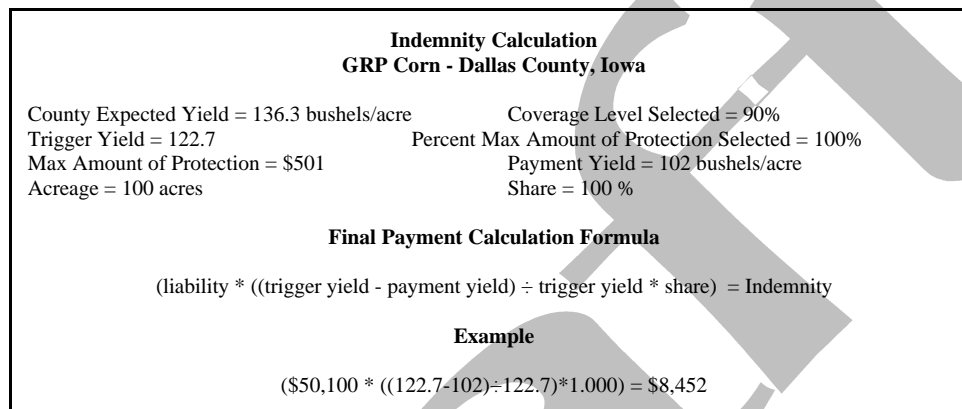


Figure 11 - Indemnity Calculation

Fixed Yield Model

This model of RMA risk management protection provides a tool against declining revenues due to damage that causes a yield shortfall and there is no price increase in the market sufficient to cover the resulting lower revenue stream. In 1999 there were 12 crops insured using this model.

Defining Attribute: Established area price or revenue is based on *broker* and/or *processor contract* price. The dollar amount of insurance selected is based on the RMA maximum price, which is in turn derived from guaranteed *production* contracts and other sources. Guaranteed *revenue* contracts are discussed later, under the framework of the Fixed Revenue model. RMA establishes the dollar revenue guarantee based upon information from several sources about the variable (and sometimes fixed) cost of production, expected market prices, and yields.

Since the mid-1990's, RMA has embarked on a mission to expand the inventory of

Because of the more specialized nature of these crops and because of the sometimes limited amount of data available regarding cultural and actuarial risk factors, there is no fixed methodology regarding how RMA fixes the revenue guarantee. Rather, the guarantee arrived at is based on extensive research and varies depending upon data discovery for each crop.

Guarantee: The individual's revenue will exceed a percentage of the reference revenue set by RMA. The individual's expected revenue is established by RMA using data about cost of production, expected market prices, yields and acreage. The producer selects a percentage of this revenue where the percentage is the choice of coverage levels between 60 and 75 percent.

Liability: RMA established revenue times coverage level percentage. Prior to the insurance period, the producer makes two selections: 1) the county/crop combination and 2) coverage level. These selections apply to all the crop, defined in the Crop Provisions, in which the insured has a share in the county.

Basis for rate making: Historic insurance experience distributed by yield spans.

Perils: Indefinite in time, broad perils plus limited downward price movement.

Acreage required to be covered: All crop acreage in the county in which the insured has a share.

All insurable acreage occupied by the insured crop is insured, whether reported or not. This is an underwriting technique to reduce adverse selection within the program and provide the insurance provider with risk dispersion. Risk dispersion is an important consideration for this model, because insuring broad areas will increase the likelihood that not all risks will be damaged by an insured event.

Units: Units by county, and sharing entity may be further divided by section, type, or practice.

For each county/crop combination, the insured producer is required to insure all the land in the county, however this may be divided into smaller tracts or units for crop insurance. The first division of units is by sharing entity. Crop acreage shared with different entities is a separate unit. For instance, a landlord of acreage in one county with three tenants would have a unit for each tenant consisting of the acreage farmed by each tenant. This level of units are called "basic."

Basic units may be divided by the rules of each crop provision. Units resulting from this election are called "optional" because they are at the option of the insured and must be requested at the time acreage is reported and records of planted acreage and harvested production must be

Provisions. Consequential damage is covered when caused by a primary covered peril.

How claims are calculated: Percent of damage minus the deductible, multiplied by the amount of protection. Damage is the evaluation of totally and partially destroyed property.

The percent of damage is the determination of the damage by the evaluation of the adjuster. The adjuster is provided with procedure for sampling and methods to quantify damage through specific measurements.

Product Example: Hybrid corn seed, hybrid sorghum seed..

Revenue Guarantees

This group of crop insurance products guarantee a certain amount of revenue to the insured. Indemnities are paid when the measured damage exceeds the deductible amount selected. Within this group, there are several models based on individual revenue streams and expectations: the non-commodity specific **Adjusted Gross Revenue** plan, and the three commodity specific individual revenue plans: **Crop Revenue Coverage, Income Protection, and Revenue Assurance**. There is also one group-based revenue plan, **Group Risk Income Protection (GRIP)**. Finally, there is the Fixed Revenue model, with a group-established guarantee and an individually established indemnity.

Adjusted Gross Revenue (AGR)

Defining Attribute: Whole farm (non-commodity specific) individual revenue coverage based on past cash receipts.

The Adjusted Gross Revenue (AGR) insurance plan is a non-traditional, whole farm risk management tool. The AGR product provides the producer protection against low revenue due to unavoidable causes. The AGR concept uses a producer's historic Schedule F tax form information as a base to provide a level of guaranteed revenue for the insurance period. Covered farm revenue is income from agricultural commodities reported on the Schedule F tax return, including incidental amounts of income from animals and animal products, and aquaculture reared in a controlled environment. Incidental livestock income represents the crop production value fed to livestock. AGR: 1) provides an insurance safety net for multiple agricultural commodities in one insurance product; 2) establishes a common denominator for commodity production -- cash receipts; 3) makes simple and straightforward use of income tax forms; and 4) reinforces program credibility by using Internal Revenue Service (IRS) tax forms and

with the Internal Revenue Service (IRS); or 2) expected revenue for the insurance year. For example, a producer with a \$100,000 approved gross revenue who chose 80/75 coverage would have \$60,000 protection ($\$100,000 \times .80$ coverage level $\times .75$ payment rate).

Liability: Whole farm projected revenue times the coverage level.

Loss payments are triggered when the adjusted gross income for the insured year is less than the loss inception point. The loss inception point is calculated by multiplying the approved gross revenue by the chosen percent coverage level (65, 75, or 80). Once a loss is triggered, the payment rate is 75 percent of the revenue shortfall. Loss payment for this example would trigger when the income for the insurance year is below \$80,000 ($\$100,000 \times .80$ coverage level).

Basis for rate making: The insured must have filed five consecutive years of Schedule F tax forms. The insured must have been the same tax entity for at least seven years (the five year history, previous year, and insurance year).

Perils: Indefinite in time, broad perils plus downward price movement. Essentially the Individual Yield Guarantee model plus downward price.

Acreage required to be covered: All acreage in which the insured produced cash receipts as reported on his Schedule F tax form as an interest for the whole farm.

All insurable acreage occupied by the insured crop is insured, whether reported or not. This is an underwriting technique to reduce adverse selection within the program and provide the insurance provider with risk dispersion. Risk dispersion is an important consideration for this model, because insuring broad areas will increase the likelihood that not all risks will be damaged by an insured event.

Units: Units are based on tax entity.

The whole farm entity, as reported on the Schedule F tax forms, constitutes the only unit.

Crop Revenue Coverage, Income Protection, and Revenue Assurance

The Federal Crop Insurance Corporation (FCIC) Board of Directors approved three pilot revenue crop insurance programs for the 1997 crop year, all of which have remained available through the 1999 crop year. These plans respond to the directive of the Federal Crop Insurance Reform Act of 1994 for RMA to develop a pilot crop insurance program that provides coverage

terms and conditions of the Actual Production History (APH) plan of multiple peril crop insurance (MPCI). APH provides the yield component and provides a yield forecast through the insured's records of historic yields. It also provides a documented process to determine the yield for the insurance period.

Revenue protection for all products is provided by extending traditional APH protection to include price variability. The price component common to CRC, IP and RA uses the commodity futures market for price discovery. Price discovery occurs twice in these plans. First, before the insurance period (Base, Projected or Projected harvest price), to establish the revenue guarantee and premium. Second, at harvest time (Harvest or Fall harvest price). CRC provides increased protection when the Harvest price is above the Base price. All revenue insurance plans pay the insured producer an indemnity when any combination of harvested and appraised yield and harvest price results in insurance revenue that is less than the revenue guarantee.

The Projected, Projected harvest, or Base price, and the Harvest or Fall harvest price are the average of the daily settlement prices for the commodity futures exchange, contract, and period listed in the insurance contract. The Projected, Projected harvest, or Base price is the average of the daily settlement prices during the month designated in the insurance contract that is before insurance begins. Harvest or Fall harvest price is an average for the month designated in the insurance contract near the end of the insurance period. These prices are available on the RMA website at www.act.fcic.usda.gov shortly after the close of the discovery period.

While CRC, RA and IP share many terms and concepts, there are differences in the plans. The following information gives a general explanation of each product.

Crop Revenue Coverage (CRC)

Redland Insurance Company (Redland) developed and submitted their Crop Revenue Coverage (CRC) policy to the Risk Management Agency (RMA) requesting Federal Crop Insurance Corporation (FCIC) reinsurance, administrative expense subsidy, and premium subsidy beginning the 1997 crop year.

Description of Coverage: The APH policy provides established procedure for setting yields, underwriting and yield measurement. Price fluctuations are measured by the difference in the average commodity price before insurance begins, “Base price,” and the price at harvest time, “Harvest price.” Price fluctuations between the Harvest and Base price is limited to \$1.50 for corn, \$0.70 for cotton, \$1.50 for grain sorghum, \$0.05 for rice, \$3.00 for soybeans, and \$2.00 for wheat.

Producers choose the amount of revenue protection that meets their risk management

are determined by ownership, owner-operator and cash rent, or each sharing entity. Optional units are determined by location and/or production practice, and each proposed Optional unit must be supported by historic records of planted acreage and yield. The revenue guarantee applies individually to each Basic, Optional, or Enterprise unit. A premium discount is available if an insured elects Enterprise units (all acreage of the insured crop in the county in which the insured has an interest).

CRC Prices and Indemnity Payments: CRC uses two prices to measure price fluctuation. Base price establishes the revenue guarantee. Harvest price establishes the crop value to count against the revenue guarantee, and is also used to recompute the revenue guarantee when it is higher than the Base price. The CRC Base and Harvest prices are a percentage of the commodity exchange's average daily settlement price for the insured crop, futures contract or index, and period specified in the Crop Provisions. Policyholders who desire a larger base revenue guarantee have the option to increase the Percent Base Price an additional 5 percent. Indemnity payments will be paid when the Harvest price and actual production are determined.

Covered and Excluded Events: The CRC policy provides insurance protection for unavoidable loss of revenue due to insured causes of loss, including market prices. Exclusions are the same as the MPCCI policy.

Market Availability: For 1999, CRC is available in all counties where the APH program is available.

Producer Subsidy: Producer premium subsidy (the portion of the premium paid by the government) is paid only on the yield risk portion of the CRC coverage. This subsidy amount is the same dollar amount as the MPCCI policy.

Income Protection (IP)

Section 508(h)(6) of the Federal Crop Insurance Act (Act) directs the Federal Crop Insurance Corporation (FCIC) to offer a pilot cost of production insurance plan. The Act provides the following pilot parameters: 1) establish the pilot program beginning with the 1996 crop year; 2) offer the pilot program in enough counties to provide a comprehensive evaluation of the feasibility, effectiveness, and demand among producers; and 3) pay an indemnity when the gross income is less than the guaranteed income as a result of a reduction in price or yield

underwriting and yield measurement. Price fluctuations are measured by the difference in the average commodity price before insurance begins, "Projected price," and the price at harvest time, "Harvest price."

Producers choose the amount of revenue protection that meets their risk management needs by selecting either catastrophic coverage (CAT) or a coverage level between 50 and either 75 or 85 percent (depending on the crop and location). The IP revenue guarantee is the insured's selected coverage level times the APH yield times the Projected price. IP policyholders are indemnified when the harvested and appraised yield times the Harvest price is less than the guarantee.

Insurance is provided for an Enterprise unit that is all insurable acreage of the insured crop in the county in which the insured has an interest. The Enterprise unit APH yield is calculated using current APH rules.

Producers may elect the CAT level of protection and pay only the \$60 administrative fee. No premium is due for CAT. For the 1999 crop year catastrophic risk protection equals 27.5 percent of your approved yield times 100 percent of the Projected price.

Beginning with the 1999 crop year, an alternative version of IP, Indexed IP, is available on a limited basis. This product is identical to regular IP except for how the APH approved yield is calculated. If the producer has experienced unusually low yields, his/her approved yield averages are reduced and do not reflect the expected yield of the crop. Indexing producer yields alleviates this problem. The indexing process uses county data to moderate the effect of unusually low yields. The Indexed IP yield is calculated by subtracting the average of the producer's reported yields at the enterprise unit level from the average of the county yields for the same years, and subtracting that difference from the county's expected yield for the current crop year. This pilot program may provide an improved yield guarantee for producers in areas that have experienced unusually low yields in recent years.

Prices And Indemnity Payments: IP uses two prices to measure price fluctuation. Projected price establishes the revenue guarantee. Harvest price establishes the crop value to count against the revenue guarantee. IP prices are 100 percent (with the exceptions of barley and grain sorghum) of the average daily settlement price for the insured crop, futures contract or index, and period specified in the Crop Provisions. Indemnity payments are paid when the harvested and appraised production and Harvest price are determined.

All insurable acreage occupied by the insured crop is insured, whether reported or not. This is an underwriting technique to reduce adverse selection within the program and provide the insurance provider with risk dispersion. Risk dispersion is an important consideration for this model, because insuring broad areas will increase the likelihood that not all risks will be

level. The actuarial development for Income Protection was conducted collaterally by researchers at Montana State University, the Economic Research Service, and RMA.

Premium subsidy follows the formula in the Act. Insureds selecting coverage at or above the 65 percent level will receive a premium subsidy equal to 75 percent of the premium for the 50 percent coverage Income Protection. Insureds selecting coverage below the 65 percent coverage level will receive a subsidy equal to 55 percent of the premium for 50 percent coverage Income Protection. Since the subsidy is based on the value of the 50 percent Income Protection premium, individual premium subsidies may be more or less than would be paid for APH. On the average, the premium subsidy is about the same as for APH.

Crop/State	Exchange and Futures Contract	Projected Price/ Period	Harvest Price/ Period
Barley-MN, MT, ND, and SD	CBOT September corn	85% of February	85% of August
Barley-ID, OR, and WA	CBOT September corn	85% of February	85% of July 15 through August 14
Corn-counties with a 2/28 S/C date (NC)	CBOT December	January 15 through February 14	November
Corn-counties with a 3/15 S/C date	CBOT December	February	November
Cotton	NYCE December	January 15 through February 14	November
Grain Sorghum	CBOT December corn	90% of February	90% of November
Soybeans-counties with a 2/28 S/C date (AR, NC)	CBOT November	January 15 through February 14	October
Soybeans-counties with a 3/15 S/C date	CBOT November	February	October
Winter Wheat-KS	CBOT July	August 15 through September 14	June

Winter Wheat-MT and SD*	CBOT July	August 15 through September 14	June
Wheat (Spring) in MN, MT**, ND, and SD**	CBOT September	February	August

CBOT - Chicago Board of Trade
 NYCE - New York Cotton Exchange

Revenue Assurance (RA)

The Farm Bureau Mutual Insurance Company (Farm Bureau) developed Revenue Assurance (RA) at the request of elected member representatives. Revenue Assurance was approved by the RMA as a pilot project covering corn and soybeans in all 99 Iowa counties for the 1997 and 1998 crop years. For 1999, RA was expanded to provide coverage for corn in Illinois, Iowa, Minnesota, North Dakota, and South Dakota; for soybeans in Illinois, Iowa, and Minnesota; and for wheat in North Dakota.

Description of Coverage: The APH policy provides established procedure for setting yields, underwriting and yield measurement. Price fluctuations are measured by the difference in the average commodity price before insurance begins, “Projected harvest price,” and the price at harvest time, “Fall harvest price.”

The RA unit revenue guarantee is the insured’s selected coverage level times the APH yield for the unit times the Projected harvest price. RA policyholders are due indemnities when the harvested and appraised yield times the harvest price is less than the unit revenue guarantee.

RA policyholders must insure all the acreage of the insured crop in the county in which they have an interest. However, they may select from several unit organizations; basic, optional, enterprise, or whole farm. Basic units are the insured crop acreage that is either owner-operated (100 percent interest) or shared with another entity. Basic units may be subdivided into Optional units based on sections and/or irrigated or nonirrigated practice if the insured has records of planted acreage and harvested production for each proposed unit. RA provides a premium discount if the insured elects an Enterprise unit, which is all the acreage of the insured crop in the county in which the insured has a share. An additional premium discount is available when the insured elects the Whole farm unit, which is all the acreage of corn, soybeans, and wheat (North Dakota only) in the county in which the insured has a share.

Replant payments will be made at the time of loss and will be based on the Projected

the Fall harvest price option is elected and the Fall harvest price is higher than the Projected harvest price. RA prices are 100 percent of the average daily settlement price for the insured crop, futures contract, and period specified in the Crop Provisions. Indemnity payments are paid when the harvested and appraised production and Harvest price are determined.

Crop/State	Exchange and Futures Contract	Projected Harvest Price/Period	Fall Harvest Price/Period
Corn	CBOT December corn	February	November
Soybeans	CBOT November soybeans	February	October
Wheat	MGE September wheat	August	February

CBOT - Chicago Board of Trade

MGE - Minneapolis Grain Exchange

Covered And Excluded Events: The RA policy provides insurance protection for unavoidable loss of revenue due to insured causes of loss, including low market prices.

Rating and Producer Subsidy: RA premium rates are calculated by a rating model incorporating the variability and correlation of yield and price. Producer premiums are subsidized and the subsidy can not exceed the comparable APH premium subsidy.

Area Revenue Model: Group Risk Income Protection (GRIP)

Description of Coverage: The Group Risk Income Protection (GRIP) model originated and was submitted by the IGF Insurance Company. It is an area-based revenue insurance product that pays the insured in the event the county average per acre revenue falls below the insured's county "trigger" revenue GRIP is similar to the Group Risk Plan in that participation is driven by the relationship of individual yield to the county expected yield, except that price is added into the equation to place the focus on revenue.

The primary objective of the GRIP model is to provide protection against widespread losses in revenue. It does not protect individual producer revenue.

Guarantee: The area (defined as county) average per acre revenue will not fall below the insured's "trigger" revenue, or coverage level selected.

The selected coverage levels can range between 70 to 90 percent in five percent

Harvest price is defined as the simple average of the final closing daily settlement prices in November on the CBOT nearby December corn futures contract and in October on the CBOT November soybean futures contract for the current crop year.

A GRIP indemnity payment occurs if the county revenue is less than the producer's trigger revenue based on the selected coverage level. Consider the following example:

- # The insured buys 85% coverage and selects \$244 protection per acre on 200 acres; the policy protection is \$48,800 ($\244×200 acres). Expected county revenue is \$271; therefore the insured's trigger revenue is \$230 (85% of \$271).
- # If RMA issues a county revenue of \$225, the insured's payment calculation factor is 0.022 ($(\$230 - 225) / 230$). The indemnity payment of \$1,074 is determined by multiplying the payment calculation factor by the amount of policy protection ($0.022 \times \$48,800$).

Premium and Subsidies: The insured selects the desired coverage level and dollar amount of coverage to calculate premium. The premium is determined by multiplying the policy protection times the premium rate per hundred dollars of protection per coverage level as set forth in the actuarial documents, by 0.01, and subtracting the applicable subsidy.

Premium subsidy for GRIP will be equal to the GRP subsidy for the same county and crop. The net premium charged the insured cannot be less than zero

Market Availability: GRIP is available for corn and soybeans in those counties in Iowa, Illinois and Indiana where GRP is offered.

Fixed Revenue Model

Since the mid-1990's, RMA has embarked on a mission to expand the inventory of insurable crops. Many of these "specialty" crops have thus required a customized insurance program due to their unique production and marketing characteristics, as well as unique regional attributes which require additional development considerations. The standard individual-based yield and loss approach used in the past has often been found lacking when attempting to design a program of risk management for these crops. The dollar yield approach works well in those cases where the insured population is fairly uniform, with similar variable costs of production, etc.

Unlike the Fixed Yield model, in this case the established price is arrived at by RMA without the use of processor contracts, or is based on contracts for guaranteed *revenue* rather than guaranteed *production*.

Indemnities are triggered by actual physical yield loss, but yield loss is often synonymous with a quality loss rather than a quantity loss in the case of fresh market fruits and vegetables. In other words, an indemnity can be paid under the strictures of this model if revenue loss is greater than the deductible amount selected, even if the raw quantity of production did not decrease. Usually, policy revenue guarantees established by RMA within this model are based on production cost and are not equivalent to gross returns or “in-field” revenue.

Unlike the Individual Yield plan, there are no varying rates when setting the guarantee based on individual grower yields. An RMA established price or revenue is set for the entire county, for all growers in that county; however, losses are triggered on an individual basis as described previously. Thus, the dollar revenue model is a “mixed” model in that the front end, or the guarantee, is based on the group population, but the indemnity, the “back end”, is based on individual performance.

This model is popular with insureds because it does not require laborious record keeping regarding unit yields, etc. It is particularly well suited to crops which are sold to processors, etc., or to those who can readily show revenue stream receipts. Also, the procedures, formulas and calculations used are easier for laymen to understand.

Defining Attribute: RMA established area price or revenue. RMA establishes the dollar revenue guarantee based upon information from several sources about the variable (and sometimes fixed) cost of production, expected market prices, and yields. Other parameters reviewed include planted acreage and inflation rates for finished goods.

Guarantee: The individual’s revenue will exceed a percentage of the revenue set by RMA. The individual’s expected revenue is established by RMA using data about cost of production, expected market prices and yields and acreage. The producer selects a percentage of this revenue where the percentage is the choice of coverage levels between 60 and 75 percent.

Liability: RMA established revenue times coverage level percentage. Prior to the insurance period, the producer makes two selections: 1) the county/crop combination and 2) coverage level. These selections apply to all the crop, defined in the Crop Provisions, in which the insured has a share in the county.

Basis for rate making: Historic insurance experience distributed by yield spans.

Acreage required to be covered: All crop acreage in the county in which the insured has a share.

All insurable acreage occupied by the insured crop is insured, whether reported or not. This is an underwriting technique to reduce adverse selection within the program and provide the insurance provider with risk dispersion. Risk dispersion is an important consideration for this model, because insuring broad areas will increase the likelihood that not all risks will be damaged by an insured event.

Units: Units by county, and sharing entity may be further divided by section, type, practice, and planting periods (if applicable).

For each county/crop combination, the insured producer is required to insure all the land in the county, however this may be divided into smaller tracts or units for crop insurance. The first division of units is by sharing entity. Crop acreage shared with different entities is a separate unit. For instance, a landlord of acreage in one county with three tenants would have a unit for each tenant consisting of the acreage farmed by each tenant. This level of units are called “basic.”

Because some of the crop are planted within specific time spans as prescribed in the crop policy provisions, these planting periods (i.e. fall, winter, spring) are also designated as basic units.

Exclusions: Non-producing physical units; damage caused by uninsured perils. Units of no commercial value are not insured. The threshold of commercial value is listed in the Crop Provisions. Consequential damage is covered when caused by a primary covered peril.

Product Examples: Fresh Market Sweet Corn, Fresh Market Tomatoes, Fresh Market Peppers.

Asset Guarantees

This group of crop insurance products indemnifies the insured producer when the measured damage exceeds the deductible amount selected. Within this group, there are two models: **Inventory Protection** and the **Perennials Replant and Renovate** policies. In 1999, RMA either insured or has plans to insure eleven crops insured using these models.

Perennials Replant and Renovate Model

This model of RMA crop insurance provides protection for two broad groups of policies: perennial plants such as trees, and forage stand establishment (“forage seeding”). In the case of

Defining Attribute: Indemnities are triggered by physical units lost. Physical units as used in this model are either acres or trees.

Guarantee: The percent of damage measured in physical units will not exceed the coverage level percent chosen by the insured, i.e., if an insured chooses a 75% coverage level, he/she is in effect choosing a 25% deductible (1-coverage level=deductible).

Liability: Stated dollar amount not to exceed RMA's maximum unit price times the number of physical units times coverage level.

Prior to the insurance period, the producer makes two selections: 1) the dollar amount (Amount of Protection) and 2) coverage level. These selections apply to all the crop, defined in the Crop Provisions, in which the insured has a share in the county. The Amount of Protection is the amount that will be paid in the event that the insured crop is totally destroyed by a covered peril and used to calculate the premium. With some variants of this model, such as Florida avocado/mango trees, the policy limits the Amount of Protection times coverage level to the number of trees before the loss multiplied by the maximum price per tree listed by RMA in the Actuarial Table.

The deductible is the complement of the coverage level. For example, an insured selecting the 75 percent coverage level would have 25 percent deductible coverage.

The maximum Amount of Protection is the result of multiplying RMA's maximum unit price times the number of physical units times the coverage level.

Basis for rate making: Frequency and severity of insured perils plus historic insurance experience.

The perils covered by this model generally events that can be documented by weather station records or other third party verification. Therefore, there is a long data series available about the frequency and severity of the covered peril. Official weather records date back to the early 1900's.

A damage model is developed for insured crops for each insured peril. The elements of this model predict damage at different degrees of severity. Often this model is developed in conjunction with regional crop experts.

Perils: Definite in time, narrow perils only. (Freeze, hurricane, hail, and others). Covered perils of this model are generally specific weather events that occur within a relatively short time. These perils are also recorded by the National Weather Service. Additionally, covered perils tend to be indiscriminate about location or crop. Some variants of this model, such as

model, because insuring broad areas will increase the likelihood that not all risks will be damaged by an insured event.

Units. Units by crop, county, and sharing entity. Units are all the acreage required to be covered in the county, item VI. Units may be divided by each sharing entity that generally is each different landlord. With some variants of this model, such as Macadamia trees, units can be based upon contiguous versus noncontiguous land or on 80 acre parcels.

How the expected yield is set. Insured's choice not exceeding the RMA limit per physical unit.

The expected yield is the yield potential of the crop before damage. Since the damage is measured in the percent of crop removed, there is little need to precisely know the yield potential before damage.

Exclusions. Non-producing physical units; damage caused by uninsured perils. Units of no commercial value are not insured. The threshold of commercial value is listed in the Crop Provisions. Consequential damage is covered when caused by a primary covered peril. Generally, the trees insured must be planted for fruit or juice to be insurable.

How claims are calculated. Percent of damage multiplied by the coverage level minus the deductible, multiplied by the amount of protection. Damage is the evaluation of totally and partially destroyed property.

The percent of damage is the determination of the damage by the evaluation of the adjuster. The adjuster is provided procedures for sampling and methods to quantify damage through specific measurements. For instance, a tree that is uprooted would be evaluated as 100 percent damaged, however a tree that has one limb removed would have 20 percent damage, but a tree with 4 out of 5 limbs removed would be 100 percent damaged, etc.

The following gives an example of how a claim is calculated:

- # Note: $(100 - \text{coverage level} = \text{deductible})$;
- # Step One: Percent of loss - deductible;
- # Step Two: Divide results of step one by the coverage level;
- # Step Three: Multiply results of Step Two by the Amount of Insurance (in the case of Avocado/Mango and Florida Fruit Trees, multiply the results of Step Two by the lesser of the unit value OR the Amount of Insurance;
- # Multiply the results of Step Three by insured's share.

Product Examples: Florida Fruit Trees, Florida Citrus.

Defining Attribute: Indemnities are triggered by damage to the nursery crop resulting in diminished plant value.

Guarantee: The percent of damage measured in dollars will not exceed the policy deductible.

Liability: Inventory times wholesale prices times coverage level times price election times share.

Prior to the insurance period, the producer declares the value of the inventory (Amount of Insurance) a coverage level and a price election that will apply to all insurable nursery plants, as defined in the Crop Provisions, in which the insured has a share in the county. The Amount of Insurance is the amount that will be paid in the event that the insured crop is totally destroyed by a covered peril and used to calculate the premium. The deductible is the complement of the coverage level. For example, an insured selecting the 75 percent coverage level would have 25 percent deductible coverage.

The maximum Amount of Insurance is the result of multiplying the grower's wholesale price for each insured species times the number of physical units times the coverage level times the price election times the share.

Basis for rate making: Frequency and severity of insured perils plus historic insurance experience.

The perils covered by this model generally events that can be documented by weather station records or other third party verification. Therefore, there is a long data series available about the frequency and severity of the covered peril. Official weather records date back to the early 1900's.

Perils: Definite in time, broad perils.

The most frequent perils covered by this model are generally specific weather events that occur within a relatively short time. These perils are also recorded by the National Weather Service. Additionally, covered perils tend to be indiscriminate about location or crop.

Acreage required to be covered. All insurable nursery plants in the county in which the insured has a share.

All of the insurable crop is insured, whether reported or not.

This is an underwriting technique to reduce adverse selection within the program and provide the insurance provider with risk dispersion. Risk dispersion is an important consideration for this model, because insuring broad areas will increase the likelihood that not all risks will be damaged by an insured event.

before damage as determined by RMA.

IX. Exclusions: Disease or insect infestation, failure of, or a reduction in, the power supply, inability to market the nursery plants, cold temperatures, if cold protection is required in the eligible plant list, and the insured fails to meet cold protection requirements, collapse or failure of buildings or structures, failure of plants to grow to an expected size due to drought. These exclusions all have qualifiers outlined in section 10 of the nursery provisions.

How claims are calculated. Dollar damage minus deductible. The dollar damage is the value of totally and partially destroyed property.

Product Example: Nursery.

Crop	Guarantee Basis	Indemnity Basis	Model Premise
AGR	Individual	Individual	Individual Revenue Guarantee
Almonds	Individual	Individual	Individual Yield Guarantee
Apples	Individual	Individual	Individual Yield Guarantee
Avocados (APH)	Individual	Individual	Individual Yield Guarantee
Avocados (California)	Group	Individual	Fixed Revenue Guarantee
Avocado/Mango Trees	Group	Individual	Perennials R & R
Barley APH	Individual	Individual	Individual Yield Guarantee
Barley IP	Individual	Individual	Individual Revenue Guarantee
Beans, Dry (Including Bush for Seed)	Individual	Individual	Individual Yield Guarantee
Beans, Fresh Market Snap			
Beans, Processing	Individual	Individual	Individual Yield Guarantee
Blackberries/Raspberries	Individual	Individual	Individual Yield Guarantee
Blueberries	Individual	Individual	Individual Yield Guarantee
Buckwheat	Individual	Individual	Individual Yield Guarantee
Cabbage	Individual	Individual	Individual Yield Guarantee
Canola/Rapeseed	Individual	Individual	Individual Yield Guarantee
Canning and Processing Beans	Individual	Individual	Individual Yield Guarantee
Cherries	Group	Individual	Fixed Revenue Guarantee
Chile Peppers	Group	Individual	Fixed Revenue Guarantee
Clams	Group	Individual	Individual Inventory Asset Guarantee
Citrus Fruit (AZ-CA)	Individual	Individual	Individual Yield Guarantee
Citrus Fruit (FL)	Individual	Individual	Individual Yield Guarantee
Citrus Fruit (TX)	Individual	Individual	Individual Yield Guarantee
Citrus Dollar (CA)	Group	Individual	Fixed Revenue Guarantee
Citrus Revenue	Group	Individual	Perennials Replant & Renovate
Citrus Trees-Texas	Group	Individual	Perennials Replant & Renovate
Corn APH	Individual	Individual	Individual Yield Guarantee
Corn CRC	Group	Group	Individual Revenue Guarantee
Corn GRIP	Group	Group	Group Revenue Guarantee
Corn GRP	Group	Group	Group Yield Guarantee

Crop	Guarantee Basis	Indemnity Basis	Model Premise
Crambe	Individual	Individual	Individual Yield Guarantee
Cranberries	Individual	Individual	Individual Yield Guarantee
Cultivated Wild Rice	Individual	Individual	Individual Yield Guarantee
Cucumbers			
Dry Peas & Lentils	Individual	Individual	Individual Yield Guarantee
ELS Cotton	Individual	Individual	Individual Yield Guarantee
Figs	Individual	Individual	Individual Yield Guarantee
Flax	Individual	Individual	Individual Yield Guarantee
Florida Fruit Trees	Group	Individual	Perennials Replant & Renovate
Forage Production	Individual	Individual	Individual Yield Guarantee
Forage Production GRP	Group	Group	Group Yield Guarantee
Forage Seed	Group	Individual	Perennials Replant & Renovate
Grain Sorghum APH	Individual	Individual	Individual Yield Guarantee
Grain Sorghum CRC	Individual	Individual	Individual Revenue Guarantee
Grain Sorghum GRP	Group	Group	Group Yield Guarantee
Grain Sorghum IP	Individual	Individual	Individual Revenue Guarantee
Grapes	Individual	Individual	Individual Yield Guarantee
Green Peas	Individual	Individual	Individual Yield Guarantee
Hybrid Corn Seed	Group	Individual	Individual Fixed Yield
Hybrid Sorghum Seed	Group	Individual	Individual Fixed Yield
Macadamia Nuts	Individual	Individual	Individual Yield Guarantee
Macadamia Trees	Group	Individual	Perennials Replant & Renovate
Millet	Individual	Individual	Individual Yield Guarantee
Mint	Individual	Individual	Individual Yield Guarantee
Mustard	Individual	Individual	Individual Yield Guarantee
Nursery	Individual	Individual	Individual Inventory Asset Guarantee
Oats	Individual	Individual	Individual Yield Guarantee
Onions	Group	Individual	Individual Yield Guarantee
Peas (Dry and Green)	Individual	Individual	Individual Yield Guarantee
Peaches	Individual	Individual	Individual Yield Guarantee

Crop	Guarantee Basis	Indemnity Basis	Model Premise
Peppers Fresh Market	Group	Individual	Fixed Revenue Guarantee
Plums	Individual	Individual	Individual Yield Guarantee
Popcorn	Individual	Individual	Individual Yield Guarantee
Potatoes	Individual	Individual	Individual Yield Guarantee
Prunes	Individual	Individual	Individual Yield Guarantee
Raisins	Group	Individual	Individual Inventory Asset Guarantee
Rangeland GRP	Group	Group	Group Yield Guarantee
Rice APH	Individual	Individual	Individual Yield Guarantee
Rice CRC	Individual	Individual	Replacement Revenue Coverage
Rye	Individual	Individual	Individual Yield Guarantee
Safflower	Individual	Individual	Individual Yield Guarantee
Soybeans APH	Individual	Individual	Individual Yield Guarantee
Soybeans CRC	Individual	Individual	Individual Revenue Guarantee
Soybeans GRIP	Group	Group	Group Revenue Guarantee
Soybeans GRP	Group	Group	Group Yield Guarantee
Soybeans IP	Individual	Individual	Individual Revenue Guarantee
Soybeans RA	Individual	Individual	Individual Revenue Assurance
Squash, Winter & Pumpkins			
Stonefruit (Apricots, Nectarines and Peaches)	Individual	Individual	Individual Yield Guarantee
Sugarcane	Individual	Individual	Individual Yield Guarantee
Sugar Beets	Individual	Individual	Individual Yield Guarantee
Sunflowers	Individual	Individual	Individual Yield Guarantee
Sweet Corn (Canning and Freezing)	Individual	Individual	Individual Yield Guarantee
Sweet Corn (Fresh Market)	Group	Individual	Fixed Revenue Guarantee
Sweet Potatoes			
Table Grapes	Individual	Individual	Individual Yield Guarantee
Tobacco (Production Guarantee) Types 41 & 32 - Pennsylvania Types 51 & 61 - Connecticut Types 51, 52 & 61 - Massachusetts	Individual	Individual	Individual Yield Guarantee

Crop	Guarantee Basis	Indemnity Basis	Model Premise
Tomatoes (Canning and Processing and Fresh Market Guaranteed Production Plan)	Individual	Individual	Individual Yield Guarantee
Tomatoes (Fresh Market)	Group		Fixed Revenue Guarantee
Walnuts	Individual	Individual	Individual Yield Guarantee
Watermelons	Individual	Individual	Individual Yield Guarantee
Wheat APH	Individual	Individual	Individual Yield Guarantee
Wheat (Fall) CRC	Individual	Individual	Individual Revenue Guarantee
Wheat (Spring) CRC	Individual	Individual	Individual Revenue Guarantee
Wheat GRP	Group	Group	Group Yield Guarantee
Wheat IP	Individual	Individual	Individual Revenue Guarantee
Wheat RA	Individual	Individual	Individual Revenue Assurance

Model Name	Yield Guarantees				Revenue Guarantees						Asset Guarantee	
	Individual	(Historic) Mixed	Area	Fixed	Income Protection	Group Revenue	Adjusted Gross revenue	Fixed Revenue	Revenue Assurance	Crop Revenue Coverage	Perennials Replant & Renovate	Inventory
Defining Attributes	Current individual yield vs. expected individual yield.	Current individual yield vs. expected area yield.	Current area yield vs. expected area yield	RMA established area revenue.	Value of individual revenue adjusted for harvest price.	Current area yield times harvest price vs. expected area yield times harvest price.	Whole farm individual revenue coverage based on past cash receipts.	RMA established area price or revenue.	Value of individual revenue adjusted for harvest price.	Both individual and guarantee adjusted for harvest price.	Indemnities are triggered by physical units lost.	Indemnities are triggered by dollar loss.
Guarantee	The individual's current yield will exceed X% of the individual's average historic yield.	The individual's current yield will exceed X% of the area's average yield.	The area's current yield will exceed X% of the area average yield.	The individual's revenue will exceed X% of the revenue set by RMA. Revenue based on production and yield information.	The individual's revenue will exceed X% of the projected revenue. Projected revenue is individual's average historic yield multiplied by the harvest-time futures price discovered in the commodity market before the risk period begins.	The area average per acre revenue will no fall below the insured's "trigger" revenue or coverage level selected.	Individual whole farm revenue will exceed X% of the projected whole farm revenue.	The individual's revenue will exceed X% of the revenue set by RMA.	Individual revenue will exceed X% of the expected revenue. Expected revenue is individual's average historic yield times the projected harvest price.	The individual's revenue will exceed X% of the final revenue. Final revenue is individual's average historic yield multiplied by the higher of the harvest-time futures price discovered in the commodity market before the risk period begins or the actual market price at the end of the risk period.	The percent of damage measured in physical units will not exceed the policy deductible.	The percent of damage measured in dollars will not exceed the policy deductible.
Examples	Actual Production History (APH) Corn	Most RMA programs prior to 1980	Group Risk Plan (GRP) Corn	Hybrid corn seed	Income Protection (IP) Corn Pilot	Group Risk Income Protection (GRIP)	AGR Pilot (see Appendix A)	Fresh Market Tomatoes	Revenue Assurance (RA) corn pilot	Crop Revenue Coverage (CRC) Corn Pilot	Florida Fruit Tree Pilot	Nursery
Liability	Guarantee times X% of RMA maximum price.	Guarantee times X% of RMA maximum price	X % of RMA maximum protection per acre.	RMA established revenue times coverage level percentage.	Projected revenue times coverage level.	X % of RMA maximum protection per acre.	Whole farm projected revenue times coverage level percentage.	RMA established revenue times cover level percentage.	Final revenue times coverage level.	Final revenue times coverage level.	Stated dollar amount not to exceed RMA's maximum unit price times number of physical units times coverage level.	Inventory times wholesale prices times coverage level.
Basis for rate making	Historic insurance experience distributed	Historic insurance experience distributed	NASS historic county yields.	Historic insurance experience distributed by	Individual yield history, county yield, national yield trend, and	NASS historic county yields & historic market prices.	Five consecutive years of Schedule F tax forms.	Historic insurance experience distributed	Historic insurance experience distributed by	Historic insurance experience distributed by yield spans plus the rate	Frequency and severity of insured perils plus historic insurance	Frequency and severity of insured perils plus historic

Model Name	Yield Guarantees				Revenue Guarantees						Asset Guarantee	
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Perils	Indefinite in time, broad perils. (Drought, plant disease, heat, etc. plus definite perils.)	Indefinite in time, broad perils.	Indefinite in time, broad perils	Indefinite in time, broad perils plus limited downward price movement.	Indefinite in time, broad perils plus downward price movement.	Indefinite in time, broad perils	Indefinite in time, broad perils plus downward price movement.	Definite, named damage events that can cause either quantitative or qualitative yield shortfalls.		Indefinite in time, broad perils plus upward and downward price movement.	Definite in time, narrow perils only. (Freeze, hurricane, hail, and others)	Indefinite in time, broad perils.
Common Underwriting Provisions												
Acreage required to be covered	All crop acreage in the county in which the insured has a share.	Same	Same	Same	Same	Same	All acreage in which the insured produced cash receipts as reported on the Schedule F tax form as an interest for the whole farm.	All crop acreage in the county in which the insured has a share.	All crop acreage in the county in which the insured has a share.	Same	Same	All containers in the county in which the insured has a share.
Units	Units by county, and sharing entity, may be further divided by section, type, or practice.	Units by crop, county, and sharing entity.	Units by county.	Units by county, and sharing entity, may be further divided by section, type, or practice..	Units by county, and sharing entity, may be further divided by section, type, or practice.	Units by county.	The whole farm entity, as reported on the Schedule F tax form, constitutes the only unit.	Units by county & sharing entity may be further divided by section, type, practice & planting periods.	Units are basic, optional, enterprise and whole farm.	Units by county, and sharing entity, may be further divided by section, type, or practice.	Units by crop, county, and sharing entity.	Units by county, sharing entity, and location.
How the expected	Individual yield historv	Set by RMA for	Historic county yield data	Individual yield historv	Individual yield historv with	Historic county yield	N/A		Individual yield historv with	Individual yield historv with	Insured's choice not exceeding	Nursery's wholesale

Model Name	Yield Guarantees				Revenue Guarantees						Asset Guarantee	
	Individual	(Historic) Mixed	Area	Fixed	Income Protection	Group Revenue	Adjusted Gross revenue	Fixed Revenue	Revenue Assurance	Crop Revenue Coverage	Perennials Replant & Renovate	Inventory
Exclusions	Losses caused by farmer, perils not listed in policy, high-risk land, excluded practices.	Losses caused by farmer, perils not listed in policy, high-risk land, excluded practices.	None	Losses caused by farmer, perils not listed in policy, high-risk land, excluded practices.	Losses caused by farmer, perils not listed in policy, high-risk land, excluded practices.	None.		Non-producing physical units, damage caused by uninsured causes.	Losses caused by farmer, perils not listed in policy, high-risk land, excluded practices.	Losses caused by farmer, perils not listed in policy, high-risk land, excluded practices.	Non producing physical units; damage caused by uninsured perils.	Unlisted plant species; undersized containers; damage caused by uninsured perils and .
How claims are calculated	Yield shortfall multiplied by indemnity price. Yield is the harvested and appraised production, reduced for low quality.	Yield shortfall multiplied by indemnity price Yield is the harvested and appraised production, reduced for low quality.	Yield shortfall minus deduct. (both stated as percent) multiplied by amount of protection. County yield is the National Agricultural Statistics Service (NASS) estimate.	Individual revenue minus harvested revenue. Harvested revenue is the harvested and appraised yield, reduced for low quality, multiplied by the greater of the RMA price or the market price.	Individual revenue minus harvested revenue. Harvest revenue is the harvested and appraised yield, reduced for low quality, multiplied by the harvest-time price discovered in the commodity market at the end of the risk period.	County revenue shortfall below insured's "trigger" revenue (stated as a percent) times the amount of protection . County revenue is current area yield times harvest price.		Individual revenue guarantee minus harvested revenue. Harvest revenue is the harvested and appraised yield, reduced for low quality, multiplied by the fall harvest price discovered in the commodity market at the end of the risk period.	Individual revenue minus harvested revenue. Harvest revenue is the harvested and appraised yield, reduced for low quality, multiplied by the harvest-time price discovered in the commodity market at the end of the risk period.	Percent of damage minus the deductible, multiplied by the amount of protection. Damage is the evaluation of totally and partially destroyed property.	Dollar damage minus deductible. Damage is totally and partially destroyed property.	