

## Diversification to reduce risk

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*Diversification is one of the most effective and widely used ways to reduce risk. There are many opportunities to diversify in agriculture.*

Diversification means doing a combination of different business activities, rather than just one. It's about not having all of your eggs in one basket.

Diversification can be attractive to farmers (or other business managers) who are risk-averse because it can reduce the riskiness of the overall business strategy.

If a farmer grows wheat in every paddock of their farm, there is minimal diversification, and any adverse event that affects the profitability of wheat production (e.g., a fall in sale price, poor weather conditions) could affect the farm's entire output. On the other hand, if the farmer diversifies by growing some wheat, some barley, some oats, some canola, some hay, and some pasture to support livestock, the business is somewhat diversified, and risk is reduced to some degree.

The reason that diversification works to reduce risk is because of a lack of correlation between the different income-generating activities. If the market is bad for wheat, there is some chance that it won't be so bad for livestock.

The lower the correlation between the activities, the bigger the reduction in risk from combining them. Best of all is combining activities whose profits are negative correlated: in a year when one activity is less profitable than usual, the other has a good chance of being more profitable than usual. In ideal circumstances, the risks from the two activities could go close to cancelling out.

More realistic in most cases is combining activities that have little or no correlation. That's hard to achieve with different farming activities on the same farm, because the weather probably affects all activities in broadly similar ways. But it's quite achievable if the farmer invests in non-farming business activities. That's one of the reasons why diversifying into off-farm activities can be so attractive.

That observation highlights that risk should really be considered at an aggregate level (the whole farm business plus any non-farm income), not one small part of it (a paddock of wheat). In [PD412](#), I wrote about risk from crop production as affected by fertilizers, but really, focussing on the riskiness of production in an individual paddock is not the right way to think about risk. It's better to take a holistic perspective, recognising that risks from one paddock of a particular crop could be partly or fully offset by other production enterprises on the farm, or by cropping on another property some distance away (to reduce the correlation between crop yields), or by income from an off-farm investment. If so, the riskiness of profit from the individual paddock would be of little concern, even if the farmer is highly risk-averse.



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Sometimes people look at farmers who have a diversified portfolio of activities and assume that it must be a response to the farmer being risk-averse. However, that is not necessarily the case, because there can be other non-risk reasons for combining different activities. For example, diversified crop rotations can have advantages in reducing crop diseases, or improving soil structure, or passing on legume-fixed nitrogen to cereal crops, or diversifying weed-control methods to delay the evolution of resistance to any one control method. It could also be that the farmer's resource constraints (labour, machinery or finance) can be better managed by diversifying activities. All of these things are not primarily about risk, they're about profitability (although they can contribute to risk mitigation as well, to some degree).

So, just observing that a farmer's business is diversified doesn't necessarily mean that the farmer is particularly risk-averse but it probably does mean that the overall riskiness of the farm business is relatively low.

## Further reading

Pannell, D.J. and Nordblom, T.L. (1998). Impact of risk aversion on whole-farm management in Syria. *Australian Journal of Agricultural and Resource Economics* 42(3), 227-247. [Available here](#). "On the larger farm, the model suggests that risk-averse farmers adopt strategies which are much more diversified than their risk-neutral counterparts."

Pannell, D.J. (1987). Crop-livestock interactions and rotation selection, In: R.S. Kingwell and D.J. Pannell (Eds). *MIDAS, A Bioeconomic Model of a Dryland Farm System*, Pudoc, Wageningen, 64-73. [Chapter available here](#). This shows that diversification can be beneficial even without considering risk.

This is #7 in my RiskWi\$e series. Read about RiskWi\$e [here](#) or [here](#).

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- [405. Risk in Australian grain farming](#)
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- [408. Farmers' risk perceptions](#)
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