

International gene pool of plant breeders to expand

Plant breeders want to do more than breed new plants—they want to breed more plant breeders.

The Society for the Advancement of Breeding Research in Asia and Oceania (SABRAO) is gravely concerned that not enough plant breeders are being trained to face the enormous challenges in developing countries.

‘We are a dying breed,’ said QPIF principal plant breeder Phillip Banks.

‘It’s a problem right across agriculture—there are fewer students in the areas of plant breeding and genetics.

‘Plant breeders need more education and training to help strengthen international plant-breeding research both in developed and developing countries.

‘If we improve education and training in Australia there will be less need to employ plant breeders from other countries.’

To address the issue, an education, training and breeding forum was held as part of this week’s 14th Australasian Plant Breeding Conference (APBC) and 11th Congress of SABRAO in Cairns.

Representatives from the Food and Agriculture Organisation of the United Nations (FAO), Grain Research and Development Corporation (GRDC), Australian universities and international crop improvement centres took part on a panel to discuss present and future initiatives.

They discussed with breeders the need to attract more young people into plant-breeding courses and ways of emphasising their vital humanitarian role in providing food security in developing countries.

‘Global food production needs to double by 2030 just to keep pace with spiralling population growth,’ Dr Banks said.

‘Climate change, diminishing water resources, higher temperatures and more frequent extreme weather events all impact on production.

‘The increased production needs to be principally from genetic improvement because additional land area, water and fertilisers will be scarce or too expensive.

‘Biofuel crops will need to be taken into account as well as food and fibre crops.’

Peanuts

Forecast

The GVP of peanuts in 2009–10 is forecast to be \$30 million, 8% below the value for 2008–09, but 20% above the drought-affected crop of 2007–08.

Analysis

The decrease in GVP is due to an 11% fall in price, despite a 6% increase in expected yields.

History and area sown

Reflecting on the 2008–09 crop, there was a lack of rain in March 2009, which prevented chances of bumper yield. The area sown in 2009–10 is expected to remain unchanged from 2008–09 (11 000 ha), despite a fall in price.

Prices

The world supply of peanuts is expected to be higher in 2009–10 compared to the previous year, hence softening prices. Prices, although having fallen by 11% to \$780 (from \$875 in the 2008–09 June quarter), are now closer to the long-term average. This fall will not deter plantings given the absolute high level of price.

The main peanut exporters are the US, China and Argentina. The US crop has increased by 30% over the past year, hence dampening world prices. Currently, Australian production is sufficient to meet domestic demand. The current premium for Australian peanuts is expected to be short-term only because processors will switch to imported peanuts if the domestic price is significantly higher than import prices.

Yields

Yields will be variable statewide, depending on rainfall and the availability of irrigation water entitlements. These are forecast to increase slightly, by 6% in 2009–10 compared to 2008–09. Despite the area sown expected to remain unchanged in 2009–10, peanut production is expected to increase by 6% to 38 000 t. Given the forecast of El Niño, irrigators will need to use more stored water, instead of relying on rains, during the growing phase.

Peanut markets

Peanut production over the past 11 years has been relatively low in Queensland due to drier-than-average summer conditions.

Peanut production is only limited by supply factors such as rainfall levels and changes in area sown due to the relative prices of other cereal crops. This is because domestic demand for peanuts remains strong, with peanuts being used in the manufacture of snack food, confectionery and peanut oil. Often peanuts are imported (e.g., from Argentina) to counter the annual shortfall in supply.

Most peanuts in the Queensland and Australian field are used as edible nuts. Only lower quality kernels in the Australian crop are used for peanut oil. Currently 6–8% of the Australian crop is used for crushing.

Summary

An increase in peanut yields of 6% in 2009–10 is expected to increase production to 38 000 t, with the area sown unchanged at 11 000 ha. However, price has fallen by 11% to \$780/t, outweighing the production increase, causing GVP to fall by 8% to \$30 million.



Soybeans

Forecast

The GVP of soybeans in 2009–10 is forecast to be \$30 million, 14% lower than QPIF estimate for 2008–09, but double the 2007–08 estimate.

Analysis

The forecast lower GVP is due to a marginal 1% fall in production, and a significant fall (16%) in estimated price.

Area sown and prices

The area sown to soybeans in 2009–10 is estimated to be 21 810 ha, a 10% decrease on the 24 310 ha in 2008–09, and nearly triple the area sown in 2007–08 with very dry conditions at sowing time.

Even though approximately two-thirds of the Queensland crop is irrigated in the growing phase of the crop, good rainfall is required in spring to boost subsoil moisture levels for planting. The area sown in 2009–10 is expected to decrease primarily due to a fall in price (16%) to \$480/t in the 2009–10 September quarter.

As for sunflowers, the domestic price of soybeans is falling in line with a forecast reduction in the world indicator oilseed price (soybeans, cost insurance and freight (CIF) Rotterdam) from US\$417/t in 2008–09 to US\$396/t for 2009–10.

Water availability in November and December will determine the amount of soybeans that are planted. Areas being planted in Bundaberg and Childers are expected to increase. Soybean continues to be an attractive rotational crop for cane in the Bundaberg and Burgen areas because it is a quick rotation leguminous crop, making a good contribution to farm cash flow. There were approximately 3000 ha of soybeans sown on cane farms over 2007–08, which represented 40% of the Queensland crop. The area of soybeans rotated with cane is expected to increase.

About one-third of soybeans are exported. There will be a premium paid for edible soybeans, averaging over \$550/t farm gate for 2009–10. Crushing grade soybeans will be sold for less at \$500/t.

Yields

In southern Queensland the area sown is expected to decrease due to lower prices. However, as most of the state's soybean crop is expected to be grown in southern Queensland, consisting mostly of irrigated and higher-yielding varieties, average yields are expected to increase by 10% on 2008–09 levels. Approximately two-thirds of the Queensland soybean crop is expected to be planted in southern Queensland in 2009–10, with the remaining third to be planted in Central Queensland.

On balance, the expected decrease in area sown will just outweigh the increase in yields, causing a marginal 1% fall in production.

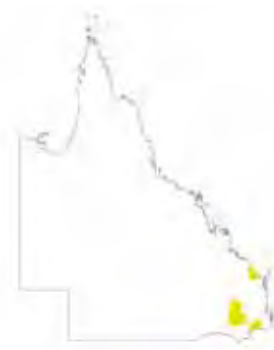
Competitor crops

Sorghum, sunflowers and peanuts are summer competitor crops with soybeans. Price is more of a determinant of the area sown for sunflowers than for soybeans, since soybeans offer legume rotation benefits for other crops such as cane.

The 2009–10 estimated price for sorghum is around \$200/t, under half the price for soybeans. As such, soybeans are expected to stay competitive with sorghum in 2009–10. Sunflowers, (returning \$600/t) and peanuts (returning \$780/t) will be more price-competitive, but peanuts require more specialist equipment and outlay than soybeans.

Soybean markets

In Australia, 80% of soybeans are used for the edible market (for soy flour, soy milk and tofu), and 20% for crushing to make oil. Significant market opportunities exist for the Japanese export



market to make tofu. Opportunities also exist for Taiwan, Korea and South-East Asia.

When soybean oil is in short supply it can be substituted, to a degree, by canola and sunflower oil. Currently, the domestic crushing market annually uses the equivalent of 30–40 000 t of seed. However, there has been a shift from demand for soybeans for crushing purposes to soybeans for edible purposes. The soybean market is still very much developing, with new opportunities currently being identified, so it is premature to estimate the size of the edible and crushing oil markets.

Like sunflowers, significant market opportunities exist for expansion of soybean production. In 2008, several private grain trading companies jointly set up soybean drying and storage facilities on the sugarcane coast around Mackay to cater for increased demand.

Summary

Area sown for soybeans is expected to decrease by 10% in 2009–10 to 21 810 ha; this is primarily due to a fall in price. The smaller area sown is estimated to just outweigh an anticipated increase in yields, causing a 1% fall in production to about 61 840 t. This, coupled with an estimated 16% fall in price to \$480/t, is expected to reduce GVP by 14% to \$30 million.

Sunflowers

Forecast

In 2009–10, Queensland's GVP of sunflower seed is forecast at \$20 million, 20% lower than 2007–08 and 2008–09 values.

Analysis

The lower GVP forecast is due to a 4% decrease in area sown, and an 18% decline in yields, reducing production by an estimated 21%. This, coupled with a marginal 3% fall in price, is estimated to reduce GVP by 20%.



Area sown

The area sown to sunflowers in 2009–10 is expected to fall by 4% to around 25 460 ha (from 26 490 ha in 2008–09).

Early planting takes place in August and September. This slight fall in area sown is due to an expected lower sunflower seed price and competition from cotton, with higher levels of irrigation water supply expected for the 2009–10 summer and relatively strong cotton prices (\$420/bale). However, with a forecast of El Niño in 2009–10, irrigation water storage levels may be lower-than-expected. Less water-demanding crops, such as sunflowers and sorghum, could therefore become more attractive.

International oilseed prices

The world indicator oilseed price (soybeans, CIF Rotterdam) is forecast to decline from US\$417/t in 2008–09 to US\$396/t in 2009–10, with a significant increase in supply expected to outweigh any increase in demand.

Soybean planting area in the US is expected to increase by 31 million ha in 2009–10 due to high prices. Production of soybeans in Brazil and Argentina is also expected to increase. Canola/rapeseed production in the EU is expected to increase to a record 19.1 million tonnes in 2009–10.

On the consumption side, continued support for mandated biodiesel use in South America, North America, and the EU is keeping biodiesel production growth strong. EU is the largest biodiesel producer and uses canola/rapeseed oil. Industrial vegetable oil consumption is estimated to increase in 2009–10 by 6% to 10 million tonnes. Human consumption vegetable oil is set to increase steadily by 3% in 2009–10 to 108 million tonnes. China is the largest consumer of edible vegetable oil (23 million tonnes in 2009–10).

Demand for oilseed meal is expected to grow, but at a slower pace in 2009–10 due to weakened

demand for livestock products. Despite relatively strong world demand for oilseeds, the higher seed supplies are expected to weigh international prices downwards, reducing Australian domestic sunflower seed prices slightly.

Domestic prices

Prices for Queensland sunflower seed are expected to fall by 3% in 2009–10 to \$600/t, from \$622/t in 2008–09, and by 25% from a high \$805/t in 2007–08. Despite expected falling world oilseed prices over 2009–10, a relatively low international stocks-to-use ratio (15% = 63 million tonnes) is expected to provide some support for international and domestic prices in the short term.

Competitor crops

Sunflowers compete directly with sorghum as a crop to grow. However, at current price levels, sunflowers will return approximately three times more per tonne than sorghum, which makes sunflowers a relatively attractive alternative crop.

The estimated sorghum price in the September 2009–10 quarter is around \$200/t. Soybeans will also be a competitive summer crop, with an estimated September 2009–10 quarter price of \$480/t.

Production

Assuming an El Niño summer for 2009–10, the extra hot and dry conditions are expected to reduce average sunflower yield by around 18%. Combining this with a small reduction in area sown, production is estimated to fall by 21% to 33 221 t from 41 998 t in 2008–09.

Sunflower seed markets

Since the early 1990s, Queensland has produced progressively less sunflower seed amid drier-than-average summers. The demand for sunflower seed is approximately 120 000 t for Australia. Companies such as Goodman Fielders are importing seed to meet the demand. Usually domestic demand outstrips supply.

Currently, Australia consumes 150 000 t of palm oil and about 100 000 t of tallow. Hence, there is a big opportunity for sunflower growers to meet the increasing demand for healthier unsaturated fat oils. Over half the oils consumed in Australia are saturated.

Currently approximately 60 000 t of sunflower seed are imported by Australia to make 25 000 t of oil annually. There has been a trend towards switching demand from polyunsaturated oils to monounsaturated sunflower oil, which requires sowing a different variety of sunflower. The poly variety is used for margarine and cooking oil, whereas the mono variety is used by the commercial sector for producing crisps, confectionaries, and other saleable food items. This represents a significant marketing opportunity for growers.

Summary

The area of sunflowers sown is expected to fall slightly, by 4% to 25 458 ha, due to a slightly lower price and more average irrigation water supplies. Also, buoyant cotton prices make sunflowers less attractive to grow in 2009–10 than in 2008–09.

Lower-than-average rainfall, due to expected El Niño conditions in 2009–10, is expected to reduce yields by 18%. Hence, production is estimated to fall by 21% to 33 221 t. This, coupled with a marginally (3%) lower price of \$600/t, is estimated to reduce GVP by 20%. Despite the relative drought tolerance of sorghum, the 200% price premium of sunflowers over sorghum, along with strong domestic demand for sunflower oil, will likely maintain sunflowers as a competitive crop in 2009–10.

WINTER CEREAL GRAINS

Wheat

Forecast

The GVP of wheat in 2009–10 is forecast at \$320 million, which is 34% lower than the bumper harvest of 2008–09 and 9% lower than the revised estimate for 2007–08.

Analysis

The lower expected GVP is due to a 6% fall in production and a 9% decline in prices, despite a 3% increase in area sown.

Competing crop prices

Average prices for Australian premium white (APW) wheat are estimated to have fallen by 9% (to \$252/t) in 2009–10 following a softening in international grains prices since the record highs experienced in 2007–08 (\$383/t). Despite this decline, wheat prices are still relatively high by historical standards.

The price of barley per tonne has fallen almost as much as wheat, by 34% (to \$216/t) in 2009–10. The price of sorghum, which competes with wheat as a crop to plant has fallen by less—25% (to \$199/t) in 2009–10.

Cotton also competes with wheat as a crop to grow. With cotton prices per bale increasing from \$390/bale in June 2008 quarter to \$420/bale in June 2009 quarter, there may have been some wheat areas on cotton farms set aside for fallow over the 2009 winter in preparation for the 2009–10 cotton crop.

Area sown

Despite this price competition from other crops, the wheat area sown in Queensland is expected to increase by 3% to 938 860 ha. This may be attributed to the high yields experienced in 2008–09, and the current sound price of wheat.

The price of sorghum, although having fallen less than wheat since 2007–08, is still low. Increased areas of wheat may have been planted in 2009 in preference to fallowing land for sorghum in 2009–10. However, wheat, which demands less water and has lower farm overheads than cotton, has continued to be attractive crop given its quick turnover.

Wheat yields

Current soil water conditions and the seasonal rainfall outlook indicate a reduced chance of an above-median wheat yield during the 2009 season for most of Queensland.

Winter grain planting in Central Queensland (about 15% of Queensland wheat) was patchy due to poor rainfall earlier in 2009. The unseasonably hot and dry weather in July and August is causing Central Queensland crops to fail.

In southern Queensland, especially in the Darling Downs, the start of the growing season was promising with good rainfall in May, and sound growing conditions prevailed until around mid-August. The Darling Downs, as at the end of August, is still maintaining its crop yields; however, much of the southern Queensland grain belt will likely suffer if there is no follow-up rain in spring.

Subsoil moisture levels have been depleted in Central Queensland and southern Queensland, with a reduced chance (30–40%) of exceeding the long-term median yield. In Central Queensland, yields are expected to fall by over 50% from 2 t/ha to 0.8 t/ha. Closer to average yields are expected in southern Queensland because of the better start to the wheat cropping season, with an average to slightly above-average chance (40–70%) of exceeding the long-term median wheat yield.

There has been stripe rust in some areas (e.g. St George), which has arrived 2–3 weeks earlier



than usual this year. This could reduce grain yields and quality by reducing grain size. Smaller wheat grain returns a lower price because it is not as effectively crushed by milling machines as larger grain.

The Roma area has produced quite a good crop in 2009, but still has lower yields than other areas (such as the Northern Downs). More of the Queensland crop has been planted in Roma this year than other areas. This has the potential to shift the average state crop yield downwards.

Transporting grain to port on time could jeopardise export contracts this year after the grain transport crisis in 2008 (when the shortage of grain trains put increased demand on road transport).

Price outlook

In 2009–10 world wheat production is forecast to fall by 40 million tonnes. This is due to a fall in area sown in response to lower world prices and high farm input costs.

World wheat consumption is expected to stay constant in 2009–10 at 641 million tonnes. Wheat for human consumption is expected to rise, but is likely to be offset by lower animal feed demand as world recession reduces demand for meat. Overall consumption will be stable, maintaining some support for prices.⁸

The average world indicator price (US hard red winter) is forecast to decline by 4%, mainly because of increased stocks. High-quality milling wheat stocks by five major exporters are estimated to increase by 3 million tonnes to 49 million tonnes in 2009–10. Also pressure on international wheat prices is also the prospect of larger US output and good US weather.

Because domestic milling-grade wheat price generally follows export prices, this may have a dampening effect on domestic milling prices as well as domestic feed grain prices. For the beginning of the 2008–09 season the world indicator price was US\$300/t, which then fell to US\$250/t in early 2009 because global production increased to a record 687 million tonnes for 2008–09.

Due to higher Australian production, an appreciation of the Australian dollar, and lower world prices, Queensland APW prices are expected to decrease to \$252/t in the 2009–10 September quarter, 9% lower than in the June 2009–10 quarter and 34% lower than in the June 2007–08 quarter.

Despite the falling price, continued increasing demand for US corn-based ethanol will likely help maintain relatively buoyant prices of wheat and other cereal grains on the global market.

Summary

Despite an estimated 3% increase in the area sown to wheat in Queensland (to 938 860 ha), wheat yields are expected to fall by 31% due to very dry and hot conditions in July and August, thus reducing grain-fill.

Production is therefore expected to fall by 29% in 2009–10 to 1.26 million tonnes, from the record 1.76 million tonnes in 2008–09. This, combined with an estimated price fall of 9% in 2009–10 from the 2008–09 level, is expected to reduce Queensland wheat GVP by 34% in 2009–10 to \$320 million. If average rainfall is not received over the spring months in 2009, average yields, and hence GVP, could fall further.

Wheat shows promise in northern and coastal Queensland

Wheat and barley trials are producing some remarkable results in northern and coastal Queensland, proving that production is feasible for producers in those areas looking at profitable alternatives.

While the trials are showing early success, more studies are needed to identify varieties that resist a range of diseases and how they are best managed in northern and coastal soils and according to climate conditions.

QPIF principal plant breeder Dr Phillip Banks said crop cycle and yield trials were well underway.

‘A few farmers with the Aussie pioneering spirit are giving wheat and barley a serious try,’ Dr Banks said. ‘They already have quite remarkable crops.’

‘Climate-change models forecast adverse impacts on traditional wheat production areas such as southern Australia and there is a growing scarcity of global wheat stocks.

‘In fact, global food production needs to be double current production by 2030 just to keep pace with spiralling population growth.’

Dr Banks discussed the latest findings from the trials at the 14th Australasian Plant Breeding Conference (APBC) and 11th Congress of the Society for the Advancement of Breeding Research in Asia and Oceania (SABRAO) in Cairns, August 10–14.

‘Plant breeding experts from 30 countries attending the APBC/SABRAO conference will discuss how to facilitate this massive increase in food production,’ Dr Banks said.

‘One thing we can do in Australia is accelerate growth in wheat and barley production in non-traditional areas.’

Yield trials are taking place on the Atherton Tableland, Pentland (100 km west of Charters Towers), near Richmond, Longreach, Home Hill, Mackay and Bundaberg.

The yield trial at Atherton, with 675 varieties of wheat and barley, will feature at one of the conference field tours on Friday.

‘It makes sense to explore the possibilities of expansion of production into the northern tropics,’ Dr Banks said.

‘In the past, leaf diseases largely thwarted the development of wheat and barley industries on coastal Queensland.’

‘Production was limited in the northern inland because of unsuitable varieties and cultivation systems incompatible with the soil structure, as well as lack of transport and marketing infrastructure.’

Dr Banks said advances in plant-breeding research internationally had delivered new wheat varieties that resisted leaf diseases (such as stem rust, leaf rust, yellow spot and spot blotch). New barley varieties were showing greater resistance to spot blotch.

‘Transport infrastructure has since improved thanks to mining activities in north Queensland,’ Dr Banks said.

‘Increasing the feasibility of northern production has been the development of cultivation systems such as controlled traffic tillage, which allows winter crops to take advantage of stored soil moisture from summer rainfall.

‘The requirement for cold weather had been bred out of many wheat and barley varieties, so they can be grown in areas that don’t have a cold climate.

‘Significantly increased production can add to profitability of the state’s wheat industry, which is already worth \$600 million at farm gate values and about \$3 billion further down the value chain.’

Barley

Forecast

The GVP for barley in 2009–10 is forecast at \$33 million, 6% less than the estimate for 2008–09 and 25% less than the revised estimate for 2007–08.

Analysis

The lower GVP is due to a forecast 10% decline in production—a result of an expected fall in yields by 14%. This is despite an estimated 5% increase in area sown and a 7% increase in price.



Area sown and price

In 2009–10, the area sown to barley in Queensland is expected to be around 80 920 ha, only 5% higher compared to the 2008–09 estimate. This is primarily due to favourable subsoil moisture storage levels in autumn 2009—a result of good 2008–09 summer rainfall. In April 2009, average to above-average rainfall was recorded for almost the entire Queensland cropping area.

Price signals for barley have been flatter than for wheat. In some areas in 2009 there was a swing away from barley to wheat, which may have been price-driven. There has also been an increase in fallowed areas in preparation for summer crops and some of these have been at the expense of barley.

World coarse grain indicator price (US corn, free on board Gulf) is set to increase in 2009–10, largely due to strong demand for corn used to produce ethanol, from US\$177 to US\$182/t in 2009–10. Despite this, Australian feed barley prices are expected to fall slightly due to an increase in barley supply from other states. Barley bids have been capped by an increase in feed wheat availability (old season wheat) in northern regions.

Beef feedlot demand has been quite low due to good pasture growth conditions in Queensland over 2009, except for very dry and hot conditions over July and August 2009. Together with high sorghum supplies from the 2007–08 and 2008–09 seasons, this has dampened feed grain prices. As at August 2009, the price is \$202/t for F1 (Feed 1 quality standard). Malting barley commands a premium price of \$240/t.

In the first week of August 2009, the price of barley increased by \$10/t, in line with sorghum prices, underpinned by increased demand for ethanol. Current dry conditions in July and August 2009 are increasing demand for feed grains domestically; as sorghum prices increase, so too will barley prices.

Competition from wheat

All Queensland barley is sold domestically, and around 90% of barley is for feed grain. Feedlot producers currently prefer wheat to barley because of its availability and high energy content.

Growers on average still continue to favour wheat as a crop to grow over barley because of comparatively higher price and better agronomic performance. However, it must be noted that barley as a winter crop will likely remain competitive with higher valued chickpeas on an agronomic basis. Barley is a far denser crop than chickpeas, requiring less chemical treatment, which significantly reduces weed control costs.

New demand for malting barley

The Barrett Burston Malting Company (BBMC) is building an \$80 million malting plant at Pinkenba in Brisbane's north-east. It is Queensland's first malting plant in over 40 years and will be the only one exporting malt into South-East Asian markets. The new Pinkenba plant will produce 86 000 t of malt a year from 100 000 t of barley, and will give barley farmers an opportunity to sell increased volumes of malting barley, which commands a \$40/tonne premium above feed barley. This will also encourage the sowing of new malting varieties. However, this is a specifically accredited process, and it may take several years for the malting industry to approve a farmer.

Yields

Barley has been planted this year on the Southern and Eastern Downs, rather than on the Western Downs/Maranoa area, which is higher-yielding than the Goondiwindi area.

There has not been much leaf rust this year; cool temperatures in June have kept the rust at bay. Despite these positive yield influences, barley yields are forecast to fall by up to 14% in 2009–10 compared to 2008–09, due to the end hot and dry conditions in winter.

Summary

As a result of lower-than-expected yields, barley production is expected to fall by 10% to 155 360 t in 2009–10 (from 171 670 t in 2008–09), despite a small increase in area sown to 80 920 ha. The fall in production is estimated to outweigh a 7% increase in price to \$216/t, causing GVP to fall by 6% to around \$33 million.

SUMMER CEREAL GRAINS

Grain sorghum

Forecast

GVP of grain sorghum is forecast to be \$245 million in 2009–10, which is 6% lower than the value for 2008–09 and 62% lower than the revised estimate for 2007–08.

Analysis

The slight decrease in GVP for 2009–10 is due to an expected 0.5% smaller area sown, a 4% decline in yield per hectare, causing a decrease in production, along with an estimated 2% fall in price.



Prices, water availability and area sown

Two of the major determinants of area sown are expected price in relation to other competing summer crops and rainfall. Sunflowers will remain a competitive summer crop, as will cotton. The rainfall in spring will also determine what gets planted, not just expected price.

Winter crops are not very profitable on the Darling Downs, which means that some areas may have been left for fallow over the 2009 winter in preparation for the 2009–10 summer sorghum crop. Dry and hot conditions in July and August 2009 are impacting on potential sorghum planting. Most sorghum sown in 2009–10 will be on land that has been fallowed over winter.

However, the soil moisture profiles maybe inadequate, for sorghum planting if the dry spell continues. The first early planting of sorghum happens in late September to early December. The second planting happens in January/February. On the Darling Downs an early crop is preferred to avoid high summer temperatures and severe summer storms, and to encourage flowering with the cooler temperatures.

The price of sorghum is estimated to fall by 2% in 2009–10 to \$199/t (from \$203/t in 2008–09). There are still significant quantities of old season sorghum in storage, which will add to downward price pressure. Sorghum prices have been falling partly in response to other feed grains (such as wheat and barley) remaining competitive because of their relatively high protein and energy contents, and digestibility. Sorghum usually needs to be steam-flaked before being sold as feed, adding more costs to growers. Despite the higher price of wheat and other summer crops, sorghum is still likely to be a popular crop to grow, since it is a relatively drought-resistant, low-outlay and high-turnover crop.

Water availability will also determine the degree of switching from sorghum to cotton. If rainfall levels are average and above then cotton will be competitive with sorghum as a crop to plant. In Central Queensland there is likely to be a switch away from sorghum to cotton due to expected full water allocations.

The sorghum crop in 2009–10 is likely to be planted more on the traditional inner Darling Downs country, which is drier than the cotton country. This will reduce the average state yield of sorghum, since some of the higher-yielding country will be planted to cotton.

Internationally, corn area planted in the US is expected to fall by 1% in 2009–10 due to an increase in soybeans planted. World coarse grain consumption is set to increase by 14 million tonnes to 1.1 billion tonnes in 2009–10, driven by strong demand for corn in ethanol production. This is expected to help maintain prices for other grains (such as wheat and barley) as well as sorghum, since little extra land is likely to be freed up to increase production of these grains.

Summary

In summary, in 2009–10 some switching is expected from sowing sorghum to other summer crops. Combining this with lower-than-expected yields is likely to reduce production by 4.4% to 1.23 million tonnes. Together with an expected price decline of 2% to \$199/t, this is estimated to reduce GVP by around 6%.

Wild crop relatives unlock potential for commercial crops

Everyone has a story about ‘wild relatives’ and the problems they cause, but in the plant world these wild plants may hold the key to boosting the nutritional content of common commercial crops in Australia.

Plant breeders from around the world gathered in Cairns for the 14th Australasian Plant Breeding Conference (APBC) and 11th Congress of the Society for the Advancement of Breeding Research in Asia and Oceania (SABRAO).

They’re learning about a range of scientific breakthroughs, including a QPIF project aimed at crossing wild native-sorghum grasses with similar commercial crops.

QPIF research scientist Dr Sally Dillon, who is spearheading the project, said the aim was to produce sorghum with higher protein and great resistance to climate conditions as well as pests and diseases.

‘Australia has 17 native sorghums that don’t look anything like commercial sorghum,’ Dr Dillon said.

‘They are weedy-looking and their seeds shatter easily making them unsuitable for commercial production.

‘But on the plus side, these lines grow in poor soil across northern Australia, require little nutrition, tolerate salinity and are extremely drought-resistant.

‘They contain more readily available starch, which can improve both livestock and human nutrition.

‘We are looking at the plant’s DNA to single out the genes that provide the traits we want in commercial crops, such as higher yield, higher protein, drought-resistance and resistance to pests and diseases.

‘By identifying these genes in these resilient native plants and crossing them with commercial cultivars we hope to produce the desirable traits.

‘These improved traits will improve the productivity, and hence profitability of sorghum growers around the world.

‘Sorghum is a staple food in some African countries, so there is potential for this genetic work to benefit millions of people.’

Dr Dillon was previously involved in crossing wild native-pigeon pea species with commercial cultivars as part of a project aimed at improving staple foods in India, Africa, the Caribbean and South-East Asia.

Maize

Forecast

The GVP of maize for 2009–10 is forecast at \$45 million, 14% lower than 2008–09 and 25% lower than 2007–08.

Analysis

The lower GVP of maize in 2009–10 is expected due to a 4% decline in area sown and production, coupled with a 7% fall in estimated price.



Area sown and prices

Average irrigation water entitlements are likely to be available due to high summer rainfall in 2008–09, which will have a positive effect on area sown.

Maize prices, on the other hand, have been steadily falling. Currently, the price of maize is estimated at \$234/t, 7% lower than the price for the June 2008–09 quarter. Low price of maize will be likely to reduce plantings. However, the price of sorghum, a major summer competitor crop, will also determine maize area sown. The price premium of maize over sorghum has fallen from 27% in the June 2007–08 quarter to 18%.

Despite the current higher price of maize, growers will be considering the greater water demands (and cost) of maize compared to sorghum, the relative drought-resistance of sorghum and the reduced price premium of maize over sorghum when deciding maize plantings over 2009–10. A decline of 4% in maize area (to 35 550 ha) is forecast for 2009–10, from 36 880 ha in 2008–09.

Yields

Due to irrigation water availability in 2009–10 expected to be closer to average, yields are expected to remain unchanged from 2008–09 levels. This combined with a 4% decline in area sown in 2009–10 is estimated to reduce production by a corresponding 4% to 197 120 t from the 2008–09 level.

Maize market and price outlook

The world coarse grains indicator price has increased by 3% to US\$182/t, from the 2008–09 level, as driven by ethanol demand. Of the 197 120 t of Queensland maize expected for 2009–10, around 40% will be sold as waxy corn and grit for human consumption. However, this is a limited market and is currently filled by domestically produced maize. The remainder will be sold domestically as feed grain.

There is a lack of available markets for maize, as a domestic feed grain and for export. However, the presence of a domestic grit maize market, continued steady demand for all feed grains by end-users in eastern Australia, and continuing strong demand for ethanol internationally are expected to support maize price. Counter to this, increased large supplies of old season sorghum and feed wheat, and increased barley supplies available in other states, will be likely to exert some pressure on domestic maize prices in 2009–10.

The price of maize will be likely to fall in line with domestic feed grain prices. The estimated price of feed maize (\$220/t) will be likely to fall by more than higher valued grit maize (\$280/t).

Summary

An expected decline in area sown and production by 4% in 2009–10, to 35 550 ha and 197 120 t, respectively, coupled with a forecast price fall of 7% to \$234/t, is estimated to reduce Queensland maize GVP by 14% to \$45 million.

Fisheries

In 2009–10, the total GVP of Queensland's fisheries is forecast at \$437 million. This includes a forecast of \$275 million for commercial fishing (1% increase on 2008–09) and \$89 million for aquaculture (5% increase from 2008–09). Recreational fishing is also included in this year's forecast with an estimated commercial value equivalent of \$73 million.

Australian seafood imports and exports

In 2007–08, Australia exported 45 500 t of seafood with a total value of \$1.07 billion. Fish contributed 23 500 t and \$325 million of exports, while crustaceans and molluscs provided 22 000 t and \$741 million of the total exported product.

Queensland accounted for 4700 t (or 16%) of the total fish exports and \$75.5 million (or 23%) of the total fish value. For crustaceans and molluscs, Queensland provided 4700 t (or 21%) of the total quantity and \$85.3 million (or 12%) of the total value.

Compared to 2006–07 export figures, there was a decrease of about 8% in quantity and value in 2007–08.

In 2007–08, Australia imported about 198 500 t of seafood product, at a total cost of \$1132 million. Fish imports were responsible for 137 000 t and \$715 million of the total cost, while 61 400 t and \$417 million of the overall cost were for crustacean and mollusc product.

In 2007–08, Australia was a net importer of seafood. It imported 154 500 t of seafood more than it exported, at an overall net cost of \$66.8 million. In comparison with 2006–07, imports decreased by 0.07% while total imported value decreased by 4.4% and the overall net cost increased by \$40.3 million from \$26.5 million.

Total net apparent consumption of seafood products is about 390 000 t, with Australian-produced seafood providing about half this consumption.

Given that apparent seafood consumption continues at about 17 kg/head, Australia will continue to be a net importer of seafood in the foreseeable future.

Likely impacts (overall)

A higher Australian dollar will mitigate against price increases for product exported and at the same time reduce the price for imported product, resulting in the potential to hold down or reduce the price being offered for Queensland harvested product. It also forces the processors (and fishers) to present Australian finfish in a convenient fillet form in order to compete with overseas product. The effects of overseas products in the different harvest sectors vary, depending on the volume of imports for competing species.

Fuel prices are likely to reduce in relative terms as the Australian dollar moves towards parity with the US dollar, which may allow a small reduction in the price of fuel to the industry.

Aquaculture production worldwide continues to increase, with the potential for product to be imported into Australia.

As part of the process of implementing the Moreton Bay Marine Park, 118 licences used to harvest product from this area were purchased in February 2009. The effects on production from this area are yet to be determined as the operators remaining adjust to the changes implemented as part of this marine park.

An extensive program of removing fishing symbols from commercial fishing operations (which provide the right to use commercial fishing gear to harvest fish for sale), based on their limited or nil use, has been undertaken recently by QPIF. This has caused some angst within parts of the commercial industry. Some fishers see symbol removal as reducing their chances to diversify when necessary. Consequently, confidence in the commercial sector continues to wane.

The wild-caught sector of Queensland fisheries includes:

- commercial (Queensland-managed and managed by other agencies but in Queensland waters)
- recreational fishing and its subset of charter fishing.

Commercial sector

In 2009–10 the forecast GVP of the commercial sector and the harvest level is at \$275 million, about the same as the 2008–09 year, and 2% lower than the estimated GVP for 2007–08. This is in spite of the declining terms of trade for fishing businesses, difficult access arrangements in a range of fisheries and a strong Australian dollar, which reduces both import prices of seafood and fuel prices.

Queensland-managed fisheries are forecast to have a GVP of about \$196 million in 2009–10, slightly higher than the 2008–09 estimate but 3% lower than the 2007–08 (see Table 5). The GVP of Commonwealth-managed fisheries in Queensland waters is forecast at \$79 million.

The total value of the commercial fishing value chain (including input suppliers, processors, wholesale and retail marketing) is estimated to be around \$460 million. The strong Australian dollar creates opportunities for competitors to develop niche live fish markets overseas and import finfish into Australia. This competition reduces prices offered to domestic fishers and forces processors to present the Australian product in a convenient fillet form in order to compete with overseas product.

Change in method of reporting

Reporting GVP and harvest has been changed to align with the categories used in the Australian fisheries statistics published by ABARE, which includes crustaceans, molluscs and finfish. The method reports by major species groups. Underlying this analysis, however, are other factors such as fishing method and the number of boats undertaking fishing activity.

Table 5. GVP of commercial fisheries by categories, 2007–08 to 2009–10

GVP (\$m)	2007–08			2008–09			2009–10		
	Cwlth in Qld	State managed	Total wild-caught	Cwlth in Qld	State-managed	Total wild-caught	Cwlth in Qld	State-managed	Total wild-caught
Tuna	15		15	15		15	14		14
Salmonids	0		0	0		0	0		0
Other	11	83	94	10	78	88	10	80	90
Total finfish	26	83	109	25	78	103	24	80	104
Prawns	44	58	102	45	66	111	45	66	111
Rock lobster	9	11	20	10	6	16	10	6	16
Crab	0	29	29	0	25	25	0	25	25
Other	0	10	10	0	9	9	0	9	9
Total crustaceans	53	108	161	55	106	161	55	106	161
Abalone	0		0	0		0	0		0
Scallops	0	10	10	0	8	8	0	9	9
Oysters	0		0	0		0	0		0
Squid	0	0	0	0	1	1	0	1	1
Other	0		0	0		0	0		0
Total molluscs	0	10	10	0	9	9	0	10	10
Total value	79	201	280	80	193	273	79	196	275

Table 6. Volume of production of commercial fisheries by categories, 2007–08 to 2009–10

Quantity (t)	2007–08			2008–09			2009–10		
	Cwlth in Qld	State managed	Total wild-caught	Cwlth in Qld	State-managed	Total wild-caught	Cwlth in Qld	State-managed	Total wild-caught
Tuna	2900		2900	3500		3500	3500		3500
Salmonids	0		0			0			0
Other	2500	11 000	13 500	2000	9700	11 700	2000	11 100	13 100
Total fish	5400	11 000	16 400	5500	9700	15 200	5500	11 100	16 600
Prawns	4700	5000	9700	4500	5600	10 100	4500	5500	10 000
Rock lobster	400	300	700	400	200	600	400	250	650
Crab	0	3300	3300	0	2900	2900	0	3000	3000
Other	0	500	500	0	450	450	0	450	450
Total crustaceans	5100	9100	14 200	4900	9150	14 050	4900	9200	14 100
Abalone	0		0			0			0
Scallops	0	700	700		600	600		700	700
Oysters	0		0			0			0
Squid	0	100	100		150	150		150	150
Other	0		0			0			0
Total molluscs	0	800	800	0	750	750	0	850	850
Total quantity	10 500	20 900	31 400	10 400	19 600	30 000	10 400	21 150	31 550

The following GVP forecasts are for Queensland-managed fisheries (see Table 5 for details).

Crustaceans

Prawn and bugs

GVP of prawn and bugs in 2009–10 is forecast to be about \$66 million, assuming that prices being offered to fishers remain about the same. Prices being offered for the various prawn species have not changed in the last few years, and for some species prices have declined slightly. A good prawn harvest in the Gulf of Carpentaria, as well as the base price provided by prawn imports into Australia, and lower returns for exports due to higher Australian dollar has limited the potential for an increase in prawn prices being offered to fishers.

Prawns and bugs are harvested by the Queensland-managed trawl fishery, which stretches from Cape York to the New South Wales border. Prawns make up about 80% of the trawl harvest by weight and GVP. The prawn harvest is estimated at 5000 t in 2007–08 with a GVP of about \$58 million. The otter trawl sector harvests about 5100 t and the beam trawlers harvest about 400 t. Bug harvest, as incidental catch to both the prawn and the scallop targeted catch, is expected to be about 450 t with a GVP of about \$9 million.

It is estimated that prawn harvest will stabilise at around 5500 t over the next few years. This is because boat numbers appear to have stabilised at about 300 active otter trawlers and 80 beam trawlers. Mean days fished per boat appear to have stabilised at about 100 days, while the mean daily prawn catch rate appears to be increasing. King prawn currently provides about 55% of the otter trawl prawn harvest; tiger prawn harvest provides about 25% of the total prawn harvest.

Crabs

The GVP for the crab fisheries is expected to be about \$25 million in 2009–10 as crab prices appear unlikely to increase and levels of harvest are expected to be maintained at the 2008–09 level.

The GVP of the commercial harvest of mud crab and blue swimmer crab harvest in 2008–09 is expected to decline by about 12% compared to 2007–08. This is mainly due to an expected

reduction in harvest due to a decline in the number of days fishing for these crabs (the price from the previous year is expected to be maintained). Mean daily catch per boat is expected remained about the same.

The spanner crab fishery is a quota-managed fishery. It is expected to fill about 1400 t of the quota in 2008–09, slightly less than the previous year. Most of Queensland’s spanner crabs are exported. This fishery produces within the available quota, driven by export prices. The appreciation of the Australian dollar is expected to only have a marginal impact on the price being offered to fishers.

Tropical rock lobster (TRL)

This dive fishery operates mainly on the eastern side of Cape York and does not include the Torres Strait. It typically produces between 200 t and 250 t of TRL with a GVP of about \$6 million. Export prices drive the harvest, especially the price offered for live TRL.

The appreciation of the Australian dollar will have a small effect on this type of fishery and its GVP in 2009–10 is expected to remain at about the same level.

Molluscs

Even with some changes in the management of the scallop fishery it is anticipated that the GVP will be about \$9 million in 2009–10, about \$1 million higher than 2008–09. Harvest is expected to be about 700 t of scallop meat.

Scallop harvest in 2008–09 is forecast to be about 600 t with a GVP of about \$8 million. As with the other sectors, scallop imports into Australia are holding down the price being offered to fishers. The high Australian dollar has also affected scallop export prices.

Finfish

Line-caught

There are three parts to the line fishery managed by Queensland:

- the Gulf
- Great Barrier Reef Marine Park area (reef line fishery)
- southern area (rocky reef fishery).

The line fisheries of Queensland have an estimated GVP for 2008–09 of about \$47 million with a harvest of about 3200 t. The reef line fishery provided about 90% of the GVP and 75% of the harvest weight. Compared to the other sectors, the reef line harvest is expected to increase from its present level to about 3300 t harvest, with an estimated GVP of about \$48 million.

The coral trout quota is expected to be filled in 2008–09 and in 2009–10. Most of Queensland’s coral trout harvest is exported, with live fish trade the main focus. Compared with other reef species, coral trout are a very high value fish (especially live fish), with fishers being paid 7–9 times the price of other species harvested. The current level of the Australian dollar compared to other currencies is likely to decrease the price offered to fishers.

Catches of other reef species, such as Spanish mackerel, red-throat emperor and fish grouped in the ‘other reef species’ category, are more seriously affected by economic and other factors currently operating in the reef line sector. These species are almost completely targeted for the domestic market.

Given the prices currently being offered, the likelihood of filling these quotas in 2008–09 and 2009–10 is low. Typically, the level of harvest is about one-third of the available quota. Fishers report that fish are available for harvest whenever prices improve.

Net-caught species

In 2008–09, production from the Queensland net fishery is expected to be about 5800 t with a forecast GVP of \$27 million—a decrease from the 2007–08 estimated GVP of \$33 million.

It is anticipated that the harvest and GVP from the net fishery, especially from the east coast, will decline further in 2009–10 with the introduction of a competitive shark quota of 600 t. The follow-on effects into netting operations are difficult to define at this stage. The main reason for the decline in harvest from this sector is a 17% reduction in the number of days fished compared to the previous year. The number of boats remained about the same and mean daily harvest rate appeared relatively stable.

As most of Queensland's net-caught product is destined for the local and wider Australian market, imports of finfish limit the price offered to fishers for locally caught fish.

Mullet harvest has declined by about one-third. The primary cause is that the price being offered for the winter fish with their roe has collapsed—other countries now supply the markets at a lower price.

As stated previously, the reduction in harvest of net-caught species cannot be interpreted as a decline in fish stocks. Recent studies indicate that, from a biological perspective, most of the species harvested by net fishers are in robust health and are being harvested at a sustainable level.

Recreational fishing

Using 2005 RFISH survey database it is estimated that the recreational finfish harvest is between 10 500 t and 13 000 t each year. The recreational crab harvest ranges between 700 t and 900 t each year—most of the harvest is mud crab.

During this year, commercial harvest of finfish (net and line) was typically about 10 000 t and about 1200 t of blue swimmer and mud crab.

Placing a value on the recreational fishery presents interesting dilemmas. Using the approach that the recreational fish harvest has a commercial value equivalent; finfish has a notional GVP of between \$57 million and \$71 million. The commercial value equivalent for crabs is about \$9 million. The estimated GVP (commercial equivalent) of recreational fishing therefore is expected to be about \$73 million in 2009–10.

The GVP of the commercial finfish is about \$74 million and the crab (not spanner) of about \$22 million.

However, the total value of recreational fishing is larger than the commercial equivalent value of fish caught. This is because recreational fishing comprises, in simple terms, a harvest component, a recreational component and a wilderness component. Expenditure figures are often taken as an indicator of this total value. Such expenditure data from the recreational fishing sector are difficult to obtain and it is difficult to attribute them to individual components.

The national fisheries survey estimated that the recreational expenditure attributable to the fishing experience and harvest for Queensland residents was about \$320 million in 2000. In 2009 dollars, and assuming the same economic conditions apply (which is unlikely), the recreational expenditure is anticipated to be within the range of \$350 million to \$420 million.

Constituting a segment within recreational fishing, there are about 250 boats reporting charter boat activity in Queensland waters, undertaking between 13 500 and 14 000 days fishing each year. Total harvest is estimated to be 580 t from this sector. Expenditure on recreational fishing activity from these charter boats is estimated to be about \$16 million.

Aquaculture

Forecast

The GVP of aquaculture is forecast at \$89 million in 2009–10, 5% higher than 2008–09 and 11% higher than 2007–08.

Discussion

Aquaculture figures for 2008–09 have not been collected at this stage but estimates at 30 June for 2008–09 were \$87 million, which is 9% higher than the 2007–08 production. This large increase was due to increasing marine prawn production by 30% from 2900 t to 3900 t.

Researchers claw award for longer-lasting mud crabs

A team of Queensland seafood researchers has won a major industry award for increasing the survival rate of mud crabs through the supply chain.

QPIF seafood team and project partner, the Northern Territory Crab Fishermen's Association, won the Seafood Research and Development Award at the recent Northern Territory Seafood Industry Awards.

QPIF principal technician John Mayze said the project sought to understand which handling steps along the supply chain imposed the greatest stress to mud crabs.

'With this information, alternative handling practices were developed to minimise stresses experienced and improve survival rates,' Mr Mayze said.

'With a 10% loss to the Northern Territory mud-crab fishery representing 60–100 t, or \$2 million per year, it's evident how important this project is in maximising revenue to the industry.'

Mr Mayze said the findings were equally applicable to the Queensland mud crab industry, with a commercial harvest in 2008 of 906 t and a GVP of \$14.5 million.

'Feedback from harvesters, wholesalers and the retail sector has indicated increased survival and improved vigour of mud crabs when the alternative handling methods had been employed,' Mr Mayze said.

'These improved methods are about lowering the stress level of the crabs, including re-immersing them for a period, then holding them in a quiet, undisturbed and moist environment.'

Mr Mayze said industry trials had demonstrated a 10% reduction in crab mortalities in the processing sector and a further 50% reduction at retail level.

'This also means mud crabs reach the consumers in premium quality, raising public confidence and perception of the commercial operators and resource sustainability,' Mr Mayze said.

'The wheels are in motion to provide all industry sectors, from harvest to plate, with the best practice protocols and assist with uptake to ensure the Q150 iconic mud crab is always at its premium.'

Sponsored by the Fisheries Research and Development Corporation, the award was given to the project due to its clear outcomes that would have significant impacts on profitability for the Northern Territory industry.

Mr Mayze said the Northern Territory Crab Fishermen's Association and QPIF worked closely over the last five years to obtain these desired outcomes as well as a major recommendation.

'The major recommendation from this research was the inclusion of a recovery step within the distribution chain for live mud crab,' Mr Mayze said.

'It is important to include a purge step of two to three hours where the crabs are returned to aerated water to allow excretion of accumulated ammonia caused by stress.'

'Of major importance for industry-wide uptake was the newly discovered information that if sea water was not available, town water could be used in this step. Importantly, no discernable difference in flavour was detected in town-water-revived crabs.'

The QPIF Innovative Food Technology Seafood Team provides new and enhanced value-adding opportunities, as well as post-harvest technical support, to Australian aquaculture and seafood industries.

It has specific experience in stress factors and mortalities of crabs and lobsters, and has conducted research for projects on extending the survival of spanner crabs, lobsters and prawns.

For more information about Queensland seafood research, call QPIF on 13 25 23 or visit www.dpi.qld.gov.au

Forestry

Forecast

The forest-growing sector of the Queensland forest industry in 2009–10 is forecast at \$170 million, a 5% increase on QPIF's final estimate of \$162 million for 2008–09. This translates into a GVP of \$351 million for the first-stage processing sector. The total GVP of the Queensland forest industry (including forest growing and first-stage processing sectors) is therefore forecast to contribute \$521 million to the Queensland economy in 2009–10.

The moderate forecast growth for the Queensland forest industry in 2009–10 follows the very poor market conditions experienced in 2008–09 as a result of the global financial crisis, and the downturn in dwelling construction activity in particular. The Housing Industry Association (HIA) reported that new housing construction commencements fell by 35% in Queensland in 2008–09. This translated to decreased activity in the forest industry with Queensland's principal forest grower, Forestry Plantations Queensland (FPQ), reporting that log harvest volumes fell by 20% in 2008–09 compared to the previous year.

The latest leading dwelling finance approval data provide evidence that the dwelling construction sector is recovering and that this improvement will translate into growth in forest industry activity over the medium term. The total number of owner–occupier home loans in Queensland increased by almost 1% in July 2009 (trend data)—the 11th consecutive monthly increase and the highest number of loans since January 2008. Loan approvals for the construction of new dwellings also show signs of improvement with the total number of loan approvals in July 2009 recovering to late-2007 levels.

Building approvals data for Queensland also provide some basis for optimism. Total building approvals in Queensland troughed in February 2009 (trend data), and they have now risen for five consecutive months to July 2009. Nevertheless, the numbers of building approvals still remain at about half the levels recorded at the peak in late 2007.

The first home owner segment of the housing market also continues to provide positive signals with first home owners accounting for almost 30% of all dwelling finance approvals in Queensland in May 2009. The historically low interest rates, together with Australian and Queensland government policy initiatives, such as the extension in the First Home Owners Boost Grant (FHOBG) and the lifting in the stamp duty exemption to \$500 000, have underpinned the strong participation of first home owners in the housing market. Although first home owners typically purchase established dwellings, the Reserve Bank of Australia reports that there has been an increase over recent months in FHOBG grant applications for new dwellings.

Over the medium term, demand for new dwellings in Queensland will be stimulated by solid population growth, historically low interest rates, pent-up demand arising from the recent downturn, and also stimulus from new public housing construction arising from the Australian Government's Social Housing Initiative to build 20 000 new dwellings across Australia by the end of 2010.

After taking account of the considerable 'lag effect' between loan approvals and the actual commencement of construction, HIA are forecasting a slow recovery in dwelling commencements in Queensland in 2009–10 (a forecast increase of 1%). FPQ also report that they expect a slow recovery in the market for timber products in 2009–10, with a stronger pick-up in the second half of the year.

HIA forecast 16% growth in new housing starts in 2010–11; this indicates that they expect the recovery in dwelling construction in Queensland to gather momentum over the medium term. Queensland Treasury also expects relatively strong growth in new dwelling investment (20.75%) in 2010–11.

The Department of Environment and Resource Management's (DERM) Forest Products Group has the responsibility for the commercial management of state-owned commercial native forest resources and therefore is a significant supplier of native hardwood and cypress log timber to the

Queensland forest industry. DERM report that they expect moderate growth in their native log timber sales from state-owned lands in 2009–10.

Reports from the hardwood processing sector confirm that there was a downturn in production in 2008–09, with a number of companies forced to reduce labour. Processors report that the market is currently flat and they expect that these conditions will continue for the remainder of 2009. However, a number of businesses are optimistic that the market will recover in 2010. Supply constraints will be a major influence on the native hardwood (and cypress) log timber segment of the market over the longer term.

Managed Investment Scheme (MIS) or ‘pooled investment’ projects have been very successful in attracting large-scale investment into the agribusiness sector, particularly the forestry plantation segment, over the last decade. For example, they have been responsible for over 80% of the estimated 300 000 ha of new forestry plantations established in Australia over the last five years. In Queensland they have underpinned the development of the emerging private plantation forestry sector with an estimated 50 000 ha of new forestry plantations being financed over the last decade through MIS projects.

Although the economic impacts generated from new plantation expansion are not currently included in the forest growing GVP data compiled by QPIF, information produced by the Agribusiness Australia Group (AAG) provides an overview of current activity in this sector.

According to AAG, the Australian agribusiness MIS sector raised \$250 million in 2008–09—a sharp 77% decrease on the previous year. Timber projects attracted \$227 million in MIS investment funds in 2008–09—a 68% decrease on the previous year. Factors such as the global financial crisis, uncertainty about the future of taxation arrangements for agribusiness MIS projects, and the high profile collapse of Australia’s two largest MIS-based companies (Great Southern Limited and Timbercorp Limited) all clearly had a significant negative impact on the ability of the agribusiness MIS sector to attract investment funds in 2008–09.

AAG further estimates that only \$12 million (or 5%) of the total Australian agribusiness MIS funds raised in 2008–09 will be invested in projects in Queensland. If the national trend holds for Queensland, most of these funds will be invested in timber/forestry projects. Nevertheless, the latest year’s result is a significant reduction in the \$150 million (on average) that has been invested in MIS agribusiness projects in Queensland over the previous four years. Clearly the agribusiness MIS sector experienced very difficult market conditions in 2008–09, and it must now develop strategies to restore market confidence.

The Queensland Government has announced that it will sell its forestry plantation agency (FPQ) as part of its Renewing Queensland Plan. Although the details of the FPQ sale arrangement are currently being determined, it arguably represents the most significant change to the structure of the Queensland forest industry since plantation-sourced log timber became the dominant input used by the timber processing sector in Queensland in the mid 1990s. In particular, privatising FPQ should attract new investment into the timber plantation sector and enable the industry to grow.

A note about forest industry data sources

Prior to September 2007 *Prospects* used the reported turnover of Australian and New Zealand Standard Industrial Classification (ANZSIC) Group 231 (Log sawmilling and timber dressing), as defined and measured by ABS in their survey of manufacturing, as an indicator of the gross value of forest industry activity in Queensland. However, while these data do separately report the forest growing sector, they exclude some elements of the first-stage processing sector and they also contain some elements of double-counting.

Prospects now uses data produced by ABARE in its biannual Australian wood and forest products statistics publication about the value of log production (gross value of logs delivered to the sawmill door or wharf gate) as an estimate of the gross value of the forest growing sector in Queensland. This, together with estimates of the ‘value-added’ to intermediate inputs) of ANZSIC Group 231 and ANZSIC Code 2321 (Plywood and veneer manufacturing), provide an overall estimate of Queensland forest industry activity.

Special feature 1: Queensland agriculture and agri-food system

The agriculture and agri-food system continues to be a complex and highly integrated group of industries that significantly contributes to Queensland's economy, particularly when the whole supply chain is considered. In 2006–07, agriculture and agri-food system contributed \$22.7 billion to the state's gross state product (GSP), or around 12% of the Queensland economy, and employed 272 471 Queenslanders.

The agriculture and agri-food system encompasses several industries including farm input and service suppliers; primary agriculture; food, beverage and tobacco (FBT) processing; retail and wholesale food industries and food service.

This paper provides a review of each segment of the system in Queensland, moving along the supply chain from consumers to food distribution, food, beverage and tobacco (FBT) processing, primary agriculture and input suppliers for 2006–07. The contributions of agriculture and agri-food system to the economy are shown in Table 7 below.

- The Food service industry was worth \$1 billion and accounts for 0.5% of Queensland's GSP.
- Food retail and wholesale industries were worth \$3.6 billion and account for 1.8% of Queensland's GSP.
- The FBT processing industry encompasses industries that transform primary production and account for 1.7% of GSP. It represents one of the largest manufacturing sectors in Queensland and contributes \$3.5 billion to the economy.
- Primary agriculture, including agriculture, fisheries and forestry, accounts for 5% Queensland economy and is at the heart of the agriculture and agri-food system. It is worth \$9.5 billion in 2006–07.
- Input suppliers and service providers also perform important functions in the agriculture and agri-food system. In 2006–07, this industry was estimated to be worth \$5.1 billion.

Table 7. Agriculture and agri-food system's contribution to Queensland's GSP and employment (2006–07)

	Industry value-added (IVA)	IVA as % GSP	Employment	
	\$million	%	Number	%
Food service	1021	0.5	39 903	1.9
Food retail/wholesale	3591	1.8	90 467	4.5
Food and beverage processing	3586	1.7	46 769	2.2
Primary agriculture	9532	4.8	78 000	3.7
Input and service suppliers*	5128	2.6	17 332	0.8
Sub-total	22 858	11.5	272 471	13.0
Total GSP	198 514		2 091 700	

(Source: Australian Bureau of Statistics (ABS), various years and various publications)

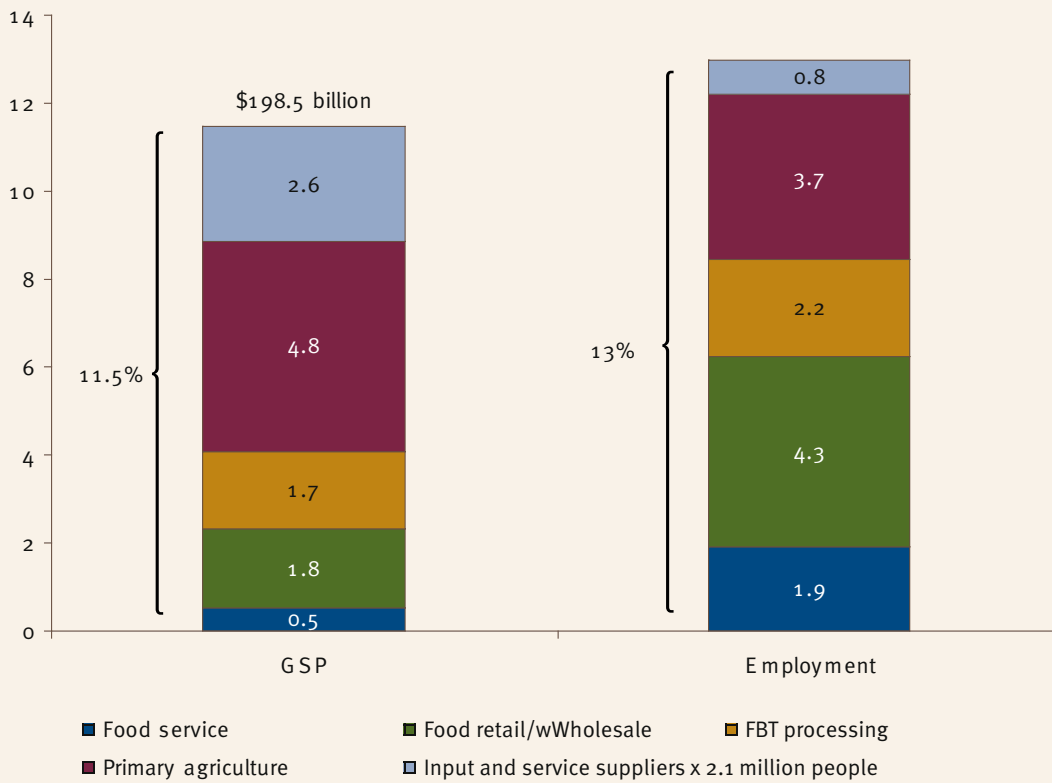
* Based on an estimate

Food and agriculture is also one of Queensland's key employers. In 2006–07, there were 272 471 jobs supported by food and agriculture or 13% of total Queensland jobs of 2 091 700. Therefore, one in eight Queensland jobs are either partially or fully supported by food and agriculture.

Applying the same supply analysis and using 2006–07 statistical data, Table 7 shows the number of jobs in the different food and agriculture-related industries. There were 39 903 jobs (2%) for food services, 90 467 jobs (4%) from the food retail and wholesale industries and 46 769 jobs (2%) from food and beverage manufacturing. There were 78 000 Queenslanders or 4% directly employed in primary agriculture and 17 332 jobs (0.8%) in input and service suppliers industry.

Figure 14 below shows the summary of food and agriculture’s contribution to GSP and employment in Queensland for 2006–07.

Figure 14. The agriculture and agri-food system’s contribution to GSP and employment, 2007



(Source: Australian Bureau of Statistics (ABS), various years and various publications)

Special feature 2: Queensland beef value chain

A value chain is a model used to illustrate the product and financial flows that occur throughout a specific industry. Value chains can be used to discern the implications that changes in inputs will have for the pricing of end retail products.

Queensland beef value chain

The Queensland beef value chain describes the Queensland beef industry by quantifying the costs associated with each sequence or link from the farm gate to the consumer. The Queensland beef value chain models the beef product flow from farmers to consumers and financial flows from consumers back to farmers. Within the value chain, value is added to the product as it passes through activities in the chain. Beef cattle move from farms to feedlots to processors and then to retailers who transform them into saleable retail beef products and co-ordinate their sale to retail customers.

The value chain consists of three stages—primary production, processing and retail. Within these stages, costs are incurred as cattle are converted from live animals into a variety of retail products. Throughout this process, costs are incurred and value is added to the product.

Any analysis of the value chain of the Queensland beef industry is inherently complex and must be simplified by making a large number of assumptions regarding meat quality, market prices and cost structures. Yet, as an approach, it can be used to make valuable comparisons between the returns at each stage in the value chain. The value chain model allows for all assumptions to be adjusted and for these changes to trickle down the value chain and ultimately impact the end retail prices of retail products.

Transport costs are incurred within each stage of the value chain for Queensland beef when live animals are transported from farm to feedlot, when live animals are transported to the abattoir and processing plants, when meat is transported to retailer warehouses and when retailers transport meat to individual stores.

Livestock costs and co-product costs are calculated based on annual averages to provide a general reflection of the relative value chain returns over time. The decision to adopt average annual costs was made due to the high sensitivity of the value chain model to changes in costs and other variables.

Saleyard and feed grain costs were derived from ABARE's *Australian Commodities*, Vol. 16, No. 1, March quarter publication. All other primary production and processing assumptions were derived from the Macarthur Agribusiness's *Economic and social/community impacts of the live cattle and processed beef export supply chains in Queensland* report. The value chain is a variant of the value chain outlined in the Macarthur Agribusiness's *Economic and social/community impacts of the live cattle and processed beef export supply chains in Queensland* report (prepared for QPIF in 2001). Although there are minor differences in the structures of both value chains, the Macarthur Agribusiness value chain provided the basic structure for the Queensland beef value chain.

The primary production stage (including saleyard, backgrounding and feedlot costs) accounts for roughly 55% of the end retail price. The processing stage accounts for roughly 10% of the end retail price. Retail costs account for roughly 26% of the end retail price. Transport costs (from farm to feedlot, from feedlot to works, from works to warehouses and then to individual stores) account for 3% of the retail price.

Information provided by Coles to the Australian Competition and Consumer Commission (ACCC) and the findings reported by Whitehall Associates' analysis of the determinants of prices and costs in product value chains yields a very similar breakdown of value-added in the beef sector. In the ACCC report, Coles revealed that the price it pays for a whole cow (inclusive of producer and feedlot costs) typically accounts for 53% of the end retail price. Processing activities and

costs (kill fee, boning, packaging and chilling) account for 14% of the end retail price while retail activities and costs (slicing and trimming, packaging, labour, shrinkage, promotion and advertising, store costs and retail margin) account for 30% of the end retail price.

Applications

The value chain model allows for parameters to be adjusted to assess the impact of changes. For example, the value chain model can be used to discern the effect changes in input costs can have on end retail prices of beef products, assuming all other input prices are unchanged and that price differences do not lead to a market realignment. Examples include saleyard prices, feed grain prices and fuel prices.

Example: Approximate value chain for grain-fed cattle (100 days)

Primary production parameters

- Beef animal is a trade steer with a live weight of 360 kg at 18–20 months.
- Farm gate price of trade steer is 300c/kg.
- Average road transport distance from farm to feedlot is 1072 km.
- Cost per deck per kilometre is \$1.50.
- Number of cattle head per deck is 37.
- Animal lose 5% live weight in transit from farm to backgrounding destination.
- Cattle are backgrounded for seven weeks.
- The weekly cost of agistment is \$2.00.
- On average, weekly gain is 4.90 kg/week.
- Cattle are lofted for 100 days.
- Ration cost is \$260/t.
- Margin on feed is 30%.
- On average, feed intake is 15.76 kg per head per day.
- Average daily gain of individual steer is 1.5 kg.

Processing parameters

- Average road transport distance from feedlot to works is 940 km.
- Cost per deck per kilometre is \$1.00.
- Number of cattle per deck is 22 head.
- Cattle lose 5% live weight in transit from feedlot to works in Brisbane.
- Feedlot steer is assumed to achieve a dressing percentage of 55%.
- Cold shrink causes a further 3 % loss of carcass weight.
- Total processing costs (inclusive of kill levy) is \$250.

Retail parameters

- Aging, storage and pre-preparation of carcass comprise 2.5 % of total retail costs.
- Transportation to stores comprises 2.5 % of total retail costs.
- In store preparation and packaging of cuts comprise 35 % of total retail costs.
- Refrigeration and display comprise 17.5 % of total retail costs.
- Gross margin to supermarket comprises 42.5 % of total retail costs.
- Total retail costs are \$700.



Impact assessment: an increase in fuel costs

The value chain can be applied to predict the effect fuel cost increases will have on beef retail prices. Within the value chain, transportation costs comprise only a small proportion of the end retail price of beef products (3%). An increase in fuel costs, which will increase transportation costs, is thus deemed to have a minimal affect on end retail prices. For example, if transportation costs (\$ per deck per kilometre) were to double as a result of a sizeable increase in fuel costs (greater than a 100% increase as fuel costs are only one component of transport costs), the model predicts retail costs will increase by only 3%.

Special feature 3: Setting a new benchmark for lifestyle horticulture

In September 2008, QPIF commissioned Queensland Treasury's Office of Economic and Social Research to undertake a comprehensive statewide telephone survey to determine the economic value of the lifestyle horticulture industry. The industry has changed significantly since QPIF last conducted a comprehensive survey in 2001, and a new benchmark was needed to gain an accurate understanding of the scope and economic contribution of this important Queensland primary production industry.

While lifestyle horticulture is commonly viewed as the initial stage of the ornamental-focused landscaping, gardening and florist supply chains, it also plays an integral role in the supply of seedlings, tubestock and trees to the forestry, production fruit, nut and vegetable industries.

In 2007–08 the estimated gross value or turnover for the production segment of the lifestyle horticulture industry was \$899 million. The survey has also revealed a much larger contribution to the Queensland economy from the service sector of the industry supply chain relative to previous surveys.

The services segment is now estimated to contribute \$2496 million of gross value to the Queensland economy in 2007–08. Collectively, the whole of industry value chain is up to \$3.4 billion, exceeding all previous industry estimates. Readers should note that as the services value is a gross figure (not value-added), the whole-of-industry figure includes significant levels of 'double-counting'. However, detailed data are unavailable about the extent of the double-counting.

Survey background

The sample population for the 2007–08 survey was 1398 businesses operating in all sectors of the lifestyle horticulture industry. The survey responses were extrapolated to provide a whole-of-sector and industry estimates. Readers should note that the definition or scope of the lifestyle horticulture industry has changed from the previous survey. Therefore, care should be taken in comparing the results from the 2007–08 survey with the 2000–01 survey.

The increased estimate of the GVP segment reflects an expansion in the larger-end enterprises when compared to previous industry and government estimates. Production nursery respondents, representing 71% of the total gross turnover of the production segment, reported that 4% had a gross annual turnover in excess of \$5 million.

The total survey frame (identified lifestyle horticulture 'population') of 5748 businesses for the new survey was significantly larger compared to earlier surveys. This delivered a more thorough and reliable estimate of industry activity.

In particular, the service segment population was significantly larger than the previous survey. The 2000–01 survey identified 1717 businesses in the landscape design, softscape installation and maintenance sectors. The 2007–08 survey identified over 2200 businesses in the same sectors.

In addition, the significant size of a number of the industry sectors necessitated that they be identified as stand-alone sectors in the new survey. For example, arboriculture businesses were included in the 'other' category in the 2000–01 survey. The new survey identified 474 arboriculture businesses in the population, justifying its categorisation as a stand-alone sector. Similarly, 318 landscape architecture businesses were identified in the 2007–08 survey.

Gross turnover

The lifestyle horticulture production segment is estimated to have generated \$899 million of gross value/turnover in 2007–08, and the lifestyle horticulture services segment is estimated to have generated \$2496 million of turnover/gross value in the same year.

The definition of the lifestyle horticulture industry for the purpose of this survey was broken into the following industry sectors:



Table 8. Lifestyle horticulture industry sectors

Production segment	\$m
Nursery-plant production	723
Turf-grass production	101
Cut flower and foliage production	74
Services segment	\$m
Retail plant nursery	412
Florists or retail flower sales	34
Landscape design and architecture	263
Landscape construction (greenscape and irrigation, excluding hardscape)	1132
Garden and lawn maintenance	343
Horticulture consultant	10
Arboriculture and tree maintenance	223
Indoor plant hire	78

The industry—both service and production segments—is comprised of a large number of small to medium enterprises. Of total survey respondents, 18% reported that their annual turnover is under \$50 000 per year and 32% of the respondents reported that their annual turnover was between \$50 000 and \$200 000 per year.

The value of the industry was boosted by the 2% of survey respondents reporting over \$10 million in gross turnover in the 2007–08 year.

Businesses and organisations providing a range of training and education, research and development, management and maintenance of golf courses, parks and sporting grounds, specialised transport services, as well as manufacturers and suppliers of allied products were not included in the scope of the new survey.

Exports

The survey results confirmed that the lifestyle horticulture industry is focused on domestic markets and is not as trade-oriented as production horticulture or the livestock industries. Only 4% of survey respondents reported that they export internationally, with production segment respondents (9%) more likely to have exported than service segment (3%) respondents.

Production sector respondents reported a focus on markets in Japan and Asia (other than China and Japan). There also appears to be growing interest in exporting with 63% of survey respondents currently exporting reporting that they intended to increase exports in the next 12 months.

The cut flower sector had the highest export propensity with 15% of respondents from this sector reporting that they currently export—mostly to markets in Japan and the greater Asia region. Respondents also indicated that exports to China accounted for 11% of the total exports from the production sector. Production nursery respondents were the only respondents to indicate that they currently exported to China.

While overall service segment exports are relatively low, respondents from the services segment reported that Europe and Oceania are their largest export markets. Exporters from the service segment were more pessimistic than their production segment counterparts, with 53% of respondents indicating that exports would be static or decline over the next 12 months.

The survey results also indicated that service segment businesses are less likely to export interstate than businesses in the production segment. New South Wales and the Australian Capital Territory are the largest interstate export markets for both the production and service segments of the lifestyle horticulture industry.

Labour

Lifestyle horticulture is a relatively labour-intensive industry. The survey results indicate that the nursery and cut flower and foliage production, particularly landscaping and maintenance sectors, require relatively high labour inputs.

The production segment is estimated to employ a total of 6260 full-time equivalents (FTEs)—based on 38-hour week—in full-time, part-time and casual capacities. Production nurseries accounted for the highest labour usage, accounting for 73% of the total estimated FTEs in the production segment.

The garden maintenance (27%) and landscape construction—greenscape—(23%) sectors account for half of the estimated service segment labour requirement of 14 060 FTEs. The landscape sectors also accounted for the highest numbers of part-time and casual staff in the lifestyle horticulture industry.

The survey also revealed that 31% of total respondents (27% production segment and 32% service segment) reported operating as a sole proprietor with no staff. Furthermore, one-third of the FTEs in the service segment did not draw a regular wage from the business. Production segment respondents reported that 30% of FTEs did not receive a regular wage from the business.

Based on the total reported salary expenditure per business and the number of reported FTEs, the average salary for FTEs in the lifestyle horticulture industry was around \$25 000.

Medium-term outlook

The lifestyle horticulture industry outlook was generally favourable when the survey was conducted, with only 16% of respondents reporting a 'poor' or 'very poor' view of business conditions for the next five years. By contrast, 66% of survey nominated 'even' or 'good' business prospects for the medium-term future. Respondents in the production and services segments reported very similar future business outlooks.

All survey respondents were requested to provide possible explanations for their responses about future business conditions. The most common justification provided by the production segment for the positive growth was 'positive market trends' and 'optimistic rainfall projection'. The service segment respondents indicated that 'positive market trends' was the key reason for their projection; however, 'good reputation and customer service' were also reported as key factors underpinning their responses. Pessimistic respondents reported 'higher production costs' and 'poor economic conditions' as the main reasons for their response.

Notes

- Gross value of commodities produced is a measure of economic output.
- Estimates of the gross values of Queensland agricultural production are calculated and published at the state level by the Australian Bureau of Statistics (ABS). Presently, ABS publishes estimates for most agricultural commodities twice a year.
- A preliminary estimate for a particular financial year is published approximately four months after the end of that year. The second (final estimate) is published approximately 12 months after the preliminary estimate.
- Estimates of the gross value of Queensland's fishery production are available from QPIF.
- Estimates of the gross value of Queensland's forestry production are available from Forest Products Queensland.
- All estimates provided in this publication are in nominal dollar values unless otherwise stated.

Definitions

Crops

Field and horticulture crops.

Fisheries

Trawl- and non-trawl fishing, and aquaculture.

Forestry

Log sawmilling and timber dressing.

Gross value of commodities produced

Value of recorded production at wholesale prices realised in the market place (for example, cattle sold for slaughter and sugarcane at the mill).

Value-added production

'Value-added' is simply measured as the value of the output produced minus the costs of the intermediate goods.

Livestock disposals

Cattle, sheep, pigs, poultry, kangaroos and other live animals sold for slaughter, plus live exports minus live imports.

Livestock products

Eggs, milk, wool and honey.

Market place

Generally, the metropolitan market in each state and territory. Where commodities are consumed locally, or where they become raw material for a secondary industry, these points are presumed to be the market places. Commodities exported overseas are generally valued at free-on-board prices.