NORTHERN
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GRDC GROWNOTES™

GRDC
GRAINS RESEARCH & DEVELOPMENT CORPORATION

# SORGHUM

## SECTION 15

## MARKETING

SELLING PRINCIPLES | NORTHERN SORGHUM: MARKET DYNAMICS AND EXECUTION | MARKETING OPTIONS FOR ERGOT-CONTAMINATED GRAIN | WEATHER-DAMAGED OR MOULDY GRAINS

# Marketing

The final step in generating farm income is converting the tonnes produced into dollars at the farm gate. This section provides best in class marketing guidelines for managing price variability to protect income and cash flow.

Figure 1 shows a grain selling flow chart that summarises:

- decisions to be made
- drivers behind the decisions
- guiding principles for each decision point.

The grower will run through a decision-making process each season, because growing and harvesting conditions, and prices for grains, change all the time. For example, over the five years to and including 2015, Brisbane sorghum values have varied A$90–190/t, a variability of 30–60% (Figure 2). For a property producing 500 tonnes of sorghum this means $45,000–$95,000 difference in income, depending on the timing of sales.

The reference column refers to the section of the GrowNote where you will find the details to help in making decisions. [1]

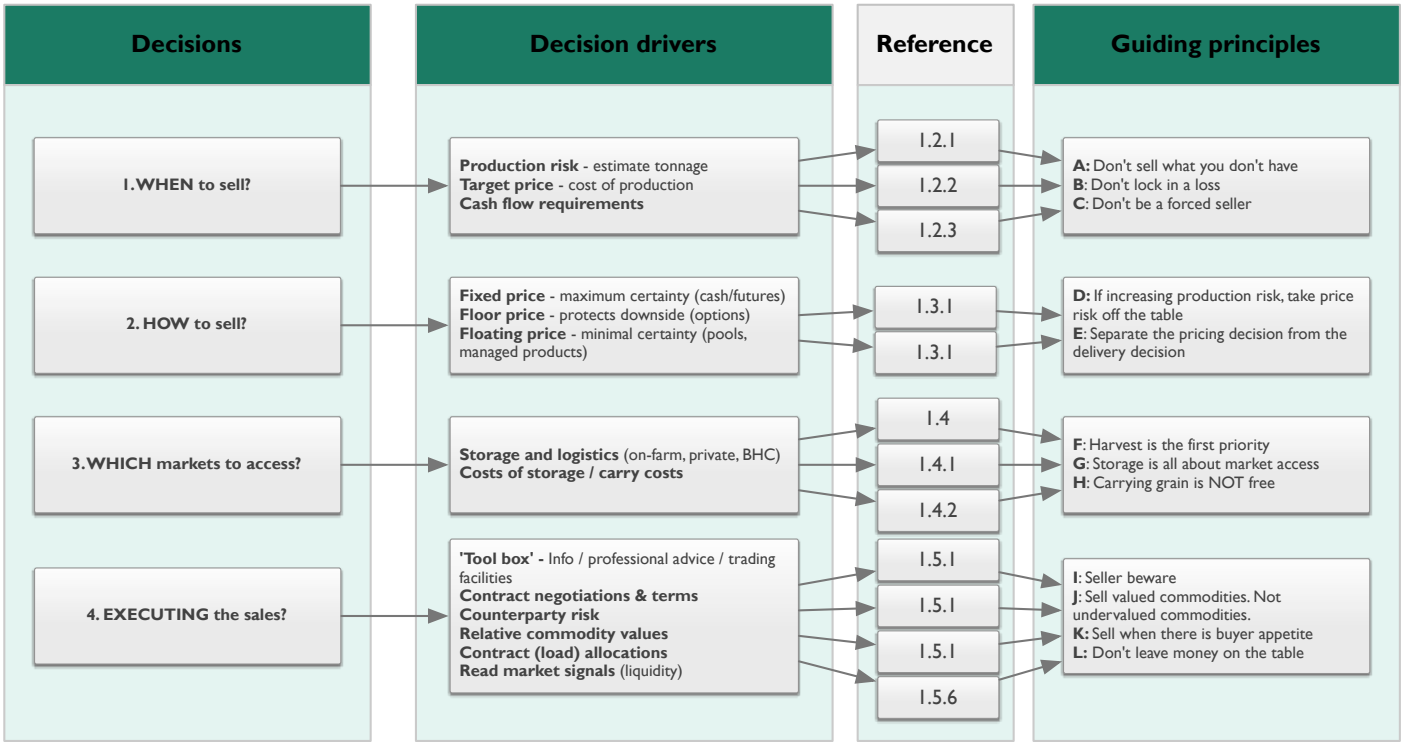



**Figure 1:** *Grain selling flowchart.*

1 Profarmer Australia (2016), Marketing Field Peas, GRDC Northern Field Pea GrowNote

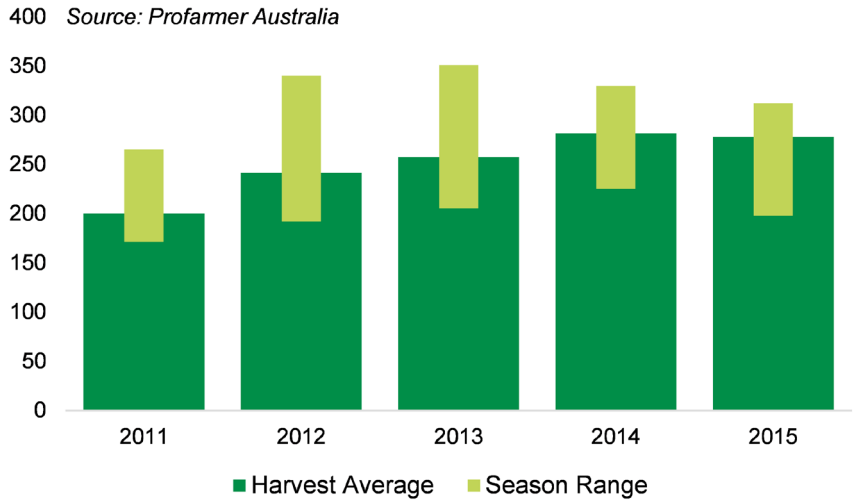



**Figure 2:** *Seasonal variance of Brisbane sorghum values.*

Source: Profarmer Australia

## 15.1 Selling principles

The aim of a selling program is to achieve a profitable average price (the target price) across the entire business. This requires managing several unknowns to establish a target price and then work towards achieving the target price.

Unknowns include the amount of grain available to sell (production variability), the final cost of producing the grain, and the future prices that may result. Australian farm-gate prices are subject to volatility caused by a range of global factors that are beyond our control and are difficult to predict.

The skills growers have developed to manage production unknowns can also be used to manage pricing unknowns. This guide will help growers manage and overcome price uncertainty. [2]

### 15.1.1 Be prepared

Being prepared by having a selling plan is essential for managing uncertainty. The steps involved are forming a selling strategy, and forming a plan for effectively executing sales. The selling strategy consists of when and how to sell.

#### When to sell

Knowing when to sell requires an understanding of the farm's internal business factors, including:

- production risk
- a target price based on the cost of production and the desired profit margin
- business cashflow requirements

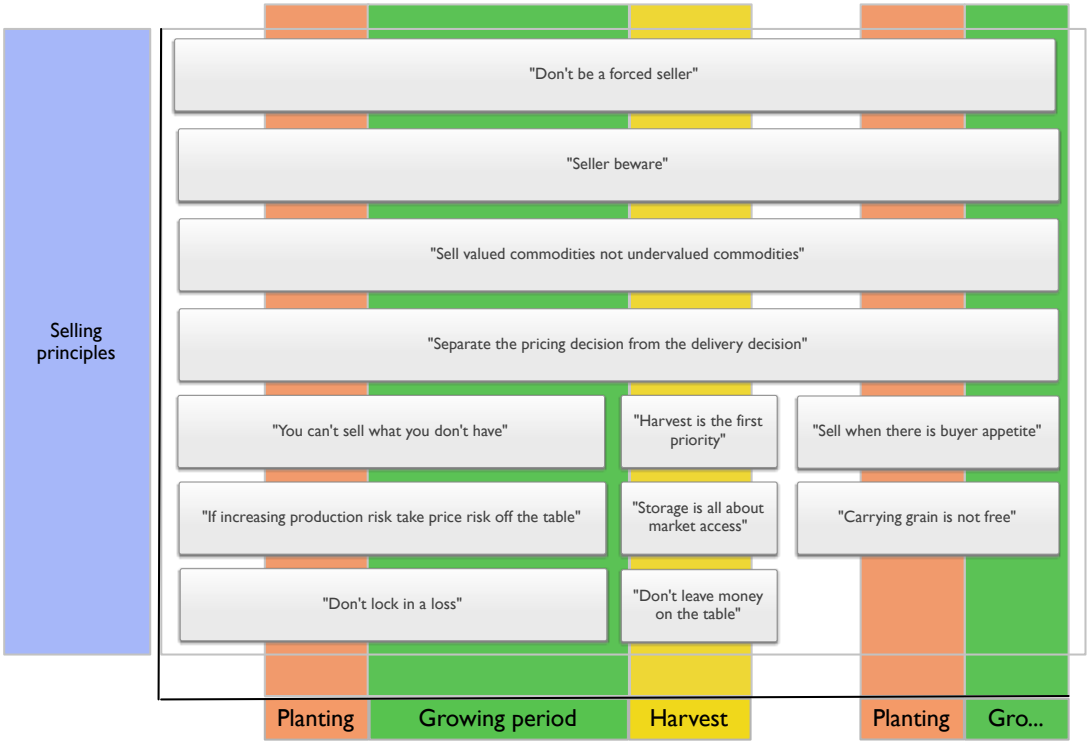
#### How to sell

Working out how to sell your grain is more dependent on external market factors, including:

- the time of year—determines the pricing method
- market access—determines where to sell
- relative value—determines what to sell

2 Profarmer Australia (2016), Marketing Field Peas, GRDC Northern Field Pea GrowNote

The following diagram (Figure 3) lists the key principles to employ when considering sales during the growing season. Exactly when each principle comes into play is indicated in the discussion of marketing planning and timing in the rest of section 15. [3]




***Note to figure:***
The illustration demonstrates the key selling principles throughout the production cycle of a crop.

Profarmer AUSTRALIA

**Figure 3:** *Timeline of grower commodity selling principles.*

Source: Profarmer Australia

## 15.1.2 Establish the business risk profile

Establishing your business risk profile helps you determine when to sell: it allows you to develop target price ranges for each commodity, and provides confidence to sell when the opportunity arises. Typical business circumstances and how to quantify the risks during the production cycle are described below (Figure 4).

3 Profarmer Australia (2016), Marketing Field Peas, GRDC Northern Field Pea GrowNote

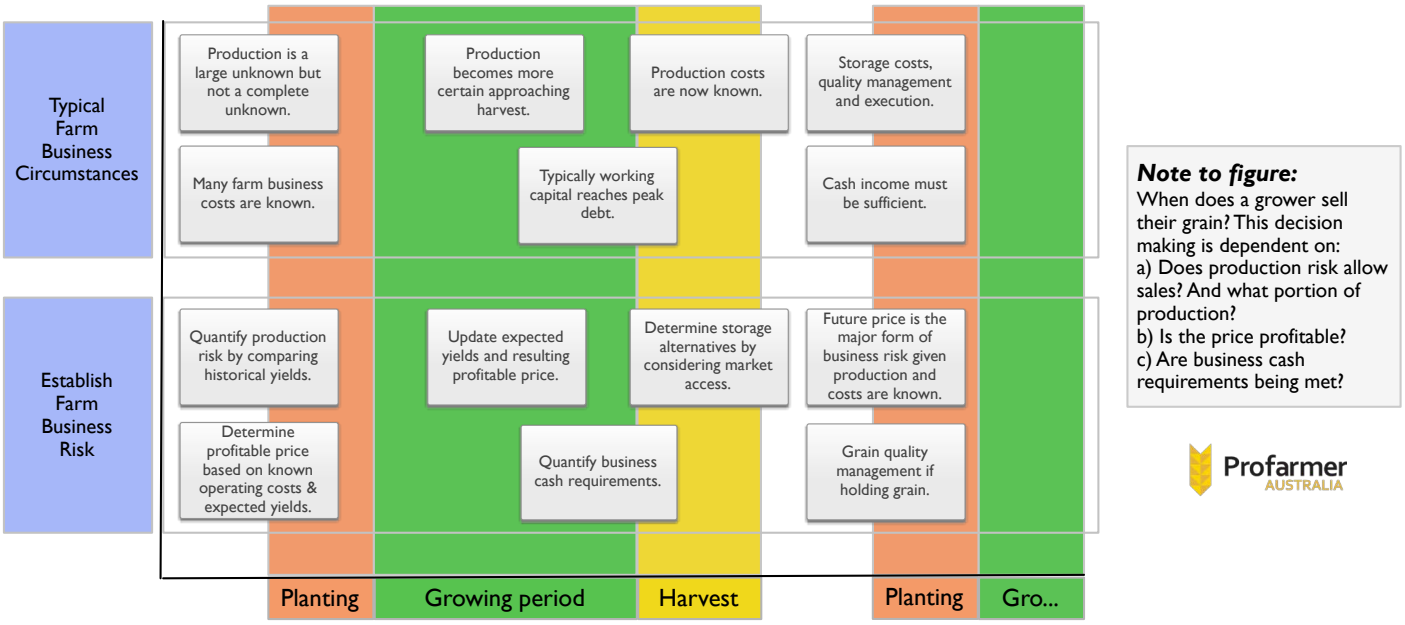



**Figure 4:** *Typical farm business circumstances and risk.*

Source: Profarmer Australia

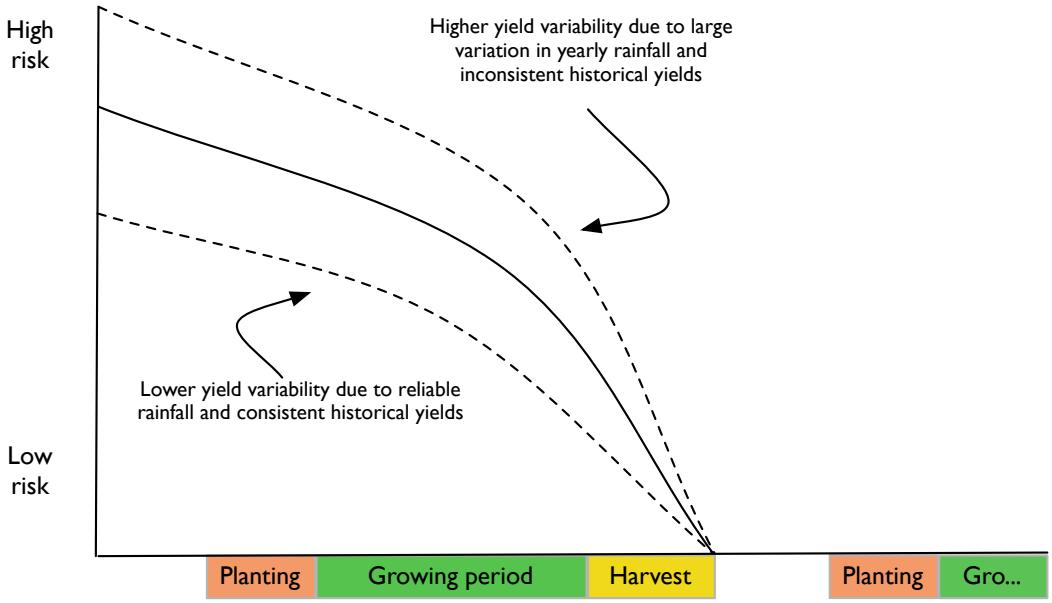
## Production risk profile of the farm

Production risk is the level of certainty around producing a crop and is influenced by location (climate, season and soil type), crop type, crop management, and the time of the year.

**Principle:** You can't sell what you don't have.

Therefore, don't increase business risk by over committing production. Establish a production risk profile (see Figure 5) by:

1. Collating historical average yields for each crop type and a below-average and above-average range.
2. Assessing the likelihood of achieving the average, based on recent seasonal conditions and the seasonal outlook.
3. Revising production outlooks as the season progresses.




***Note to figure:***
The quantity of crop grown is a large unknown early in the year however not a complete unknown. 'You can't sell what you don't have' but it is important to compare historical yields to get a true indication of production risk. This risk reduces as the season progresses and yield becomes more certain. Businesses will face varying production risk levels at any given point in time with consideration to rainfall, yield potential, soil type, commodity etc.

Profarmer AUSTRALIA

**Figure 5:** *Typical risk profile of a farm operation.*

Source: Profarmer Australia

## Establishing a target price

A profitable commodity target price is the cost of production per tonne plus a desired profit margin. It is essential to know the cost of production per tonne for the farm business, which means knowing all farming costs, both variable and fixed.

**Principle:** Don't lock in a loss.

If committing production ahead of harvest, ensure the price will be profitable. The steps needed to calculate an estimated profitable price is based on the total cost of production and a range of yield scenarios, as provided below (Figure 6).

| Estimating cost of production - Wheat | |
|---|---|
| Planted Area | 1,200 ha |
| Estimate Yield | 2.85 t/ha |
| Estimated Production | 3,420 t |
| **Fixed costs** | |
| Insurance and General Expenses | $100,000 |
| Finance | $80,000 |
| Depreciation/Capital Replacement | $70,000 |
| Drawings | $60,000 |
| Other | $30,000 |
| **Variable costs** | |
| Seed and sowing | $48,000 |
| Fertiliser and application | $156,000 |
| Herbicide and application | $78,000 |
| Insect/fungicide and application | $36,000 |
| Harvest costs | $48,000 |
| Crop insurance | $18,000 |
| Total fixed and variable costs | $724,000 |
| Per Tonne Equivalent (Total costs + Estimated production) | $212 /t |
| **Per tonne costs** | |
| Levies | $3 /t |
| Cartage | $12 /t |
| Receival fee | $11 /t |
| Freight to Port | $22 /t |
| Total per tonne costs | $48 /t |
| Cost of production Port track equiv | $259.20 |
| Target profit (ie 20%) | $52.00 |
| **Target price (port equiv)** | **$311.20** |

Step 1: Estimate your production potential. The more uncertain your production is, the more conservative the yield estimate should be. As yield falls, your cost of production per tonne will rise.

Step 2: Attribute your fixed farm business costs. In this instance if 1,200 ha reflects 1/3 of the farm enterprise, we have attributed 1/3 fixed costs. There are a number of methods for doing this (see M Krause "Farming your Business") but the most important thing is that in the end all costs are accounted for.

Step 3: Calculate all the variable costs attributed to producing that crop. This can also be expressed as $ per ha x planted area.

Step 4: Add together fixed and variable costs and divide by estimated production

Step 5: Add on the "per tonne" costs like levies and freight.

Step 6: Add the "per tonne" costs to the fixed and variable per tonne costs calculated at step 4.

Step 7: Add a desired profit margin to arrive at the port equivalent target profitable price.

**Figure 6:** *An example of how to estimate the costs of production.*

Source: Profarmer Australia

GRDC's manual Farming the Business also provides a cost-of-production template and tips on grain selling *v.* grain marketing.

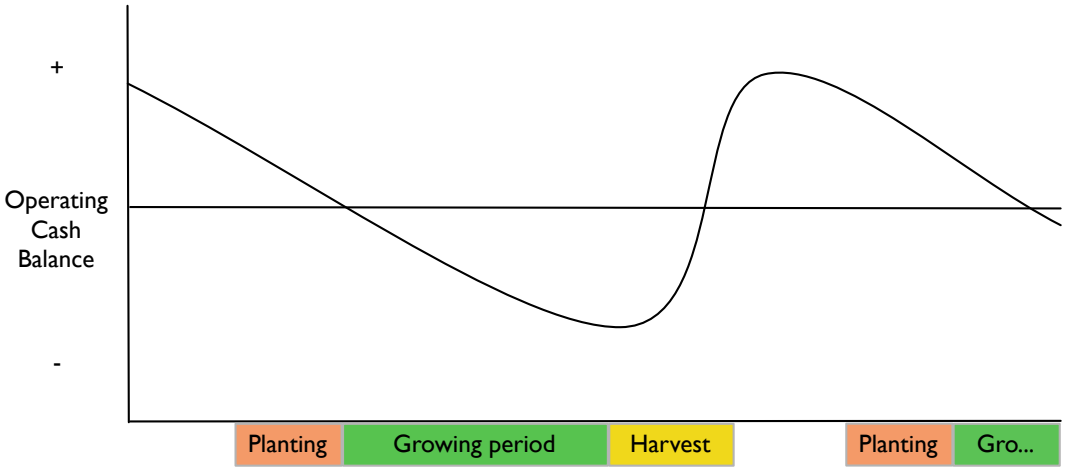
## Income requirements

Understanding farm business cash-flow requirements and peak cash debt enables growers to time grain sales so that cash is available when required. This prevents having to sell grain below the target price to satisfy a need for cash.

**Principle:** Don't be a forced seller.

Be ahead of cash requirements to avoid selling in unfavourable markets.

Typical cash flow to grow a crop are illustrated below (Figures 7 and 8). Costs are incurred up front and during the growing season, with peak working capital debt incurred at or before harvest. Patterns will vary depending on circumstance and enterprise mix. Figure 8 demonstrates how managing sales can change the farm's cash balance.

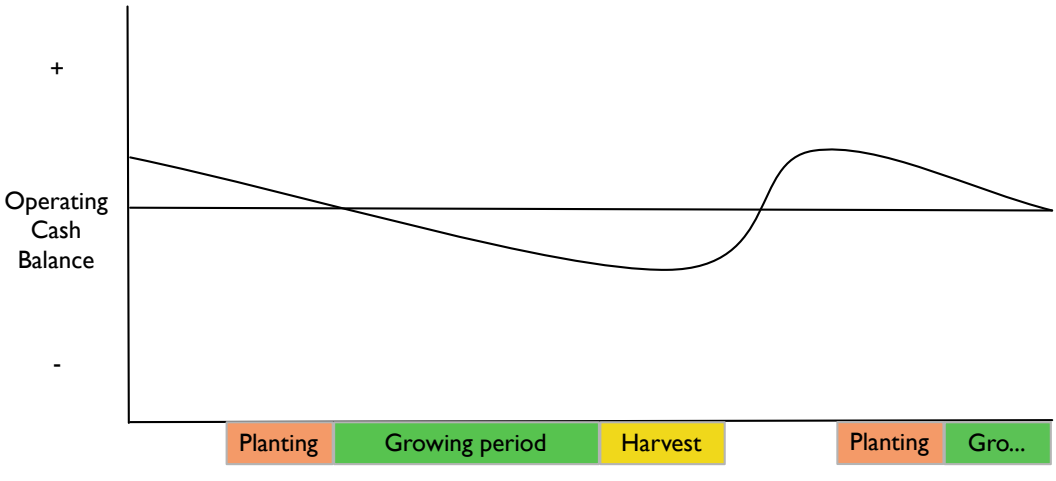



***Note to figure:***
The chart illustrates the operating cash flow of a typical farm assuming a heavy reliance on cash sales at harvest. Costs are incurred during the season to grow the crop, resulting in peak operating debt levels at or near harvest. Hence at harvest there is often a cash injection required for the business. An effective marketing plan will ensure a grower is 'not a forced seller' in order to generate cash flow.

Profarmer AUSTRALIA

**Figure 7:** *A typical operating cash balance when relying on cash sales at harvest.*

Source: Profarmer Australia




***Note to figure:***
By spreading sales throughout the year a grower may not be as reliant on executing sales at harvest time in order to generate required cash flow for the business. This provides a greater ability to capture pricing opportunities in contrast to executing sales in order to fulfil cash requirements.

Profarmer AUSTRALIA

**Figure 8:** *Typical operating cash balance when crop sales are spread over the year.*

Source: Profarmer Australia

The 'when to sell' steps above result in an estimated production tonnage and the risk associated with producing that tonnage, a target price range for each commodity, and the time of year when cash is most needed. [4]

4 Profarmer Australia (2016), Marketing Field Peas, GRDC Northern Field Pea GrowNote

## 15.1.3 Managing your price

The first part of the selling strategy answers the question about when to sell and establishes comfort around selling a portion of the harvest.

The second part of the strategy, managing your price, addresses how to sell your crop.

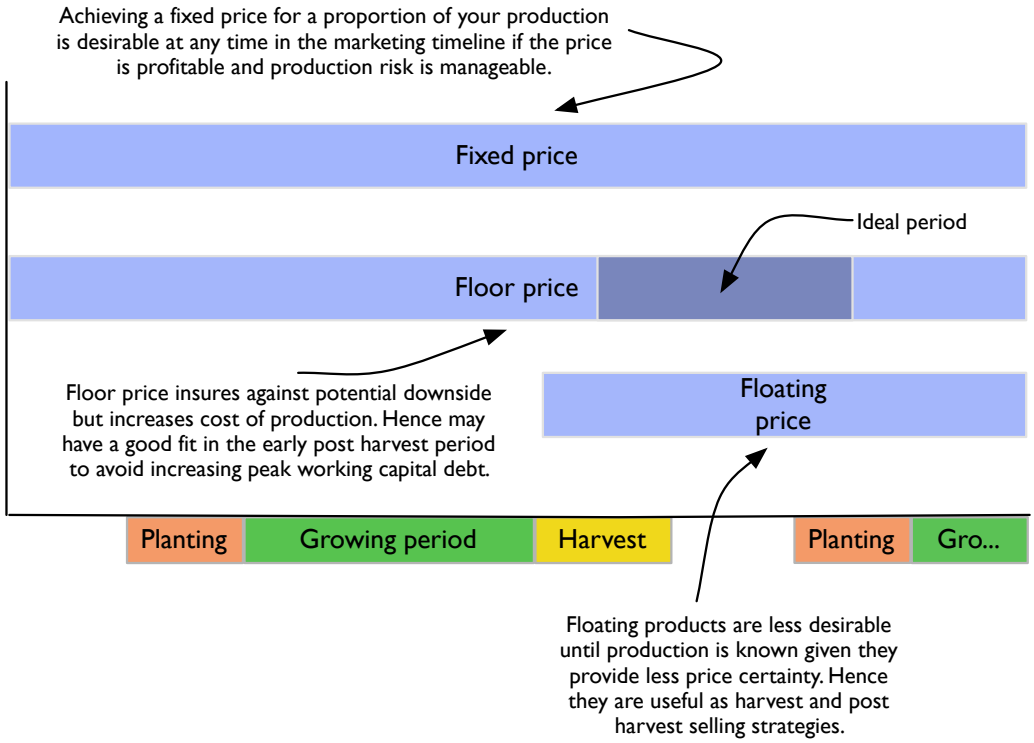
### Methods of price management

Pricing products provide varying levels of price risk coverage, but not all products are available for all crops (Table 1).

**Table 1:** *Pricing methods and how they are used for different crops.*

| | Description | Wheat | Barley | Canola | Oats | Lupins | Field Peas | Chick Peas |
|---|---|---|---|---|---|---|---|---|
| Fixed price products | Provides the most price certainty | Cash, futures, bank swaps | Cash, futures, bank swaps | Cash, futures, bank swaps | Cash | Cash | Cash | Cash |
| Floor price products | Limits price downside but provides exposure to future price upside | Options on futures, floor price pools | Options on futures | Options on futures | none | none | none | none |
| Floating price products | Subject to both price upside and downside | Pools | Pools | Pools | Pools | Pools | Pools | Pools |

Figure 9 summarises how the different methods of price management are suited to the majority of farm businesses.




***Note to figure:***
Different price strategies are more applicable through varying periods of the growing season. If selling in the forward market growers are selling something not yet grown hence the inherent production risk of the business increases. This means growers should achieve price certainty if committing tonnage ahead of harvest. Hence fixed or floor products are favourable. Comparatively a floating price strategy may be effective in the harvest and post harvest period.

Profarmer AUSTRALIA

**Figure 9:** *Price strategy timeline, summarising the suitability for most farm businesses of different methods of price management for different phases of production.*

Source: Profarmer Australia

**Principle:** If increasing production risk, take price risk off the table.

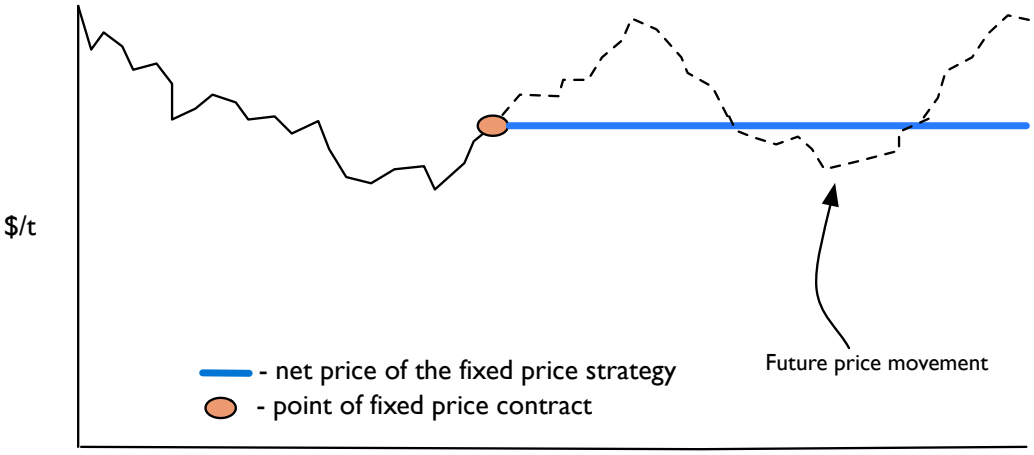
When committing to unknown production, price certainty should be achieved to avoid increasing overall business risk.

**Principle:** Separate the pricing decision from the delivery decision.

Most commodities can be sold at any time with delivery timeframes being negotiable, hence price management is not determined by delivery.

1. *Fixed price*

A fixed price is achieved via cash sales and/or selling a futures position (swaps) (Figure 10). It provides some certainty around expected revenue from a sale as the price is largely a known factor, except when there is a floating component in the price, e.g. a multi-grade cash contract with floating spreads or a floating-basis component on futures positions.




***Note to figure:***
Fixed price product locks in price and provides certainty over what revenue will be generated regardless of future price movement.

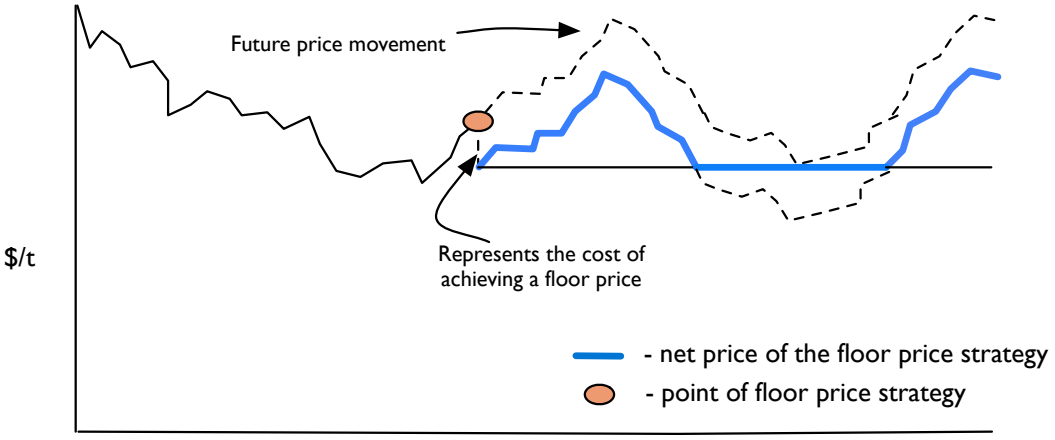
Profarmer AUSTRALIA

**Figure 10:** *Fixed price strategy.*

Source: Profarmer Australia

2. *Floor price*

Floor price strategies (Figure 11) can be achieved by utilising options on a relevant futures exchange (if one exists), or via a managed-sales program (i.e. a pool with a defined floor price strategy) offered by a third party. This pricing method protects against potential future price decrease while capturing any price increase. The disadvantage is that this kind of price 'insurance' has a cost, which adds to the farm's cost of production.




***Note to figure:***
A floor price strategy insures against potential future downside in price while allowing price gains in the event of future price rallies.

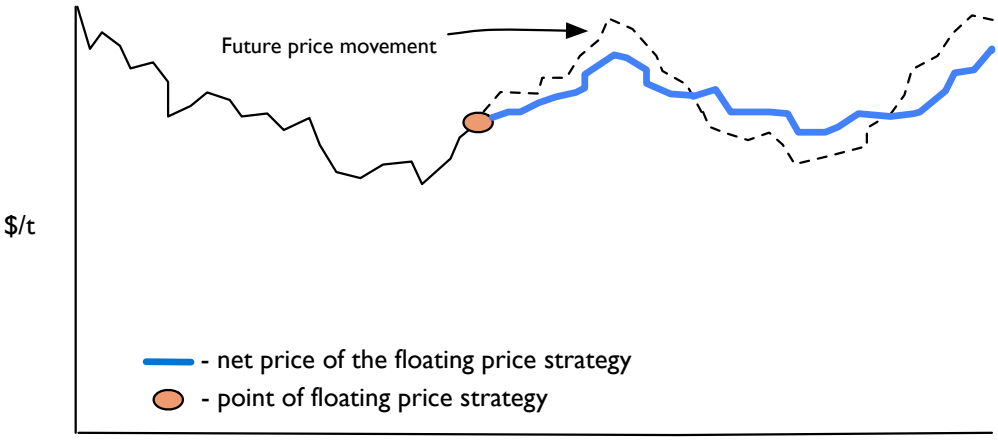
Profarmer AUSTRALIA

**Figure 11:** *Floor price strategy.*

Source: Profarmer Australia

3. *Floating price*

Many of the pools or managed-sales programs are a floating price, where the net price received will move up and down with the future movement in price (Figure 12). Floating price products provide the least price certainty and are best suited for use at or after harvest rather than before harvest.




***Note to figure:***
A floating price will move to some extent with future price movements.

Profarmer AUSTRALIA

**Figure 12:** *Floating price strategy.*

Source: Profarmer Australia

Having considered the variables of production for the crop to be sold, and how these fit against the different pricing mechanisms, the farmer may revise their selling strategy, taking the risks associated with each mechanism into account.

Fixed price strategies include physical cash sales or futures products, and provide the most price certainty, but production risk must be considered.

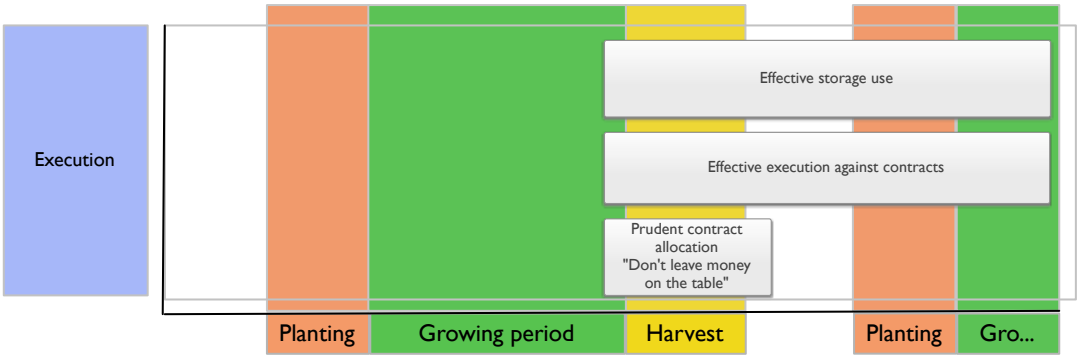
Floor price strategies include options or floor price pools. They provide a minimum price with upside potential and rely less on production certainty, but cost more.

Floating price strategies provide minimal price certainty, and so are best used after harvest. [5]

## 15.1.4 Ensuring access to markets

Once the questions of when and how to sell are sorted out, planning moves to the storage and delivery of commodities to ensure timely access to markets and execution of sales. Planning where to store the commodity is an important component of ensuring the type of access to the market that is likely to yield the highest return (Figure 13).

5 Profarmer Australia (2016), Marketing Field Peas, GRDC Northern Field Pea GrowNote




***Note to figure:***
Once a grower has made the decision to sell the question becomes how they achieve this? The decision on how to sell is dependent on:
a) Time of the year determines the pricing method
b) Market Access determines where to sell.
c) Relative value determines what to sell.

Profarmer AUSTRALIA

**Figure 13:** *Storage decisions are influenced by selling decisions and the timing of all farming activities.*

Source: Profarmer Australia

## Storage and logistics

The return on investment from grain handling and storage expenses is optimised when storage is considered in light of market access so as to maximise returns as well as harvest logistics.

Storage alternatives include variations of bulk handling, private off-farm storage, and on-farm storage. Delivery and quality management are key considerations in deciding where to store your commodity (Figure 14).

**Principle:** Harvest is the first priority.

During harvest, getting the crop into the bin is the most critical aspect of business success; hence storage, sale and delivery of grain should be planned well ahead of harvest to allow the grower to focus on the harvest itself.

Bulk export commodities requiring significant quality management are best suited to the bulk handling system. Commodities destined for the domestic end user market, (e.g. feedlot, processor, or container packer), may be more suited to on-farm or private storage to increase delivery flexibility.

Storing commodities on the farm requires prudent quality management to ensure that the grain is delivered to the agreed specifications. If not well planned and carried out, it can expose the business to high risk. Penalties for out-of-specification grain arriving at a buyer's weighbridge can be expensive, as the buyer has no obligation to accept it. This means the grower may have to incur the cost of taking the load elsewhere, and may also have to find a new buyer.

On-farm storage also requires that delivery is managed to ensure that the buyer receives the commodities on time and with appropriate weighbridge and sampling tickets.

**Principle:** Storage is all about market access.

Storage decisions depend on quality management and expected markets.

For more information on on-farm storage alternatives and economics refer to Section 13: Grain Storage.

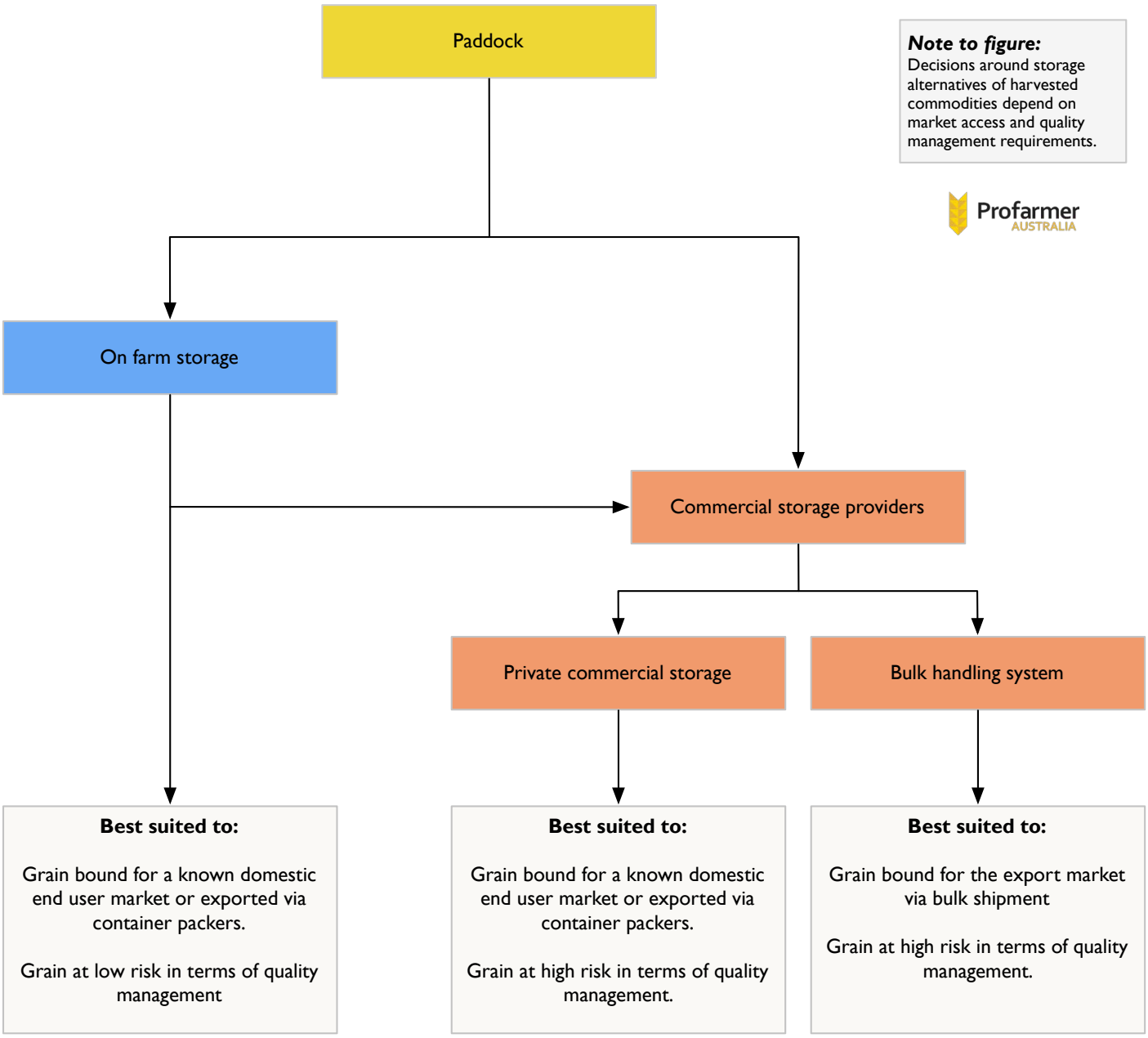



**Figure 14:** *Grain storage decision-making.*

Source: Profarmer Australia

## Cost of holding grain

Storing grain to access sales opportunities post-harvest invokes a cost to 'carry', or hold, the grain (Figure 15). Price targets for carried grain need to account for the cost of carrying it. Carrying costs are typically $3–4/t per month and consist of:

- monthly storage fee charged by a commercial provider (typically ~$1.50–2.00/t)
- monthly interest associated with having wealth tied up in grain rather than available as cash or for paying off debt (~$1.50–$2.00/t, depending on the price of the commodity and interest rates).

The price of carried grain therefore needs to be $3–4/t per month higher than the price offered at harvest.

The cost of carrying also applies to grain stored on the farm, as there is the cost of the capital invested in the farm storage plus the interest component. A reasonable assumption is a cost of $3–4/t per month for on-farm storage.

**Principle:** Carrying grain is not free.

The cost of carrying grain needs to be accounted for if holding it for sale after harvest is part of the selling strategy.

If selling a cash contract with deferred delivery, a carrying charge can be negotiated into the contract. For example, a March sale of canola for March–June delivery on the buyers call at a price of $300/t + $3/t carrying per month, would generate revenue of $309/t delivered in June.

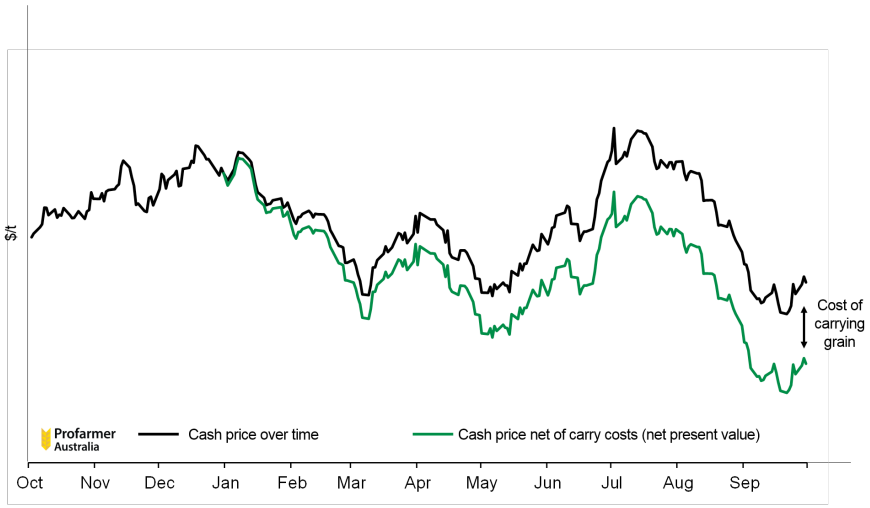



**Figure 15:** *Cash values v. cash values adjusted for the cost of carrying.*

Source: Profarmer Australia

Optimising farm-gate returns involves planning the appropriate storage strategy for each commodity so as to improve market access and ensure that carrying costs are covered in the price received. [6]

## 15.1.5 Converting tonnes into cash

This section provides guidelines for converting the selling and storage strategy into cash by effective execution of sales.

### Set up the toolbox

Selling opportunities can be captured when they arise by assembling the necessary tools in advance. The toolbox for converting tonnes of grain into cash includes the following.

1. Timely information—this is critical for awareness of selling opportunities and includes:

- market information provided by independent parties
- effective price discovery including indicative bids, firm bids and trade prices
- other market information pertinent to the particular commodity.

2. Professional services—grain-selling professional services and cost structures vary considerably. An effective grain-selling professional will put their clients' best interests first by not having conflicts of interest and by investing time in the relationship. A better return on investment for the farm business is achieved through higher farm-gate prices, which are obtained by accessing timely information, and being able to exploit the seller's greater market knowledge and greater market access.

6 Profarmer Australia (2016), Marketing Field Peas, GRDC Northern Field Pea GrowNote

## MORE INFORMATION

Access to buyers, brokers, agents, products and banks through Grain Trade Australia

Commodity futures brokers

ASX's Find a futures broker

3. Futures account and a bank-swap facility—these accounts provide access to global futures markets. Hedging futures markets is not for everyone; however, strategies which utilise exchanges such as the Chicago Board of Trade (CBOT) can add significant value.

### How to sell for cash

Like any market transaction, a cash–grain transaction occurs when a bid by the buyer is matched by an offer from the seller. Cash contracts are made up of the following components, with each component requiring a level of risk management (Figure 16):

- Price—future price is largely unpredictable, so devising a selling plan to put current prices into the context of the farm business is critical to managing price risk.
- Quantity and quality—when entering a cash contract, you are committing to deliver the nominated amount of grain at the quality specified, so production and quality risks must be managed.
- Delivery terms—the timing of the title transfer from the grower to the buyer is agreed at time of contracting. If this requires delivery direct to end users, it relies on prudent execution management to ensure delivery within the contracted period.
- Payment terms—in Australia, the traditional method of contracting requires title on the grain to be transferred ahead of payment, so counterparty risk must be managed.

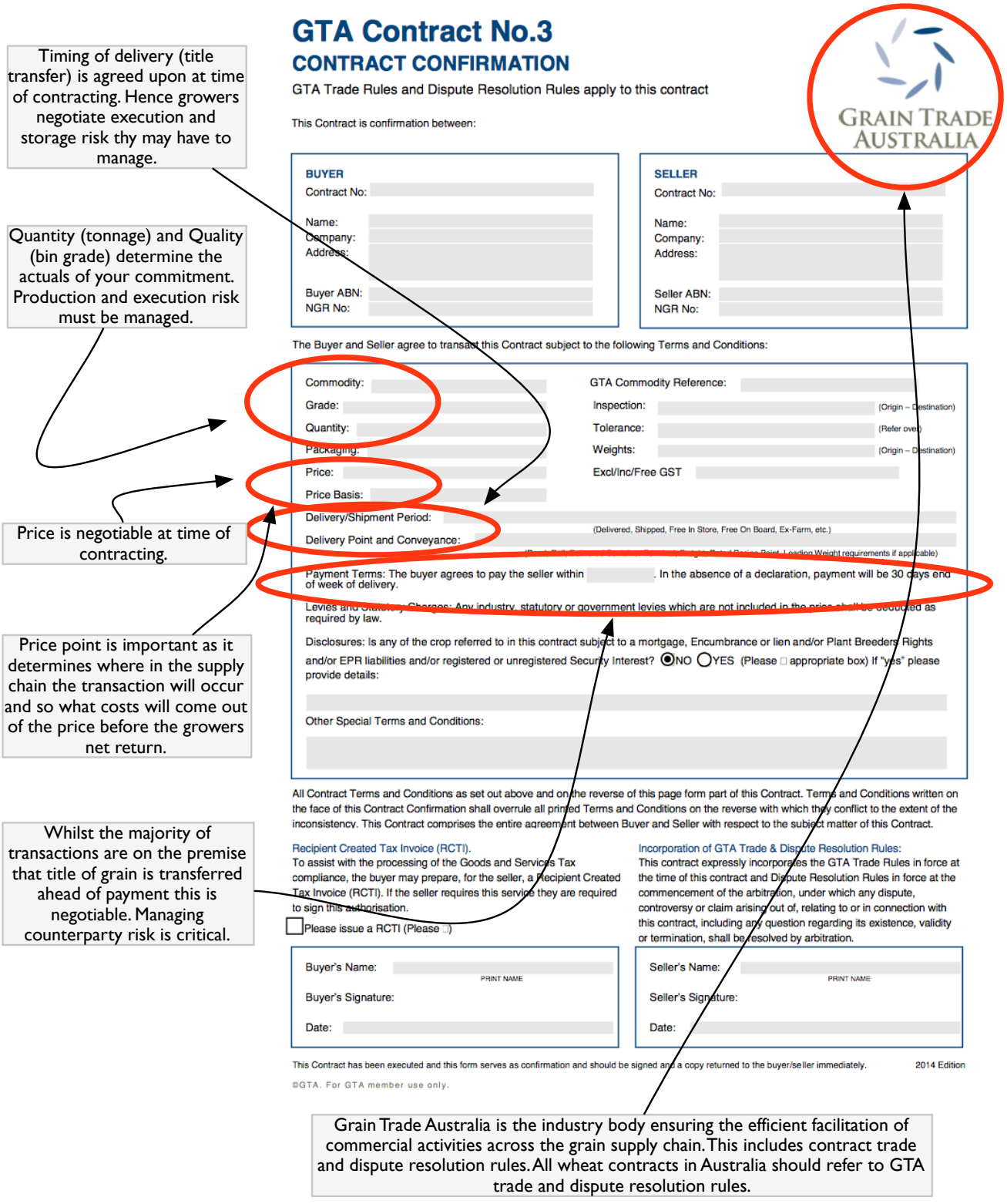
Timing of delivery (title transfer) is agreed upon at time of contracting. Hence growers negotiate execution and storage risk thy may have to manage.

Quantity (tonnage) and Quality (bin grade) determine the actuals of your commitment. Production and execution risk must be managed.

Price is negotiable at time of contracting.

Price point is important as it determines where in the supply chain the transaction will occur and so what costs will come out of the price before the growers net return.

Whilst the majority of transactions are on the premise that title of grain is transferred ahead of payment this is negotiable. Managing counterparty risk is critical.



**GTA Contract No.3**

**CONTRACT CONFIRMATION**

GTA Trade Rules and Dispute Resolution Rules apply to this contract

GRAIN TRADE AUSTRALIA

This Contract is confirmation between:

**BUYER**
Contract No:
Name:
Company:
Address:
Buyer ABN:
NGR No:

**SELLER**
Contract No:
Name:
Company:
Address:
Seller ABN:
NGR No:

The Buyer and Seller agree to transact this Contract subject to the following Terms and Conditions:

Commodity:
Grade:
Quantity:
Packaging:
Price:
Price Basis:
Delivery/Shipment Period:
Delivery Point and Conveyance: (Delivered, Shipped, Free In Store, Free On Board, Ex-Farm, etc.)

GTA Commodity Reference:
Inspection: (Origin – Destination)
Tolerance: (Refer over)
Weights: (Origin – Destination)
Excl/Inc/Free GST

Payment Terms: The buyer agrees to pay the seller within . In the absence of a declaration, payment will be 30 days end of week of delivery.

Levies and Statutory Charges: Any industry, statutory or government levies which are not included in the price shall be deducted as required by law.

Disclosures: Is any of the crop referred to in this contract subject to a mortgage, Encumbrance or lien and/or Plant Breeders' Rights and/or EPR liabilities and/or registered or unregistered Security Interest? ◉NO ○YES (Please □ appropriate box) If "yes" please provide details:

Other Special Terms and Conditions:

All Contract Terms and Conditions as set out above and on the reverse of this page form part of this Contract. Terms and Conditions written on the face of this Contract Confirmation shall overrule all printed Terms and Conditions on the reverse with which they conflict to the extent of the inconsistency. This Contract comprises the entire agreement between Buyer and Seller with respect to the subject matter of this Contract.

Recipient Created Tax Invoice (RCTI).
To assist with the processing of the Goods and Services Tax compliance, the buyer may prepare, for the seller, a Recipient Created Tax Invoice (RCTI). If the seller requires this service they are required to sign this authorisation.
☐ Please issue a RCTI (Please □)

Incorporation of GTA Trade & Dispute Resolution Rules:
This contract expressly incorporates the GTA Trade Rules in force at the time of this contract and Dispute Resolution Rules in force at the commencement of the arbitration, under which any dispute, controversy or claim arising out of, relating to or in connection with this contract, including any question regarding its existence, validity or termination, shall be resolved by arbitration.

Buyer's Name: PRINT NAME
Buyer's Signature:
Date:

Seller's Name: PRINT NAME
Seller's Signature:
Date:

This Contract has been executed and this form serves as confirmation and should be signed and a copy returned to the buyer/seller immediately. 2014 Edition

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Grain Trade Australia is the industry body ensuring the efficient facilitation of commercial activities across the grain supply chain. This includes contract trade and dispute resolution rules. All wheat contracts in Australia should refer to GTA trade and dispute resolution rules.

**Figure 16:** *Typical terms of a cash contract.*

Source: Grain Trade Australia

The price point within a cash contract will depend on where the transfer of grain title will occur along the supply chain. Figure 17 depicts the terminology used to describe these points and the associated costs to come out of each price before growers receive their net return.

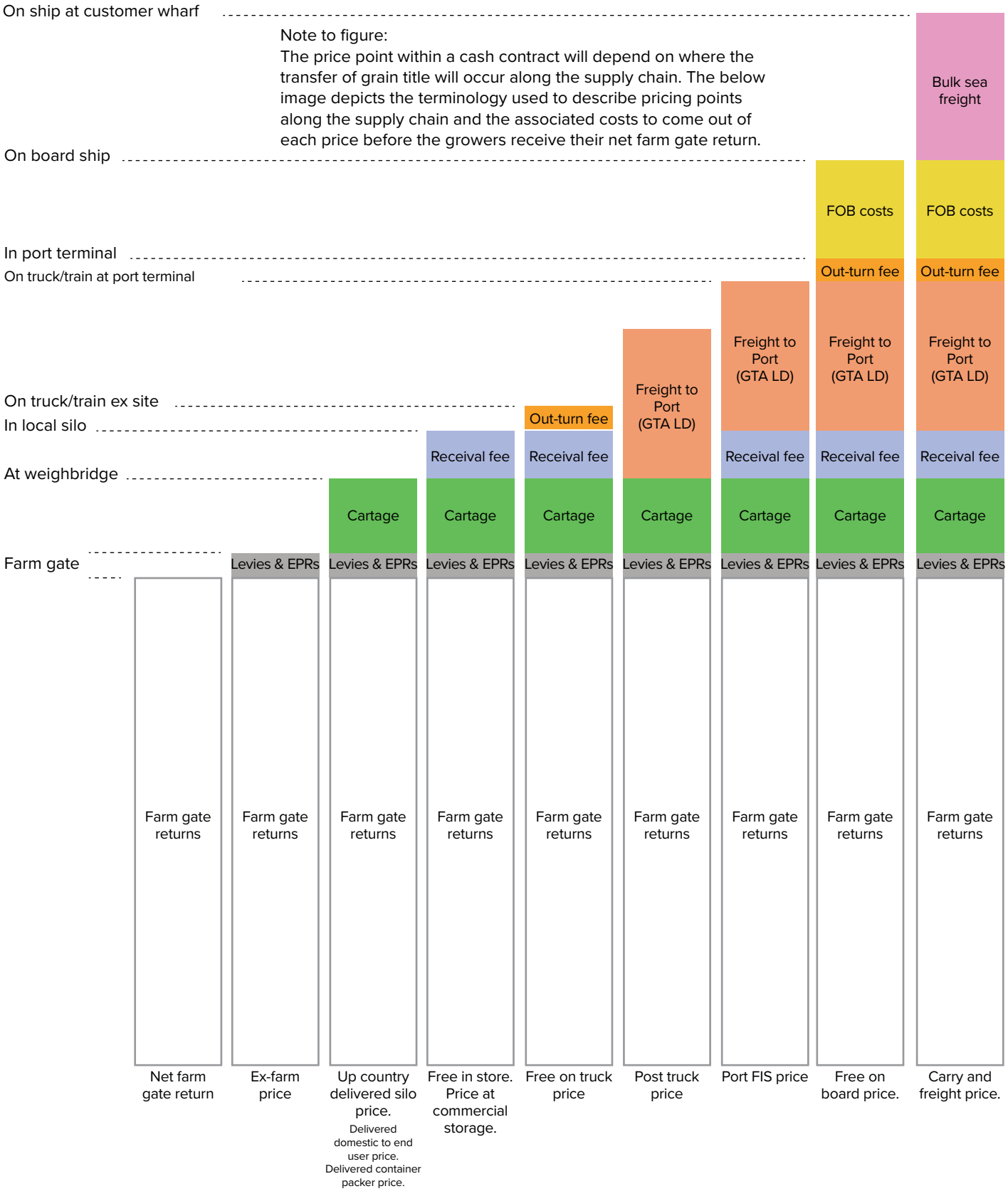



**Figure 17:** *Cost and pricing points throughout the supply chains.*

Source: Profarmer Australia

## MORE INFORMATION

http://www.graintrade.org.au/contracts

http://www.graintrade.org.au/commodity_standards

http://www.graintransact.com.au

http://www.grainflow.com.au

http://emeraldgrain.com/grower-logins/

https://www.cleargrain.com.au/terms-and-conditions

https://www.cleargrain.com.au/get-started

## MORE INFORMATION

GTA managing counterparty risk 14/7/2014

Clear Grain Exchange title transfer model

GrainGrowers guide to managing contract risk

Counterparty risk: A producer perspective, Leo Delahunty

Cash sales generally occur through three methods:

- Negotiation via personal contact—traditionally prices are posted as a public indicative bid. The bid is then accepted or negotiated by a grower with the merchant or via an intermediary. This method is the most common and is available for all commodities.
- Accepting a public firm bid—cash prices in the form of public firm bids are posted during harvest and for warehoused grain by merchants on a site basis. Growers can sell their parcel of grain immediately by accepting the price on offer via an online facility and then transfer the grain online to the buyer. The availability of this option depends on location and commodity.
- Placing an anonymous firm offer—growers can place a firm offer price on a parcel of grain anonymously and expose it to the entire market of buyers, who then bid on it anonymously using the Clear Grain Exchange, which is an independent online exchange. If the offer and bid match, the particulars of the transaction are sent to a secure settlement facility, although the title on the grain does not transfer from the grower until they receive funds from the buyer. The availability of this option depends on location and commodity. Anonymous firm offers can also be placed to buyers by an intermediary acting on behalf of the grower. If the grain sells, the buyer and seller are disclosed to each counterparty.

### Counterparty risk

Most sales involve transferring the title on the grain prior to being paid. The risk of a counterparty defaulting when selling grain is very real and must be managed. Conducting business in a commercial and professional manner minimises this risk.

**Principle:** Seller beware.

There is not much point selling for an extra $5/t if you don't get paid.

Counterparty risk management includes:

- Dealing only with known and trusted counterparties.
- Conducting a credit check (banks will do this) before dealing with a buyer they are unsure of.
- Selling only a small amount of grain to unknown counterparties.
- Considering credit insurance or a letter of credit from the buyer.
- Never delivering a second load of grain if payment has not been received for the first.
- Not parting with the title before payment, or requesting and receiving a cash deposit of part of the value ahead of delivery. Payment terms are negotiated at time of contracting. Alternatively, the Clear Grain Exchange provides secure settlement whereby the grower maintains title on the grain until they receive payment, and then title and payment are settled simultaneously.

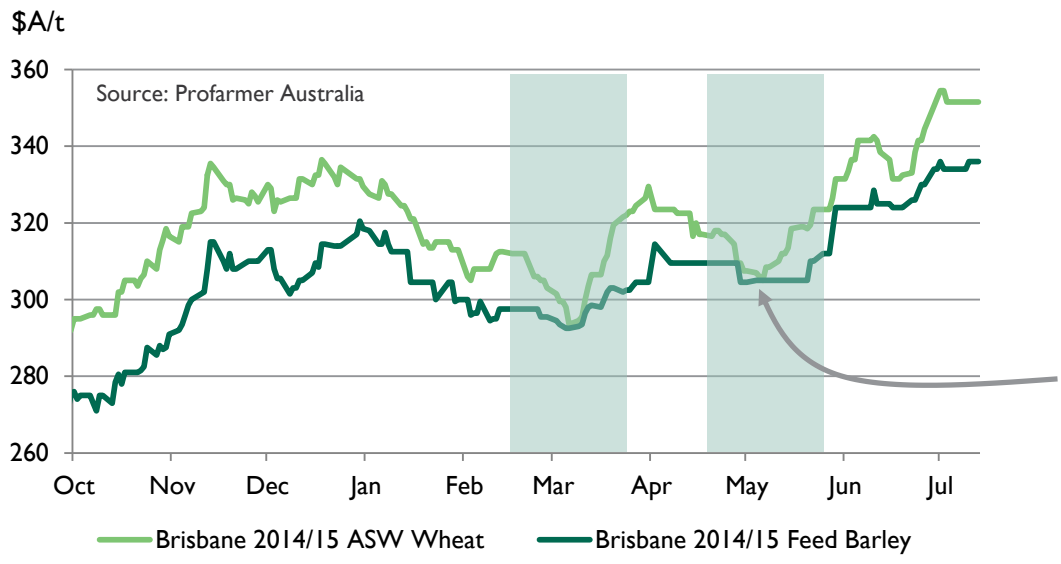
Above all, act commercially to ensure the time invested in implementing a selling strategy is not wasted by poor management of counterparty risk.

### Relative values

Grain sales revenue is optimised when selling decisions are made in the context of the whole farming business. The aim is to sell each commodity when it is priced well, and to hold commodities that are not well priced at any given time. That is, give preference to the commodities with the highest relative value. This achieves price protection for the overall revenue of the farm business and enables more flexibility to a grower's selling program while achieving the business goal of reducing overall risk.

**Principle:** Sell valued commodities, not undervalued commodities.

If one commodity is priced strongly relative to another, focus sales there. Don't sell the cheaper commodity for a discount. For example, a farmer with wheat and barley to sell will sell the one that is getting good prices relative to the other, and hold the other for the meantime (see Figure 18).



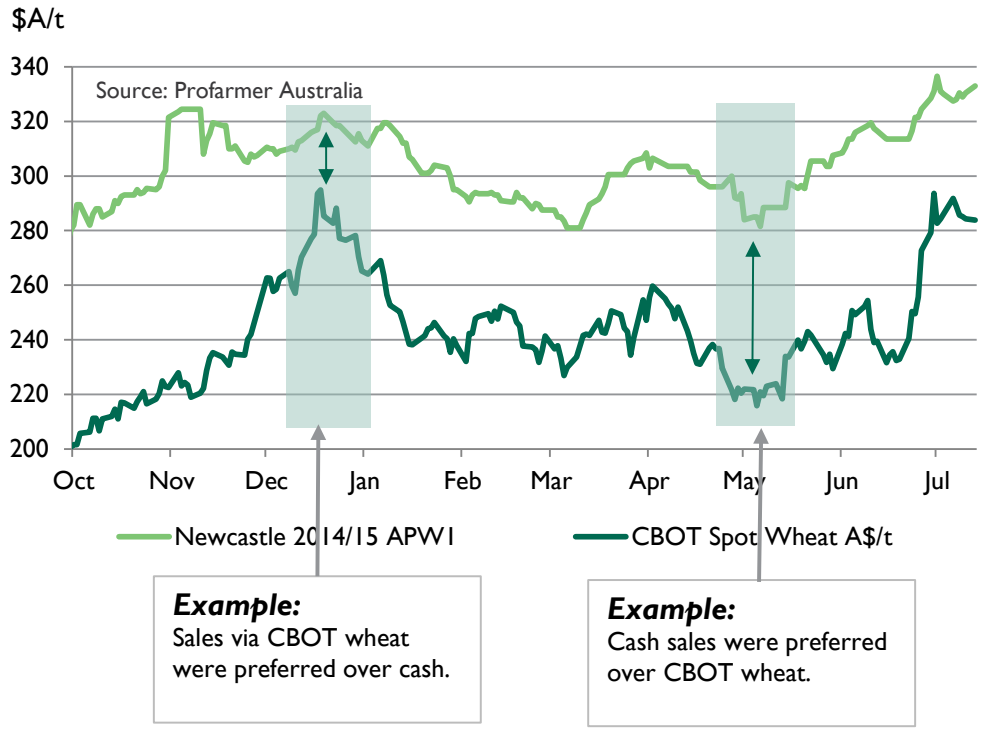

***Note to figure:***
Price relativities between commodities is one method of assessing which grain types 'hold the greatest value' in the current market.

***Example:***
Feed barley prices were performing strongly relative to ASW wheat values (normally ~15% discount) hence selling feed barley was more favourable than ASW wheat during this period.

**Figure 18:** *Brisbane ASW wheat v. feed barley are compared, and the barley held until it is favourable to sell it.*

Source: Profarmer Australia

If the decision has been made to sell wheat, CBOT wheat may be the better choice if the futures market is showing better value than the cash market (Figure 19).




***Note to figure:***
Once the decision to take price protection has been made, choosing which pricing method to use is determined by which selling methods 'hold the greatest value' in the current market.

**Figure 19:** *By comparing prices for Newcastle APWI vs CBOT wheat, the grower can see which market to sell into.*

Source: Profarmer Australia

## Contract allocation

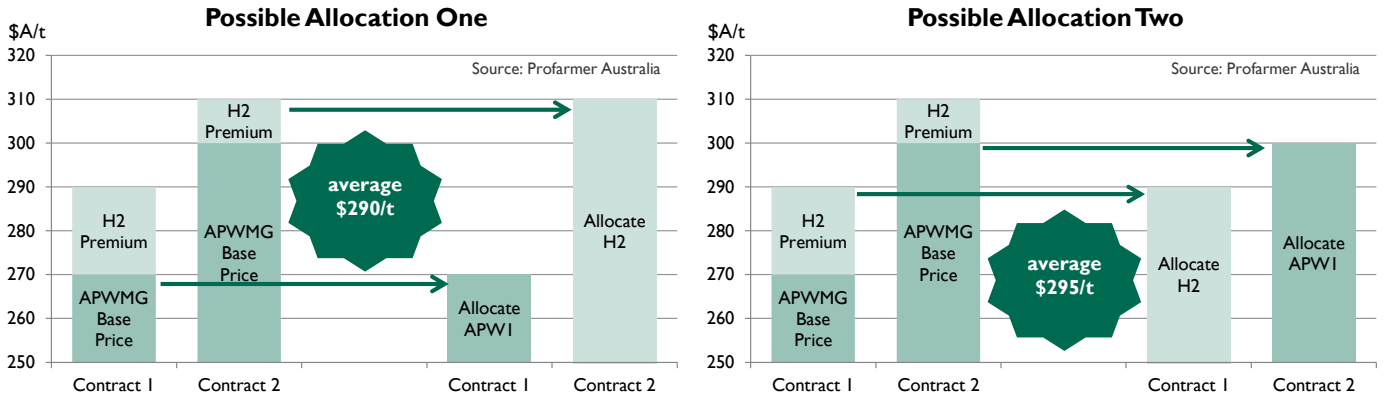
Contract allocation means choosing which contracts to allocate your grain against come delivery time. Different contracts will have different characteristics (e.g. price, premiums-discounts, oil bonuses), and optimising your allocation reflects directly on your bottom line.

**Principle:** Don't leave money on the table.

Contract allocation decisions don't take long, and can be worth thousands of dollars to your bottom line.

To achieve the best average price for their crop growers should:

- allocate lower grades of grain to contracts with the lowest discounts.
- allocate higher grades of grain to contracts with the highest premiums (Figure 20).




***Note to figure:***
In these two examples the only difference between acheiving an average price of $290/t and $295/t is which contracts each parcel was allocated to. Over 400/t that equates to $2,000 which could be lost just in how parcels are allocated to contracts.

**Figure 20:** *How the crop is allocated across contracts can have an impact of earnings from the crop. Although this example uses wheat, the same principle applies for sorghum.*

Source: Profarmer Australia

## Read market signals

The appetite of buyers to buy a particular commodity will differ over time depending on market circumstances. Ideally growers should aim to sell their commodity when buyer appetite is strong, and stand aside from the market when buyers are not very interested.

**Principle:** Sell when there is buyer appetite.

When buyers are chasing grain, growers have more market power to demand the price they want.

Buyer appetite can be monitored by:

- The number of buyers at or near the best bid in a public bid line-up. If there are many buyers, it could indicate that buyer appetite is strong. However, if one buyer is offering $5/t above the next best bid, it may mean that cash prices are susceptible to falling $5/t as soon as that buyer satisfies their appetite.
- Monitoring actual trades against public indicative bids. When trades are occurring above indicative public bids it may indicate strong appetite from merchants and the ability for growers to offer their grain at price premiums to public bids.

The selling strategy is converted to maximum business revenue by:

- ensuring timely access to information, advice and trading facilities.
- using different cash-market mechanisms when appropriate.
- minimising counterparty risk by conducting effective due diligence.
- understanding relative value and selling commodities when they are priced well.
- thoughtful contract allocation.
- reading market signals to extract value from the market or to prevent selling at a discount. [7]

## 15.2 Northern sorghum: market dynamics and execution

### 15.2.1 Price determinants for northern sorghum

In a normal year Australia produces 1.5–2.2 Mt of sorghum. Australia is a small producer of sorghum relative to global production, accounting for 2–3% of the global crop. Over 99% of sorghum grain produced in Australia is grown in Queensland and northern NSW.

Although it is only a small player in terms of production, Australia is an important contributor to global sorghum trade, accounting for 12–14% of global sorghum exports. On average, Australia exports approximately 50% of the sorghum production in each year, while the remainder of the crop will find buyers in the domestic feed or ethanol markets. Ethanol consumes approximately 150 kt of sorghum in Queensland each year.

The major sorghum-exporting nations are USA, Argentina and Australia; these three countries account for 90–95% of global sorghum trade. The major importing nations are China, Japan and Mexico, which account for 75–90% of world sorghum imports.

The proportion of the Australian crop that is exported is great enough that a major determinant of Australian sorghum values is the price at which international trade is transacting. This is influenced by:

- global supply *v.* demand
- the quality of the global crop
- the timing of Australian exports

Traditionally Australia's main export markets have been Japan and New Zealand, where Australian sorghum is used for animal feed. Combined these two nations would account for ~90% of Australian sorghum exports.

However, in 2013 China showed a strong appetite for Australian sorghum, and over three years volumes to China grew to over 90% of Australian sorghum exports (Figure 21). The increase in demand from China was a combination of demand for alcohol and demand for stockfeed. The alcohol market is serviced primarily by container, whereas the stockfeed market is serviced via a combination of bulk and container exports.

Since then changes to Chinese import regulations for feed grain has resulted in a reduction in Chinese demand for Australian sorghum. The dynamics of this market continue to evolve.

7 Profarmer Australia (2016), Marketing Field Peas, GRDC Northern Field Pea GrowNote

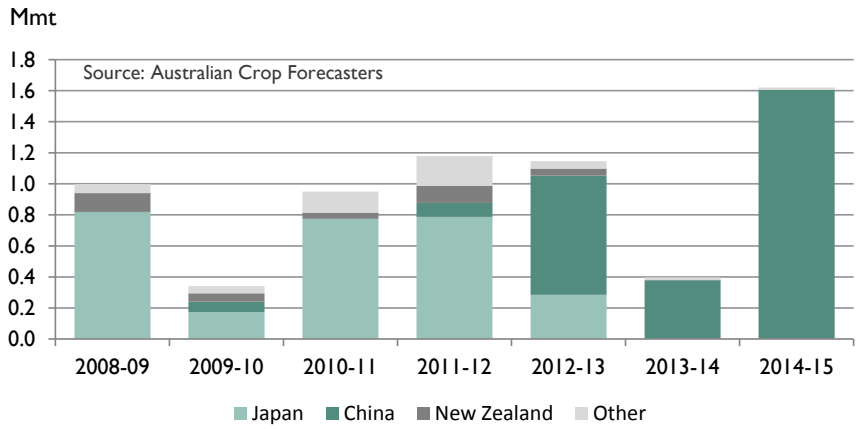



**Figure 21:** *Fluctuations in Australian sorghum export markets and quantities from 2008 to 2015.*

Source: Australian Crop Forecasters

As sorghum is an important input to animal-feed rations in domestic and export markets, sorghum prices are also influenced by relative values to other feed grains such as wheat, barley and corn (Figure 22). [8]

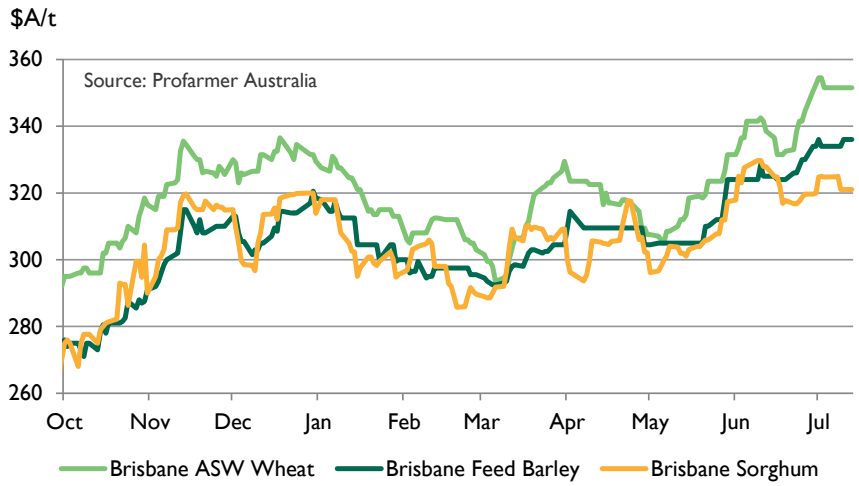



**Figure 22:** *Relative prices for Brisbane feed grains, 2014–15.*

Source: Profarmer Australia

## 15.2.2 Ensuring market access for northern sorghum

Australian sorghum generally ends up in one of four major markets:

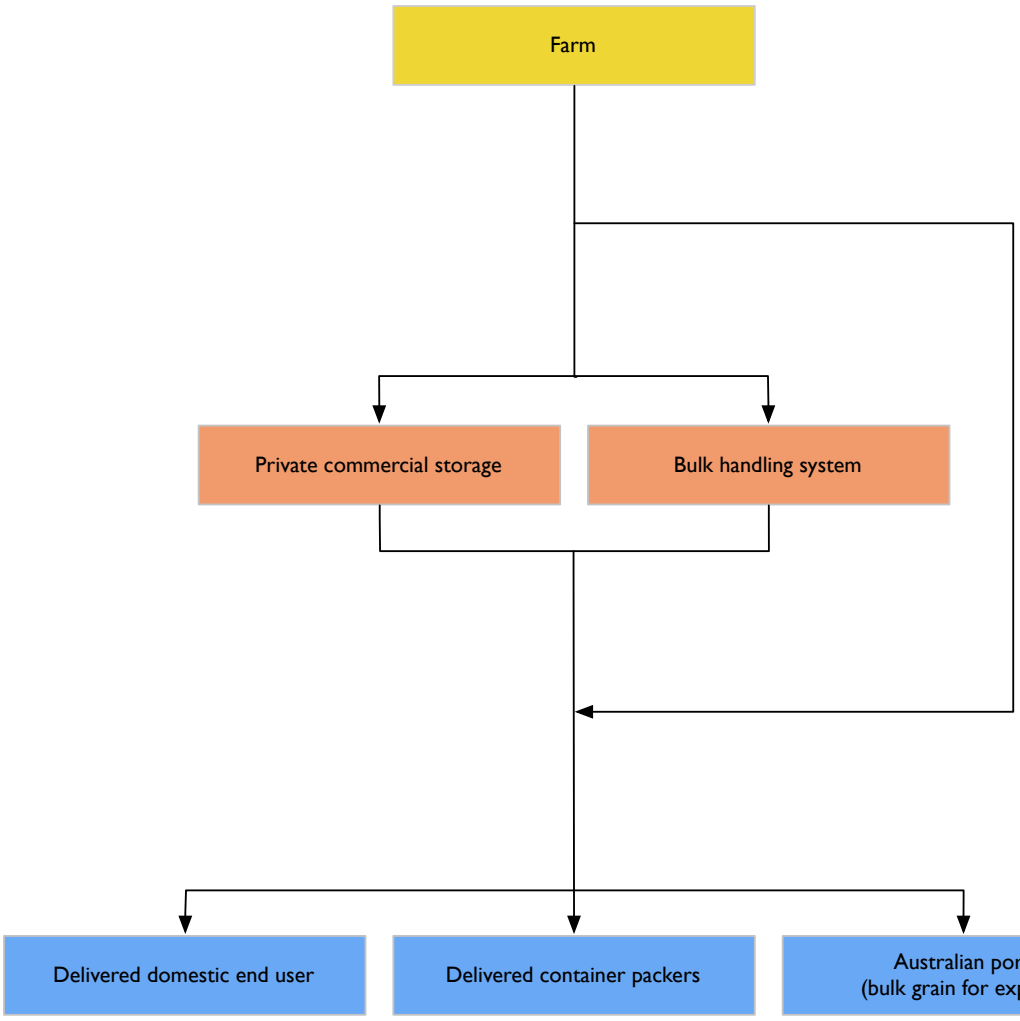
1. Domestic market for use as stockfeed
2. Domestic market for use as biofuel
3. Export market for use as stockfeed
4. Export market for human consumption and alcohol.

Of the sorghum that is destined for export markets, over 90% is executed via bulk export vessels rather than container exports. Hence the bulk handling system is an effective means for sorghum destined for the export market.

8 Profarmer Australia (2016), Marketing Field Peas, GRDC Northern Field Pea GrowNote

For off-spec sorghum, sorghum destined for domestic consumption or container-packing markets, on-farm storage may be cheaper than off-farm storage.

For sorghum that is destined for export markets, understanding whether they are likely to ship via bulk export or in containers can help to inform storage decisions and ensure market access (Figure 23). Although the bulk-handling system can be cheaper for product destined for bulk export, storage on the farm and delivery direct to the end user is likely to be cheaper and also more flexible in the domestic and container export markets. [9]




***Note to figure:***
Storage decisions should be determined by assessing market access. The large majority of northern canola is exported in bulk. Hence the bulk handling system should provide efficiencies to market. NSW also services a relatively large domestic market and private commercial and on-farm storage should provide a reasonable method to access these markets.

Profarmer AUSTRALIA

**Figure 23:** *Australian supply chain flow.*

Source: Profarmer Australia

## 15.2.3 Converting tonnes into cash for northern sorghum

Growers of sorghum have a number of avenues to convert tonnes into cash.

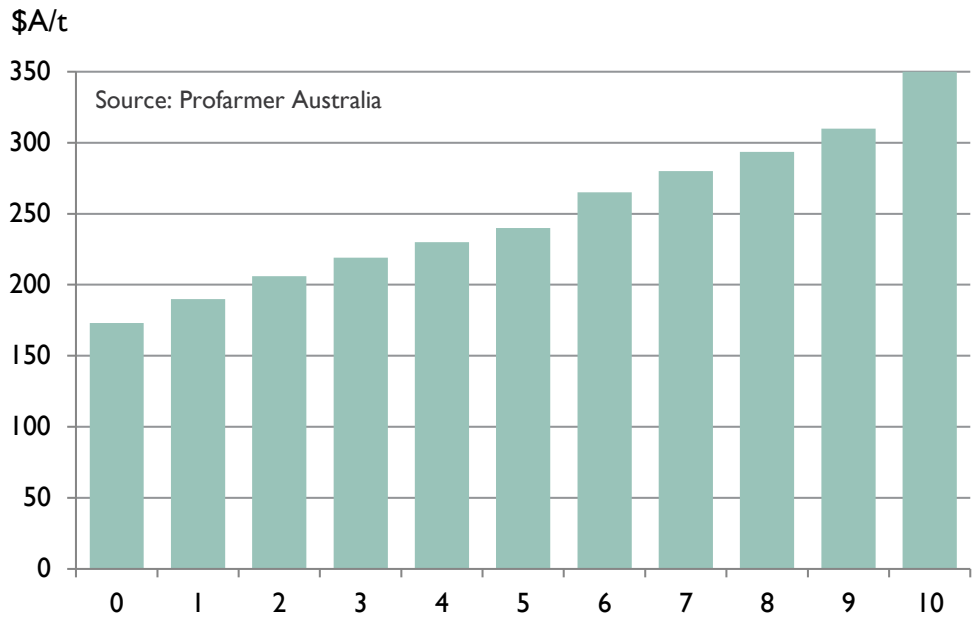
In the forward market, forward multigrade contracts for fixed tonnages are available. An important consideration of any forward contract is the quality of grain that is deliverable against the contract. There are a number of receival grades for sorghum, from SOR1 down to SORX, so it is important to consider which grade you may end up delivering and whether this will meet the terms of your contract.

9 Profarmer Australia (2016), Marketing Field Peas, GRDC Northern Field Pea GrowNote

Only SOR1 is acceptable for the human-consumption and alcohol markets, unless otherwise specifically negotiated with the buyer.

Delivery periods on forward contracts are also an important consideration. Premiums may be offered for prompt delivery; however, the seller needs to ensure they will be able to meet a commitment to deliver.

It can be important to separate the delivery decision from the pricing decision when making sales of sorghum. This means that, at times, it may be advantageous to secure a price in the current market for delivery at a later, but pre-defined, time. This may be achieved through contracts that contain delivery dates in the future, or through the use of forward multigrade contracts with various delivery periods. Rather than waiting until being ready to deliver the grain to the customer, using a contract with delivery at a point in the future allows the seller to lock in the price in advance of delivery, rather than remaining exposed to the risk of prices falling up to the delivery date. Decile charts can help the farmer determine where to set their price (Figure 24). [10]




***Note to figure:***
Decile charts such as the one to the left provide us an indication of how current values are performing relative to historical values. For example, a decile of 8 or above indicates current values are in the top 20% of historical price observations.

**Figure 24:** *Brisbane sorghum deciles. Deciles provide an indication of price performance relative to historical values. Decile 1 indicates values in the bottom 10% of historical observations, and a decile 9 indicates the top 10%.*

Source: Profarmer Australia

## MORE INFORMATION

Sorghum marketing guide

Grain Trade Australia, sorghum trading standards

10 Profarmer Australia (2016), Marketing Field Peas, GRDC Northern Field Pea GrowNote

**MORE INFORMATION**

http://www.graintrade.org.au/

**Figure 25:** *Ripe grain on the eve of harvest.*

Photo: Jill Alexander, AppliedAg

## 15.3 Marketing options for ergot-contaminated grain

Although there is a 0.3% sclerote contamination limit for sorghum intended for livestock, some end users will not accept ergot-contaminated grain. Grower pigs, chickens and laying hens are most tolerant of the alkaloids in sclerotes, and so are a potential market for sorghum that contains 0.3% sclerotes.

While this 0.3% limit remains for all other uses, stockfeed intended for feedlot cattle has been further limited to 0.1% sclerotes by weight since 2004.

Deliveries of sorghum with sclerote levels >0.3% will be rejected by grain merchants, and >0.1% will be rejected by cattle feedlotters. Most commonly, a sorghum sample containing 0.3% sclerote will contain ~1 mg alkaloid/kg (1 ppm), but because the alkaloid concentration can vary, it will be advisable to minimise ergot wherever possible. Some end-users will not accept ergot-contaminated grain at all.

Sorghum with levels higher than the stockfeed limit can be mixed with clean grain to reduce the sclerote levels. Fortunately, the incidence of ergot contamination of bulk grain has been extremely low over the past few years. If large amounts of sorghum become ergot-contaminated in future, then alkaloid estimation should be undertaken in order to plan for end-uses.

Several effective analytical tests have been developed for this purpose. These tests are provided by the Department of Agriculture, Fisheries and Forestry, Queensland (QDAF), but additional laboratories will eventually be able to provide this service. [11]

**MORE INFORMATION**

http://www.hsrseeds.com.au/pdf/news/HSR_MR_007_WhiteSorghum.pdf

http://www.daff.qld.gov.au/plants/field-crops-and-pastures/broadacre-field-crops/sorghum/planting-information

http://www.apri.com.au/1B-114_Final_Research_Report_101019.pdf

11 QDAF (2010) The biology, management and toxicity of sorghum. Department of Agriculture, Fisheries and Forestry Queensland, http://www.daff.qld.gov.au/plants/field-crops-and-pastures/broadacre-field-crops/sorghum/disease-management/biology-management-and-toxicity-of-sorghum-ergot

## 15.4 Weather-damaged or mouldy grains

There is a legislated limit of 0.02 mg/kg for aflatoxin B1 in grain sold for stockfeed in Queensland. Testing over many years has indicated that that sorghum is unlikely to contain this limit without a history of high-moisture storage. Aflatoxins are not a significant risk in weathered sorghum. No other mycotoxins are legislated against in sorghum in Australia.

Marketing and use of mould-affected grain often presents a dilemma for growers and livestock producers, and usually rests on how much the grain should be discounted.

The key questions that need to be answered are whether the nutritional content has been affected and whether fungal toxins (mycotoxins) are present in high enough concentrations to adversely affect livestock.

### 15.4.1 Two groups of toxins

Growers need to be aware of two main groups of toxins in sorghum, which are controlled under Queensland stock food regulations. The first group is ergot alkaloids, produced by sorghum ergot growing prior to harvest, and the second is aflatoxins, which are mainly produced if sorghum is stored with high moisture content. Other types of mould associated with 'weathering' generally produce only slight affects on the feeding value of the grain.

**Figure 26:** *Immature sclerotes of* Claviceps africana.

### 15.4.2 Variable levels of toxin

Sclerotes of *Claviceps africana* (Figure 2) contain toxic chemicals, in particular the ergot alkaloid dihydroergosine. Feeding trials have established that sorghum contaminated with sclerotes can affect milk production in cows and sows, and weight gain in cattle. There is large variation in the levels of alkaloids (and toxicity) between ergot-contaminated grain samples, a result of differences in the maturity of the sclerotes and perhaps other factors such as weather and variety.

If ergot is present at harvest, delays can occur from clogging of machinery by honeydew on the heads; however, ergots are toxic to livestock, whereas honeydew is not.

### 15.4.3 Weathered grain

Weathering refers to any deterioration in the appearance of grain caused by climatic influences on a crop. This results in:

- shrunken and pinched grain, following drought or from soil fertility constraints
- discoloured grain, often covered with black, gray, pink or orange fungal growth (mould), after extensive warm, humid periods during grain maturation (Figure 4)

- premature germination of the grain, caused by wet or humid weather conditions at harvest, resulting in sprung, shot or sprouted grain

**Figure 27:** *Grain mould on sorghum.*

## 15.4.4 Mouldy grain

Various fungi are associated with weathered grain, mostly requiring moisture contents of >20% to grow, so they are rarely a problem after harvest. The most important of these is *Alternaria alternata*.

These moulds can produce mycotoxins, but even in very badly affected grain, these toxins rarely reach concentrations that can adversely affect livestock. Pigs and poultry are far more likely to be affected than are cattle and other ruminants. There have been instances of false oestrus in young pigs from zearalenone from *Fusarium* species, and of slightly impaired feed conversion in pigs, and altered feathering in chickens, from very badly weathered sorghum in central Queensland, possibly from *Alternaria* mycotoxins. Dilution of damaged grain or not feeding it to young livestock will minimise this risk.

Mould growth in storage, particularly of *Aspergillus* species, will occur when grain is stored having a high moisture content or suffers water damage during storage. Lightweight material and weed seeds increase the risk because they block aeration channels in the grain. If grain is stored with high moisture contents (14–20%), resultant heating promotes the growth of *Aspergillus* fungi. These produce aflatoxins, which can cause severe liver damage and reduce growth rates in pigs and other livestock. There have been several instances of this occurring in Queensland grain-growing areas.

## 15.4.5 Nutritional changes

Nutritional changes can result from weathering of grain, and this varies depending on the cause. Grain that is shrunken and pinched from drought or impaired soil fertility will have reduced starch content and increased fibre. Protein and lysine are usually higher, but less available for pigs and poultry. Such grain will be lightweight and have reduced value as feed. Grain that is in the early stages of sprouting (shot or sprung) can have a slightly increased digestibility for pigs.

Mould growth in sorghum can also reduce its value for pigs and poultry feed mixes (there is little effect on ruminants). In severe instances, reduction of the nutritional value of grain occurs by the removal of fat and starch and the hydrolysis of protein. The amount of fibre in mouldy grain will increase relative to the decline in starch, protein components and lipids and, in some instances, lead to reductions in digestible and metabolisable energy. However, in the most cases, nutritional changes in weathered grain due to mould growth are slight. Badly damaged grain often exhibits ‘off’ aromas and flavours, which pigs may find unpalatable; caution is warranted when feeding young pigs where maximum feed intakes are sought.