

Farm decision making – how does your risk profile affect your business decision making?

*Cam Nicholson,
Nicon Rural Services.*

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Take home message

- Managing risk is not about the middle or the average, it is the opposite. It is appreciating what happens at the extremes, the size or value of these extremes and how often they occur.

Introduction

Risk is a natural and accepted part of farming. Australian agricultural production (based on value of output) is the most volatile in the world and the most volatile sector of the Australian economy (Keogh, 2013). This volatility conveys a level of risk that needs to be managed. Given most farmers are still operating despite two centuries of volatility suggest they have developed long term strategies and operational tactics to cope with this ongoing challenge.

There are many strategies farmers use to manage production risk. Diversification in crop and pasture type, enterprise mix, targeting multiple markets and property location are common strategies. So is managing input costs, especially when production and prices can be highly variable.

Understanding risk

When we talk about risk most of us immediately think about the negative consequences if an action goes bad. Dictionary definitions re-inforce this thinking. However this is only one aspect of risk. The word risk is derived from Italian word *risicare*, which means 'to dare'. To manage risk effectively we need to understand both the downside, or the potential harm from taking a risk and also the opportunities that taking a risk can offer.

There is no reward without risk. In farming, risk is a necessary part of making returns. Managing risk is about making decisions that trade some level of acceptable risk for some level of acceptable return for an acceptable amount of effort. Decisions can be made to reduce risk, but it usually comes at a price, namely lower returns.

A common definition of risk is likelihood by consequence. In other words risk requires knowing how often an event happens (the frequency) and what is the impact (the value) when it does happen. A decision that increases risk will either increase the likelihood of an event happening and/or increase the consequence if it does occur. This increased consequence may be a greater return, not just a greater loss.

Average values are commonly used in agricultural extension. We present average yields, average prices and average costs. While these averages convey a value (and are convenient), they rarely present the frequency of this average occurring. This would be fine if we consistently got these

average values, but in agriculture we rarely do. The key drivers of profit in agriculture, namely yield, prices and some costs have a range of values within and between production periods. If we use averages for analysis, it usually over estimates the profits and hides the volatility in those profits (Nicholson, 2013).

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Decisions around risk

Firstly we need to understand there are three broad influences that shape a decision around risk. These are simply described as the head, the heart and the gut (Figure 1).

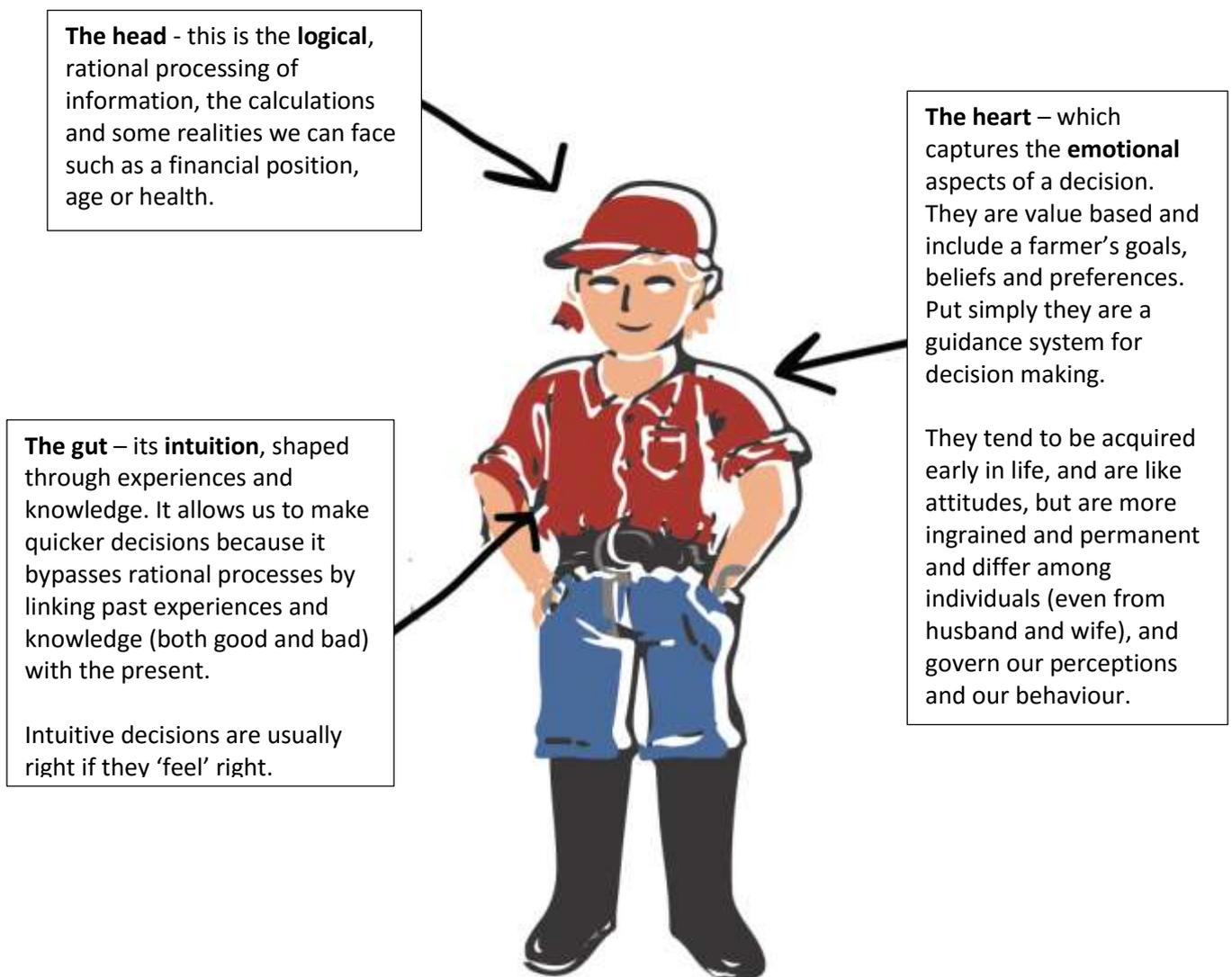


Figure 1: The head, heart and gut influence our decisions (Image courtesy of Alice Long, AgCommunicators).

The relative influence of the head, the heart and the gut depends on:

- The **type** of decision required (simple, complicated, complex),

- the relevant **information** available (usually imperfect),
- the **personality** of the decision maker, and;
- the **risk** involved.

In my experience most farmers make decisions around risk by relying on their gut and their heart. Gut or intuitive decisions are informed through experience, both good and bad – although bad experiences are usually more influential than good experiences. The heart decisions reflect your personality (are you naturally a risk taker) and what you want to achieve from farming. This means everyone will have a different position on risk and this position can change rapidly, sometimes triggered by sudden events. Importantly no position is right or wrong, it is what you are comfortable living with.

The analysis I will show adds to the head part of a decision, by generating some numbers (usually profit) that we can combine with our intuition and goals. In combination the three influences lead to a more informed decision.

Analysing risk

As described previously the derivation of risk is 'to dare'. This implies there is opportunity but it also implies a choice. As individuals we can influence how much risk we expose ourselves to by making choices.

Through the Grain and Graze program we have developed a relatively simple way to put some numbers around the risk in your farming business. It is based on Excel with an additional program called @Risk (www.palisade.com). Firstly we identify the risky variables in your business that we have little or no control over at the start of the season. These are typically yields, prices and some costs. Graphs are created that show *the amount or value* of this risk and *how often this amount or value occurs*. It includes extreme and more common results and are referred to as distributions. The broader the range in values the greater the volatility or risk (figure 2).

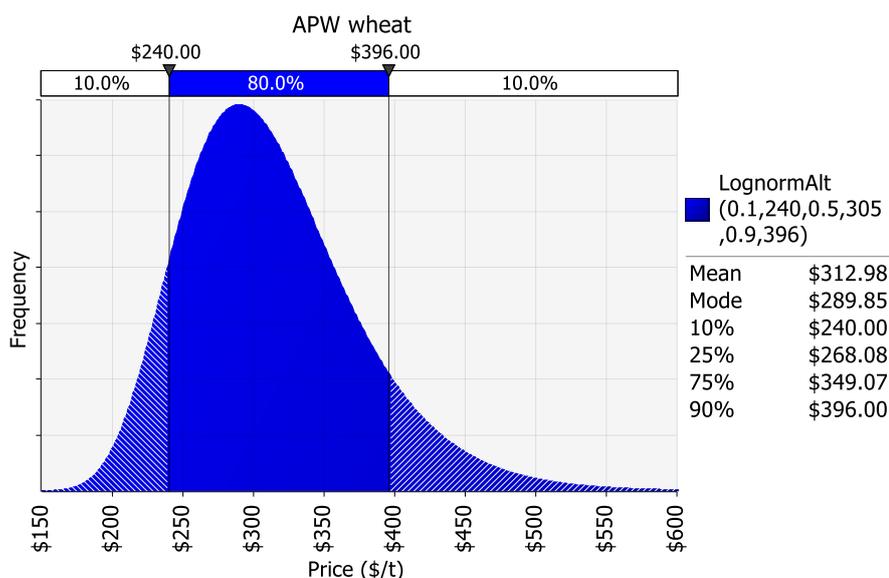


Figure 2: Example weekly price range for APW wheat at Kwinana from 1 July 2005 to 30 June 2015, inflated to 2015 values. (www.agprice.grainandgraze3.com.au)

These 'risky' distributions are then substituted for the average values used in calculations. For example we may have used an average price for APW wheat delivered at Kwinana of \$313/t. By substituting this distribution, the program will do some calculations with a price around \$313/t, but also do calculations with prices at \$240/t, \$210/t, \$350/t and even \$500/t. However the frequency these prices occur will be different. There will be more calculations around \$315/t than around \$240/t or \$350/t and many more than around \$500/t.

The same can be done for yields (and some costs, although most costs increase in price but are not highly variable throughout the season). When the risky yield, price and cost values are combined, they reflect what happens in real life. For example we may have a high yield but poor prices, so our gross income is about average. Less often we will have poor yields and poor prices and conversely we occasionally get high yields and high prices. Adjustments can also be made to link events such as often getting higher prices when yields are poor.

We create these distributions through a combination of historic information ('form guides') and gut feel. I call this 'framing the odds'. Each distribution can be customised to suit your location, soil type, frost risk etc.

Not all risks are equal. The computer program enables a comparison between the risky variables. For example we might have a farm with 20 or so distributions but not all of these risks are of equal influence to our final profit. Some create more volatility than others and some are more influential in making or losing large amounts of money. We can identify these and examine the impact if we were able to change them. This scenario analysis is extremely valuable as it enables an understanding of the risk implications of large (and small) changes on the farming business *before* we make the changes.

References

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Contact details

Cam Nicholson
Nicon Rural Services
Grain and Graze
cam@niconrural.com.au