

A piece of my pie- budgeting and profit analysis



Teacher notes

The business of farming does not involve only the physical planting and harvesting of a crop. Farmers undertake many roles and being a good business manager is important to ensure a successful enterprise. Successful businesses make a profit and in farming profit can be measured using the following equation

$$(\text{Yield} \times \text{Price}) - \text{Costs} = \text{Profit}$$

- Yield – how much a farmer grows or produces
- Price – what the farmer is paid for the crop he grows
- Cost – how much it costs to grow the crop
- Profit – what is left after costs are paid.

Cereal farmers make money by selling the grain they produce, but it is difficult for a farmer to know exactly how much grain they will grow as it is very dependent on seasonal conditions. It is also not unusual for the price paid for grain to fluctuate considerably over the year. The table below outlines some of the variables that affect a farmer's profitability.

Variables		
Yield can be affected by:	Price can be affected by:	Costs can be affected by:
Rainfall	Global markets	Global markets
Soil type	Marketing decisions	Amount of inputs (e.g. fertiliser)
Inputs (e.g. fertiliser and chemical)	Quality of product	Investment decisions
Technology inputs	Time of marketing	Outsourcing of work (seeding or harvesting)

Adapted from Plan, Prepare, Prosper. DAFWA 2011.

Profitable cereal growing requires high production and low costs. All input decisions like chemical and fertiliser are based on the benefit to the yield and quality potential of the crop. Farmers use many tools to guide their decision making. Having clear projections of yields and potential selling price points helps them to manage the costs of production and understand the financial consequences of market fluctuations and seasonal variation.

Reflection

Farmers undertake many roles but often outsource work to specialists. In the students activities provided the farmer has an agronomist, a grain marketer and a farm advisor working for him. What services do they provide?

Agronomist: Advises on growing the crop, for example chemical, fertiliser, new seed varieties, inputs, timing of seeding and harvesting. Has a science background.

Grain marketer: Assists with planning and executing marketing strategies. They analyse markets, identify trends and suggest which companies the farmer should sell the wheat to get the best price. These people may have a science, business or agriculture degree, and are broadly interested in world commodity markets and future trends.

Farm advisor: Assists with the financial management of the business, such as planning the amount of land to seed with crops, new machinery the farmer could purchase, preparing yearly budgets and reviewing how profitable the business has been on a year to year basis. Often have an economics or management degree.

Budgeting and profit analysis assignment

Farmer Black planted 800ha of wheat this season. She works to produce maximum yields for minimum costs knowing that seasonal variability can affect her yields and global markets can change the price she is paid for her grain.

This season had average seasonal conditions and she received a good price for her grain. You need to assess her profitability.

Profit can be measured by the equation below:

$$\text{(Yield x Price) - Costs = Profit.}$$

The components of profit for a grain enterprise are:

Yield – how much grain a farmer produces

Price – what the farmer is paid for the grain produced

Cost – how much it costs to grow the crop

Profit – what is left after the costs are paid

Income – total money received for grain from buyer.



1. Farmer Black averaged 2.6 tonnes per hectare (t/ha) over her 800ha crop. What was her total yield?

$$2.6t \times 800ha = 2080t$$

2. She sold her grain for \$311 per tonne. What was her total income from selling the grain?

$$2080 \times \$311 = \$646\,880$$

3. To use the equation, you also need to know the costs of growing and delivering the crop. The table below shows the input costs that were budgeted. The growing costs remain the same, regardless of yield and are calculated per hectare. Delivery costs are directly related to how much is harvested and are worked out on a per tonne basis.

Inputs	Cost	\$
Seed	30/ha	24 000
Fertiliser	148/ha	118 400
Chemical	73/ha	58 400
Fuel	35/ha	28 000
Crop Insurance	2/ha	1600
Grain Marketing	1/ha	800
Agronomy	1/ha	800
Farm Advisor	1/ha	800
Wages	22/ha	17 600
Freight	10/t	20 800
Receival Fees	10.2/t	21 216
Destination Freight Fee	18.6/t	38 688
Total Cost		\$ 331 104

Note: All calculations based on an average yield of 2.6t/ha

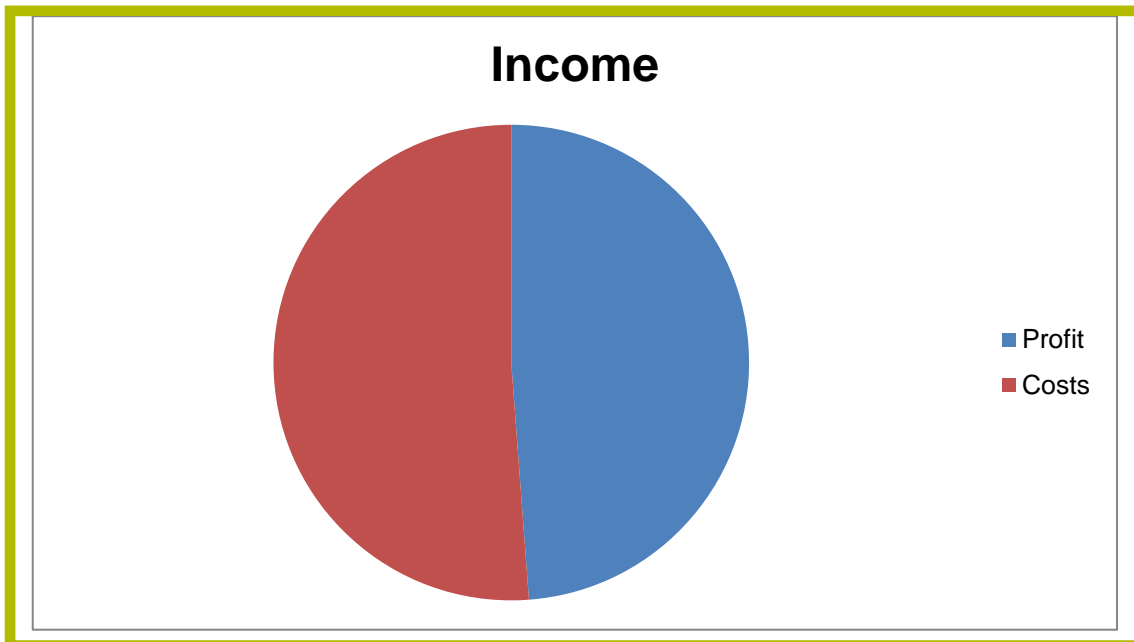
4. Use the equation **(Yield x Price) – Costs = Profit** to work out this year's profit.

$$(2080 \times 311) - 331\,104 = \text{Profit}$$

$$646\,880 - 331\,104 = 315\,776$$

$$\text{Profit} = \$315\,776$$

5. Create a pie chart to illustrate how much of her income she got to keep and how much was paid to her suppliers and service providers.



6. Can you recommend ways that Farmer Black can increase her 'piece of the pie' next season? Consider yield, price and cost...

Improving yield by adding fertiliser

Waiting for a better price

Reducing costs

Focusing on marketing so she sells the wheat to the buyer who will offer the best price



7. Farmer Black has budgeted for next season's crop based on the same input costs over 800ha. As yields and prices can fluctuate she wants to analyse profit at different yield and price points.

Complete the following budgeting table to show:

- The costs of growing and delivering the crop – use the table in Q3 to assist.
- The income that may be expected at different yields and price points.
(Yield x Price = Income)
- The profit that may be expected at different price points per hectare
(Yield x Price – Costs = Profit)

Wheat Price		\$250/t		\$300/t		\$350/t	
Yield	Costs	Income	Profit	Income	Profit	Income	Profit
1.0t/ha	281 440	200 000	-81 440	240 000	-41 440	280 000	-1440
2.0t/ha	312 480	400 000	87 520	480 000	167 520	560 000	247 520
3.0t/ha	343 520	600 000	256 480	720 000	376 480	840 000	496,480
3.5t/ha	359 040	700 000	340 960	840 000	480 960	980 000	620 960

8. Farmer Black could put extra 30kg/ha of Nitrogen fertiliser on the crop in August. It will cost \$17/ha and could improve yields by 10% if it is followed by a significant rain event. Without any rain, the plant cannot uptake the nitrogen and there is no benefit. Over the last 6 years, her average yield has been 2.8t and she has sold her wheat at an average price of \$295/t. Can you do a cost-benefit analysis on this scenario and recommend whether or not she should go ahead?

If average yield is 2.8t/ha the nitrogen has the potential to add another 280kg.

At \$295/t (\$295 divided by 1000kg = 0.295c/kg), 280kg is worth \$82.60 The worst case scenario is there is no yield improvement and the farmer loses the \$17/ha

Best case scenario the farmer gains 10% improvement and makes an extra \$82.60/ha

Cost for 800ha is \$13 600

Benefit of up to \$66 080

The farmer will remain profitable even if there is no yield improvement so I would recommend he take the risk and add the fertiliser.

Some students may recommend that the decision be made based on weather predictions.