year and tends to be a problem only from late September onwards.

Severe rust causes premature defoliation, and being more of a late-season disease, lowers yield by reducing pod set and seed size.

Management practices can help in slowing the onset of the disease:

- Hygiene–incorporate faba bean residues, eliminate volunteers.
- Paddock separation–select paddocks as far away from previous faba bean crops as practical.

In-crop management involves monitoring during early growth (4–6 weeks after sowing) for signs of rust, which, if present, warrants ‘cleaning up’ with a fungicidal spray. The earlier the disease develops the greater the potential damage.

Further fungicide applications after flowering might be required, and should be considered with reference to disease stage and level, yield potential, seasonal conditions and outlook. This decision should be made after consultation with your local agronomist.

Fortunately, the importance of rust in the northern region will be greatly reduced as the plant breeding program has identified sources of rust resistance which have been incorporated into breeding lines from which new varieties are being released.

Plots sprayed with fungicide to control rust stay green longer

Harry Marcellos

Viruses

Virus diseases have been of concern since the early 1990s, particularly in northern NSW, with two types of disease symptoms being observed. Virus mosaic (dark and light green areas on leaves) accompanied usually by leaf roughness or distortion and virus yellowing accompanied usually by leaf stiffness or rolling, stunting, and root blackening. Both types are carried into crops by aphids during autumn or late winter. Both reduce yields, but virus yellowing is more severe (sometimes lethal) and widespread. Virus species which cause mosaic symptoms include BYMV and BBWV. Virus species which cause yellowing (also referred to as luteoviruses or luteo-type viruses) include AMV, BLRV, BWYV, SCRLV, and SCSV, of which BLRV (often in mixed infection with SCRLV) has been most severe and widespread.

Plant breeding research in NSW Agriculture has identified sources of resistance to BLRV which have been introduced by crossing into lines having higher resistance to ascochyta blight, chocolate spot and rust. As a result, new varieties will be released from the northern breeding program in the medium term with resistance to BLRV as well as fungal diseases.

Virus yellowing in faba bean plants

Harry Marcellos

There are no current in-crop recommendations specifically for controlling virus diseases. The highest virus infection risks are associated with:

- Earlier than recommended sowing–higher likelihood of encountering late summer aphid flights. Follow recommendations for sowing time for each district.

- Sowing into bare, cultivated ground–standing cereal stubble deters aphids. Retain standing stubble and direct drill faba beans.
- Thin stands–a high population and dense canopy can reduce aphid visitation. Use recommended sowing densities.

Oedemas

Raised, black spots up to several millimetres in diameter are often seen on the surface of green pods during later stages of their development. These are caused by insect bites and although unsightly, are usually of no concern. In odd cases, the oedema penetrates the pod wall and can damage the developing seed through secondary infection.

For further information on diseases and disorders of faba beans refer to *Winter Pulse Disorders: The Ute Guide*, by M. Wurst, W. Hawthorne, A. Nikandrow and M. Ramsey.

Oedemas–raised spots commonly occur on pods

Harry Marcellos

INSECT THREATS

In very high numbers, quite a few species of insect could severely damage faba bean crops during their growth and development. Consult the latest edition of *Insect and Mite Control in Field Crops* for descriptions, effects and control of a wide range of insects.

The most important pests of faba bean in NSW have been the native budworm, corn earworm and aphids. On odd occasions, blue oat and red-legged earth mite, lucerne flea, and cutworm may cause damage while the crop is emerging and establishing.

Red legged earth mite (*Halotydeus destructor*) and blue oat mite (*Penthaleus major*)

Mites feed by a rasping and sucking action on the leaves of seedlings, turning the damaged tissue silvery in colour. Severe or older mite damage turns red-brown in colour. Mite damage is most severe at the seedling stage, where deformation of the developing buds and leaves occurs. In severe infestations seedlings may be killed at emergence. The damaged tissue and reduced vigour also increases disease infection potential. The mites usually feed from late afternoon until early morning, and may be active on overcast days. Crops should be monitored as they emerge, or a bare earth spray applied to the paddock post-sowing pre-emergent. Control mites at the first signs of plant damage.

Red legged earth mite (*Halotydeus destructor*)

Lowan Turton

Blue oat mite (*Penthaleus major*)

Lowan Turton

Red legged earthmite damage to faba bean leaves

Leigh Jemkins


Peter Matthews

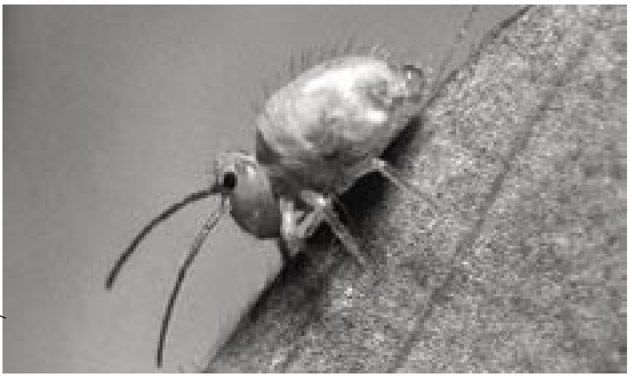
Lucerne flea damage on leaves

Lucerne flea (*Sminthurus viridis*)

Lucerne flea is a sporadic pest and causes characteristic small round holes in the leaves as they feed on the leaf tissue.

The adults and nymphs feed on the soft parts of the leaves during the day and night. Very young nymphs eat isolated holes in one epidermis through to the other epidermis, leaving small membranous windows in leaves. Adults and larger nymphs can completely eat out whole sections of leaves leaving only the veins and outer epidermis. Severe infestations can reduce plant growth and increase the potential for disease infection. Crops should be monitored as they emerge and lucerne flea should be controlled at the first signs of tissue damage.

Lucerne flea (*Sminthurus viridis*)


Anonymous

Cutworms (*Agrotis spp.*)

Cutworms feed on the leaves and stems of young plants. Most damage is caused by older caterpillars, which may cut off and eat leaves, cut down plants and eat the top growth or cause plants to wilt and die by cutting off or eating partly through the stems near ground level.

They usually feed in the evening and night and hide in the soil during the day. Damage can be serious if cutworms are in the soil at sowing or outbreaks occur soon after. Inspect damaged crops in the late evening for the presence of caterpillars. Band spraying over the row when the caterpillars are feeding is the most effective method of pesticide application. Spot treatment of affected patches may be all that is needed. The likelihood of infestation can be reduced by clean fallowing and eliminating weeds from around the paddock perimeter for at least one month prior to sowing.

Cutworm (*Agrotis infusa*)


Lowan Turton

Aphids

Although several species may infest faba beans the cowpea aphid *(Aphis craccivora)* is the most common. Aphids damage plants by direct feeding, generally causing minimal damage unless they are in high numbers. Direct feeding damage is seen in hot spots, where the insects are concentrated at the growing tips of one or more plants, causing wilting, stunting and sometimes tip death.

The main concern with aphids is their capacity to act as vectors, carrying and transfering virus diseases during feeding/sucking.

Natural control agents like weather, ladybird larvae, larvae of hover flies, lacewings and tiny parasitic wasps often kill out the infestation.

Cowpea aphids (*Aphis craccivora*)


Lowan Turton

Grey residues or cast of the aphids may be seen on the plants.

Severe aphid infestations can be controlled by spraying with insecticide, but this generally has no effect on virus transmission, which would have occurred when the aphids commenced feeding in the crop.

Thrips

Several species can damage faba bean crops, but little is known of their economic impact. Of these, onion thrips (*Thrips tabaci*), plague thrips (*T. imaginis*) and tomato thrips (*Frankliniella schultzei*) could be important.

Thrips feed on the flower buds, flowers and small pods, which are shed on being damaged.

Damaged leaves and older pods are marked with silvery brown blotches. The pods may also be distorted and hold few seeds. Crops should be examined from flower bud formation until flowering ends. Hit the growing points and recently opened flowers onto your hand (or white paper) to dislodge the thrips. The limited information available suggests that they should be controlled if 4 to 6 thrips are found per flower.

Thrips

Lowan Turton

Native budworm (*Helicoverpa punctigera*) and corn earworm (*Helicoverpa armigera*)

Two species of helicoverpa can cause damage to pods and the developing seed. The more important of the two is the native budworm, although the corn earworm is becoming increasingly important around irrigation and cotton growing areas.

Infestation of faba beans in advanced stages, particularly during podding, is common and will affect both yield and seed quality. The native budworm moths migrate into NSW from inland Australia in spring, whereas the corn earworm moths hatch in the local area from over-wintering pupae in legume-based pastures or previous crop stubbles, especially cotton, and late planted maize, sorghum and sunflower.

The female moths will lay eggs on leaves, stems, flowers or pods. The young larvae graze on the leaves, flowers, buds, stems and small pods. Older larvae (greater than 10mm) chew through pod walls and feed on the developing seed.

Crops should be inspected at least twice a week from flowering. One approach is to sample each of 10 widely separated sites, by laying a 0.5m^2 piece of white fertiliser bag between the rows. Beat the plants on each side over the bag and count the number of 4–9 mm long larvae which fall.

Native budworm larva (*Helicoverpa punctigera*)

Eric Armstrong

Spraying with insecticide is indicated when the average number of small larvae (less than 10 mm) exceeds 2–4 /m^2, but if human consumption is sought, a lower threshold of 1/m^2 would be advisable. Any insecticidal spray program should be conducted in accordance with your local Helicoverpa Resistance Management Strategy to avoid possible spray failures and the build up of resistance in the local corn earworm populations. One well-timed spray is usually sufficient, but check the crop for about a week after spraying for caterpillars emerging from the pods and, if necessary, respray.

HARVESTING

Having invested so much in time, decision making, effort and money in growing the crop, it is vital to pay attention to this operation, as it will impact on yield and quality.

Following the completion of podding, the faba bean crop turns rapidly from:

1. a pleasing green, well podded and luxuriant crop,
2. through a ragged mosaic of yellow, brown then black foliage,
3. followed by leaf drop to become a field of greenish 'sticks' bearing blackening pods, and
4. finally a black field of very dry stems and pods.

Timing

The crop should be harvested when most stems are defoliated, but still have some green in them. The odd tuft of green leaf may be seen at the top of a small percentage of plants when looking across the paddock. At this stage, seed will be bright and light, with moisture content above 12% (maximum delivery moisture 14%)

Faba beans being harvested in southern NSW

Di Carpenter

and, provided the header is properly set up, physical damage to the seed will be minimised.

In most cases, the bean crop will be ready to harvest at about the same time or earlier than barley. If storing faba beans on farm at moisture contents above 12%, silo aeration should be considered to avoid silo heating and quality downgrading.

Waiting until the crop is completely dry will increase shattering loss before the header front, and mechanical damage through the drum as the seeds, being very dry, will be brittle.

Peter Matthews

A crop of faba beans being windrowed in the Temora district

Windrowing

Faba bean crops can be windrowed, a common practice in south eastern Australia.

Although requiring a separate operation and equipment, windrowing faba bean crops may have advantages:

- Crop maturity is more uniform, and shattering of lower, over-mature pods minimised.
- Harvesting is not delayed by late-maturing weeds.
- Staining of seed by green weed trash can be avoided.
- Heat build-up during storage by green weed trash is avoided.
- A lower cutting height using windrowers enables lower pods to be harvested.
- Losses in tall crops due to vibration and pod shattering ahead of the cutter bar are reduced.
- Tall, bulky crops can sometimes be windrowed before the crop can lodge, speeding up harvest. Tall, bulky crops are very difficult to feed into the header, due to the large amount of material.
- Harvest time can be advanced a few days, depending on time of windrowing and seasonal conditions.
- Header operation may be more efficient at picking up windrows than direct harvesting.

Disadvantages of windrowing are:

- An extra paddock operation and cost is involved.
- Incorrect timing can cause yield loss through premature crop senescence and unfilled grain.
- Heavy rain on windrowed beans may downgrade quality.

The earliest the crop should be windrowed is when the seed in the top pods is physiologically mature (indicated by blackening of the seed hilum). Further information on windrow timing can be found in *Pulse Point 9 Windrowing faba beans.*

Header type and set-up

Open front headers are best for harvesting faba beans as most of the crop has to go through the machine. Rotary combines are gentler on the seed than concave, drum and straw-walker machines.

Mature faba bean seed, showing the black hilum

Di Carpenter

Be as gentle with the seed as possible during harvesting. This means wide concave clearances (15–35 mm) and slow drum speeds (400–600 rpm). Use maximum airflow to get a clean sample. The reel should only touch the top part of the crop, its speed adjusted to match the ground speed of the machine so as to reduce shattering of pods. Minimise the amount of repeat threshing by adjusting sieves.

Faba beans can be handled in bulk when marketing for human consumption. This should be done gently to minimise cracking of seed. Belt conveyors are preferable to augers, but where the latter must be used, choose larger diameter types with greater flight-to-barrel clearance.

Care is needed during bulk handling of faba beans to avoid grain damage

Di Carpenter

FINANCIAL RETURNS

The reward for growing faba bean needs to be considered in two contexts: firstly that of the single crop; and secondly that of the system, or rotation, involving faba bean. Various rotations or systems are possible, and will depend on the farming system. Growers need to look at long-term financial outcomes on an individual basis over a number of years.

The annual crop of faba bean

Budgets based on average yields, conservative prices and common costs are developed by NSW Agriculture economists. They are updated yearly and are available on the NSW Agriculture web site.

Seed yields of faba beans vary with season, crop management and disease pressure. Highest yields have approached 6 t/ha, but most yield in the range 2 to 4 t/ha.

On-farm prices for faba bean have ranged from around AUD$200 per tonne to over $300. Base level prices are set by the stockfeed market and are influenced by factors like the parity of the AU$ against the US$ and economic considerations in the stockfeed market. The higher prices are for beans destined for human consumption.

Annual profitability can be gauged by analysing crop gross margin, which is the difference between gross return and costs (Table 4). These figures are indicative only, and growers should adjust them to reflect their circumstances, expectations and prices.

ROTATION BENEFITS

Cereal systems

Faba bean is an efficient rotation crop in wheat systems because it:

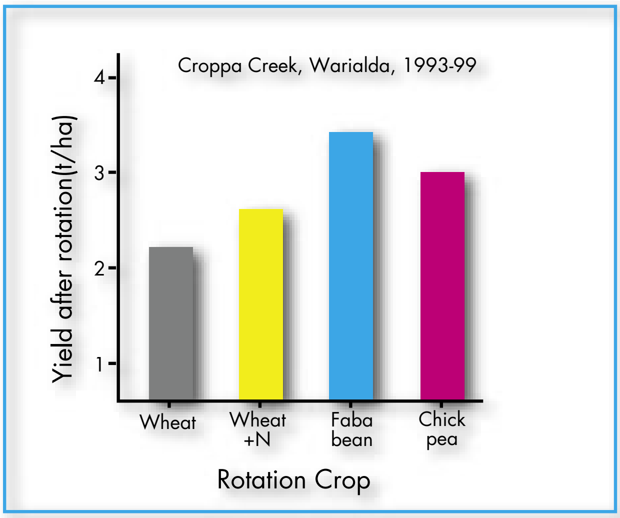
- Increases yield (up 1–1.5 t/ha), and grain protein (up 0.7–1%) in the next wheat crop.
- Has a high level of N fixation.
- Reduces the incidence of diseases like crown rot and cereal nematodes in the next wheat crop.
- Provides alternative grass weed management options in the rotation.

Results from research in northern NSW involving wheat, faba bean and chickpea rotations are illustrated in Figure 4, showing the superior performance of faba beans as a break crop for cereal rotations.

Cotton systems

Collaborative research by the Australian Cotton Research Institute at Narrabri of 35 irrigated faba bean crops has shown that they fixed up to 350 kg N/ha, removed up to 160 kg N/ha in harvested seed and contributed up to 270 kg fixed N/ha to the soil after harvest. The study showed that most faba bean crops fixed almost 3 times as much N as was removed in grain, and the amount of N below the ground accounted for about 40% of the maximum amount of N in the crop, or about 100 kg N/ha.

Figure 4: Average yields of wheat following wheat, with and without nitrogen fertiliser, and following faba bean and chickpea at Croppa Creek in northern NSW.



Source: H. Marcellos, W. Felton (2000). GRDC project DAN 23.

Nitrogen fixation

It is important that faba bean be grown to maximise N fixation, so that:

- growth and yield potential will be highest, and
- the benefits to soil N from N fixation will also be greatest.

The highest levels of N fixation will be achieved by faba bean crops when:

- levels of available soil N (soil nitrate-N) at sowing are low. N fixation is highest when levels of soil nitrate-N in the top 90 cm are less than about 50 kg N/ha at sowing.
- the N demand by the faba bean plant for growth is high.

As a general rule, the higher the yield and grain protein of the previous cereal crop, and the shorter the fallow, the lower will be the level of soil nitrate at the time faba bean is to be sown.

The nature of N benefits from faba bean

These benefits are of two types:

- the N dynamics (N balance) of the legume crop itself, and
- the nature and size of the benefit for the next crop.

N balance of the faba bean crop refers to the difference between the amount of N fixed by the crop, and that removed in the seed at harvest. For example, in Table 5 a well-grown faba bean crop producing 6 t/ha of dry matter above ground will fix about 120 kg N/ha, provided levels of soil nitrate-N in the root zone at sowing are less than about 50 kg N/ha. There would be a gain to the soil of 25 kg N/ha once the grain was harvested.

Table 4: Comparisons of gross margins (GM:$/ha) for dryland wheat (short fallow) and dryland faba beans for the different regions of NSW.

	Faba bean				Wheat				
Region	Yield (t/ha)	Income ($/ha)	Costs ($/ha)	GM ($/ha)	Yield (t/ha)	Quality[1]	Income ($/ha)	Costs ($/ha)	GM ($/ha)
North east	2.5	550	276	274	2.5	AH12	455	219	236
North west	1.8	396	249	147	1.7	PH13	365	132	233
Central east	2.0	440	329	111	2.5	AH	450	216	234
Central west	1.6	352	282	70	1.6	AH	288	171	117
Southern	2.2	515	395	120	3.3	AH	640	286	354
Southern (irrigation)	4.25	935	582	353	4.75	ASW	784	466	318

1 Quality: ASW = Australian Standard White; PH 13 = Prime Hard; AH 12 = Australian Hard.

Source: NSW Agriculture's Farm Budgets for 2002.

Table 5: Working out the N balance for a faba bean crop.

Item		Our crop	Your crop
A.Crop biomass	kg/ha	6000	
B.Crop N @ 2.2%N	kg/ha	132	
C.Add 30% of crop N to allow for roots	kg/ha	40	
D.Total crop + root N	kg/ha	172	
E. Proportion of crop N from fixation.	%	70	
F.Total N fixed	D x E/100, kg/ha	120	
G. Seed yield	kg/ha	2500	
H. N harvested	(Yield x 3.8%)	95	
N balance , or new N. (F–H)	kg/ha	+25	

The **N benefit** refers to how much extra soil nitrate-N will be available to the following wheat crop at the time it is sown. On average in research trials in northern NSW, about 30–40 kg more soil nitrate-N/ha was available to the next wheat crop as compared with a wheat-to-wheat system.

LIVESTOCK FEEDING

Faba beans are palatable, digestible and non-toxic when incorporated into rations for livestock and poultry. They are excellent sources of protein and energy, but have lower levels of the sulfur-containing amino acids, methionine and cysteine, than wheat.

The extent of inclusion of pulses in stockfeed is dependant on which, and how much, anti-nutritional factors they contain.

These factors may interfere with the digestion and utilisation of nutrients in the feed. Research has set various restrictions on the inclusion of raw pulses in the diets of animals.

General nutrient composition of pulses and soybean meal is given in Table 6. Detailed information for Australian faba bean varieties is shown in Table 7.

Table 6: Nutrient composition of pulses

Pulse	Fibre (%)	Protein (MJ/kg)	Energy (%)	Lysine	Methionine
Soybean	6.0	46.0	14.5	2.89	0.56
Lupin (narrow-leaf)	13.0	29.0	14.5	1.35	0.15
Chickpea (desi)	17.0	22.5	15.3	1.20	0.16
Faba bean	8.0	23.0	13.7	1.53	0.18
Field pea	6.0	23.0	14.1	1.60	0.20

Source: Ellen Howard (personal communication). Note: These are average values and significant variation does occur depending on factors such as varieties, agronomic practices and climatic conditions

Table 7: Variation in composition of Australian faba bean varieties

Variety	Protein	Total Starch (%, dry basis)	Cysteic acid	Lysine	Methionine
Aquadulce	29.7	35.6	0.30	1.48	0.17
Ascot VF	28.3	37.4	0.28	1.57	0.18
Barkool	24.7	36.9	0.28	1.50	0.18
Fiesta VF	28.3	39.2	0.25	1.61	0.18
Fiord	28.0	37.2	0.31	1.50	0.19
Icarus	27.7	37.4	0.30	1.50	0.18

Source: P. Burridge (1999). GRDC Project DAW440B.

Faba beans for pigs

NSW Agriculture piggery officers coordinated feeding demonstration trials at four locations throughout the State during the mid-1980s to compare faba beans, field peas, chickpeas, lupins and soybean meal in grower diets for pigs.

There were no differences between the pulses and soybean meal in terms of daily rate of weight gain, backfat levels, feed conversion or dressing percentages. The inclusion of pulses at 20 per cent of the diet gave performance similar to 10 per cent soybean meal, provided the diets were balanced for amino acid content.

Similar results were obtained in South Australia with growing boars fed wheat-based diets equalised for digestible energy and total lysine, in which supplementary protein was provided either by Fiord faba beans or White Brunswick field pea. Pigs grew equally well whether supplemented with faba beans or field pea.

It was concluded at that time that there was a cost advantage to be obtained in preparing feed rations including pulses provided that they could be purchased for half the price of soybean meal less $10. This costing can now be determined using computer programs.

Faba beans for poultry
Canadian research has shown that diets for laying hens and growing turkeys containing 20 and 25 per cent ground faba bean resulted in production performance equal to that from standard diets.

Faba beans for cattle
In rations for dairy cattle, faba beans may replace soybean or other protein meals. Except for coarse grinding, faba beans require no further processing. Faba beans can make up to 35 per cent of dairy concentrates.

Faba beans are an alternative to lupins in beef cattle feeding, and are relatively safe to feed compared with cereal grains due to their lower starch levels. They should be introduced to cattle slowly and with caution, as with any grain, to avoid the risk of poisoning due to a change in diet.

Faba beans for sheep
Faba beans are rarely used for sheep, but could be fed unprocessed in the field in much the same way as lupins, bearing in mind that lupins contain higher protein levels.

Pulses and the feed grain market
Australia's feed grain usage has increased significantly in recent years, from about 6 million tonnes nationally around 1990 to about 8 million in the mid-1990s, to match demand from intensive industries and beef cattle feed lots. Globally, feed grain usage also continues to increase, with the United States and China leading the way.

About 1 million tonnes of pulses (mainly lupins) was used in the domestic feed grain market in Australia during the mid 1990s.

Considerable potential exists for greater use of pulses in compounded stockfeed as pig, poultry and beef feedlot industries expand, and the quantity and/or location of Australian protein ingredient production remains inadequate for total feed demand. It will depend on cost-competitive replacement of imported soybean meal and domestic canola meal.

FABA BEAN MARKETING

Presently only half of the faba beans produced in Australia make human consumption grades, with the remainder going into the stockfeed market. To meet human consumption standards beans must have acceptable colour and minimal blemishes on seed coats (see Tables 8 and 9). This can be achieved by management which limits damage by insects and diseases, avoids late plantings and implements early harvest.

Export marketing
Over recent years faba beans have been mainly exported to Egypt and Saudi Arabia for human consumption as dry beans. Saudi Arabia also has a premium market available due to their canning operations. Smaller quantities have been exported to Jordan, Yemen, Malaysia, Taiwan, Indonesia, Spain and United Arab Emirates. The largest exporter of faba beans is Australia; others include China, United Kingdom, Turkey, France, Ethiopia and Netherlands.

Segregation
Different markets require different sizes of faba beans. As an example, Saudi Arabia requires small beans, similar to Fiord, and Egypt a medium size bean. Australian faba beans are now being segregated on size to meet varying market requirements.

Contracting
Faba beans are generally marketed from harvest when quality and quantity are known. Storage is not normally used as a marketing tool to sell into human consumption markets as seed coats discolour over time. It is advisable to keep in contact with traders and advise of likely quantities for sale during the growing season. Full receival standards are available from grain traders or the Pulse Australia web site. Current delivery standards are shown in Tables 8 and 9 for the two commonly delivered grades in Australia.

Faba beans being fed to sheep in southern NSW

Peter Matthews

Table 8: Minimum receival standard for farmer dressed faba beans No 1 Grade (CSP–4.2.1)
(Source: NACMA Standards 2001)

Parameter	Requirements	Comments / Variations
Physical Characteristics	The faba beans shall be sound, dry and fresh and light to medium brown or pale green in colour	
Purity	97% minimum by weight	Whole faba beans, defective faba beans and seed coats
Moisture	14% maximum	
Defective Seeds	Total 8% maximum by weight including 5% maximum broken etc and 3% maximum poor colour	Faba beans not of the specified variety. Faba bean cotyledons seed that are broken, heat damaged, hail damaged, insect damaged, shrivelled, split, chipped, sprouted and/or affected by mould (field or storage). Includes pods that contain faba bean, whether broken or unbroken and loose seed coat.
Poor Colour	3% maximum by weight	Faba beans with excessive discolouration of the seed coat as per the Pulse Australia faba bean Photographic Charts. Includes ascochyta lesions.
Screen Size	3.75 mm slotted	Faba bean seed material defective if passes through this screen.
Foreign Material	3% maximum by weight	Includes unmillable material and all vegetable matter other than faba bean seed material. This includes stalks and plant material that may be connected with the plant.
Unmillable Material	0.5% maximum by weight	Includes soil, stones, metals and non-vegetable matter.
Snails	Two (2) maximum	Whole or part , dead or alive, per 200g sample
Ryegrass Ergot	Two (2) cm maximum	Pieces laid end to end per 200 g sample
Field Insects	Fifteen (15) maximum	Dead or alive per 200 g sample
Foreign Seeds		See appendix page 4/56 National Agricultural Commodities Marketing Association Inc. (NACMA). Agricultural Commodities: A reference series on the grain industry. Number 4 Pulses, October 2001.
Objectionable Material	Nil tolerance	See appendix page 4/56 National Agricultural Commodities Marketing Association Inc. (NACMA). Agricultural Commodities: A reference series on the grain industry. Number 4 Pulses, October 2001.

Note: Western Australian adjustments: Foreign seeds: No more than the following per 200 g sample
Five (5) Double gees
Five (5) Pulses (including lupins and Icarus faba beans)

Table 9: Minimum receival standard for farmer dressed faba beans No 2 Grade CSP–4.3.1
(Source: NACMA Standards 2001)

Parameter	Requirements	Comments / Variations
Physical Characteristics	The faba beans shall be sound, dry and fresh and light to medium brown or pale green in colour	
Purity	97% minimum by weight	Whole faba beans, defective faba beans and seed coats
Moisture	14% maximum	Faba beans with excessive discolouration of the seed coat as per the Pulse Australia faba bean Photographic Charts. Includes ascochyta lesions.
Defective Seeds	10% maximum by weight including poor colour	Faba beans not of the specified variety. Faba bean cotyledons seed that are broken, heat damaged, hail damaged, insect damaged, shrivelled, split, chipped, sprouted and/or affected by mould (field or storage). Includes pods that contain faba bean, whether broken or unbroken and loose seed coat.
Poor Colour	7% maximum by weight	
Screen Size	3.75 mm slotted	Faba bean seed material defective if passes through this screen.
Foreign Material	3% maximum by weight	Includes unmillable material and all vegetable matter other than faba bean seed material. This includes stalks and plant material that may be connected with the plant.
Unmillable Material	0.5 % maximum by weight	Includes soil, stones, metals and non-vegetable matter
Snails	Two (2) maximum	Whole or part , dead or alive, per 200g sample
Ryegrass Ergot	Two (2) cm maximum	Pieces laid end to end per 200 g sample
Field Insects	Fifteen (15) maximum	Dead or alive per 200 g sample
Foreign seeds		See appendix page 4/56 NACMA Commodity Standards (annual)
Objectionable Material	Nil tolerance	See appendix page 4/56 NACMA Commodity Standards (annual)

Note: Western Australian adjustments: Foreign seeds: No more than the following per 200 g sample
Five (5) Double gees
Five (5) Pulses (including lupins and Icarus faba beans)

Processing and utilisation of faba beans

In most countries, humans consume faba beans as dishes prepared from dry beans. Faba beans are consumed as medamis (stewed beans), falafel (deep fried bean/vegetable mix), bussara (bean paste) and nabet soup (boiled germinated beans).

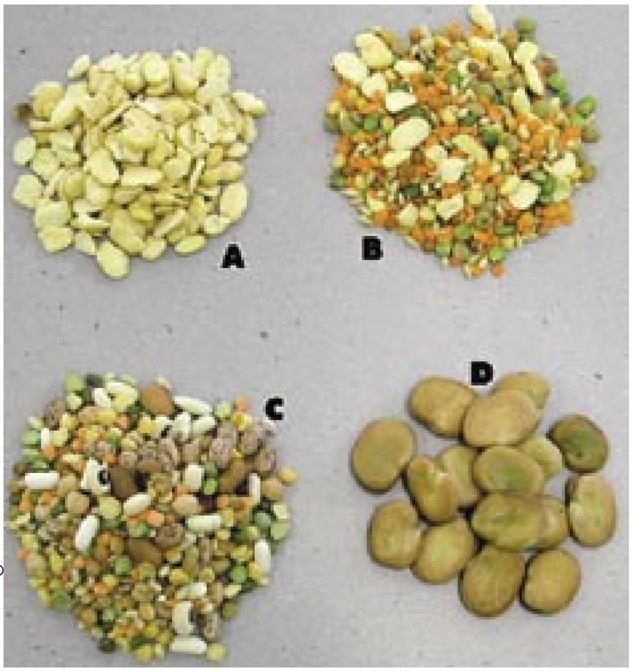
Faba beans can be dehulled, split and ground into flour. The flour is often used as a source of vegetable protein in meat extenders. Faba beans can also be processed into protein-rich and starch-rich fractions. Starch extracted from faba beans is used to make vermicelli, noodles, dumplings and steamed bread.

FABA BEANS IN HUMAN DIETS

Pulses have a long history as human foods in many societies. Chickpeas, faba beans and lentils are important foods in the Middle East. Chickpea, lentil and summer growing pulses are staples in south and south-eastern Asia.

In Australia and other developed countries, their value in human diets is becoming increasingly identified with their potential to improve human health and reduce the risk of chronic degenerative diseases like coronary heart disease, bowel cancer, diabetes, obesity, constipation and diverticular disease.

Faba retail products–A: Faba bean splits; B: Soup mix containing faba bean splits; C: Soup mix; D: Whole faba bean.



Michel Dignand

The role of diet in the prevention and management of these problems is most important, and health authorities recommend that people increase their consumption of complex carbohydrates (starch and fibre) and reduce the intake of total and saturated fats.

The Australian consumer needs to be made more aware of these diet and health issues, and to be given a better understanding of the various pulses and how they may be used. A number of pulse products can be found on the shelves in major Australian supermarkets, and in large cities in small markets which cater for ethnic communities.

Cookbooks are also available: GRDC has published *Passion for Pulses* containing 150 recipes from around the world. The Victorian Department of Agriculture and Rural Affairs has produced *Creative Cooking with Peas, Beans and Lentils*, which describes the pulses, cooking methods and 20 recipes.

FURTHER INFORMATION

For more information on faba bean production consult your local district agronomist.

NSW Agriculture publishes topical information on faba beans in Agnotes and *Pulse Points*, copies of which are available on the Department's worldwide web site or from district offices.

The following publications may also be useful:

Carpenter D, *Pulse Points*, NSW Agriculture, Wagga Wagga.

Grain Legume Handbook Committee, updated 2002 , *Grain Legume Handbook*, Finsbury Press, South Australia.

Hertel K. & Roberts K., annual publication *Insect and Mite Control in Field Crops*, NSW Agriculture, Orange.

McRae F.J. annual publication, *Winter Crop Variety Sowing Guide*, NSW Agriculture, Orange

Moore, K., Nikandrow A., Carter J., Ramsey, M. & Mayfield, *A Field Guide to Faba Bean Disorders in Australia*, GRDC.

Mullen, C.L., Dellow, J.J. & Francis R.J. annual publication *Weed Control in Winter Crops*, NSW Agriculture, Wagga Wagga.

Powell, C. annual publication, *Winter Crop Variety Experiments*, NSW Agriculture, Wagga Wagga.

National Agricultural Commodities Marketing Association Inc. (NACMA). *Agricultural Commodities: A reference series on the grain industry. Number 4 Pulses*, October 2001.

Wurst, M., Hawthorne, W., Nikandrow, A. and Ramsey, M. *Winter Pulse Disorders: the Ute Guide*, PIRSA, South Australia.

World Wide Web sites for faba beans:

NSWAgriculture: www.agric.nsw.gov.au

Pulse Australia: www.pulseaus.com.au

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