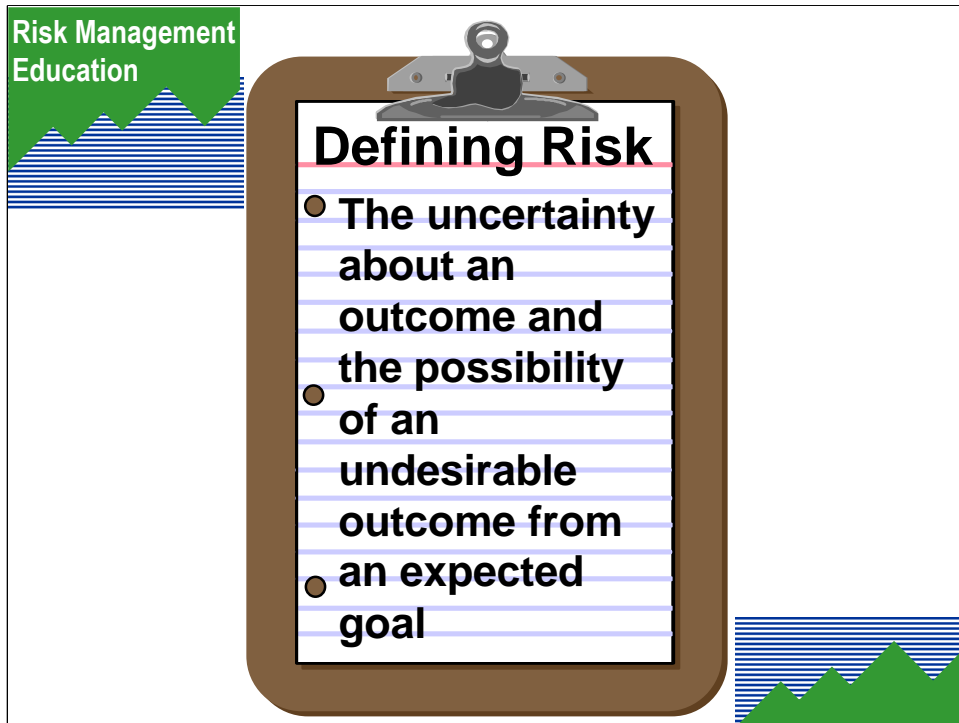


Risk Management
Education

Managing for the Millennium

Managing Risk in Risky Times



The topic of risk management can be introduced with a discussion of several current events and the risk implications. Several changes in the business environment for agriculture heighten the awareness of risk, including a changing government role; outside forces of globalization, market structure, technology, and weather; and increased connections between different risks affecting a farm, including marketing and financial risks.

Once an introduction is made and the stage is set, the issue becomes understanding risk and risk management. In an academic setting, risk and uncertainty can be defined separately. Risk can be associated with a probability distribution of outcomes while uncertainty exists when the outcomes or probabilities are not known.

In a common setting, risk can be thought of as uncertain consequences, particularly exposure to unfavorable consequences. As an example, if a farmer is expecting to grow 150 bushels of corn per acre, then a 100 bushel yield and a 200 bushel yield are both a possibility. When addressing risk from a risk management approach, we are generally more interested in how to provide a safety net under the undesirable outcome of a 100 bushel yield than we are in dealing with the 200 bushel yield.

It should be noted that historically, risk management in agriculture has been used as a synonym for crop insurance as a safety net for production risk. As we will discuss later, risk management is very different than insurance management, and insurance is just one of a number of risk management tools available to the farmer.

Sources of Risk

- **Production**
- **Marketing**
- **Financial**
- **Legal**
- **Human Resources**

While most people would categorize production and price risk as the major risks farmers face, it is important to recognize the five broad categories of risk.

As we will define in the next few slides, each category of risk includes a number of items that can have a major impact on the farm's bottom line and on its long-term growth in net worth.

Production Risk

- **Weather**
- **Diseases**
- **Pests**
- **Technology**
- **Management**



Production risk is one of the main categories that most people think of when talking about risk. While weather patterns and crop conditions make headlines throughout the growing season, there is relatively little that crop producers can do after planting a crop to control yield risk, outside of irrigation and weed, insect, and disease control. Livestock producers as well face production risks, including weather conditions, reproductive problems, and insect and disease problems. Technology and management decisions can also have risk implications. As an example, investing in new seed technology may provide more options for weed control, or may lead to production of crops with specific attributes, which in turn face a set of market risks.

Marketing Risk

- **Input cost variability**
- **Output price variability**
- **Price volatility**
- **Market access**



Marketing risk generally receives the most attention on a daily basis in terms of commodity prices for grains and livestock. However, it is important to note that marketing risk involves the price risk for inputs as well as for outputs. In addition to the variability in price levels, the volatility of price levels can be important.

For a livestock feeder, typical marketing risks could include the price of meat in the output market, the price of grain, protein, and supplements in the input market, and the price of feeder animals entering the feeding phase of production. For a cow-calf producer or a farrow-to-feeder hog producer, the outputs are the same as the inputs for the livestock feeder, namely the price of the feeder animals. But, the input price risk will focus on grain, protein, and supplements as well as the price of breeding stock.

For a grain producer, marketing risks include the price of grain in the output market, but also the price of fertilizer, fuel, seed, chemicals, labor, machinery, and other inputs.

For all producers, market access is also an important consideration, whether it impacts the feasibility of a livestock operation, or whether it may affect the potential to grow and market a specialty or identity-preserved product.

Financial Risk

- Access to capital
- Interest rate risk
- Credit obligations
- Asset control



Financial risks can be more difficult to detect than production and marketing risks, but they have every bit as much of an impact on the success of the operation.

Interest rate risk can significantly impact the financial stability of an operation, especially one that is highly leveraged. Small changes in interest rates can lead to significant changes in interest expenses and financial success.

As operations have become larger over time, the amount of capital required to finance an operation has grown. Whether this capital is provided by the farmer in terms of equity, whether it is borrowed from a bank or lending agency, whether it is just controlled by the farmer through capital leasing arrangements, or whether it is controlled through farmland lease arrangements, the access to capital is an important measure of the feasibility of an operation.

One not need look back any further than the 1980s to see a period where financial risks represented a major risk for farmers. Lessons learned from that period about monitoring the farm's financial situation and identifying the risks the farm faces are critical to success.

Legal Risk

- **Production, marketing, and leasing contracts**
- **Business and personal liability**
- **Business and environmental regulations**



The economic and social forces which are shaping agriculture are really opening new chapters in the area of legal risks.

Contract law can impact farms in a number of ways. Contract disputes were at the center of recent legal problems over grain marketing tools such as hedge-to-arrive contracts. Contract production represents a newer facet of agriculture, where the production and marketing decisions are fixed before the crop is even planted. Finally, as the amount of land operated by tenants increases, the role of leasing contracts is brought to the forefront. When one considers the total financial stake tied up in these basic agreements, one can recognize the importance of an understanding of contract law and associated legal risks.

Liability issues and regulations can go hand in hand in their impact on agriculture. Agriculture has faced a number of environmental regulations for some time, including wetlands and clean water regulations, soil erosion controls, chemical registrations and requirements, labor regulations, and others. Additional issues such as animal welfare, animal odor issues, and non-farm nuisance issues, and others are increasingly coming to the forefront.

Human Resources Risk

- **Hired labor**
- **Death and disability**
- **Divorce**
- **Business continuity**
- **Time**



Human resources risks may be the most hidden, and yet the most critical of all the categories of risk. Farms traditionally depended on family and seasonal workers to meet their labor needs. Yet, as farms continue to grow and change, hired labor and personnel management needs become a major issue.

The three “D’s” of human resources risk can be devastating. Death, disability, or divorce can each bring a farm to its knees if there is not a plan for addressing these risks. While one might say insurance or prenuptial agreements are the methods for addressing these risks, the reality is we generally don’t have a plan for working through these events should they occur.

Business continuity can be a significant risk in the absence of effective planning. Impacts of any of the three “D’s” as well as retirement decisions can adversely impact any opportunities for the continuation of the business.

Additionally, issues such as planning and time management represent a risk to the operation if they are insufficient or ineffective. On the other hand, effective planning serves as the foundation of a comprehensive risk management plan.

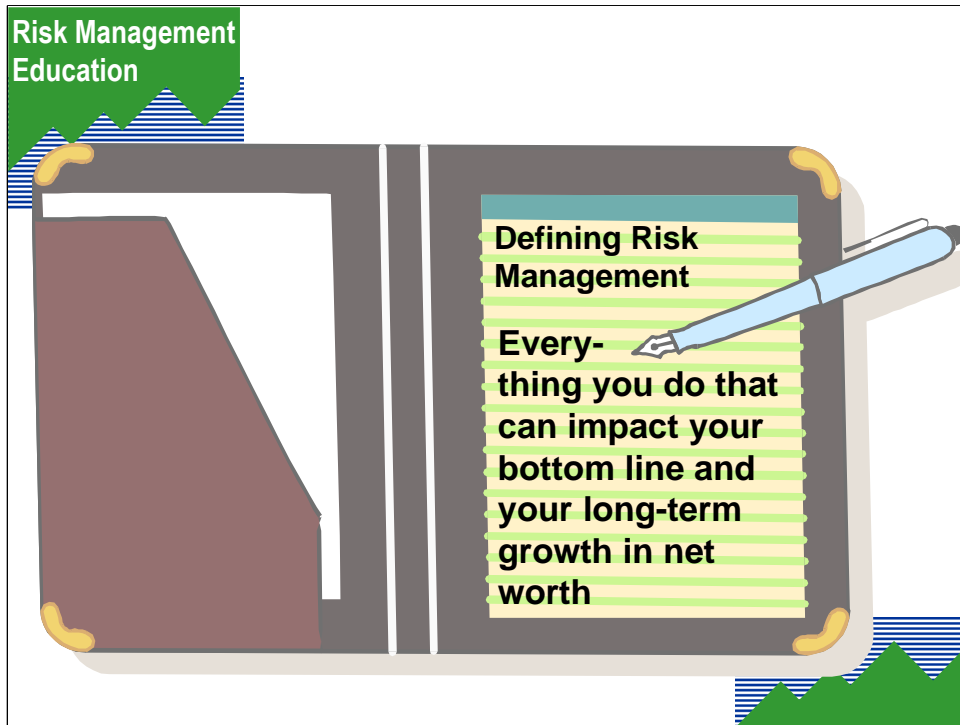
Rankings of Risk Exposure

- **Output price variability**
- **Yield variability**
- **Operator injury, illness, or death**
- **Changes in government programs**
- **Changes in environmental regulations**
- **Costs of inputs**

Patrick and Ullerich, 1996, Purdue University

This listing of risk exposure rankings gives some insight into how farmers view each of the different risks they face on their farms. This study was done with leading crop producers at the annual Purdue Top Farmers Crop Workshop.

The ranking of output price variability and yield variability at the top of the list is consistent with the amount of attention that is spent on production and marketing risk. The other concerns simply highlight the broad base of risks that farmers are aware of and see as impacting their farm.



Setting the stage for an effective risk management plan is important. An appropriate definition of risk management is comprehensive. Risk management is more than insurance, it is the effective use of the full range of tools and strategies for dealing with risk.

It is important to note as well that risk management does not necessarily mean eliminating risk. In fact, it may be very appropriate for some farms to retain the risks they face or even to take on additional risks as they strive for success.

Academically, one can speak of profitability as a function of the risk taken and equate it to the expected returns of stocks and bonds in the financial markets. Stocks have a higher risk than bonds and generally have a higher expected return. In the same fashion, if a farmer were to attempt to avoid every risk, they would also likely eliminate every opportunity for profit. Thus, the goal is not to eliminate risk, but to manage it effectively.



Steps of Risk Management

- Identification
- Evaluation
- Treatment
- Implementation
- Monitoring



It is important to recognize risk management as a process and not just as a particular tool or strategy. There are five basic steps to the risk management process.

Identification involves listing the goals and risk tolerances in the operation and then finding the sources of risk that affect these goals.

Evaluation looks at the sources of risk in the operation and measures them by frequency and severity, as measured against the goals and risk tolerances identified earlier.

Treatment is the development of appropriate methods for managing the sources of risk.

Implementation involves the selection of appropriate tools and strategies to manage the risks being treated.

Monitoring is necessary to measure the performance of the risk management plan and continually adapt it to changing conditions.

Risk Management Education

Identification

- **Goal setting**
- **Risk tolerance**
- **Sources of risk**



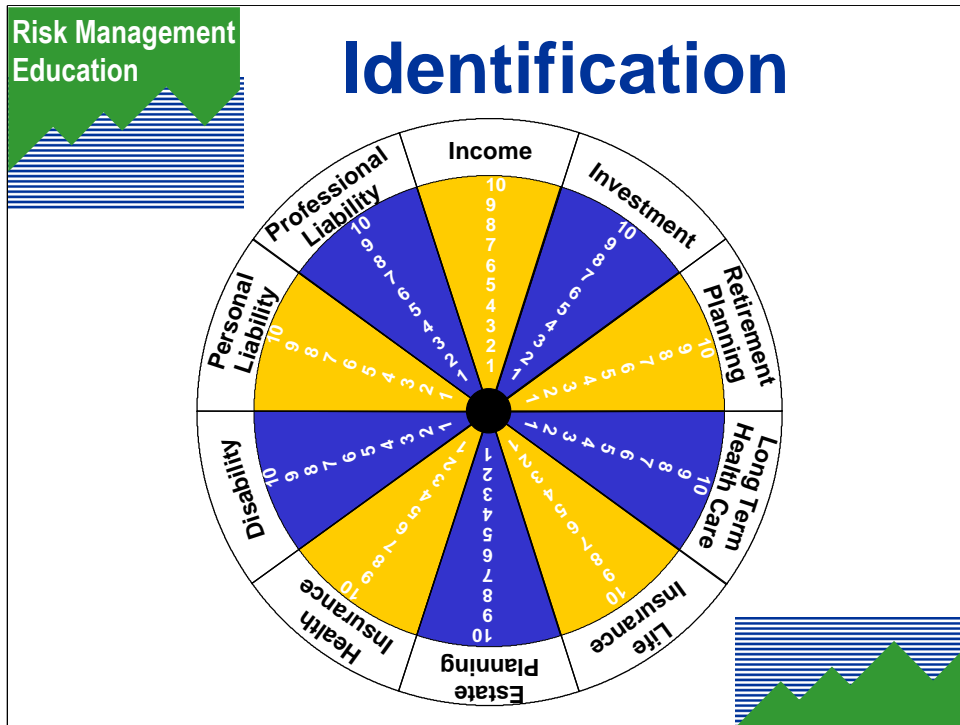
The slide features a green header with the text 'Risk Management Education' and a blue and white striped graphic. The main title 'Identification' is in large blue font. Below it, a bulleted list contains three items: 'Goal setting', 'Risk tolerance', and 'Sources of risk'. To the right of the list is a black stick figure holding a large magnifying glass. The slide is decorated with green mountain-like shapes and blue and white striped patterns in the corners.

In the identification stage, farmers work not only on identifying risks, as we have done earlier, but also on identifying the measuring sticks for evaluating their risk management strategies.

Setting goals provides the overall target for what a risk management plan is designed to accomplish. Different goals for a different operations should quite expectedly lead to different risk management strategies. Someone who is nearing retirement may have stronger preference for preservation of capital while someone who is just starting out may be targeting long-term growth.

Risk tolerance is also an important measuring stick, as effective risk management strategies must not only work on paper, but also allow the farmer to sleep at night. Measuring risk tolerance directly can be difficult, but some decisions can be made by considering the following points:

- 1) a complete understanding of the risk management tools involved
- 2) a clear definition of objectives based on the goals set above
- 3) the expectations about earnings
- 4) the alternatives available
- 5) the lowest acceptable outcomes

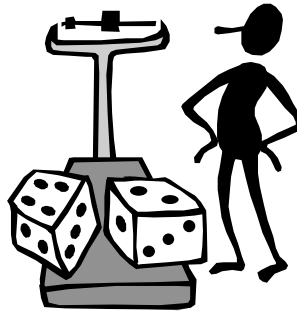


When identifying the different sources of risk in the operation, it can be useful to address them and analyze them together in a comprehensive framework. By identifying the relevant sources of risk and arranging them as appropriate on a wheel diagram, one can see the full comprehensive risk management needs of the operation.

Just as a wheel does not work well if it is out of balance, a comprehensive risk management plan will not work well if some sources of risk are successfully managed while other sources of risk are ignored or not sufficiently addressed. By rating each source of risk on the basis of how well it is currently managed, one can quickly identify priority needs and address them through the various risk management tools and strategies.

Evaluation

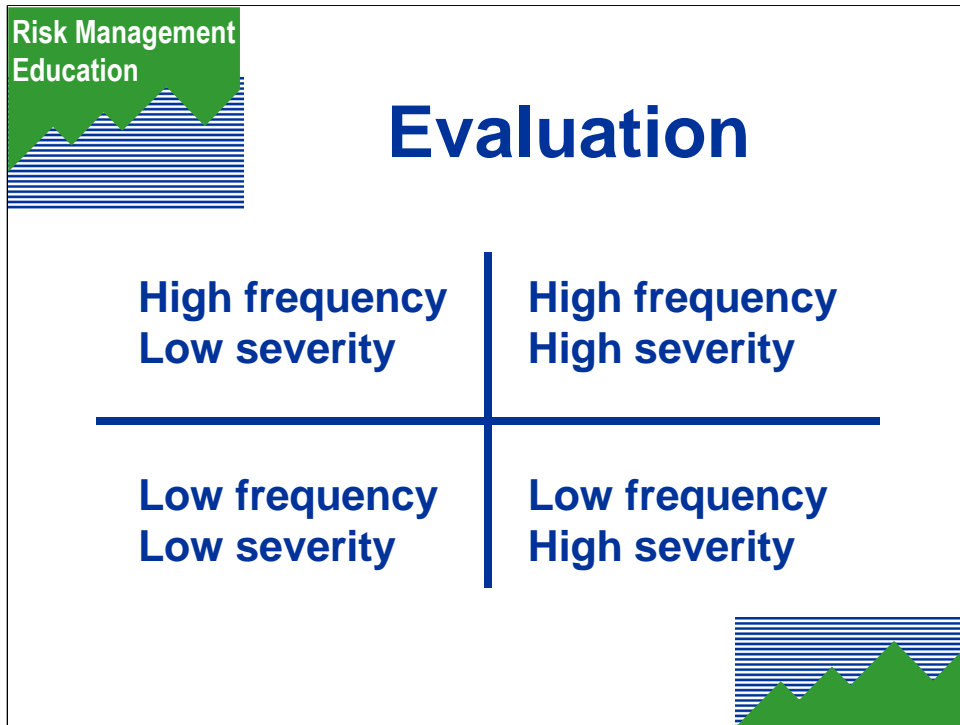
- Frequency
- Severity



Risk can be evaluated based on two key factors, frequency and severity.

Frequency relates to the number of times a certain risky event may happen, such as the number of years out of twenty that you can expect a shortened growing season because of an early fall frost.

Severity relates to the potential impact and the negative effects that can occur from a risky event. A tornado brings a possibility for damage that is much more severe than an early fall frost generally carries.



Based on the measurements of frequency and severity, one can define most risks as falling in one of four categories:

High frequency-low severity events might include grain marketing decisions as well as minor vehicle accidents around the farm, as they may happen often, and the cost of a failure may not significantly impact the overall operation .

High frequency-high severity events may be difficult or impossible to insure, such as flooding in floodplains.

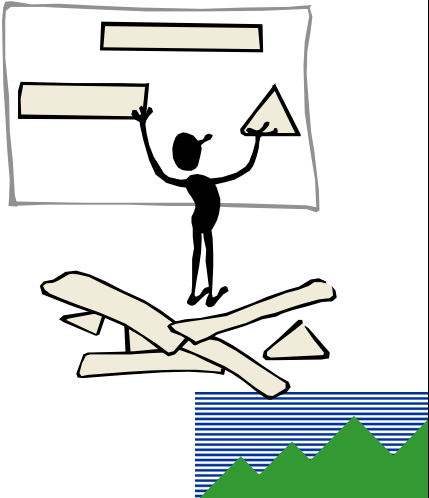
Low frequency-low severity events could include the adoption of new technology, as the decision is not made that often, and the cost of being wrong is limited to lost opportunity.

Low frequency-high severity events could include all of the devastating “D’s” of human resources risk: death, disability, and divorce.

Risk Management Education

Treatment

- **Reduce**
- **Transfer**
- **Avoid**
- **Retain**
- **Self-insure**

An illustration of a stick figure standing on a seesaw. The figure is pointing towards a whiteboard that displays three symbols: a rectangle, a horizontal bar, and a triangle. The seesaw is tilted, with the figure's feet on the lower side. The background features a green mountain range and blue horizontal stripes.

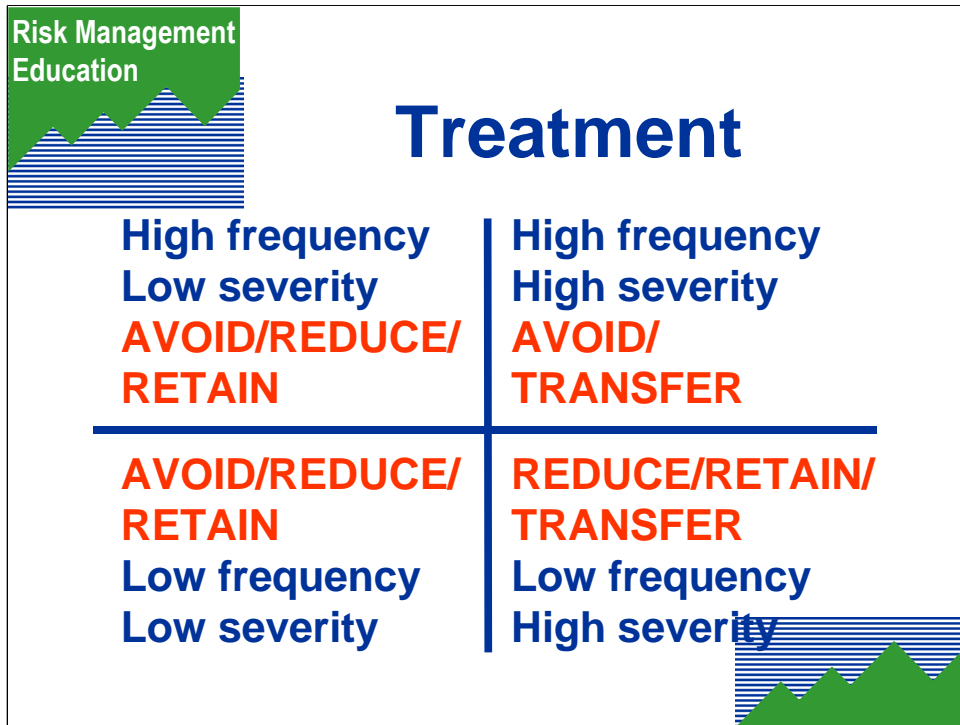
There are five basic methods for managing risk. All risk management tools and strategies can be categorized by these methods or by a combination of these methods.

Reducing risk means we are taking the necessary precautions to reduce the incidence of the risky event occurring. Insurance companies offer discounted rates for several things that we can do to reduce risk, such as the presence of smoke detectors and fire extinguishers. Farmers can also exercise good management practices to reduce environmental risks on their operations.

Transferring risk involves passing the risk on to someone else. As one example, buying insurance provides protection and transfers the risk to the insurance company in exchange for the cost of the insurance premium.

Avoiding risk may be appropriate when the risky event can be severe but cannot be effectively managed in other ways. The threat of injury or death to children operating farm machinery may be enough to avoid letting children near machinery until they are old enough to safely operate the equipment.

Retaining risk may be an appropriate strategy if you believe you can manage the risk effectively or can handle the possible outcomes. Self-insurance is closely related to retaining in that you shoulder the responsibility. However, it does vary in that you expect the risky event to occur at some point and prepare for it by holding enough reserves or saving enough money to recover from the event.



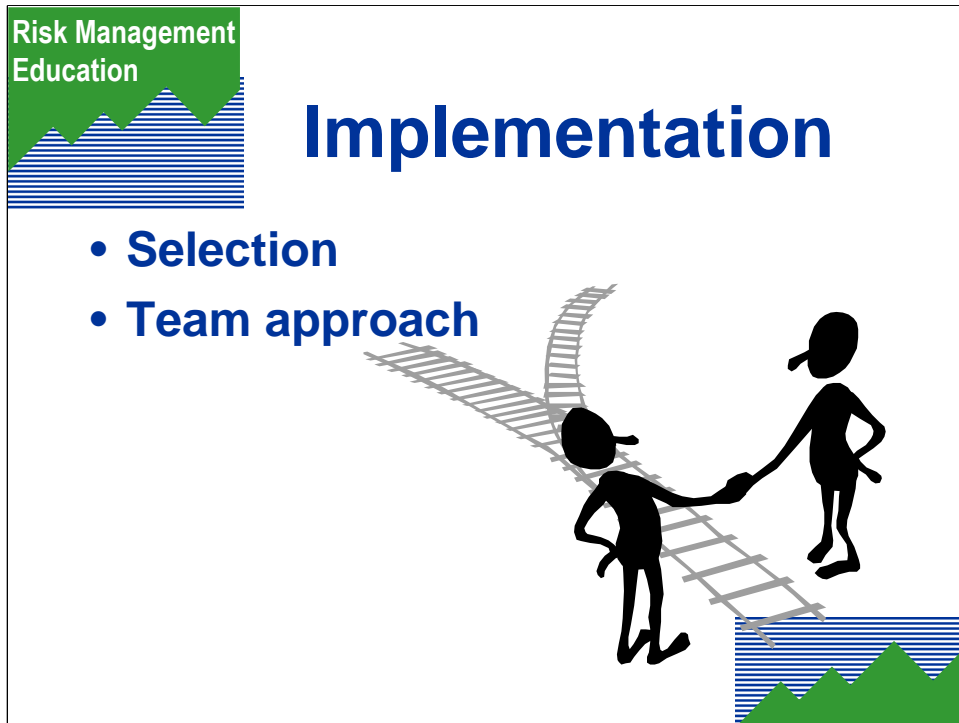
This chart can be reviewed again in light of the basic strategies for managing risk.

High frequency, low severity events often lend themselves to management decisions to address the risk internally. A farmer may adopt certain practices that avoid or reduce the risk, or the farmer may see the risk as something that can be retained and managed effectively. Adopting marketing decisions represents one such management strategy.

High frequency-high severity events can be difficult to insure, as the cost can become prohibitive. Regulations on development of floodplains and flood insurance are cognizant of this fact. Another approach to these types of risks is simply to avoid the risk if at all possible.

Low frequency-low severity events can also be managed internally through strategies to avoid or reduce the risk, or retain it if it can be effectively managed. Putting aside enough money to finance the adoption of new technology is one approach here.

Low frequency-high severity events generally demand that we reduce or transfer the risks we cannot manage. Purchasing life and health insurance represents a common example in this category.



Implementation of the risk management plan involves the selection of appropriate tools to manage risk based on the method of treatment identified earlier. As an example differentiating the two, the treatment for production risk might be crop insurance, while selection of the tool might be the purchase of crop revenue coverage at the 75% protection level.

When selection of the various tools is studied, it is a good time to consider the role of professionals in addressing risk management. These risk management professionals include grain elevator operators, commodity brokers, crop insurance agents, loan officers, extension educators, commodity organizations, farm organizations, cooperatives, lawyers, accountants, private consultants, and many others. Each of these professionals has a unique set of strengths, skills, and experiences.

Together with the farmer and the farm family, these professionals help to create the risk management team that can assist in the implementation of a successful risk management plan.



Implementation

- **Production**
 - ▶ Enterprise choice
 - ▶ Technology
 - ▶ Yield insurance
 - ▶ Revenue insurance
 - ▶ Contract production
 - ▶ Management
- **Marketing**
 - ▶ Marketing plan
 - ▶ Futures contracts
 - ▶ Options contracts
 - ▶ Cash contracts
 - ▶ Revenue insurance
 - ▶ Contract production

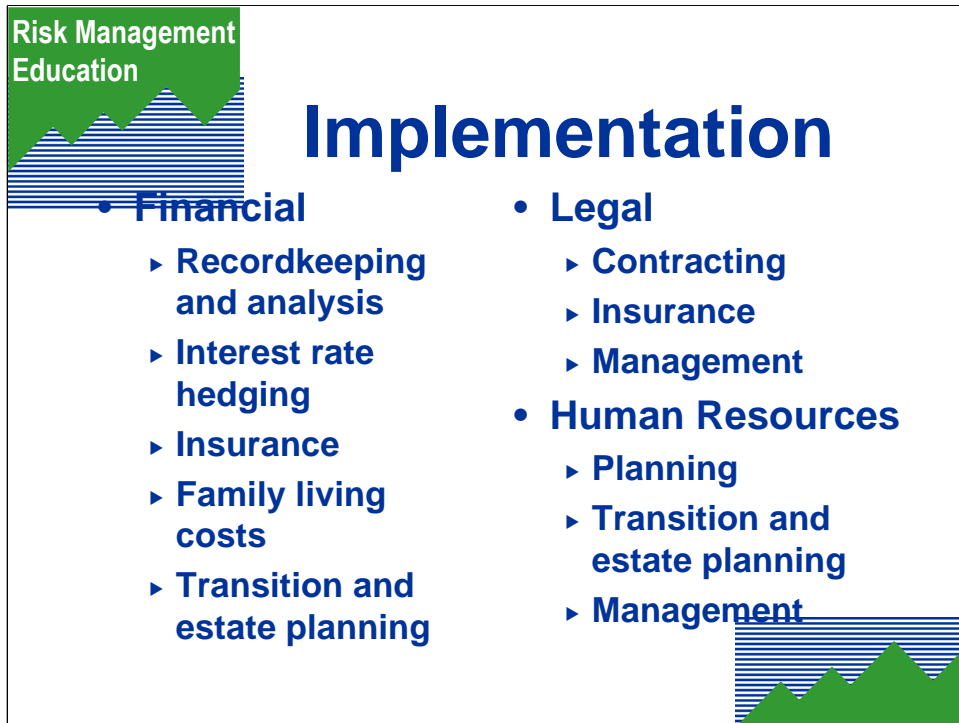


There are a number of tools available for risk management in the production and marketing risk categories.

For production risks, a farmer may consider enterprise choices and technology adoption as possible strategies to reduce and/or retain risk. Yield and revenue insurance products help to transfer risk, while contract production and management decisions may help to avoid certain risks while retaining or assuming those that the farmer wants to manage.

For marketing risks, the development of a marketing plan and the use of futures contracts, options contracts, and/or cash contracts can help transfer risk, just as revenue insurance can transfer part of the risk associated with market prices. Contract production can also be considering a marketing tool when it is used to secure market access.

As production and marketing risk management tools are being considered, it is important to remember the synergy that some tools have with each other, such as the use of yield insurance along with marketing tools. However, it is also critical to note that some tools do not work well together, such as some revenue insurance products linked with marketing tools. As an example, an income protection insurance policy, linked with a forward cash contract, may actually open the farmer up to more risk instead of offsetting risk as one might think.



Just as with production and marketing risk, there are a number of tools available to address financial, legal, and human resources risk. It is important to note however that many of these tools involve specific management strategies or actions on the part of the farmer and the risk management team as opposed to selection of the various tools offered in the marketplace for production and marketing risk management.

To address financial risks, the farmer needs to first start with a solid foundation in bookkeeping and financial analysis. Determining the outlook for the operation is difficult, if not impossible, without a firm hold on the current situation. Hedging interest rates through careful financing decisions or through bond market activity may help cover interest rate exposure. Managing the insurance portfolio and also controlling family living expenses will also be critical to managing financial risks. Finally, transition and estate planning provides a blueprint for the succession and continuity of the farm from both a financial risk and human resource risk standpoint.

Covering legal risks generally involves the advice of a lawyer in regards to contract and regulatory issues. In addition, careful management and “due diligence” is necessary on the part of the farmer to limit exposure to legal risk.

Addressing human resource risk involves a number of basic management strategies including effective personnel management, business and personal planning, and as with financial risks, the development of a transition and estate plan.

Risk Management Education

Monitoring

- Performance
- Balance
- Changing conditions
- Advisory group

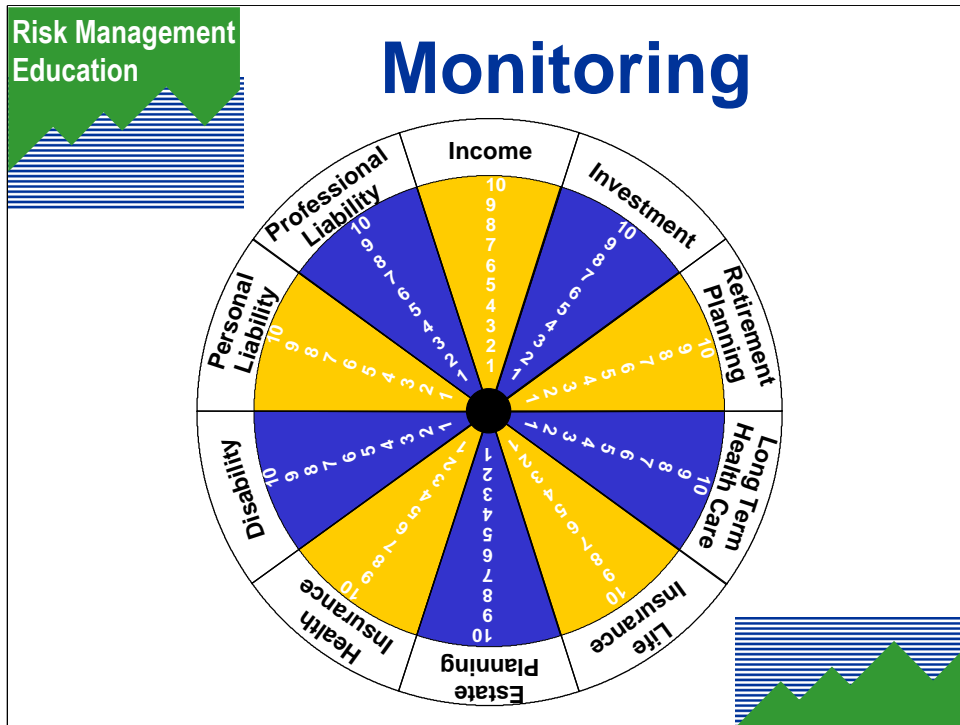
The illustration shows a black silhouette of a person running to the right, carrying a large green horizontal bar on their back. They are also holding a yellow measuring tape. In the background, there are several vertical grey lines and three horizontal green bars of varying lengths, suggesting a measurement or monitoring process. The slide also features a green mountain range graphic in the top-left and bottom-right corners, with blue horizontal lines representing a sky or water background.

Monitoring the risk management plan at least annually is critical to the long-term success of the plan and the overall operation.

Monitoring should include a measurement of the performance of the risk management strategies used against the stated goals and risk tolerances. Some strategies may prove successful, while others may be counterproductive to the goals, or may be more expensive than necessary to accomplish the stated goals.

Addressing balance in the risk management plan should be a continual task, analyzing the plan against the risk management wheel. Noting risk exposures that are insufficiently managed or changing conditions that have created new risk exposures in the past year (such as a new baby!) are critical to keep the risk management plan relevant and appropriate.

Finally, the risk management monitoring process is an appropriate role for the entire risk management team. As assembled earlier in the implementation phase, the farmer can benefit from the strengths of a risk management team to successfully refine and maintain an effective risk management plan.



At the monitoring stage, one should return to the risk management wheel developed earlier in the identification stage and evaluate the risk management plan for its performance on each of the risk exposures identified on the wheel.

By evaluating the plan against each risk exposure, one can determine if the plan provides the necessary balance and work to address those areas found lacking. Those areas become essential elements of discussions with the risk management team and priority issues to address in the revised risk management plan.

Benefits of Risk Management

- Risk management increases the value of the business
- Businesses with an appropriate risk management plan are positioned for future growth

In the end, the outcome of a successfully developed and implemented risk management plan should hit the farmer in the pocketbook.

A successful plan increases the business's value because it effectively manages the risks that the business faces. As an example, effectively managing production and marketing risk should make an operation more appealing to a lender and result in more favorable interest rates or borrowing terms. As another example, effective transition and estate planning can facilitate the successful transfer of an operation from one generation to another, without unnecessary financial stress or burdens resulting from large estate tax bills due to poor estate planning.

Finally, an effective risk management plan positions the operation for future growth, because it effectively manages the impact that risk can have on the operation in the present. By being positioned appropriately in the present, long-term opportunities become more attainable.

Summary

- **Review your business plan**
 - goals
 - risk tolerance
 - risk exposure
- **Understand risk management methods, tools, and interactions**
- **Build your risk management team**

With this foundation in risk management, there is a basic set of steps to get started.

First, one needs to build a foundation and identify goals for the operation. These are critical as all risk management decisions will be dependent on the stated goals. Identifying risk tolerances and risk exposures comes next in developing the plan.

Understanding the methods of risk management and the appropriate use of tools is necessary to successfully implement any identified strategies.

At this point, the reliance on a risk management team built from professionals can help with the implementation and monitoring phase of the process.