Risk Management Options for Montana Farms

Objective Analysis

For Informed

Decision Making

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Executive Summary

Farmers are involved in financially risky enterprises and, as a result, develop strategies and tools to manage that risk. Typically, those strategies involve the use of multiple production, price and business risk management tools. Farmers protect their operations against production risk and adverse movements in commodity and input prices. They use output price risk management techniques such as hedging in futures and options markets and forward contracting. They also manage input price risk, often through bulk purchasing and forward contracting for price and quantity of inputs such as fertilizer and fuel.

Increasingly, federal crop insurance programs for agricultural commodities offered by USDA have become an important and attractive risk management tool for agricultural producers. These programs are approved and overseen by the USDA Federal Crop Insurance Corporation and managed on a day-to-day basis by the USDA Risk Management Agency. Farm managers in Montana now have a range of federally subsidized crop insurance products to help them manage production and revenue risks.

This paper describes federally subsidized production and revenue insurance products available to Montana farming operations and presents simulations of the effects of alternative risk management strategies for a representative Montana farm. The farm represents a typical operation in Roosevelt County managed by an American Indian producer. The risk management strategies consist of different mixes of RMA insurance products.

The representative farm has a resource base of 3,000 acres of nonirrigated cropland and also includes land for the farmstead, roads, fences and waste. The cropland is planted to 260 acres of safflower, 40 acres of flaxseed, 1,020 acres of recropped spring wheat, 240 acres of recropped durum wheat, 360 acres of hay barley, 540 acres is fallowed, 120 acres of durum wheat produced on fallow, and 420 acres of spring wheat produced on fallow. In Roosevelt and other northeastern Montana counties, cyclical changes in weather patterns may change the allocations of crop production acres under recrop conditions and after fallow production. On the model farm all crops are sold on the cash market. Other farms with this or similar cropland bases in Roosevelt County also have rangeland that sustains a livestock enterprise. On these operations the hay barley crop is likely to be used as livestock feed and some additional cropland might be devoted to feed grain production.

Many different agricultural risk management strategies are available. Farmers choose among them on the basis of their farm's financial structure and their preferences for taking on or avoiding risk. In this study, farm managers are assumed to be interested in different risk management strategies that involve different combinations of the crop insurance products available to Montana crop producers. Two strategies employ combinations of RMA-approved individual crop yield and revenue risk products. A third strategy uses AGR-Lite as a stand-alone insurance product. The fourth and fifth strategies use AGR-Lite as an umbrella product in conjunction with the crop specific products used in the first two strategies.

Three "production year outcome" scenarios are examined. In the first, producers have an average or good year in which actual crop yields are close to, or exceed, average yields, and harvest prices are similar to those expected when insurance coverage was purchased. Consequently, there are no shortfalls in yields or revenues, and the farm receives no insurance indemnities but pays premiums for the insurance coverage it purchases. In the second, severe drought occurs and crop and forage yields (or proxy measures for yields) are 40 percent lower than expected. In the third, severe drought causes a 40 percent decline in crop and forage yields and the durum wheat is of such poor quality that it is sold for feed.

Introduction

Agricultural production is a financially risky business. In Montana, production losses from natural hazards do occur (for example, drought, fire, hail and insect damage). Farm managers also face substantial price risks, both in resource markets where they purchase their inputs and in commodity markets where they sell their crops. Energy prices can vary substantially from one month to the next, as can nitrogen and other fertilizer prices. Crop prices can be volatile. Moreover, the link between farm-level production losses and commodity prices is weak. At the market level, when production is relatively low prices tend to be relatively high, but an individual agricultural producer may experience low levels of production because of locally adverse production conditions when commodity prices are also low.

Farm managers know they are involved in risky enterprises and typically use several tools to reduce the likelihood that they will suffer financial losses; that is, they develop and implement risk management strategies for their operations. They use production techniques that reduce crop production losses except in cases of extremely low precipitation. These include crop rotations and other cropping practices to improve soil moisture retention and to control the incidence of weed infestations. Individual producers may also respond to the risk of crop loss by spreading production of a specific crop over several locations to limit damage from hail or localized insect and disease infestations.

Farm managers also protect themselves against adverse price movements. Some managers use output price risk management techniques such as hedging in futures and options markets and forward contracting. They also manage input price risk, often through bulk purchasing and/or forward contracting for price and delivery of key inputs such as fuel and fertilizer.

Increasingly, federal insurance for agricultural commodities offered by the Federal Crop Insurance Corporation has become an important and attractive risk management tool for crop producers. Farm managers in Montana can use a range of federally subsidized insurance products to facilitate their management of production and revenue risks. These include crop insurance products based on a producer's actual production history (APH) that provide farm managers with indemnities when their farm operations experience crop-specific yield losses or crop-specific revenue losses. Both types of products are widely known as Actual Production History or APH products. Crop-specific yield APH insurance products, also described as Multiple Peril Crop Insurance (MPCI) products, provide indemnities when crop yields are relatively low. Crop specific revenue APH products provide indemnities when per acre revenues for a crop are low (because of either low per acre yields, low prices, or both). Crop Revenue Coverage (CRC), Revenue Assurance (RA), and Income Protection (IP) are revenue-based insurance products available for select Montana crops in certain counties.

For some crops in Montana, farm managers are able to purchase insurance products that provide indemnities when the areas in which their farms are located experience low per acre crop yields (called Group Risk Plans) or low per acre revenues (called Group Risk Income Protection plans). Historically, the area has been the county in which a farm is located. Recently, an area-based product that provides insurance for forage loss, the Pasture, Rangeland and Forage (PRF) insurance product, became available to Montana farm managers. The PRF product bases indemnities on rainfall indexes calculated for six different intervals during the year for grids that are about 8 miles square (instead of using county-wide yield and/or revenue estimates).

Until recently, farm managers could only insure each crop under a separate insurance contract, leading to a complex set of insurance choices for multiple enterprise farms. Whole-farm revenue insurance is now available to farm managers in all Montana counties in the form of Adjusted Gross Revenue-Lite (AGR-Lite). AGR-Lite provides indemnities to producers when a farm's adjusted gross income is either low relative to historical levels or low relative to expected revenues. It may be used as a stand-alone product or as umbrella coverage in conjunction with crop enterprise specific insurance products.

This paper describes the crop insurance products available to Montana farm operations and presents simulations of the effects of alternative risk management strategies for a representative Montana farm. The alternatives include strategies in which each enterprise is insured under a separate RMA insurance product, the whole farm is insured solely using AGR Lite, and the farm uses AGR-Lite in combination with individual crop risk management products. The focus is on the premium outlays required and indemnities received under each strategy in different production and revenue environments.

RISK MANAGEMENT ON MONTANA FARMS

Some production risk management efforts undertaken by farm managers are highly visible. Other efforts may not be so obvious.

Production Risk Management: Crop production on nonirrigated in most Montana counties involves considerable production risk. Land use intensity is influenced by cyclical and year-to-year climatic conditions. For most of the past decade, total annual precipitation in most locales in Roosevelt County has been at or above the long-term average. Therefore, a relatively high proportion of the cropland base has been planted to annual crops. As a result, the proportion of total acreage in fallow has recently been below longer term historical levels.

On way to limit production risk has been to plant crops after a year of fallow. The fallow year contributes to the antecedent soil moisture and provides sufficient moisture for germination and early season plant growth. The remaining plant growth depends on growing season precipitation. Under recrop conditions, a crop is planted onto fields cropped the previous season. Producers using the recrop practice generally measure soil moisture accumulation after the previous year's harvest to determine whether sufficient soil moisture has accumulated to support germination and early season plant growth.

On average, yields and production costs are different for the same crop under the two practices. For crops like wheat, yields per ace for crops produced on fallow are usually 2 to 5 bushels higher than under recrop conditions. But production costs per acre can be considerably higher for crops produced under recrop conditions than instead of fallow. Part of the increase in production costs under recrop conditions is associated with the increased need for fertilizer. Part of the increased cost attributable to additional herbicide chemicals. Producers also often encounter considerably different pest regimes under recrop conditions than when they fallow.

Perils such as hail and insect infestations are often a concern because they can severely limit crop production. As farm size has increased, some managers have designed rotations and managed their selection of fields for planting so that a crop is geographically dispersed across their operations. The objective is to limit the chances of production losses due to localized storms or insect and/or disease infestations. For instance, a farm manager may plant a higher crop value like durum wheat in several different field locations to reduce the chances that the entire crop will suffer a loss because of hail.

In recent years, the range of federally subsidized crop insurance products that address farm production risks has been expanded. These products have been developed by several entities under contractual agreements with the USDA Risk Management Agency (RMA). Each new product must be reviewed and approved by the Federal Crop Insurance Corporation (FCIC) Board of Directors prior to being offered to farm managers and other agricultural producers. These insurance products are intended to reduce the adverse economic impacts of production losses associated with natural events beyond a farmer's control. Federally subsidized insurance products provide protection against yield losses of food and feed grains, forage crops, oil seed crops, and other seed crops on many Montana farms.

Revenue Risk Management: Revenue variability is a source of risk encountered by farm operations. Farm managers pursue several strategies to reduce the revenue risks associated with the commodities they produce and market. Farm managers may contract for the future delivery of commodities they

produce for sale. For instance, a farm manager may contract for the future delivery of a stated quantity of safflower at a pre-specified price.

In recent years, some revenue risk insurance products have been approved by RMA to address crop revenue risks for individual crops based on specific commodity futures prices and either individual farm yields or area yields, depending on the insurance product. These federally subsidized insurance products are available in several Montana counties for a limited number of crops, crops for which a futures market exists. A farm-level adjusted gross revenue insurance product applicable to whole farm revenues is also available in all Montana counties.

FUNDAMENTAL ELEMENTS OF RMA PRODUCTION INSURANCE PRODUCTS

Introduction: Farm managers generally consider three production risk management options with respect to crop insurance. First, they may opt not to purchase any type of insurance. Farm managers who pursue this strategy are choosing to *self-insure.* Second, for certain potential causes of production loss, *single peril* crop insurance products may be available. For instance, farm managers may choose to purchase insurance coverage that would provide an indemnity if a field of durum wheat were to burn as a result of a range fire. Single peril insurance products are available through private insurance companies, but are not developed under RMA funding and their premiums are not federally subsidized. Third, farm managers may use *multiple peril* crop insurance products developed under the auspices of the RMA with premium subsidies provided by the federal government.

Actual Production History Insurance (APH): These are RMA-approved *multiple peril* products that that cover production losses from several natural causes. There are two general APH categories. *Yield insurance*, also called *Multiple Peril Crop Insurance* (*MPCI*), provides indemnities for losses when per acre yields are low. *Revenue insurance* provides indemnities when per acre revenues (price x quantity) are low, or when whole farm adjusted gross revenue is low because

of shortfalls in production, declines in product quality, and/or low prices.

These products provide risk protection for production and revenue losses because of unavoidable natural occurrences, including but not limited to adverse weather, fire, insects, disease, wildlife, earthquakes, volcanic eruption, failure of irrigation supply that cause production losses and, in the case of revenue insurance, unanticipated decreases in prices. Insurance payments are not made for losses due to negligence or failure to use good farming practices.

APH yield and revenue multiple peril insurance products are sold and serviced by private-sector insurance companies. These products are approved by the Federal Crop Insurance Corporation (FCIC) prior to being offered to producers. The FCIC, a public corporation, oversees the operations of the Risk Management Agency (RMA), the agency that manages federal crop insurance programs on a day-to-day basis.

Units for Insurance Coverage: Producers who use RMA production and revenue insurance products that cover risks associated with individual commodities need an understanding of insurable units. For an individual insurable commodity where coverage is based on the insured producer's *actual production history* (individual established yields), multiple peril insurance may be available at the *optional, basic,* and *enterprise unit* levels, depending on the insurance product and the commodity. In group risk plans, where the producer buys insurance based on area yields (typically county yields or county level per acre revenues) for the insured commodity, coverage is only available at the *enterprise level.*

An *optional unit* is land planted to a specific crop in a specific section (per the legal definition of section). Land planted to the same crop in another section by the same operator is in a different optional unit.

A *basic unit* is land planted to a particular crop under the same share arrangements. So a basic unit could be two fields planted to the same crop, either in different sections or the same section, owned and

operated by a farm manager. Alternatively, two fields operated under the same share or lease arrangements with a particular landlord would form a basic unit.

An *enterprise unit* consists of all the land in a county planted to a particular crop by the farming operation.

Farm managers have the option of selecting different units for different crops in most multiple peril contracts. For example, spring wheat might be insured at the optional unit level while safflower might be insured at the basic unit level.

Farm managers consider two issues in making the decision on units– the possibility of being indemnified for an insurable loss and the premium incurred for crop insurance coverage. For example, if a farm manager knows that there is considerable difference in most years in yields on two geographically separated fields located in two different sections for the same crop (perhaps because of hail), a manager may want to insure at the optional unit level to increase the likelihood of receiving an indemnity. However, premium rates per dollar of coverage for a crop are highest for optional units, lower for basic units, and lowest for enterprise units. In deciding whether to insure optional, basic or enterprise units, farm managers weigh the tradeoffs between the indemnities they are likely to receive and the premium costs they will incur.

Actual Production History Yield Issues: The yields that are relevant to assessments of the benefits of insurance contracts depend on whether the insurance product is an individual APH-based yield or revenue product, or a group risk product.

For group risk products, yields on which coverage is based, and on which indemnities are determined, are county (or area) yields for an insured commodity. Yield and production information reported by the National Agricultural Statistics Service (NASS) of USDA is used for most commodities.

Farm managers who select individual farm-specific based insurance products must establish an *actual*

production history (APH) for each crop on each insured unit.

Establishing an APH is a critical part of the insurance process. An APH is developed for each insured unit of a crop. A yield history of *four* to *ten* consecutive years is required and must include the most recent crop year. If a producer changes cropping practices, their APH may change. The term "consecutive years" applies to the years in which the unit is cropped under the cropping practice for which insurance is provided. If the cropping practice requires that a unit be fallowed in certain years, those years don't count as part of the APH yield history. For example, under a summer fallow cropping practice in which a field is fallowed in alternate years, a 10-year crop APH would require information on crop yields over the previous 20 calendar years.

To illustrate how APHs are established, consider the following information on the production histories of two producers for the same crop (Table 1).

Table 1: Production Histories of a Crop as Reported by Two Producers

Year	Producer A (bushels per acre)	Producer B (bushels per acre)
1998	—	33
1999	—	34
2000	—	39
2001	—	33
2002	—	35
2003	—	30
2004	27	27
2005	29	29
2006	36	36
2007	24	24
APH Yield	29	32

Producer A has only four years of acceptable yield records. Adding these yields and dividing by four provides an APH of 29 bushels per acre. Producer B had 10 years of acceptable yield records. Adding

these yields and dividing by 10 provides an APH of 32 per acre.

If a farm has a crop with less than four years of recorded yield history, a *Transitional Yield* or *T-yield* provided by RMA (often on a county basis) is used to calculate an APH for the crop.

A farm manager who has produced a crop in a particular county but has no acceptable yield information will be given an APH equal to 65 percent of the *T-yield* for the crop. If a farm manager has acceptable annual yield data, but for less than four years, then *T-yields* will used in the APH calculation according to a set of specifications related to the years of recorded information (Table 2).

Table 2: Specifications for the Use of T-Yields Predicated on Years of Proven Production

Proven Production	Use of T-Yield
If there is yield/production information for **one year**	Use **80 percent** of the *T-Yield* for the other three years
If there is yield/production information for **two years**	Use **90 percent** of the *T-yield* for the other two years
If there is yield /production information for **three years**	Use **100 percent** of the *T-yield* for the missing year

If a farm manager is a "new" producer who has not previously produced a commodity in a county, then the APH for the commodity will be 100 percent of the relevant *T-yield.*

In many years, Montana producers realize yields a little below or above their APH yields. In other years, atypically low yields are realized. RMA allows producers to substitute a value equal to 60 percent of the relevant *T-yield*, called a plug yield, for atypically low yields in their APH calculations. Using plug yields enables producers to avoid large year-to-year decreases in their APH, but when plug yields are used producers pay higher premiums.

Coverage, Premiums and Subsidies, and Price and Indemnity Information for Crop Insurance Products Using Individual Yields: Both conventional yield insurance, often referred to as MPCI, and revenue products like *Crop Revenue*

Coverage (CRC) use a producer's actual production history as the basis for determining their multiple peril crop insurance coverage.
Yield based insurance requires a farm manager to establish a *Yield Guarantee* by selecting an insurance coverage level for losses and multiplying the coverage level by a farm's *APH*; that is, the *Yield Guarantee = Actual Production History x Coverage Level. Coverage Level* is defined as the percentage of an *APH* a farm manager selects for coverage of a crop planted on an insurable unit. A farm manager's choice of *coverage level,* available in five percentage point intervals, also determines the percent of total premium that will be subsidized by the federal government (Table 3).

Table 3: Applicable Subsides for APH and Crop Revenue Products

Coverage Levels (% of *APH*)	Premium Subsidies (% of **Total Premium**)
50	67
55	64
60	64
65	59
70	59
75	55
80	48
85	38

For each MPCI crop product, in advance of the sales closing date, RMA announces an *Established Price* for the commodity based on expected marketing conditions. Sometimes, prior to the sales closing date, RMA may amend the *Established Price* by announcing an *Additional Price* for a crop based on updated market information. A farm manager establishes a *Price Election* by taking 55 to 100 percent of the *Established Price* (or *Additional Price*).

The per acre *Gross Premium* associated with a producer's insurance contract is:

Gross Premium = [(*Yield Guarantee* x *Price Election*)] x [*Premium Rate*].

The producer premium, the premium the farm business incurs, equals the difference between the *gross premium* and the *gross premium* multiplied by the *premium subsidy percentage*.

Catastrophic Risk Protection (or *CAT* coverage) is available for all crops for which yield-based MPCI insurance is offered at the 50 percent *coverage level* and a 55 percent *price election* for *$300 per crop* insured by a farm manager (up to a maximum of three crops per farm in each county).

An indemnity is paid when, because of some insurable cause, a producer's actual yield is less than the *yield guarantee* for the crop. On a per acre basis, a farm then receives the following indemnity:

Indemnity = [*Yield Guarantee - Actual Yield*] x *Price Election*.

Crop Revenue Coverage (CRC), a revenue insurance product, considers two prices for an insured crop. Prior to the production of a crop and prior to the sales closing date for CRC coverage, a *CRC Base Price* is announced. The *CRC Base Price* is specified as a specific average futures contract settlement price for delivery at harvest time for a crop over a period just prior to the closing date for the *CRC* contract (typically at or just before the crop is planted). Using the CRC *Base Price*, a producer establishes an initial per acre *Revenue Guarantee* as follows:

Revenue Guarantee = *APH* x *Coverage Level* x *CRC Base Price.*

At harvest time, the *Revenue Guarantee* may be increased if a crop's *Harvest Price* exceeds its CRC *Base Price*. The *Harvest Price* is defined as a specific average futures contract settlement price at harvest time.
The CRC per acre *Gross Premium* is:

Gross Premium = *Revenue Guarantee* x *Premium Rate*.

The premium to be paid by a farm manager is the difference calculated as the *gross premium* less the *gross premium* multiplied by the *premium subsidy percentage*. The *premium subsidy percentage* is determined by a farm manager's *coverage level*. Catastrophic Risk Protection is not available for Crop Revenue Coverage.

An indemnity is paid when a farm's estimated per acre *Crop Value*, defined as a producer's *actual yield* x *harvest price,* is less than the farm's *revenue guarantee*.

Other revenue products such as *Income Protection* and *Revenue Assurance* are offered for some crops such as spring wheat in some Montana counties.

Coverage, Premiums and Subsidies, Price and Indemnity Information for Multiple Peril Group Risk and Income Protection Plans:

Group Risk Plan (GRP) and **Group Risk Income Protection (GRIP)** insurance products employ county-based yields or proxies for yields as the basis for determining multiple peril crop insurance coverage.

For GRP products, farm managers determine their *yield guarantee* by multiplying a *coverage level* percentage they select by the *expected yield* for a crop in a county, where the National Agricultural Statistics Service (NASS) average yield (or a proxy measure) for a county is generally used as the *expected yield.* For *GRIP* products farm managers determine their *trigger revenue* by multiplying the *coverage level* they select by the *expected revenue* for the crop, as established by RMA.

Premium subsidies are provided at each coverage level for GRP and GRIP (Table 4). These two sets of subsidies differ from those applied to insurance products based on individual APH yields.

Table 4: Applicable Subsides for GRP and GRIP Products

Coverage Levels (% of *APH*)	Premium Subsidies For GRP (%)	Premium Subsides For GRIP (%)
70	59	59
75	59	55
80	55	55
85	55	49
90	51	44

For GRP products, a producer specifies a *Trigger Yield* by choosing a coverage level where:

Trigger Yield = *Expected Yield* x *Coverage Level*.

On a county-by-county basis, RMA announces an *Amount of Protection* per acre, but does not announce an *established price* for crops covered under GRP policies. Farm managers planning risk management strategies for the next insurance year can approximate the *Amount of Protection* by multiplying the GRP county-level historical average yield for a crop by the announced price (*established price*) for APH coverage for the same crop, and then further multiplying this product by 1.5.

Farm managers may insure from 60 to 100 percent of the *Amount of Protection* per acre to establish a *Dollar Protection per Acre. Catastrophic Risk Protection* (*CAT*) is available at 45 percent of the *Amount of Protection*.

The gross premium per acre for GRP product is as follow:

Gross Premium = [*Dollar Protection per Acre*] x *Premium Rate*.

The per acre producer premium for GRP insurance equals the difference between the gross premium and the gross premium multiplied by a subsidy rate. The coverage level selected by a farm manager determines the subsidy rate.

The indemnity per insured acre is:

Indemnity per Acre = [(*Trigger Yield - Payment Yield*) / (*Trigger Yield*)] x [*Dollar Protection per Acre*].

Group Risk Income Protection products are similar to GRP products except that several terms are expressed in revenues per acre rather than production per acre. The *Expected County Yield* per acre is based on the NASS data on annual average yields for the county. The *Expected Price* is defined by the average daily settlement price for the appropriate underlying futures contract. Per acre *Expected County Revenue* = *Expected Yield* x *Expected Price*. The *Maximum Protection per Acre* available to the producer is 150 percent of the *Expected County Revenue.*

A farm manager determines *Protection per Acre* by selecting 60 to 100 percent of the *Maximum Protection per Acre.*

Gross premium per acre is calculated as:

Gross Premium = *Protection per Acre* x *Premium Rate*.

A farm manager's per acre premium is the difference between the gross premium and the gross premium multiplied by the premium subsidy percentage. The premium subsidy percentage is determined by a farm manager's choice of *coverage level,* (that is, the percent of *expected county revenue* used to identify the *trigger revenue* for crop on the farm).

A farm manager determines the *Trigger Revenue per Acre* by multiplying the selected *coverage level* (70, 75, 80, 85 or 90 percent) by the *Expected County Revenue*.

A farm manager with a crop insured under GRIP receives an indemnity when actual county revenue, a value determined by RMA by multiplying the final county yield by the national estimated average harvest price, is less than the *Trigger Revenue* established by a farm manager.

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An indemnity is calculated by first establishing a *payment calculation factor*, which is defined as:

Payment Calculation Factor = [*Trigger Revenue - Actual County Revenue*] / [*Trigger Revenue*].

The per acre indemnity is then:

Indemnity = [*Payment Calculation Factor* x *Protection per Acre*].

FUNDAMENTAL ELEMENTS OF AGR-LITE, A WHOLE FARM RISK MANAGEMENT PRODUCT

Introduction: *Adjusted Gross Revenue Lite* (*AGR-Lite*) is a whole-farm revenue protection insurance plan available to producers in all Montana counties. The product covers revenue losses from crops, livestock and unprocessed (unaltered) livestock products such as milk and wool. The plan protects against low revenue due to losses in production and declines in product quality and market price. Specifically, the plan provides protection against low revenue attributable to unavoidable natural disasters and market fluctuations during the insurance year. *AGR-Lite* may be used as a stand-alone insurance plan or an "umbrella plan" in conjunction with other RMA insurance plans that address crop production and revenue risks and livestock price risks. *AGR-Lite* premiums are reduced when other multiple peril RMA insurance plans are used to address specific crop production and revenue risks.

In the *AGR-Lite* insurance program, coverage is based on the lower of either (a) the farm's most recent five-year average of its gross revenue as reported to the Internal Revenue Service on Schedule F or other pertinent federal income tax return or (b) the farm's expected revenue for the current production year computed using the farm's expected yields and planted acreages, livestock numbers, and the expected prices for all crops and livestock products (as defined by RMA).

AGR-Lite protects against revenue losses attributable to unavoidable natural occurrences or market fluctuations that cause revenue losses during the insurance year. Some losses are not covered by AGR-Lite. No insurance indemnities will be paid for losses attributable to negligence, mismanagement, a failure to use good farming practices, theft, or mysterious disappearance. Nor will indemnification occur if losses are attributable to lack of labor, crop abandonment, or bypassing of acreage. On the marketing side, no indemnification is due when commodities cannot be marketed because of quarantines, boycotts, or failure of buyers to make payments for commodities to producers. Losses due to an insured operator's failure to obtain a price for any commodity that is reflective of the local market value will also not be indemnified. Procedurally, if a producer fails to provide adequate records when seeking indemnification for revenue losses, indemnifications will not be awarded.

Application Information: Producers must provide five years of income and expense information from their IRS income tax returns (Schedule F or equivalent) and certify that the information is accurately reported. Specifically, historical information is needed from the Farm Income and Farm Expenses sections of a producer's IRS tax filings. Some items are included in farm income reported for income tax purposes but excluded from AGR-Lite *allowable income*; these include (1) cooperative distributions not tied to the commodities insured, (2) agricultural program payments, (3) crop insurance indemnities and federal disaster payments, (4) custom hire income, and (5) income attributable to post-harvest value added activities. Some items are included in farm expenses reported for income tax purposes but excluded from AGR-Lite *allowable expenses*; these include (1) depreciation costs (except for animals), (2) employee benefits including pensions and profit sharing, (3) interest costs, (4) rents paid, and (5) post-harvest costs (including costs associated with value-added production).

The five years of *allowable income* are summed and then divided by five to obtain the *5-Year Average Preliminary Adjusted AGR. Allowable expenses* for each tax year are summed and then divided by five to obtain the *5-Year Average Preliminary Adjusted Expenses.*

For each revenue-generating commodity, in each insurance year, producers work with their insurance agent to report the acres (or head, number, etc.) that are to be produced, total expected production, price per unit of production, and total value of production. These commodity specific total value estimates are summed to provide *Total Expected Income.* Producers who select higher *coverage levels* will also be required to submit commodity profiles for the two years prior to the current insurance year.

Adjustments and Uses of Information: To increase the effectiveness of insurance coverage an *Indexed Average AGR* (*Indexed Income*) can be calculated for an operation whose annual adjusted gross revenues are increasing. To qualify for indexing, (1) allowable income in at least one of the last two most recent years in the five year base period must be greater than the *Average AGR* and (2) the insurance year's *Total Expected Income* must be greater than the *Average AGR.* An *Income Trend Factor* is developed and the *Average AGR* is multiplied by the *income trend factor* to provide the *Indexed Average AGR* (*Indexed Income*). The *Approved AGR* is the *lesser of:* (1) the *Average AGR* or *Indexed AGR* (*Indexed Income*) or (2) *Total Expected Farm Income*, the estimated expected income for the insurance year.

Approved Expenses depend on which adjusted gross income value is designated as the *Approved AGR.* *Approved Expenses* may be derived by direct assignment, indexing or factoring *Allowable Expenses* up or down.

Producer Decisions and Contract Specifications: To be eligible for **AGR-Lite** a producer has to meet several criteria, including a maximum liability of less than $1,000,000 and an *approved gross income* of less than $ 2,051,181. Once *Approved AGR* and *Approved Expenses* are determined, farm managers have to make two decisions. They must first select a *coverage level*. In part, the *coverage level* depends on the number of revenue generating commodities included in the operation's production and marketing plan. The available coverage levels are 65, 75 and 80 percent of the *Approved AGR*. For a producer to obtain the highest *coverage level* (80 percent), at least three commodities must each

contribute a significant portion of total income. A significant portion is defined as 1/number of commodities in the annual farm plan x 0.333 x *Total Expected Income*, where *Total Expected Income* is the amount defined in the insurance year farm plan.

A farm manager must also select a *payment rate*. Two *payment rates,* 75 or 90 percent, are available at each *coverage level*.

One *coverage level/payment rate* combination is applied to all commodities in a farm plan.

Once a coverage level is selected, a *Loss Inception Point* (also called the *Trigger Level*) is established where :

Loss Inception Point = *Trigger Level* = *Approved AGR* x *Coverage Level*.

AGR-Lite Premium Calculations: Joint application of the coverage level and the payment rate determines a farm's maximum liability, called the *AGR-Liability* or *Coverage*. *Coverage* is specified as:

AGR-Liability = *Coverage* = *Approved AGR* x *coverage level* x *payment rate.*

When *AGR-Lite* is used as an "umbrella" policy, other RMA-approved multiple peril insurance policy coverage is subtracted from the AGR-Lite *Coverage* up to a maximum reduction of 50 percent of the AGR-Lite liability. The reduced liability is called the *Premium Liability*.

Premium Calculations are as follows:

Total Premium = *Premium Liability* x *AGR premium rate*.

Subsidy Amount = *Total Premium* x *Subsidy Rate*.

Producer Premium = *Total Premium* - *Subsidy Amount.*

The *AGR premium rate* is calculated by accounting for (1) the actual commodities grown on the farm, (2) degree of diversification on the farm, and (3)

number of commodities grown on the farm. *Subsidy rates* vary by *coverage level* and equal 59 percent for 65 percent coverage, 55 percent for 75 percent coverage, and 48 percent for 80 percent coverage.

Indemnities: An indemnity is paid when *Total Income,* as specified in a farm's report of actual income performance for the insurance year, is less than the *Trigger Level*.

When a farm's *allowable income* appears likely to fall below its *Trigger Level*, a farm manager is expected to contact his insurance agent for guidance on how to document an actual loss in farm revenue. In addition to submitting the information required to document *Total Income*, a farm manager must also submit an IRS return for the insurance year and each of the previous five years.

Actual expenses for the insurance year are determined from IRS forms. Some accrual adjustments may be needed to ensure that the expenses considered in the adjustment process are those for the insurance year. When actual expenses are less than 70 percent of their five year average, the *Approved AGR* is reduced by one tenth of a percent for each one tenth of a percent that expenses fall below their average. The farm's *Trigger Level* is then recalculated as follows:

Trigger Level = *Approved AGR* (for expense reductions) x *coverage level* percentage.

Revenue to Count is subtracted from the *Trigger Level*. *Revenue to Count* includes allowable income from the sale of covered commodities, other crop insurance indemnities, NAP payments, income lost due to non-insured causes, net gains from hedging, and changes in accounts receivable and inventories held for sale.

Once *Revenue to Count* has been identified, the farm's *Revenue Deficiency* is calculated as:

Revenue Deficiency = *Trigger Level* - *Revenue to Count*

The payment rate is then applied to determine the indemnity: that is,

Indemnity = Revenue Deficiency x Payment Rate.

Alternative Risk Management Strategies for a Montana Representative Farm

The example farm represents an American Indian farm operation in Roosevelt County where the principal occupation of the operator is farming. The representative farm has a resource base of 3,000 acres of nonirrigated cropland plus some associated land in the farmstead, roads, fences and waste. The cropland is allocated as follows: 260 acres of safflower, 40 acres of flaxseed, 1,020 acres of recropped spring wheat, 240 acres of recropped durum wheat, 360 acres of hay barley, 540 acres in fallow, 120 acres of durum wheat produced on fallow, and 420 acres of spring wheat produced on fallow. In this and other northeastern Montana counties, cyclical changes in weather patterns may change the allocations of crop production acres under recrop conditions and after fallow production.

On the representative farm, all crops are produced for the cash market. Other Roosevelt county farms with a similar cropland base also have rangeland that sustains a livestock enterprise. On such operations, hay barley would likely be used by the operator as a livestock feed and some cropland might be devoted to feed grain production. The representative farm is expected to have an income of $ 515,611 in the insurance year (Table 5). Historical adjusted gross incomes realized by this farm are present in Appendix Table A-1.

Table 5: Montana Representative Farm 2008 Expected Gross Income

Commodity	Acres	Expected Yield[1]	Expected Production	Expected Price[2]	Expected Income
Safflower	260	800 lb	208,000	$ 0.217	$ 45,136
Flax	40	12 bu	480	$ 12.50	6,000
S. Wheat, fallow	420	29 bu	12,180	$ 9.25	112,665
D. Wheat, fallow	120	29 bu	3,480	$ 9.45	32,886
S. Wheat, recrop	1,020	24 bu	24,480	$ 9.25	226,440
D. Wheat, recrop	240	25 bu	6,000	$ 9.45	56,700
Hay Barley	360	1.4 ton	504	71.00[3]	35,784
Fallow	540	NA[4]	NA[4]	NA[4]	NA4
TOTAL	3,000	NA[4]	NA[4]	NA[4]	$515,611

[1] The 2008 yields are the average of the 2001 through 2006 yields
[2] Expected prices are those specified by RMA for the 2008 crop year for MPCI products.
[3] This was the 2008 FSA-specified price for grain hay
[4] NA denotes not applicable.

Table 6: Alternative RMA Product-Based Risk Management Strategies for a Representative Montana Farm

Commodity	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5
Safflower	MPCI	MPCI		MPCI	MPCI
Flax	MPCI	MPCI		MPCI	MPCI
S. Wheat, fallow	MPCI	CRC		MPCI	CRC
D. Wheat, fallow	MPCI	CRC		MPCI	CRC
S. Wheat, recrop	MPCI	CRC		MPCI	CRC
D. Wheat, recrop	MPCI	CRC		MPCI	CRC
Hay Barley	NA[1]	NA[1]		NA[1]	NA[1]
Fallow	NA[1]	NA[1]		NA[1]	NA[1]
Whole Farm	NA[1]	NA[1]	AGR-Lite	AGR-Lite	AGR-Lite

[1] NA denotes not applicable.

Typically, many alternative risk management strategies are available to a farm. Farm managers choose among those alternatives of the basis of the farm's financial condition and the farm manager's preferences for taking or avoiding risk. In this analysis, the farm manager is assumed to be interested in three basic strategies (strategies 1 – 3) and two combinations of those strategies (strategies 4 and 5)for managing production and revenue risks (Table 6).

The insurance premiums for each product in each strategy are estimated using the RMA Premium Calculator[1]. Producer-selected characteristics for each insurance product are described in the Appendix (Table A2). These premiums are presented by commodity and strategy (Table7).

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[1] The calculator is available on the RMA Web site at www.rma.usda.gov/tools/premcalc.html

Table 7: Insurance Premiums[1] for the RMA Product-Based Risk Management Strategies for a Representative Montana Farm

Commodity	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5
Safflower	$2,314	$2,314	NA[3]	$2,314	$2,314
Flax	295	295	NA[3]	295	295
S. Wheat, fallow	3,110	2,638	NA[3]	3,110	2,638
D. Wheat, fallow	929	775	NA[3]	929	775
S. Wheat, recrop	8,383	6,981	NA[3]	8,383	6,981
D. Wheat, recrop	2,001	1,625	NA[3]	2,001	1,625
Hay Barley	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]
Fallow	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]
Subtotal	$17,032	$14,628	NA[3]	$17,032	$14,628
Whole Farm	NA[3]	NA[3]	$4,675	$2,353[2]	$2,353[2]
TOTAL	$17,032	$14,628	$4,675	$19,385	$16,981

[1] The $30 administrative fee is included in each product premium total.

[2] The premiums for AGR-Lite, when used as umbrella coverage are reduced in part by the coverage (maximum liability) of other crop insurance products as shown in the Appendix (Table A3).

[3] NA denotes not applicable.

Scenarios

Three production outcome scenarios are examined to assess the risk management provided by each of the risk management strategies.

In Scenario 1, the farm had an average or good year. Crop yields are close to or exceed their APH average yields and prices are close to their expected levels. No insurance indemnities are received for losses in production or revenue due to insurable causes. However, the farm incurs premium charges for the crop insurance coverage it purchases to limit production and revenue risks (as shown in Table 7).

In Scenario 2, a severe drought results in a 40 percent decline in all crop yields. Fortunately, the drought does not create crop quality problems. Safflower and flax were contracted with buyers in the spring at the preseason expected prices, and so the production harvested is purchased at these prices. Neither of the wheat crops were contracted for price or hedged in the futures markets, so the producer receives the prices that prevailed in the fall of 2008 for spring and durum wheat. The hay market is buoyant in the area, and so the farm manager receives the price he expected in the spring for the barley hay harvested. The insured crop losses are indemnified for the covered shortfalls in production and revenue. Per acre and total indemnities for crop losses in Scenario 2 are as follows:

Safflower:

APH = 800 pounds per acre
Payment Yield = 800 pounds per acre x 0.65 = 520 pounds per acre
Actual Yield = 480 pounds per acre
Per Acre Indemnity = [520 – 480] x $ 0.217 per pound =$ 8.68 per acre
Total Indemnity = $ 8.68 per acre x 260 acres = $ 2,257.

Flax:

APH = 12.0 bushels per acre
Payment Yield = 12.0 bushels per acre x 0.65 = 7.80 bushels per acre
Actual Yield = 7.20 bushels per acre
Per Acre Indemnity = [7.80 – 7.20] x $ 12.50 per bushel = $ 10.00 per acre
Total Indemnity = $10.00 per acre x 40 acres = $ 400.

Spring Wheat, fallow: (under MPCI)

APH = 29.0 bushels per acre
Payment Yield = 29.0 bushels per acre x 0.65 = 18.90 bushels per acre
Actual Yield = 17.40 bushels per acre
Per Acre Indemnity = [18.90 – 17.40] x $ 9.25 per bushel = $ 13.88 per acre
Total Indemnity = $ 13.88 per acre x 420 acres = $5,830.

Durum Wheat, fallow (under MPCI):

APH = 29.0 bushels per acre
Payment Yield = 29.0 bushels per acre x 0.65
= 18.90 per acre
Actual Yield = 17.40 bushels per acre
Per Acre Indemnity = [18.90 – 17.40] x $ 9.45 per
bushel = $ 14.18 per acre
Total Indemnity = $ 14.88 per acre x 120 acres
= $ 1,702.

Spring Wheat, Recrop:

APH = 24.0 bushels per acre
Payment Yield = 24.0 bushels per acre x0.65 =
15.60 bushels per acre
Actual Yield = 14.40 bushels per acre
Per Acre Indemnity = [15.60 – 14.40] x $ 9.25 per
bushel = $ 11.10 per acre
Total Indemnity = $ 11.10 per acre x 1,020
acres = $ 11,322.

Durum Wheat, Recrop:

APH = 25.0 bushels per acre
Payment Yield = 25 bushels per acre x 0.65 =
16.30 bushels per acre
Actual Yield = 15.00 bushels per acre
Indemnity per Acre = [16.30 – 15.00] x $ 9.45 per
bushel = $ 12.29 per acre
Total Indemnity = $12.29 per acre x 240 acres =
$ 2,950.

Spring Wheat, fallow: (under CRC):

APH   = 29.0 bushels per acre
Premium Guarantee per Acre = 29.0 bushels per
acre x 0.65 = 18.90 bushels per acre
Initial Revenue Guarantee per Acre = 18.90 bushels
per acre x $ 5.88 per bushel = $ 111.13
Final Revenue Guarantee per Acre = 18.90 bushels
per acre x $7.88 per bushel = $ 148.93
Actual Yield = 17.40 bushels per acre per acre
Per Acre Indemnity = $ 148.93 per acre – [17.40 x
$ 7.88 per bushel] = $ 11.82
Total Indemnity = $ 11.82 per acre x 420 acres =
$ 4,964.

Durum Wheat, fallow: (under CRC):

APH = 29.0 bushels per acre
Premium Guarantee per Acre = 29.0 x o.65 = 18.90
bushels per acre
Initial Revenue Guarantee per Acre = 18.90 bushels
per acre x $ 5.88 per bushel = $ 111.13
Final Revenue Guarantee per Acre = 18.90 bushels
per acre x $7.88 per bushel = $ 148.93
Actual Yield =17.40 bushels per acre per acre
Per Acre Indemnity = $ 148.93 per acre – [17.40 x
0.65 x $ 7.88 per bushel] = $ 11.82
Total Indemnity = $ 11.82 per acre x 120 acres =
$1,418.

Spring Wheat, recrop: (under CRC):

APH = 24.0 bushels per acre
Premium Guarantee per Acre = 24.0 bushels per
acre x 0.65 = 15.60 bushels per acre
Initial Revenue Guarantee per Acre = 15.60 bushels
per acre x $ 5.88 per bushel = $ 91.73
Final Revenue Guarantee per Acre = 15.60 bushels
per acre x $7.88 per bushel = $ 122.93
Actual Yield = 14.40 bushels per acre per acre
Per Acre Indemnity = $ 122.93 per acre – [14.40 x
$ 7.88 per bushel] = $ 9.46
Total Indemnity = $ 9.46 per acre x 1020 acres =
$9,649.   .

Durum Wheat, recrop: (under CRC):

APH = 25.0 bushels per acre
Premium Guarantee per Acre = 16.30
Initial Revenue Guarantee per Acre = 16.30 bushels
per acre x $ 5.88 per bushel = $ 95.84
Final Revenue Guarantee per Acre = 16.30 bushels
per acre x $7.88 per bushel = $ 128.44
Actual Yield = 15.00 bushels per acre per acre
Per Acre Indemnity = $ 128.44 per acre – [15.00 x
$ 7.88 per bushel] = $ 10.24
Total Indemnity = $ 10.24 per acre x 240 acres =
$2,548.

AGR-Lite: (as a stand alone product):

AGR-Lite Coverage = $ $248,297 x 0.65 x 0.90 = $ $145,254

Safflower sales = 480 pounds per acre x $ 0.217 per pound x 260 acres = $ 27,082
Flax sales = 7.20 bushels per acre x $ 12.50 per bushel x 40 acres = $ 3,600
S. Wheat, fall. = 17.40 bushels per acre x $ 8.30 per bushel x 420 acres = $ 60,656
D. Wheat, fall. = 17.40 bushels per acre x $ 12.00 per bushel x 120 acres = $ 25,056
S. Wheat, recrop = 14.40 bushels per acre x $ 8.30 per bushel x 1,020 acres = $ 121,910
D. Wheat, recrop = 15.00 bushels per acre x $ 12.00 per bushel x 240 acres = $ 43,200
Hay Barley = 1.4 tons per acre x $ 71.00 per ton x 360 acres = $ 35,784

Revenue to Count   **$ 317,288**

The AGR-Lite Indemnity is zero because the AGR *Revenue to Count* ($317,288) is greater than the AGR-Lite *Coverage* ($145,254).

AGR-Lite: (as umbrella coverage with Strategy 1 or Strategy 2 individual products)

Indemnities from individual insurance products are added to commodities sales to calculate the AGR-Lite *Revenue to Count* when AGR-Lite is used as an umbrella product. So, under Strategies 4 and 5, in Scenario 2, the AGR-Lite *Revenue to Count* would increase and continue to exceed AGR-Lite *Coverage*, resulting in no additional indemnity.

The indemnities received by the farm in Scenario 2 are presented below (Table 8).

Table 8: Scenario 2 Insurance Indemnities Received for Production and Revenue Losses on the Representatives Montana Farm

Commodity	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5
Safflower	$2,257	$2,257	NA[1]	$2,257	$2,257
Flax	400	400	NA[1]	400	400
S. Wheat, fallow	5,830	4,964	NA[1]	5,830	4,964
D. Wheat, fallow	1,702	1,418	NA[1]	1,702	1,418
S. Wheat, recrop	11,322	9,649	NA[1]	11,322	9,649
D. Wheat, recrop	2,950	2,458	NA[1]	2,950	2,458
Subtotal	$24,461	$20,966	NA[1]	$24,461	$20,966
Whole Farm	NA[1]	NA[1]	0	0	0
TOTAL	$24,461	$20,966	0	$24,461	$20,966

[1] NA denotes not applicable.

Scenario 3:

In Scenario 3, all crops suffer a 40 percent yield loss, as described in Scenario 2. However, in addition, durum wheat is so damaged by drought conditions that it is rejected for food use and sold as feed by the farm manager at $ 5.75 per bushel.

However, the indemnities for durum wheat do not change from Scenario 2 under for either the durum insured under MPCI or CRC. The actual yields are the same. Under CRC, it is not the producer's price received that influences the indemnity for loss of revenue, but the Harvest Price, as established from the appropriate futures contract.

However, the *Revenue to Count* in determining the AGR-Lite indemnity does decline; that is,:

Safflower sales = 480 pounds per acre x $ 0.217 per pound x 260 acres = $ 27,082
Flax sales = 7.20 bushels per acre x $ 12.50 per bushel x 40 acres = $ 3,600
S. Wheat, fall. = 17.40 bushels per acre x $ 8.30 per bushel x 420 acres = $ 60,656

D. Wheat, fall. = 17.40 bushels per acre x $ 6.00 per bushel x 120 acres = $ 12,528
S. Wheat, recrop = 14.40 bushels per acre x $ 8.30 per bushel x 1,020 acres = $ 121,910
D. Wheat, recrop = 15.00 bushels per acre x $ 12.00 per bushel x 240 acres = $ 21,600
Hay Barley = 1.4 tons per acre x $ 71.00 per ton x 360 acres = $ 35,784

Revenue to Count $ 283,160

The **AGR-Lite Indemnity** is zero, however, because the **AGR *Revenue to Count*** ($283,160) exceeds the AGR-Lite *Coverage Level* ($145,254).

Indemnities from individual insurance products are added to commodities sales to calculate the AGR-Lite *Revenue to Count* when AGR-Lite is used as an umbrella product. So, under Strategies 4 and 5, the AGR-Lite *Revenue to Count* increases and continues to exceed AGR-Lite *Coverage*, resulting in no additional indemnity.

Indemnities for all strategies under Scenario 3 are summarized (Table 9).

Table 9: Scenario 3 Insurance Indemnities Received for Production and Revenue Losses on the Representative Montana Farm

Commodity	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5
Safflower	$2,257	$2,257	NA[1]	$2,257	$2,257
Flax	400	400	NA[1]	400	400
S. Wheat, fallow	5,830	4,964	NA[1]	5,830	4,964
D. Wheat, fallow	1,702	1,418	NA[1]	1,702	1,418
S. Wheat, recrop	11,322	9,649	NA[1]	11,322	9,649
D. Wheat, recrop	2,950	2,458	NA[1]	2,950	2,458
Subtotal	$24,461	$20,966	NA[1]	$24,461	$20,966
Whole Farm	NA[1]	NA[1]	0	0	0
TOTAL	$24,461	$20,966	0	$24,461	$20,966

[1] NA denotes not applicable.

Summary:

A 3,000 acre farm in Roosevelt County employs five different strategies using RMA insurance products to manage production and revenue risks.

In Scenario 1, production is normal and harvest prices are as expected. So the producer does not receive insurance indemnities, but does incur costs for his insurance protection. Under Strategy 1, premium costs of $17,032 are incurred for the use of MPCI insurance products for all crops except barley hay (for which no crop-specific insurance coverage is available). Under Strategy 2, a combination of MPCI and CRC insurance products are used, resulting in a total premium cost of $ 14,628. The usual expectation is that a strategy that employs CRC insurance products will be more costly than a strategy that uses MPCI products for the same crops at similar coverage levels and price elections. MPCI insurance products address only production risk while CRC products address both yield and revenue risks. In the 2008 insurance year, however, relatively high prices were established prices for the MPCI products available for durum wheat and spring wheat. In contrast, the base price used to establish the revenue guarantees for spring wheat and durum wheat under CRC coverage, as derived from a pre-specified futures contract, were much lower than the MPCI price.

Under Strategy 3, the whole farm AGR-Lite insurance product is used as a stand-alone product for a total premium cost of $4,675. Under Strategy 4, the whole farm product is used as umbrella coverage over the MPCI coverage embodied in Strategy 1. The combined cost of this strategy is $ 19,385. Under strategy 5, the whole farm product is used as umbrella coverage over the MPCI and CRC coverage embodied in Strategy 2 and the combined premium is $16,981.

In Scenario 2, there is a 40 percent loss in production for all crops due to a severe drought. Indemnities are largest under Strategy 1 because of the relatively high prices specified for MPCI yield contracts. Strategy 2, which uses CRC coverage for wheat, provides lower indemnities because the Harvest Price for wheat, as determined from the applicable futures contract, is lower than the price established for MPCI yield contracts. Under Strategy 3, when the farm only uses AGR-Lite, no indemnity is paid in Scenario 2. In the five years used as the historical base for this coverage, allowable income was relatively low in some years due to both low yields and low prices relative to yield and price expectations for 2008. In fact, the approved adjusted gross revenue is less than half of the insurance year expected income. Thus, in a period of improved production and price expectations, this product does not offer much protection.

In Scenario 3, the farm also experiences a 40 percent loss but the quality of durum wheat is so low that it has to be sold as feed grain at a reduced price. Nevertheless, this quality loss does not trigger any additional indemnities. Under CRC, the price received by the producer does not enter the indemnity calculation. The market Harvest Price, as determined by the appropriate futures contract, is used to determine losses and indemnities. The actual revenue received from durum sold for feed is half what it would have been if sold for human consumption, but this reduction in revenue is not sufficient to trigger any AGR-Lite indemnity.

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Appendix 1: Supporting Information

Table A1: Montana Representative Farm Historical Allowed Income

Crop Year 2002:

Crop	Acres	Yield	Production	Price/Unit	Income
Safflower	260	780 lb	202,800	$0.097	$19,671
Flax	40	15 bu	600	6.15	3,690
S Wheat, fallow	420	28 bu	11,760	4.08	47,980
D. Wheat, fallow	120	27 bu	3,240	4.49	14,548
S. Wheat, recrop	1,020	23 bu	23,529	4.68	95,998
D. Wheat, recrop	240	26 bu	6,240	4.49	28,018
Hay Barley	360	1.2 ton	432	66.16	28,581
Fallow	540	NA[1]	NA[1]	NA[1]	NA[1]
TOTAL	3,000	NA[1]	NA[1]	NA[1]	$238,486

[1] NA denotes not applicable.

Crop Year 2003:

Crop	Acres	Yield	Production	Price/Unit	Income
Safflower	260	1,070 lb	278,200	$0.137	$38,113
Flax	40	9 bu	360	5.80	2,088
S Wheat, fallow	420	28 bu	11,760	3.78	44,453
D. Wheat, fallow	120	29 bu	3,480	4.07	14,164
S. Wheat, recrop	1,020	26 bu	26,520	3.78	100,246
D. Wheat, recrop	240	24 bu	5,760	4.07	23,443
Hay Barley	360	1.3 ton	468	69.83	32,680
Fallow	540	NA[1]	NA[1]	NA[1]	NA[1]
TOTAL	3,000	NA[1]	NA[1]	NA[1]	$255,187

[1] NA denotes not applicable.

Crop Year 2004:

Crop	Acres	Yield	Production	Price/Unit	Income
Safflower	260	620 lb	161,200	$0.121	$19,505
Flax	40	19 bu	760	7.94	6,034
S Wheat, fallow	420	37 bu	15,540	3.69	57,342
D. Wheat, fallow	120	36 bu	4,320	3.86	16,675
S. Wheat, recrop	1,020	35 bu	35,700	3.69	131,733
D. Wheat, recrop	240	33 bu	7,920	3.86	30,571
Hay Barley	360	1.9 ton	684	72.17	49,364
Fallow	540	NA[1]	NA[1]	NA[1]	NA[1]
TOTAL	3,000	NA[1]	NA[1]	NA[1]	$311,494

[1] NA denotes not applicable.

Crop Year 2005:

Crop	Acres	Yield	Production	Price/Unit	Income
Safflower	260	970 lb	252,200	$0.14	$35,308
Flax	40	14 bu	560	6.20	3,472
S Wheat, fallow	420	33 bu	13,860	3.80	52,668
D. Wheat, fallow	120	29 bu	3,480	3.45	12,006
S. Wheat, recrop	1,020	25 bu	25,500	3.80	96,900
D. Wheat, recrop	240	27 bu	6,480	3.45	22,356
Hay Barley	360	1.5 ton	540	75.00	40,500
Fallow	540	NA[1]	NA[1]	NA[1]	NA[1]
TOTAL	3,000	NA[1]	NA[1]	NA[1]	$263,210

[1] NA denotes not applicable.

Crop Year 2006:

Crop	Acres	Yield	Production	Price/Unit	Income
Safflower	260	530 lb	137,800	$0.135	$18,603
Flax	40	4 bu	160	6.13	981
S Wheat, fallow	420	21 bu	8,820	4.58	40,396
D. Wheat, fallow	120	23 bu	2,760	4.61	12,724
S. Wheat, recrop	1,020	13 bu	13,260	4.58	60,731
D. Wheat, recrop	240	14 bu	3,360	4.61	15,490
Hay Barley	360	0.9 ton	324	74.67	24,193
Fallow	540	NA[1]	NA[1]	NA[1]	NA[1]
TOTAL	3,000	NA[1]	NA[1]	NA[1]	$173,118

[1] NA denotes not applicable.

Table A2: Producer-selected Characteristics of RMA Insurance Products that Compose Risk Management Strategies 1, 2, and 3

Commodity	Strategy 1	Strategy 2	Strategy 3
Safflower	APH: 65% coverage level 100% price election	APH: 65% coverage level 100 % price election	NA[1]
Flax	APH: 65% coverage level 100% price election	APH: 65% coverage level 100 % price election	NA[1]
S Wheat, fallow	APH: 65% coverage level 100% price election	CRC: 65% coverage level 100 % price election	NA[1]
D. Wheat, fallow	APH: 65% coverage level 100% price election	CRC: 65% coverage level 100 % price election	NA[1]
S. Wheat, recrop	APH: 65% coverage level 100% price election	CRC: 65% coverage level 100 % price election	NA[1]
D. Wheat, recrop	APH: 65% coverage level 100% price election	CRC: 65% coverage level 100 % price election	NA[1]
Hay Barley	NA[1]	NA[1]	NA[1]
Fallow	NA[1]	NA[1]	NA[1]
Whole Farm	NA[1]	NA[1]	AGR-Lite: 65% coverage 90% payment

[1] NA denotes not applicable.

Table A3: Coverage (Maximum Liability) by Crop, Strategies 1, 2, & 3

Commodity	Strategy 1	Strategy 2	Strategy 3
Safflower	$29,388	$29,388	NA[2]
Flax	3,900	3,900	NA[2]
S Wheat, fallow	73,427	46,675	NA[2]
D. Wheat, fallow	21,433	13,336	NA[2]
S. Wheat, recrop	147,186	93,563	NA[2]
D. Wheat, recrop	36,968	23,003	NA[2]
Hay Barley	NA[2]	NA[2]	NA[2]
Fallow	NA[2]	NA[2]	NA[2]
Whole Farm	NA[2]	NA[2]	$145,254[1]
TOTAL	$312,302	$209,865	$145,254

[1] The maximum MPCI liability is $72,627, the amount the AGR-Lite liability can be reduced when used as an umbrella over multiple peril coverage for individual crops.
[2] NA denotes not applicable.