

# Controlling Risk in Grazing-Based Production Systems

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## 1 INTRODUCTION

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Agricultural producers make decisions in the presence of risk every day. It is generally not a matter of determining if risk is present, but rather, what the risks are and what, if anything, you can do about them. It is important to understand that risk/risk management isn't all about negative consequences or the prevention thereof. The international definition of risk is: "the effect of uncertainty on objectives" (ANSI/ASSE/ISO 31000 (Z690.2-2011) Risk Management Principles and Guidelines, 2011). This definition is first and foremost objective focused, meaning that risk, and consequently risk management, should be focused on what you are trying to achieve. Identifying risks, then, becomes a task of identifying uncertainties that have an effect on what you are trying to achieve. These risks are usually thought of as uncertainties that could prevent you from achieving your objectives. However, they could just as easily be risks that, when taken, increase the probability that you will achieve your objectives.

Risk is an inherent part of agriculture. For each decision, there is a risk-return tradeoff. If there were no risk, there would not be any returns to successfully managing it. Producers who are good at managing risk can gain a competitive advantage by doing so, and thus increase their net profits over the long run.

## 2 SOURCES OF RISK IN AGRICULTURE

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There are five main sources of risk in agriculture: marketing/price risk, production risk, institutional/legal risk, human risk, and financial risk (Crane, Gantz, Isaacs, Jose, & Sharp, 2013). The first four are classified as business risks, which means that they are risks inherent with being involved in the business of agriculture. They are risks that are present even if you are 100% equity capitalized. That is, even if you don't have any debt whatsoever, they are present. Financial risk is the risk that is present when you owe somebody money.

### 2.1 MARKETING RISK

Marketing risk is any event that leads to variability in the prices paid for inputs and/or received for production outputs by the agricultural firm after committing to a plan of action. Access to markets can also be considered a market risk. In a grazing livestock production system, there are two main areas to be concerned about when it comes to marketing risk: the price of feed and the price of livestock. When you make a commitment to raise livestock for a living, you are going to have certain investments in your operation including the livestock themselves, certain infrastructure surrounding those livestock, and a commitment to feed and grow the livestock to an endpoint for sale. Any fluctuation in the prices associated with these items is a marketing risk to the producer.

Typical contributing factors to marketing risk in a grazing-based production system include: national and regional supply and demand relationships; consumer demand for the output product; seasonal effects; and government programs that affect pricing. However, the end result is the same in that you have market price volatility to deal with and marketing decisions to make about when to buy inputs and sell outputs and how to go about doing it.

## 2.2 PRODUCTION RISK

Production risk is any event that leads to fluctuations in the quantity and/or quality of output produced. In grazing livestock production systems there are several major contributing factors to production risks including: weather, pests, diseases, genetics, and the quality of inputs.

Dry or cold weather will likely reduce the amount of forage growth and raise the cost of production for the operation. You will either need to supplement feed (raising costs) or experience lower output weights (reducing revenue). In either case, the cost per unit of output you produce will go up, meaning you will need a higher output price to compensate for it or profits will go down.

Pests and diseases can have a similar effect on raising costs of production to that of dry or cold weather. You will either be confronted with increased costs associated with treatments, or suffer decreased revenues because of lower outputs due to death loss or lack of performance. Unfortunately, you may have both of these effects occur despite your best efforts.

Finally, quality of inputs is also a contributing factor to production risk. Genetics can be considered an input and, certainly, poor quality genetics can result in poor performance and output. Feed quality is another area to be concerned about. Whether it is harvested feed or grazed forage, poor quality feed will reduce performance and drive up the cost of production. On the bright side, high quality feed and good genetics can result in high performance and positive outcomes.

Production risk is typically an area where producers can make a difference with diligent planning, monitoring and action items that keep their animals performing in the black.

## 2.3 INSTITUTIONAL/LEGAL RISK

Institutional risks are risks to the business that come from people outside the business. Sometimes this category of risk is called legal risk. Sometimes it is also called social risk. In short, it changes the rules of the game.

In addition to the threat of lawsuits, contributing factors to institutional risk include uncertainty about changes in social attitudes or conditions, changes in regulations and rules, changes in enforcement of rules and regulations, and changes in government programs. These may be things that appear beyond the producer's control, and many of them are, but they are things that can have a big impact. A lot of what you can do about them involves controlling the impact of them on your operation if they occur.

## 2.4 HUMAN RISK

Unlike institutional risk that comes from people outside of your organization, human risk comes from people within your organization. Examples of human risk include the risk of people getting injured on the job, the risk of losing a key person, and the uncertainty around job performance by people involved with and contributing to the operation.

Human risks tend to be things that impact the operation infrequently but have a big impact when they do happen. They derive directly from the people involved in the operation, but they can be very difficult to anticipate, and thus difficult to manage at times.

## 2.5 FINANCIAL RISK

Financial risk is the extra risk and added variability that comes about from the financial obligations associated with being leveraged. Anything that can affect your ability to meet your financial obligations is a contributing factor to financial risk.

Production and market risks would certainly be contributing factors, but so would things like the risk of losing a lease. If you have a production system and the infrastructure in place to produce on a certain level under the assumption that you have access to a certain amount of land, and suddenly a lease is pulled out from under you, you could find yourself scrambling to meet the production levels needed to meet your cash flow needs and satisfy your financial obligations.

Other contributing factors to financial risk include interest rate uncertainty, access to capital, unstable financial partners, and anything else that could severely hinder cash flow.

# 3 STRATEGIES FOR MANAGING RISK

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There are many management actions you can take and tools you can employ to manage risk. Diversification is a major strategy for managing risk that can take a number of forms including diversified production (producing more than one product for sale or producing similar products in different ways) and diversified marketing (different products, marketing multiple times during the year, or reaching multiple markets). In short, not putting all of your eggs in one basket is called diversification. Having said that, we usually think of diversification as an action or a tool for managing risk more so than a strategy.

When we think of strategies for managing risk, the following five things come to mind as primary strategies for managing risk.

## 3.1 AVOID IT

One strategy for managing risk is to completely avoid it. This is impossible in a comprehensive sense, but plausible in isolated situations. For example, if you don't like the institutional and financial risk associated with relying on rented pasture resources, you can avoid the risk by simply not renting any pastures. Obviously, this could have a large effect on how you structure your business, but it does erase the uncertainty around rented pastures, namely, pricing and availability.

### 3.2 REDUCE IT

Reducing risk can be done in a couple of different ways. You can reduce the probability of something bad happening that keeps you from achieving your objectives or you can reduce the impact if it does. Either way, the net effect is that it will increase the probability of you achieving your objectives.

If you think back to some of our earlier examples, we can articulate some actions a person might take to reduce some of those risks. For example, weather and markets are two things that may be out of your control in terms of controlling the probability of something happening. However, there are actions you can take to reduce the impact of drought, for example. You can stockpile some feed resources. You can take out rainfall insurance. You can stock your range with a mix of cows and growing cattle with the option of taking the growing cattle to a feedlot if range conditions fall short of expectations. Each of these actions wouldn't stop a drought from happening, but could lessen the impact on you if it did.

The risk of losing a lease can be mitigated by putting lease agreements in writing and writing them in such a way that they are multi-year commitments with appropriate conditions. This would definitely reduce the probability of losing a particular lease.

The risk of people getting injured on the job can be reduced by properly training and supervising employees to reduce the probability of injury occurring.

### 3.3 TRANSFER IT

Risk can be managed by transferring it outside the business organization. One of the more common ways of doing this is through insurance products. A producer pays a premium to an insurance firm in exchange for the insurance firm accepting liability for losses beyond a limit that the producer is unwilling to accept. The insurance company maintains a diversified portfolio through reinsurance mechanisms and by pooling risks over many people or types of coverage so it can afford to pay for individual losses when they occur. The producer receives piece of mind knowing that they are only liable for a certain portion of the possible risk impact. We will take a look at some particular insurance products in the next section of this paper that may be of interest to producers with grazing-based production systems.

### 3.4 INCREASE CAPACITY TO BEAR IT

The fourth strategy for managing risk is to increase your capacity to bear it. It was mentioned earlier that one way to reduce the impact of drought is to stockpile feed resources. This is an example of increasing the capacity to bear risk. Having extra help on hand or having extra money in the bank are two other examples of increasing the capacity to bear risk. This strategy is somewhat like saving for a rainy day. It is building a cushion so that if a risk impact occurs, you can bear through it and move on in decent shape.

### 3.5 ACCEPT IT

The final strategy for managing risk is to accept it. In some cases, you may be comfortable not doing anything about the risk other than accepting it and taking the chance with the opportunity at hand. It may be that there is very little you can do about it or that the actions you can take involve more cost than you are willing to expend for the treatment effects they would provide you in risk mitigation. For example, sometimes insurance premiums are more expensive than we are willing to pay for the

protection the insurance product provides. Another example would be employee benefit programs that would increase the morale of your workforce and decrease the probability of losing a key employee but that are cost prohibitive for you to provide. You may choose to accept the risk of employee turnover rather than incur the large expenses necessary to mitigate it.

## 4 SPECIFIC RISK MANAGEMENT TOOLS FOR GRAZING-BASED PRODUCTION

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The origins of crop insurance in the United States dates back to the Dust Bowl and the Great Depression of the 1930s, but it wasn't until the turn of the century about 15 years ago that insurance products for livestock producers began to be developed. They are continuing to be developed today. The USDA Risk Management Agency (RMA) was created in 1996 to administer the Federal Crop Insurance Corporation (FCIC) programs and other non-insurance-related risk management and education programs that help support U.S. agriculture. In addition to RMA, some insurance and disaster program assistance is available through the USDA Farm Service Agency (FSA). I will briefly discuss a few of the main ones to be aware of below.

### 4.1 RAINFALL INDEX - PASTURE, RANGELAND, AND FORAGE INSURANCE (RI - PRF)

Rainfall Index – Pasture, Rangeland, and Forage insurance (RI-PRF) is an insurance product administered by RMA that is designed to protect against deficits in precipitation. To insure land under RI-PRF, it must be intended for use under livestock grazing or haying. The insurance intervals are two-month intervals that run through the calendar year.

With RI-PRF, the producer is insuring based on the Expected Grid Index representing the average precipitation data for the Grid ID during the index interval based on National Oceanic and Atmospheric Administration Climate Prediction Center (NOAA CPC) data from 1948 to present. The grids are roughly 17 miles by 17 miles, and each grid has an historic precipitation index calculated for each of the two-month intervals dating back to 1948. RI-PRF insurance provides producers with the opportunity to insure up to 90% of the Expected Grid Index for their chosen intervals. If the current year calculated precipitation index for an insured interval falls below the insured level, the producer purchasing the insurance would receive an indemnity payment based on the amount of the deficit and the dollar value insured. RI-PRF is the closest thing to weather insurance that producers currently have available.

Producers interested in using RI-PRF are encourage to visit the RMA website to access more information including a grid locator, decision support tool, and all of the historical indices. The direct link to the RMA PRF insurance page is <http://www.rma.usda.gov/policies/pasturerangeforage/>. The signup period for RI-PRF ends on November 15 and the insurance is in force for the following calendar year.

### 4.2 RAINFALL INDEX – ANNUAL FORAGE INSURANCE PLAN

The Rainfall Index – Annual Forage Insurance Plan is a new pilot insurance program from RMA first offered for 2015 for the states of Nebraska, North Dakota, South Dakota, Kansas, Oklahoma, and Texas. This product provides coverage for fall-planted annual forage crops used for livestock feed or fodder.

Like RI-PRF, the Annual Forage Insurance Plan is based off of rainfall index data provided by NOAA CPC. However, sign up for the product takes place during the summer (July 15 deadline) and coverage options

span from September 1 of one year through September 30 of the following year. It is designed to meet the needs of those producers planting annual forage crops for use as a fall or spring grazing resource. It also has a decision support tool, historical indices, grid locator and other documentation available online at <http://www.rma.usda.gov/policies/ri-vi/annualforage.html>.

### **4.3 NONINSURED CROP DISASTER ASSISTANCE PROGRAM (NAP)**

The Noninsured Crop Disaster Assistance Program (NAP) is administered by the USDA's Farm Service Agency (FSA). NAP provides producers of non-insurable crops with at least some basic or catastrophic coverage when a low yield, loss of inventory, or prevented planting occurs due to natural disasters. The catastrophic coverage level is 50% of approved yield for all applicable acres, with losses below that covered at 55% of the approved market prices. Eligible crops include those for which the catastrophic risk protection level of crop insurance is not available, and include crops planted and grown for livestock consumption.

When purchasing NAP, producers pay a service fee that is the lesser of \$250 per crop or \$750 per producer per administrative county, not to exceed a total of \$1,875 per producer with farming interests in multiple counties. The 2014 Farm Bill authorized the FSA to offer producers "buy-up coverage," which allows a producer to select higher levels of yield protection (55%, 60% or 65%) with 100% price level coverage. Unfortunately, buy-up coverage is not available for those crops and grasses intended for grazing. Limited-resource producers, beginning farmers, and socially disadvantaged farmers may request a waiver of service fees and reduction of "buy-up" premiums.

NAP coverage is available for alfalfa, alfalfa mixture, native grass rangeland, and other forage acreage intended to be grazed. Leased land is only eligible if the lessee has a risk in the production of the crop acreage or the lease conveys control of the crop acreage to the lessee. The NAP price for grazing is established nationally on an animal unit basis, and then the stocking rates are established on a state-by-state basis by the respective FSA State committees.

Producers interested in the possibility of using NAP should contact their local FSA office or visit <http://www.fsa.usda.gov>.

### **4.4 LIVESTOCK FORAGE DISASTER PROGRAM (LFP)**

The Livestock Forage Disaster Program (LFP) is also administered by USDA's FSA. Under LFP, livestock producers can receive financial compensation for grazing losses when pasture or rangeland under their control has been classified by the U.S. Drought Monitor as being in a county under a qualifying drought-related event for the designated period of time required under the guidelines of the program. This is a single peril (drought) disaster assistance program with payment rates established by FSA on a per head basis.

Of interest to producers may be the fact that the 2014 Farm Bill made LFP a permanent program. More information about LFP can be found on the FSA website or by contacting your local FSA office.

### **4.5 LIVESTOCK INDEMNITY PROGRAM (LIP)**

The Livestock Indemnity Program (LIP) is another disaster assistance program made permanent by the 2014 Farm Bill and administered by USDA's FSA. LIP provides compensation to eligible livestock

producers who have suffered livestock death losses in excess of normal mortality due to adverse weather or attacks by animals reintroduced into the wild by the federal government. Providing proper LIP documentation to your local FSA office to report a notice of loss and application for payment is dependent upon keeping accurate and complete inventory records throughout the year. Keeping good records is an important risk management practice, and this importance becomes readily apparent when these records provide access to benefits from government programs like LIP that are designed to keep people in business through tough times brought on periodically by extreme weather events.

#### 4.6 LIVESTOCK RISK PROTECTION INSURANCE (LRP)

Livestock Risk Protection Insurance (LRP) is a single-peril insurance product insuring against downward movements in national market prices for livestock. LRP is available for lightweight (< 600 pounds) feeder cattle, heavier weight (600-900 pounds) feeder cattle, and fed cattle (> 900 pounds). LRP insurance contracts operate much like a European put option in that they provide a price floor on the basis of a national market price index in exchange for a premium paid for the coverage. The determination of the outcome is only done at the end of the contract period and indemnities are paid to the contract holder if the actual index price falls below the selected coverage price.

LRP is administered by RMA with many different coverage periods and price levels offered on any given day for cattle, swine, and lamb. To learn more about LRP, producers are encouraged to visit the RMA website at <http://www.rma.usda.gov/livestock/> or contact an authorized provider of Livestock Price Insurance. I also encourage you to consult two University of Nebraska-Lincoln NebGuides available on LRP-Feeder Cattle (<http://ianrpubs.unl.edu/live/g1723/build/g1723.pdf>) and on LRP-Fed Cattle (<http://www.ianrpubs.unl.edu/epublic/live/g2257/build/g2257.pdf>).

#### 4.7 USDA NATURAL RESOURCES CONSERVATION SERVICE (NRCS) PROGRAMS

One final set of programs to mention is the programs offered by USDA's Natural Resources Conservation Service (NRCS). There are too many programs available from NRCS to do justice to them in just a short note, but many of these programs provide some risk management protection in the form of improved production practices supplemented by financial assistance at the time of implementation or annual payments over a prescribed period of time.

An example of an NRCS program that could provide risk management protection is the Environmental Quality Incentives Program (EQIP). EQIP is a voluntary program that provides producers with technical and financial assistance to plan and implement conservation practices through contracts that can last up to ten years. These practices can address natural resource concerns and/or improve soil, water, plant, animal, or air resources on agricultural land. The payments for participating in the program can provide solid financial footing for implementing production practices that improve the resiliency of the farm or ranch over the long haul. This is just one of many programs that producers might tap into to help them manage risk over the long run.

You can find out more about EQIP and other NRCS programs at <http://www.nrcs.usda.gov>.

## 5 WRAPPING IT UP

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Managing risk has never been easy on America's farms and ranches. In a grazing-based production system, producers are relying on a whole lot of biology to come together in a productive fashion in a very exposed environment. It is important to look at risk management as an area of focus in which you can earn a competitive advantage by being persistent and open-minded in willingness to address it.

In this document, I have outlined the five areas of risk to think about on a regular basis and five different strategies to consider when dealing with risk in your operation. I have also briefly described several different programs or insurance tools that might aid you in your effort to manage risk in your operation. However, the most important thing to remember is that you build a more resilient and a more profitable operation for the long haul by being an effective risk manager. This does not have to involve reliance on disaster or insurance programs sponsored by the government, but they are definitely tools to consider in your deliberations about what is right for your operation.

At the end of the day, though, the decisions come down to what you feel is right for you. How much risk are you willing to expose yourself to, and for those risks you are not comfortable with, what are the best risk management tools and policies to implement to help you manage the risks you want to address?

## 6 WORKS CITED

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- ANSI/ASSE/ISO 31000 (Z690.2-2011) Risk Management Principles and Guidelines. (2011, February). *American National Standard*. Des Plaines, IL, USA: American Society of Safety Engineers.
- Crane, L., Gantz, G., Isaacs, S., Jose, D., & Sharp, R. (2013). *Introduction to Risk Management. Understanding Agricultural Risks: Production, Marketing, Financial, Legal, Human*. Extension Risk Management Education and USDA-Risk Management Agency.

## 7 ONLINE RESOURCES

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- University of Nebraska-Lincoln: <http://farm.unl.edu>  
<http://beef.unl.edu>
- RightRisk Education Team: <http://www.RightRisk.org>
- U.S. Department of Agriculture  
Farm Service Agency: <http://fsa.usda.gov>  
Risk Management Agency: <http://rma.usda.gov>  
Natural Resources Conservation Service: <http://nracs.usda.gov>