9.0 RISK AND UNCERTAINTY IN AGRICULTURE

Introduction

Decision making in farming is usually based on incomplete knowledge which increases the uncertainty of the outcome.

Definition: Certainty

Certainty can be described as a state with a known expected outcome.

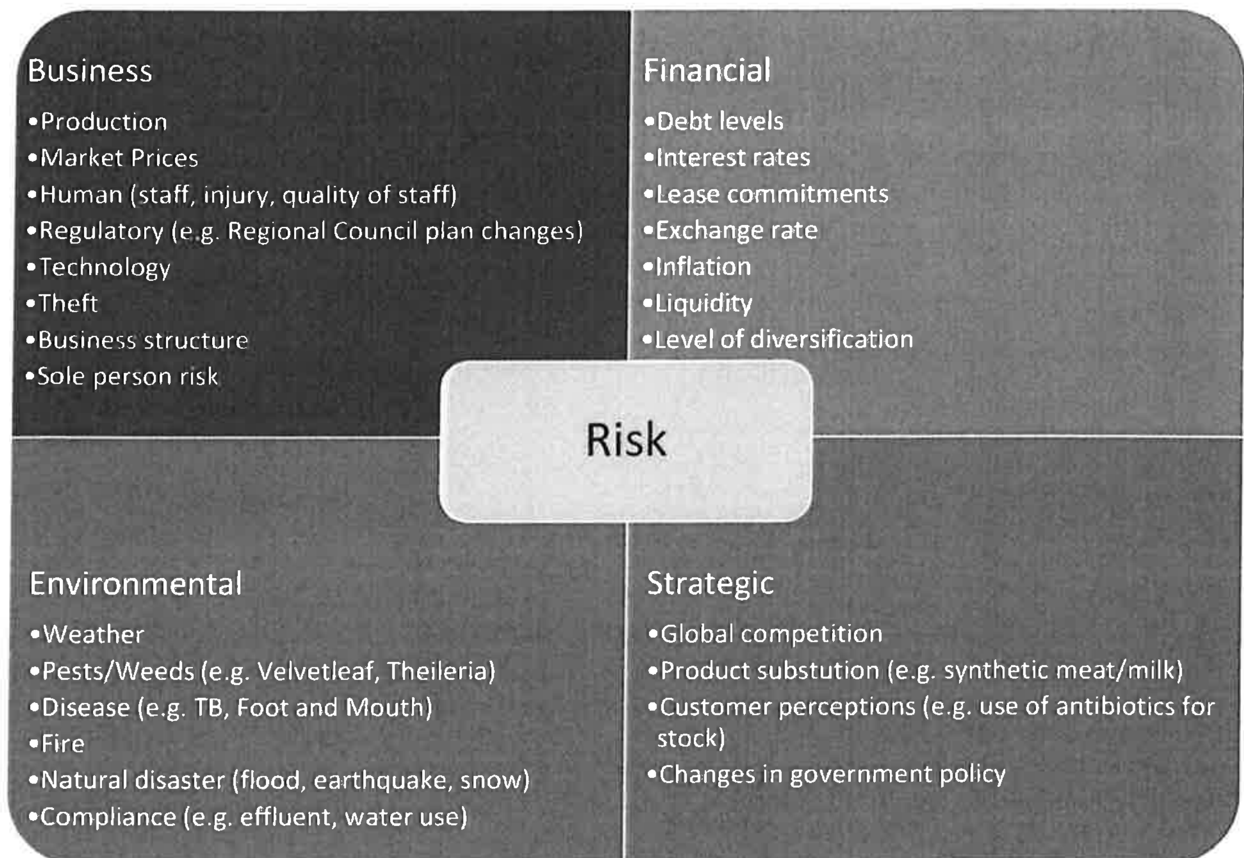
Definition: Uncertainty

Uncertainty is a state where the average outcome may be known but the variation in individual outcomes is unknown.

Definition: Risk

Risk is the probability of an expected outcome being realised.

What are the **key areas** of risk in a farming business?



Various methods can be followed to reduce the uncertainty and risk in farming. The actions of a farmer when facing risk situations is determined by their judgement, their capital available, and their objectives. Depending on the farmer's personality, they will have a different appetite for risk. Some will be happy to take on risk when there is the possibility of making a good profit, others will prefer less risk, forgoing big gains but having more certainty they will not make a loss.

Any method used to reduce risk and uncertainty in farming involves costs. These costs should be offset against the advantages.

Types of Risk

Farming will always include some risk, what type of risk can often depend on the farm system. For example, farm systems with a low level of imported supplements or cropping tend to have increased climatic risk as milk production/liveweight gains will drop if there is a dry summer etc. On the other hand, farms with high levels of supplement feeding are less exposed to the climate as pasture makes up a smaller percentage of the diet, they are however much more exposed to supplement price risk.

Likewise, there can be financial risk associated with purchasing more land to add to the farm. This can increase debt levels, increase interest costs and reduce liquidity. There are also risks that if a small farm does not expand they cannot take advantage of 'economies of scale' and this could reduce the long term viability of the farm.

Risks that farm owners/managers need to understand but are not able to be managed include price risk (e.g. the milk/schedule price and farm input prices). Farmers need to understand these risks so that they are aware of their impact on the farm business. These risks though are essentially unmanageable at the farm level, or at the least very difficult to manage or mitigate.

Risk can be categorised as follows:

- Risks which **can** be accepted;
- Risks that **should** be accepted (which form an inherent part of the business);
- Risks which **cannot be afforded**; and
- **Unacceptable** Risks

When thinking about the risks affecting your business, simplify the process into two key questions:

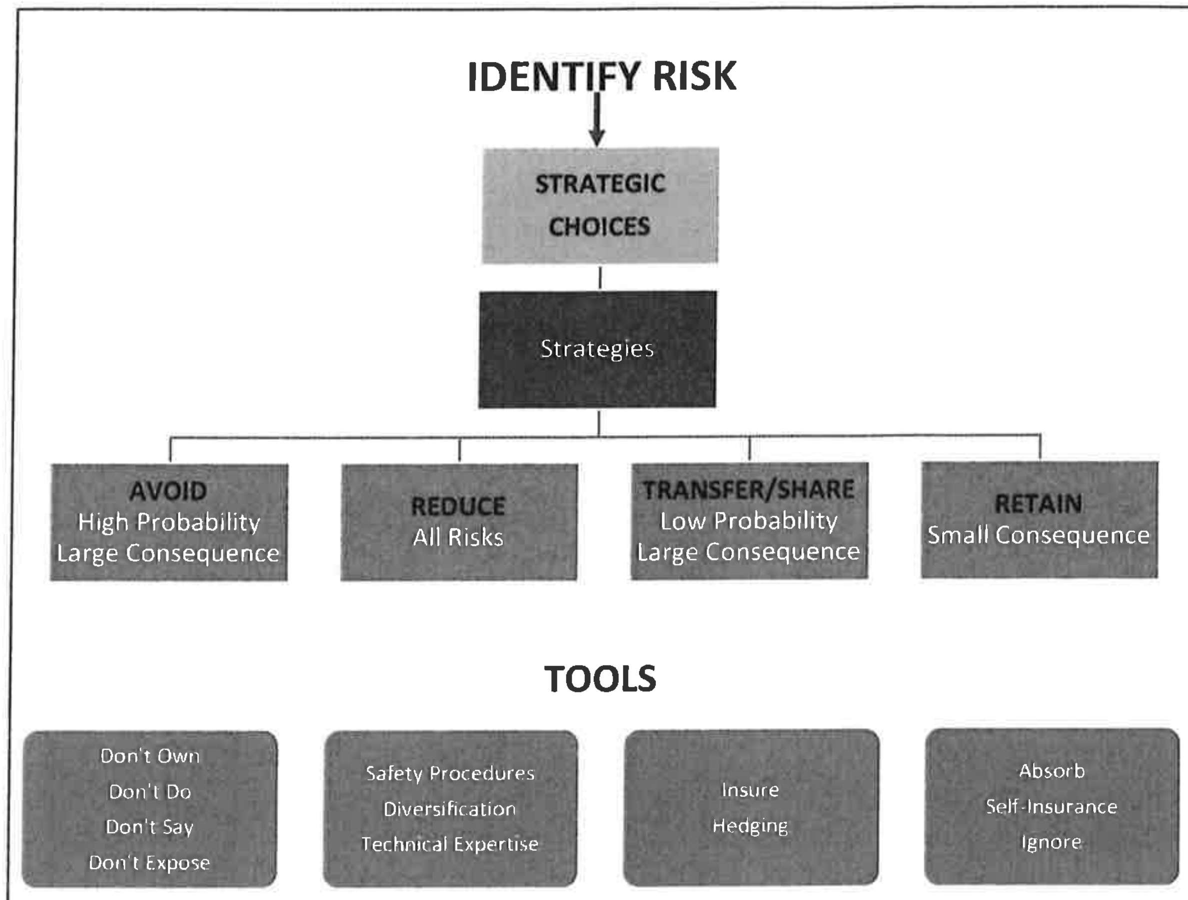
1. What is the **likelihood** of the risk occurring?
2. If the risk eventuates what is the **impact**?

Impact →	**1**	**2**	**3**	**4**	**5**
Probability ↓	Negligible	Minor	Moderate	Significant	Severe
(81-100)%	Low Risk	Moderate Risk	High Risk	Extreme Risk	Extreme Risk
(61-80)%	Minimum Risk	Low Risk	Moderate Risk	High Risk	Extreme Risk
(41-60)%	Minimum Risk	Low Risk	Moderate Risk	High Risk	High Risk
(21-40)%	Minimum Risk	Low Risk	Low Risk	Moderate Risk	High Risk
(1-20)%	Minimum Risk	Minimum Risk	Low Risk	Moderate Risk	High Risk

Put this into a farming context....

Impact	1	2	3	4	5
Probability	Negligible	Minor	Moderate	Significant	Severe
(81-100%)	Minor injury				
(61-80%)				Lamb schedule decline	Milk price decline
(41-60%)		Weeds	Contract risks (eg contract milkng)	Major injury	
(21%-40%)		Theft		Drought	
(0-20%)			P house(!)	Fire	TB, Lepto, FMD

Risk Management - Strategic Options



It is part of good management to decide which risks to take and which risks to avoid. In other words, the manager should decide in a realistic way when they should take a chance, and when not.

Proper management should always take risk and uncertainty into account. There should be a balance between security and accepting risk. A compulsive **risk averter** never accepts opportunities or challenges, they very reluctantly, if ever, accept new practices and are never a successful entrepreneur. A compulsive **gambler**, on the other hand gambles with their business to such an extent that it will inevitably be ruined.

The focus is on the maximisation of opportunities, not the minimisation of risks. It is important to determine which opportunities and risks suit the business and which don't.
What is **your** appetite for risk? What risks can you accept? What risks can you simply not afford, because they will destroy your business?

Risk Management – options

1. Avoidance of risk
   Changing to less risky production systems and types of farming will to a large extent remove risk and uncertainty from farming. The income loss under the original system represents the cost involved in avoidance. Such possibilities for change are however restricted by the

limited alternative possibilities of farming resources. The possibilities for change are restricted by the farming resources that farmers have available.

2. Mitigation/Alleviation (lessening of risk)

   The effect of risks in farming can often be alleviated by one or more of the following measures:

   (i) **Liquidity** - farmers can maintain their liquidity by building up a security reserve in good years. In such a manner they can protect themselves from possible future disasters. The cost of this is the reduction of potential earnings, i.e. that money could also be used to buy more land or capital fertiliser to expand the business.

   (ii) **Diversification** - through diversification risks are spread over a number of products so that the total risk is reduced. The cost of diversification lies mainly in the fact that diversification is less efficient than specialisation, i.e. rearing beef animals on farm is not practical for most dairy farmers.

   (iii) **Adaptability** - The objective of adaptability is to adjust to changing circumstances. For example, having a dairy farm that can efficiently increase production in high payout years and easily shift back to a low cost production system during low payout years is an advantage, or in the case of a sheep and beef farm move to livestock trading policies which are forecast to have the highest margin. Some investments can cause a farm to be less adaptable, e.g investing in a wintering barn for a dairy farm may result in the need to keep supplement feeding at a high level to pay for the investment. Or for a sheep and beef farm running a breeding ewe flock leaves the less flexibility to move to more cattle if the lamb schedule comes down

   (iv) **Sales contracts** - In a sales contract, a seller agrees to sell a certain quantity of their produce for a buyer for an agreed price. This process gives certainty around product quantity, timing and price, allowing both parties to plan and invest accordingly. Sales contracts are used extensively in the meat industry and are increasingly being offered for milk supply. They are also a good way to give certainty over feed costs, i.e. 12 month PKE contract. The down side of the sales contracts is that if prices change, your contract may be set at a less favourable price than the market rate at the time.

   (v) **Information** - The more information that is available when making decisions, the less risky they are likely to be. For farmers' useful information can include weather forecasts, feed budgets, financial budgets, industry analysis on milk and schedule price forecasts etc.

3. Transfer

   Transfer is a term used to describe methods by which the risk and uncertainty of one party is reduced because it is transferred to another party who is better equipped and/or specialised to handle such risks.

   Speculation and insurance are examples of such methods - the main purpose of speculation is to make a profit from fluctuating values, i.e., buy when the prices are low and sell when

the prices are high. In this process and speculating on prices of goods, other parties to the transaction are relieved from the risk. However, to the speculator, the cost would be the potential loss he faces, while for the rest of the community, it is abnormal price levels and inefficient use of the production resources.

While speculation is merely a hedge against fluctuating values of agricultural prices, **insurance** lends protection against a definite loss. Through insurance the risk that an adverse event may occur for one party (the insured) can be reduced by transferring such a specific risk to another party (the insurer). The insurer is then able to lend total or partial protection to the insured, who is the farmer, against the occurrence of certain economic losses by using a protection fund built up through the contributions of individual insured people (premium payments over a period of time).

Dairy Scenario:
You are a 50/50 sharemilker wanting to progress your career. Currently based in the North Island, milking 300 cows, you have been offered a 600 cow 50/50 sharemilking position at Winton, Southland. What are the risks you will need to consider before accepting this position?

1. Consider the risks each of the four categories: business, financial, environmental, strategic.
2. How will you manage the risks identified in the previous question? Outline your response to each risk with regards to avoidance or mitigation of the risk, and how this will be achieved.

Sheep and Beef Scenario:
You are a farm owner looking to purchase a second sheep and beef property. Your current farm is a 800 ha breeding property near Taihape, the farm you are looking at is a 300 ha finishing farm near Bulls. What are the risks you will need to consider before making an offer on the farm?

1. Consider the risks each of the four categories: business, financial, environmental, strategic.
2. How will you manage the risks identified in the previous question? Outline your response to each risk with regards to avoidance or mitigation of the risk, and how this will be achieved.

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