



australian commodities

june quarter 07.2

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ABARE project 1163 ❖❖

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ISSN 1321-7844

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lupins

australia's role in world markets

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- » **Australia is the dominant world producer of lupins, accounting for around 85 per cent of world lupin production over the past ten years. Other producers include Belarus, Chile, the European Union and the Russian Federation, where production is relatively small compared with Australia's.**
- » **The main use of lupins (a legume) is for stockfeed, with the cattle, pigs, poultry and aquaculture industries being the major consumers. There is some use of lupins for human consumption but this is relatively small compared with livestock feeding.**
- » **The European Union, Japan and the Republic of Korea are the major destinations for Australia's lupin exports, accounting for an average 90 per cent of total exports.**

Although lupins are a relatively minor crop compared with some of the major grains, such as wheat and barley, they are an important contributor to Australia's grain production and exports.

lupin production

Lupins are a member of the *Fabaceae* family and are a legume (pulse) crop. Legume plants have an ability to fix atmospheric nitrogen into ammonia that, in turn, can have a fertilising effect in the soil for subsequent nonlegume crops and pasture. This process occurs through bacteria, known as rhizobia, found in the root nodules of legume plants. Because of their nitrogen fixing ability, lupins (and other pulse crops) can be used in cropping rotations to replenish nitrogen depleted soils.

Lupins are the major pulse crop produced in Australia and have accounted for around half of Australia's total pulse production over the past ten years. Other major pulse crops grown in Australia include field peas, chickpeas, faba beans and lentils. The major varieties of lupins produced in Australia are narrow leafed lupins (*Lupinus angustifolius*) and sweet albus lupins (*L. albus*). However, production of sweet albus lupins is relatively small compared with narrow leafed lupins. In the drought affected 2006-07 year, sweet albus lupins accounted for around 5 per cent of both the total Australian area sown to lupins and total lupin production. In 2004-05 and 2005-06, which were more 'normal' seasons, sweet albus lupins accounted for 2 per cent and 4 per cent respectively of the total area sown to lupins, and 2 per cent and 5 per cent respectively of total lupin production.

1 Australian lupin production

	New South Wales kt	Victoria kt	Queensland kt	Western Australia k	South Australia kt	Tasmania kt	Australia kt
1997-98	75	33	0	1 347	106	0	1 561
1998-99	175	46	0	1 372	102	0	1 695
1999-2000	240	45	0	1 603	80	0	1 968
2000-01	127	47	0	783	98	0	1 055
2001-02	123	41	0	904	147	0	1 215
2002-03	37	11	0	587	90	1	726
2003-04	56	32	0	969	122	1	1 180
2004-05	55	20	1	792	68	1	937
2005-06	62	37	0	1 104	125	0	1 328
2006-07	14	5	0	125	30	0	174

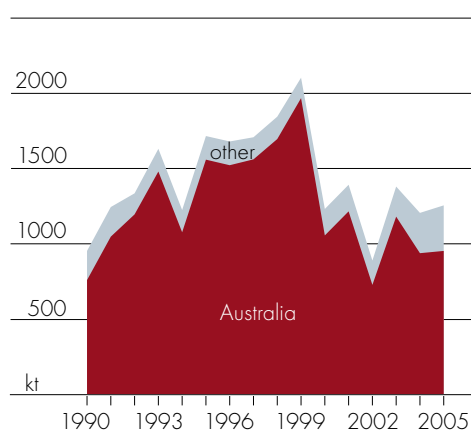
In Australia, lupins are generally sown between late April and early June, with harvest occurring in October and November. Over the past ten seasons, lupin production in Australia has averaged almost 1.2 million tonnes a year. In the 2006-07 season, lupin production in Australia was drastically reduced as a result of the drought. Total Australian lupin production dropped to 174 000 tonnes, the smallest volume produced in at least the past twenty years.

The largest lupin producing state is Western Australia, which accounts for an average 80 per cent of total Australian production. Lupins are grown widely in that state because of the plant's ability to adapt to the sandy and acidic soils that are more prevalent in Western Australia than in cropping areas in the rest of Australia. Over the past ten years, Western Australia has produced on average 959 000 tonnes of lupins a year. The next largest lupin producing state is South Australia, with an average 97 000 tonnes of lupins produced a year over the same ten year period. This is closely followed by New South Wales, with an average production of around 96 000 (table 1).

Assuming a return to average seasonal conditions in 2007-08, lupin production is forecast to be more than triple that of the previous year. This is based on a return to average yields. Over the medium term (to 2011-12) the area sown to lupins is forecast to increase to around the 1 million hectares a year that was sown during the 1990s and early 2000s. With continued increases in productivity through varietal improvement and better management, lupin production is projected to be around 1.2 million tonnes by 2011-12, an 8 per cent increase over predrought production.

Global lupin production is dominated by Australia (figure A; FAO database). Other producers include Belarus, Chile, the European Union and the Russian Federation. The European Union 27 (that is, the current full 27 members of the EU) is the second largest producer of lupins, averaging 65 000 tonnes over the past ten seasons, equating to an average 5 per cent of global lupin production.

fig A world lupin production



lupin consumption

The majority of the world's lupins are used by stockfeed manufacturers for animal feed. It is estimated that less than 4 per cent of global lupin production is currently consumed as human food (information resource portal for lupins).

Lupins for human consumption have many different uses, including flour, pasta, tofu, tempe, soy sauce and snack foods. Lupin seeds possess many nutritional and food processing qualities, making them an attractive alternative to dry beans and soybeans. Lupin seeds are high in protein and high in the dietary fibre component that is associated with lowering cholesterol. In many EU countries, bitter large seeded lupins are commonly eaten as a snack food preserved in brine (information resource portal for lupins).

Lupins are often used as a substitute for high protein soybean meal in livestock feeds. The composition of the lupin grain has different nutritional characteristics for ruminants (cattle) and monogastrics (particularly poultry). The hull of lupins is a readily digestible fibre for ruminants yet is of limited value to monogastrics. Dehulling (removing the hull or outer coating) can improve the utilisation of lupins, with the kernel directed to monogastric feeds and the hulls and other particles processed into stockfeed for ruminants.

Ruminants are efficient in accessing the energy contained in the lupin seed. The low levels of starch and high levels of fermentable carbohydrate make lupins a desirable feed for ruminants such as cattle and sheep. Australia, Europe and Japan use sweet lupins in dairy production. However, in Australia the largest utilisation of lupins is whole grain feeding to sheep, to supplement low grade roughage diets.

Commercial pig producers have successfully used up to 30 per cent narrow leaved lupin seed in pig diets. Poultry diets normally contain less than 10 per cent lupins because of 'sticky' or 'wet' droppings (Hawthorne 2006). This is aesthetically undesirable and a potential health risk to the birds, but is not known to affect feed conversion rates.

The use of lupins in aquaculture has been increasing. The aquaculture industry uses lupins (lupin seed and lupin kernel meal) as a feed to replace high protein fish meal in diets. Feeds for salmon and prawns are high in protein and lupin kernel meal is used widely in feed formulations. It is estimated that up to 50 per cent of the fish meal or soybean meal in diets of tiger prawns can be replaced by lupins (Department of Agriculture and Food, Western Australia). The use of lupins in aquaculture diets varies and it is estimated that diets of rainbow trout can contain up to 25 per cent whole lupins. Commercial diets of tilapia and milkfish can contain up to 10 per cent lupins and pink snapper diets can contain up to 40 per cent lupin seed meal with no loss in productivity (Department of Agriculture and Food, Western Australia 2007).

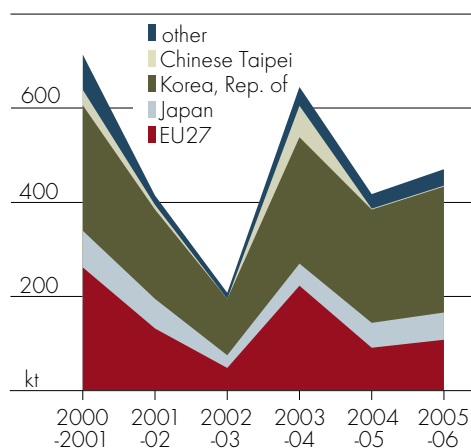
lupin exports

Lupin exports from Australia averaged 41 per cent of annual production over the five years to 2005-06. Over this period, exports averaged around 430 000 tonnes, with a value of nearly \$100 million a year. Shipments of lupins account for around 2 per cent of the total value and volume of Australian exports of grains and oilseeds.

In the 2006-07 marketing year (November-October), however, exports are estimated to have been down substantially because of the widespread drought and reduced lupin production. Lupin exports are forecast to be 70 000 tonnes in 2006-07, a reduction of around 85 per cent from exports in the previous year. The value of lupin exports is also

lupins

fig B **Australian lupin exports**



forecast to fall, from \$100 million in 2005-06 to \$17 million in 2006-07. However, reflecting the reduced Australian and global supply of lupins, the unit value of exports is estimated to increase from \$202 a tonne in 2005-06 to about \$243 a tonne in 2006-07.

Over the medium term, domestic consumption of lupins for livestock feed and export demand are both projected to increase. Australian exports of lupins are projected to be around 550 000 tonnes in 2011-12, around half of total lupin production.

The major destination for Australia's lupin exports is the Republic of Korea, which takes around half of Australia's lupin exports. The other major markets for Australian lupins include the European Union (27 countries), which accounts for 27 per cent, Japan 12 per cent and Chinese Taipei 3 per cent (figure B).

Consumption of livestock products has increased considerably in Korea, leading to growth in the Korean livestock sector and consumption of livestock feeds. The increased consumption of livestock products in Korea has resulted in increased imports of lupins from Australia. With consumption of livestock and livestock products expected to continue to rise in Korea, lupin imports from Australia are likely to continue to increase.

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