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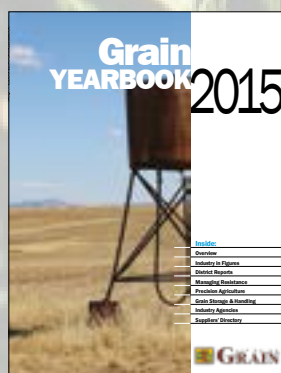
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**FRONT COVER:**

After the rush! A post harvest scene in South Australia's Mid North between Laura and Caltowie. Typical of many regions across the national grain belt, the 2014 winter crop was average to slightly above but "coodabeen anything" with rain in spring and fewer heavy frosts. (PHOTO: Paul Stephenson)



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# Section

# 1

## Overview

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## Australia area ('000 ha) and production ('000 tonnes) of major winter and summer crops planted for grain during 2014

	NSW		VIC		QLD		WA		SA		TAS		AUSTRALIA TOTAL	
2014-15	Area	Prodn	Area	Prodn	Area	Prodn	Area	Prodn	Area	Prodn	Area	Prodn	AREA	PROD'N
Wheat	3900	6725	1613	2700	840	1050	5097	8900	2350	4650	7	32	13807	24057
Barley	640	1184	908	1590	100	150	1285	3075	870	1931	7	24	3810	7954
Oats (for grain)	250	270	128	193	20	10	230	495	81	132	3	7	712	1127
Triticale	50	105	31	48	1	1	19	26	50	67	1	2	152	248
Sorghum#	180	585	1	2	422	1200	1	3					604	1790
Maize#	22	180	2	12	41	176	1	7					66	374
Rice#	70	680	0.5	2	0.5	2							71	684
Canola	650	904	453	550	1	0.5	1322	1630	285	328			2711	3413
Sunflowerseed#	17	23			7	7							24	30
Soybean#	18	38	0.6	0.8	8	15							27	54
Peanuts#	0.2	0.8			7.5	18							8	19
Cottonseed#	136	439			74	226							210	665
Lupins	56	66	32	40			287	382	68	75			443	563
Field peas	51	79	51	47			25	33	110	125			237	284
Chickpeas	209	282	26	15	165	201	3	4	21	16			424	517
Faba beans	33	77	62	79	3	5	4	7	62	83			164	251
Mung beans#	10	9			25	22							35	31
Navy bean#					5	6							5	6
Lentils	1	1	86	93					102	162			189	256
<b>TOTAL</b>	<b>6281</b>	<b>11725</b>	<b>3440</b>	<b>7153</b>	<b>1701</b>	<b>3235</b>	<b>8450</b>	<b>17591</b>	<b>3731</b>	<b>8176</b>	<b>19</b>	<b>66</b>	<b>23698</b>	<b>42305</b>

# Estimate for summer crop harvested in 2015. Principal source: ABARES.

## Farmers' terms of trade from Australian grain production (base year is 1997-98 = 100)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16 (forecast)
<b>PRICES RECEIVED</b>							
Wheat	110.4	130.1	114.6	158.3	162.1	152.1	164.0
Barley	108.3	135.8	131.7	173.4	165.1	182.1	189.8
Canola	114.2	141.1	133.1	142.1	134.2	124.6	134.0
Lupins	127.2	136.9	118.7	173.5	177.3	149.3	152.3
Oats	116.9	143.2	147.7	172.9	179.2	189.2	184.7
Sorghum	115.9	125.8	111.6	148.8	171.3	175.9	159.9
<b>Total grains</b>	<b>108.8</b>	<b>126.3</b>	<b>115.7</b>	<b>147.9</b>	<b>148.7</b>	<b>145.3</b>	<b>153.2</b>
<b>PRICES PAID</b>							
Fuel & lubricants	191.7	211.3	228.2	216.8	221.1	189.8	161.4
Fertiliser	156.0	157.3	165.5	157.9	153.2	154.7	159.4
Chemicals	116.2	110.4	112.6	110.3	113.6	114.7	118.1
Seed	109.4	120.0	116.4	128.0	130.0	130.2	135.4
Marketing	134.0	144.8	154.1	153.6	159.2	151.4	144.2
Interest paid	111.2	122.3	114.9	96.4	85.3	79.7	83.4
Rates & taxes	144.9	149.4	153.0	156.4	160.5	164.5	168.6
Insurance	167.0	173.7	185.8	190.0	195.0	199.8	204.8
Other overheads (incl. labour)	140.6	143.9	147.3	151.8	155.7	159.6	163.6
Capital items	144.8	149.3	153.2	157.0	161.4	165.7	170.1
<b>Total prices paid*</b>	<b>140.8</b>	<b>144.8</b>	<b>147.2</b>	<b>145.2</b>	<b>145.6</b>	<b>146.4</b>	<b>149.4</b>
<b>TERMS OF TRADE</b>	<b>77.3</b>	<b>87.2</b>	<b>78.6</b>	<b>101.9</b>	<b>102.1</b>	<b>99.2</b>	<b>102.5</b>

Note: Terms of trade is the ratio of the index of prices received and the index of prices paid by farmers. \* Excludes livestock costs, fodder, breeding stock etc. Sources: ABARES, ABS



# The global grains outlook

## ABARES' FORECASTS AT A GLANCE...

- In 2015–16 the world indicator price for corn is forecast to increase, while the world indicator prices for wheat and soybeans are forecast to fall.
- World indicator prices for grains and oilseeds are projected to average lower in real terms over the period to 2019–20, compared with the five years to 2014–15.
- World corn production is forecast to fall in 2015–16, reflecting a decline in area planted coinciding with an increase in area planted to soybeans.
- Growth in grains and oilseeds production over the medium term is expected to be concentrated in relatively low cost producing regions, including the Black Sea region and Latin America.
- Australian grains and oilseeds production is projected to rise over the outlook period and is expected to support an increase in export volumes.

## World outlook for 2015–16

### World grain prices, 2015–16

#### Wheat

The world wheat indicator price (US no. 2 hard red winter, fob Gulf) is forecast to average US\$265 a tonne in 2015–16, compared with US\$270 a tonne in 2014–15.

Assuming average seasonal conditions in 2015–16, an increase in the supply of high-quality milling wheat is expected despite an overall decline in world wheat production. In the previous year, there were low supplies of milling grade wheat (including hard red winter wheat) in the US and harvest quality issues in other major wheat producing countries. A risk to the price forecast is the uncertainty (at the time of writing) around the condition of the northern hemisphere winter wheat crop, when it emerged from dormancy.

#### Coarse grains

The world coarse grains indicator price (US no. 2 yellow corn, fob Gulf) is forecast to increase by 8 per cent in 2015–16 to average US\$193 a tonne. This reflects an expected increase in demand for corn and a forecast decline in production from the record achieved in 2014–15. The world barley indicator price (France feed barley, fob Rouen) is forecast to increase by 9 per cent in 2015–16 to average US\$226 a tonne.

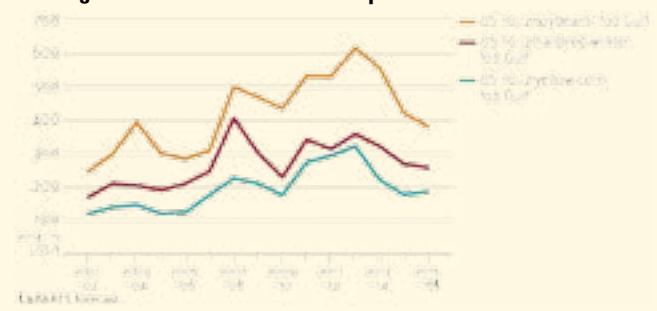
#### Oilseeds

The world oilseeds indicator price (US no. 2 soybeans, fob Gulf) is forecast to fall by 8 per cent in 2015–16 to average US\$390 a tonne, the lowest since 2009–10. This reflects an expected increase in stocks to record levels.

In contrast, the world canola indicator price (Europe Rapeseed,

fob Hamburg) is forecast to rise by 3 per cent in 2015–16 to average US\$436 a tonne. This reflects an expected increase in EU import demand and a forecast fall in EU production.

### World grains and oilseeds indicator prices



### World grain production, 2015–16

#### Wheat

World wheat production is forecast to fall by 2 per cent in 2015–16 to 707 million tonnes (mt), assuming average seasonal conditions. An increase of around 1 per cent in harvested area is expected to be more than offset by a decline in the average yield. The largest falls in production are expected in the European Union and the Black Sea region (Russian Federation, Ukraine and Kazakhstan), albeit from significantly above average production in 2014–15.

Among other major exporters, production is forecast to increase in Argentina, Australia, Canada and the US.

Wheat production in the Black Sea region is forecast to fall by 10 per cent in 2015–16 to 88 mt, largely reflecting an expected fall in yields in the Russian Federation and Ukraine from the high yields achieved in 2014–15. Conditions for the dormant winter wheat crop have generally been favourable. But in some areas, dry conditions hindered crop establishment and snow cover has been insufficient to protect the crops from cold. The extent of any damage will not become clear until after the crop emerges from dormancy.

### Forecast change in world wheat production, 2015–16



### SECTION 1 OVERVIEW

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■ The reports in this chapter have been reproduced from an article written by Clay Mifsud, David Mobsby and Christopher Price published in the March 2015 edition of the ABARES publication, *Agricultural Commodities*.

In the European Union, wheat production is forecast to fall by 8 per cent in 2015–16 to 143 mt. The forecast decline largely reflects an expected fall in yields following high yields across much of the European Union in the previous year. Overall, crop quality is expected to be better than the previous year, when heavy rainfall during harvest adversely affected quality in some regions.

Wheat production in the US is forecast to increase by 6 per cent in 2015–16 to 58 mt. This forecast increase follows production declines in the past two years. Harvested area is forecast to increase by 1 per cent and the average yield is expected to rise by 4 per cent. Planted area of winter wheat is estimated to have declined by 5 per cent, including a 3 per cent fall in area planted to hard red winter wheat. But harvested area is expected to increase because of an assumed fall in the winter wheat abandonment rate to around the 10-year average.

### Coarse grains

World production of coarse grains is forecast to fall by 2 per cent in 2015–16 to 1.25 billion tonnes, largely reflecting an expected decline in world corn production.

Following record production in 2014–15, world corn production is forecast to fall by 3 per cent in 2015–16 to 965 mt, reflecting expected falls in planted area and yields, particularly in the US. Production is also expected to decline in the European Union and the Black Sea region. Small increases are expected in China and Latin America.

In the US, corn production is forecast to fall by 7 per cent in 2015–16 to 345 mt. The area planted to corn is forecast to fall by 4 per cent to 32 million hectares, reflecting more favourable returns from soybean production. The average yield is assumed to fall by 3 per cent in 2015–16 from the record high achieved in 2014–15.

World coarse grains production			
Commodity	2013–14 mt	2014–15 <sup>f</sup> mt	2015–16 <sup>f</sup> mt
Corn	989	990	965
Barley	145	139	138
Other	146	144	145
Total	1280	1273	1248

<sup>f</sup> ABARES forecast.

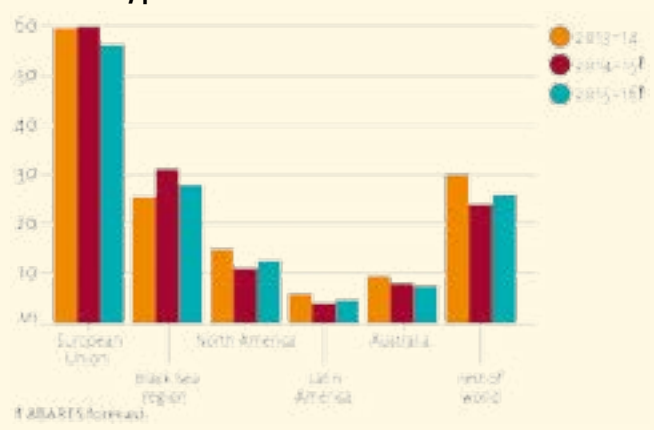
Corn production in the European Union is forecast to fall by 11 per cent in 2015–16 to 65 mt, reflecting an expected fall in planted area and an assumed return to average yields from the record high achieved in 2014–15. The area planted to corn is forecast to fall by 6 per cent to 9.3 million hectares because of an expected decline in returns from corn production relative to other grains.

In the major Latin American exporting countries (Argentina and Brazil), corn production is forecast to increase by 3 per cent in 2015–16 to 101 mt, driven by an expected increase in area planted. Corn production is forecast to increase by 2 per cent in Brazil to 77 mt and by 4 per cent in Argentina to 24 mt.

World barley production is forecast to fall by 1 per cent in 2015–16 to 138 mt, largely reflecting a decline from the above average yields achieved in 2014–15. Lower production in the European Union and

the Black Sea region is forecast to more than offset higher production in North America.

World barley production



### Oilseeds

World oilseeds production is forecast to fall by 2 per cent in 2015–16 to 522 mt.

World soybean production is forecast to fall by 2 per cent to 307 mt and world canola production is forecast to fall by 4 per cent to 69 mt. In contrast, world production of sunflower seed is forecast to rise.

In the US, soybean production is forecast to fall by 4 per cent to 104 mt, driven by an assumed decline in yields from the above average yields achieved last year. But producers are forecast to increase the area planted to soybeans. Despite the forecast fall in the soybean indicator price in 2015–16, returns from planting soybeans are expected to remain more favourable in the US than the returns from planting corn.

In Latin America, the area planted to soybeans in 2015–16 is forecast to be largely unchanged from the previous season. Assuming a return to trend yields, soybean production is forecast to rise by 1 per cent in Brazil to 95 mt but fall by less than 1 per cent in Argentina to 55 mt.

World soybean production and area



### Canola

World canola production is forecast to decline by 4 per cent in 2015–16 to 69 mt. This forecast reflects expected falls in production in the European Union and Ukraine more than offsetting a forecast production increase in Canada.

EU rapeseed (canola) production is forecast to decline by 14 per cent to 20.6 mt. The area planted to winter rapeseed (which accounts for more than 90 per cent of total EU rapeseed area) is estimated to have fallen by 6 per cent in 2015–16.

Rapeseed (canola) production in Ukraine is forecast to fall by 22 per cent in 2015–16 to 1.7 mt. The area planted to winter rapeseed, which

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\*Note: Not for use on Clearfield JNZ or STL wheat varieties.

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typically accounts for more than 90 per cent of total rapeseed area, is estimated to have fallen by around 5 per cent.

Canola production in Canada is forecast to rise by 3 per cent in 2015–16 to 16 mt, reflecting a 3 per cent increase in area planted. The area planted is forecast to increase because of relatively favourable returns expected from canola.

## World grain consumption, 2015–16

### Wheat

World consumption of wheat is forecast to decline by 1 per cent in 2015–16 to 707 mt, which largely reflects an expected 5 per cent decline in the use of wheat for feed. This reflects expected reductions in wheat consumption in the European Union and the Black Sea region from 2014–15, when there were abundant regional supplies of feed wheat. The use of wheat for human consumption, which accounts for around 70 per cent of total consumption, is forecast to increase by 1 per cent but mainly reflects population growth.

### Coarse grains

World coarse grains consumption is forecast to increase by 1 per cent in 2015–16 to 1.26 billion tonnes. Consumption of corn is forecast to increase, because of higher feed and industrial use. Consumption of barley and other coarse grains is forecast to be largely unchanged from 2014–15.

World coarse grains consumption			
Commodity	2013–14 mt	2014–15 <sup>f</sup> mt	2015–16 <sup>f</sup> mt
<b>Corn</b>			
Feed	576	595	605
Food, seed and industrial uses	370	373	375
<b>Barley</b>			
Feed	97	94	95
Food, seed and industrial uses	42	43	43
<sup>f</sup> ABARES forecast.			

World corn consumption is forecast to increase by 1 per cent in 2015–16 to a record of 980 mt. This reflects a 2 per cent increase in the use of corn as feed to 605 mt and a 1 per cent increase in the use of corn for industrial purposes to 375 mt. Total corn consumption is forecast to rise in the US, China and Latin America.

Corn consumption in the US is forecast to rise by 1 per cent in 2015–16 to 305 mt, driven by an expected increase in the demand for feed. The industrial use of corn, which is mostly for ethanol production, is forecast to be largely unchanged in 2015–16 at around 169 mt.

World barley consumption is forecast to increase by 1 per cent in 2015–16, to 138 mt.

### Oilseeds

Total oilseeds consumption is forecast to rise by 2 per cent in 2015–16 to 514 mt.

World oilseeds crush is forecast to rise by 2 per cent in 2015–16 to 451 mt, driven by strong world demand for protein meals and vegetable oil.

World protein meal production is forecast to rise by 3 per cent to 300 mt and vegetable oil production is forecast to rise by 3 per cent to 180 mt.

World use of vegetable oil is forecast to grow by 1 per cent in 2015–16 to 179 mt. Food consumption of vegetable oil is expected to rise by around 1 per cent to 133 mt and industrial consumption of vegetable oil is forecast to rise by 1 per cent to 45 mt. This growth is slower than previous years, which reflects an expected slowdown in biodiesel production in Argentina.

World protein meal use is forecast to rise by 3 per cent in 2015–16 to 297 mt. Soybean meal consumption is forecast to rise by 4 per cent to 205 mt, with large consumption increases expected in China and Brazil.

## World grain trade, 2015–16

### Wheat

World trade in wheat is forecast to fall by 3 per cent in 2015–16 to 147 mt, despite expected strong import demand for milling grade wheat. Exports from the US are expected to increase by 13 per cent in 2015–16 but this is expected to be more than offset by declines in exports from other major exporters, including Canada, the European Union and the Black Sea region.

### Coarse grains

World trade in coarse grains is forecast to increase by 1 per cent in 2015–16 to 152 mt. World trade in corn is forecast to increase by 2 per cent in 2015–16 to 117 mt, reflecting an expected increase in imports into the European Union, Mexico and Japan. World trade in barley and other coarse grains is forecast to fall slightly.

Corn imports into the European Union are forecast to increase by 13 per cent in 2015–16 to 9 mt, primarily reflecting two factors.

First, the supply of feed wheat is expected to be significantly lower than the previous year when a high proportion of the wheat crop was graded as feed.

Second, corn production in the European Union is forecast to decline in 2015–16 and more imports will be required to satisfy the demand for feed.

Corn imports into Mexico are forecast to increase by 4 per cent in 2015–16 to 11.3 mt, reflecting expected higher feed demand. Over the coming year, pig meat, poultry and dairy production are forecast to increase by between 1 per cent and 3 per cent. Most of this forecast increase in corn imports is expected to be sourced from the US. Over the five years to 2014–15, more than 90 per cent of corn imports into Mexico were from the US.

### Corn imports, European Union



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Imports of corn into China are forecast to remain largely unchanged in 2015–16. In December 2014 China's Ministry of Agriculture lifted a ban on the importation of MIR162, a GM variety of corn grown in the US, Argentina and Brazil. The ban was in place from December 2013. During this period imports of non-GM feed grains, including barley and grain sorghum, increased.

World trade in barley is forecast to fall by 3 per cent in 2015–16 to 21 mt, reflecting an expected fall of imports into China. The Chinese Government's decision to permit imports of the genetically modified corn variety MIR162 is likely to result in lower imports of barley. Imports of feed barley are likely to be replaced by imports of distiller's dried grain, a by-product of corn-based ethanol production. Demand for barley in the other major import markets, Saudi Arabia and Japan, is expected to be largely unchanged in the short term. Growth in demand for livestock feed is expected to be met by imports of other feed grains.

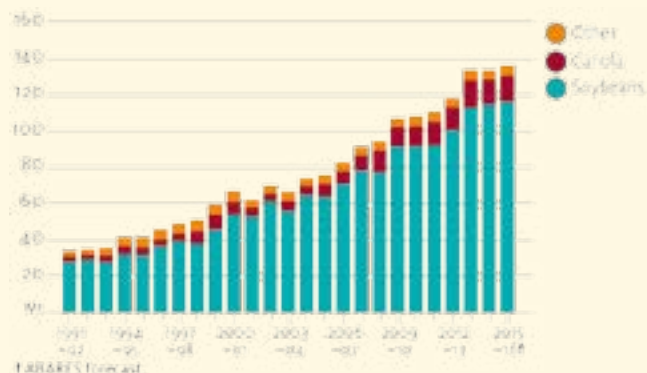
#### Oilseeds

World oilseeds exports are forecast to rise by 2 per cent in 2015–16 to 136 mt. World soybean exports are forecast to increase by 1.5 per cent to 116 mt, driven by a forecast increase in imports into China. Exports are forecast to rise by 16 per cent from Argentina to 9.5 mt and by 4 per cent from Brazil to 48 mt. US soybean exports are forecast to decline by 6 per cent to 46 mt because an expected rise in US soybean crush is expected to limit the supply of soybeans available for export.

World canola trade is forecast to rise by 4 per cent in 2015–16 to 14 mt, largely reflecting an expected increase in canola imports into the European Union. This follows below average EU imports expected in 2014–15 because of above average production in that year. Canola exports from Canada are expected to rise.

Most of the forecast exports from Canada are expected to go to the US, Mexico, China and Japan, so the most of the expected increase in EU imports is forecast to be met by shipments from Australia and Ukraine.

#### World oilseeds trade



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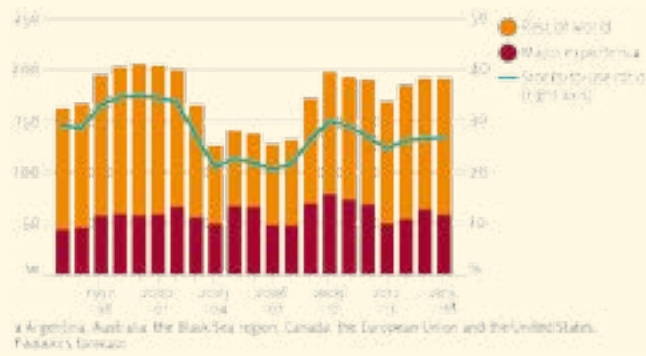


## World grain stock, 2015–16

### Wheat

World closing stocks of wheat are expected to be largely unchanged in 2015–16 at around 192 mt. The combined stocks of the major exporting countries are forecast to decline but remain well above the lows of 2007–08 and 2012–13.

#### World wheat closing stocks



### Coarse grains

World coarse grains stocks are forecast to fall by 7 per cent in 2015–16 to 214 mt, primarily reflecting a decline in corn stocks. Corn consumption is forecast to exceed production for the first time in three years and stocks are expected to fall by 6 per cent in 2015–16 to 182 mt. The largest declines in stocks are expected to be in the US and Latin America. Corn stocks are forecast to fall by 12 per cent in the US to 46 mt and by 14 per cent in Latin America to 18 mt.

World barley stocks are forecast to fall by 5 per cent in 2015–16 to 22 mt. The largest decline in stocks is expected in the Russian Federation, with a forecast fall of 27 per cent to 1.6 mt.

### Oilseeds

World closing stocks of oilseeds are forecast to rise by 7 per cent in 2015–16 to a record 113 mt. Although world oilseeds production is forecast to fall, it is still expected to exceed world consumption by around 8 mt. World soybean stocks are forecast to increase to 102 mt, with stocks expected to increase in the three major exporting countries, Argentina, Brazil and the US. In contrast, world canola stocks are forecast to decline to around 5 mt, largely reflecting an expected run-down in stocks in the European Union in response to expected falls in domestic production.

#### World oilseeds closing stocks





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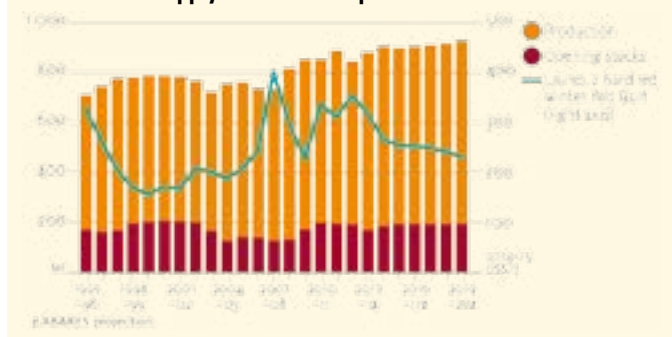
## Medium-term outlook (2016–20)

### World grain prices, 2016–20

#### Wheat

The world wheat indicator price is projected to decline in real terms over the medium term to average US\$235 a tonne in 2019–20 (in 2014–15 dollars). World production and consumption are expected to grow at similar rates over the outlook period, with world closing stocks expected to be largely unchanged. The projected price decline reflects assumed productivity gains and the effect of an expected increase in wheat exports from relatively low-cost producers in the Black Sea region (Russian Federation, Ukraine and Kazakhstan).

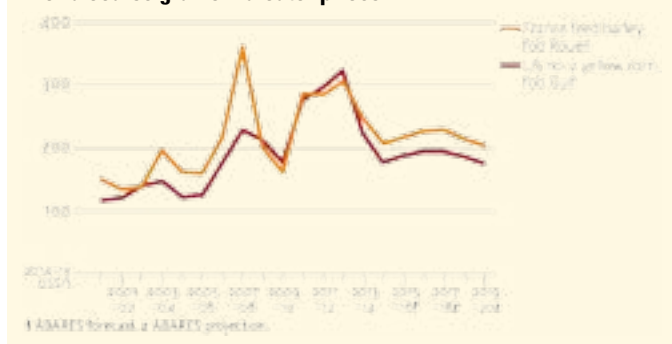
World wheat supply and indicator price



#### Coarse grains

World coarse grains prices are projected to increase in real terms in 2016–17, reflecting an expected increase in demand for feed, particularly in developing countries. Industrial demand for coarse grains is also projected to increase, but at a slower rate than feed. Reflecting this projected growth in demand for feed and industrial uses, stocks are forecast to decline to 197 mt by 2017–18. After 2017–18 coarse grains prices are projected to fall modestly in real terms, reflecting projected increases in production.

World coarse grains indicator prices



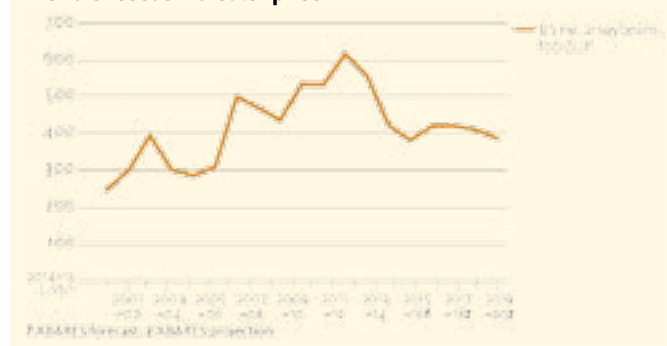
#### Oilseeds

In 2016–17 the world soybean indicator price is projected to rise

by 10 per cent in real terms to average US\$420 a tonne (in 2014–15 dollars), largely because of a forecast reduction in world oilseeds stocks. The indicator price is projected to average US\$421 a tonne in 2017–18, before declining in real terms to US\$387 a tonne in 2019–20.

The world stocks-to-use ratio is expected to reach a peak of 22 per cent in 2015–16, before falling gradually to around 19 per cent towards the end of the projection period.

World oilseeds indicator price



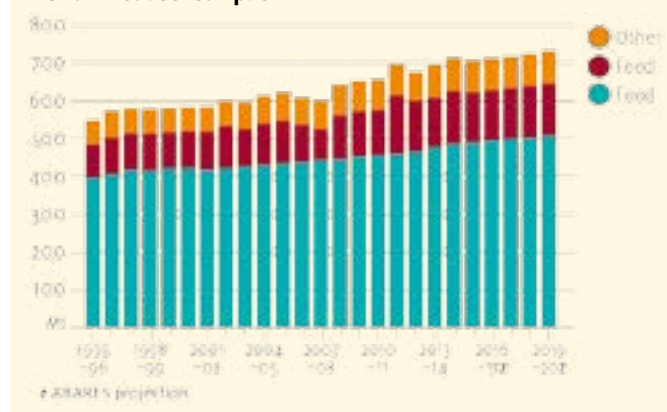
### World grain consumption, 2016–20

#### Wheat

World wheat consumption is projected to rise by an average of around 1 per cent a year from 2015–16 to 732 mt in 2019–20. Use of wheat for human consumption is projected to increase in line with population growth over the medium term to reach 508 mt in 2019–20.

The use of wheat for feed is projected to rise, but the increase is likely to be constrained by competition from alternative feed sources. The use of wheat for industrial purposes is also projected to rise, but is expected to grow slowly and remain a relatively small proportion of total wheat consumption.

World wheat consumption



#### Coarse grains

World coarse grains consumption is projected to increase at an average annual rate of 1 per cent over the projection period to reach 1.3 billion tonnes in 2019–20, led by an expected increase in the use of coarse grains for feed.

The use of coarse grains for feed is projected to increase by an average of 2 per cent a year to 806 mt in 2019–20. Income growth in emerging market economies is expected to result in increasing consumption of livestock products, resulting in increased demand for feed.

Growth in the use of coarse grains for industrial purposes is projected to slow and average less than 1 per cent a year to 2019–20. Over the 10

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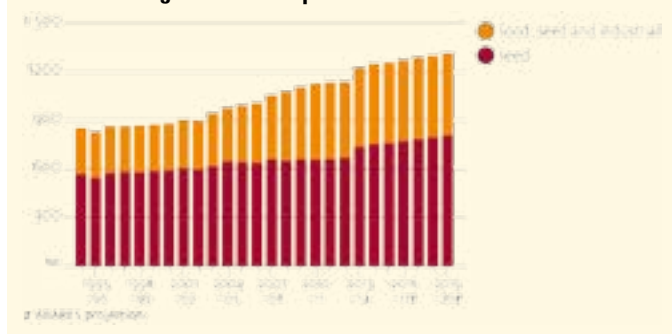


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### World coarse grains consumption



years to 2014–15, the use of coarse grains for industrial purposes grew at an average annual rate of 4 per cent, largely because of the rapid increase in US ethanol production. Over the medium term, little growth is expected in the use of corn for ethanol production in the US because of limits stipulated in the Renewable Fuel Standard.

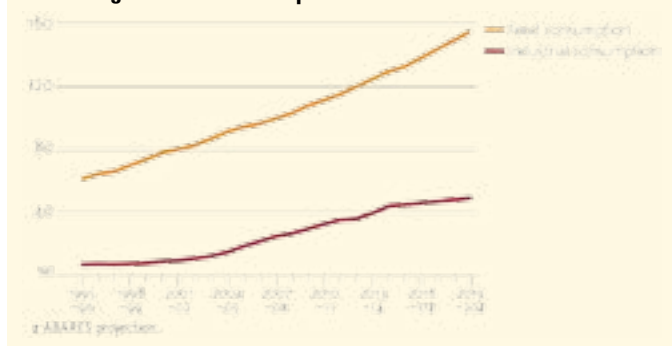
Other industrial uses such as malting and starch are projected to increase in line with world population growth.

### Vegetable oil and protein meal

World use of vegetable oil and protein meal are both expected to rise by 3 per cent a year to 203 mt and 332 mt, respectively. This demand is underpinned by growth in world population and incomes.

World vegetable oil use is expected to be driven mainly by higher food use. The food use of vegetable oil is projected to rise by 2.8 per cent a year to 154 mt in 2019–20. Per person consumption of vegetable oil for food is projected to rise by 2 per cent a year to 20.1 kilograms in 2019–20.

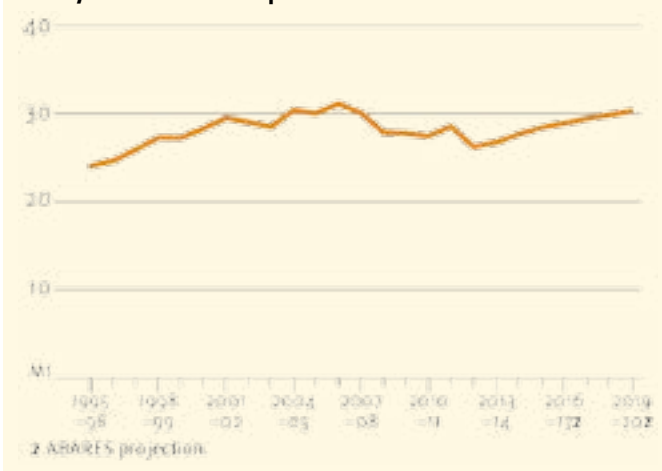
### World vegetable oil consumption



World protein meal use is expected to be driven by growth in world livestock production. Soybean meal use is projected to rise by 3 per cent a year to 234 mt in 2019–20, which is expected to be driven by an average annual increase of 5 per cent in the use of soybean meal in China. By 2019–20 the use of soybean meal is expected to have grown to 71 mt.

US soybean meal use is projected to rise by 1 per cent a year to around 30 mt in 2019–20. The projected increase is expected to be driven principally by growth in livestock production.

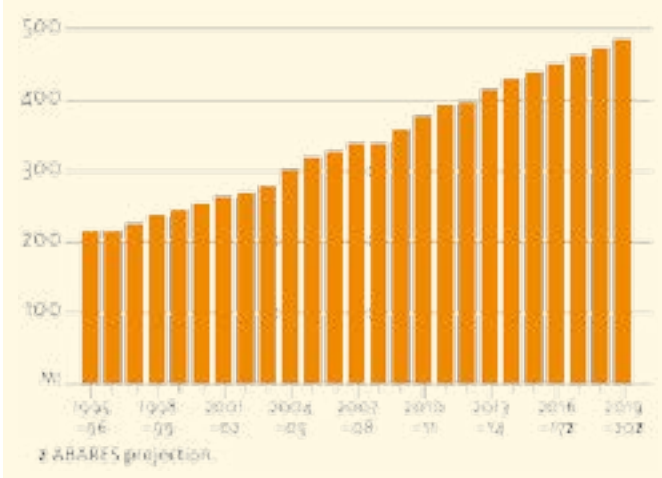
### US soybean meal consumption



### Oilseeds crush

World oilseeds crush is projected to increase by 2.5 per cent a year to 486 mt by 2019–20. Soybean crush is expected to account for two-thirds of the expected increase in world oilseeds crush. Soybean crush in China is projected to rise by 4 per cent a year to 92 mt by 2019–20, reflecting growing demand from domestic livestock producers.

### World oilseeds crush



## World grain production, 2016–20

### Wheat

World wheat production is projected to increase by around 1 per cent a year over the medium term to 734 mt in 2019–20. This mainly reflects productivity growth from the adoption of higher yielding varieties of wheat and improved farming practices in developing countries.

Planted area is projected to increase only slowly over the medium term, because of limited availability of suitable cropping land and competition from other crops. Among the major exporters, production is expected to increase significantly in the medium term in the Black Sea region, Argentina and Canada. Production is expected to decline in the US over the outlook period because of an expected decline in planted area.

Production in the Black Sea region is projected to grow at an average annual rate of 2 per cent to reach 95 mt in 2019–20. The Black Sea region has considerable potential for increasing the area planted to wheat. But competition from other crops is expected to constrain growth in the

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area planted to wheat to an average annual rate of 1 per cent a year. The average yield is expected to increase at a similar rate.

In contrast to the Black Sea region, wheat production in the US is projected to fall by almost 1 per cent a year over the medium term. Planted area is expected to decline by more than 1 per cent a year to around 21 million hectares in 2019–20, reflecting a projected decline in total area used for cropping and higher expected returns from production alternatives.

A downward trend in the area planted to wheat has been apparent in the US since the 1980s, and the continuation of this trend over the outlook period is expected to result in the smallest area planted to wheat since 1970.

### Coarse grains

World coarse grains production is projected to increase over the medium term at an average annual rate of 1.5 per cent to 1.3 billion tonnes in 2019–20. Large increases in coarse grains production are projected in Latin America and the Black Sea region, mainly reflecting an increase in planted area. Projected growth in production in China is primarily expected to come from higher yields, which are currently below those achieved in many other major coarse grain producing countries.

World corn production is projected to increase over the outlook period, reaching 1.03 billion tonnes in 2019–20. Production is projected to increase in 2016–17, reflecting an expected increase in planted area in the US. Over the remainder of the outlook period, production is projected to increase at 2 per cent a year.

World barley production is projected to increase over the outlook period to 148 mt in 2019–20. The largest increases in production are projected to be in the Black Sea region.

In Ukraine, barley production is projected to increase to 10 mt in 2019–20, compared with a forecast 8.5 mt in 2015–16. In the Russian Federation, barley production is projected to increase to 19 mt in 2019–20, compared with a forecast 17 mt in 2015–16.

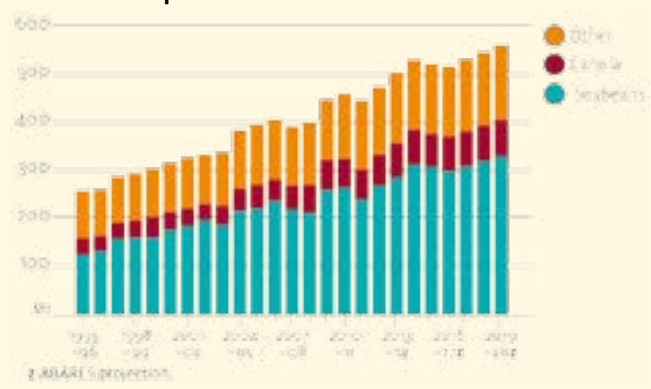
Smaller increases in production are projected in the European Union, Canada and Australia.

### Oilseeds

World oilseeds production is expected to decline by 1 per cent in 2016–17, then increase at an average annual rate of 3 per cent to 562 mt in 2019–20. The projected fall in world oilseeds production in 2016–17 reflects an expected 3 per cent decline in the area planted to soybeans as producers respond to an expected increase in returns from producing corn. After 2016–17 world soybean harvested area is projected to rise by 1 per cent a year to 124 million hectares in 2019–20. World soybean production in 2019–20 is expected to be 329 mt.

An increase in the area planted to soybeans is expected in the major Latin American exporting countries (Argentina and Brazil) over the projection period, particularly in Brazil. In Brazil, a large amount of new land could be brought into crop production at a relatively low cost. Assuming improvements in logistics, technology and yields, returns from producing soybeans in this region are expected to remain favourable.

World oilseeds production



The harvested area of soybeans in the US is projected to fall from its forecast peak of 34.5 million hectares in 2015–16 because of higher expected returns from producing corn. Harvested area is expected to only expand marginally out to 2019–20.

The total supply of land available for cropping is expected to remain largely unchanged in the US, so competition from corn is expected to limit increases in soybean area over the medium term. Assuming trend yields, US soybean production is expected to be 98 mt in 2019–20.

World canola production is projected to rise by 2 per cent a year from 2016–17 to 75 mt in 2019–20, largely reflecting forecast production increases in Canada. Production in Canada is expected to grow in response to strong demand in export markets and the domestic crush industry.

Rapeseed (canola) production in the European Union is expected to rise by around 1 mt over the medium term to around 21.5 mt.

## World grain trade, 2016–20

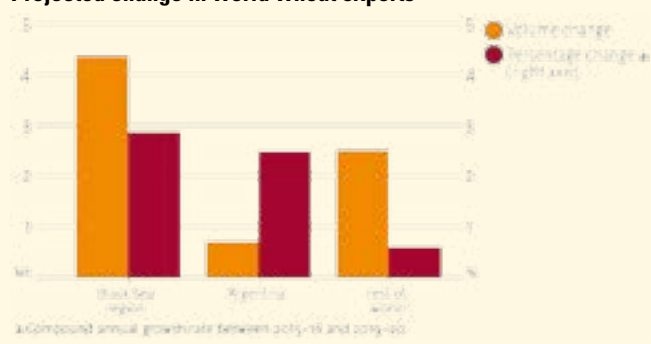
### Wheat

World trade in wheat is projected to increase by just over 1 per cent a year over the medium term to 154 mt in 2019–20, driven by increases in demand for milling grade wheat in developing countries. Growth in feed wheat trade is expected to be constrained by competition from feed alternatives.

Strong growth in wheat imports is expected in developing Asian countries, particularly Indonesia, Vietnam and the Philippines. Imports into Indonesia are projected to grow at an average annual rate of around 3 per cent over the outlook period to 8.6 mt in 2019–20.

Egypt is projected to remain the largest wheat import destination over the projection period, despite an expected decline from 9.5 mt in 2015–16 to 9.0 mt in 2019–20. The projected decline in imports into Egypt partly reflects the expected impact of food subsidy reform and

Projected change in world wheat exports



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is expected to be offset by increases elsewhere in North Africa and the Middle East. Growth in imports is expected to be particularly strong in the Middle East.

Growth in wheat exports is expected to come mostly from the Black Sea region, where the volume of wheat exports is projected to increase at around 3 per cent a year to over 40 mt in 2019–20. The Black Sea region is expected to account for more than half the projected growth in world trade to 2019–20.

But investment in export infrastructure in the Black Sea region is expected to be required for the region to fully realise its export potential.

### Coarse grains

World trade in coarse grains is projected to increase over the medium term, reflecting increased demand for corn as livestock feed and barley for industrial uses.

Japan is expected to remain the world's largest import destination for corn over the medium term. It is projected that 16 mt will be imported into Japan in 2019–20. But this is only marginally higher than the five-year average to 2014–15 and mainly reflects the increasing substitution of other grains for corn in livestock feed. The total demand for livestock feed in Japan is expected to remain largely unchanged to 2019–20.

Corn imports into China are projected to grow over the medium term, from 3 mt in 2016–17 to 7.2 mt in 2019–20. Growth in demand for corn in China, which largely reflects an expected increase in livestock production, is expected to exceed the projected increase in domestic production.

World trade in barley is projected to grow at 2 per cent a year to 25 mt in 2019–20, compared with 22 mt in 2014–15. This reflects expected growth in demand for barley for use in the manufacture of malt. Demand for barley for feed is projected to remain largely unchanged.

### Oilseeds

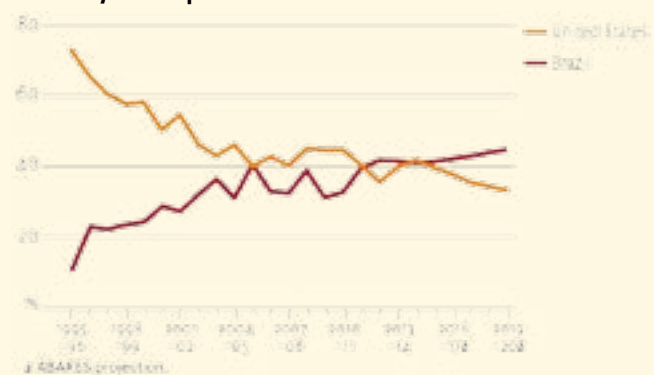
World trade in oilseeds is projected to increase by 4 per cent a year to 153 mt in 2019–20. World soybeans trade is projected to increase at an average annual rate of 4 per cent to 132 mt. The proportion of world consumption of soybeans that is traded is projected to rise to more than 40 per cent by 2018–19, mainly because of expected growth in soybean consumption in China.

To supply this expected consumption growth, imports of soybeans

into China are projected to rise by 4 per cent a year to 92 mt in 2019–20. This is expected to be around 70 per cent of world trade.

The increase in world import demand for oilseeds (largely soybeans) is projected to be met by increases in soybean exports from Argentina and Brazil. Exports from Brazil are expected to increase at 5 per cent a year to 59 mt by 2019–20. If realised, soybean exports from Brazil would account for 47 per cent of world trade and exports from the US would account for around 34 per cent. Soybean exports from Argentina are projected to rise from 10 mt in 2015–16 to 14.5 mt in 2019–20 and account for 11 per cent of world trade.

World soybean export shares



China soybean imports



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# The Australian grain scene

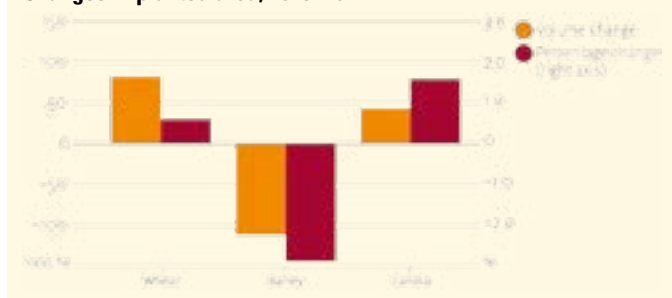
**T**he total area planted to grains and oilseeds in Australia is forecast to remain largely unchanged in 2015–16 at 22.4 million hectares.

The area planted to wheat and canola is forecast to increase at the expense of barley, reflecting anticipated relative returns. These forecast changes in area planted assume average seasonal conditions towards and during the Australian winter cropping planting window from April to July. Drier than average conditions would be likely to result in a fall in area planted to canola in favour of cereals.

Australian wheat production is forecast to rise by 3 per cent in 2015–16 to 24.4 million tonnes (mt), driven by an assumed increase in yields in eastern Australia from the below average yields in 2014–15. Barley production is forecast to fall by 6 per cent to around 7.5 mt, reflecting a forecast fall in planted area. Canola production is forecast to fall by 4 per cent to 3.3 mt as a result of an assumed 6 per cent decline in the average yield more than offsetting an expected 2 per cent increase in area planted.

The volume of Australian wheat exports is forecast to rise by 6 per cent in 2015–16 to 17.9 mt, largely reflecting the expected increase in wheat production. The value of exports is forecast to increase by 12 per cent to around \$6.1 billion, reflecting the forecast increase in export volume and an assumed fall in the value of the Australian dollar.

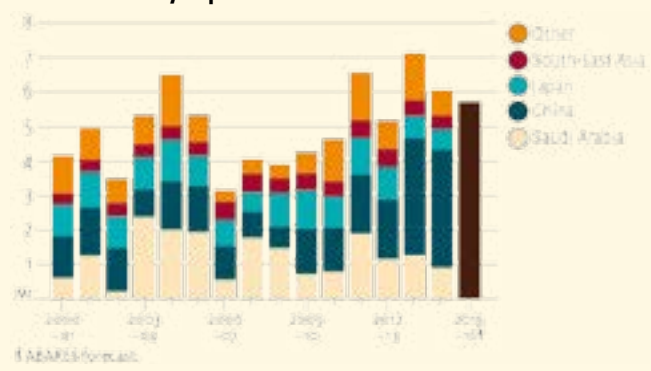
**Changes in planted area, 2015–16**



Australian barley exports are forecast to fall by 7 per cent in 2015–16 to around 5.7 mt, with domestic production and demand from China both forecast to fall. Australian barley exports to China are forecast to fall by 15 per cent in 2015–16 to 2.9 mt because of expected lower demand for feed barley. The expected lower demand reflects increased

competition from US exports of distiller's dried grains. Demand for Australian malting barley is expected to remain strong in 2015–16.

**Australian barley exports**



Canola exports are forecast to rise by 2 per cent in 2015–16 to 2.4 mt, despite a forecast fall in production. This forecast rise in canola exports mainly reflects lower expected exports in 2014–15 as a result of a decline in domestic supplies. On a marketing year basis (November to October), canola exports are forecast to fall by 4 per cent in 2015–16 to 2.5 mt.

The value of canola exports is forecast to rise by 10 per cent in 2015–16 to \$1.4 billion, supported by a forecast increase in world canola prices and an assumed depreciation of the Australian dollar.

## Medium-term outlook (2016–20)

The total area planted to grains and oilseeds in Australia is forecast to increase marginally over the projection period to around 22.5 million hectares. In 2016–17 the area planted to coarse grains is expected to rise, largely at the expense of canola, and the area planted to wheat is expected to be largely unchanged.

For the remainder of the outlook period, the proportions of crop area planted to wheat, coarse grains and oilseeds are not expected to change markedly because relative returns for these crops are expected to remain relatively stable.

Total grains and oilseeds production is projected to rise at an average annual rate of 1.7 per cent to 42.6 mt in 2019–20. Wheat, barley and

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canola yields are projected to increase at a rate of around 1 per cent a year over the projection period. Wheat production is projected to be 25.9 mt in 2019–20, barley production 8.0 mt and canola production 3.4 mt.

The volume of Australian grains and oilseeds exports is projected to rise by 1.7 per cent a year to 29.3 mt in 2019–20, with a projected value of \$9.3 billion (in 2014–15 dollars). Growth in total grains and oilseeds exports is expected to be supported by increased production and an assumed lower value of the Australian dollar.

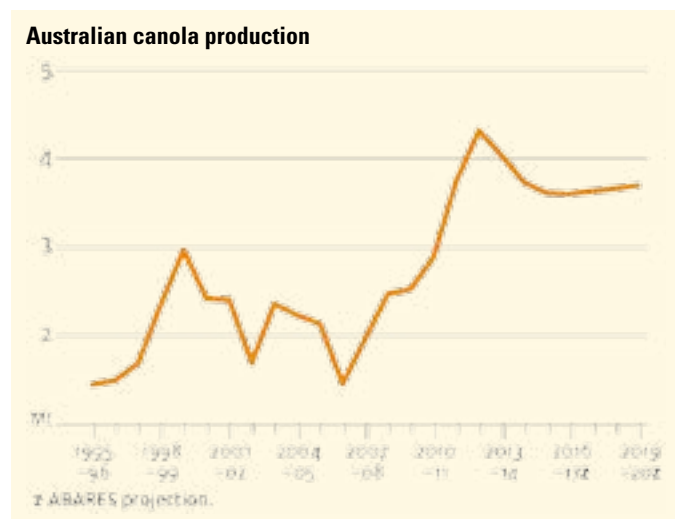
The volume of wheat exports is projected to rise at an average annual rate of more than 1 per cent during the outlook period to 19.0

mt in 2019–20, with a value of \$5.7 billion (in 2014–15 dollars). An increasing share of Australian exports is anticipated to go to Asia instead of North Africa and the Middle East. Demand in Asia is expected to rise over the medium term and Australian wheat exports to the Middle East and North Africa are expected to face increasing competition from exports from the Black Sea region.

Coarse grains exports are projected to increase from 7.2 mt in 2016–17 to 7.5 mt in 2019–20. An increasing share of Australia's coarse grains exports is also anticipated to go to Asia, reflecting an expected increase in demand for malting barley in China and South-East Asia. Demand for malting barley is projected to grow in these regions largely because of an expected increase in beer consumption.

Feed barley exports are expected to face increasing competition from the low-cost producing countries of the Black Sea region and limit growth in Australia's exports to the Middle East. Grain sorghum exports are projected to rise over the medium term. China is projected to remain a significant importer of grain sorghum, where it is used as an ingredient in liquor production and as animal feed.

Australian canola exports are projected to rise by around 1 per cent a year over the medium term to 2.5 mt in 2019–20. This projected increase



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reflects increases in Australian canola production. The value of canola exports is projected to be \$1.3 billion (in 2014–15 dollars) in 2019–20.

World canola imports into the European Union are projected to average around 3.3 mt a year over the medium term. Canola production in Ukraine, Australia's main competitor in the European Union, is expected to remain largely unchanged over the projection period at around 2 mt a year. Australian canola exports to the European Union are forecast to average around 1.5 mt a year to 2019–20.

Import demand for Australian canola from China is projected to remain strong but below the record level in 2013–14. This is mainly because of projected higher exports to China from Canada. Australian canola exports to China are projected to average around 500,000 tonnes a year to 2019–20.

**Australian grains and oilseeds exports**



**TABLE 1: World and Australia grains production, stocks and price forecasts**

	Unit	2012–13	2013–14	2014–15f	2015–16f	2016–17z	2017–18z	2018–19z	2019–20z
<b>WHEAT</b>									
<b>World wheat</b>									
Production	Mt	655	713	720	707	713	718	726	734
Closing stocks	Mt	169	185	192	192	192	192	193	194
Price* (US Hard red winter, Gulf)	US\$/t	359	323	270	259	257	253	246	235
<b>Australia wheat</b>									
Production	kt	22,856	26,929	23,607	24,390	24,908	25,305	25,634	25,871
Price* (APW 10%, net pool)	A\$/t	343	344	315	331	329	324	314	301
<b>COARSE GRAINS</b>									
<b>World coarse grains</b>									
Production	Mt	1136	1280	1273	1248	1266	1284	1303	1326
Closing stocks	Mt	169	210	229	214	204	197	193	193
Price* (US corn, Gulf)	US\$/t	323	223	178	189	195	195	188	177
<b>Australia coarse grains</b>									
Production	Kt	11,500	12,667	11,494	11,157	11,393	11,571	11,777	12,028
Price*: Feed barley	A\$/t	258	238	255	261	260	264	259	248
Malting barley	A\$/t	269	256	271	274	272	276	271	262
Grain sorghum	A\$/t	265	297	298	264	253	243	237	231
<b>OILSEEDS</b>									
<b>World oilseeds</b>									
Production	Mt	475	505	530	522	517	531	547	562
Closing stocks	Mt	67	81	106	113	108	104	104	106
Price* (US no. 2 soybeans, Gulf)	US\$/t	616	557	423	381	420	421	411	387
<b>World protein meals</b>									
Production	Mt	268	280	292	300	307	315	322	330
Price* (Soybean meal, Rotterdam)	US\$/t	567	565	451	397	398	395	386	367
<b>World vegetable oils</b>									
Production	Mt	161	170	175	180	186	192	198	204
Price* (Soybean oil, Dutch)	US\$/t	1201	1003	841	785	766	755	726	688
<b>Australia oilseeds</b>									
Total production	Kt	5752	5187	4203	4187	4261	4462	4568	4673
Canola production	Kt	4142	3795	3413	3264	3252	3290	3329	3369
Canola price (Melb)*	A\$/t	590	542	485	516	516	510	493	478
Sunflowers production	Kt	44	32	31	35	36	37	38	39
Sunflower price (Melb)*	A\$/t	547	572	614	557	547	541	528	514

Sources: Australian Bureau of Statistics; UN Comtrade; USDA; ABARES. (\* Real prices are used in 2014–15 dollars). z = ABARES projection.

# Agricultural cooperatives: Quenching the thirst for capital

■ By Hayley Moynihan, Rabobank



**S**ourcing capital is firmly on the agenda for many large agricultural cooperatives. Creating this thirst are growing global opportunities stemming from the rising demand for food and agricultural production, as well as the need to better manage risk through dedicated supply chains.

In the past, cooperatives have looked no further than their member base or modest debt facilities for this capital. However obtaining capital from just these sources may no longer be sufficient.

## The food and agribusiness sector is changing

The need for further expansion of productive capacity is clear. Cooperatives have historically played a key role in increasing this capacity through securing inputs, services, infrastructure, buyers or a route to market – enabling members to concentrate on efficiency and expansion of their own farming businesses.

Cooperatives are also seeing their basis for competition change. For some, this has resulted in globalisation or greater cross-border activities. And for others, there has been the need for domestic or regional consolidation to achieve further economies of scale.

For agricultural cooperatives seeking to capture value from the favourable global market environment, maintaining the status quo is not a strategy.

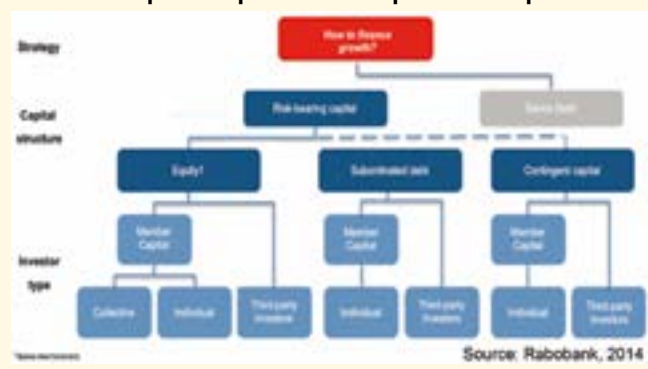
Cooperatives are under pressure to participate in these changes, not only from their members but also in light of merger and acquisition activity occurring around them. Playing a greater role may be necessary to secure the future survival of the cooperative or provide members with flexibility and additional resources as competition to secure their production offtake intensifies.

An example of a cooperative adapting to an increasingly complex and global marketplace is New Zealand's largest dairy cooperative, Fonterra Co-operative Group Ltd. Responsible for collecting, processing and marketing around 87 per cent of New Zealand's milk production; its members have become a target for processors seeking to procure a greater share of the country's milk.

The challenge for Fonterra is retaining and attracting members, growing their milk supply and sourcing additional capital throughout a strong industry growth phase. While milk price competitiveness remains paramount to membership retention; the offering to member suppliers has widened. Initiatives include; introduction of tradable shares and units, flexible options for new member suppliers, contract milk supply options and group purchasing programmes – to give the cooperative greater flexibility to remain competitive.

The emergence of dedicated supply chains is also a consequence of

**FIGURE 1: Simplified capital structure options for cooperatives**



the increasingly complex environment in which agricultural cooperatives operate. These more closely aligned supply chains are evolving to satisfy the need to increase traceability, food safety, supply security or provide particular specifications – among others.

Cooperatives have the potential to be at the forefront of this supply



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### SECTION 1 OVERVIEW

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**Sourcing capital is firmly on the agenda for many large agricultural cooperatives as they look to cash-in on the rising demand for food production.**

chain evolution. The special relationship a cooperative has with its members already gives it a degree of integration.

But to fully capture the opportunities available in the current environment, cooperatives require further investment and hence, capital.

Agricultural cooperatives usually accrue capital from members over a long period of time, based on setting aside contributions from members transacting with the cooperative. Additional capital is then usually obtained through retained earnings or debt facilities provided by either members or financial institutions.

Obtaining capital from these sources alone has proven to limit many cooperatives' ability to pursue the current opportunities and provide sufficient or timely funding at the current rate of change.

As a result, cooperatives are increasingly considering external capital options through third party investors (including pension funds, hedge funds, retail investors and end users seeking supply) or financial instruments (including capital notes, bonds, shares and units).

In turn, investors are increasingly keen to invest in the food and agribusiness sector, with their appetite whetted by the agricultural commodities boom and declining returns from investments in other sectors.

For large agricultural cooperatives, accessing external capital in the same way that a publicly listed or private company would is not straightforward. Strategic and financial investors typically want the capability to influence and control strategy and enjoy the benefits of ownership and full recourse in return for their risk-bearing capital.

As a result there are often trade-offs with additional considerations or risks to the business. These challenges may include; the dilution or loss of member control, differing profit expectations of members and investors or the distribution of profits (or returns for capital providers).

For cooperatives though, retention of ownership and control strikes at the very core of their enterprises and is usually non-negotiable.

This creates a quandary as cooperatives look at how to access sufficient capital to tap into opportunities without compromising the cooperative business model. The challenge is to accommodate the needs and additional demands this type of capital can bring within the cooperative model and strategy.

## SECTION 1 OVERVIEW

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### CHS: A US ag cooperative showing the way

CHS Inc. is an example of an agricultural cooperative balancing the needs of its members and external shareholders. A diversified agricultural cooperative active in energy, grain and food, CHS has 600,000 farmer-owners – predominately in the US.

Expansion both within the US and globally has remained a clear strategy for CHS, with member equity redemptions reduced at an early stage to fund growth. External equity was accessed for the first time a decade ago, through the issuance of publicly traded preferred shares – which provided an 8 per cent dividend but no voting rights.

Since then, voting rights have been based on active membership and business volume or patronage with CHS, and there are various classes of shares traded on the NASDAQ Global Select Market. These have given CHS the option to retain cash and provide a proportion of member returns via preferred shares. Currently, around 18 per cent of CHS equity is held via this mix of tradable preferred shares.

**FIGURE 2: The share price movements of CHS preferred stocks, 2009–14**



Source: Bloomberg, 2014

Regardless of whether capital is sourced via the cooperative's member base or externally, there are two important fundamentals required for success, which must precede the designing or structuring of any potential equity or capital solutions.

- Cooperatives need to ensure they have a clear vision for the business, are highly relevant to their members and that they have strong member engagement. This involves a high degree of communication and collaboration between the cooperative, its members, governors and management.
- Secondly, it is necessary to understand and elect for the appropriate trade-offs. Cooperatives and their members should be aware of what is being compromised and the risks entailed in any proposed capital strategy, and ensure they match their appetite for risk and reward.

Maintaining the status quo is not a strategy. Agricultural cooperatives seeking to capture value from a favourable global market environment will need to confront the issue of sourcing capital, alongside tackling increased market complexity.

# Section

# 2

## The grain industry in figures

- All figures and tables presented in this Yearbook have been derived from a combination of ABARES, ABS, International Grains Council, AWB and USDA sources.
- For Australian and other southern hemisphere winter crops the year listed is generally the calendar year the crop is planted and harvested.
- Australian summer crop figures are for the harvest in the following calendar year.
- For northern hemisphere crops, a figure for 2014 for example, is an estimate for the crop harvested in the 2014–15 financial year.
- (Mt = 1,000,000 tonnes) (Kt = 1000 tonnes)

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suspension and smart on-board technology as standard, each delivers the same exacting levels of performance, efficiency, versatility and reliability that have made CLAAS the world leader in harvesting technology. Contact your local CLAAS Harvest Centre today and find out why CLAAS is the new force in Australian broadacre farming.

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# Commoditised or customised – where to for Australian grains?

By Ron Storey, Head of NZX Australian Agribusiness



It should come as no surprise – Australian grain exports are inherently Asian-centric. Our geographic proximity to these markets has provided us a natural freight advantage over some of our competitors into these markets.

Our trading relationship with China in particular has prospered in recent years as restrictions on canola imports were lifted and China's appetite for Australian grains expanded, for both food and feed grains.

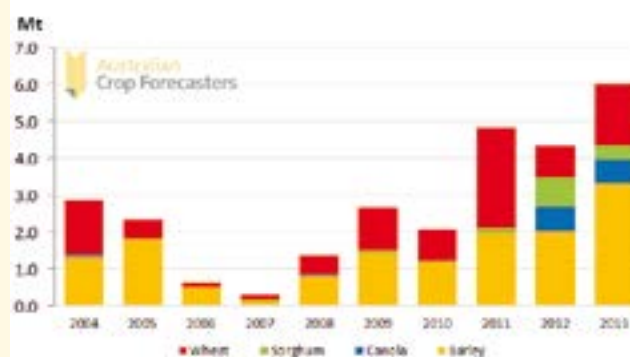
In the 2014–15 harvest, record export pace of Australian barley, primarily to China, has supported feed barley values, at times at premiums to wheat.

It's difficult not to get caught up in such good news stories, but it's important to recognise Australia's relationship with Asia is bigger than China alone. There is a wealth of opportunities across food and feed grain markets in North Asia, South East Asia and the Asian sub-continental region.

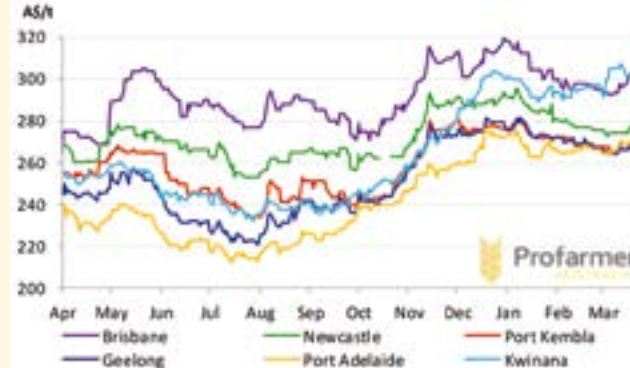
## Commoditised or customised

Although few doubt there is a strong future for the Australian grain industry in Asia, we are unable to produce enough grain to feed the entire market. But we must not take the status quo for granted. With Asian demand exceeding our capacity to supply, we have a choice as to where we position ourselves to meet the future needs of the market – commoditised or customised?

Australian grain exports to China



Australian feed barley values by port zone, 2014–15 season



## SECTION 2 THE GRAIN INDUSTRY IN FIGURES

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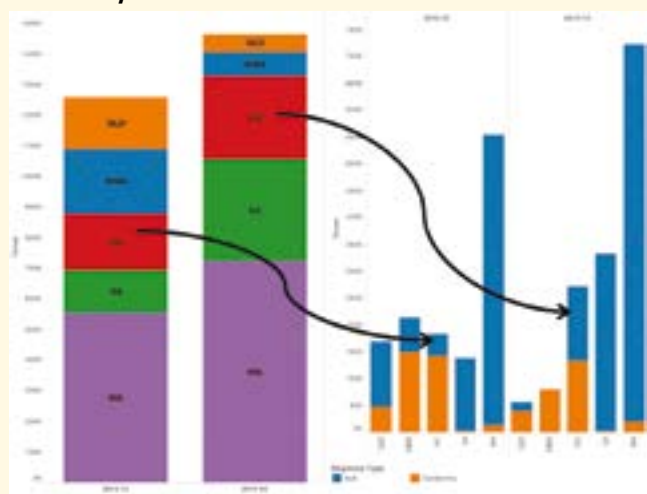
# SEED HAWK



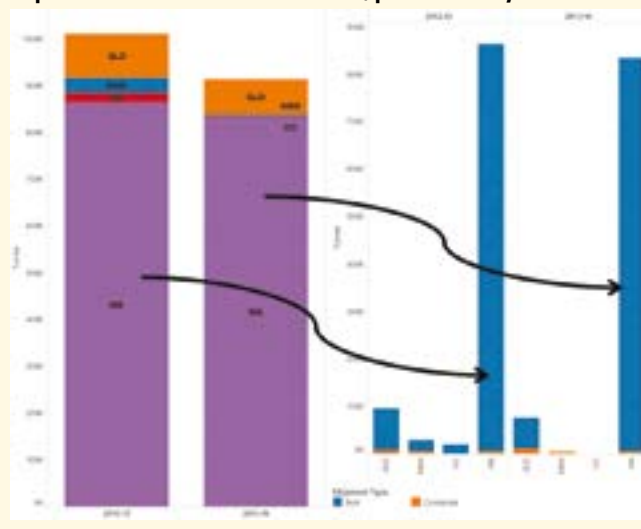
## Australian exports of wheat, barley, canola and sorghum (2011–14)



**Vietnam is supplied from all states in Australia and a combination of bulk and containers – this will raise questions of quality consistency**



**Japan sources wheat from Australia, predominantly from WA**



This article is an adaptation of a presentation by Ron Storey, Head of NZX Australian Agribusiness, at the Australian Grains Industry Conferences in Singapore and Hong Kong (March 2015).

We can stay at the generic, bulk commodity end of the market, competing with large, low cost producers like the Black Sea (Russia and Ukraine), Europe (particularly France), South America and at times the US. Or we can seek the higher value and emerging middle-income markets that will pay more for quality, traceability, consistent supply – in short, more customised.

There is a natural tension between price and quality consistency – the more consistent and customised product will come at a premium to the commoditised competitor – so we need to understand our customer needs really well.

Australia will not be the 'food bowl' to Asia, but there is a great opportunity to segment our markets to tap into the emerging middle class markets where we chose to compete on value-to-the-customer attributes, rather than price alone. We can be much better than that.

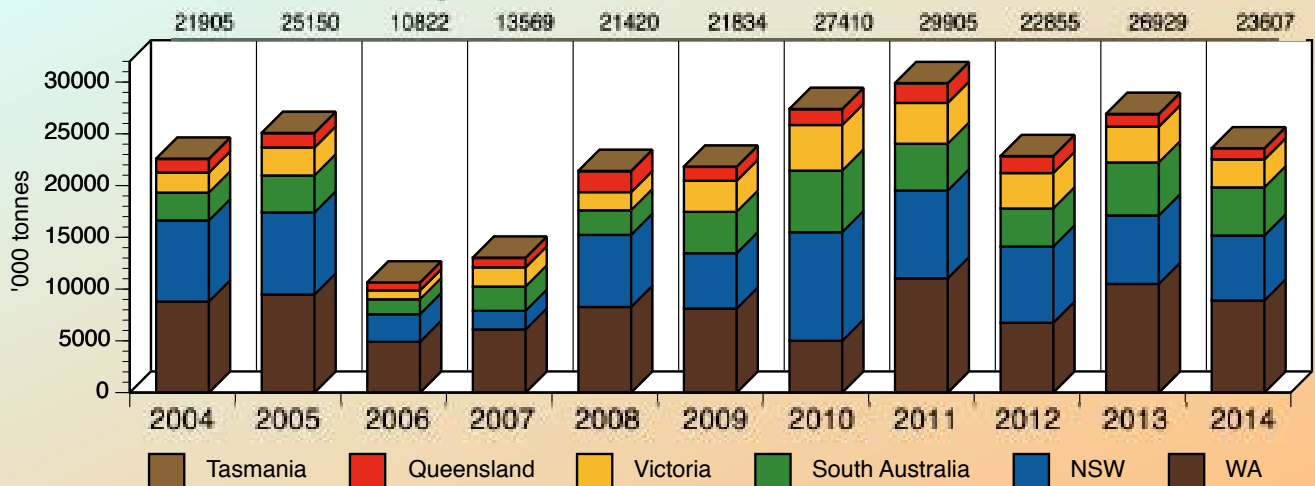
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## SECTION 2 THE GRAIN INDUSTRY IN FIGURES

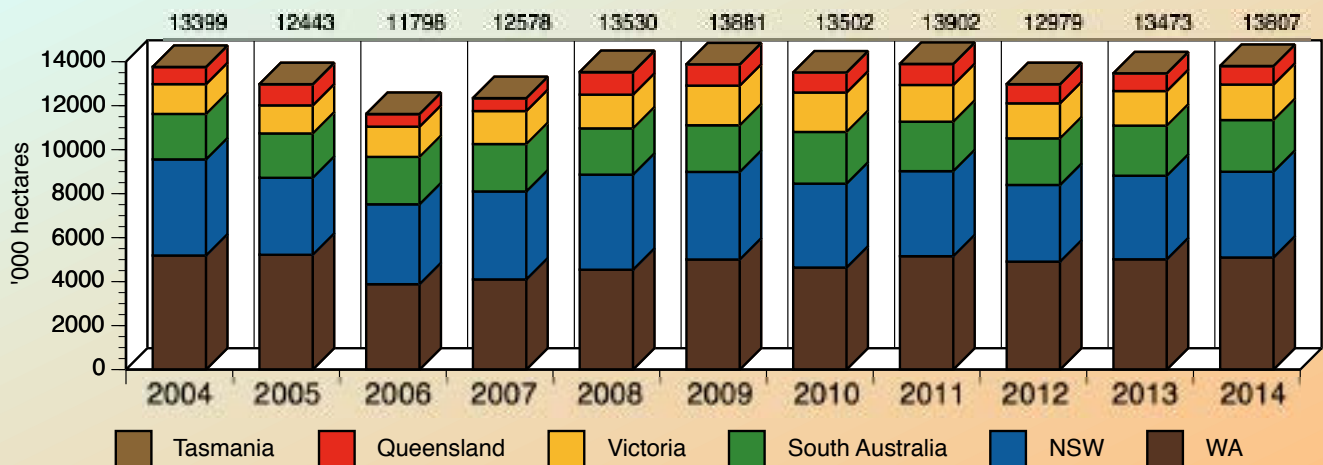
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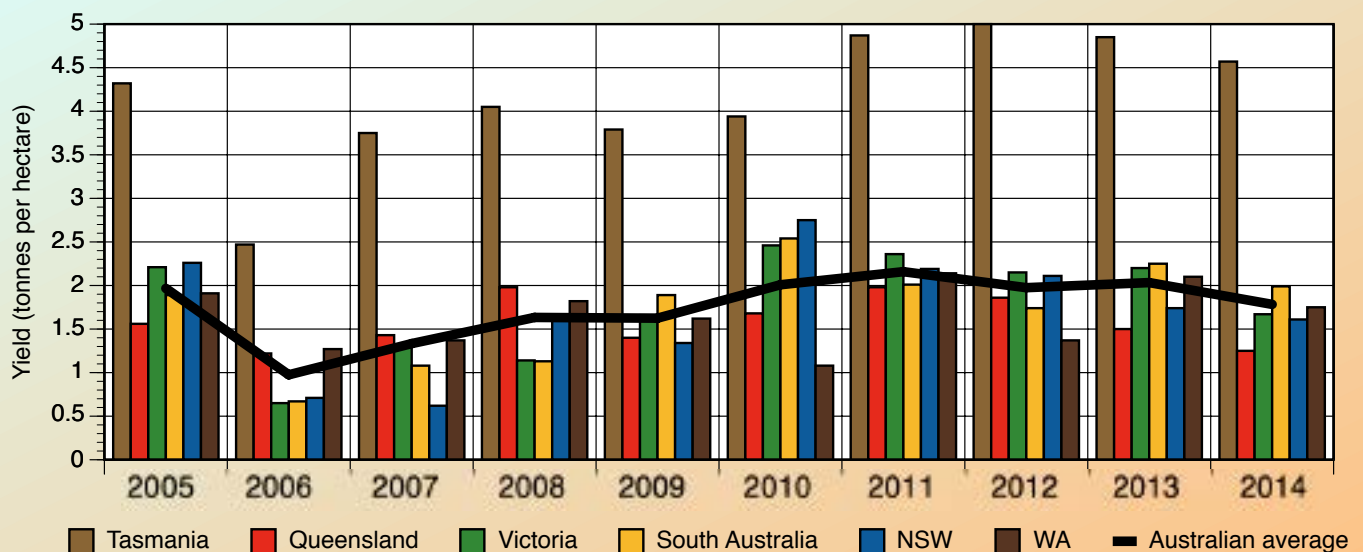
## Total Australian wheat production



## Total Australian wheat area



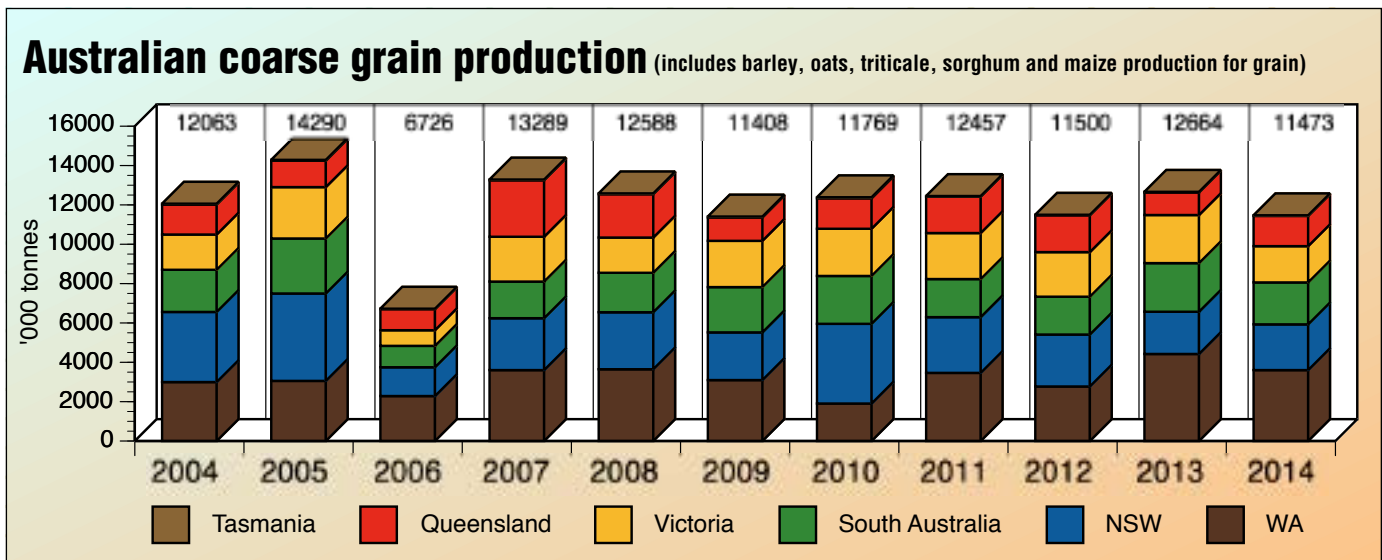
## Average Australian wheat yields by state



Australian wheat production, domestic disposal and exports (kt)					
	2010	2011	2012	2013	2014
Opening stocks	5798	9114	9659	4660	6438
Production	27410	29905	22856	26929	23607
Availability	33208	39019	32515	31589	30045
Total domestic use	5663	6334	6590	6815	7300
Stockfeed, Human, Indus	4968	5685	5916	6125	6615
Seed	695	649	674	690	685
EXPORTS					
Wheat (incl. grain & flour)	18431	23026	21265	18336	16944
MAJOR DESTINATIONS					
China	530	1872	1235	1491	na
Japan	1175	1293	1178	882	na
Korea, Rep. of	1197	2343	1496	910	na
Malaysia	928	894	855	957	na
Thailand	661	1442	475	387	na
Indonesia	3892	4066	4424	3720	na
Egypt	730	618	514	275	na
Iran	0	208	1292	849	na
Iraq	906	522	1771	959	na
United Arab Emirates	353	180	182	40	na
Yemen	779	841	722	1070	na
Kuwait	372	320	320	436	na
Saudi Arabia	66	349	409	377	na
Oceania (NZ, Fiji, PNG)	688	864	785	845	na
CLOSING STOCKS	9114	9659	4660	6438	5801

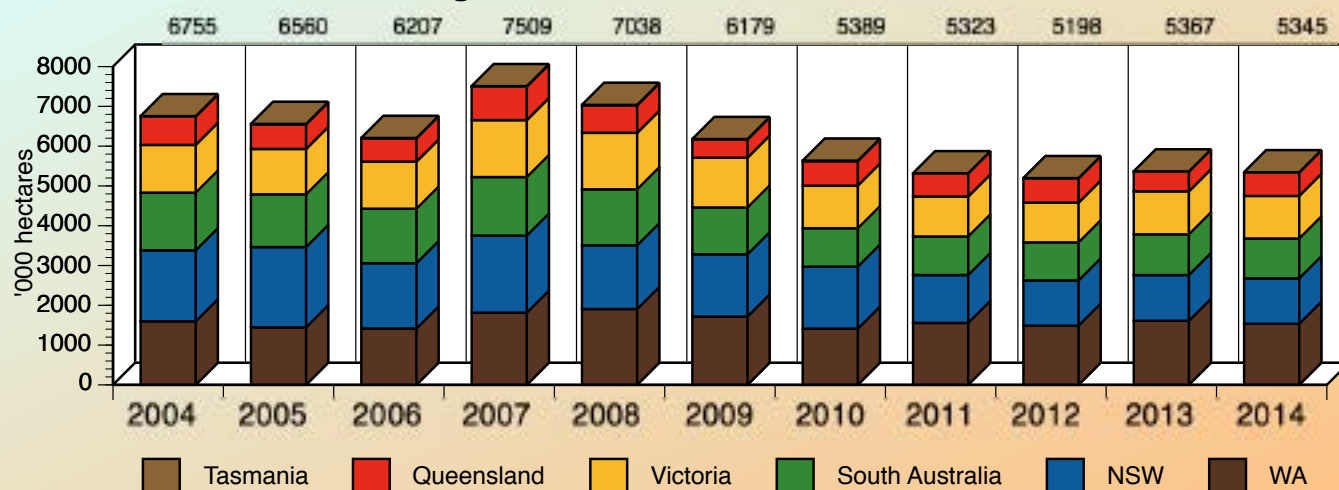
Wheat production & area by state					
	2010	2011	2012	2013	2014
NSW: Prod. (Kt)	10488	8473	7365	6612	6725
Area ('000 ha)	3815	3868	3487	3800	3900
Vic: Prod. (Kt)	4412	3943	3423	3455	2700
Area ('000 ha)	1793	1669	1592	1572	1613
Qld: Prod. (Kt)	1524	1886	1614	1200	1050
Area ('000 ha)	905	953	866	800	840
WA: Prod. (Kt)	5005	11045	6744	10500	8900
Area ('000 ha)	4640	5156	4909	5015	5097
SA: Prod. (Kt)	5949	4525	3679	5128	4650
Area ('000 ha)	2341	2249	2119	2279	2350
Tas: Prod. (Kt)	32	32	30	34	32
Area ('000 ha)	8	7	6	7	7

Barley production & area by state					
	2010	2011	2012	2013	2014
NSW: Prod. (Kt)	2194	1425	1286	1380	1184
Area ('000 ha)	878	673	619	690	640
Vic: Prod. (Kt)	1945	2005	1952	2105	1590
Area ('000 ha)	802	831	854	918	908
Qld: Prod. (Kt)	146	191	170	138	150
Area ('000 ha)	94	80	90	90	100
WA: Prod. (Kt)	1549	2761	2252	3800	3075
Area ('000 ha)	1101	1246	1215	1350	1285
SA: Prod. (Kt)	2122	1816	1794	2225	1931
Area ('000 ha)	795	881	861	888	870
Tas: Prod. (Kt)	39	23	17	22	24
Area ('000 ha)	11	6	5	6	7

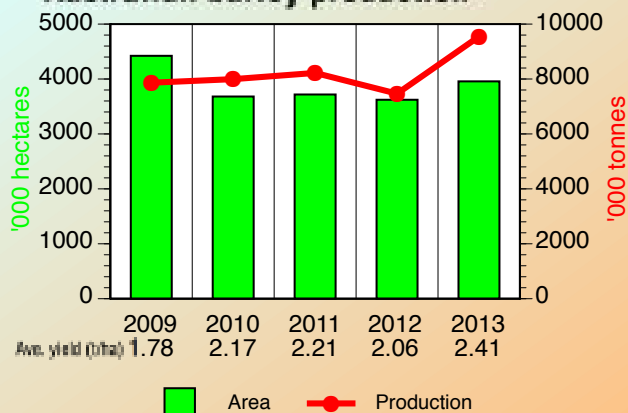




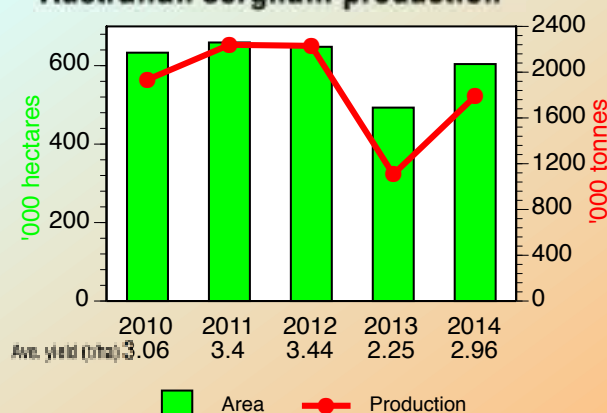
## Total Australian coarse grains area (includes barley, oats, triticale, sorghum and maize production for grain)



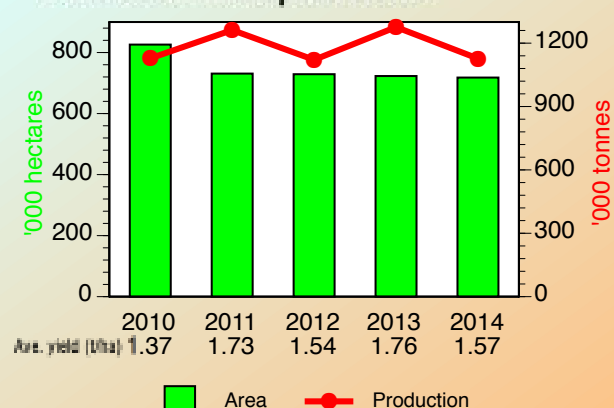
### Australian barley production



### Australian sorghum production



### Australian oats production



### Supply and disposal of Australian coarse grains (Kt)

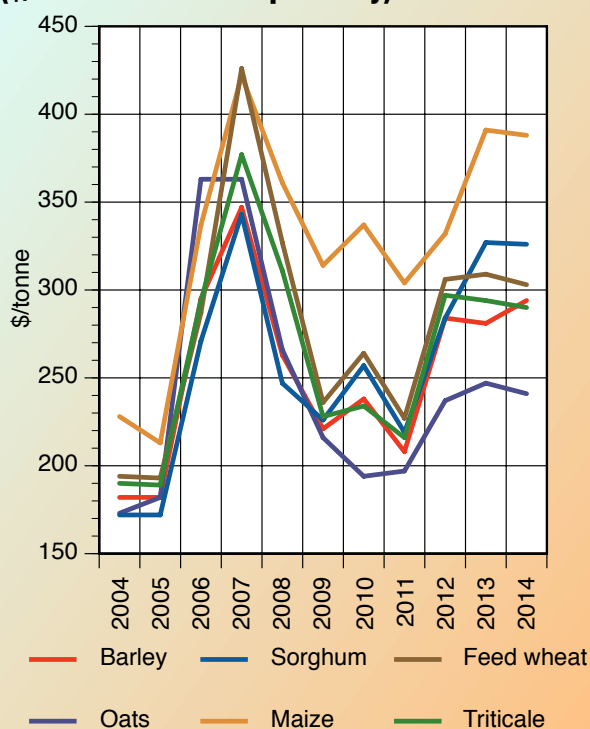
	2010	2011	2012	2013	2014
<b>BARLEY</b>					
Production	7995	8221	7472	9669	7954
Domestic use & stocks	3370	1653	2307	2545	1839
Exports	4625	6568	5165	7124	6115
<b>OATS</b>					
Production	1128	1262	1121	1276	1127
Domestic use & stocks	1001	1099	921	1039	869
Exports	127	163	200	237	258
<b>SORGHUM</b>					
Production	1935	2239	2230	1107	1790
Domestic use & stocks	1382	1127	939	406	1248
Exports	553	1112	1291	701	542
<b>MAIZE</b>					
Production	357	451	507	340	374
Domestic use & stocks	345	383	373	257	319
Exports	12	68	134	83	55
<b>TRITICALE</b>					
Production	355	285	171	274	248
Domestic use & stocks	355	285	171	274	274
<b>TOTAL (production)</b>	<b>11769</b>	<b>12457</b>	<b>11500</b>	<b>12664</b>	<b>11473</b>

## SECTION 2 THE GRAIN INDUSTRY IN FIGURES

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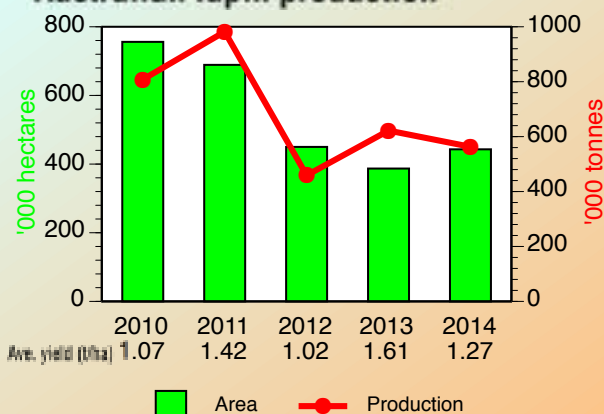
**Australian coarse grains domestic feed prices (\$/tonne delivered capital city)**



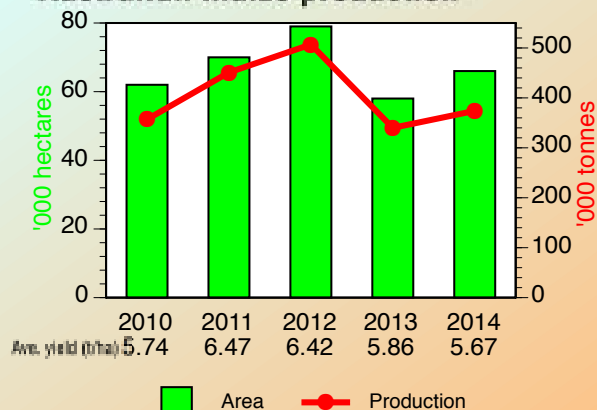
**Supply and disposal of Australian pulses (Kt)**

	2010	2011	2012	2013	2014
<b>LUPINS</b>					
Production	808	982	459	622	563
Domestic use & stocks	519	666	43	394	na
Exports	289	316	416	228	na
<b>FIELD PEAS</b>					
Production	395	342	320	339	284
Domestic use & stocks	141	94	112	185	na
Exports	254	248	208	154	na
<b>CHICKPEAS</b>					
Production	513	673	813	632	517
Domestic use & stocks	104	20	0	70	na
Exports	409	653	852	562	na

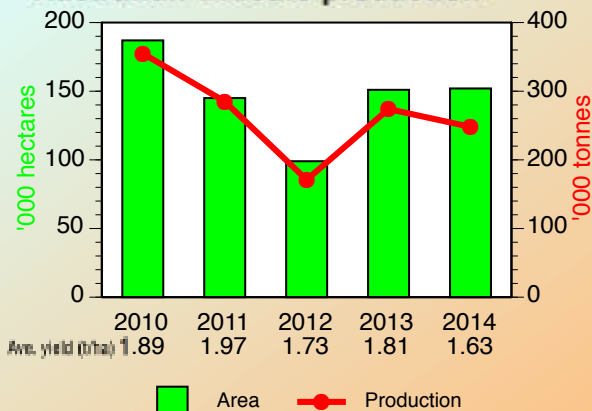
**Australian lupin production**



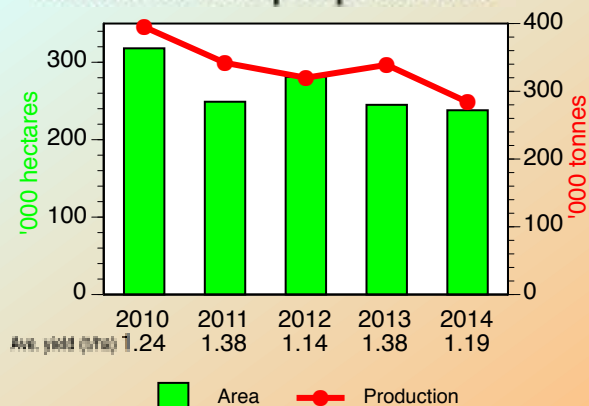
**Australian maize production**



**Australian triticale production**



**Australian field pea production**

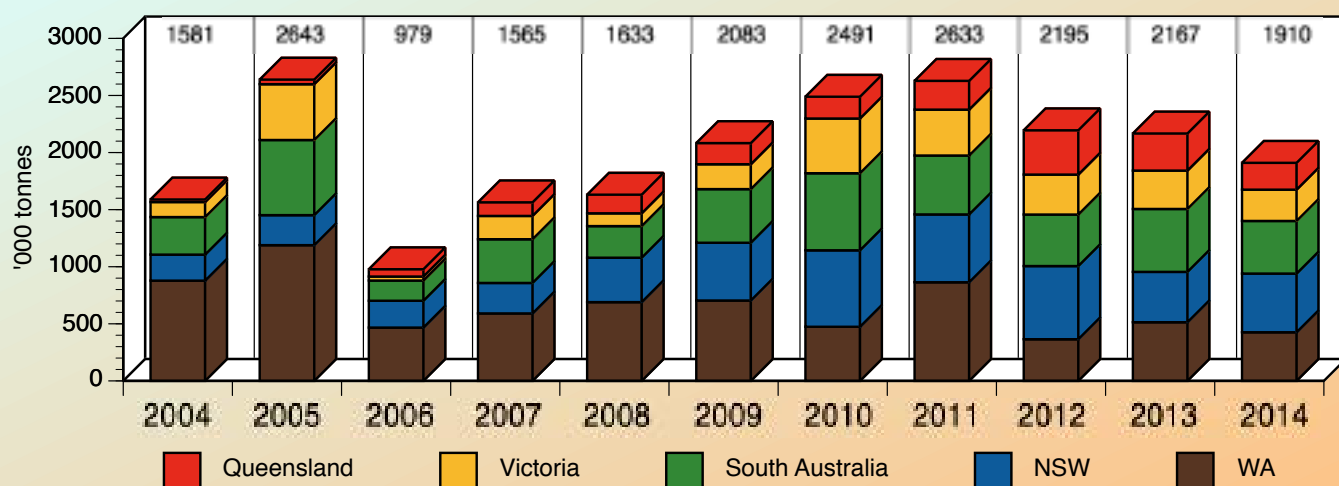


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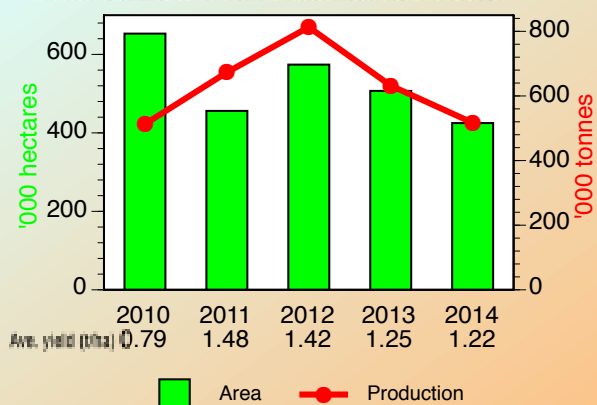
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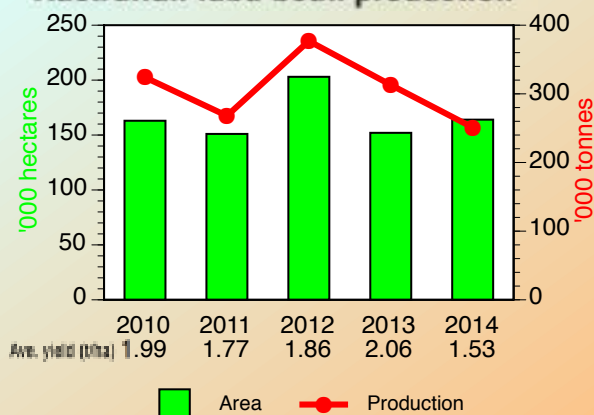
## Total Australian pulse production



## Australian chickpea production



## Australian faba bean production



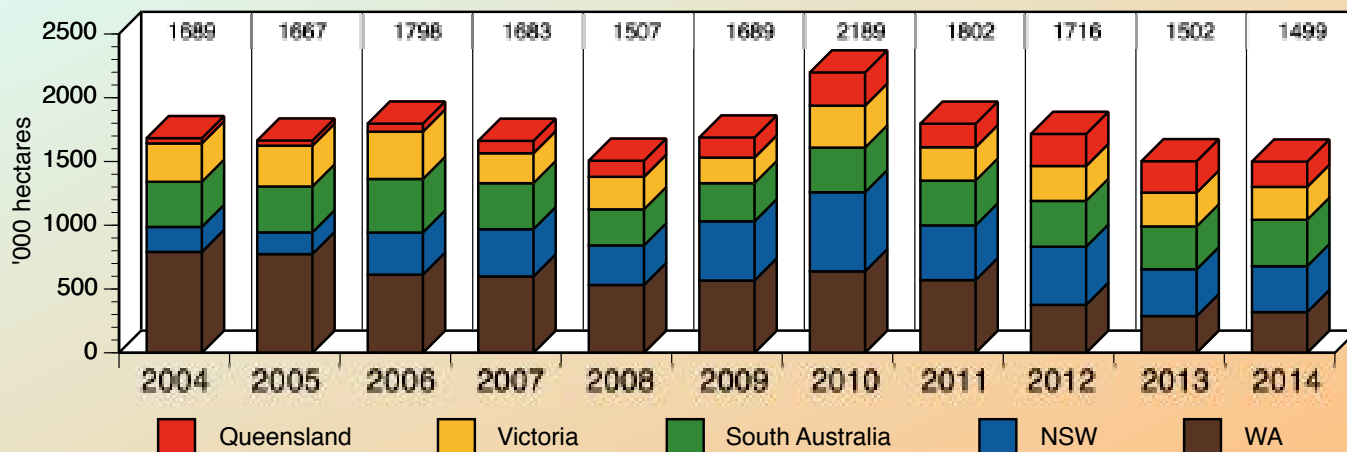
## SECTION 2 THE GRAIN INDUSTRY IN FIGURES

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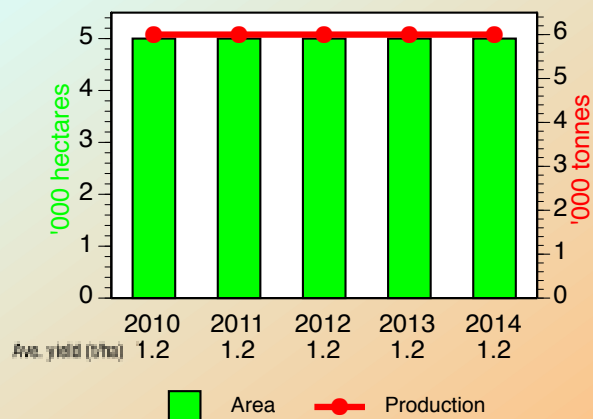
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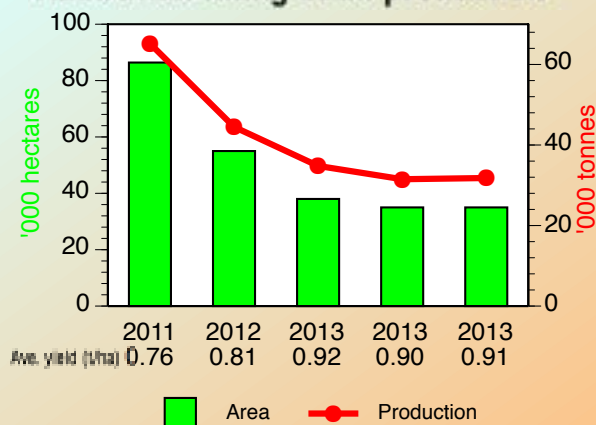
## Total Australian pulse area



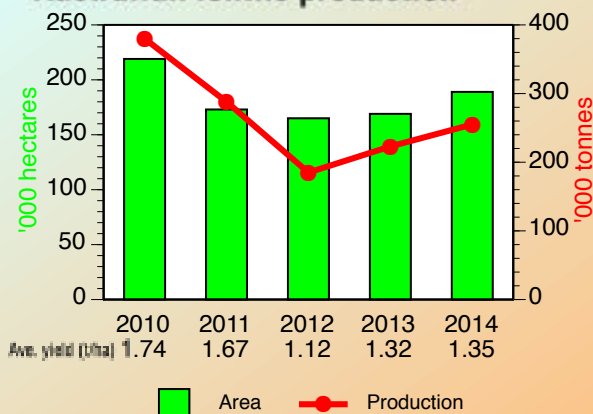
## Australian navy bean production



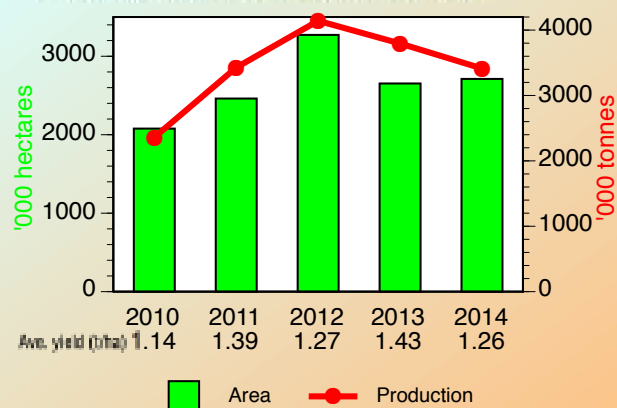
## Australian mung bean production



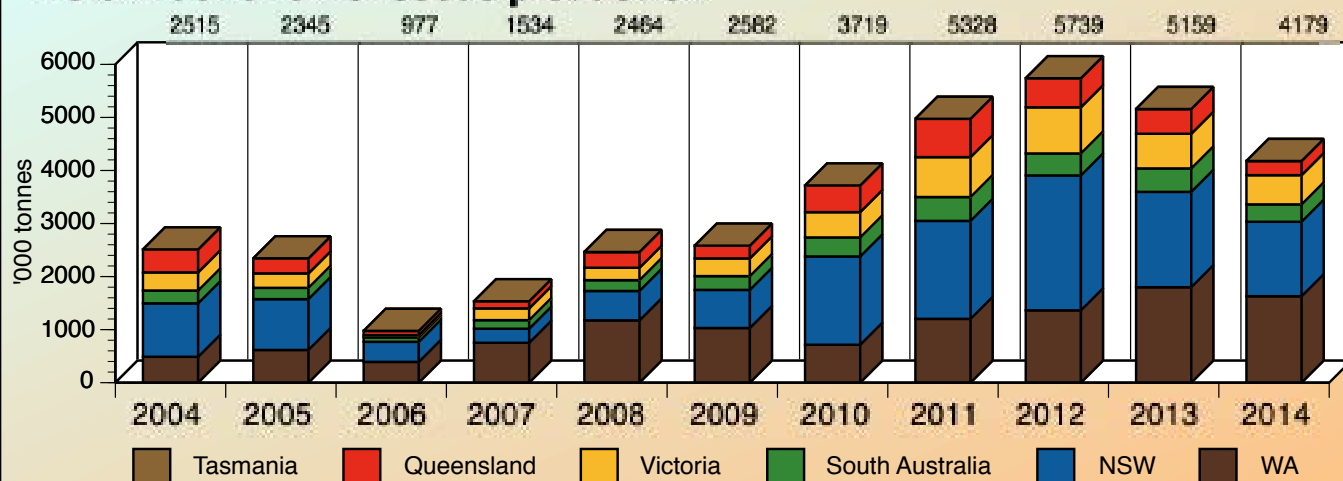
## Australian lentils production



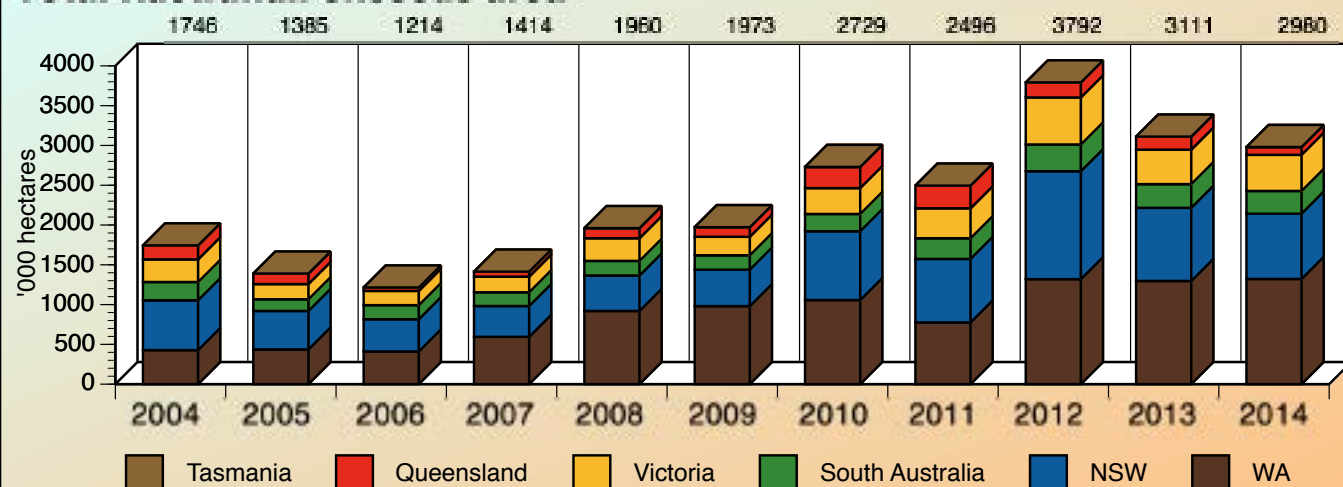
## Australian canola production



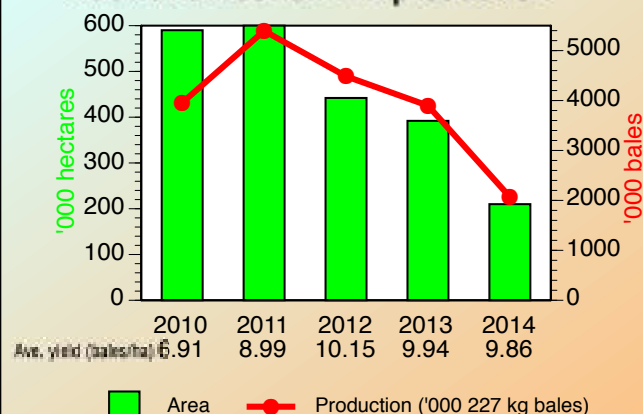
## Total Australian oilseeds production



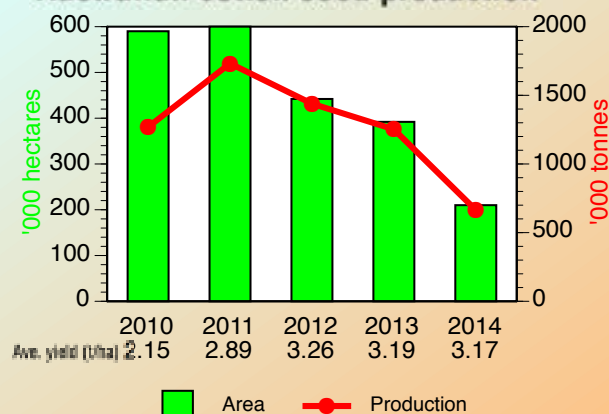
## Total Australian oilseeds area



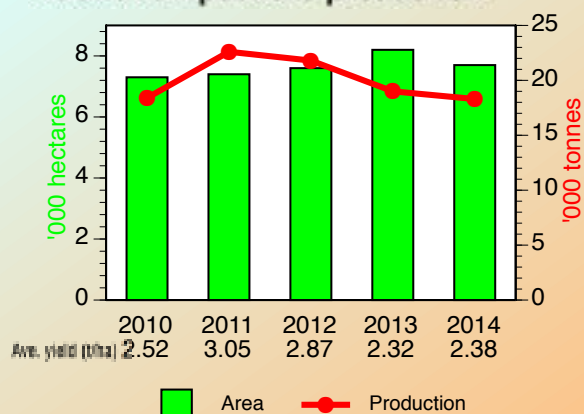
## Australian cotton lint production



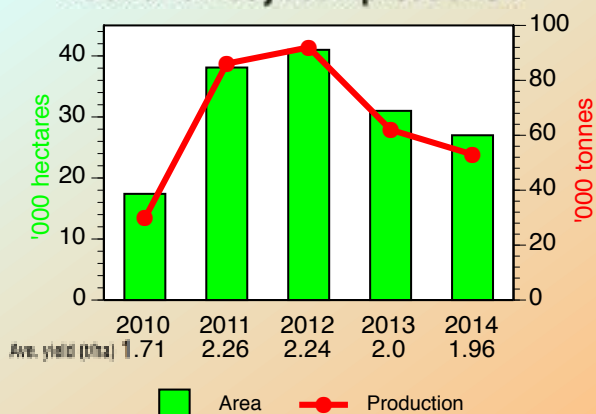
## Australian cotton seed production



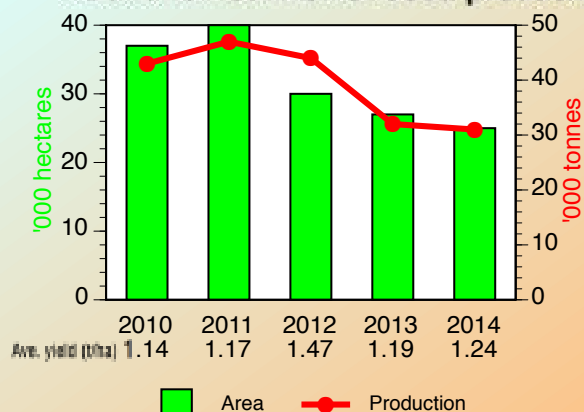
**Australian peanuts production**



**Australian soybean production**



**Australian sunflower seed production**



**Australian canola production, domestic use, seed and oil exports (kt)**

	2010	2011	2012	2013	2014
<b>Seed production</b>	2359	3427	4142	3795	3413
<b>DOMESTIC USE</b>					
Crushers	810	871	631	931	na
<b>EXPORTS</b>					
Seed	1471	2323	3488	3194	2382
Oil	104	117	116	152	na
Meal	31	22	41	42	na

**Australian exports of oilseeds, vegetable oils and meals, by type (kt)**

	2009	2010	2011	2012	2013	2014
<b>OILSEEDS</b>	Canola	1238.0	1471.0	2323.0	3488.0	3194.0
	Cottonseed	105.5	267.9	653.6	753.6	463.7
	Linseed	0.17	0.02	0.01	0.05	0.02
	Peanuts	4.9	3.5	2.9	2.8	3.2
	Safflowerseed	0.02	0.10	1.2	3.1	0.86
	Soybeans	6.8	2.1	1.1	3.1	9.0
	Sunflowerseed	1.6	0.94	0.61	0.95	0.51
	<b>Total</b>	<b>1357.0</b>	<b>1745.6</b>	<b>2982.4</b>	<b>4251.6</b>	<b>3671.3</b>
<b>OILS</b>	Canola	87.1	104.2	117.3	116.1	151.7
	Cottonseed	5.4	18.2	2.1	3.7	3.0
	Peanut	0.93	0.08	0.07	0.38	0.70
	Safflower & Sunflowerseed	0.04	0.20	0.40	1.5	0.22
	Soybeans	3.3	0.97	0.18	1.4	2.1
	Olive	6.9	6.1	5.2	3.0	4.9
	<b>Total</b>	<b>103.7</b>	<b>129.8</b>	<b>125.2</b>	<b>126.1</b>	<b>162.6</b>
<b>OILSEED MEALS</b>	Cottonseed	11.5	31.7	42.1	42.6	35.8
	Soybeans	2.2	3.5	6.4	2.9	2.0
	Canola	19.0	31.5	21.6	41.2	42.2
	Sunflowerseed	1.2	1.8	2.0	1.7	0.0
	Other	27.2	35.4	21.7	43.1	43.9
	<b>Total</b>	<b>61.1</b>	<b>103.9</b>	<b>93.8</b>	<b>131.5</b>	<b>123.9</b>



**Australian gross grain prices [\$A/tonne delivered to principal market/port, averaged across all grades]**

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15 f
Wheat (APW 10 net pool return)	446	341	256	368	275	326	336	315
Barley (feed)	347	263	221	238	208	284	281	255
Oats	363	266	216	194	197	237	284	246
Triticale	377	311	228	234	216	297	294	240
Maize	422	361	314	337	304	332	391	214
Sorghum	343	247	226	257	219	284	327	332
Rice (average return to growers)	415	566	457	240	270	260	306	300
Lupins	335	280	269	268	232	340	373	323
Field peas	407	345	241	266	295	406	434	370
Chickpeas	622	450	443	404	457	393	354	442
Sunflowerseed (at crusher)	814	696	696	567	551	520	559	614
Soybeans	554	551	551	501	472	434	574	570
Canola	543	548	440	544	513	560	529	485

**Gross value of Australian grain production [\$A million]**

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Wheat	5292	6021	4765	7052	6775	7154	8631	7100
Barley	2244	1850	1356	1729	1723	2063	2541	2306
Oats	423	251	186	221	255	265	313	291
Triticale	113	93	120	65	50	43	68	61
Maize	100	106	88	92	113	120	86	89
Sorghum	977	553	296	412	423	562	321	533
Rice	7	34	90	174	248	302	272	279
Lupins	222	198	222	216	228	156	216	168
Field peas	109	82	86	105	101	130	143	125
Chickpeas	195	199	216	207	308	320	222	214
Canola	659	1011	840	1283	1759	2270	1964	1640
Sunflowerseed	59	38	29	24	26	25	23	20
Soybeans	19	44	33	15	41	41	29	25
Peanuts, linseed, safflower seed	35	28	37	30	33	27	23	20
<b>TOTAL</b>	<b>10454</b>	<b>10508</b>	<b>8364</b>	<b>11625</b>	<b>12083</b>	<b>13478</b>	<b>14852</b>	<b>12871</b>

**Value of major Australian grain exports [\$A million, fob]**

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Wheat (incl. flour)	2990	5028	3692	5516	6378	6776	6103	5426
Barley (incl. malt)	1496	1321	1093	1295	1875	1626	2199	2037
Oats	37	64	53	37	47	61	72	77
Sorghum	76	405	116	146	299	364	253	181
Rice	110	143	43	165	427	459	490	525
Lupins	31	61	115	89	86	143	116	110
Field peas + Cow peas	61	62	60	85	93	89	67	98
Chickpeas	139	275	255	213	384	533	297	287
Cottonseed	8	19	46	85	195	219	168	95
Canola	303	595	583	866	1344	2094	1929	1251
Other oilseeds	27	27	24	14	10	13	18	13
<b>TOTAL</b>	<b>5278</b>	<b>8000</b>	<b>6080</b>	<b>8511</b>	<b>11138</b>	<b>12377</b>	<b>11712</b>	<b>10100</b>

# Five-year global supply and demand projections



## AT A GLANCE...

- Food and feed uses drive projected consumption growth, mainly linked to population increase and rising meat demand.
- Some tightening of world grains stocks is expected from the relatively abundant levels recently.
- World trade is projected to rise to new highs on demand from Asian buyers.
- Grains and oilseeds prices are expected to be underpinned by growth in animal feed demand in particular.

**W**orld total grains output is expected to retreat from the exceptional results of the past two seasons, but is then expected to resume growth, surpassing 2 billion tonnes, and the previous record, by 2017–18. Although some increase in harvested areas is projected, particularly in the CIS and South America, most of the gain in output is expected to come from better average yields.

Increases in consumption are seen mainly being driven by food and feed sectors.

Some tightening of world stocks is envisaged, but from a fairly high starting point.

World trade is seen reaching fresh records towards the end of the period.

Following the robust expansion of recent years, world oilseeds (soybeans and rapeseed/canola) production is set to fall in 2015–16, before trending higher thereafter, mostly due to larger soybean crops in the US and Brazil. Underpinned by demand for animal feed, especially in Asia, global consumption of oilseeds is anticipated to increase. After reaching a peak in 2014–15, oilseed inventories are projected to contract. World traded volumes of oilseeds are anticipated to expand on bigger deliveries to Asian markets.

World rice production is projected to rise during the next five years, but at a slower rate than in the past.

## Projections and assumptions

The following projections present a possible supply and demand scenario for global grains, rice and oilseeds markets in the next five-year period to 2019–20, taking into account a number of broad assumptions. These include assumed trends in population growth, prices, agriculture and trade policies, as well as prospects for the global economy.

## Wheat and coarse grains

After the exceptional results of the past two seasons, world total grains

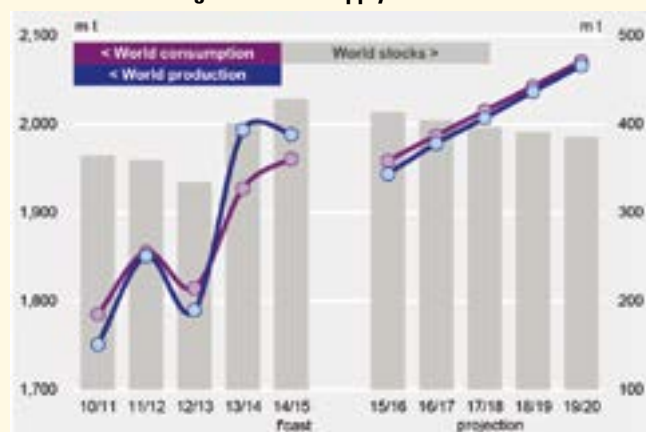
(wheat and coarse grains) production is expected to retreat slightly in the early part of the projection period, but then resume growth, surpassing the previous record by 2017–18 and exceeding two billion tonnes for the first time. Only modest gains in area are anticipated, contained by competition from other crops, especially oilseeds, with much of the expansion in output coming from steadily rising average yields.

World wheat and coarse grains consumption is projected to grow by around one per cent per annum, driven mainly by expanding feed and food uses. Per capita food demand shows little overall change, but population increase maintains an upward trend in total consumption.

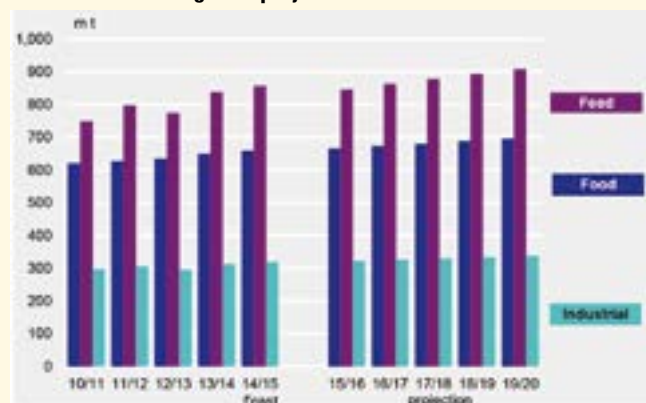
Demand for meat and livestock products is assumed to grow at a comparatively faster rate, as consumers in some developing countries continue to diversify diets away from grains-based staples. Feed needs are therefore set to expand strongly relative to other uses, accounting for almost half of the overall rise. Industrial use of grains is projected to increase, but at a fairly modest pace as grains-based ethanol sectors mature.

After being built up to relatively high levels in the past few seasons, some tightening of global total grains inventories is possible, particularly for maize. The ratio of stocks to use is seen at a five-year peak of 22 per cent at the end of 2014–15, but is expected to tighten to around 19 per cent.

Wheat and coarse grains world supply and demand



Wheat and coarse grains projected world use

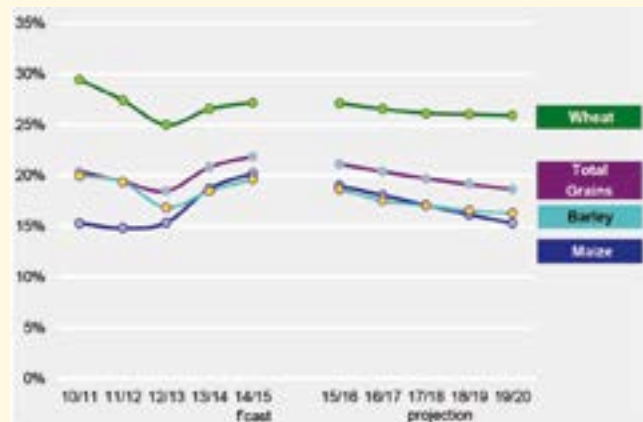


## SECTION 2 THE GRAIN INDUSTRY IN FIGURES

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### Wheat and coarse grains stock-to-use ratios



Projected growth in world grains trade is centred on heavier buying of maize, particularly by China, but with solid rises for that grain elsewhere in Asia, Latin America and Africa as well. Trade in wheat is expected to stay below the record in 2013–14, but nevertheless maintain an upward trend.

### Rice

Global rice output is projected to trend higher in the five years to 2019–20, but the rate of increase will be slower than in the past amid likely limited growth in China. In that country, higher incomes are expected to see a rise in protein demand at the expense of traditional staples, as the expansion of world rice uptake slows. Much of the forecast

increase in consumption in sub-Saharan Africa will be due to stronger demand for high quality white and parboiled varieties.

Global carryovers are seen falling owing to declines in major exporters.

### Soybeans and canola

Following the strong growth of recent years, production of oilseeds (soybeans and rapeseed/canola) in 2015–16 is expected to fall for the first time in four seasons, before resuming an upward trend, to reach 396 million tonnes in 2019–20. This will be a net increase of 18 million on five years earlier. World consumption is projected to grow throughout the medium term, by 1.6 per cent per annum, underpinned by expanding demand from animal feed sectors, especially in Asia, as rising populations and higher incomes boost protein uptake.

After an expected 30 per cent year on year increase in 2014–15, oilseed inventories are expected to decline in the period to 2019–20, reflecting a fall in soybean stocks, led by major exporters. Nevertheless, supplies would still be comfortable compared to the prior five years. Global trade is seen reaching new peaks, mostly driven by expanding feed demand, especially in Asia.

### Grain prices to remain strong

Despite continued uncertainties about global economic prospects and recent pressure on agricultural markets from heavier supplies, grains and oilseeds prices are assumed to remain favourable for sustained investment, underpinned by growth in demand for animal feed in particular.

Data up to 2014–15 are based on the forecasts made in the International Grains Council Grain Market Report 449, issued on October 30, 2014.



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World supply and demand for wheat and total coarse grains, million tonnes (Mt)							
Supply and demand for wheat (by major producer)							
	Opening stocks	Production	Imports	Total supply	Total use	Exports	Closing stocks
<b>Argentina</b>							
2012	0.7	8.0	0.0	8.7	4.9	3.7	0.2
2013	0.2	9.2	0.0	9.4	5.2	2.5	1.7
2014	1.7	12.0	0.0	13.7	5.5	7.0	1.2
<b>Australia</b>							
2012	9.7	22.9	0.0	32.5	6.6	21.2	4.7
2013	4.7	26.9	0.0	31.6	6.8	18.3	6.4
2014	6.4	23.6	0.0	30.0	7.3	16.9	5.8
<b>Canada</b>							
2012	5.9	27.2	0.1	33.2	8.7	19.4	5.1
2013	5.1	37.5	0.1	42.7	9.4	23.5	9.8
2014	9.8	27.5	0.1	37.3	9.1	23.2	5.0
<b>EU-27</b>							
2012	10.9	131.6	5.3	147.8	115.8	23.5	8.5
2013	8.8	143.1	4.1	156.0	114.4	32.8	8.8
2014	8.8	154.1	5.5	168.4	123.3	28.1	17.0
<b>Russia</b>							
2012	11.0	37.7	1.4	50.1	33.4	11.2	5.5
2013	5.5	52.1	1.0	58.5	34.6	18.5	5.5
2014	5.5	60.0	0.5	66.0	36.0	22.7	7.2
<b>Ukraine</b>							
2012	5.7	15.8	0.0	21.4	11.4	7.1	3.0
2013	3.0	22.3	0.0	25.3	11.9	9.5	3.9
2014	3.9	24.0	0.0	27.9	12.3	10.3	5.3
<b>United States</b>							
2012	20.2	61.8	3.3	85.3	38.3	27.4	19.5
2013	19.5	58.0	4.6	82.1	34.1	32.0	16.1
2014	16.1	55.4	4.6	76.1	33.1	25.0	17.9
<b>China</b>							
2012	52.1	120.8	3.3	176.2	122.0	0.4	53.7
2013	53.7	121.9	6.7	182.4	123.3	0.3	58.7
2014	58.7	125.3	2.7	186.7	122.9	0.5	63.3
<b>India</b>							
2012	20.0	94.9	0.1	114.9	83.9	6.8	24.2
2013	24.2	93.5	0.0	117.7	93.8	6.0	18.0
2014	18.0	95.9	0.0	114.0	93.5	2.8	17.7
<b>Total world supply and demand for wheat</b>							
2012	191.2	655.0	140.6	846.2	677.0	140.6	169.2
2013	169.2	712.5	155.2	881.7	696.7	155.2	185.0
2014	185.0	717.6	149.1	902.6	709.8	149.1	192.9
<b>Total world supply and demand for coarse grains (ie. total of corn, barley, sorghum, oats &amp; rye)</b>							
2012	168.9	1134.8	128.4	1303.7	1137.9	128.4	165.9
2013	165.9	1280.7	152.4	1446.6	1230.5	152.4	216.1
2014	216.1	1270.6	145.7	1486.7	1250.7	145.7	236.0
<b>Total world supply and demand for wheat and coarse grains</b>							
2012	360.1	1789.8	268.9	2149.9	1814.9	268.9	335.1
2013	335.1	1993.3	307.6	2328.3	1927.2	307.6	401.1
2014	401.1	1988.2	294.8	2389.3	1960.5	294.8	428.9

## Summary of world statistics for wheat

	Area million ha	Production (Mt)	Use (Mt)	CLOSING STOCKS		Stocks to use ratio (%)	Trade (imports) Mt	Price US\$ (Hard Red Winter, Gulf)
				World (Mt)	Major exporters (Mt)			
2006	211	597	609	127	48	21	111	212
2007	215	607	602	132	48	22	110	362
2008	223	685	645	172	69	27	137	271
2009	222	678	652	199	77	31	128	209
2010	218	652	659	194	74	29	126	317
2011	221	697	698	192	68	28	145	299
2012	215	655	677	169	50	25	141	348
2013	220	713	697	185	54	26	155	317
2014	223	718	710	193	64	27	149	270

## World wheat production by region (Mt)

	EU 27	Ukraine	Russia	Kazak.	Other FSU 12	Turk.	Canada	US	Argen.	Iran	China	India	Pakis.	North Africa	Aust.	TOTAL WORLD
2007	118.0	13.9	49.4	16.5	13.9	15.5	20.1	55.8	16.4	15.0	109.3	75.8	23.3	11.8	13.6	607
2008	150.7	25.9	63.8	12.5	13.3	17.0	28.6	68.0	11.0	10.0	112.5	78.6	20.1	13.0	21.4	685
2009	138.3	20.9	61.8	17.1	14.2	18.5	26.8	60.4	11.0	12.0	115.1	80.7	24.0	17.0	21.8	678
2010	136.8	16.8	41.5	9.6	13.1	17.0	23.3	60.1	15.9	13.5	115.2	80.8	23.9	16.5	27.4	652
2011	137.4	22.3	56.2	22.7	13.8	18.8	25.3	54.4	14.5	12.4	117.4	86.9	25.0	18.4	29.9	697
2012	131.6	15.8	37.7	9.8	14.5	16.0	27.2	61.8	8.0	13.8	120.8	94.9	23.3	17.2	22.9	655
2013	143.1	22.3	52.1	13.9	15.6	18.7	37.5	58.0	9.2	14.5	121.9	93.5	24.0	20.1	26.9	713
2014	154.1	24.0	60.0	13.5	15.9	15.2	27.5	55.4	12.0	13.0	125.3	95.9	25.0	19.7	23.6	718

## TABLE NOTES...

**European Union 27 (EU 27)** consists of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany (originally West Germany), Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden.

**Former Soviet Union 12 (FSU 12)** consists of Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

**Near East Asia** refers to Iran, Saudi Arabia, Syria and Turkey.

**Far East Asia** refers to China, Afghanistan, India and Pakistan.

**Southeast Asia** refers to Indonesia, Malaysia, Philippines, Thailand and Vietnam.

## Major world wheat trading regions/countries [Mt]

	2010	2011	2012	2013	2014
<b>IMPORTS</b>					
EU 27	4.7	7.4	5.3	4.1	5.9
FSU 12	5.7	8.0	7.2	7.4	7.5
Northern Africa	24.3	24.9	22.1	25.2	24.1
Middle East	18.1	20.9	25.5	26.4	30.4
Southeast Asia	15.7	17.4	15.8	16.4	18.0
Mexico	3.4	5.0	3.8	4.6	4.6
Brazil	6.7	7.3	7.4	7.1	6.7
Japan	5.9	6.4	6.6	6.1	5.9
<b>EXPORTS</b>					
Argentina	9.5	12.9	3.7	2.5	7.0
Australia	18.4	23.0	21.3	18.3	16.9
Canada	16.6	17.3	19.6	23.5	23.1
EU 27	22.9	16.7	23.5	32.8	32.1
US	35.1	28.6	27.4	32.0	24.5
Russia	4.0	21.6	11.2	18.5	20.3
Ukraine	4.3	5.4	7.1	9.5	11.8
Others	22.1	19.3	26.8	18.1	13.4
<b>Total wheat trade</b>	<b>132.9</b>	<b>144.8</b>	<b>140.6</b>	<b>155.2</b>	<b>149.1</b>

## SECTION 2 THE GRAIN INDUSTRY IN FIGURES

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## World durum wheat production and trade

	2010	2011	2012	2013	2014
<b>PRODUCTION (Mt)</b>					
EU 27	9.1	8.2	7.9	7.9	7.0
Kazakhstan	1.7	3.0	1.4	2.0	2.1
Canada	3.0	4.2	4.6	6.5	4.8
Mexico	2.2	2.2	2.1	2.3	2.3
US	2.9	1.4	2.2	1.7	1.4
Algeria	2.2	2.5	3.0	2.5	1.3
Syria	1.6	1.7	1.5	1.5	0.8
Turkey	2.9	3.0	3.0	3.0	2.1
India	1.0	1.1	1.2	1.2	1.3
Australia	0.5	0.6	0.5	0.5	0.5
Other	7.8	8.8	7.8	8.9	8.7
<b>WORLD TOTAL PROD'N (Mt)</b>	<b>34.9</b>	<b>36.7</b>	<b>35.2</b>	<b>38.0</b>	<b>32.3</b>
<b>MAJOR IMPORTERS (Kt)</b>					
EU 27	1928	1860	1453	1900	2030
US	474	614	667	819	850
Venezuela	403	403	424	440	400
Japan	230	273	197	212	230
Morocco	773	661	765	735	721
Algeria	1335	1821	1613	1529	1840
Other	2257	1737	2285	2513	2442
<b>MAJOR EXPORTERS (Kt)</b>					
Canada	3117	3859	4289	4740	5245
EU 27	2060	1379	1390	1089	950
US	1051	554	581	689	550
Mexico	770	918	841	1275	1250
Turkey	20	2	1	4	4
Australia	233	348	237	245	240
<b>WORLD TOTAL TRADE (Mt)</b>	<b>7.4</b>	<b>7.4</b>	<b>7.4</b>	<b>8.1</b>	<b>8.5</b>
<i>Semolina component (Kt)</i>	<i>360</i>	<i>360</i>	<i>350</i>	<i>350</i>	<i>360</i>

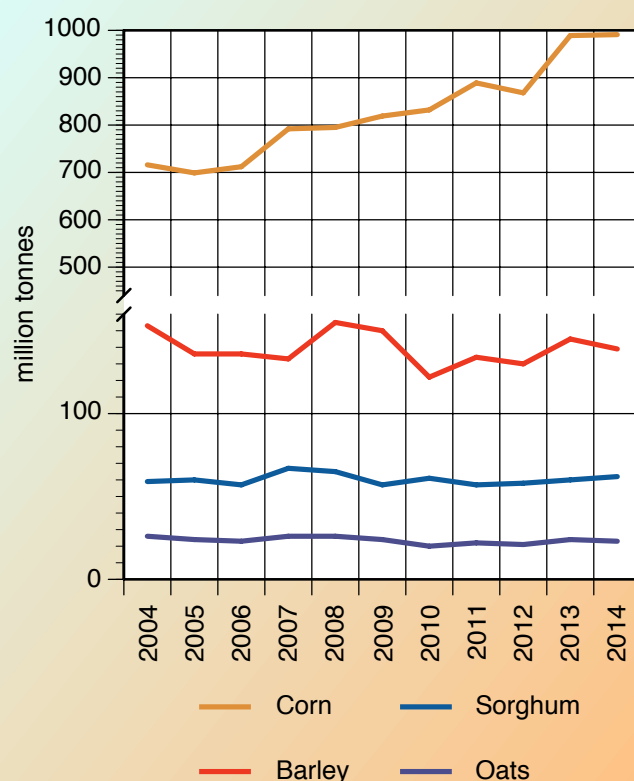
## Summary of world statistics for coarse grains

	2010	2011	2012	2013	2014
Area (million ha)	304	312	316	323	319
Production (Mt)	1097	1155	1135	1281	1271
Total use (Mt)	1126	1159	1138	1231	1251
Closing stocks: World (Mt)	173	169	166	216	236
Closing stocks: US (Mt)	32.3	22.9	23.5	34.3	47.9
S.T.U.R. (%)	15.4	14.6	14.6	17.5	18.9
Trade (Mt)	117	125	128	152	146

## World coarse grains production by region and country (Mt)

	2010	2011	2012	2013	2014
EU 27	139.5	149.9	145.9	158.5	168.2
Russia	16.4	33.1	28.7	35.7	40.5
Ukraine	21.4	33.5	29.5	39.9	39.3
Canada	22.7	22.9	24.4	28.7	21.9
Mexico	29.4	25.7	28.9	32.0	31.1
United States	330.2	323.7	285.3	367.1	377.1
Argentina	33.2	30.1	37.2	35.7	31.0
Brazil	60.4	75.9	84.2	82.6	77.8
Turkey	9.5	10.6	11.1	13.2	13.8
China	183.4	199.3	212.2	225.1	222.1
India	43.4	42.1	40.0	42.7	41.9
Southeast Asia	23.2	25.1	25.3	26.9	27.7
Nth Africa & Mideast	28.6	26.0	26.5	30.2	25.4
Sub-Saharan Africa	83.6	80.1	81.2	80.5	82.0
Australia	11.8	12.5	11.5	12.7	11.5
Other	60.3	64.5	63.1	69.5	59.7
<b>TOTAL</b>	<b>1097</b>	<b>1155</b>	<b>1135</b>	<b>1281</b>	<b>1271</b>

## World coarse grain production [Mt]



Major world barley and sorghum producers (Mt)					
	2010	2011	2012	2013	2014
<b>BARLEY</b>					
EU 27	53.1	51.8	54.5	59.5	59.8
United States	3.9	3.4	4.8	4.7	3.9
Canada	7.6	7.9	8.0	10.2	7.1
Russia	8.4	16.9	13.9	15.4	19.0
Ukraine	8.5	9.1	6.9	7.6	9.4
Argentina	3.0	4.1	5.2	4.7	3.9
China	2.0	2.5	1.6	1.7	1.6
Turkey	5.9	7.0	5.5	7.3	4.0
Australia	8.0	8.2	7.5	9.7	7.9
<b>TOTAL WORLD PROD'N</b>	<b>122</b>	<b>134</b>	<b>129</b>	<b>145</b>	<b>138</b>
<b>SORGHUM</b>					
United States	8.8	5.4	6.3	9.9	10.4
Mexico	6.3	6.1	5.9	7.3	7.7
Argentina	4.5	4.3	4.0	4.2	4.0
India	7.0	6.1	6.0	5.3	5.0
Sub-Saharan Africa	26.1	23.3	23.4	22.8	24.1
Australia	1.9	2.2	2.2	1.1	1.8
<b>TOTAL WORLD PROD'N</b>	<b>62</b>	<b>56</b>	<b>57</b>	<b>60</b>	<b>62</b>

World coarse grains trade by region and country (Mt)					
	2010	2011	2012	2013	2014
<b>IMPORTS</b>					
EU 27	8.6	7.0	11.8	16.2	8.3
United States	2.5	2.9	6.6	3.2	3.1
Mexico	10.8	12.8	7.6	11.3	11.2
Southeast Asia	7.8	6.7	8.0	10.5	9.2
Japan	18.6	17.7	17.7	17.5	17.8
South Korea	8.2	6.7	8.3	10.5	9.7
China	2.7	7.9	5.6	12.4	15.6
Saudi Arabia	7.4	10.5	10.7	11.7	11.1
Nth'n Africa & Middle East	21.6	25.0	23.5	29.9	31.5
Others	28.8	49.8	28.2	28.8	28.5
<b>EXPORTS</b>					
Argentina	19.7	23.9	24.0	21.2	17.5
Brazil	8.4	24.3	25.0	21.0	20.5
Australia	5.8	7.9	6.8	8.2	7.0
Canada	4.5	3.7	5.0	5.3	3.6
EU 27	6.2	6.5	7.4	8.6	10.9
Ukraine	7.8	17.7	15.0	22.8	22.4
Russia	0.3	5.8	4.3	6.9	7.0
United States	50.7	41.0	20.7	54.4	47.9
<b>TOTAL WORLD TRADE</b>	<b>117</b>	<b>147</b>	<b>128</b>	<b>152</b>	<b>146</b>

World barley trade by region (Mt)					
	2010	2011	2012	2013	2014
<b>IMPORTS</b>					
Europe	0.4	0.9	0.3	0.4	0.2
FSU 12	0.6	0.7	0.3	0.3	0.4
Saudi Arabia	5.4	8.6	8.2	9.0	8.8
Other Near East Asia	2.3	3.4	4.0	3.7	4.2
China	2.1	2.3	2.1	4.1	3.7
Japan	1.4	1.2	1.4	1.3	1.3
United States	0.2	0.4	0.5	0.4	0.5
Brazil	0.3	0.2	0.3	0.4	0.4
Mexico	0.1	0.1	0.2	0.2	0.1
Africa	1.3	1.8	1.3	2.4	1.7
Others	0.6	0.7	0.9	0.7	0.9
<b>EXPORTS (feed and malting)</b>					
Australia	5.4	6.1	5.3	7.1	6.1
Canada	1.4	1.2	1.5	1.1	1.1
EU 27	4.7	3.1	5.0	5.7	6.4
United States	0.2	0.1	0.2	0.3	0.2
Ukraine	2.8	2.5	2.1	2.5	3.7
Russia	0.3	3.5	2.2	2.7	3.3
Argentina	1.0	3.2	3.3	2.8	1.9
<b>TOTAL EXPORTS (Mt)</b>	<b>14.7</b>	<b>20.3</b>	<b>19.5</b>	<b>22.9</b>	<b>22.2</b>
<b>TOTAL PRODUCTION (Mt)</b>	<b>122</b>	<b>134</b>	<b>129</b>	<b>145</b>	<b>138</b>

World sorghum trade by country (Kt)					
	2010	2011	2012	2013	2014
<b>IMPORTS</b>					
EU27	715	78	254	203	75
Mexico	2154	1392	2090	501	100
Colombia	307	453	707	194	150
Chile	701	487	459	195	200
Japan	1386	1343	1934	1034	1150
Israel	123	3	53	82	40
Sudan	233	187	114	178	150
New Zealand	42	72	92	29	80
Others	672	614	1238	3883	6423
<b>MAJOR EXPORTERS</b>					
Australia	341	950	1179	1146	800
Argentina	1862	1595	3216	1114	1400
China	53	52	32	11	15
India	53	104	236	81	50
United States	3775	1772	2064	4093	5900
<b>TOTAL EXPORTS (Kt)</b>	<b>6333</b>	<b>4629</b>	<b>6941</b>	<b>6299</b>	<b>8368</b>

## Major world oilseeds trade and production (Mt)

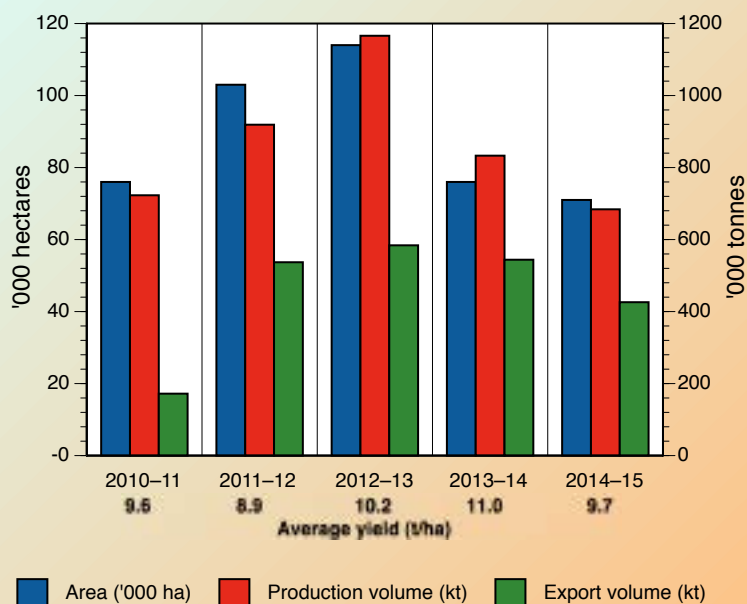
	2008	2009	2010	2011	2012	2013	2014
<b>IMPORTS: Canola</b>	11.23	11.11	10.49	13.10	13.00	16.30	13.80
<i>Japan</i>	2.15	2.31	2.32	2.40	2.50	2.40	2.60
<b>Soybeans</b>	76.84	93.10	88.76	93.45	95.90	111.25	114.07
<i>China</i>	41.10	53.90	52.34	59.24	59.86	70.36	74.00
<b>EXPORTS: Canola</b>	11.23	11.11	10.49	13.10	13.00	16.30	13.80
<i>Australia</i>	1.07	1.19	1.55	2.562	3.51	2.86	2.50
<i>Canada</i>	7.32	7.35	7.21	8.69	6.71	10.0	8.0
<b>Soybeans</b>	76.84	93.10	91.70	92.16	100.53	113.03	117.42
<i>Brazil</i>	25.36	28.58	29.95	36.26	41.90	46.83	46.00
<i>United States</i>	31.60	41.70	40.96	37.15	35.85	44.82	48.72
<b>Sunflowerseed</b>	2.28	1.61	1.78	1.92	1.44	2.03	2.08
<b>Total world oilseeds trade</b>	<b>93.91</b>	<b>111.42</b>	<b>108.36</b>	<b>111.03</b>	<b>118.11</b>	<b>134.10</b>	<b>136.80</b>
<b>PRODUCTION: Canola</b>	57.92	60.81	60.56	61.57	63.76	71.18	71.33
<i>Australia</i>	1.84	1.91	2.36	3.43	4.14	3.79	3.41
<i>Canada</i>	12.61	12.94	12.79	14.61	13.87	17.97	15.55
<b>Soybean</b>	221.14	260.85	264.25	240.49	268.76	283.74	315.01
<i>Brazil</i>	61.00	69.12	75.30	66.50	82.00	86.70	94.50
<i>United States</i>	72.86	91.42	90.66	84.29	82.79	91.39	108.01
<b>Sunflowerseed</b>	34.75	32.17	33.07	39.68	35.97	42.91	39.78
<b>Total world oilseeds production</b>	<b>391.69</b>	<b>442.32</b>	<b>460.97</b>	<b>447.70</b>	<b>475.82</b>	<b>504.31</b>	<b>532.20</b>

## Major world pulse trade and production (kt)

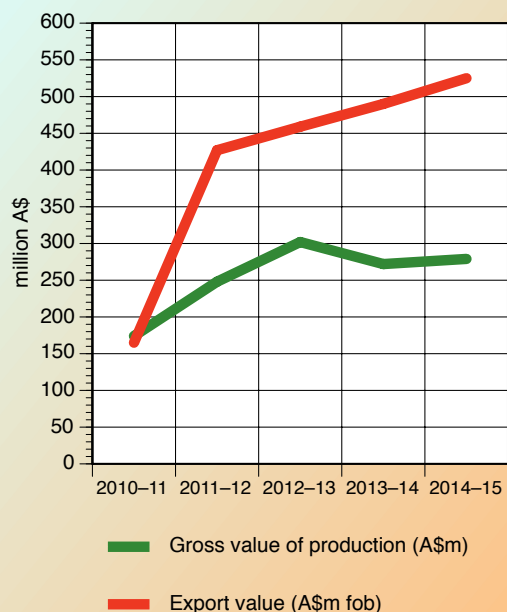
	2008	2009	2010	2011	2012	2013	2014
<b>IMPORTS: Asia</b>	3591	4840	3761	5000	na	na	na
<i>India</i>	2594	3750	2304	3222	4013	3655	3664
<b>Africa</b>	848	698	1088	927	na	na	na
<b>Americas</b>	1175	1154	1125	1196	na	na	na
<b>Europe</b>	1116	1130	1204	1108	na	na	na
<b>Middle East</b>	316	380	314	368	na	na	na
<b>EXPORTS: Americas</b>	4649	5842	6083	5889	na	na	na
<i>Canada</i>	3126	4193	4307	4308	4955	5237	5275
<b>Asia</b>	3021	2743	2644	1797	na	na	na
<b>Europe</b>	930	1168	1065	1109	na	na	na
<b>Turkey</b>	165	239	254	267	na	na	na
<b>Australia</b>	974	1312	1437	2132	2226	>1500	na
<b>TOTAL WORLD PULSE TRADE</b>	<b>10813</b>	<b>12609</b>	<b>12864</b>	<b>12407</b>	<b>12800</b>	<b>13500</b>	<b>13000</b>
<b>PRODUCTION: Africa</b>	7903	7186	9221	7507	8629	na	na
<b>Americas</b>	11740	12321	12503	9603	11239	na	na
<i>Canada</i>	4948	5189	5347	3883	5676	6880	6069
<b>Asia</b>	24314	24266	26470	28335	27479	na	na
<i>India</i>	14065	14072	17236	17647	18343	19780	18430
<b>Europe</b>	3811	3963	4330	4695	4143	na	na
<b>Turkey</b>	960	1237	1345	1234	1309	na	na
<b>Australia</b>	1633	2083	2491	2633	2195	2167	1910
<b>TOTAL WORLD PULSE PRODUCTION</b>	<b>62446</b>	<b>63964</b>	<b>69627</b>	<b>68218</b>	<b>70419</b>	<b>71000</b>	<b>69000</b>



### Summary of Australian rice statistics (paddy) by area and volume



### Australian rice export value and gross value of production



### Summary of world statistics for rice

	Area million ha	Production (Mt, milled)	Use (Mt)	Closing stocks (Mt)	Stocks to use ratio (%)	Trade Mt	Av. price US\$/t (Thai 100%)
2009-10	158	441	438	94	21.5	31	532
2010-11	160	450	443	100	22.6	35	518
2011-12	160	467	456	107	23.5	40	590
2012-13	158	472	466	110	23.6	39	565
2013-14	161	477	477	106	22.2	42	430
2014-15	160	475	481	98	20.4	43	420

### World rice production, by country [Mt, milled equivalent]

	Aust.	B-desh	Brazil	China	EU-27	India	Indon.	Japan	Myan.	Pakis.	Philip.	Thail.	US	Viet.	TOTAL
2009-10	0.14	31.6	7.9	136.6	1.9	89.1	36.4	7.7	10.6	6.8	9.9	20.3	7.1	25.0	441
2010-11	0.51	31.7	9.3	137.0	2.1	96.0	35.5	7.6	11.1	5.0	10.5	20.3	7.6	26.4	450
2011-12	0.64	33.7	7.9	140.7	2.1	105.3	36.5	7.8	11.4	6.2	10.7	20.4	5.9	27.1	467
2012-13	0.82	33.8	8.0	143.0	2.1	105.2	36.5	7.8	11.7	5.8	11.4	20.2	6.3	27.5	472
2013-14	0.64	34.4	8.3	142.5	1.9	106.5	36.3	7.8	11.9	6.7	11.8	20.5	6.1	28.2	477
2014-15	0.50	34.6	8.3	144.5	2.0	102.5	36.5	7.7	12.2	6.5	12.2	19.2	7.1	28.2	475

### SECTION 2 THE GRAIN INDUSTRY IN FIGURES

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**CLAAS**

In this section the rice crop is the year of planting.  
(The 2014-15 figure is therefore a forecast of the Australian rice harvest in March-April 2015.)

# Section

# 3

## District Reports

Reviews of the 2014–15  
season and plans  
for 2015–16

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# Western Australia

## GIWA report – 2014 in review

The Grain Industry Association of Western Australia's total production estimate for the 2014 WA winter grain crop is 14.52 million tonnes and the fourth largest WA crop on record.

The 2014 season was characterised by the strong and confidence-boosting start to the season in all regions other than the Esperance zone. Despite some dryness in Esperance soils and waterlogging in the lower Great Southern, crops were mostly sown into ideal soil conditions. Very good establishment of crops followed, contributing to above average yield potential to the middle of June.

### Kwinana Zone

Yields of all grains were average to above average and quality was good. However, visually, all crops delivered less grain than was apparent before harvest. Wheat yields were average with less grain in the head than 2013 probably due to the hot weather in August. Additionally, root lesion nematodes, and crown rot caused some yield losses. Yields were about 10 to 20 per cent off expectations in the **central wheatbelt**.

For the **western Kwinana** zone, 2014 grain quality was very good. In the mid-west region, wheat made H1 and H2 grades in eastern districts, while in the western districts, with higher yields, wheat at least made APW grades. Throughout, Mace was the most popular wheat variety. The noodle variety Calingiri achieved the N2 grade mainly due to high protein.

Canola yields were average to above average with high oil content.



Various soil amelioration techniques, such as clay spreading, was a 'popular summer pastime' for many WA growers after a better than expected 2014 harvest in most regions.

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Barley made expected rates of Malt grade at about 60 per cent of total receivals. Bass mostly made Malt with some deliveries suffering staining and poor colour. Baudin mostly achieved the Malt grade, but needed shandyng for protein and grading for screenings. As a consequence, there will likely be a decline in area sown to Baudin in 2015.

The Hindmarsh barley variety was disappointing in its performance in the Kwinana Zone for yield, head retention and colour. Net blotch was a problem with double sprays needed for control. The performance of Scope barley was acceptable, while Bass head retention did cause some concern, though head loss occurred with all varieties.

For 2015, there is likely to be more oats sown in the Goodlands district on acid soils. Bass barley will become the dominant variety at the expense of Baudin. Overall, the barley area will decline in favour of wheat.

The canola area will be similar but the proportion of hybrid canola and Roundup Ready varieties to Triazine Tolerant varieties will increase.

The lupin area will rise, perhaps by 10 per cent, with PBA Gunyidi popular in the east and PBA Barlock in the west.

The pasture area is likely to be similar to 2014.

In the **east Kwinana** zone, yields and quality in 2014 were low though grain quality was good with high protein and low screenings in wheat. Yilgarn and Westonia yields were very low at about 0.3 tonnes per hectare. For these eastern districts, not much change is planned to the mix of commodities. By contrast Wongan Hills and Ballidu produced up to 1.8 tonnes per hectare of wheat. There may be less canola but this is dependent on the timing and intensity of the break to the season.

### Albany Zone

In the **Lakes region** of the Albany zone, the 2014 season provided consistent rainfall, warm winter temperatures and no damaging frosts in spring. But harvest was delayed by frequent rain in October. Despite this, yields were a little disappointing.

The crops looked to have more grain in them than was harvested. The exceptional 2013 season may have depleted soil nutrition more than was anticipated, with growers suggesting that applying more nitrogen would have been beneficial. Crops grown after a legume, lupins or pasture, produced higher yields throughout the region. Wheat and barley was about 200 kg per hectare below expectations. But generally, quality was good and the pre harvest rain didn't affect falling numbers. Screenings were about 1 per cent higher than desired.

For some crops, ergot was a big problem and became worse as harvest progressed. Grain cleaning was needed to meet CBH delivery standards,

**TABLE 1: GIWA production estimates – 2014 (tonnes)**

Port zone	Wheat	Barley	Canola	Oats	Lupins	Field pea	State total
Kwinana	4,141,000	1,293,000	524,000	277,000	134,000	6,200	6,375,200
Albany	1,778,000	1,411,000	512,000	226,000	33,000	5,700	3,933,700
Esperance	1,200,000	746,000	312,000	4,000	18,000	19,100	2,299,100
Geraldton	1,538,000	52,000	147,000	6,000	160,000	1,700	1,904,700
<b>Totals</b>	<b>8,657,000</b>	<b>3,470,000</b>	<b>1,495,000</b>	<b>513,000</b>	<b>345,000</b>	<b>32,700</b>	<b>14,512,700</b>



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principally in wheat. There appears to be no correlation to the quantity of ryegrass in the paddock, while the frequency and lateness of rain contributed more to the incidence of ergot.

All barley varieties suffered head loss and shedding with the late October 2104 rains, with yield losses of at least 200 to 300 kg per hectare as a consequence.

For 2015, there will be more lupins sown mostly at the expense of canola. The oat area will also rise as prices are high and oats provide a rotational benefit as well.

In the **Great Southern region** of the Albany zone, the wet start to harvest caused delays and some quality issues and extended through to mid-December. Again ergot was a real problem, and probably the first time it has occurred to this extent. The incidence of ergot was not related to ryegrass infestations, and became more of a problem where harvest was delayed.

For barley, colour was a problem in early harvest but diminished with bleaching where harvest was delayed. All barley varieties suffered head loss to some extent.

Wheat grain quality was excellent, with very good hectolitre weights. But protein was only just enough to make the required grades.

Generally canola yields were lower than forecast, although waterlogging was a contributing factor taking patches of paddocks out of production. Canola oil quality was very good at 50 per cent with a 48 per cent average, but yields were disappointing where normally a 2 tonnes per hectare cropped area only achieved 1.7 tonnes. Again, a shortage of nitrogen is suspected to be the main cause of the lower than expected yields. Any canola crops planted after a good rotation – lupins or pasture in particular – yielded closer to expectations.

For 2015, there is likely to be more lupins included in the rotations.

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The last two seasons have seen lupin yields at close to 3 tonnes per hectare with good pricing.

Rising atrazine and clethodim resistance, among other agronomic reasons, will cause the canola area to decline.

Nitrogen applications for cereals and canola may also rise, if the seasonal prospects allow, after an obvious shortage of nitrogen prevented achieving optimal yields in 2014.

### Esperance Zone

The 2014 crop saw the second highest grain delivery total in the Esperance zone. To enable a faster harvest, growers were storing on-farm and still delivering grain to CBH into January after finishing harvest earlier in December. The warm August was seen as too harsh, with anything early sown and flowering in August suffering from the heat and dry soil. After a dryish winter provided little confidence of nothing more than an average season, wheat crops in particular turned around and yielded very well due to good September and October rainfall.

Grain quality was good for early harvested wheat with a big percentage making the H1 and H2 grades. Later harvested grain had lower quality, making the AUH and GP grades, but not much hit the Feed grade.

The 2015 season is likely to see a similar mix of grains sown throughout the Esperance zone.

### Geraldton Zone

The quality of the 2014 crop in the Geraldton zone was pleasing with good sized grain heads and high protein. This is despite the season being dry and producing below average yields.

Overall, the **northern districts** of the Geraldton zone produced yields 30 to 40 per cent below average, while **southern** and **western districts** were 20 per cent below average to average in yields. No districts recorded above average yields.

The dry August combined with very high temperatures caused yield potential to fall quickly.

Rain events in October caused some issues, including re-greening of lupins, but these were minor. The real concern – not unexpected – was the low volume of grain.

Wheat grain quality was good throughout with protein at 12 to 15 per cent in many cases and with low screenings. But yields were below average and very disappointing. The Yuna, Binnu and Ajana districts had a very poor season.

For the coming 2015 season, the area of lupins will grow. This is in response to the cost and pricing currently for canola. Establishment costs of canola are generally around \$150 per hectare higher than for lupins. A tight rotation of canola and wheat has led to sclerotinia becoming a high production risk and cost.

The profitability of lupins is good with low production costs and lower risk on suitable sands.

Strong interest is continuing for Albus lupin and the area may double again. The barley area in the lower Geraldton zone may increase with the this area also coming from a reduction in canola plantings.

■ Compiled from Grain Industry Association of WA crop reports

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## Northern Agricultural Region WA

### The 2014 season in review

The 2014 year started with holidaying as the top priority for most growers. Planning and budgeting through January and February were the main activities. Many areas also had to spray weeds after the header had left the paddock at the end of 2013. Occasional isolated thunderstorms were around at times but in our area generally, 2014 delivered very dry summer and autumn periods.

Most districts in the northern region had a fantastic opening rain of between 50 and 100 mm in the two weeks after Anzac Day 2014. Then there were a couple of follow up rains. The first rains were around 10 times the amount forecast!

Low winds and very good soil moisture levels gave us the mildest May that I can remember. Growing conditions in early and mid May were a very rare "10 out of 10".

Seeding was completed in May for most growers. Mould board ploughing of nonwetting sand was underway in late May and was drying and getting warm by this time. This did give some establishment issues with ploughed soil drying rapidly and seed not emerging until a rain in mid to late June. Some of these paddocks had wind events and eroded.

Crops were up and growing rapidly through late May and June. Good knockdown herbicide opportunities meant that most crops emerged clean of weeds. Crop development was very fast during this period with the warm conditions. June was subsequently dry and the shine started to come off the seasonal prospects.

Nitrogen applications were generally high, given the good start. Many

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had the finger on the trigger for another application but as the season dried and warmed up, a lot of these planned applications didn't go ahead.

Dry conditions through the winter months saw crops with high yield potential but year to date rainfall was moderate to low. Western areas tended to receive better rainfall and it was enough to keep yield potential up while the eastern areas had small ineffective rainfalls if any.

Many areas did not have a double digit rainfall event between May 8 and September 22. The September 22 rain was too late for many eastern and northern crops.

Temperatures were well above average with the first and second weeks of August very hot and damaging to crops. Northern and eastern parts had several days above 35°C. The crops with moisture under them had crop development that was some of the fastest I have seen.

Early May sown – or volunteer wheat crops – were haying off in August and were harvested in September! This is very early.

### Crop performance linked to soil type

Crop performance ran with soil water holding capacity. Crops on lower water holding capacity soils suffered under the dry conditions with a loss of yield potential on these soils even in the wetter parts of the region. Deep loam and clay soils generally produced good crops.

Pastures finished with good late growth but struggled to catch up after the dry periods. Perennial pastures grew well through late spring and early summer and thrived on the moisture from a wet September.

Aphids and DBM were in much lower numbers than in 2013. The very dry summer and good break to the season may have helped.

The prolonged dry spells in June and August, coupled with hot conditions, had growers extra vigilant but these insects never took off.

Budworm were an issue in all broadleaf crops and required control right across the region.

The warm conditions delivered fast crop development and a record early start to harvest. The first grain deliveries to CBH were in mid September! As usual in September, there were a couple of warm days

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**A thin 2014 wheat crop from a mouldboard ploughed paddock at south Eradu in WA's northern cropping zone.**  
(PHOTO: Peter Norris)

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followed by cool damp weather resulting in slow harvest progress early on. Crop yields were generally disappointing and more so on lighter sand soils. The hot dry August conditions did much more damage than expected.

**Wheat** – Yields were generally below average in most areas and trending to above average in the south west of the region. Grain quality was mixed with some crops having screenings problems. Sprouting was also a problem in some varieties, particularly in early sown crops. Although sprouting was widespread, it didn't downgrade too much of the crop. Ryegrass ergot contamination was also a problem for many coastal growers. Many had to clean the grain before being allowed to deliver into the CBH system.

**Canola** – Roundup Ready hybrids handled the dry conditions better than the open pollinated 'TT' crops. Crop yields were very mixed with some growers very happy and others very disappointed. Good loam soils (and an extra shower of rain) were generally where yields were good. Roundup Ready crops generally out-performed triazine tolerant crops. Weed control is becoming more difficult in TT canola due to herbicide resistance issues.

**Lupins** – The late rain resulted in many crops greening up in October and delayed harvest for some of the northern crops. Some growers were impressed with their lupin performance on deeper sand soils when compared to disappointing wheat crops close by. The Amira Albus lupin crop area grew in the west and these crops generally looked better and yielded well.

**Barley** – Crops had issues with late green heads and for many growers, presented challenges at harvest. The barley area is not big in our region and any barley crops on sand soils yielded below expectations. Harvest finished early in most areas due to the early start.

The late September rainfall gave late weed germinations and many growers – particularly in the west – had the issue of weeds growing under crops at harvest. Many growers finished the year spraying these weeds to stop radish, melons and some grasses setting seed.

Average yield estimates for 2014 northern WA			
Crop	Western Zone	Central Zone	Eastern Zone
Wheat and barley	1.7–3.0 t/ha	0.8–2.4 t/ha	0.4–2.0 t/ha
Lupins	1.25–2.4 t/ha	0.5–1.2 t/ha	0–0.9 t/ha
Canola	0.5–1.9 t/ha	0.5–1.1 t/ha	0.0–0.7 t/ha
2014 rainfall April–Sept	300–400 mm	200–300 mm	180–230 mm
2013–14 summer rainfall	5–20 mm	10–30 mm	10–30 mm

## Total grain deliveries

CBH deliveries to the Geraldton Port Zone for 2014–15 were a total of around 1.9 million tonnes – which is about 350,000 less than our five year or so, average in the north.

Individual grain deliveries were:

- Wheat – 1,510,000 tonnes;
- GM canola – 103,000 tonnes;
- Non GM canola – 67,000 tonnes;
- Lupins – 158,000 tonnes;
- Barley – 46,000 tonnes; and,
- Oats and other grains – approx 7000 tonnes.

## Trends for 2015

Wheat will again dominate plantings and areas may go up slightly in the 2015 season. The lupin area will be static to slightly up. Canola area

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Amira Albus lupins at East Chapman. (PHOTO: Peter Norris)

will be static but a swing toward Roundup Ready and away from the Triazine Tolerant canola with the ratio likely to be around 60:40. This is due to lower weed control levels in the TT canola system in our area with Group A herbicide resistant ryegrass and some Group C herbicide resistant wild radish.

Livestock numbers are close to static with more growers maintaining flocks for meat production.

Land prices are variable with slight increases in value in higher rainfall areas, prices steady in medium rainfall areas with land being very hard to sell in lower rainfall areas. Only one larger farm has sold and it brought good money for the quality sand soils. There have been average sale prices for the heavier soils. The lower rainfall Yuna district has more than 40,500 hectares of land for sale which is the most in memory.

■ Peter Norris, WA Northern Agricultural consultant  
Agronomy For Profit and Synergy Consulting

## South Coast WA

### Overview of the 2014 season

Given the very dry year, 2014 winter crop yields for the WA South Coast region were better than most growers expected. This is largely a result of soil moisture carried over from the very wet 2013.

The growing season through to early October was generally dry. But between October 18 and 20 the region received 50 to 120 mm of rain which unfortunately coincided with the start of harvest – some growers had already started on canola. The rain delayed harvest for over a week and many were very anxious about what the effect would be on grain quality.

When harvest recommenced growers were pleasantly surprised that grain quality had held up. One of the biggest issues caused by the rain was sand contaminating canola windrows. With the heavier falls, sand



was splashed onto windrows. In some cases, growers had to clean canola to meet receival standards.

But the October rain (and then some further rain in December) has boosted stored soil moisture levels for the 2015 season and also resulted in germinations of summer weeds.

In early December the rain continued to delay the finish to harvest. Finally, in late December, the rain stayed away long enough to allow harvest to finish.

Final crop yields were generally good given the very dry season. The Esperance Port Zone received approximately two million tonnes of grain – well above CBH's pre harvest forecasts.

### Prospects for 2015

Seasonal conditions turned dry again early in 2015 but growers were busy spraying summer weeds to conserve the valuable soil moisture from the October through December 2014 rain events. Weeds have been very well controlled which also eliminates the green bridge thereby providing a good buffer against pest and disease carryover.

Soil amelioration – in its various forms – was also a focus for many South Coast growers. Acid soils were treated with lime applications, sodic soils with gypsum, non wetting soils with clay spreading or delving and compacted soil with deep ripping.

Predicta B root disease testing is showing an increase in the levels of root lesion nematodes (*Pratylenchus neglectus*) in the region – something that will need to be closely watched with perhaps some reconsideration of current crop rotations.

**■ Quenten Knight, Agronomist**  
Precision Agronomics Australia

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# South Australia

## 2014 South Australian crop highlights

- Total SA grain production was above the 10 year average;
- 7.6 million tonnes produced from 4.0 million hectares of crop area;
- Soil moisture profiles filled by early season rains carried the crop through the critical crop flowering stage in spite of the record dry spring;
- Harvest progressed in ideal conditions and in many areas, finished well ahead of normal.

The 2014–15 winter crop harvest was completed in most areas of the state by mid-December with only southern Yorke Peninsula, Kangaroo Island and the lower South East still harvesting into January.

Many farmers have reported that it was the earliest they have ever completed harvest.

Despite having one of the warmest and driest springs on record, total crop production across the state in 2104 was above the long term average, mainly due to crops drawing on moisture stored in the soil from heavy rainfalls earlier in the season.

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## SOUTH AUSTRALIA 2014–15 WINTER CROP PRODUCTION (tonnes) AND AREA (hectares) AGAINST THE 5 YEAR AVERAGE

		5 year average	2014–15
Wheat	Area	2,209,300	2,311,100
	Prod'n	4,565,700	4,616,500
Durum	Area	70,000	53,100
	Prod'n	199,600	106,200
Barley	Area	973,400	845,200
	Prod'n	2,284,300	1,897,000
Oats	Area	80,300	81,300
	Prod'n	138,900	131,500
Rye	Area	9,000	9,000
	Prod'n	8,300	9,000
Triticale	Area	74,100	40,300
	Prod'n	116,900	67,150
Peas	Area	114,700	107,100
	Prod'n	164,700	125,850
Lupins	Area	65,800	71,800
	Prod'n	95,400	79,400
Beans	Area	70,700	68,300
	Prod'n	135,800	96,900
Chickpeas	Area	15,300	20,700
	Prod'n	20,800	21,200
Lentils	Area	87,900	106,200
	Prod'n	141,300	152,350
Vetch	Area	13,800	23,200
	Prod'n	11,200	13,150
Canola	Area	250,500	302,400
	Prod'n	389,500	314,200
<b>Total SA crop</b>	<b>Area</b>	<b>4,034,800</b>	<b>4,039,700</b>
<b>Total SA crop</b>	<b>Prod'n</b>	<b>8,272,400</b>	<b>7,630,400</b>

Yields and quality were variable across the state. Western Eyre Peninsula and the northern part of the Upper North had an exceptional season with yields of most crops well above average.

The upper South East had an exceptionally poor season with well below average yields for all crops. Approximately 15 per cent of the total crop area was cut for hay – further reducing grain production.

Canola yields were generally well below average across the state and oil content was variable with some districts achieving average levels while others had lower oil content.

Lower canola yields resulted from a combination of beet western yellow virus, waterlogging, frost damage and dry spring conditions.

Barley yields and quality were above expectations in most districts with average to above average yields in all districts except the upper South East. Grain quality was also excellent with a higher proportion of grain making malting quality than normal.

### Wheat yields variable

Wheat yields were variable across the state with above average yields on upper Eyre Peninsula and the northern part of the Upper North but average to below average in other districts.

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Wheat yields were above expectations in the low to medium rainfall areas and below expectation in many higher rainfall areas, due to wet conditions early in the season and the hot dry finish.

Wheat grain protein was generally below average with more wheat than normal in the lower protein segregation of Australian Standard White (ASW) and less than normal in the higher protein classifications of Australian Premium White (APW) and Australian Hard (AH).

Durum crops suffered with the hot, dry finish resulting in below average yields and high proportions of screenings.

Frost significantly reduced the yields of peas in some districts but unaffected crops returned average yields.

Bean crops were severely affected by waterlogging, frost and hot, dry windy conditions with yields below average in all districts.

Lentil yields were slightly below average in most districts but high prices ensured good returns were achieved.

Lupin crops suffered from the frost and dry conditions giving below average yields but prices increased with good local and interstate demand.

Hay yields varied from above average in the lower and Mid North and Yorke Peninsula, to well below average in other districts.

Hay quality was also highly variable, but the hay exporting industry reported that the dry finish and frost resulted in excellent quality export hay. Higher prices reflected the higher quality hay with demand from both domestic and export markets.

■ PIRSA Crop and Pasture Report, March 2015



After a patchy season, South Australian growers delivered an above average tonnage of winter grain in 2014.





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# Victoria

## Victorian Mallee

### The 2014 season overview

After an excellent start, the 2014 cropping season was largely disappointing for growers in the Southern Mallee, while those further north fared better. Mallee growers had to contend with beet western yellows virus in canola, severe frost events (with a lot of hay being cut around the region), an outbreak of diamondback moth and, for parts of the southern Mallee, one of the worst finishes on record.

Harvest wrapped up from late November to early December 2014, with yields around the Mallee ranging from average to very poor. The dry finish to the season, meant harvest was underway about two weeks earlier than usual in most areas.

The southern Mallee was hit the hardest, with next to no rainfall from July onwards, resulting in yields well below average, or crops not being harvested at all. While some parts of the northern Mallee also experienced a dry finish to the year, the full profile of moisture was the saviour, ensuring crops had enough resources left when the season ended harshly. Crops also performed better on the lighter sandy soils.

Where yields were very low in cereals, protein was quite high and lower retention (due to the dry finish and frost events) resulted in some malt barley being downgraded to feed. Subsequently, there was not much malt barley around the area.

Canola yields across the region were generally disappointing with many

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crops not reaching expectations. For many canola growers, input costs were higher than usual with spraying undertaken to control green peach aphids and diamondback moths.

Following on from a disappointing harvest – apart from having a well-deserved break – growers were controlling summer weeds (in small patches) selling grain and buying sheep to clean up left-over crop residues in paddocks.

### The year ahead

By mid-January 2015, most areas of the Mallee had received around 25–40 mm of rain, but also parts of the southern Mallee received a much needed 80 mm. This saw growers busily spraying summer weeds to ensure valuable stored soil water wasn't lost to high weed burdens. Research data has shown that uncontrolled heliotrope following rainfall can remove 50 mm of soil water from the profile. This is the equivalent amount of water required to grow one tonne per hectare of wheat, reinforcing the value of summer weed control and the actions that growers are undertaking.

Paddock plans for 2015 have been discussed with plant-back risk, weeds and nutrition in mind. But the 'king' of crop production is water and many are keeping an open mind in case a second significant rain event occurs which would allow for a higher percentage of higher risk break crops to be grown.

The cost of production is forefront of growers thinking, given the difficult 2014 season encountered, particularly in the southern Mallee. High risk paddocks, such as those with high weed burdens, may be easy to leave out.

To reduce risk it seems that marrying both agronomics and business management is key to improved decision making and 'building a better bottom line' – BCG's theme for 2015.

■ Birchip Cropping Group

## Wimmera

The 2014 season opened early and rains during April, May and June ensured a great establishment of winter crops and a good opportunity to use knockdown herbicides to take care of expensive to control weed problems.

July continued to send small but timely rains and farmers were becoming excited that the dry finished forecast for the season would not eventuate. Rain at the beginning of August ended up being the last



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**Crops in Victoria's Wimmera were away to a flier but were then stopped in their tracks by a dry spring and frosts.**

substantial rain for the growing season for most Wimmera growers. As a result, a large part of the Wimmera crop had almost died as drought-affected plants attempted to set seed.

A series of frosts in spring caused major damage to early cereals by killing the head as it moved up the stem. Later frosts damaged some canola and pulse crops as they were podding.

The 2014 harvest started early in the Wimmera, The Emerald site at Donald received barley a week earlier than ever before as the dry finish bit into the hopes of farmers.

Barley receivals were about 60 per cent F1 grade with the remainder F2 and F3. Very few loads made malting grade in 2014.

Wheat had reasonable quality but with a very low yield. Some canola performed reasonably well where sown onto fallow paddocks and where there was some stored moisture to finish the crop.

Lentil prices were sky high and this was to be the crop to save the day. The frosts in October reduced lentil yields and downgraded quality, but the final result was generally still a profit for this crop.

Looking back on the 2014 growing season, other problems were also encountered. Insect pressure as a result of favourable autumn and winter temperatures saw large amounts of insecticide being used in crops and pastures. Green peach aphid showed up in the Wimmera for the first time as a serious threat. Some canola crops were sprayed but just as the aphids appeared, they disappeared, thanks to Mother Nature. Later, diamond back moth moved into flowering canola in numbers. At the end of the season etiology and heliothis needed to be controlled in pulse crops.

The dry finish left most crops free of late germinating winter weeds which was one good thing to be salvaged from an otherwise disappointing season in the Wimmera.

### Glad to put 2014 behind them

Wimmera farmers were glad to put 2014 firmly behind them as harvest dribbled into receival bins. The regional result was well below average and only about 30 per cent of the previous year. This means some important planning decisions are needed for the year to come.

The area to be sown to canola seems likely to fall in 2015. Low canola prices as a result of very low world oil prices, coupled with a moisture deficit, could see the canola planted area drop.

Growers are more likely to retreat to the safer, cheaper options of cereals and perhaps increased fallow to try to improve the chances of a crop in 2016.

Land prices are still buoyant in the Wimmera with one reported sale in excess of \$3000 per hectare and lease opportunities attracting plenty of interest.

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It is good to see an air of optimism in the area following a very ordinary 2014 harvest.

■ Mike Laidlaw

Harberger Farm Supplies, Donald, Victoria.

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# New South Wales

## State overview

Total winter crop production in NSW in 2014 is estimated to have fallen by four per cent (from 2013) to 9.2 million tonnes, reflecting relatively low wheat yields brought about by a drier than average season. The total area planted to winter crops in 2014 was around 5.8 million hectares.

Wheat production is estimated to have fallen by 5 per cent on 2013 levels to around 6.3 mt. A dry finish across most of the state adversely affected yields. Wheat yields are estimated to have averaged 1.6 tonnes a hectare. Protein levels were relatively high in the northern regions, but lower in the Central West and south-west cropping areas.

Barley production was around 1.2 mt from a planted area of 640,000 hectares.

Canola production was around 904,000 tonnes off 650,000 hectares, but the average yield is estimated to have declined by 3 per cent to 1.4 tonnes a hectare.

Compared with 2013, oil content from canola grown in southern NSW was lower.

## Summer crop 2014–15

Drier than average seasonal conditions at the beginning of this season's summer crop planting window initially limited the NSW area sown to summer crops. Rainfall during November was below average to well below average, and soil moisture levels were mostly low.

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Some summer crops planted early suffered moisture stress and their development was adversely affected.

But in December 2014 and January 2015, above average rainfall replenished upper layer soil moisture levels and made further planting of grain sorghum possible.

The area planted to cotton was largely unaffected because the rain came after the planting window for cotton had closed.

The area planted to summer crops in NSW is forecast to have fallen by 16 per cent (on the 2013–14 area) to 453,000 hectares, driven by a significant decline in the area planted to cotton. But the area planted to grain sorghum has estimated to have increased by almost 30 per cent on last season.

NSW summer crop production is forecast to fall by 9 per cent to around 2 mt, assuming yields increase from the low levels of last year.

■ ABARES Australian Crop Report, February 2015

## Western Murray Valley

The 2014 winter crop harvest finished with little interruptions from rainfall and with plenty of happy farmers as yields were generally average to above. Good yields, good grain prices and an easy harvest – what's going on? Most growers were waiting for something bad to happen!

After the 2014 winter crop harvest, there were two rainfall events – 15–20 mm in December and 40–70 mm in early January. This late rain stimulated a lot of summer weed growth. This meant some sheep green

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**Leigh Hepner, agronomist with IK Caldwell, Moama, inspecting plant populations and cob sizes in a crop of P1070 corn.**



feed for mixed farming enterprises, but with the risk of flystrike – and for cropping farmers – some weeds to control.

Most croppers sprayed the summer weeds to conserve moisture and make the sowing operation easy. Weeds of particular concern (and on the increase) were fleabane, umbrella grass, prickly lettuce/sow thistles and pannicum grass.

With a reasonable harvest from 2014 behind them, and an improvement in the bank balance, growers looked to some soil maintenance with the addition of lime and gypsum. This meant a thorough re-assessment of the quality of both lime and gypsum and finding the best and most economic product for the job. Buying quality product can mean paying more for the product and the freight – but economically, it will often be of more value once spread in the paddock.

### The 2014–15 summer crop

Very little summer rainfall fell during February and March 2015 with the result being a much deserved break for most livestock and cropping farmers.

By late February rice and corn growers were slowing down irrigation wheels and they began to drain paddocks. Without any summer rainfall of consequence, water usage has been high this year with many rice growers using more than 14 megalitres per hectare! It is worth noting that high water usage has little relevance if the rice commodity price is \$360–\$400 per tonne – it's all about profitability and \$/ha and \$/ML.

Most corn crops sown prior to November had reached milk line 2.5 (mid starch layer in the kernel) by late February and irrigation had ceased. Interesting to note that corn crops didn't use any more than about 8.0 ML per hectare even without summer rainfall.

Summer croppers will be looking hard at \$ return per megalitre before the next summer season is upon us.

Temporary water prices have eased slightly as corn and rice growers' requirements decrease. But as summer croppers slow down the pasture and winter croppers are gearing up.

Watering pastures has always been 2–3 ML per hectare in a 'normal' autumn and pre-watering winter crops 1–1.5 ML. With current water prices still at \$100 per ML, farmers need to be mindful of returns.

Winter cropping is usually the best \$ return per ML crop we can grow due to low water usage (2–3 ML per hectare total) and good \$ per hectare returns.

### Trends for 2015

With a successful 2014 winter season for most growers in the WMV – plus high commodity prices for both grains and livestock – more land has changed hands than I can ever remember. Land prices are currently between \$600–\$1000 per acre (\$1500 to \$2500 per hectare) depending on soil type, infrastructure, cropping history etc.

Another positive after of a good season is a return to growers using more lime and gypsum as well as considering break crops for root disease issues and controlling herbicide resistant ryegrass and wild oats.

Fingers and toes crossed for another early autumn break!

■ Laurence Pearce, Agronomist, IK  
Caldwell, Deniliquin NSW

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## Central West of NSW

The 2014 winter crop season in the Central West will go down as the Year of the Confused Agronomist.

Magazine and newspaper headlines could easily read *"Where did my chickpea yield go?"*; *"Farmer delivers seven different grades of wheat off one farm"*; *"Protein and screenings all over the place"*; and, *"Canola at Nyngan yields higher than irrigated canola at Trangie"*.

The district enjoyed a dream harvest with a mixed bag of yield results related of course to rainfall and starting moisture, but also soil type and sowing dates.

Coonamble had suffered the worst of the sub-districts of the Central West, but this area also had both good and bad. With its heavy soil types and little to no sub-soil moisture in the north and west of the town, wheat yields were low, averaging around two tonnes per hectare. Some crops to the east of Coonamble were up to the five tonne mark on long fallow paddocks while the Quambone area also enjoyed some solid wheat yields.

Wheat harvest results elsewhere were all over the place:

- Dubbo had a range of 2.0 to 4.0 tonnes per hectare, for an average of 2.5 tonnes;
- Trangie 2.0–5.0 tonnes, averaging closer to 3.0 tonnes; and,
- Warren 1.5 to 5.0 tonnes with about 2.6 tonnes per hectare being the middle mark.
- Nyngan enjoyed a dream run, in particular those farms closer to town. Rainfall in the Nyngan area up to the end of October 2014, was 460 mm versus the long term average of 397 mm – but it was the 88 mm in August that really made it a stellar season. Wheat yields ranged from 2.2 to 3.6 tonnes per hectare.

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**This crop of Gregory wheat at Nyngan, went on to yield 3.6 tonnes per hectare.**

The wheat quality was erratic not only within farms, but also within paddocks. The protein spread ranged from 7.0 through to 17 per cent. But the bulk of the grain was low in protein, even on the back of pulse crops. Screenings were also erratic with high screenings often the result of the increased levels of crown rot. No surprise here considering the season's dry finish. The crown rot damage was far more evident in the heavy clay soils or crops sown late – a double whammy if both occurred.

There were also some terrific barley yields around the place – up to six tonnes at Armatree. Barley yields were generally above the wheat across the Central West, no doubt a result of the dry finish with barley coming in just that little bit quicker than its bread-making cousin!

With the kind 2014 autumn break, the area sown to canola was up on previous years. Results were as per usual with variable canola yields but not to the same extent we have come to expect with this crop. Yields were above the norm across the region and oil contents also followed this pattern. Average canola yields were around the 1.5 to 1.7 tonnes per hectare mark.

Across the region, there was an increase in the area of canola direct headed. This is on the back of the excellent extension work that GOA (Grain Orana Alliance) has put into this space.

Pulse crops were a mixed bag. Chickpeas were the most disappointing crop of the lot with yields way below the average. This was a consequence of low temperatures leading up to the end of September 2014 that aborted flowers, and then crops ran out of moisture in October during pod filling. Chickpea yields ranged from 0.8 to 1.8 tonnes per hectare, with an average closer to one tonne.

Lupins were badly frosted over the winter. Field peas were a real winner in some parts of the region but frosted in many others. Nyngan pulled off a 3.0 tonne crop, but probably averaged closer to the 2.5 tonnes to the hectare mark – which is amazing.

Back to the east, yields were less impressive ranging from 1.0 to 1.5 tonnes. The price premium for the blue/green pea for human consumption was again evident.

Overall there were big smiles in the Central West after the 2014 harvest with some outstanding yields in a moisture-challenged year!

**Penny Heuston**  
Delta Agribusiness, Warren

# Queensland

## Darling Downs

### Overview

A challenging 2014 for grain growers saw those paddocks where moisture was conserved shining through. The winter crop of 2014 grew mainly on subsoil moisture from the early March rain, and performed very well. The main planting opportunity was early so more oats and barley were planted at the expense of wheat, and the barley in particular performed well.

The chickpea area was well back and the crop did reasonably well, although it did suffer from the frosts.

The spring planting was limited by patchy planting rains and there was a long dry spell until it remembered how to rain again in late December – so most of the summer crop was planted late.

### Winter 2014

Winter 2014 had a difficult start because the March rain was too early for most Downs' crops, and the early May rainfall was scattered, allowing only individual paddocks to be planted rather than large areas.

The chickpeas emerged well but then had a tough time with a run of cold and dry conditions. There was very little ascochyta last winter, with more damage caused by wild pigs, whose numbers were well up after a couple of reasonable summers. The frosts did reduce the chickpea plants' structure and because of this yields were average, with 2.5 tonnes per hectare the best.

Barley was the main cereal crop planted as there was no follow up rain to enable widespread wheat planting. Early barley did have some disease but the dry conditions stopped that spreading. The crop really had to grow on the stored moisture and it surpassed expectations with yields up to six tonnes per hectare and good feed quality grain.

The reduced area of wheat suffered from the cold conditions, and particularly a late mid-October frost. Yields only reached 2.5 tonnes per hectare at best and double cropped ground had heavy screenings.

Overall, growers were happy to get the returns they did from the 2014 winter crop, but many growers missed out with either low yields or no opportunity to plant at all.

### Summer 2014–15

There were some strong prices floating around in the lead up to summer, particularly for sunflowers and mung beans. Irrigation water was not plentiful, with most that was available going towards the smaller than average area of cotton crop.

Spring planting opportunities were very limited and by November only 40 per cent of the expected area was sown. Establishment was not easy and many crops had low populations, which was a blessing considering how long they had to survive without good rain and with over 40°C conditions in November. The only shining light was sunflowers which were planted from August and have yielded reasonably well – some paddocks yielding up to 3.5 tonnes per hectare.

The spring mung beans generally failed.

But in December 2014 the rain started to appear, with much better falls around Christmas. So the last week of December and early January saw the bulk of the summer planting take place – later than ideal but still in time. Sorghum was the main crop, but there was a significant increase in the mung bean area as growers took advantage of its quick growth and good prices.

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**Sunflowers on the Downs also enjoyed the December rains.**

The early sorghum was mainly harvested in February with yields very dependent on stored moisture levels. The late sorghum was in the flowering to grain fill stage during February–March and was battling fair numbers of midge but low numbers of heliothis. Dryland sorghum crops have yielded two to four tonnes per hectare but spring sown irrigated crops have yielded up to 10 tonnes per hectare.

Mung bean crops were in the pod fill stage by late February and most crops had good potential. Mirid activity needed extra attention this summer and there has also been the need for heliothis control.

The preventative fungicides appear to be helping. Most crops will be harvested in March.

Soybeans have responded well to the conditions. Irrigated cotton is also looking at an above average yield.

To summarise, it has been a difficult summer. The growing conditions have been harsh and there is still some way to go for the late planted crops – but overall crop yields should be fair.

### Winter outlook for 2015

The fallow area for winter crop is good on the Western Downs but limited on the Eastern Downs. This means that some growers will be looking to double crop, but a significant rainfall event will be needed for that to occur.

Some of the prices for winter crops are strong, especially chickpeas at this point in time. There has been strong interest in oats and it is anticipated that there will be strong interest in chickpeas – and to a lesser extent barley – with the wheat area likely to suffer.

The main hindrance will be rainfall, especially with the POAMA model suggesting we shall be entering an El Niño event – but they predicted that 12 months ago, so...

■ **Hugh Reardon-Smith, Agronomist**  
Landmark, Pittsworth

## Western Downs

### Winter crop 2014

Overall yields across the Western Downs were probably close to average with some paddocks doing better than expected and others not performing that well. Some isolated crops that received extra rain and were planted into long fallow, recorded some excellent results. Some

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wheat crops yielded over four tonnes per hectare, but this was only a minor number of paddocks.

The late rain in August 2014 showed us that timing is everything. The rain helped grain fill leading to low screenings and good grain size. Again the low wheat protein was noted in the varieties of Gregory and Suntop but yields were up compared to other varieties.

Chickpeas gave average results even after having endured a few nasty frost events.

Faba beans also proved promising and I expect to see a few more around in 2015 if prices are attractive.

### Summer crop 2014–15

The majority of the summer plant occurred late in December–January with only a few crops planted earlier than that. The early crops were harvested in February and they did benefit from the December–January rain.

The late summer plant had a very good start with large amounts of rainfall, but some damage from pre-emergent herbicides was noted causing some stunting. Further rain will finish these crops off nicely.

A larger area than normal of mung beans was planted due to the attractive price.

High insect pressure from mirids and helicoverpa occurred but by late February, the helicoverpa pressure had dropped off in both mung beans and sorghum.

### 2015 winter outlook

After some good summer rain, the Western Downs has been set up well going into the 2015 winter crop. Soil moisture profiles are very good unlike this time last year.

There is strong enthusiasm for chickpeas due to high prices.

The area allocated to barley will be reduced this year with most growers leaning towards more wheat.

■ **Nikolaus Fritz, Account Manager**  
Agronomy – Landmark, Miles

## South Burnett

### Winter crop 2014

Due to an extremely dry season and poor soil moisture reserves, the 2014 winter crop was generally one to forget for most South Burnett farmers.

Some wheat and barley crops were planted in late April and early May 2014 on fallowed ground and went on to harvest quite well. Some yields reached three to four tonnes per hectare with parts of paddocks close to five tonnes.

But any later planted crops on double cropped ground either failed or yielded less than one tonne per hectare.

Entering the summer crop planting window, the mood of South Burnett growers was one of pessimism. Finding cash or credit to plant had become a real problem for a number of farmers.

But then the rains came.



## Summer crop 2014–15

Areas to the north of Kingaroy had a good start with good rain in mid-November, while to the south, the rain was more patchy. But more planting rain arrived in mid January.

The January rain was too late to plant peanuts so the planting options changed for many growers to corn and beans. The South Burnett had the biggest bean crop area for a number of years with soybeans, mungbeans, adzuki beans and navy beans all being planted.

Some paddocks were held over for winter crops in 2015. Overall, about 90 per cent of the intended summer plantings went in.

Sorghum plantings were down due to the late plant and concern about ergot with later plantings.

The rain promoted many weeds in peanut crops and peanut fungicide sprays were needed.

The season was going along pretty well but then the tap turned off in early February. A lot of the rain came in smaller falls of 5–15 mm so it made little contribution to soil moisture reserves.

Then Cyclone Marcia delivered some very timely rain on February 19 with little of the expected accompanying wind. By the time it got to the South Burnett it had turned into a rain depression. Rainfall of 25 to 150 mm was received without really high intensity falls. Corn was tasselling, sorghum, peanuts and beans were flowering – so the timing could not have been better.

Many crops of peanuts and corn were planted late, so we are hoping that the season stays mild until well into May – as it has done over the past few years.

Hope the favourable summer season continues as we have avoided one potential flooding event and crops are looking good.

■ Ian Crossthwaite  
BGA AgriServices, Kingaroy

## Central Queensland

### Winter crops 2014

**Wheat and chickpea:** Wheat planting began in the second week of April 2014 and continued through to mid-May. Most paddocks were planted on marginal moisture (1/3–2/3 plant available water) and many had less. Rain that fell on June 14 was sufficient only in the wetter paddocks to develop secondary roots, which assisted crops to stand at harvest but was a long way short of adding yield.

Rain in mid-August was too late to benefit most crops. Dry conditions and unseasonal warm weather during May–June resulted in many crops going to head early resulting in an early start for wheat harvest. I estimate about 130,000 hectares of wheat and 35,000 hectares of chickpea was planted with about two-thirds of the chickpea crop north of Emerald and one third (10,000–15,000 hectares) south of Emerald and in the Dawson/Callide.

Chickpea was planted later, (early to mid-May 2014) and handled the dry conditions better. There were reports of stem frost damage in wheat in the Callide and chickpea pods and flowers lost as a result of frost in the Dawson and central highlands – but for most farmers, drought was the biggest limitation to yield.

Average yields in wheat crops in CQ were low (about one tonne per hectare) with many paddocks yielding less. Chickpea harvest was better.

### Summer crop 2014–15

The summer season has been one of scattered storms. A lack of widespread general rain to fill the gaps has resulted in paddocks across CQ ranging from flooded and very wet through to dry and effectively

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Chickpeas will be a popular choice for CQ growers in 2015.

‘in drought’. Prior to Cyclone Marcia (February 19) the Callide was very wet, the Dawson wet and the southern highlands dry to very dry especially around Rolleston. North of Emerald was generally wet with some farms around Capella and Dysart very wet.

So this meant that the rain and wind from Marcia caused catastrophic flooding and severe damage on the alluvial flats of the Callide Valley with major destruction of crops, enormous damage to infrastructure and serious soil erosion. For some farmers, this is more damage on top of losses suffered as a result of early floods this summer.

The Dawson had good rain (50–110 mm) without the damage and only minor flooding in the lower Dawson River as a result of the cyclone. The Central Highlands was largely unaffected.

**Sorghum:** I estimate about 250,000 hectares of sorghum has been planted in CQ this summer. This is a slightly smaller area than many farmers planned and despite double cropping of many paddocks. An increase in the area planted to mungbeans, and a lack of subsoil moisture in some areas, were major reasons for the reduced plant. While some paddocks had full profiles at planting and follow-up rain, others were planted on 30 cm of wet soil and little follow-up rain. As a result, yield expectations ranged from excellent through to some crops having already droughted.

**Mungbeans:** High prices were a major driver for a big spring mungbeans plant in CQ. I estimate about 15,000 hectares of spring mungbeans were planted throughout CQ – much of this in the Callide Valley. Spring planting in CQ is high risk. As a result many crops suffered some drought stress, rain at harvest, and in some paddocks, even flooding. Excellent yields and high quality were recorded by some, while others suffered very low yields, low quality with high grade outs – Oh the joy!

Again high prices and an increased confidence in newer, better varieties saw a summer mungbean plant in CQ of 30,000 to 40,000 hectares. There are some excellent crops around and as yet almost no disease.

### 2015 winter crop prospects

Rainfall prior to and at planting will have a significant influence, but given good yields and excellent prices in recent years, a large area is expected to be planted to chickpeas in CQ – perhaps over 60,000 hectares. As a result the area planted to wheat may be down on previous years – perhaps more than 150,000 hectares.

■ Maurie Conway,  
Central Queensland Grower Solutions, Sustainable Farming Systems,  
Department of Agriculture, Fisheries and Forestry, Emerald.

# Section

# 4

## Managing Resistance

Triathlon®

Demonstration Site

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# Nature mimicking science

By researchers from the Australian Herbicide Resistance Initiative

The Wright brothers spent a lot of time observing the curved shape of birds' wings and how air flowing over this curved shape caused lift. This is one of the great examples of science mimicking nature. But does nature ever mimic science?

One of the first glyphosate tolerant crops was GA21 Corn. This corn cultivar was created by molecular biologists in the lab. It contained the so called 'TIPS mutation' which gave it glyphosate tolerance.

The TIPS mutation had never been observed in nature until recently when AHRI PhD scholar, Adam Jalaludin, and AHRI researcher Dr Qin Yu, discovered it in a population of glyphosate resistant crowsfoot grass.

The TIPS mutation is a powerful beast. Plants with the TIPS mutation can survive applications of greater than 57 litres per hectare of glyphosate. If crowsfoot grass can do it surely other weed species can too, so we may see other species with huge levels of glyphosate resistance in the future.

Many of the known glyphosate resistance mechanisms give relatively low level glyphosate resistance. How is it that the TIPS mutation give huge levels of glyphosate resistance?

We have previously reported how a population of crowsfoot grass (*Eleusine indica*) in Malaysia discovered by Adam Jalaludin and others that was resistant to glyphosate, glufosinate and paraquat. It is this population that contains the TIPS mutation.

The TIPS mutation describes the combination of two target site mutations – 102 + 106.

## But what does 106 and 102 refer to?

Most herbicides kill plants by binding to enzymes. All plant enzymes are proteins. Proteins are made up of long chains of amino acids. These chains can be several thousand amino acids long. When a random mutation occurs, one of the amino acids in the chain is substituted with another one.

Scientists describe target site mutations by counting along the chain of amino acids. If they find a different amino acid (other than what should be there) at the 102nd amino acid in the chain, they say that this is a target site mutation at point 102.

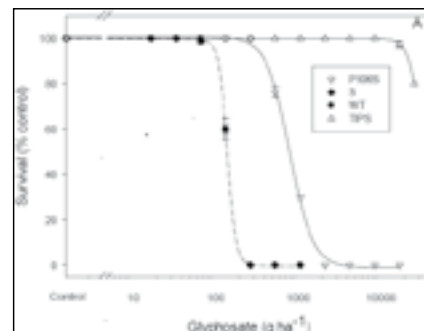
It gets deeper than that.

A mutation may be described as Threonine 102 Isoleucine or T102I. This means that there should have been a Threonine amino acid in the chain at point 102, but instead there is an Isoleucine due to the mutation.

The TIPS mutation is Threonine 102 Isoleucine + Proline 106 Serine. Hence the name TIPS – T102I + P106S.

Plants with the 106 mutation only have approximately five-fold resistance to glyphosate with 50 per cent survival to 1.75 L/ha glyphosate 450. The TIPS mutation gives huge levels of glyphosate resistance. Around 80 per cent of plants with the TIPS mutation in this study survived 57 L/ha glyphosate 450 (more than a 180-fold resistance).

This figure shows the dose response curve of the TIPS mutation, compared to the 106 mutation (P106S) and susceptible (S). Wild type (WT) is also a susceptible. This dose response curve is for plants that are homozygous (two copies of the gene) for the TIPS mutation. Plants that are heterozygous (one copy of the gene) for the TIPS mutation have similar resistance levels (data not shown).



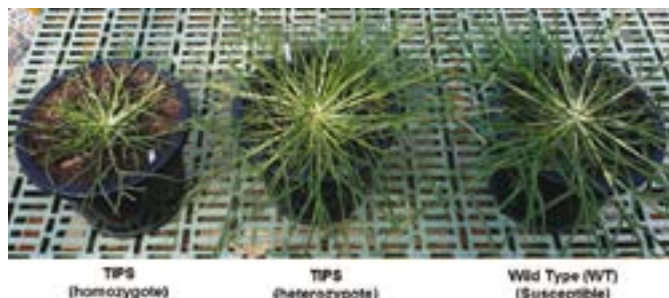
## Fitness penalty

The TIPS mutation gives a large fitness penalty. That is, there is a cost to the plant for having this mutation and the plants don't grow as well as susceptible plants. But the large fitness cost is only associated with plants homozygous for the TIPS mutation (two copies of the gene).

The bad news is that plants heterozygous (one copy of the gene) for the TIPS mutation are as resistant as homozygous TIPS plants but may not have much fitness penalty.



This photo shows the reduced growth of the crowsfoot plants homozygous for the TIPS mutation compared to plants with just the 106 mutation (P106S) or the wild type (WT) plants with no mutation. No herbicide has been applied to these plants. There is little evidence of any fitness penalty for plants with the 106 mutation only.



This photo shows lack of fitness cost for plants heterozygous for the TIPS mutation and large fitness penalty for plants that are homozygous for the TIPS mutation.

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## Fitness of transgenic corn

As mentioned earlier, the TIPS mutation was responsible for one of the first transgenic glyphosate resistant corn cultivars. But the TIPS mutation did not cause a fitness penalty in this transgenic corn due to coexistence of endogenous (ie. originating from within) wild-type and over-expressed TIPS genes.

So begs the question – How did a mutation with such a big fitness penalty evolve in nature?

Normally, unfit plants don't survive in a population because they cannot compete with the more vigorous plants around them.

The crowsfoot grass in this study are from a palm tree nursery in Malaysia where herbicides are sprayed around palm plants that are being displayed for sale in polyethylene bags. Glyphosate was applied about once a month for several years to this population.

It is likely that this is sequential evolution of resistance. In other words, the plants evolved resistance first through the 106 mutation, and then with repeated applications of glyphosate they then evolved the 102 mutation as well. In this environment all of the susceptible weeds die so the resistant plants do not have to compete with other weeds for resources. Very high level resistance is an advantage to the plant in this situation because the plants survive high rates.

The fitness penalty in the presence of herbicide doesn't matter because all of the other weeds are dead (no competition).

Where would we find such an environment on our grain farms?

The answer is fencelines, roadsides and chemical fallow.

These are glyphosate resistance hot spots and the ideal environment to select for very high level glyphosate resistance.

## Some molecular biology 101

Don't be afraid to read on, we won't go too deep into the molecular biology. This is such a great example of how target site resistance works, and it is worth understanding at a deeper level.

Firstly, let's consider how the EPSPS enzyme is supposed to work.

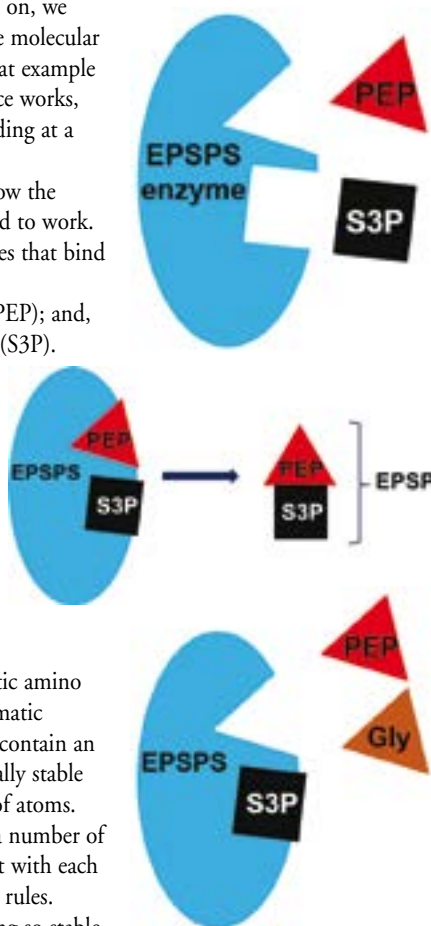
There are two substrates that bind to the EPSPS enzyme:

- Phosphoenolpyruvate (PEP); and,
- Shikimate-3-phosphate (S3P).

The substrates bind to the enzyme at their catalytic (active) sites. The enzyme works its magic and joins part of PEP to S3P to form EPSP. This molecule is one of the building blocks of aromatic amino acids.

There are three aromatic amino acids. They are called aromatic amino acids because they contain an aromatic ring – an unusually stable nature of some flat rings of atoms. These structures contain a number of double bonds that interact with each other according to certain rules.

As a result of their being so stable,



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such rings tend to form easily, and once formed, tend to be difficult to break in chemical reactions.

Glyphosate and PEP compete for the same binding site.

If glyphosate binds, PEP cannot bind and aromatic amino acids cannot be formed by the plant. The plant dies due to both starvation of these essential amino acids, and disturbance of the shikimate pathway (which may be involved in other biosynthesis such as lipid).

## Resistance

We need to remember that enzymes are 3D shapes. They contain catalytic (active) sites deep inside the enzyme where all of the action happens. PEP is trying to bind to its catalytic site. The 106 mutation occurs a short distance away from the binding site of PEP. So PEP can still bind but glyphosate cannot bind very well. This mutation gives low level (five-fold) glyphosate resistance because glyphosate binding is restricted, it is not totally inhibited.

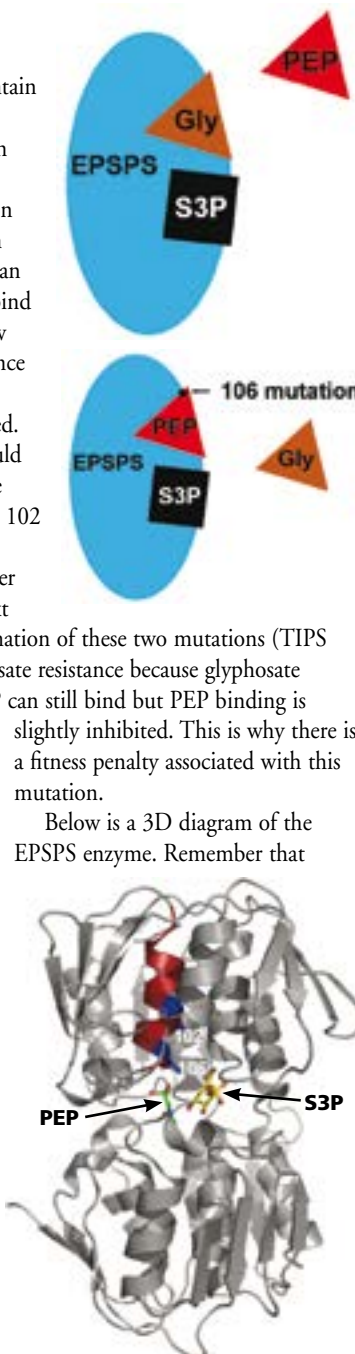
If PEP could not bind we would call this a lethal mutation and the plant would die (for example, the 102 mutation alone).

The 102 mutation occurs closer to the PEP binding site, right next to the 106 mutation. The combination of these two mutations (TIPS mutation) gives high level glyphosate resistance because glyphosate binding is severely inhibited. PEP can still bind but PEP binding is slightly inhibited. This is why there is a fitness penalty associated with this mutation.

Below is a 3D diagram of the EPSPS enzyme. Remember that

enzymes are chains of amino acids that are 'curled up' into a 3D shape. The binding site of PEP or glyphosate is shown in green and the binding site of S3P is shown in yellow.

This diagram shows that the 102 and 106 mutations are not right at the binding site of PEP or glyphosate – rather they are a short distance away.



# Adama and TeeJet collaboration targeting weed control on fence lines

**E**scalating fence line weed burdens and herbicide resistance are proving a bugbear to various farm weed management programs, but a new herbicide registration combined with specialist spray equipment technology is set to provide a long term, sustainable solution for growers.

Uragan – a unique extended residual pre-emergent herbicide that controls weeds longer than any other herbicide – has received a label extension for fence line weed control.

Belonging to the uracil herbicide sub group, Uragan controls grass and broadleaf weeds, including glyphosate-resistant weeds, often for in excess of 12 months, thereby reducing the need for multiple herbicide applications.

Adama Australia Senior Product Manager Jock Leys said the company had been seeking solutions to the ever-increasing issue of herbicide resistant weeds for Australian farmers.

“We recognise fencelines are a growing source of resistant weeds and we have worked in conjunction with the University of Adelaide to develop a solution,” Jock said.

“Uragan, as a long term soil residual pre-emergent herbicide, was identified as an ideal candidate and we are very pleased to launch this new use pattern.”

Uragan contains bromacil and is mainly absorbed through weed roots. It is highly compatible with non-selective knockdown herbicides, allowing immediate control of existing weeds. The level and duration of control with Uragan depends on soil type, rainfall and the application rate, but it is often more than 12 months.

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“It is ideal against hard-to-kill weeds and the herbicide can deal with the majority of resistant weed types that farmers may have on their properties,” Jock said.

### Special spray nozzle kit

In a further boost for fence line weed control, Adama Australia has teamed up with TeeJet Australasia to make Uragan available with a special fence line spray nozzle kit.

TeeJet Australasia Technical Specialist Jake Lanyon said the XP BoomJet boomless nozzle produced an ultra-course droplet size over a pressure range of 1.5 to 4 bar and a highly uniform distribution pattern in a spray swath of 3.5 to 5 metres.

“Good uniformity over such a wide spray swath from a single nozzle is not easy to achieve, but the XP BoomJet is the best on the market. It is almost boom-like in terms of distribution,” Jake said.

“Farmers want to know they won’t get drift with a longer acting



Uragan herbicide controlling glyphosate resistant annual ryegrass 12 months after application.





# Uragan®. The best d-fence for fence line weed control.

Uragan® is the ideal choice for use where hard to kill and resistant weeds are present along fence lines and where an extended length of protection is required. Uragan® is highly compatible with non-selective knockdown herbicides and once in the soil Uragan® acts to control germinating weeds for up to and beyond 12 months reducing the need for multiple herbicide applications.

## ADAMA

To find out more about defending your fence lines from resistant weeds use your QR reader below.

[adama.com](https://adama.com)



Uragan







**Jock Leys, Senior Product Manager with Adama Australia, says “we recognise fence lines are a growing source of resistant weeds” and have worked with others such as the University of Adelaide to develop a solution.**



**Jake Lanyon, Technical Specialist with TeeJet Australasia, says Uragan herbicide and the XP BoomJet boomless nozzle is a case of “matching the product to a specific nozzle”.**

residual herbicide and that’s why we selected an ultra-course nozzle with less than one per cent drift-prone droplets.”

He said fence line weed control had previously been an after-thought for most growers and the spray technology traditionally used was far from ideal.

“The standard has been to use an off-centre (OC), flat fan nozzle, but these nozzles produce a significant proportion of small droplets that can drift and result in damage to neighbouring paddocks. Depending on the size, with OC nozzles we could be looking at as much as 30 to 50 per cent of the nozzles output being classified as driftable,” Jake said.

### Time to fix it

“Ultimately, sub-optimal application along fence lines will lead to weed resistance and after years of poor management with incorrect nozzle technology, it’s now time to fix it.”

Jake said Uragan and the XP BoomJet was a case of “matching the product to a specific nozzle”.

“They match up really well. We know such products can produce very effective control of problematic weed banks, but how they are applied has a huge bearing on how well they work. Bringing these two together is the ‘Holy Grail’.”

He said the spray kit could be used on the boom end or with a ute tray-mount sprayer, small trailing unit or ATV sprayer.

The full kit includes the accurate XP BoomJet boomless nozzle, a wet or dry mount nozzle body assembly with shut-off tap, and fence line calibration and installation instructions.

“We are excited that Adama has chosen to work with us on the best application technology for fence line spraying and we have tried to make it as clear and easy as possible for farmers,” Jake said.

**The nozzle kit is free with every two packs of Uragan purchased. For further information, farmers can contact their local reseller or visit [www.uragan.com.au](http://www.uragan.com.au)** ■



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Dinner Plain is the place where the family can be together by the fireside or miles apart exploring the cross-country trail network. Where you stroll the treelined streets simply for the sights or to meet friends for a restaurant dinner or drinks at the bar. The village itself helps set the community atmosphere, natural building materials and earthy tones blur the line between man made and alpine environment. Over 200 lodges and chalets with all the conveniences of a modern resort.

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# New herbicide proves its value in 2014

**G**rain growers keen to attain some residual weed control from their early post-emergent broadleaf herbicide application, plus utilise a new option to improve resistance management, have welcomed the registration of a new herbicide in the 2014 cropping season.

Triathlon is a unique, broad spectrum herbicide for use in winter cereals. It contains three active ingredients (diflufenican, bromoxynil and MCPA) from three different herbicide groups (Groups F, C and I).

Applied from the three-leaf crop growth stage, it is highly effective against 58 broadleaf weeds, including hard-to-control wild radish.

Triathlon, from ADAMA, has shown promising activity on herbicide resistant wild radish populations and extensive testing has also shown excellent crop safety across multiple varieties.

Last year Beverley, WA farmer Darryl Sims was one of the first in the area to use ADAMA's new Triathlon and he was impressed with the results and intends using more this season.

Darryl used Triathlon after seeing presentations at farmer meetings and recommendations from his local Landmark agronomist Karrie Stratford. "Triathlon certainly gave the desired results for me," says Darryl. "I used 750 ml per hectare and controlled my three key weeds – wild radish, capeweed and doublegee – and I didn't have to go back with a second spray either.

"Other paddocks where we used a triasulfuron and 2,4-D mix needed a re-spray. It was initially a bit cheaper but it didn't stack up to the performance of Triathlon."

Darryl has no herbicide resistance problems with his wild radish population and not a huge weed burden – and because he targeted his

weeds when small he was able to get away with a very reasonable rate. By the early adoption of a multi-mode of action product he can not only get good weed control and immediate crop production benefits, he will also reduce the risk of resistance build up.

In addition to grazing pastures and hay cropping, Darryl has a true integrated weed management strategy explains ADAMA Market Development Manager for WA, Bevan Addison.

"Triathlon's three modes of action could reduce the need to include other herbicides with it; its good residual activity could improve yields and reduce the need for second sprays in some situations; and it could prove a good fit in conjunction with other herbicides for resistance management," says Bevan.

"It is vital to rotate all available modes of action to help extend the life of existing herbicides and to also employ non-chemical weed control practices such as windrow burning, spray-topping and weed seed collection at harvest."

Triathlon's knockdown control is better on smaller weeds and if applied when crop canopies are relatively open, it allows the herbicide to reach the ground, which helps maximise the residual activity.



Darryl Sims from Beverley, WA, was able to control his three key weeds with Triathlon and not have to resort to a second spray.



Wild radish sprayed with 15 g/ha of a Group B product and 300 ml/ha of a group I. Very limited control due to group I and B resistance.



The same wild radish population sprayed with Triathlon at 750 ml/ha giving excellent control.

## SECTION 4 MANAGING RESISTANCE

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## Section

## 5

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# Tools and planning to ease the transition to controlled traffic farming

James Hagan, Dr Paul Blackwell, Dr Steve Davies, Bindi Isbister – DAFWA, Geraldton

## THE MAIN POINTS...

- As rainfall patterns change access to stored subsoil moisture is becoming increasingly important.
- Long term planning is important to move to Controlled Traffic Farming (CTF).
- Protect your investment in costly soil renovation by limiting re-compaction.

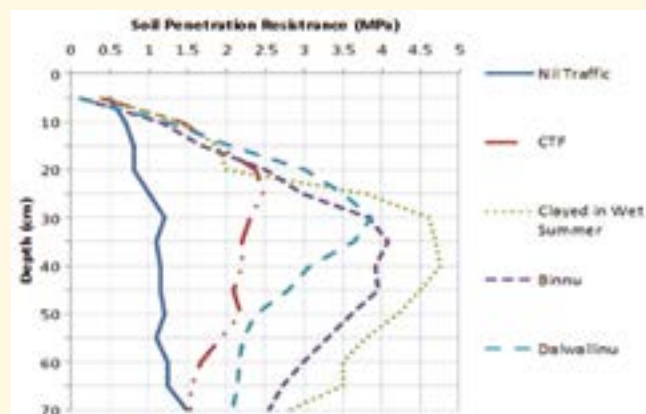
Compaction has been calculated conservatively as costing Western Australian agriculture alone around \$333 million annually and with the weight and size of farm machinery increasing it is likely that this lost value is also increasing. Not only are the impacts of compaction increasing, it is also becoming more expensive to fix.

As compaction moves deeper through the subsoil to depths of 60 cm and beyond, regular deep ripping programs, which may have been alternatives to controlled traffic, are no longer able to reach all compacted layers. This is especially critical on deep sands where unrestricted root growth regularly needs to exceed two metres, as restricted root growth will limit plant available water, and thus reduce yield potential.

Average rainfall over the past 15 years has also been declining which is likely to enhance the negative impact that compaction, along with a number of other soil constraints have on crop yields. This decline in annual rainfall has often been accompanied by dry spells within the growing season, with periods of four to eight weeks of minimal rainfall and warm growing conditions. This period of minimal rainfall makes plant access to stored subsoil moisture a critical factor in the ability of crops to survive these periods of stress without major yield penalty.

The effect of this increasing reliance on access to stored moisture during the growing season means that subsoil constraints, such as compaction and acidity, which limit plant access to the soil profile are going to be of increasing importance going into the future.

**FIGURE 1: Moist penetration resistance data, nil vs various levels of traffic**



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## Minimising the impact of compaction

Numerous paddocks across the WA wheat belt have been measured for moist penetration resistance in the past 15 years.

The data collected from these samples suggests that 80 per cent of sandplain paddocks had moist penetration resistance of 3 MPa, which severely restricts root growth, at 30 cm depth.

More concerning is that 40 per cent of paddocks had a soil resistance of greater than 3 MPa at 50 cm, largely induced by higher axle loads and increased loaded footprint.

In the most extreme examples of this compaction at depth, as depicted in Figure 1, a carry grader used for claying on a wet summer has created a soil penetration resistance of greater than 3 MPa to a depth of almost 70 cm. Compared to an area of bushland where there has been nil traffic, or a nearby CTF paddock, off a tramline, where we can see peak resistance occurs at around 20 cm and then moves back towards the MPa of nearby bushland which has had nil traffic.

It is possible for uncontrolled traffic to cover a significant portion of a paddock in a single year, with the effects of just two years of machinery use capable of covering over 90 per cent of a paddock in wheel tracks, especially if traffic directions change.

A standard scenario with a 45 ft (13.7 m) header, 50 ft (15.2 m) seeding bar, a 120 ft (36.5 m) boomspray, and a chaser bin not running on tramlines, can result in 46 per cent of a paddock carrying traffic in a season.

The perfect scenario for minimising the impact of compaction is a fully matched CTF system, which is typically accomplished via a 1:3 ratio, with the header and seeder being one-third the width of the boomspray. This sort of system results in 10 to 12 per cent paddock wheel track coverage (Figure 2).

Whilst a perfectly matching system is the optimal situation for minimising the impact of compaction, there are often compromises that need to be made in order to fit into existing production systems, with considerations such as straw and fertiliser (including lime) spreading widths, time constraints for spraying, and even basic factors such as the size of seeding and harvest programs.

A current popular compromise, due to the requirement for larger seeding gear, is a 1:2:3 fit, with the header being a third the size of boom spray whilst seeding bar is half the width of the boom spray, eg 40 ft (12.2 m), 60 ft (18.2 m), 120 ft (36.5 m) system on 3 metre centres which, whilst not being perfect, reduces the tracked percentage to approximately 18 per cent (Figure 3).

Growers looking to better calculate their current tracked percentage may find a tool developed by DAFWA and PrecisionAgriculture.com.au as a component of the new GRDC/DAFWA project in West Australia *Minimising the impacts of soil compaction*.



# Connecting data and people during planting



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### Calculating the cost of compaction

Whilst tracked percentage is worth knowing it is the yield penalty that the compaction caused by the machinery that runs on these tracks that is most important. Various trials in the WA wheatbelt suggest that yield penalties on deep sands can range from 20 – 47 per cent, whilst deep duplex soils in WA averaged 22 per cent yield penalty from compaction.

While yield penalties from compaction may vary across a paddock

**TABLE 1: Calculating the yield benefit of transitioning to CTF for two different soil types**

Soil type	Current tracked (%)	Proposed tracked (%)	Yield penalty tracked (%)	Benefit of CTF (% yield Increase)
Deep sand	45%	18%	35%	9.5%
Loam	35%	12%	22%	5%

**TABLE 2: Example machinery replacement schedule**

Machinery	Current age (yrs)	Replacement age (yrs)	Years to replacement	Size required
Tractor 1	5	10	5	350 hp
Tractor 2	2	10	8	—
Header (35 ft – 10.7 m)	3	5	2	40 ft (12.2 m)
Seeding Bar (60 ft – 18.2 m)	8	15	7	60 ft (18.2 m)
Air Cart 7	15	8	20,000 litres	
Boom Spray (100 ft – 30.5 m)	3	10	7	120 ft (36.5 m)
Multispreeder 5	15	10	40 ft (12.2 m)	

due to a number of factors, the best way to calculate the possible yield benefits from moving to a CTF system is to look at the difference between the area current being trafficked, and comparing this to a proposed CTF system. Multiplying this difference in tracked area by the identified yield penalty for the relevant soil type, thus estimating yield benefits as in Table 1.

### Moving to CTF

Moving to CTF may take minimal effort particularly if all gear is already at complementary widths and the only necessary changes are wheel spacing modifications to create a fully matching system. Unfortunately for others, it may require the replacement of all current machinery to create a system that works effectively.

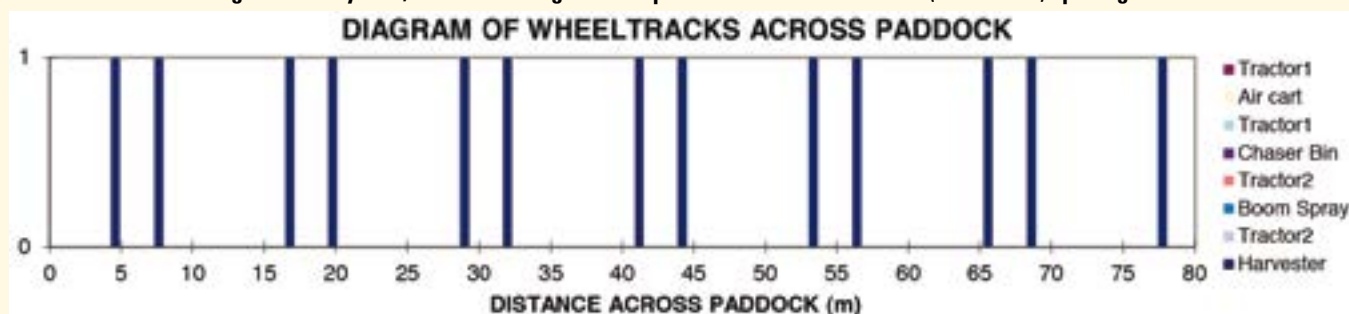
It is important in either scenario to carefully incorporate forward planning and consider the long term requirements.

In the easy scenario it is important to consider whether current operating widths are likely to match with your future plans.

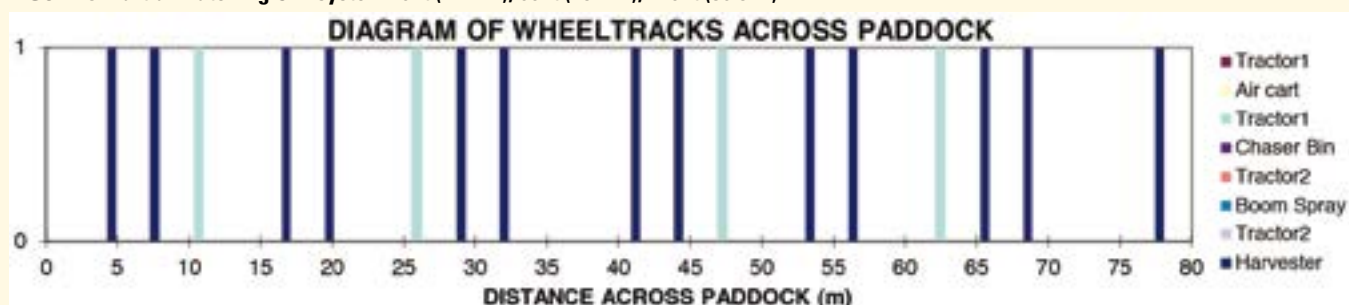
Whilst in the latter more difficult scenario it is important to recognise that whilst replacing all machinery to fit a system may sound expensive, it can be worked into your standard machinery replacement schedule.

A proven method for creating a machinery investment plan is to note down current machinery, its age, and the age at which it is planned to be replaced and from such a list work out a schedule for moving to CTF (see Table 2).

**FIGURE 2: Full Matching 40 ft CTF system; all traffic fitting onto the permanent tramlines at 40 ft (about 12 m) spacing**



**FIGURE 3: Partial matching CTF system 40 ft (12.2 m), 60 ft (18.2 m), 120 ft (36.5 m)**



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\*Results may vary based on conditions.



**Table 3: Return on investment for amelioration costing \$150/ha**

Yield benefit (kg/ha)	3 years duration	7 years duration
200kg/ha	0.12	1.61
500kg/ha	1.8	5.5
800kg/ha	3.48	9.45

In the majority of case studies conducted in Western Australia for the CTF technical manual, farm businesses have stated that their total cost of moving to a CTF system was less than \$20,000, and this was largely attributed to moving wheel widths.

### Protect your investment in costly soil renovation

Growing numbers of farm businesses across the state are using tools such as the mouldboard plough, or rotary spader to improve non-wetting soils, incorporate lime, or bury resistant weeds, as well as remove compaction in the top 30 cm. These treatments are seeing some excellent yield responses in the same season, with some mouldboard treatments still providing benefits seven years after initial incorporation where traffic has been controlled.

A driving factor behind the adoption of these amelioration techniques has been the strong early returns that they have been generating for farm businesses. But one of the most significant factors influencing the true value of costly subsoil amelioration strategies is the length of time that the benefits persist for. By protecting the benefits that costly subsoil amelioration methods provide, return on investment can be significantly increased as is shown in Table 3.

A return on investment of greater than 1.0 suggests that the benefits are greater than the costs and the practice should go ahead. As can be seen in Table 3, the difference in the duration of benefit can easily be the difference between subsoil amelioration being a worthwhile undertaking, or simply a costly exercise.

The difference between three years duration and seven years duration at 500 kg per hectare benefit, is the difference between getting \$1.80 back for every dollar spent, and getting \$5.50 back for every dollar spent.

### To sum up

The renewed interest in CTF may be due to the need to take better advantage of stored subsoil moisture due to seasonal conditions, reducing the cost of deep ripping programs where compaction is moving deeper through the soil profile, to protect farm investment in costly soil amelioration techniques such as spading or mould board ploughing, or a combination of all these factors.

Whilst there are barriers to adoption – and transitioning to CTF requires farm businesses to plan for the long term in choosing suitable operating widths – the benefits make CTF adoption worth the effort.

**Acknowledgments:** Thanks to collaborating, growers, consultants and DAFWA colleagues, who have facilitated field trials, compaction measurements, and associated soil health issues, across the state. Thanks also to GRDC for their support of this project.



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GLONASS – which provides almost twice as many satellites – is included free for the duration of the CenterPoint RTX subscription and results in increased reliability from a more robust position solution.

As CenterPoint RTX doesn't require as many unlocks or additional hardware as other precision correction services on the market, it's a technology that may be a lot cheaper and easier to adopt than you think. The money you save can be allocated towards equipment that further improves your bottom line.

Professional management and monitoring 24/7 by a global operations team provides peak performance and high reliability. As we also look after all the inbuilt redundancy and system backups, it provides your agricultural enterprise with peace of mind and saves you money.

The CenterPoint RTX Farm and Contractor Licences recognise many farmers and contractors operate multiple RTX compatible devices across their farms. Multiple units can now be subscribed to at a greatly reduced average price, which rewards farmers who use RTX compatible devices.

With the new CenterPoint RTX Farm or Contractor Licence a farmer or contractor is able to purchase a correction signal licence which includes an initial subscription for Trimble's satellite delivered CenterPoint RTX correction service. Each subsequent additional subscription is able to be purchased at a greatly reduced rate.

Many agricultural enterprises operate a variety of Auto-Steer and Guidance systems across their vehicle fleet. This is especially true as operators upgrade to new platforms compatible with state of the art technologies such as RTX.

The new CenterPoint RTX Farm and Contractor Licence allows operators to include both CenterPoint RTX and OmniSTAR services under the one initial subscription thus reducing the cost across their whole operation.

For more information on CenterPoint RTX or to arrange a free three day trial of CenterPoint RTX, contact your local Trimble RTX dealer.

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# Section

# 6

## Grain Storage & Handling

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# Making sure grain protectants do their job

## AT A GLANCE...

- Consider grain protectants when gas-tight sealable storage is unavailable and to ensure security of planting seed.
- Grain protectants work best when combined with meticulous storage hygiene and aeration cooling.
- Stringent maximum residue limits (MRLs) leave no margin for error in application. Always check with your grain buyer before applying.
- Even coverage needed to manage stored grain insects.

**G**rain protectants are one of many management tools for preventing pests in stored grain and have a particular role in unsealed storage and seed storage. Growers across Australia's northern and southern cropping regions can use grain protectants to help prevent pest infestations in stored grain. The use of protectants combined with meticulous hygiene and aeration cooling are especially useful in unsealed storages, where effective fumigation is not possible.

### Pest prevention

Grain protectants are designed to prevent pest infestations and not to control existing infestations. Grain must be clean and free of pests before applying a protectant. A common misunderstanding is that grain protectants kill insects already infesting the grain, but those types of products (contact disinfestants) are no longer available for on-farm use.

To give protectants the best chance to defend stored grain, combine their use with meticulous storage hygiene practices before and after harvest. Cleaning up the storage site and the harvesting equipment removes harbours where pests can survive, ready to infest the new season's grain. The addition of aeration cooling also provides an unattractive environment for pests in stored grain.

## SECTION 6 GRAIN STORAGE & HANDLING

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### Read the label

Always read the chemical label before choosing a protectant to ensure it is registered for use on the grain you wish to apply it to and will target the main insects commonly found in your storage. As a general guide, most protectants are only registered for use on cereal grains, except malting barley, rice and maize.

The lesser grain borer (*Rhyzopertha dominica*) is the toughest of the common grain storage pests to deter with protectants, with only two products currently available – K-Obiol® and Conserve On-Farm™ (under permit PER14362).

To prolong the working life of these two products, alternate their use each year or two to avoid pests developing resistance to them.






### Close to MRL

As grain markets have become less tolerant to protectants and maximum residue limits (MRLs) are monitored scrupulously, accurate application is essential.

Some of the protectants – even if used at the recommended label rate – are right on the MRL leaving no room for error in applying the correct rate and even spread.

Commodity vendor declarations are also used in many cases to ensure a parcel of grain is only subjected to one application of the protectant to avoid exceeding the MRL.

**TABLE 1: Northern and southern region stored grain protectants guide**

Protectant	 Lesser grain borer ( <i>Rhyzopertha dominica</i> )	 Rust-red flour beetle ( <i>Tribolium castaneum</i> )	 Rice weevil ( <i>Sitophilus oryzae</i> )	 Saw-toothed grain beetle ( <i>Oryzaephilus surinamensis</i> )	 Flat grain beetle ( <i>Cryptolestes ferrugineus</i> )
Pirimiphos-methyl eg. Actellic 900®					
Fenitrothion eg Fenitrothion 1000®					
Chlorpyrifos-methyl eg Reldan Grain Protector®					
Chlorpyrifos-methyl + S-methoprene eg Reldan Plus IGR®					
Deltamethrin + Piperonyl Butoxide eg K-Obiol® 1					
Spinosad + Chlorpyrifos-methyl + S-methoprene eg Conserve On-Farm™					

KEY:   Effective control.   Resistance widespread (unlikely to be effective).   Not registered for this pest.  
Notes: 1 Approved user ID card required for purchase – contact Bayer to obtain ID. Source: APVMA



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## Accurate application

Always follow label directions, but as an example, some protectants are applied at a rate of one litre of mixed product per tonne of grain. To achieve even coating of the grain best results are achieved with one – or even better with two – flat fan nozzles mounted to spray into the auger as the grain is loaded into storage.

Mixing one litre per tonne is not easy and relies on agitation as the grain passes up the auger.

Applying protectants in a belt conveyor does not provide adequate mixing and even coating. Spray can also cause issues with the belt slipping on drive rollers. Some conveyor manufacturers offer a separate application kit – ensure it can apply the protectant evenly to the stream of grain and includes agitation to mix the product through the grain.

Some protectants start deteriorating 48 hours after being mixed with water so avoid leaving for long periods before applying to grain. The product label will also indicate the anticipated effective life of the protectant on the grain.

The effective life of protectants is shortened if applied to grain above 12 per cent moisture content and above 27°C or is exposed to direct sunlight, such as the end of a shed or an open bunker.

**Acknowledgements:** Philip Burrill, DAFF QLD; Peter Botta, PCB Consulting; Chris Newman, Stored Grain Services; Ben White, GIWA; and, Chris Warrick, Primary Business.

**Further information:** GRDC Grain Storage Fact Sheet – Project code PAD00001

# Inland Rail the key to lowering grain transport costs

**T**he Australian Government's Inland Rail Program could be a boon for grain growers throughout New South Wales and Queensland.

Inland Rail is a new freight rail connection between Melbourne and Brisbane via Wagga Wagga, Parkes, Narrabri, North Star, Oakey and Toowoomba. It will complete the spine of Australia's existing national freight rail network and connect Australia's major capital cities, farms and export ports.

With transport representing as much as 30 per cent of the cost of production for some grain growers, this efficient freight rail service is expected to provide welcome relief, driving down supply chain costs and providing efficient access to the ports of Melbourne and Brisbane.

Deputy Prime Minister, the Hon Warren Truss, announced \$300 million in funding for preconstruction activities in December 2013 and appointed the Australian Rail Track Corporation (ARTC) to lead those activities under the guidance of the Implementation Group.

Since then, the ARTC has worked with all major rail operators, end users and peak bodies to develop a Service Offering that meets the needs of rail users.

The Service Offering will see Inland Rail offer a road competitive service with a transit time of less than 24 hours and 98 per cent reliability. The service will be made highly efficient through double stacking and will be future proofed to support 30 tonne axle loads.

Connectivity to regional branch lines and existing sidings will be maintained and the entire Queensland section of the alignment will be dual-gauge – a critical factor for growers to the west of Goondiwindi.

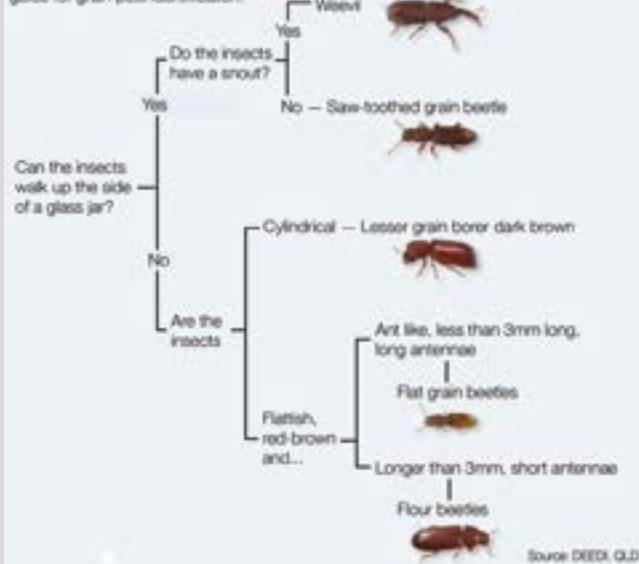
## Where is the project up to?

In NSW, early field work has commenced for the Parkes to Narrabri and Narrabri to North Star sections. Tenders have been called for environmental and engineering design consultancies.

In Queensland, the section from Gowrie to Kagaru, including the challenging Toowoomba tunnel, has been highlighted as a priority development project.

## HOW TO ID COMMON BEETLE PESTS OF STORED GRAIN

The following flow chart provides a useful guide for grain pest identification.



## SECTION 6 GRAIN STORAGE & HANDLING

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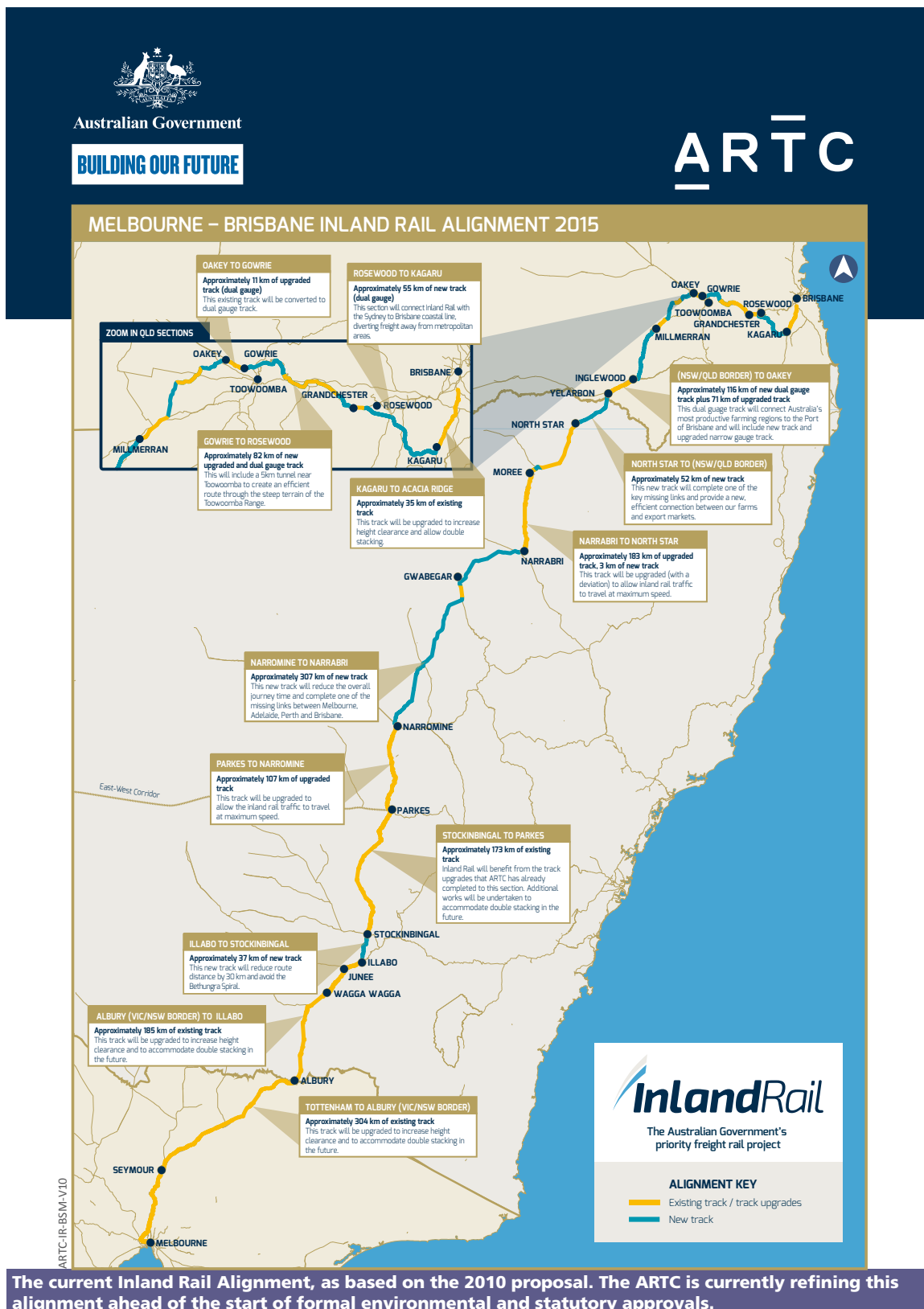
**Proposed specifications for the Inland Rail will see highly efficient movement of freight through double stacking and the capacity to support 30 tonne axle loads**

A number of ARTC's existing customers are embracing the early opportunities presented as a result of work around Inland Rail, to increase axle loads to 25 tonnes between Parkes and Melbourne, Port Botany and Port Kembla. This area of the network had previously been limited to 21 tonne axle loads.

Former Deputy Prime Minister, the Hon John Anderson, chairs the

Inland Rail Implementation Group, which will report to Minister Truss mid-year 2015.

John Anderson has been a staunch supporter of the Inland Rail program, citing its potential to drive down the cost of transport for agricultural producers and to provide vital connectivity for regional Australia and agricultural industries to export ports including the Port of Brisbane.



# Deregulation behind new investment in Australian bulk grain handling

**G**lobal markets are influencing the Australian agriculture sector more than ever and it is now being reflected in the investment in capital and operations infrastructure, particularly in the grain sector.

After many years of status quo, intelligent new investment in infrastructure and supply chain equipment is being seen as a positive, according to Soto Consulting Group.

"Recent publicity shows the grain sector of Australian agriculture has begun new growth acquisition and bulk handling infrastructure renewal and for very calculated reason," said Managing Director, Frank Soto.

"The ABC's Landline television program gave good coverage to this issue, with top industry players suggesting 'deregulation' is the catalyst changing the way our ports in particular are working to maintain market share against international competition."

Soto Consulting Group is a large niche-sized engineering firm with global markets and reach, specialising in partnering arrangements.

Partnering involves extensive on-site presence and face-to-face contact for clients with its motivated engineers who utilise cutting edge technology and software because speed and accuracy are critical for outcomes.

"It is important for grain companies to have an engineering company prepared to work very closely as deregulation is forcing smarter analysis, design and planning in CAPEX and OPEX so existing assets and new construction give the best possible return on investment."

Arguably, the most notable example of agri-sector investment change is found on the east coast of Australia where the Newcastle Agri Terminal (funded by a consortium that includes CBH, the farmers' co-op from WA) and one of GrainCorp's seven east coast ports are operating just a few hundred metres from each other across the Port of Newcastle.

When asked why build a port right next door to the powerful GrainCorp, Newcastle Agri Terminal's Jock Carter referred to cyclical capacities and how his terminal was engineered and designed to manage bulk handling for the modern global market and shipping, whereas its competitor had not upgraded for quite some time.

"This is an example of one company in the grain handling industry of Australia engineering its system for a competitive advantage – this being



Frank Soto.

to meet modern turnaround expectations such as train lengths, shipping access and loading etc," said Frank.

"It is very much about more closely controlling modern supply chain requirements, so this type of infrastructure design focuses on managing time frames in the buying and selling of grain."

As Landline also pointed out, global player Bunge is spending about \$40 million on a new grain terminal at Bunbury, WA.

Bunge has been buying port capacity from nearby CBH, but invested in specifically designed infrastructure to control its own destiny.

Bearing in mind CBH's Kwinana port ships nearly all the export grain out of the west and runs its own rail network, Bunge's Chris Aucote said the company looked at either going through the existing infrastructure ... but chose to invest and build more capacity which it thinks is needed by the Australian market.

According to Frank, the telling factor in this project is Bunge retrofitting and upgrading an existing woodchip loader while building its own storage and conveyor to reduce capital costs to counter its more expensive mode of grain delivery, by road rather than rail.

"These snapshots into the beginning of new infrastructure modernisation for the Australian agriculture sector shows just how paramount are smart planning and design," said Frank.

"Precise strategies can be formed with consultation between grain companies and its engineering partner with ideal outcomes being bulk handling systems that can be changed according to market needs."

"Now that Asia is beginning to mature as a market with extremely high potential for Australian grain exports, the agriculture companies know how imperative it is to invest capital in upgrading domestic supply chains – which many industry commentators publicly refer to as 'Third World'.

"Deregulation is creating an operating environment calling for faster rates of grain handling and movement to port and onto ships.

"As the fourth largest grain exporter in the world, Australia is wise to maintain its place among the best, but it can't lose sight of the standard of its infrastructure and this new wave of investment is very timely."

For more information, please contact Soto Group Pty Ltd, 113 Princess Hwy, Unanderra, NSW 2526, Australia. Tel: 02 4271 7755



Bulk handling of grain is on the verge of bigger things.

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- Continuous mixed flow design so overall power requirement is low.
- 25 to 30 per cent of the drier is used for cooling. This gives the best opportunity to cool the grain as much as possible with ambient air.
- Touch Screen PLC control panel. The drier program is written by our own engineers so we know every aspect in detail. If the drier panel is connected to the internet our UK staff can connect to the panel and diagnose problems and even control and adjust all of the drier functions. This also provides the ability to text or email drier status reports to the operator's mobile phone and the drier performance can be monitored and adjusted by PC from the farm office.
- The handling plant can also be controlled by the PLC as an extra cost option.
- Oil or gas burners.
- Ledge free internal design to minimise the amount of chaff and straw etc from lodging inside the drier.
- Fully galvanised construction internally and externally for a long service life.
- Pneumatically operated shutter discharge.
- High throughput of cereals and canola.

**P**erry of Oakley Ltd is a family manufacturing business now in its third generation. It is the UK's oldest and most experienced manufacturer of grain driers and grain handling equipment – their products are now available to the Australian market.

Perrys have appointed Aust-Mech as their main distributor in Australia. Aust-Mech was chosen because they are a similar family run manufacturing business. They also understand the importance of manufacturing a quality product and providing good aftersales service and support.

Aust-Mech engineers are trained on how to service, maintain and troubleshoot drier problems should they arise. They will also carry a stock of critical spares so parts availability is not a problem within Australia. This will ensure that customers can receive the same level of service as they would from a local manufacturer.

Aust-Mech are situated in Dalby and manufacture the well known Tubeveyor product.

### Perry's first driers already operating in NSW

Perry's first on-farm drier has been successfully installed and commissioned. It belongs to TN Bailey, 'Pine Ridge', Quirindi in northern NSW. It is a 40 tph continuous flow drier based on drying feed wheat from 20 to 15 per cent (or 53 tph extracting three per cent moisture from 16 to 13 per cent).

The conveying and elevating equipment supplied is all 60 tph.

Perry sent a supervising engineer from the UK to build the drier and handling equipment with engineers supplied by the customer.

A similar installation has been commissioned at Willow Tree, not far from Quirindi. Mr Benham is operating a 21 tph continuous flow drier to take feed wheat from 20 to 15 per cent moisture. The system is capable of 28 tph if only extracting three per cent moisture (from 16 to 13 per cent) is needed.

The conveying and elevating equipment supplied is all 60 tph.



Curved conveyors are part of the wide Perry product range.

### SECTION 6 GRAIN STORAGE & HANDLING

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**The continuous flow systems can dry 40 tonnes of feed wheat per hour from 20 to 15 per cent moisture content.**

As with the Quirindi installation, Perry sent a supervising engineer from the UK to supervise construction at Willow Tree.

Mr Benham farms around 1000 hectares and plans to put several thousand tonnes of product – mainly sorghum – through his new drier each year. Because grain merchants have recently lowered the moisture content that they will accept into their stores, the new grain drier will allow Mr Benham to guarantee to meet that moisture content.



**The drying system at Willow Tree incorporates four silos.**

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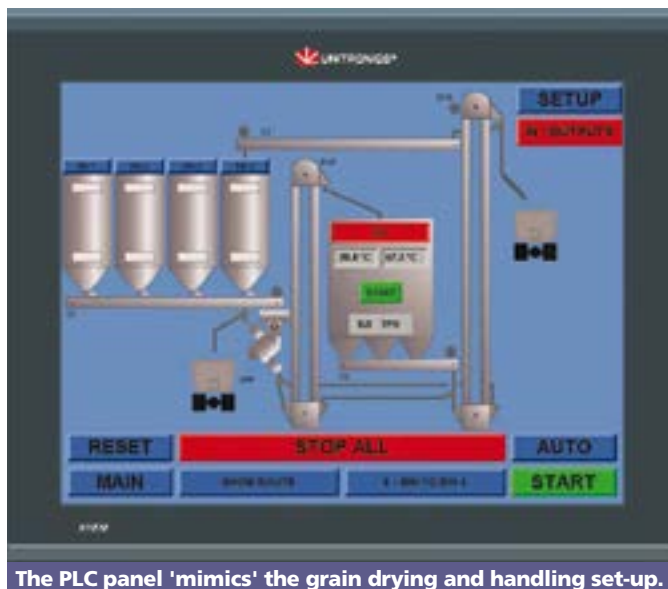
Mr Benham wanted to incorporate four existing silos into his new drying set-up. The four silos feed a conveyor which puts the product through an aspirator cleaner removing the majority of the husk and chaff. It then enters the oil-fired drier via a double leg elevator.

The elevator not only feeds the drier but also elevates away the driers discharged product.

### The customer's key reasons for purchase were:

- To enable more timely harvesting of the existing crop so planting and other field activities can commence earlier than if the crop had to dry in the field.
- To enable the crop to be harvested when the quality is at its best and to achieve best prices.
- Ease of drying. The new system is simple to operate and has a fully automated Programmable Logic Controller (PLC) system for both the drier and the handling equipment. In the Willow Tree installation the PLC panel has a mimic of the complete set up and will also allow Mr Benham to control each of his machines (including the pre-existing silos) individually. The panel has also been supplied with the capability for further expansions and enhancements.
- Increased drying capacity. This provides the opportunity to offer drying facilities to other farmers.
- Both customers have chosen Perrys because they could provide the complete package of handling equipment and the drier plus they had the expertise and knowledge to enable them to design the drying plant that was required.
- Perrys also have a full range of critical spares stocked at Dalby with Aust-Mech in case of breakdowns to ensure that customers in Australia can have the same level of back up and support as they would in the UK.

For more information contact Perry Sales and Technical manager, Rob Coleman based in Tamworth – Email: [rob.coleman@perryengineering.com](mailto:rob.coleman@perryengineering.com); Ph: 0439 362 693 or contact Aust-Mech at Dalby on 07 4662 4200 or visit [www.perryengineering.com](http://www.perryengineering.com)



**The PLC panel 'mimics' the grain drying and handling set-up.**





# Section

# 7

## Industry Agencies

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*Australian Grain* on 07 4659 3555 or  
Email: [grain@greenmountpress.com.au](mailto:grain@greenmountpress.com.au)



# National Bodies

## National Farmers' Federation

NFF House, 14–16 Brisbane Ave, Barton  
Locked Bag 9, KINGSTON ACT 2604  
Ph: 02 6269 5666 – Fax: 02 6273 2331  
Email: reception@nff.org.au

**President:** Brent Finlay

**Chief Executive Officer:** Simon Talbot

## Grain Producers Australia

PO Box 3517, MANUKA ACT 2603  
Ph: 02 6273 3000 – Fax: 02 6273 3756  
Email: admin@grainproducers.com.au  
Web: www.grainproducers.com.au

### GPA Board of Directors

**Northern Region:** Luke Arbuckle

Mob: 0403 547 997

Email: luke.arbuckle@grainproducers.com.au

**Northern Region:** Andrew Earle

Mob: 0427 565 193

Email: andrew.earle@grainproducers.com.au

**Western Region:** Barry Large

Mob: 0427 549 023

Email: barry.large@grainproducers.com.au

**Southern Region:** Andrew Weidemann (Chairman)

Mob: 0428 504 544

Email: andrew.weidemann@grainproducers.com.au

**Independent:** Michael Schaefer

Mob: 0428 274 031

Email: michael.schaefer@grainproducers.com.au

**Independent:** Peter Bridgman

Email: peter.bridgman@grainproducers.com.au

# State Bodies

## Queensland

### AgForce Queensland

Level 2, 110 Mary Street, BRISBANE QLD 4000  
Ph: 07 3236 3100 – Fax: 07 3236 3077  
Email: agforce@agforceqld.org.au – Web: www.agforceqld.org.au

**State President:** Grant Maudsley

**Chief Executive Officer:** Charles Burke

**Grains President:** Wayne Newton

**Grains Policy Director:** Tamara Badenoch

## Western Australia

### Council of Grain Grower Organisations (COGGO)

26 Winthrop Drive, WINTHROP WA 6150

Ph: 08 9310 2636

Email: hugh.lennerts@coggo.net.au

**Independent Chairman:** Chris Wilkins

**Company Secretary:** Hugh Lennerts

### Grain Industry Association of Western Australia (GIWA)

PO Box 1081, BENTLEY DC, WA, 6983

Ph: 08 6262 2128

Email: info@giwa.org.au

**Executive Officer:** Johanna Gastevich

### Pastoralists' & Graziers' Association of WA (PGA)

Ground Floor, 28–42 Ventnor Ave, WEST PERTH WA 6005

Ph: 08 9212 6900 – Fax: 08 9485 0299

Email: pga@pgaofwa.org.au – Web: www.pgaofwa.org.au

**PGA Western Graingrowers Chairman:** John Snooke

**Policy Officer:** Ian Randles

### Western Australian Farmers Federation (WAFarmers)

PO Box 68, GUILDFORD WA 6935

125 James Street, GUILDFORD WA 6055

Ph: 08 9486 2100 – Fax: 08 9279 1188

Email: reception@wafarmers.org.au

**Chief Executive Officer:** Stephen Brown

### WA Grains Group (WAGG)

C/- PO, LAKE GRACE WA 6353

Ph: 0428 654032

Email: wagrainsgroup1@bigpond.com – Web: wagrainsgroup.com

**Chairman:** Doug Clarke

## South Australia

### Grain Producers SA

PO Box 781 (26 Hack St), MT BARKER SA 5251

Ph: 1300 734 884 – Fax: 08 8391 4901

Email: info@grainproducerssa.com.au

Web: www.grainproducerssa.com.au

**Chief Executive Officer:** Darren Arney

**Chairman:** Garry Hansen

## Victoria

### Victorian Farmers Federation (VFF)

Farrer House, Level 5, 24 Collins Street, MELBOURNE VIC 3000

Ph: 1300 882 833 – Fax: 03 03 9207 5500

Email: vff@vff.org.au – Web: www.vff.org.au

**President:** Peter Tuohey

**Chief Executive Officer:** Graeme Ford

## Tasmania

### Tasmanian Farmers & Graziers Association (TFGA)

Cnr Charles and Cimitiere Streets, LAUNCESTON TAS 7250

PO Box 193, Launceston TAS 7250

**Rural Affairs Manager:** Nick Steel

Ph: 03 6332 1800 – Fax: 03 6331 4344

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**Graeme Easey:** 0427 700 779 (NSW)

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## New South Wales

### NSW Farmers Association

PO Box 459, ST LEONARDS NSW 1590

Ph: 02 9478 1000 – Fax: 02 8282 4500

Email: emailus@nswfarmers.org.au – Web: www.nswfarmers.org.au

**Chief Executive Officer:** Matt Brand

**Grains Committee:** Daniel Cooper

# Government Bodies

## Federal

### Minister for Agriculture – The Hon. Barnaby Joyce MP

PO Box 6022 House of Representatives

Parliament House, CANBERRA ACT 2600

Ph: 02 6277 7520 – Fax: 02 6273 4120

Email: minister@maff.gov.au – Web: www.aph.gov.au/B\_Joyce\_MP

### Minister for the Environment – The Hon. Greg Hunt MP

PO Box 6022 House of Representatives

Parliament House, CANBERRA ACT 2600

Ph: 02 6277 7920 – Fax: 02 6273 7330

Email: greg.hunt.mp@environment.gov.au

Web: www.aph.gov.au/G\_Hunt\_MP

### Shadow Minister for Agriculture – The Hon. Joel Fitzgibbon MP

Parliament House, CANBERRA ACT 2600

Ph: 02 6277 4550 – Fax: 02 6277 8556

Email: joel.fitzgibbon.mp@aph.gov.au –

Web: www.aph.gov.au/J\_Fitzgibbon\_MP

### Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)

Department of Agriculture

18 Marcus Clarke Street, Canberra City

GPO Box 858, CANBERRA ACT 2601

Ph: 02 6272 2000 – Fax: 02 6272 2361

Email: info.abares@agriculture.gov.au

Web: www.agriculture.gov.au/abares

**Executive Director:** Karen Schneider

### business.gov.au

New Acton Nishi

2 Phillip Law Street, Canberra City 2601

GPO Box 9839, CANBERRA ACT 2601

Ph: 13 28 46

Web: www.business.gov.au

### Australian Pesticides and Veterinary Medicines Authority (APVMA)

18 Wormald Street, Symonston, ACT, 2609

PO Box 6182, KINGSTON ACT 2604

Ph: 02 6210 4701 – Fax: 02 6210 4813

Email: enquiries@apvma.gov.au – Web: www.apvma.gov.au

**Chief Executive Officer:** Ms Kareena Arthy

### Australian Government Department of Agriculture

GPO Box 858, CANBERRA ACT 2601

Ph: 02 6272 3933 – Freecall: 1800 651 313

Web: www.agriculture.gov.au

### Australian Plague Locust Commission

46–56 Collie St, Fyshwick ACT 2609

GPO Box 858, CANBERRA ACT 2601

Toll call (within Australia): 1800 635 962 – Fax: 02 6272 5074

Email: aplc@agriculture.gov.au – Web: www.agriculture.gov.au

### Department of Foreign Affairs and Trade

R G Casey Building, John McEwen Crescent, BARTON ACT 0221

Ph: 02 6261 1111 – Fax: 02 6261 3111

Web: www.dfat.gov.au

**Secretary:** Peter Varghese

**Deputy Secretary, Office of Trade Negotiations:** Jan Adams

### Department of Agriculture – Levies

18 Marcus Clarke Street, Canberra City

Locked Bag 4488, KINGSTON ACT 2604

Free call: 1800 020 619 – Free fax: 1800 609 150

Email: levies.management@agriculture.gov.au

Web: www.agriculture.gov.au/levies

**Chief Financial Officer:** Emily Canning

### National Residue Survey

Department of Agriculture

18 Marcus Clarke Street, Canberra City

GPO Box 858, CANBERRA ACT 2601

Ph: 02 6272 5668 – Fax: 02 6272 4023

**Director National Residue Survey:** Ian Reichstein

Email: ian.reichstein@agriculture.gov.au – Web: www.daff.gov.au/nrs

### Office of the Gene Technology Regulator

GPO Box 9848, CANBERRA ACT 2601

Ph: 1800 181 030 – Fax: 02 6271 4202

Email: ogtr@health.gov.au – Web: www.ogtr.gov.au

**Gene Technology Regulator (A/g):** Dr Robyn Cleland

### Office of Rural Financial Counselling

GPO Box 858, CANBERRA ACT 2601

Ph: 1800 900 090 – Fax: 02 6272 4414

Web: www.rfcs.gov.au

### Plant Breeder's Rights Office (located within IP Australia)

Discovery House

47 Bowes Street, Phillip ACT 2606

PO Box 200, WODEN ACT 2606

Ph: 1300 651 010 – Fax: 02 6283 7999

**Registrar:** Fatima Beattie

Email: assist@ipaustalia.gov.au – Web: www.ipaustalia.gov.au

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Ph: 1800 900 090  
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**First Assistant Secretary:** Louise Vanmeurs

## Biosecurity Animal

18 Marcus Clarke Street, Canberra City  
GPO Box 858, CANBERRA ACT 2601  
Ph: 1800 900 090  
Web: [www.agriculture.gov.au](http://www.agriculture.gov.au)  
**First Assistant Secretary:** Tim Chapman

## State Agriculture Departments

### NSW Department of Primary Industries

161 Kite Street, Orange  
Locked Bag 21, ORANGE NSW 2800  
Ph: 02 6391 3100 – Fax: 02 6391 3336  
Email: [nsw.agriculture@dpi.nsw.gov.au](mailto:nsw.agriculture@dpi.nsw.gov.au) – Web: [www.dpi.nsw.gov.au](http://www.dpi.nsw.gov.au)  
**Director General:** Scott Hansen

### Department of Economic Development, Job, Transport and Resources Victoria

1 Spring Street, MELBOURNE 3001  
Customer Service Centre: 136 186  
Email: [customer.service@ecodev.vic.gov.au](mailto:customer.service@ecodev.vic.gov.au)  
Web: [www.delwp.vic.gov.au](http://www.delwp.vic.gov.au)

### Department of Agriculture and Fisheries (Qld)

80 Ann Street, Brisbane  
GPO Box 46, BRISBANE QLD 4001  
Customer Service Centre: 13 25 23  
Interstate – Ph: +61 7 3404 6999 – Fax: 07 3404 6900  
Email: [callweb@daff.qld.gov.au](mailto:callweb@daff.qld.gov.au) – Web: [www.daff.qld.gov.au](http://www.daff.qld.gov.au)  
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**Deputy Director-General:** Beth Woods

### Primary Industries and Regions SA (PIRSA)

L 14, 25 Grenfell Street, Adelaide  
GPO Box 1671, ADELAIDE SA 5001  
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**Chief Executive:** Scott Ashby  
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**Assistant Director PIRSA Strategic Communications:** Stephen Cox  
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Email: [stephen.cox2@sa.gov.au](mailto:stephen.cox2@sa.gov.au)

### SA Research and Development Institute (SARDI)

**Climate Applications:** Dr Peter Hayman, Ph: 08 8303 9729  
**Crop Improvement:** Dr Tim Sutton  
Ph: 08 8303 9734 – Fax: 08 8303 9669  
**Crop Pathology:** Dr Hugh Wallwork, Ph: 08 8303 9382  
**Entomology:** Greg Baker, Ph: 08 8303 9544  
**Farming Systems:** Dr Nigel Wilhelm, Ph: 08 8303 9353  
**Grains Research:** Dr Kathy Ophel Keller, Ph: 08 8303 9368  
**Food Safety:** Jessica Tan, Ph: 08 8303 9771  
**Oilseeds Development:** Andrew Ware, Ph: 08 8688 3417

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Email: [pirs.sardi@sa.gov.au](mailto:pirs.sardi@sa.gov.au) – Web: [www.sardi.sa.gov.au](http://www.sardi.sa.gov.au)

### Department of Agriculture and Food, WA

3 Baron-Hay Court, South Perth WA 6151  
Locked Bag 4, BENTLEY DELIVERY CENTRE WA 6983  
Ph: 08 9368 3333 – Fax: 08 9474 2405  
Email: [enquiries@agric.wa.gov.au](mailto:enquiries@agric.wa.gov.au) – Web: [www.agric.wa.gov.au](http://www.agric.wa.gov.au)

### Tasmanian Department of Primary Industries, Parks, Water and Environment

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Ph: 1300 368 550 – Fax: 03 6344 9814  
Email: [Information@dpipwe.tas.gov.au](mailto:Information@dpipwe.tas.gov.au)  
Web: [www.dpipwe.tas.gov.au](http://www.dpipwe.tas.gov.au)

### Northern Territory, Department of Primary Industry and Fisheries

Berrimah Farm, Makagon Road, Berrimah, Northern Territory 0828  
GPO Box 3000, DARWIN NT 0801  
Phone: 08 8999 2006 (Business hours) – Fax: 08 8999 2010  
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# Research & Development

## Research and Development Corporations

### Grains Research & Development Corporation

Level 4, East Building, 4 National Circuit, BARTON, ACT 2600n  
PO Box 5367, KINGSTON ACT 2604  
Ph: 02 6166 4500 – Fax: 02 6166 4599  
**Chairman:** Richard Clark  
**Managing Director:** John Harvey  
Email: grdc@grdc.com.au – Web: www.grdc.com.au

### Rural Industries Research & Development Corporation

Level 2, 15 National Circuit, Barton  
PO Box 4776, KINGSTON ACT 2604  
Ph: 02 6271 4100 – Fax: 02 6271 4199  
Email: rirdc@rirdc.gov.au – Web: www.rirdc.gov.au  
**Managing Director:** Craig Burns

### Cotton Research & Development Corporation

2 Lloyd Street, Narrabri NSW 2390  
PO Box 282, NARRABRI NSW 2390  
Ph: 02 6792 4088 – Fax: 02 6792 4400  
Email: crdc@crdc.com.au – Web: www.crdc.com.au  
**Chair:** Mary Corbett  
**Executive Director:** Bruce Finney

### Dairy Australia

Level 5, IBM Centre, 60 City Road, Southbank, Victoria 3006  
Locked Bag 104, FLINDERS LANE VIC 8009  
Ph: 03 9694 3777 – Fax: 03 9694 3733 – Web: www.dairyaustralia.com.au  
**Farm Productivity & Delivery:** Chris Murphy

### Meat & Livestock Australia (MLA)

Level 1, 40 Mount Street, North Sydney NSW 2060  
PO Box 1961, NORTH SYDNEY NSW 2059  
Ph: 02 9463 9333 – Free call: 1800 023 100 – Fax: 02 9463 9393  
Email: info@mla.com.au – Web: www.mla.com.au  
**Chair:** Michele Allan

### Australian Pork Limited

Level 2, 2 Brisbane Avenue Barton ACT 2600  
PO Box 4746, KINGSTON ACT 2604  
Ph: 1800 789 099 – Fax: 02 6285 2288  
Email: apl@australianpork.com.au  
Web: www.australianpork.com.au  
**Chief Executive Officer:** Andrew Spencer

### Sugar Research Australia

50 Meiers Road, Indooroopilly, 4068  
PO Box 86, INDOOROOPIILLY Q 4068  
Ph: 07 3331 3333 – Fax: 07 3871 0383  
Email: sra@sugarresearch.com.au

### Australian Wool Innovation Limited

Level 30, HSBC Centre, 580 George St, Sydney NSW 2000  
GPO Box 4177, SYDNEY NSW 2001  
Ph: 02 8295 3100 – Fax: 02 8295 4100  
Email: info@wool.com – Web: www.wool.com  
**Chief Executive Officer:** Stuart McCullough

## CSIRO Enquiries

Bag 10, CLAYTON SOUTH, VIC 3169  
Phone: 1300 363 400 Mon-Fri 9:00am–4:00pm EST  
Email: enquiries@csiro.au – Web: www.csiro.au

## Grain-related CSIRO Flagships

www.csiro.au/en/Research/AF  
**Agriculture Flagship, Director** – John Manners Ph: 02 6246 4001

## Related Cooperative Research Centres

### Plant Biosecurity CRC

Level 2, Building 22, Innovation Centre  
University Drive, University of Canberra, BRUCE ACT 2617  
LPO Box 5012, BRUCE ACT 2617  
Ph: 02 6201 2882 – Fax: 02 6201 5067  
Web: www.pbrc.com.au  
**Chief Executive Officer:** Michael Robinson  
**Communications Manager:** Tony Steeper  
Email: t.steeper@pbrc.com.au

### CRC for High Integrity Australian Pork

PO Box 466, WILLASTON, SA 5118  
Ph: 08 8313 7683 – Fax: 08 8313 7686  
Email: roger.campbell@porkcrc.com.au – Web: www.porkcrc.com.au  
**Chief Executive Officer:** Dr Roger Campbell

## International agencies

### Australian Centre for International Agricultural Research (ACIAR)

38 Thynne Street, Fern Hill Park, BRUCE ACT 2617  
GPO Box 1571, CANBERRA ACT 2601  
Ph: 02 6217 0500 – Fax: 02 6217 0501  
Email: aciar@aciarc.gov.au – Web: aciar.gov.au  
**Chief Executive Officer:** Dr Nick Austin

### International Center for Agricultural Research in the Dry Areas (ICARDA)

PO Box 114/5055, BEIRUT, LEBANON  
Ph: +961 1 843472/813303 – Fax: +961 1 804071/01-843473  
E-mail: icarda@cgiar.org – Web: www.icarda.org  
**Director General:** Mahmoud Solh

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## International Maize and Wheat Improvement Center (CIMMYT)

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Ph: +52 55 5804 2004 – Fax: +52 55 5804 7558

Web: [www.cimmyt.org](http://www.cimmyt.org)

**Director General:** Thomas Lumpkin

## Associated Industry

### AgriFood Awareness Australia Limited

PO Box E10, KINGSTON ACT 2604

Ph: 02 6269 5620 – Fax: 02 6273 3968

### AgriFood Technology

260 Princes Highway, Werribee

PO Box 728, WERRIBEE VIC 3030

Ph: 1800 801 312 – Fax: 03 9742 4228

Email: [lab.vic@agrifood.com.au](mailto:lab.vic@agrifood.com.au) – Web: [www.agrifood.com.au](http://www.agrifood.com.au)

### Australian Herbicide Resistance Initiative

School of Plant Biology

The University of Western Australia

35 Stirling Highway, CRAWLEY WA 6009

Ph: 08 6488 7870 – Fax: 08 6488 7834

**Director:** Professor Stephen Powles

Ph: 08 6488 7833 – Fax: 08 6488 7834

Email: [stephen.powles@uwa.edu.au](mailto:stephen.powles@uwa.edu.au)

**Centre Manager:** Ms Lisa Mayer

Email: [lisa.mayer@uwa.edu.au](mailto:lisa.mayer@uwa.edu.au) – Web: [www.ahri.uwa.edu.au](http://www.ahri.uwa.edu.au)

### Australian Lot Feeders' Association

Level 5 131 Clarence Street, Sydney

GPO Box 149, SYDNEY NSW 2001

Ph: 02 9290 3700 – Fax: 02 9290 2808

Email: [dougal.gordon@feedlots.com.au](mailto:dougal.gordon@feedlots.com.au)

Web: [www.feedlots.com.au](http://www.feedlots.com.au)

**President:** Don Mackay

**Chief Executive Officer:** Dougal Gordon

### Australian Oilseeds Federation Inc

PO Box H236, AUSTRALIA SQUARE NSW 1215

Ph: 02 8007 7553 – Fax: 02 8007 7549

**President:** Robert Wilson

**Treasurer:** Charles Aldersey

Web: [www.australianoilseeds.com](http://www.australianoilseeds.com)

### Australian Research Council

Level 2, 11 Lancaster Place, Majura Park ACT 2609

GPO Box 2702, CANBERRA ACT 2601

Ph: 02 6287 6600 – Fax: 02 6287 6601

Email: [info@arc.gov.au](mailto:info@arc.gov.au) – Web: [www.arc.gov.au](http://www.arc.gov.au)

**Chief Executive Officer:** Professor Aidan Byrne

### Australian Seed Federation Limited

Unit 1, 20 Napier Close, Deakin ACT 2600

PO Box 3572, MANUKA ACT 2603

Ph: 02 6282 6822 – Fax: 02 6282 6922

Email: [enquiry@asf.asn.au](mailto:enquiry@asf.asn.au) – Web: [www.asf.asn.au](http://www.asf.asn.au)

**President:** Steve Brill

**Chief Executive Officer:** Bill Fuller

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### Barley Australia

PO Box 422, VERMONT VIC 3133

Ph: 0408 178 872

Web: [www.barleyaustralia.com.au](http://www.barleyaustralia.com.au)

**Executive Chairman:** Andrew Gee

Email: [andrew.gee@barleyaustralia.com.au](mailto:andrew.gee@barleyaustralia.com.au)

### Bean Growers' Australia Limited

82–86 River Road, Kingaroy QLD 4610

PO Box 328, KINGAROY QLD 4610

Ph: 07 4162 1100 – Fax: 07 4162 4706

**Managing Director :** Lloyd Neilsen

Email: [lneilsen@beangrowers.com.au](mailto:lneilsen@beangrowers.com.au)

Email: [info@beangrowers.com.au](mailto:info@beangrowers.com.au)

Web: [www.beangrowers.com.au](http://www.beangrowers.com.au)

### Centre for Legumes in Mediterranean Agriculture (CLIMA)

The University of Western Australia,

35 Stirling Highway, CRAWLEY, WA 6009

Mailbox M080

Ph: 08 6488 2505 – Fax: 08 6488 1140

Email: [reception-clima@uwa.edu.au](mailto:reception-clima@uwa.edu.au) – Web: [www.clima.uwa.edu.au](http://www.clima.uwa.edu.au)

**Director:** Prof. William Erskine

### CropLife Australia

Level 2, AMP Building, 1 Hobart Place, Canberra ACT 2601

Locked Bag 916, CANBERRA ACT 2601

Ph: 02 6230 6399 – Fax: 02 6230 6355

Web: [www.croplifeaustralia.org.au](http://www.croplifeaustralia.org.au)

**President:** Lachlan McKinnon

**Chief Executive Officer:** Matthew Cossey

### Farmsafe Australia

Head Office: 5 Greenbah Road, Moree

P O Box 256, MOREE NSW 2400

Ph: 02 6752 8218 – Fax: 02 6752 6639

Email: [info@farmsafe.org.au](mailto:info@farmsafe.org.au) – Web: [www.farmsafe.org.au](http://www.farmsafe.org.au)

**Executive Officer:** John Temperley

**State Farmsafe Contacts:**

NSW Ph: 02 9478 1000

SA Ph: 08 8676 7062

QLD Ph: 1300 737 470

WA Ph: 08 9359 4118

VIC Ph: 03 9207 5511

NT Ph: 02 6752 8210

TAS Ph: 03 6398 6212

### Fertilizer Australia

Level 2 1 Hobart Place, Canberra

Locked Bag 916, CANBERRA ACT 2601

Ph: 02 6230 6987

Email: [info@fertilizer.org.au](mailto:info@fertilizer.org.au) – Web: [www.fertilizer.org.au](http://www.fertilizer.org.au)

**Chairman:** Adam Richardson



## Grains & Legumes Nutrition Council

1 Rivett Road, NORTH RYDE, NSW 2113  
Ph: 1300 472 467 (Australia only) or 02 8877 78771  
Email: [contactus@glnc.org.au](mailto:contactus@glnc.org.au) – Web: [www.glnc.org.au](http://www.glnc.org.au)  
**Managing Director:** Georgie Alely

## Grains Research Foundation Ltd (GRFL)

PO Box 299, SOUTHTOWN QLD 4350  
Mob: 0447 763 852  
Email: [admin@grf.org.au](mailto:admin@grf.org.au)  
**Chairman:** Damien Scanlan

## Sustainable Agriculture Branch

18 Marcus Clarke Street, Canberra City  
GPO Box 858, CANBERRA ACT 2601  
**General Manager:** Sally Standen  
Ph: 02 6272 3522

## Nuffield Australia Farming Scholarships

PO Box 586, MOAMA NSW 2731  
Ph: 03 5480 0755 – Fax: 03 5480 0233  
Email: [enquiries@nuffield.com.au](mailto:enquiries@nuffield.com.au) – Web: [www.nuffield.com.au](http://www.nuffield.com.au)  
**Chief Executive Officer:** Jim Geltch AM  
**Chairman:** Andrew Johnson

## Peanut Company of Australia

133 Haly Street, Kingaroy QLD 4610  
PO Box 26, KINGARoy QLD 4610  
Ph: 07 4162 6311 – Fax: 07 4162 4402  
Email: [peanuts@pca.com.au](mailto:peanuts@pca.com.au) – Web: [www.pca.com.au](http://www.pca.com.au)  
**Chief Executive Officer:** John Howard

## Plant Health Australia

Level 1, 1 Phipps Close, DEAKIN ACT 2600  
Ph: 02 6215 7700 – Fax: 02 6260 4321  
Email: [admin@phau.com.au](mailto:admin@phau.com.au) – Web: [www.planthealthaustralia.com.au](http://www.planthealthaustralia.com.au)  
**Chairman:** Dr Tony Gregson  
**Executive Director and CEO:** Greg Fraser  
**Toll Free Exotic Plant Pest Hotline 1800 084 881**

## Pulse Australia Ltd

Level 10, Farrer House 24–28 Collins Street, MELBOURNE Vic 3000  
**Chief Executive Officer:** Tim Edgecombe  
Ph: 03 9004 4081 – Mobile: 0425 717 133  
Email: [tim@pulseaus.com.au](mailto:tim@pulseaus.com.au) – Web: [www.pulseaus.com.au](http://www.pulseaus.com.au)  
**Senior Industry Development Manager (Northern Region):** Gordon Cumming  
Mob: 0408 923 474 – Fax: 07 4696 8505  
Email: [gordon@pulseaus.com.au](mailto:gordon@pulseaus.com.au)  
**Industry Development Manager (Southern Region):** Mary Raynes, Mob: 0408 591 193  
Email: [mary@pulseaus.com.au](mailto:mary@pulseaus.com.au)

**Industry Development Manager (Western Region):** Alan Meldrum  
Mob: 0427 384 760  
Email: [alan@pulseaus.com.au](mailto:alan@pulseaus.com.au)

## Puragrain Pty Ltd

287 Birdwood Terrace, TOOWOONG QLD 4066  
Ph: 07 3471 0071 – Mob: 0419 693 078  
Email: [info@puragrain.com](mailto:info@puragrain.com) – Web: [www.puragrain.com](http://www.puragrain.com)  
**Managing Director:** Professor Robert Henry

## Ricegrowers' Association of Australia

NIP 37, Yanco Avenue, Leeton  
PO Box 706, LEETON NSW 2705  
Ph: 02 6953 0433 – Fax: 02 6953 3823  
Email: [rga@rga.org.au](mailto:rga@rga.org.au) – Web: [www.rga.org.au](http://www.rga.org.au)  
**President:** Les Gordon  
**Executive Director:** Ruth Wade

## Ricegrowers' Limited – trading as SunRice

NIP 37, Yanco Avenue, Leeton  
Locked Bag 2, LEETON NSW 2705  
Ph: 02 6953 0411 – Fax: 02 8916 8350  
Email: [mdelgigante@sunrice.com.au](mailto:mdelgigante@sunrice.com.au) – Web: [www.sunrice.com.au](http://www.sunrice.com.au)  
**Chairman:** Laurie Arthur  
**Chief Executive Officer:** Rob Gordon

## Sustainability and Biosecurity Policy

18 Marcus Clarke Street, Canberra City  
GPO Box 858 CANBERRA ACT 2601  
Ph: 1800 900 090  
Web: [www.agriculture.gov.au](http://www.agriculture.gov.au)  
**First Assistant Secretary:** Ian Thompson

## Tractor and Machinery Association of Australia

Suite 617, 434 St Kilda Road, MELBOURNE VIC 3004  
Ph: 03 9867 4289 – Fax: 03 9867 4061  
Email: [info@tma.asn.au](mailto:info@tma.asn.au) – Web: [www.tma.asn.au](http://www.tma.asn.au)  
**Executive Director:** Richard Lewis



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# Grain Marketing & Handling Organisations

## AWB

Ph: +61 3 9268 7200  
**Toll Free Grower Services Centre 1800 4 GRAIN (1800 447 246)**  
 GPO Box 58, MELBOURNE VIC 3001  
 Web: [www.awb.com.au](http://www.awb.com.au)

## Cargill Australia

Ph: +61 3 9268 7200  
 GPO Box 58, MELBOURNE VIC 3001  
 Web: [www.cargill.com.au](http://www.cargill.com.au)

## GrainFlow

**Toll Free Grower Services Centre 1800 4 GRAIN (1800 447 246)**  
 Web: [www.grainflow.com.au](http://www.grainflow.com.au)

## GrainCorp Operations Ltd (Sydney)

Level 26, 175 Liverpool Street, Sydney NSW 2000  
 GPO Box A268, SYDNEY SOUTH NSW 1235  
 Ph: 02 9325 9100 – Fax: 02 9325 9180  
 Email: [enquiries@graincorp.com.au](mailto:enquiries@graincorp.com.au) – Web: [www.graincorp.com.au](http://www.graincorp.com.au)  
**Chairman:** Don Taylor  
**CEO:** Mark Plamquist

## Viterra Ltd

124–130 South Terrace, Adelaide  
 GPO Box 1169, ADELAIDE SA 5001  
 Ph: 08 8304 5000 – Fax: 08 8231 1249 – FreeCall: 1800 018 205  
 Email: [viterraus@viterra.com](mailto:viterraus@viterra.com) – Web: [www.viterra.com.au](http://www.viterra.com.au)

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## Australian Grain Exporters Association (AGEA)

PO Box R1826, Royal Exchange NSW 1225  
 Executive Officer: Rosemary Richards  
 Ph: 02 9427 6999 – Fax: 02 9427 6888  
 Email: [agea@agea.com.au](mailto:agea@agea.com.au)  
**President:** Chris Aucote

## Cooperative Bulk Handling Limited (WA)

Gayfer House, 30 Delhi Street, WEST PERTH WA 6005  
 GPO Box L886, PERTH WA 6842  
 Ph: 08 9237 9600 – Fax: 08 9322 3942  
 Email: [info@cbh.com.au](mailto:info@cbh.com.au) – Web: [www.cbh.com.au](http://www.cbh.com.au)  
**Chairman:** Wally Newman  
**Deputy Chairman:** Vern Dempster

## Australian Securities Exchange (ASX) Limited

20 Bridge Street, Sydney  
 PO Box H224, AUSTRALIA SQUARE NSW 1215  
 Ph: 02 9227 0197 – Fax: 02 9227 0667  
 Email: [grainfutures@asx.com.au](mailto:grainfutures@asx.com.au) – Web: [www.asx.com.au/grainfutures](http://www.asx.com.au/grainfutures)  
**Enquiries:** Kristen Hopkins, Manager, Commodities Sales

## Namoi Cotton Commodities Pty Ltd

1B Kitchener Street, TOOWOOMBA QLD 4350  
 Ph: 07 4631 6100 – Fax: 07 4631 6184  
**Grain Marketing and Logistics:** John Haigh  
 Ph: 07 4631 6118 – Mob: 0428 146 318 – Fax: 07 4631 6184  
 Email: [jhaigh@namoicotton.com.au](mailto:jhaigh@namoicotton.com.au)  
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## Grain standards/rules/contracts

### Grain Trade Australia Ltd

PO Box R1829, Royal Exchange, NSW 1225  
Level 7, 12–14 O'Connell Street, SYDNEY NSW 2000  
Ph: 02 9235 2155 – Fax: 02 9235 0194  
Email: admin@graintrade.org.au – Web: www.graintrade.org.au  
**Chief Executive Officer:** Geoff Honey

## Grower Groups

### AgVance Farming Pty Ltd

172A George Street, QUIRINDI NSW 2343  
Ph: 02 6746 2336  
Email: office@agvance.com.au – Web: www.agvance.com.au  
**Contact:** Jackie Crossing

### Birchip Cropping Group Inc. (BCG)

PO Box 85, BIRCHIP Vic 3483  
Ph: 03 5492 27873  
Email: info@bcg.org.au – Web: www.bcg.org.au  
**Chief Executive Officer:** Chris Sounness

### Conservation Agriculture & No-till Farming Association (CANFA)

PO Box 276, WELLINGTON NSW 2820  
**Chair:** Anne Williams  
Ph: 02 6825 6212 – Mob: 0428 177 225  
Email: magomadine2@bigpond.com  
**Secretary/Treasurer:** John Shepherd  
Mob: 0414 661 445 – Email: john@goodedownes.com.au  
Email: canfa@bigpond.com – Web: www.canfa.com.au

### Conservation Agriculture Australia (CAA)

**Executive Officer:** John Rochecouste  
Ph: 07 4635 0824 – Mob: 0419 790 747  
Email: rochecouste@iinet.net.au

### Corrigin Farm Improvement Group Inc. (CFG)

PO Box 2, CORRIGIN WA 6375  
**Group Coordinator:** Veronika Crouch  
Mob: 0476 046 100  
Email: cfg@cfg.asn.au – Web: www.cfg.asn.au

### Central West Farming Systems

1 Fifield Road/PO Box 171, CONDOBOLIN NSW 2877  
**Chief Executive Officer:** Di Parsons  
Ph: 02 6895 1007 – Mob: 0408 655 205 – Fax: 02 6895 2688  
Email: diana.parsons@dpi.nsw.gov.au

### Conservation Farmers Inc (CFI)

PO Box 1666, TOOWOOMBA QLD 4350  
Ph: 07 4638 5356 – Fax: 07 4632 2689  
Email: office@cfi.org.au – Web: www.cfi.org.au  
**Executive Officer:** Bernard O'Brien

### Eyre Peninsula Agricultural Research Foundation (EPARF)

SARDI, Minnipa Agricultural Centre  
Box 31, MINNIPA SA 5654  
**Project Manager:** Naomi Scholz  
Ph: 08 8680 6200 – Fax: 08 8680 5020  
Email: naomi.scholz@sa.gov.au

### Facey Group

40 Wogolin Rd, WICKEPIN WA 6370  
Ph: 08 9888 1223  
Email: admin@faceygroup.org.au – Web: www.faceygroup.org.au  
**Executive Officer:** Sarah Hyde

### FarmLink Research Limited

Temora Agricultural Innovation Centre  
PO Box 521, TEMORA NSW 2666  
361 Trundle Hall Road, TEMORA NSW 2666  
Ph: 02 6980 1333 – Mob: 0467 244 631  
**Chief Executive Officer:** Cindy Cassidy  
Email: farmlink@farmlink.com.au – Web: www.farmlink.com.au

### Grain Growers Limited

PO Box 7, NORTH RYDE NSW 1670  
Ph: 02 9888 9600 – Fax: 02 9888 5821  
Freecall 1800 620 519  
Email: enquiry@graingrowers.com.au – Web: www.graingrowers.com.au  
**Chief Executive Officer:** Alicia Garden

### Grain Orana Alliance Inc (GOA)

PO Box 2880, DUBBO NSW 2830  
Ph: 0400 066201 Email: admin@grainorana.com.au  
**Chief Executive Officer:** Maurie Street

### Grower Group Alliance

PO Box 1081, BENTLEY DC, WA, 6983  
**Project Leader:** Rebecca Wallis  
Ph: 08 6180 5759 – Mobile: 0400 681 054  
Email: rwallis@gga.org.au – Web: www.gga.org.au

### Hart Field Site Group Inc.

Hart Field Site Group Inc.  
PO Box 939, CLARE SA 5453  
Ph: 0427 423 154  
Email: admin@hartfieldsite.org.au – Web: www.hartfieldsite.org.au  
**Chairman:** Justin Wundke  
Mobile: 0429 708 772  
Email: chairperson@hartfieldsite.org.au  
**Trials Manager:** Sarah Noack  
Mobile: 0420 218 420  
Email: trials@hartfieldsite.org.au  
**Secretary:** Ms Sandy Kimber  
Email: admin@hartfieldsite.org.au  
Mobile: 0427 423 154

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### Kondinin Group

**Head Office:** 613–619 Wellington Street, Perth WA 6000  
PO Box 78, LEEDERVILLE WA 6902  
Free Ph: 1800 677 761 – Ph: 08 6316 1355 – Fax: 08 6263 9177  
Web: [www.farmingahead.com.au](http://www.farmingahead.com.au)

### Liebe Group

PO Box 340, DALWALLINU WA 6609  
Ph: 08 9661 0570 – Fax: 08 9661 0575  
**Executive Officer:** Clare Johnston  
Email: [clare@liebegroup.org.au](mailto:clare@liebegroup.org.au) – Web: [www.liebegroup.org.au](http://www.liebegroup.org.au)

### Mallee Sustainable Farming Inc

1/152 Pine Avenue, MILDURA VIC 3500  
Ph: 03 5021 9100 – Fax: 03 5022 0579  
Web: [www.msfp.org.au](http://www.msfp.org.au)  
**Executive Manager:** Stuart Putland  
Ph: 03 5021 9106, Mob: 0427 219 103  
Email: [stuart.putland@msfp.org.au](mailto:stuart.putland@msfp.org.au)

### Mackillop Farm Management Group (MFMG)

Limestone Coast, SA  
Nyroca Road, PADTHAWAY SA 5271  
**Executive Officer:** Krysteen McElroy

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Web: [www.mackillopgroup.com.au](http://www.mackillopgroup.com.au)

### Mingenew Irwin Group

PO Box 6, MINGENEW WA 6522  
Ph: 08 9928 1645 – Fax: 08 9928 1540  
**Executive Officer:** Sheila Charlesworth  
Mob: 0427 281 007 – Email: [sheila@mig.org.au](mailto:sheila@mig.org.au)  
Web: [www.mig.org.au](http://www.mig.org.au)

### Northern Grower Alliance

**Chief Executive Officer:** Richard Daniel  
Ph: 07 4639 5344 – Mobile: 0428 657 782  
Email: [richard.daniel@nga.org.au](mailto:richard.daniel@nga.org.au) – Web: [www.nga.org.au](http://www.nga.org.au)

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## Partners in Grains

**National Coordinator:** Kim Blenkiron  
Mobile: 0427 592 243  
Email: kim.blenkiron@bigpond.com – Web: [www.partnersingrain.org.au](http://www.partnersingrain.org.au)  
**National Chair:** Sharon Honner  
Mobile: 0438 322 254  
Email: sharon.honner@gmail.com

## Riverine Plains Inc

**Executive Officer:** Fiona Hart  
PO Box 214, MULWALA NSW 2647  
Ph: 03 5744 1713  
Email: [info@riverineplains.com.au](mailto:info@riverineplains.com.au) – Web: [www.riverineplains.com.au](http://www.riverineplains.com.au)

## SANTFA (South Australian No-Till Farmers Association Inc)

Web: [www.santfa.com.au](http://www.santfa.com.au)  
**Chairman:** Tom Robinson  
Mob: 0400 291 219 – Email: [admin@santfa.com.au](mailto:admin@santfa.com.au)  
PO Box 923, CLARE SA 5453  
Ph: 08 8842 4278 – Fax: 08 8842 1875

## South East Premium Wheat Growers Association (SEPWA)

PO Box 365, ESPERANCE WA 6450  
**Executive Officer:** Niki Curtis  
Ph: 08 9083 1125 – Fax: 08 9083 1100 – Mob: 0447 908 311  
Email: [eo@sepwa.org.au](mailto:eo@sepwa.org.au) – Web: [www.sepwa.org.au](http://www.sepwa.org.au)

## Southern Farming Systems Ltd

23 High Street, INVERLEIGH, VIC 3321  
Ph: 03 5265 1666 – Fax: 03 5265 1678  
Email: [office@sfs.org.au](mailto:office@sfs.org.au) – Web: [www.sfs.org.au](http://www.sfs.org.au)  
**Chief Executive Officer:** Jon Midwood  
Email: [jmidwood@sfs.org.au](mailto:jmidwood@sfs.org.au)

## SPAA Society of Precision Agriculture Australia

PO Box 3490, MILDURA VIC 3502  
Ph: 0437 422 000 – Fax: 1300 422 279  
**Executive Officer:** Nicole Dimos  
Email: [info@spaa.com.au](mailto:info@spaa.com.au) – Web: [www.spaa.com.au](http://www.spaa.com.au)

## Victorian No-Till Farmers Association (VNTFA)

PO Box 1397, HORSHAM VIC 3402  
Ph: 03 5382 0422 – Mob: 0429 820 429  
Email: [info@vicnotill.com.au](mailto:info@vicnotill.com.au) – Web: [www.vicnotill.com.au](http://www.vicnotill.com.au)

## Walgett Special One Grain (WSOG)

PO Box 496, WALGETT NSW 2832  
Ph: 02 6828 1228 – Fax: 02 6828 1249  
Email: [admin@specialonegrain.com.au](mailto:admin@specialonegrain.com.au)  
Web: [www.specialonegrain.com.au](http://www.specialonegrain.com.au)  
**Trading Manager:** Jaimee Carrigan

## WANTFA

PO Box 5, WEMBLEY WA 6014  
Ph: 0409 056 350  
Web: [www.wantfa.com.au](http://www.wantfa.com.au)  
**Executive Director:** David Minkey – Mob: 0417 999 304  
Email: [david.minkey@wantfa.com.au](mailto:david.minkey@wantfa.com.au)

## Yorke Peninsula Alkaline Soils Group

61–63 Main Street, MINLATON SA 5575  
Ph: 08 8853 2241 – Fax: 08 8853 2269  
**Project and Funding Coordinator:** Kristin McEvoy  
Mob: 0400 283 015  
Email: [projects@alkalinesoils.com.au](mailto:projects@alkalinesoils.com.au) – Web: [www.alkalinesoils.com.au](http://www.alkalinesoils.com.au)

# Government Grants

For special circumstances assistance administered by DAFF go to:

Web: [www.agriculture.gov.au/agriculture-food/drought](http://www.agriculture.gov.au/agriculture-food/drought)

GrantsLINK (for assistance with federal grants for community projects) see:

Web: [www.grantslink.gov.au](http://www.grantslink.gov.au)  
Ph: 1800 026 222  
Web: [www.business.gov.au](http://www.business.gov.au)







# Section

# 8

## Suppliers' Directory

### AGRICULTURAL CHEMICALS

**4Farmers** – [www.4farmers.com.au](http://www.4farmers.com.au)  
**Achieve** – **Crop Care**: [www.cropcare.com.au](http://www.cropcare.com.au)  
**Axial** – **Syngenta**: [www.syngenta.com](http://www.syngenta.com)  
**Barrack 720 Fungicide** – **Crop Care**: [www.cropcare.com.au](http://www.cropcare.com.au)  
**Barrack Betterstick** – **Crop Care**: [www.cropcare.com.au](http://www.cropcare.com.au)  
**Boxer** – **Syngenta**: [www.syngenta.com](http://www.syngenta.com)  
**Cognito** – **Syngenta**: [www.syngenta.com](http://www.syngenta.com)  
**Deluge** – **Victorian Chemicals**: [www.vicchem.com](http://www.vicchem.com)  
**Envoy** – **Victorian Chemicals**: [www.vicchem.com](http://www.vicchem.com)  
**Hammer** – **Crop Care**: [www.cropcare.com.au](http://www.cropcare.com.au)  
**Hasten** – **Victorian Chemicals**: [www.vicchem.com](http://www.vicchem.com)  
**Hot-Up** – **Victorian Chemicals**: [www.vicchem.com](http://www.vicchem.com)  
**Ken-Up Dry** – **Kenso**: [www.kenso.com.au](http://www.kenso.com.au)  
**Pentagon** – **Farmoz**: [www.farmoz.com.au](http://www.farmoz.com.au)  
**Precept** – **Bayer CropScience**: [www.bayercropscience.com.au](http://www.bayercropscience.com.au)  
**Rancona** – **Chemtura**: [www.chemturaagrosolutions.com.au](http://www.chemturaagrosolutions.com.au)  
**Roundup Ultra Max** – **Sinochem**: [www.roundupag.com.au](http://www.roundupag.com.au)  
**Roundup PowerMax** – **Nufarm**: [www.nufarm.com.au](http://www.nufarm.com.au)  
**Sakura** – **Bayer**: [www.sakuraherbicide.com.au](http://www.sakuraherbicide.com.au)

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