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Objective Analysis

For Informed

Decision Making

Risk Management Options for Montana Ranchers

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Executive Summary

Ranchers know they are involved in risky enterprises and use many tools to manage risk. Typically, they choose several techniques to reduce the chances that they will suffer financial losses; that is, they develop and implement risk management strategies for their operations. Ranchers also protect themselves against adverse price movements. 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 purchases of feed commodities, to minimize the cost of purchased feedstuffs such as range supplements used during the early grazing season.

Increasingly, federal insurance for agricultural commodities offered by the Federal Crop Insurance Corporation has become an important and attractive risk management tool for agricultural producers. Ranchers in Montana now have a range of federally subsidized insurance products to facilitate their ability to manage production, price and revenue risks. This policy paper describes forage production, livestock price, and whole-ranch insurance products available to representative American Indian livestock enterprises in Montana and presents simulations of the effects of alternative risk management strategies that embody these insurance products for representative small and large livestock enterprises in northeast Montana that are managed by American Indian operators.

Some American Indian producers in northeast Montana operate relatively small cow-calf enterprises, many with the objective of supplementing their household incomes. Ranching is often not the principal occupation for these operators. A representative small cow-calf enterprise consists of an inventory of 40 mature cows, eight replacement heifers, and two herd bulls. The operator controls a resource base sufficient to produce most roughage feedstuffs for the enterprise. The ranch controls of a couple of sections of range for grazing and some hayland. On an annual basis, the representative cow calf enterprises is assumed to plant 20 acres of hay barley (harvested for hay) and to harvest 40 more acres of perennial wild hay. Annual revenues are generated from the sale of 18 steer and 10 heifer calves, 8 cull cows and in alternate years, a herd bull.

Ranching is generally the principal occupation of American Indian operators managing larger cow-calf enterprises in northeast Montana. A representative larger cow-calf enterprise is assumed to have a livestock inventory of 220 mature cows, 45 replacement heifers, and 10 herd bulls. The ranch has a resource base sufficient to produce roughage feedstuffs for the cow-calf enterprise. The ranch utilizes 10 sections of grazingland and 400 acres of hayland, of which 100 acres are planted to hay barley, 200 acres to perennial wild hay, and 100 acres to nonirrigated alfalfa. Annual revenues are generated from the sale of 104 steer calves, 59 heifer calves.

Many different risk management strategies can be pursued on any ranch. Ranch managers choose among these alternatives on the basis of their ranch's financial structure and their preferences about taking or avoiding risks. In this analysis, large ranch managers are assumed to be interested in three basic risk management strategies and two combinations of these basic strategies. The small ranch's risk management options consist of two basic risk management

strategies. These strategies involve different combinations of the following insurance products: AGR-Lite, Actual Production History (APH), Livestock Risk Protection (LRP), and Pasture, Rangeland, Forage (PRF).

Three "production year outcome" scenarios are examined for each ranch. In the first, producers have an average or good year, crop yields are close to, or above average, and prices for crops and livestock commodities are also close to those that were expected. Consequently there are no shortfalls in yields, prices or revenues and the ranch receives no insurance indemnities. However it does pay the premiums it owes for the insurance it purchases. In this scenario, the largest reductions in ranch net incomes occur when the small & large ranch operators carry AGR-Lite as an umbrella policy over commodity specific insurance policies.

In the second scenario, substantial price changes take place over the insurance period. Poor planting conditions and growing conditions in the Corn Belt result in harvest prices for corn that are 50 percent higher than anticipated early in the production year. Nationally, and in Montana, feeder cattle prices decline substantially by 40 percent. In this scenario, the small and large ranch both receive indemnities under the LRP policies purchased for feeder steers and heifers.

In the third scenario, a severe local drought occurs in northeast Montana, leading to a 40 percent decline in crop and forage yields (and proxy variables for yields). The drought is localized, so livestock sale prices remain stable. In this scenario, the small and large ranches receive indemnities from yield and dollar value insurance products for harvested forage and grazingland.

It is important to note that AGR-Lite provides very limited downside risk protection for the representative ranches. On these ranches, market revenues are obtained only from sales of feeder cattle, cull cattle, and bulls. The forage and crop enterprises are feedstuffs for the cow-calf enterprises but do not provide revenue from market sales. Even when feeder cattle prices fall precipitously, AGR-Lite provides indemnities that are less than the AGR-Lite insurance premiums. Production losses in ranch forages are not covered under AGR-Lite because these are non-revenue enterprises.

INTRODUCTION

Agricultural production is a financially risky business. On Montana ranches, forage losses from natural hazards (lack of moisture, severe drought, etc.) are frequent. Livestock losses also occur because of adverse winter weather, summer heat, animal disease and predation. Ranches also face substantial price risks, both in the resource markets where they purchase their inputs and the commodity markets where they sell their livestock and crops. Energy and feed prices often vary substantially from one month to the next. Livestock prices can also be volatile. Moreover, the link between ranch 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.

Ranchers know they are involved in risky enterprises and use many tools to manage risk. Typically, they select several techniques to reduce the chances that they will suffer financial losses; that is, they develop and implement risk management strategies for their operations. Ranchers use production techniques that reduce forage and livestock production losses (for example, inoculating cattle against diseases, raising feed crops and forage in several locations to reduce risk of losses from hail or moisture shortage, and managing a mix of irrigated and non-irrigated pasture and rangeland). They use rotational and other cropping and forage management decisions to improve soil moisture retention, and they manage the wildlife - domestic livestock interface to reduce stock losses.

Ranchers also protect themselves against adverse price movements. 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 of feed commodities such as nutrition supplements used during the early grazing season.

Increasingly, federal insurance for agricultural commodities offered by the USDA Federal Crop Insurance Corporation (FCIC) has become an important and attractive risk management tool for agricultural producers. Ranchers in Montana now have a range of federally subsidized insurance products to facilitate their ability to manage both production and price risk. These include products based on an operation's actual production history (APH) that provide a rancher with an indemnity when their ranch operation experiences crop/forage specific production or yield losses or crop specific revenue loss. Yield products, called Multiple Peril Crop Insurance (MPCI) products, provide indemnities when yields for the insured crop are low. Revenue products pay an indemnity when the producer's per acre revenue for a crop is low (because of either low per acre yields, low prices, or both). Revenue Assurance (RA), Crop Revenue Coverage (CRC), and Income Protection (IP) are examples of these types of products. Some operation-specific products are crop-loss products that provide an indemnity only when the producer's yields for a crop are low. These products are widely known as Actual Production History (APH) products.

Ranchers in Montana are now also able to purchase insurance products that provide indemnities when the area in which the ranch operation is located experiences low per acre crop yields (called Group Risk Plans) or low per acre revenues (Group Risk Income Protection plans). Historically, the area has been the county in which the ranch is located. A new area-based product that provides insurance for forage loss, the Pasture Rangeland and Forage (PRF) Rainfall Index Insurance product now available to Montana ranchers, bases indemnities on estimates of forage loss within much smaller areas. The PRF is based on rainfall information for areas that are approximately 12 miles square.

Livestock prices and gross margins can now also be insured using RMA products. These include Livestock Risk Protection (LRP) insurance - available for feeder cattle, fed cattle, hogs and lambs - that provides insurance against unexpected price declines, and Livestock Gross Margin (LGM) insurance - available for fed cattle, dairy cattle, and hogs - that provides insurance against declines in gross margins caused by higher feed prices, or lower livestock

prices and, in the case of dairy cattle, milk prices, or both.

Until recently, ranchers and farmers have had to insure each crop or forage under a separate insurance contract, leading to a complex set of insurance choices for multi-enterprise operations. Since 2007, whole farm insurance has been available in Montana in the form of Adjusted Gross Revenue Lite (AGR-Lite). This product provides indemnities to producers when a ranch's adjusted gross income from multiple enterprises is either low relative to historical levels or low relative to expected revenues. AGR-Lite may be used as a stand-alone product or in conjunction with crop and livestock commodity specific insurance products.

This paper describes the crop, forage and livestock insurance products available to Montana ranch operations and presents simulations of the effects of alternative risk management strategies for representative large and small Montana ranches. The alternative strategies include those in which each crop & livestock enterprise is insured under a separate RMA insurance product, the whole ranch is insured using AGR-Lite, as a stand alone product, and the ranch uses AGR-Lite in combination with individual risk management products. The focus is on the premium outlays required and the indemnities received under each strategy in different price and production environments.

RISK MANAGEMENT ON MONTANA LIVESTOCK RANCHES

Some of the production risk management efforts undertaken by a ranch manager are highly visible. Other risk management efforts may not be so obvious.

Production Risk Management: In most Montana counties, hay is the primary forage harvested for feed. Hay is subject to considerable production risk. On some ranches, only upland hay is produced and in drought years they may have no production or reduced production. In drought years, on ranches where hay is irrigated, irrigation may either not be possible or limited to the early part of the production season and total production will be reduced because of lower yields per cutting and/or fewer cuttings. In other years, even when sound management practices are followed, hay production may be relatively low because of other natural causes such as disease or insect infestations.

Many ranch managers use a similar risk management strategy to protect their operations from shortfalls in hay production. They maintain hay inventories in excess of what they are most likely to need in the next winter feeding period. This strategy generally guarantees that they will have sufficient hay if that winter feeding period is longer and/or more severe than usual. It also provides some carryover hay for the next year's feeding period. If hay production is reduced in the next growing season, operators then have carryover hay in their inventories.

Substantial production risks are also associated with rangeland utilized by Montana livestock producers. Most ranch managers employ stocking rates that maintain the quality of the rangeland and leave inventories of useable forage after grazing. Views differ about how much of a forage resource should be utilized, but in periods of adequate precipitation and other satisfactory growing season conditions, most Montana producers leave some forage ungrazed. As with harvested roughage, standing forage serves as inventory for periods when range production is restricted because of limited precipitation, excessive heat and/or other factors during the growing season. When range is stressed, or rangeland is leased from public agencies, how rangeland forage is utilized may be restricted, (for example, by lowering stocking rates or specifying an early pull-off date).

Many Montana ranches raise their own replacement heifers. A cow-calf operation may retain more replacement heifers than might be expected. Such "overstocking" provides the rancher with some risk protection against loss of animals or infertility. In addition, more mature cows may be culled from a herd than would be indicated by recommended culling rates. For instance, additional culling might be needed if pregnancy testing indicates that several mature cows are open. In addition, some replacement heifers may be without calf, or the ranch manager

may wish to cull some of the replacement heifers that are with calf for other reasons.

In recent years, the range of federally-subsidized crop insurance products that address ranch production risks has expanded. The new products have been developed by several entities under contractual agreements with the USDA Risk Management Agency (RMA) and reviewed and approved by FCIC. They are intended to reduce the adverse economic impacts of production losses associated with natural catastrophic events. On many ranches, federal-subsidized insurance products provide protection against yield and/or revenue losses of feed grains, forage and rangeland production.

Price Risk Management: Price variability is a source of risk encountered by ranch operations. There is a tendency to associate price risks with commodities that are produced and sold by the ranch, but price risks are also associated with many production inputs. Some ranch managers contract ahead for inputs such as fuel and fertilizer. These forward contracts often specify the quantity and price of the input to be purchased. Sometimes, ranch managers have such inputs delivered to the farm well before the next production year, perhaps in the current tax year.

Ranch managers with livestock feeding enterprises sometimes use forward contract for the delivery of specified feed quantities at a fixed price. For example, a rancher retaining calves may forward contract for the future delivery of several thousand bushels of corn. Ranch managers may also contract for the future delivery of commodities they produce for sale. For instance, a rancher may contract for the future delivery of a specified number of steer calves at a pre-specified price.

Other methods exist for forward pricing of both production inputs purchased for use on the ranch and commodities produced for sale on the ranch. Some producers use commodity futures markets to manage price risk by hedging through the use of futures contracts or purchase options contract to assure the opportunity to market at a minimum price.

In recent years, some price insurance products have been approved by RMA to address livestock price risks. These federally-subsidized insurance products are available in all Montana counties for feeder and fed cattle, lambs and swine.

FUNDAMENTAL ELEMENTS OF RMA PRODUCTION INSURANCE PRODUCTS

Introduction: Ranch managers generally consider three production risk management options. First, they may choose not to purchase any type of insurance. A ranch that pursues this option is choosing to ***self insure.*** Second, for certain potential causes of production loss, ***single peril*** crop insurance products may be available. For instance, a producer may choose to take out an insurance policy that would provide an indemnity if a crop such as hay barley were to burn as a range fire spread. 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, the ranch may use a ***multiple peril*** crop insurance product developed under the auspices of the RMA with premium subsidies provided by the federal government.

Actual Production History Insurance (APH)*:* RMA-approved products that address production losses are ***multiple peril offerings*** that cover production losses attributable to several natural causes. There are two general APH categories. ***Yield insurance*** (often referred to as 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 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 insurance products are sold and serviced by private-sector insurance companies. The products must have been approved by the Federal Crop Insurance Corporation (FCIC) before they can be offered to producers. The FCIC, a public corporation, oversees the operations of RMA.

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 is usually available at the ***optional, basic,*** and ***enterprise unit*** levels. In group risk plans, where the producer buys insurance based on area yields (typically county yields) for the insured commodity, coverage is only available at the ***enterprise level.***

An ***optional unit*** is land planted to a particular crop in a given 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 the ranch. 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 particular crop by the operation.

Ranch managers have the option of selecting different units for different crops in most multiple peril contracts. For example, feed barley might be insured at the optional unit level while forage production such as alfalfa hay might be insured at the basic unit level.

A ranch manager should consider two major issues in making the "units" decision – the possibility of being indemnified for an insurable loss and the premium incurred for crop insurance coverage. For example, if a ranch manager knows that there is considerable difference in most years in yields on two geographically separated fields for the same crop (perhaps because of hail), the ranch 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 and lowest for enterprise units. So a ranch manager should evaluate the tradeoff between the indemnities the operation is likely to receive and the premium costs it incurs.

Actual Production History Insurance 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, alternatively, a group risk product.

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

Ranches who select individual ranch-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 must be developed for each insured unit of a crop. A 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 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 do not count as part of the APH yield history. For example, under a summer fallow cropping practice in which a field is fallowed every other year, a 10-year crop APH would require information on crop yields over the previous twenty years.

To illustrate how APHs are established, consider information on two production histories for the same crop (Table 1). Producer A has only four years of acceptable yield records. Adding these yields and dividing by four provides an APH of 29 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.

Table 1: Production Histories for a Crop, as Reported on Two Different Ranches

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

If a ranch has less than four years of recorded yield history, a ***Transitional Yield*** or ***T-yield*** provided by RMA (generally on a county basis) is then used to calculate the ranch's APH for a particular crop.

A rancher who has produced a crop but has no acceptable yield information will be given an APH equal to 65 percent of the ***T-yield*** for the crop. If the rancher has acceptable annual yield data, but for less than four years, then ***T-yields*** will used in the producer's APH calculation as shown (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 ranch manager is a "new" producer who has not previously produced the commodity in the county, then the operation's APH 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, abnormally low yields are realized. The RMA allows a producer to substitute a value equal to 60 percent of the relevant ***T-yield***, called a plug yield, for the abnormally low yields in their APH calculation. Using plug yields enables producers to avoid large year-to-year decreases in their APH, but if they use plug yields they are also required to pay higher premiums.

Coverage, Premiums and Subsidies, and Price and Indemnity Information for Multiple Peril Products Using Individual Yields: Both conventional yield insurance, often referred to as APH, 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 the producer to establish a ***Yield Guarantee*** by selecting an insurance ***Coverage Level*** for losses and multiplying the coverage level by the producer's APH; that is, the ***Yield Guarantee = Actual Production History x Coverage Level.*** The

Coverage Level is defined as the percentage of the ***APH*** the producer selects for coverage of a crop planted on an insurable unit. The ranch's ***Coverage Level*** choice also determines the percent of the total premium that will be subsidized by the federal government. Coverage levels and applicable subsides for MPCI (yield risk) products are shown (Table 3).

Table 3: Applicable Subsidies for MPCI and Crop Revenue Products based on APH

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

For each MPCI crop product, RMA announces an ***Established Price*** for the commodity based on expected marketing conditions in advance of the sales closing date. Sometimes, prior to the sales closing date, RMA will amend the ***Established Price*** by announcing an ***Additional Price*** for a crop based on up-dated market information. A producer establishes a ***Price Election*** by taking 55 to 100 percent of the ***Established Price*** (or ***Additional Price***). Most producers take a 100 percent ***Price Election.***

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

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

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

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

The producer premium, the premium the ranch must pay, 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 APH insurance is offered at the 50 percent ***coverage level*** and a 55 percent ***price election*** for ***$300 per crop*** insured by a rancher (up to a maximum of three crops per operation).

The revenue insurance product, ***Crop Revenue Coverage*** (CRC), involves two prices for the 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 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).

Given the CRC ***Base Price***, the producer establishes an initial per acre ***Revenue Guarantee*** as follows:

Revenue Guarantee = ***APH*** x ***Coverage Level*** x ***CRC Base Price x 100 %.***

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

The CRC per acre gross premium is:

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

The rancher's 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 the rancher's ***coverage level***. ***Catastrophic Risk Protection*** is not available for Crop Revenue Coverage.

An indemnity is due when the ranch's estimated per acre ***Crop Value***, where the ***crop value*** is defined as the producer's actual yield x ***harvest price,*** is less than the ranch's ***revenue guarantee***.

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 (or similar) yields or proxies for yields as the basis for determining multiple peril crop insurance coverage.

In GRP products, producers determine their ***trigger yield*** by multiplying the ***coverage level*** percentage they select by the ***Expected Yield*** for the crop in the county, where the National Agricultural Statistics Service (NASS) average yield (or a proxy measure) for the county is usually used as the basis for the ***Expected Yield***. So ***Trigger Yield*** = ***Expected Yield*** x ***coverage level***. In GRIP products, producers determine their ***Trigger Revenue*** by multiplying the ***Coverage Level*** they select by the ***Expected Revenue*** for the crop (as established by RMA). So, ***Trigger Revenue*** = ***Expected Revenue*** x ***Coverage Level***.

On a county-by-county basis, for GRP policies, RMA announces an ***Amount of Protection*** per acre (that is, RMA does not announce an ***Established Price*** for crops covered under GRP policies)**.** Ranchers 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 the crop by the price announced by RMA (***Established Price***) for APH coverage for the same crop, and then multiplying this product by 1.5.

Ranchers chose to insure 60 to 100 percent of the ***Amount of 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 rancher's per acre premium for GRP insurance equals the difference between the gross premium and the gross premium multiplied by the subsidy rate. Subsidy rates are determined by the ***coverage levels*** that ranchers select (Table 4).

Table 4: Applicable Subsidies for GRP and GRIP Insurance Products

Coverage Levels (% of County Yield)	**GRP Premium Subsidies*** (% of Total Premium)	**GRIP Premium Subsidies*** (% of Total Premium)
70	59	59
75	59	55
80	55	55
85	55	49
90	51	44

Group Risk Income Protection products are similar to those of GRP products except that several terms are expressed in ***revenue per acre*** rather than ***production per acre***.

The ***Expected County Yield*** per acre is based on the NASS data on average yields for the county. The ***Expected Price*** is defined by the average daily settlement price for the appropriate underlying futures contract. The 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 rancher determines his ***Protection per Acre*** by selecting from 60 to 100 percent of the ***Maximum Protection per Acre.***

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

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

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

Payment Calculation Factor = [***Trigger Yield - Actual County Revenue***] / [***Trigger Revenue***]. The per acre indemnity is then:

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

The gross premium per acre is calculated as:

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

The rancher'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 the rancher's choice of coverage level (that is, the percent of ***expected county revenue*** they choose for the specification of their ***trigger revenue***).

FUNDAMENTAL ELEMENTS OF RMA PRODUCTS DIRECTLY APPLICABLE TO LIVESTOCK PRICE RISKS

Introduction: The crop production yield and revenue insurance products provided by RMA are useful tools for managing financial risks on ranches. For example, some producers use these insurance products to moderate the adverse economic consequences of production losses in alfalfa hay production and rangeland production. Others use revenue insurance to moderate revenue losses associated with the production of corn for grain.

The Risk Management Agency also offers two types of products specific to livestock prices. **Livestock Risk Protection** (**LRP**) constitutes a family of ***single peril*** insurance offerings that allow livestock producers to insurance against unexpected declines in livestock prices for feeder cattle, fed cattle, swine, and lambs. **Livestock Gross Margin** (**LGM**) is a family of ***single peril*** insurance offerings that allow cattle, swine, and dairy producers to insure against losses from decreases in margins for fed livestock operations due to movements in livestock prices, milk prices and feeding costs. Here we focus on LRP for feeder cattle and LGM for fed cattle.

Livestock Risk Protection for Feeder Cattle (LRP-Feeder Cattle): ***LRP-Feeder Cattle*** provides insurance against declining market prices for feeder cattle below an established coverage price. This insurance is applicable to feeder cattle of a specified type that the rancher expects to market at weights of 900 pounds or less at the end of the insurance period.

LRP-Feeder Cattle covers feeder cattle of different types and weights (Table 5). ***Target weight,*** expressed in hundredweight, is the anticipated average weight for a specified type of feeder cattle covered under an insurance policy. LRP-Feeder Cattle insurance policies are offered for 13, 17, 21, 26, 30, 39, 43, 47, or 52 week ***endorsement lengths***, but seldom has coverage been available for more than 30 weeks. Livestock producers select the ***endorsement length*** that, at the time they purchase the insurance, is closest to the date at which the insured cattle are to be marketed.

Table 5: Feeder Cattle Types and Weights Eligible for LRP Feeder Cattle Coverage

Insurable Type	Target Weight
Steers Weight 1	Less than 6.0 hundredweight
Steers Weight 2	6.0 to 9.0 hundredweight
Heifers Weight 1	Less than 6.0 hundredweight
Heifers Weight 2	6.0 to 9.0 hundredweight
Brahman Weight 1	Less than 6.0 hundredweight
Brahman Weight 2	6.0 to 9.0 hundredweight
Dairy Weight 1	Less than 6.0 hundredweight
Dairy Weight 2	6.0 to 9.0 hundredweight

To obtain ***LRP-Feeder Cattle*** coverage, a producer must obtain, complete and have a ***Substantial Beneficial Interest Reporting Form*** approved. To receive approval, the applicant must have least a 10 percent share in the cattle to be fed. The form establishes the insurance eligibility of the applicant and tracks insurance limits (a maximum of 1,000 head per reporting

form and 2,000 head per entity per "crop" year, where the "crop" year is defined as July 1 through June 30).

Coverage prices are the prices that may be insured by a producer. ***Coverage prices*** are based on the ***expected ending value*** of the feeder cattle to be insured. ***Expected ending values,*** based on the Chicago Mercantile Exchange's (CME) Feeder Cattle Contract, are determined by RMA (not the producer) and posted for most business days on the RMA web site. ***Expected ending values*** for feeder cattle are those that are expected to occur at the end of the coverage period. ***Coverage levels*** range from 70 to 95 percent of the expected ***ending values*** and are known to the producer at the time LRP-Feeder Cattle insurance is attached to a group of feeder cattle by the rancher. The ***coverage level*** and ***coverage price*** are determined at the same time on the date the insurance is attached when a producer selects a ***coverage price*** from a RMA-posted table denoting available endorsement lengths and all related information.

Premiums are based on the ***Insured Value*** of the feeder cattle, which is defined as:

Insured Value = Number of Head x ***Target Weight*** x ***Coverage Price*** x ***Insured Share***.

The total premium is defined as:

Total Premium = ***Insured Value*** x ***Premium Rate***.

This value is rounded to the nearest whole dollar and referred to as the ***Rounded Total Premium.*** The federal government provides a 13 percent premium subsidy on LRP insurance. The total subsidy is calculated as:

Total Subsidy = 0.13 x ***Rounded Total Premium***.

The amount paid by the producer, the producer premium, is:

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

An indemnity is paid if the ***actual ending value*** is less than the ***coverage price*** selected by the producer. The ***actual ending value*** for feeder cattle at the end of the endorsement period is the price of feeder cattle as determined by the cash-settled CME Feeder Cattle Reported Index. The indemnity is calculated as: ***Indemnity*** = [Number of head insured x ***Target Weight*** x (***Coverage Price - Actual Ending Value***)] x Insured Share.

Note that neither the weight nor price at which the rancher sells feeder cattle enters the indemnity calculation.

Livestock Gross Margin: ***Livestock Gross Margin*** (***LGM)*** is insurance offered for fed cattle, dairy, and slaughter hogs. The ***LGM*** products for all three types of livestock are similar. ***LGM for Cattle*** provides protection against a decline in cattle feeding margins by hedging for feeder cattle and corn input costs and the fed cattle selling price. Although LGM is based on futures market prices, producers using ***LGM*** do not take futures or options positions themselves. ***LGM for Cattle*** pays an insured producer an indemnity when the spread between the fed cattle sales price and both feeder cattle and corn prices narrows beyond the producer's coverage level due to changing market conditions. As the estimated gross margin narrows because of higher corn prices and/or lower fed cattle prices, the insurance indemnity becomes larger to offset lower revenues and/or increased costs.[1]

LGM for Cattle is used to prevent large losses in the event reductions in feeding margins caused by lower revenues and/or increased input costs. Reduced cattle feeding margin, based on the calculations specified in this policy, can result from lower fed cattle prices and/or increases in feeder cattle and corn prices.

Two types of cattle feeding operations can be insured using ***LGM for Cattle.*** A yearling feeder operation may be insured where the yearlings are assumed to be placed on feed at 750 pounds, fed 57.5 bushels of corn a month during the five month feeding period, and marketed at a finished weight of 1,250 pounds. A calf finishing

[1] The fed cattle gross margin may also decline if the fed cattle price increases but corn price increases are large enough to more than offset the effects of the increase in the fed cattle price on the gross margin.

operation may be insured where the calves are placed on feed at 550 pounds, fed 54.5 bushels of corn during the eight month feeding period and marketed at a finished weight of 1,150 pounds. To be eligible for ***LGM for Cattle*** insurance, the producer must have ***substantial beneficial interest*** in the cattle – defined as at least a 10 percent ownership of the insured cattle. Furthermore, the cattle must be located in a state like Montana where ***LGM for Cattle*** is offered.

Once a producer has been approved for ***LGM for Cattle*** insurance coverage and ***substantial beneficial interest*** has been verified, ***target marketings*** are established. ***Target marketings*** identify the number of slaughter ready cattle that are expected to be marketed during the insurance period and that the producer wants to insure. Specific numbers of cattle are insured for each target month in the 11-month insurance period. Producers are not required to insure all of the fed cattle they intend to produce but the total number insured cannot exceed a producer's approved total marketings. A producer may insure up to 5,000 head of cattle for any 11-month insurance period and a maximum of 10,000 head in any given "crop" year, which is defined as the period from July 1 through June 30.

LGM for Cattle is sold only on the last business day of every month. Thus coverage can only be purchased on 12 days during the year. Sales commence once RMA reviews the price data from which the ***Expected Gross Margin*** (***EGM)*** is calculated; sales end at 9:00 am (Central Standard Time) on the next business day.

The ***Expected Gross Margin*** (***EGM***) is the gross margin expected at the end of each month of the insurance period at the time insurance is purchased. Once all gross margins are calculated for each of the 11 target months (no targeted marketings are allowed in the first month after the insurance purchase date), then each monthly ***EGM*** is multiplied by the expected monthly marketings to arrive at a total ***EGM.***

The calculation of the ***EGM*** for a calf finishing operation is defined as:

EGM_t = [11.50 hundredweight x per hundredweight Fed Cattle Live Price $_t$] - [5.50 hundredweight x per hundredweight Feeder Cattle Price $_{t-8}$] - [54.5 bushels of corn x per bushel corn price $_{t-4}$].

Month t is the month in which the ranch expects to sell the fed cattle. The fed cattle price for the target marketing month is the Chicago Mercantile Exchange closing futures price for the month in which the cattle are expected to be sold (month t in the formula for EGM) averaged over the last three days in the month in which the insurance is purchased. The producer's state and month specific basis is then added to the three day average expected fed cattle price.

The next step is to determine the expected feeder cattle price. For a calf feeding operation the standardized feeding period is 240 days, or eight months prior to marketing, month t - 8. The feeder cattle price for the eighth month prior to the target marketing month is the Chicago Mercantile Exchange closing futures price for the last three days in the current month (the month in which the insurance is purchased). A state and month-specific basis is then added to the average expected feeder cattle price.

To determine the cost of corn, an expected corn price is established using Chicago Board of Trade futures prices. Livestock consume corn continuously throughout the feeding period. So the midpoint of the feeding period is used (four months for the eight month calf feeding period). The expected corn price is the average of the Chicago Board of Trade closing price for the corn contract that expires in the fourth month of the calf feeding period over the last three days of the month in which insurance is purchased. The state and month specific basis for corn is then added to this average expected corn price. (A similar set of calculations are used in the ***LGM*** product for yearling feeder operations.)

At the time of the policy purchase, ***EGMs*** are calculated for each target marketing month (so there could be up to 11 values for fed cattle). Each ***EGM*** is multiplied by its respective ***target marketing*** and these products are summed to create the total ***EGM***.

Producers may choose not to insure all of the maximum insurable gross margin value by selecting a deductible, which can range from $0 to $150 per insured head in $10 increments.

Once the producer selects the deductible, the ***Gross Margin Guarantee*** (***GMG)*** is established; that is, ***Gross Margin Guarantee*** = ***Total Expected Gross Margin – Deductible.***.

LGM for Cattle insurance premiums depend on several factors including the producer's marketing plan. These include the number of cattle to be sold (i.e., the ***targeted marketings*** for the insurance period) and the per head deductibles selected. Premiums vary for each of the 12 sales periods within a year because of movements in the underlying futures prices for fed cattle, feeder cattle and corn embodied in the premium determination.

For most RMA-approved insurance products, the total premium is calculated by determining the maximum liability for the coverage selected by the producer and multiplying that maximum value by the specified premium rate. The producer then pays the difference between this premium and the premium subsidy for the policy. The premium calculation for ***LGM for Cattle*** is different and is based on Monte Carlo or random draw simulation procedures where the same random "draws" are used for every insured cattle producer. The premium calculation involves the following five step process:

Step 1: The total ***Expected Gross Margin*** (***EGM***) and ***Gross Margin Guarantee*** (***GMG***) are calculated, where total ***EGM*** is the sum of the products of the monthly gross margins times their monthly cattle marketing expectations, and ***GMG*** is the total ***EGM*** less the per head deductible level (***DL)*** times the sum of the monthly ***targeted marketings***.

Step 2: The calculated ten month total ***Simulated Gross Margins*** (***SGM***) are calculated, where ***SGM*** is the sum of the products of the simulated gross margins for each month in the insurance period times the ***targeted marketings*** in each month of a producer's marketing plan for the insurance period.

Step 3: Calculate the loss for each of the 5,000 months simulated, ***loss*** (***I***), where ***loss***(***I***) = ***GMG*** less ***SGM*** for each month.

Step 4: ***premium*** = 1/5,000 x sum of 5,000 ***loss*** (***i***) values.

Step 5: ***total premium*** = 1.03 x ***premium***.

An indemnity is paid to the insured livestock producer at the end of the 11-month insurance period if there is a positive difference between the ***Gross Margin Guarantee*** (***GMG***) and the ***Actual Gross Margin*** (***AGM***). The ***AGM*** for each month in the insurance period is the difference between the actual fed cattle revenues and the actual costs of feeder cattle and corn (determined by exchange contract prices), as described in the gross margin calculations where there are fixed weights for the included variables. The monthly values for the ***AGM*** values are multiplied by their ***targeted marketing*** values to provide a total ***AGM***. This total ***AGM*** is subtracted form the total ***GMG*** to determine the indemnity.

In the indemnity calculation, ***Actual Gross Margin*** (***AGM***) is determined as follows:

AGM_t = [11.50 hundredweight x per hundredweight Fed Cattle Live Price $_t$] - [5.50 hundredweight x per hundredweight Feeder Cattle Price $_{t-8}$] - [54.5 bushels of corn x per bushel corn price $_{t-4}$].

The actual fed cattle price for the target marketing month, t, is the average of the Chicago Mercantile Exchange closing futures prices for the last three days in the month the contract expires. The state and month specific basis is then added to this average actual fed cattle price.

For a calf feeding operation, the standardized feeding period is 240 days, or eight months prior to marketing, t - 8. The actual feeder cattle price is the average of the Chicago Mercantile Exchange closing futures prices for the last three days in the month the feeder cattle contract expires. The state and month-specific basis is then added to this average actual feeder cattle price.

To determine the cost of corn, the actual corn price is established by using Chicago Board of Trade futures prices. Because livestock consume corn continuously throughout the feeding period, the midpoint of the Feeding period is used, (for example, four months into the eight month calf feeding period). The actual corn price is average of the Chicago Board of Trade closing prices for corn in the last three days in the month the corn contract expires. The state and month specific basis is then added to this average expected corn price.

FUNDAMENTAL ELEMENTS OF ONE RISK MANAGEMENT AGENCY WHOLE FARM (RANCH) RISK MANAGEMENT PRODUCT: **AGR-LITE**

Introduction: ***Adjusted Gross Revenue Lite*** (***AGR-Lite***) is a whole-farm/ranch revenue protection insurance plan that covers market sales revenue losses from all unprocessed commodities on the farm. 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 that affect farm revenue in 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 RMA MPCI insurance plans are used to address crop specific yield and revenue risks.

AGR-Lite is offered in all Montana counties. In the AGR-Lite program Coverage is based on the lower of either the ranch's most recent five year average of its gross income, as reported to the Internal Revenue Service on Schedule F or other relevant federal income tax return forms, or the farm's expected revenue estimated using the operation's expected yields and expected prices (estimated by RMA) for all crops. ***AGR-Lite*** protects against loss in revenue attributable to any 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 made for losses attributable to negligence, mismanagement, 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 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. Items included in farm income reported for income tax purposes but excluded from AGR-Lite ***allowable income*** are (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. Items included in farm expenses reported for income tax purposes but excluded from AGR-Lite ***allowable expenses*** are (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 those 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 totaled to provide the ***5-Year Total Adjusted Expenses*** and 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. For livestock commodities, reporting will be by enterprises such as spring calves sold at weaning, calves retained and sold as yearlings, etc.

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 multiple by the ***income trend factor*** to provide the ***Indexed Average AGR*** (***Indexed Income***).

The ***Approved AGR*** is ***the lesser*** of: (1) ***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 Resultant Specification: To be eligible for **AGR-Lite**, a producer has to meet several criteria, including a maximum liability of less than one million dollars and an approved gross income of less than $2,051,281.[2] Once ***Approved AGR*** and ***Approved Expenses*** are determined, ranch managers have to make two decisions relative to ***AGR-Lite.*** They must first select a ***coverage level*** percentage. In part, the ***coverage level*** percentage 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***, 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 producer must then select a ***payment rate***. Two ***payment rates,*** 75 or 90 percent, are available at each ***coverage level***.

Each ranch therefore chooses one ***coverage level/payment rate*** combination that is applied to all commodities in the farm plan.

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

The 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 ranch's maximum liability, called the ***AGR-Liability*** or ***Coverage***. ***Coverage*** is specified as:

AGR-Lite = Coverage = Approved AGR x ***coverage level percentage*** x ***payment rate***

When ***AGR-Lite*** is used as an "umbrella" policy, other RMA-approved multiple peril insurance policy liabilities are 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.***

[2] See the RMA Fact sheet on AGR-Lite at *www.rma.usda.gov/pubs/rme/agr-lite.pdf* for complete details of all producer eligibility requirements.

The ***AGR premium rate*** is calculated using (1) the actual commodities grown on the farm, (2) the amount of diversification on the farm, and (3) the 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 the ranch's report of actual income performance for the insurance year, is less than the ***Trigger Level.***

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

Actual expenses for the insurance year are determined from the 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 below 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 ranch's ***Trigger Level*** is then recalculated as follows:

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

The ***Trigger Level*** is reduced by ***Revenue to Count***. ***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 ranch'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***.

Risk Management Strategy Alternatives: Examples Based on Two Representative Northeast Montana Ranches with American Operators

Two cow-calf operations, one small and one large, that are representative of many ranches in Roosevelt County managed by American Indian operators, were chosen to evaluate the use of several risk management strategies that involve the use of RMA insurance products.

Small Ranch: Some American Indian ranchers in northeast Montana have relatively small cow-calf enterprises that provide supplemental incomes for their households. Ranching is generally not the principal occupation for most of the operators of these small cow calf enterprises. The representative small cow-calf enterprise consists of 40 mature cows, eight replacement heifers and two bulls. The operator's resource base is sufficient to produce most roughage feedstuffs needed for the cow-calf enterprise. The operator utilizes two sections of range for grazing and some hayland. The operator is assumed annually to plant 20 acres to hay barley that is harvested as hay and also to harvest 40 acres of perennial wild hay. Annual revenues for the ranching operation are derived from the sale of 18 steers and 10 heifer calves, eight cull cows, and a range bull in alternate years.

Revenue enterprises in a typical year when (no catastrophic loss occurs) are:

- Heifer calf sales: 10 head at an average of 525 pounds per calf
- Steer calf sales: 18 head at an average 550 pounds per calf
- Cull cows: 8 head at an average of 1,100 pounds per cow
- Cull Bull: 1 head at an average of 1,900 pounds per bull in alternate years (in 2009)

In 2009, the expected gross income estimated for this typical **small** ranch is:

- Heifers: 10 head x 5.25 hundredweight x $ 98.81 per hundredweight = $ 5,188
- Steers: 18 head x 5.50 hundredweight x $ 108.70 per hundredweight = $ 10,761
- Cows: 8 head at 11.0 hundredweight x $ 45.88 per hundredweight = $ 4,037
- Bulls: 1 head at 19.0 hundredweight x $ 59.80 per hundredweight = $ 1,136

Cow-Calf Enterprise Subtotal = $ 21,112

Projected 2009 Ranch Gross Income = $ 21,112

Non-revenue enterprises, enterprises that do not generate revenues from market sales of crops or forage for the ranch, are:

- Hay Barley: 20 acres with an average yield of 1.4 tons per acre
- Wild Hay: 60 acres with an average yield of 0.9 tons per acre
- Native Range: 1,280 acres

Large ranch: Ranching is principal occupation of most American Indian operators who manage larger cow-calf enterprises in northeast Montana. A representative larger cow-calf enterprise consists of a livestock inventory of 220 mature cows, 45 replacement heifers, and 10 herd bulls. The ranch has a resource base sufficient to produce most of the roughage for the cow-calf enterprise. The operator utilizes 10 sections of grazingland and 400 acres of hayland. In a typical year the ranch harvests 100 acres of hay barley, 200 acres of perennial wild hay, and 100 acres of nonirrigated alfalfa for hay.

In a typical year, the revenue enterprises on the large ranch (no catastrophic loss) are:

- Heifer calf sales: 59 head with an average weight of 600 pounds per calf
- Steer calf sales: 104 head with an average weight of 625 pounds per calf
- Cull cows: 45 head with an average weight of 1,100 pounds per cow
- Cull Bull: 2 head with an average weight of 1,900 pounds per bull

For the 2009 production year, the expected gross income estimated for this **large** ranch is:

- Heifers: 59 head x 6.00 hundredweight x $ 89.34 per hundredweight = $ 31,626
- Steers: 104 head x 6.25 hundredweight x $ 99.28 per hundredweight = $ 64,532
- Cows: 45 head at 11.00 hundredweight x $ 45.88 per hundredweight = $ 22,711
- Bulls: 4 head at 19.00 hundredweight x $62.99 per hundredweight = $ 4,787

Cow-Calf Enterprise Subtotal: = $ 123,653

Projected 2009 Ranch Gross Income = $ 123,653

Non-revenue enterprises on this ranch are:

- Hay Barley: 100 acres with an average yield of 1.4 tons per acre
- Wild Hay: 200 acres with an average yield of 0.9 tons per acre
- Nonirrigated Alfalfa Hay: 100 acres with an average yield of 1.3 tons per acre
- Native Range: 6,400 acres

Risk Management Strategies:

Many different risk management strategies can be pursued on most ranches. Ranch managers choose among these alternatives on the basis of the ranch's financial structure and their preferences for taking or avoiding risk.

In this analysis, the ranch manager for the **small** ranch is assumed to be interested in two basic risk management strategies and one combination of these two basic strategies. These strategies are described in Table 6. Insurance premiums incurred in each strategy, as estimated using the RMA Premium Calculator, are presented in Table 7. Coverage levels, price elections and other specifications for the premium calculations are described in Appendix Table A-2.

The large ranch's insurance options differ from those available to the small ranch because it has a non-irrigated alfalfa hay enterprise. The large ranch may therefore choose to use either APH or PRF Rainfall Index insurance to address production risks associated with that enterprise. Therefore, the large ranch has three basic risk management strategies and two combinations of these strategies. These strategies are described in Table 8. Insurance premiums for each strategy, describe in estimated using the RMA premium calculator, are presented in Table 9. Coverage levels, price elections and other specifications for the premium calculations are described in Appendix Table A-4.

Table 6: Alternative RMA Product-Based Risk Management Strategies for the Small Ranch

Item	Strategy 1	Strategy 2	Strategy 3
Revenue Enterprises:			
Cow Calf			
Heifers	LRP		LRP
Steers	LRP		LRP
Cows, cull			
Bulls, cull			
Subtotal		AGR-LITE	AGR-LITE
Non-revenue Enterprises:			
Rangeland	PRF		PRF
Wild Hay	PRF		PRF
Hay Barley			

Table 7: Insurance Premiums[1] Paid by the Small Ranch Under Each Risk Management Strategy

Item	Strategy 1	Strategy 2	Strategy 3
Revenue Enterprises:			
Cow Calf			
Heifers	$140		$140
Steers	$291		$291
Cows, cull			
Bulls, cull			
Subtotal	$431	$501	$431 + 501
Non-revenue Enterprises:			
Rangeland	$340		$340
Wild Hay	$350		$350
Hay Barley			
Subtotal	$690		$690
TOTAL	$1,121	$501	$1,632

[1] These estimates include the $30 administrative fees per contract where applicable.

Table 8: Alternative RMA Product-Based Risk Management Strategies for the Large Ranch

Item	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5
Revenue Enterprises:					
Cow Calf					
Heifers	LRP	LRP		LRP	LRP
Steers	LRP	LRP		LRP	LRP
Cows, cull					
Bulls, cull					
Subtotal			AGR-LITE	AGR-LITE	AGR-LITE
Non-revenue Enterprises:					
Rangeland	PRF	PRF		PRF	PRF
Wild Hay	PRF	PRF		PRF	PRF
Alfalfa Hay	PRF	APH		PRF	APH
Hay Barley					

Table 9: Insurance Premiums Paid by the Large Ranch Under Each Risk Management Strategy[1]

Item	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5
Revenue Enterprises:					
Cow Calf					
Heifers	$596	$596		$596	$596
Steers	$1,216	$1,216		$1,216	$1,216
Cows, cull					
Bulls, cull					
Subtotal	$1,812	$1,812	$2,788	$1,812 + $2,788	$1,812 + $2,788
Non-revenue Enterprises:					
Rangeland	$1,578	$1,578		$1,578	$1,578
Wild Hay	$1,082[2]	$1,092[3]		$1,082	$1,092
Alfalfa Hay	$541[2]	$470[3]		$541	$470
Hay Barley					
Subtotal	$3,201	$3,140		$3,201	$3,140
TOTAL	$5,013	$4,952	$2,788	$7,801	$7,740

[1] These estimates include the $30 administrative fees per contract where applicable.
[2] All hayland was covered under one PRF-Rainfall Index Contract. The total producer premium was allocated on a acre basis to wild hay (2/3 of premiums) and alfalfa hay (1/3 of premium).
[3] Only PRF-Rainfall Index is available to insure wild hay. APH insurance is used for alfalfa hay under this strategy.

Scenarios:

Three "production year outcome" scenarios are examined for each ranch.

Scenario 1: Producers have an average or good year. Crop yields are close to, or above average, and prices are also close to those that were expected. There are no shortfalls in yields, prices or revenues.

Scenario 2: Substantial price changes take place over the insurance period. Poor planting conditions in the Corn Belt lead to a substantial reduction in the total area planted to corn in the United States. Furthermore, poor weather conditions continue into the growing season. Excess rains severely damage the corn crops in certain areas and lack of rain severely reduces corn yields in other areas. The result is that harvest prices for corn are 50 percent higher than anticipated early in the production year.

The sharp increase in national average corn prices leads to a 25 percent decline in national average feeder heifer and feeder steer prices in the fall of 2009. Cull cows and bulls do not require much feeding after coming off of the range, but slaughter prices for culls decline about 15 percent in the fall of 2009, likely reflecting the impacts of higher corn prices on short-term conditioning costs.

Scenario 3: A severe drought occurs in northeast Montana during the 2009 growing season leading to a 40 percent decline in yields (and proxy variables for yields). The drought is localized, so feeder cattle prices do change from those that were anticipated prior to the production period.

Scenario Outcomes:

Scenario 1: In scenario 1, neither the large ranch nor the small ranch receives any indemnities. Each ranch's net indemnity is negative (there is a reduction in ranch net income) and equal to the premiums paid by the ranch for the insurance it purchases (see Tables 7 and 9). The largest reduction in ranch net income for both the small and large ranch occurs under strategies where the ranch operator carries AGR-Lite as an umbrella policy over commodity-specific insurance policies.

Scenario 2: Indemnities paid under this scenario for each risk management strategy are presented in Table 10 for the small ranch, and Table 11 for the large ranch.

In Scenario 2, the **small ranch** receives indemnities under **Strategy 1**and **Strategy 3**. In each case, indemnities are paid on the LRP policies purchased for feeder steers and heifers. The LRP indemnities are calculated as follows:

Indemnity = [Number of head insured x target weight x (coverage price - actual price) x share].

Heifer Indemnity = [10 head x 5.25 hundredweight x ($ 93.12 - $ 59.29) x 1.0] = $ 1,776

Steer Indemnity = [18 head x 5.50 hundredweight x ($102.43 - $ 65.22) x 1.0] = $ 3,683

Gross revenue generated from sales of feeder steers and heifers in the fall of 2009 were:

10 head x 5.25 hundredweight x $ 59.29 = $ 3,112
18 head x 5.50 hundredweight x $ 65.22 = $ 6,457

There was a 15 percent decline in the price of culls, so the revenue from cull cows and the range bull was:

8 head x11.00 hundredweight x $39.00 = $ 3,4,32
1 head x 19.00 hundredweight x $53.54 =$ 1,017

Under AGR-Lite, an indemnity is paid if the **Revenue to Count** is less than the **Trigger Level,** where the **Trigger Level= Approved AGR x Coverage Level**.

For the small ranch, the AGR-Lite **Trigger Revenue** = $ 21,112 x 0.65 = $ 13,722.80. There is no AGR-Lite indemnity as the small ranch's **Revenue to Count** is:

Heifers	$ 3,112
Steers	$ 6,457
Cows	$ 3,432
Bulls	$ 1,017

Total Revenue to Count $ 14,018

So there is no AGR-Lite indemnity under Strategy 3.

Table 10: Scenario 2 Insurance Indemnities Received by the Small Ranch Under Each Risk Management Strategy

Item	Strategy 1	Strategy 2	Strategy 3
Revenue Enterprises:			
Cow Calf			
Heifers	**LRP $1,776**		**LRP $1,776**
Steers	**LRP $3,683**		**LRP $3,683**
Cows, cull			
Bulls, cull			
Subtotal	**$5,459**	**0**	**$5,459 + 0**
Non-revenue Enterprises:			
Rangeland			
Wild Hay			
Hay Barley			
Subtotal	**0**	**0**	**0**
Total	**$5,459**	**0**	**$5,459**

Table 11: Scenario 2 Insurance Indemnities Received by the Large Ranch Under Each Risk Management Strategy

Item	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5
Revenue Enterprises:					
Cow Calf					
Heifers	**LRP $9,045**	**LRP $9,045**		**LRP $9,045**	**LRP $9,045**
Steers	**LRP $18,447**	**LRP $18,447**		**LRP $18,447**	**LRP $18,447**
Cows, cull					
Bulls, cull					
Subtotal	**$27,492**	**$27,492**	**$274**	**$27,492 + $274**	**$27,492 + $274**
Non-revenue Enterprises:					
Rangeland					
Wild Hay					
Alfalfa Hay					
Hay Barley					
Subtotal	**0**	**0**	**0**	**0**	**0**
Total	**$27,492**	**$27,492**	**$274**	**$27,492 + $274**	**$27,492 + $274**

In Scenario 2 the large ranch receives LRP indemnities and also receives an AGR-Lite indemnity (Table 11).

The LRP indemnities are**:**

Heifer Indemnity = [59 head x 6.00 hundredweight x ($ 79.15 - $ 53.60) x 1.0 = $ 9,045.

Steer Indemnity = [104 head x 6.25 hundredweight x ($ 87.95 - $ 59.57) x 1.0 = $ 18,447.

The AGR-Lite situation is as follows. The sales prices received by the producer for heifers and steers are respectively assumed to be $ $53.60 and $ 59.74 per hundredweight (just assuming a zero basis for illustrative purposes). The ranch's sales receipts for steers and heifers are required to estimate whether the ranch will receive an AGR-Lite indemnity. These are estimated to be:

59 heifers x 6.00 hundredweight x $ 53.60 = $ 18,974.
104 steers x 6.25 hundredweight x $ 59.57 = $38,721.

The culls sold at a price 15 percent less than expected:

45 cows x 11.00 hundredweight x $ 39.00 = $ 19,305
4 bulls x 19.00 hundredweight x $ 53.54 = $ 4,069

For the large ranch, the AGR-Lite **Trigger Level** = $123,653 x 0.65 = $ 80,374.

The ranch's **Revenue to Count** is:

Heifers	$ 18,974
Steers	$ 38,721
Cows	$ 19,305
Bulls	$ 4,069

Total Revenue to Count $ 81,069

The **Revenue to Count** is less than the **Trigger Level** of $ 80,374**,** so there is an indemnity due under AGR-Lite**.**

The AGR-Lite Indemnity = ***Revenue Deficiency*** x ***payment rate,*** where the ***Revenue Deficiency*** = ***Trigger Level*** – ***Revenue to Count***.

Indemnity = ($ 80,374 – $ 80,069) x 0.90 = $274.

The AGR-Lite indemnity for the large ranch is relatively small even in the face of a 40 percent decline in the national average price decline of prices for feeder cattle and a decline of 15 percent for culls in the local markets.

Scenario 3: In this scenario, drought in Roosevelt County and nearby northeast Montana counties results in yields that are 60 percent of average. Thus, both the small ranch and the large ranch receive insurance indemnities for rangeland and hayland losses.

Table 12: Scenario 3 Insurance Indemnities Received by the Small Ranch Under Each Risk Management Strategy

Item	Strategy 1	Strategy 2	Strategy 3
Revenue Enterprises:			
Cow Calf			
Heifers			
Steers			
Cows, cull			
Bulls, cull			
Subtotal	**0**	**0**	**0**
Non-revenue Enterprises:			
Rangeland	**$2,342**		**$2,342**
Wild Hay	**$2,037**		**$2,037**
Hay Barley			
Subtotal	**$4,379**	**0**	**$4,379 + 0**
Total	**$4,379**	**0**	**$4,379 + 0**

Table 13: Scenario 3 Insurance Indemnities Received by the Large Ranch Under Each Risk Management Strategy

Item	Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5
Revenue Enterprises:					
Cow Calf					
Heifers					
Steers					
Cows, cull					
Bulls, cull					
Subtotal	**0**	**0**	**0**	**0**	**0**
Non-revenue Enterprises:					
Rangeland	**$11,712**	**$11,712**		**$11,712**	**$11,712**
Wild Hay[1]	**$6,791**	**$6,791**		**$6,791**	**$6,791**
Alfalfa Hay[1]	**$3,395**	**$567**		**$3,395**	**$567**
Hay Barley	**NA[2]**	**NA[2]**		**NA[2]**	**NA[2]**
Subtotal	**$21,898**	**$19,070**	**0**	**$21,898 + 0**	**$19,070 + 0**
Total	**$21,898**	**$19,070**	**0**	**$21,898 + 0**	**$19,070 + 0**

[1] Indemnities prorated on acres under strategy 1. Under Strategy 2 Wild Hay is insured under PRF and Alfalfa Hay under APH.
[2] Not applicable. Hay barley is not insurable under PRF or APH.

The total indemnities received by each ranch differ because they insure different areas of rangeland.

In Scenario 3, the ranch's Pasture, Rangeland, and Forage-Rainfall Index insurance becomes important. Pasture, Rangeland, and Forage-Rainfall Index (PRF) insurance, a recently introduced group risk plan product, is available to ranchers in all Montana counties. PRF is a group risk insurance product based on geographic areas within counties. PRF is offered for areas or grids that are about 12 miles by 12 miles in size and indemnities based on a rainfall index for each grid.

The product works as follows: RMA establishes a ***County Base Value*** or ***Revenue Value per Acre*** for each county that applies to all grids in the county. A producer then selects a ***Productivity Factor*** of 60 to 150 percent of the ***Revenue Value per Acre*** and a ***coverage level*** (70, 75, 80, 85, or 90 percent). The producer's ***Dollar Protection per Acre*** = ***County Base Value*** x ***Productivity Factor*** x ***Coverage Level.***

The ***premium liability*** is determined by multiplying the ***Dollar Protection per Acre*** times the ***producer share.***

The RMA establishes a ***Grid Index*** for each **production interval**. There are six two-month production intervals during the year. Index values for each production interval are centered on a grid value of 100, and the average or expected value for the index is therefore 100. A producer establishes a ***Trigger Grid Index*** by choosing a ***coverage level*** and applying it to the ***Expected Grid Index***. The producer's ***Trigger Grid Index*** = ***Expected Grid Index*** x ***Coverage Level.***

An indemnity is paid if the ***Final Grid Index***, determined from actual rainfall data during the each production interval, is less than the ***Trigger Grid Index***. To determine the indemnity, the RMA applies a ***Payment Calculation Factor***, where,

Payment Calculation Factor = [(***Trigger Yield Index - Final Grid Index***)/(***Trigger Grid Index***)]

Per acre indemnity = ***Payment Calculation Factor*** x ***Dollar Protection per Acre.***

The 2009 PRF ***County Base Value*** for grazingland in Roosevelt Count is **$7.92** per acre. A productivity factor of 1.0 (100 percent) and a coverage level of 70 percent were selected for each ranch for all periods in which PRF was obtained for grazingland.

- ***Dollar Protection per Acr***e = $7.92 per acre x 1.00 x 0.70 =$ 5.54 per acre.
- ***Trigger Index Value*** = 100 x 90 = 90
- ***Final Index Value*** = 60 (for all production intervals)
- ***Payment Calculation Factor*** = [(90- 60)/(90)] = 0.33
- **Indemnity per Acre** = 0.33 x $ 5.54 per acre = $ 1.83 per acre.

For the small ranch, grazingland indemnities are:

Interval I: $ 1.83 per acre x 640 acres = $ 1,171
Interval III: $ 1.83 per acre x 640 acres = $ 1,171
Small Ranch Grazingland Indemnity = $ 2,342.

For the large ranch, grazingland indemnities are:

Interval I: $1.83 per acre x 3,200 acres = $ 5,856
Interval III: $1.83 per acre x 3,200 acres = $ 5,856
Large Ranch Hayland Indemnity = $ 11,712

The PRF product is also available for hayland production in all Montana counties. For 2009, the forage ***County Base Value*** was $161.67 per acre all Montana counties. At a 100 ***percent productivity factor*** and 70 percent ***coverage level***, the ***Dollar Protection per Acre*** = $161.67 x 1.00 x 0.70 = $102.89 per acre.

With a forage ***Expected Index Value*** of 100 and an ***Actual Index Value*** of 60 for the grid, the *payment calculation factor* is 0.60.

The hayland indemnity per acre - $102.89 per acre x 0.33 = $33.95 per acre.

The PRF forage indemnities for the small ranch are:

Interval I: $33.95 per acre x 20 acres - $679
Interval II: $33.95 per acre x 40 acres - $1,358
Small Ranch Hayland Indemnity = $2,037

The PRF hayland indemnities, under Strategy 1 and 3 for the large ranch are:

Interval I: 90 acres (wild & alfalfa) x $33.95 per acre - $3,056
Interval II: 210 acres (wild & alfalfa) x $33.95 per acre = $7,130

Large ranch total of wild & alfalfa - $10,186, 1/3 allocated to alfalfa - $3,395 and 2/3 allocated to wild hay = $6,791.

The PRF indemnity under Strategy 2 and 4 for 200 acres of hayland in wild hay is:

Interval I: 60 acres x $33.95 per acre - $2,037
Interval II: 140 acres x $33.95 per acre - $4,754
Large ranch total for alfalfa =$6,791

The 100 acres of nonirrigated alfalfa on the large ranch is covered by APH insurance under Strategy 2 and 4. The APH indemnity is calculated as:

Indemnity per acre = [Yield Guarantee – Actual Yield x [Price Election] = [0.85 tons per acre – 0.78 tons per acre] x $81 = $5.67 per acre.

Total Indemnity = $5.67 per acre x 100 acres = $567

Under AGR-Lite, the only revenue enterprises are livestock enterprises. These enterprises are only insured for declines in output prices, which do not change from their expectations due to the localized drought. So there will be not AGR-Lite indemnities for either small or large representative ranch under Scenario 3.

CONCLUSION

Montana ranchers have access to a wide array of RMA crop, rangeland and livestock insurance products that can help them to manage their financial risks. This paper describes many of these products and demonstrates by example how ranchers may choose to combine several of these to obtain protection against crop losses and adverse movements in commodity prices.

Some products are likely to be more useful to Montana ranchers than others. For example, AGR-Lite may provide effective and relatively inexpensive protection against financial risks for farms that market all or most of the crops they produce. Nevertheless, for ranches that use most of the crops and forage they produce to feed their own livestock, AGR-Lite provides no protection against crop and forage losses for those crops and forages that are not revenue crops and do not contribute directly to the ranch's adjusted gross income. AGR-Lite provides only minimal revenue protection for ranches, even under precipitous drops in prices for feeder cattle.

The recently introduced PRF product for forage production on grazingland and hayland appears to provide meaningful protection against losses in forage production.

Appendix 1: Supporting Information

Table A1: Montana Representative Small Ranch, Historical Allowed Income

Production Year 2003:

Commodity	Number	Weight	Production	Price/Unit	Income
Steers	18	5.50 cwt	99 cwt	$105.27	$10,422
Heifers	10	5.25 cwt	52.5 cwt	$97.77	$5,133
Cows, cull	8	11.0 cwt	88 cwt	$49.08	$4,319
Bulls, cull	1	1.90 cwt	19 cwt	$64.62	$1,228
TOTAL	NA[1]	NA[1]	NA[1]	NA[1]	$21,102

[1] NA denotes not applicable.

Production Year 2004:

Commodity	Number	Weight	Production	Price/Unit	Income
Steers	18	5.50 cwt	99 cwt	$121.63	$12,041
Heifers	10	5.25 cwt	52.5 cwt	$115.86	$6,083
Cows, cull	8	11.0 cwt	88 cwt	$47.80	$4,206
Bulls, cull	0	0	0	0	0
TOTAL	NA[1]	NA[1]	NA[1]	NA[1]	$22,330

[1] NA denotes not applicable.

Production Year 2005:

Commodity	Number	Weight	Production	Price/Unit	Income
Steers	18	5.50 cwt	99 cwt	$126.96	$12,569
Heifers	10	5.25 cwt	52.5 cwt	$116.88	$6,136
Cows, cull	8	11.0 cwt	88 cwt	$46.60	$4,001
Bulls, cull	1	19.0 cwt	19.0 cwt	$60.28	$1,145
TOTAL	NA[1]	NA[1]	NA[1]	NA[1]	$23,851

[1] NA denotes not applicable.

Production Year 2006:

Commodity	Number	Weight	Production	Price/Unit	Income
Steers	18	5.50 cwt	99 cwt	$127.04	$12,577
Heifers	10	5.25 cwt	52.5 cwt	$119.10	$6,253
Cows, cull	8	11.0 cwt	88 cwt	$45.38	$3,993
Bulls, cull	0	0	0	0	0
TOTAL	NA[1]	NA[1]	NA[1]	NA[1]	$22,823

[1] NA denotes not applicable.

Production Year 2007:

Commodity	Number	Weight	Production	Price/Unit	Income
Steers	18	5.50 cwt	99 cwt	$123.96	$12,272
Heifers	10	5.25 cwt	52.5 cwt	$113.75	$5,972
Cows, cull	8	11.0 cwt	88 cwt	$46.25	$4,070
Bulls, cull	1	19.0 cwt	19.0 cwt	$62.99	$1,197
TOTAL	NA[1]	NA[1]	NA[1]	NA[1]	$23,511

[1] NA denotes not applicable.

Table A2: Producer-Selected Characteristics of RMA Insurance Products Employed for the Small Ranch Risk Management Strategies 1 & 2

Item	Strategy 1	Strategy 2
Revenue Enterprises:		
Heifers Weight 1	LRP: 21 weeks, highest Coverage Level and Price Election	
Steers Weight 1	LRP: 21 weeks, highest Coverage Level and Price Election	
Cows, cull		
Bulls, cull		
Whole Ranch		AGR-Lite: 65% coverage level and 90% payment rate
Non-revenue Enterprises:		
Rangeland	PRF: Rainfall Index, Intervals I & II 70% coverage level 100% productivity factor	
Wild Hay	PRF: Rainfall Index, Intervals I & II 70% coverage level 100% productivity factor	
Hay Barley		

* Strategy 3 includes the same producer-selected characteristics as included of Strategies 1 and 2.

Table A3: Montana Representative Large Ranch, Historical Allowed Income

Production Year 2003:

Commodity	Number	Weight	Production	Price/Unit	Income
Steers	104	6.25 cwt	650 cwt	$103.45	$67,242
Heifers	59	6.00 cwt	354 cwt	$97.77	$34,681
Cows, cull	45	11.00 cwt	495 cwt	$49.08	$24,295
Bulls, cull	4	19.00 cwt	76 cwt	$64.62	$4,910
TOTAL	NA[1]	NA[1]	NA[1]	NA[1]	$131,128

[1] NA denotes not applicable.

Production Year 2004:

Commodity	Number	Weight	Production	Price/Unit	Income
Steers	104	6.25 cwt	650 cwt	$114.37	$74,341
Heifers	59	6.00 cwt	354 cwt	$107.26	$37,970
Cows, cull	45	11.00 cwt	495 cwt	$47.80	$23,661
Bulls, cull	4	19.00 cwt	76 cwt	$68.51	$5,206
TOTAL	NA[1]	NA[1]	NA[1]	NA[1]	$141,178

[1] NA denotes not applicable.

Production Year 2005:

Commodity	Number	Weight	Production	Price/Unit	Income
Steers	104	6.25 cwt	650 cwt	$119.86	$77,909
Heifers	59	6.00 cwt	354 cwt	$113.01	$40,006
Cows, cull	45	11.00 cwt	495 cwt	$46.60	$23,067
Bulls, cull	4	19.00 cwt	76 cwt	$60.28	$4,582
TOTAL	NA[1]	NA[1]	NA[1]	NA[1]	$145,564

[1] NA denotes not applicable.

Production Year 2006:

Commodity	Number	Weight	Production	Price/Unit	Income
Steers	104	6.25 cwt	650 cwt	$109.94	$71,461
Heifers	59	6.00 cwt	354 cwt	$100.09	$35,432
Cows, cull	45	11.00 cwt	495 cwt	$45.28	$22,414
Bulls, cull	4	19.00 cwt	76 cwt	$62.10	$4,720
TOTAL	NA[1]	NA[1]	NA[1]	NA[1]	$134,027

[1] NA denotes not applicable.

Production Year 2007:

Commodity	Number	Weight	Production	Price/Unit	Income
Steers	104	6.25 cwt	650 cwt	$108.83	$70,740
Heifers	59	6.00 cwt	354 cwt	$99.73	$35,304
Cows, cull	45	11.00 cwt	495 cwt	$46.25	$22,894
Bulls, cull	2	19.00 cwt	38 cwt	$62.99	$4,788
TOTAL	NA[1]	NA[1]	NA[1]	NA[1]	$133,726

[1] NA denotes not applicable.

Table A4: Producer-Selected Characteristics of RMA Insurance Products Employed for the Large Ranch Risk Management Strategies 1-3

Item	Strategy 1	Strategy 2	Strategy 3
Revenue Enterprises:			
Heifers Weight 2	LRP: 26 weeks, highest Coverage Level and Price Election	LRP: 26 weeks, highest Coverage Level and Price Election	
Steers Weight 2	LRP: 26 weeks, highest Coverage Level and Price Election	LRP: 26 weeks, highest Coverage Level and Price Election	
Cows, cull			
Bulls, cull			
Whole Ranch			AGR-Lite: 65% coverage level and 90% payment rate
Non-revenue Enterprises:			
Rangeland	PRF: Rainfall Index, Intervals I & III 70% coverage level, 100% productivity factor	PRF: Rainfall Index, , Intervals I & III 70% coverage level, 100% productivity factor	
Wild Hay	PRF: Rainfall Index, Intervals I & II 70% coverage level, 100% productivity factor	PRF: Rainfall Index, Intervals I & II 70% coverage level, 100% productivity factor	
Alfalfa Hay		APH: 65% coverage level 100% price election	
Hay Barley			

* Strategy 4 and 5 include insurance choices that have the same producer-selected characteristics as they involve various combinations of Strategies 1 through 3.