NSW DEPARTMENT OF
PRIMARY INDUSTRIES

FIELD PEA: WESTERN NSW PLANTING GUIDE

Better Varieties Faster

KEY POINTS

- Choose the best variety to suit your situation.
- Powdery mildew disease resistance is critical for the central and northern regions of NSW. Be aware of current management strategies for powdery mildew, bacterial blight, ascochyta and yellowing viruses in particular.
- Harvest management has improved with varieties that are more erect, have better standability at maturity, and/or have the sugar pod trait to provide shattering resistance.
- Field peas are suited to a wide range of soil types. Avoid paddocks that have high-exchangeable aluminium levels, are subject to prolonged waterlogging, and where sticks, rocks or hardpans are present.
- Sow in the right cropping sequence, preferably into standing cereal stubble. Never sow pulses after another pulse crop.
- Source high quality seed which is inspected or certified, and has been fumigated against pea weevil.
- Aim to sow early in the optimum planting window for your district.
- Avoid paddocks with problem weeds which either cannot be controlled or may contaminate the grain sample. Consider herbicide residues.
- Plan an insect monitoring schedule for pea weevil and heliothis larvae, at least weekly from early flowering. Ensure insecticides used fit with Insecticide Resistance Management Strategy guidelines for your region.
- Consider desiccation as an aid to harvest management. Understand the correct timing for application of desiccants.
- Early harvest (as soon as seed moisture falls to 14%) ensures maximum yield potential and high seed quality.
- Marketing: understand the contract requirements of the three pea types grown.

New field pea varieties, with improved standability at harvest and disease resistance, have the potential to revolutionise production in central and northern NSW. Field peas are a hardy winter legume that can provide good gross margins in their own right as well as flow on benefits to a following cereal crop. Rotational benefits include the ability to conserve or increase soil nitrogen levels, increased weed control options, and as a break crop for cereal diseases. Wheat yield after field peas can be up to 50% more than wheat after wheat. Wheat protein is also often higher. Field peas tend to use less soil moisture (especially deeper in the profile), leaving some moisture stored for the following wheat crop. Many growers observe that soil tilth is often improved after a field pea crop. Most field peas are grown for grain; however some varieties are also increasingly being used for green manure, forage or hay. The major pea required in the market place is the dun type, with other types (blue and white) filling niche markets.

FIELD PEA VARIETIES

Criteria for selecting a variety

A large number of new field pea varieties with improved characteristics have been released in recent years. These include tare leaf or semi-leafless varieties, better erectness, powdery mildew resistance, improved standability at harvest, and most recently, sugar pod types that give greater seed shattering tolerance at harvest.

Unfortunately, no one variety contains all of these desirable traits, although this is the ultimate objective of current breeding programs. In the drier western regions of NSW, emphasis should be placed on selecting a variety that stands up and does not shatter at harvest. Powdery mildew disease resistance is critical, particularly in central and northern NSW

Sugar pod trait

Photo: Eric Armstrong

Conventional pod type

Photo: Eric Armstrong

(north and west of Dubbo). Good yield potential is important in marginal western areas.

Other factors which may influence variety selection include seed availability (some newer lines may be in short supply), sowing window opportunities, seed type (dun, white or blue), and marketing opportunities for the different pea types.

The table opposite describes differences in variety characteristics, reaction to diseases, and yield potential based on NSW DPI trials.

Photo: Di Carpenter

White flowering Moonlight

Photo: Kathi Hertel

Dark purple flower of Yarrum

Photo: Di Carpenter

Distinctive pink flowers of Kaspa

Moonlight

- White seeded type released specifically for southern NSW
- Special features include shatter resistance and erect growth
- Large round white seed favoured by human consumption markets
- Moderately resistant to downy mildew (avoid growing where powdery mildew may be a problem)
- Out-yields other white pea varieties in both low and high rainfall areas
- Commercialised by Premier Seeds

Yarrum

- Dun seeded type selected and developed for the central and northern region
- Special features: powdery mildew resistance and excellent standability at harvest
- Semi-leafless, semi-dwarf type of medium maturity
- Wide adaptability confers high yield potential from central west NSW to southern QLD
- Commercialised by SunPrime Seeds Pty Ltd

Kaspa

- Dun type with distinctive pink flowers
- Special features: shatter resistant pods, semi-leafless type
- Medium round seeds with attractive reddish-brown seed coat
- Resistant to downy mildew but not powdery mildew
- Vigorous growth, medium height but can lodge at maturity
- Very high yield potential, but can suffer under tough finishes because of its late flowering (later than Parafield)
- Commercialised by AWB Seeds

Morgan

- Semi-leafless dun type (purple flowered)
- Tall scrambling type with excellent vigour and bulky upright vegetative growth habit

Photo: Greg Brooke

Morgan crop in flower

- Lodges at maturity, but because of bulk, is easy to pick up
- Very competitive against weeds
- Well suited to produce either grain, high quality forage, hay or as a green manure crop
- Later flowering than most other varieties; hence can be sown earlier
- Commercialised by Hart Bros. Seeds

Parafield

- Conventional tall scrambling dun type (purple flowered)
- Highest and most stable yielding commercial variety across south west and parts of central NSW
- Appearance similar to Dundale but flowers later and seed size larger
- Has some tolerance to powdery mildew
- Commercialised by PlantTech Pty Ltd

Excell

- High yielding blue seed type
- Semi-leafless type with medium height (white flowered)
- Best standability of all current commercial varieties
- Commercialised by Harvest Grain Australia

This logo indicates that a Pulse Variety Management Package (Pulse VMP) is available for this variety. The Pulse VMP identifies the best available information for new varieties, and summarises the key strengths and weaknesses of the new variety, and how it should be managed relative to current varieties. The program is conducted by Pulse Australia in association with the plant breeders, state agriculture departments and marketers of the new varieties.

Variety characteristics and reaction to diseases

Variety	PBR	Standing at maturity	Leaf type	Height	Maturity	Disease		Seed size (g/100 seeds)	Yield % Kaspa*				Yield % Yarrum*		Comments
						Downy mildew	Powdery mildew		South East		Central & West		North		
									%	No. Trials	%	No. Trials	%	No. Trials	
Dun Peas									Kaspa = 2.60 t/ha		Kaspa = 1.74 t/ha		Yarrum = 1.16 t/ha		
Dundale	No	2	C	T	7	P	S	22	83	58	87	51	–	–	
Kaspa	Yes	4	SL	M	8	R	S	22	**100**	**40**	**100**	**31**	73	7	Shatter resistant
Morgan	Yes	3	SL	T	9	VG	S	18	90	58	94	51	76	3	Vigorous, bulky
Parafield	Yes	2	C	T	7	P	S	23	101	58	101	51	79	17	Dundale replacement
Yarrum	Yes	4	SL	M	7	?	R	–	96	10	91	9	**100**	**16**	Powdery mildew resistant
Blue Peas															
Excell	Yes	6	SL	M	6	M	S	22	94	9	93	9	72	4	Erect
Soupa	Yes	2	C	M	7	G	S	22	93	33	89	33	–	–	
White Peas															
Moonlight	Yes	5	SL	M	5	M	S	23	93	39	95	31	–	–	Shatter resistant
Mukta	Yes	2	SL	M	8	G	R	22	98	58	98	50	88	17	Powdery mildew resistant
Snowpeak	Yes	5	SL	M	4	G	S	22	93	53	91	47	83	3	Erect
Sturt	Yes	2	C	T	5	M	S	19	96	34	104	24	–	–	

* Yields results from trials 1997–2003.
Standing: 1–9 (1 = flat on ground, 9 = erect)
Leaf type: C = Conventional; SL = Semi-leafless
Height: T = Tall; M = Medium
Maturity: 1 to 9 (1 = early, 9 = late) less than 5 best for crop-topping.
Downy mildew resistance: VG = Very good; G = Good; M = Moderate; P = Poor; – = Insufficient data; ? = Unknown
Powdery mildew resistance: R = Resistant ; S = Susceptible

PLANNING TO PLANTING

Paddock selection

Soil type

Field peas are the most adaptable pulse to soil type. They are suited to a wide range of soils, from moderately acid conditions found in some sandy soils (pH_{Ca} 4.8), through to the red loams and heavier clay, alkaline soils (pH_{Ca} 8.0). Field peas are the only pulse crop adapted to tighter hard setting clay soils (sodic soils). However, they are sensitive to high-exchangeable aluminium levels, and do not tolerate extended periods of waterlogging. Level paddocks are preferred; avoid paddocks with gilgai's, sticks or rocks, and hardpans.

Paddock history and broadleaf weeds

All pulse crops should be sown in the right cropping sequence. **Do not sow a pulse after another pulse crop, even following a drought.**

Field peas are well suited to no-till systems. The previous crop should preferably have been a cereal, resulting in low soil nitrogen and disease levels for pulses. This maximises nitrogen fixation and helps minimise disease, through reduced spore splash of fungal diseases. Standing cereal stubble also inhibits aphid activity, which can transmit viruses, and provides support for the growing pea crop.

Broadleaf weed pressure should be low – the weed seed bank should have been reduced in previous crops. Avoid problem weed paddocks, considering both weeds which are difficult to control, and weeds which may contaminate the grain sample.

Herbicide Residues

Herbicide history must also be considered: herbicide residues of, for example sulfonylurea herbicides such as chlorsulfuron (e.g. Glean®) and metsulfuron methyl (e.g. Ally®), can be very damaging, particularly in alkaline soils after extended dry periods.

Seed source

All new variety releases are covered by Plant Breeders' Rights (PBR), and are likely to have an End Point Royalty (EPR). All seed should be fumigated against pea weevil – check with your seed supplier that this has been done.

Sowing

Inoculation

Inoculation with Group E inoculum is essential on all soil types. If using fungicides, treat the seed with fungicide first, then apply inoculum separately just before sowing.

Target plant density and sowing rate

Don't skimp on seed – plant population is important. Aim for 30 plants/m² for early sowing or for tall conventional types; and up to 40 plants/m² for later sowing or shorter semi-leafless types. The newer varieties Kaspa and Moonlight should target intermediate populations ranging from 35–50 plants/m². Sowing rate is usually around 80 to 100 kg/ha, depending on seed size, germination and establishment conditions.

Kaspa field peas with establishment of 45 plants/m²

Photo: Barry Haskins

To calculate your seeding rate, use the following formula:-

100 seed weight (gm)	×	target plant population/m²	×	10	÷	establishment % *	=	seeding rate (kg/ha)

* Be aware that not all germinating seeds will grow, so establishment losses should be taken into account.

Sowing time

Sowing too early increases the risk of frost damage and diseases such as blackspot and bacterial blight. Sowing later than recommended reduces yield potential due to high temperatures or moisture stress at flowering and grain fill. At Dubbo, mid May to early June is preferred, with mid-late May being ideal. At Nyngan, early May suits later flowering types such as Morgan and Kaspa, whilst quicker types should be sown by late May. At Condobolin, the sowing window is from the second week of May through to the first week of June, with the ideal time being mid-late May. At Hillston, late May is the preferred period but the window can extend to late June.

The sowing time guide and map opposite show the preferred sowing times for field peas based on rainfall zones. Within each zone, field peas can generally tolerate being sown up to a week later on the heavier soil types.

Sowing depth and seed placement

Ideally field peas should be sown at 3 to 5 cm depth, but they will emerge from deeper.

In no-till systems, heavy straw can cause problems with emergence and early vigour, especially when too much straw is forced into the seeding slot. Uneven crop growth and ripening make weed and insect control more difficult, and cause problems with harvest. For no-till systems to be fully effective, true inter-row seeding is required.

Levelling/rolling

Since field pea harvesting is generally conducted close to the ground, a level soil surface is highly desirable. This helps with the pick-up of the crop, and avoids header damage and grain contamination from loose stones, sticks and soil. Rolling is best done at sowing using a roller or coil packer, but can be done after emergence at the 2–3 node stage. Post emergence rolling under some conditions can lead to increased disease incidence.

Row spacing

15 cm to 30 cm is preferred, unless using a wider twin-row seeding system. Sowing on wide individual rows, e.g. 60 cm, increases susceptibility to lodging and clumping at harvest.

Fertiliser

Phosphorus is essential for adequate root development. Apply 12 to 20 kg/ha of phosphorus at sowing on most soils in the western region. Decisions should be based on soil testing and/or previous fertiliser history.

CROP MANAGEMENT

In-crop management

Weed control

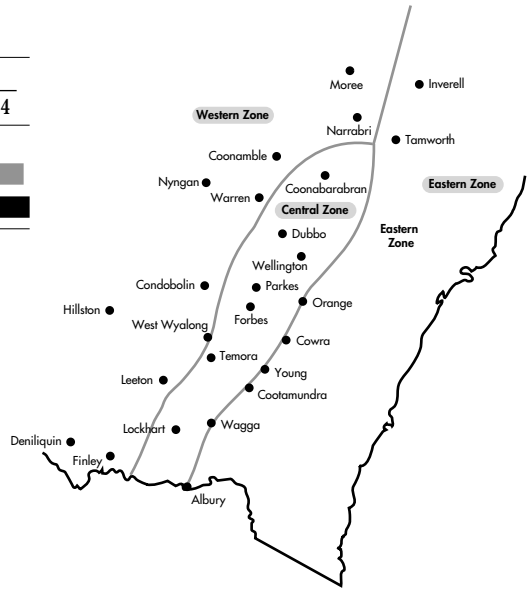
A wide range of herbicides are available for controlling both grass and broadleaf weeds in field pea crops, providing both an effective tool for in-crop weed control, and for rotation of herbicide groups within paddocks. In addition, the relatively late sowing of field peas compared to other crops, and the availability of competitive varieties such as Morgan, provide a major strategy for weed control and herbicide resistance management. Avoid weedy situations where there are no control options or where weeds are unlikely to be controlled.

Sowing time

Suggested sowing times (see map)

Region	Week	May 1	May 2	May 3	May 4	June 1	June 2	June 3	June 4
Western Zone									
Central Zone									
Eastern Zone									

Only suggested for the lower rainfall areas of zones
Preferred sowing time
Later than recommended, yield reduction likely



Herbicide options available include the following:

Pre-emergents:- trifluralin e.g. Treflan®; triallate e.g. Avadex Xtra®; cyanazine e.g. Bladex®; pendimethalin e.g. Stomp® (in southern NSW only).

Post-sowing, pre-emergent:- Spinnaker® (observe plantback periods); metribuzin e.g. Lexone®, Sencor®. Note: care should be taken when applying metribuzin to grey clay soils in areas prone to waterlogging as crop damage can occur.

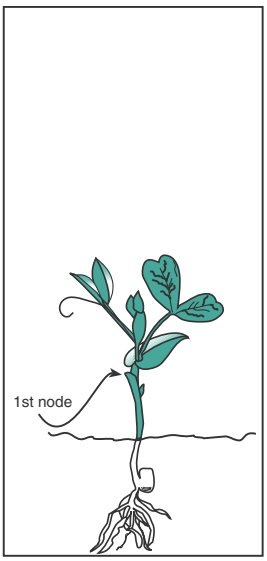
Post-emergent broadleaf control:- Broadstrike®; MCPA® (amine formulations only – use high water rate); Lexone®; Sencor®; Sniper®; Bladex®; Brodal®; Spinnaker®; Raptor®.

Post-emergent grass control: - A good range of grass selective herbicides is available. Note: care should be taken to fit their use with herbicide resistance management programs.

Caution: some varieties have shown lower tolerance to some of the herbicides listed above. Check timing and/or growth stage of the crop – use the diagram below to assess growth stage of young crops prior to herbicide applications. Read herbicide labels carefully. Consider plantback periods when selecting residual herbicides.

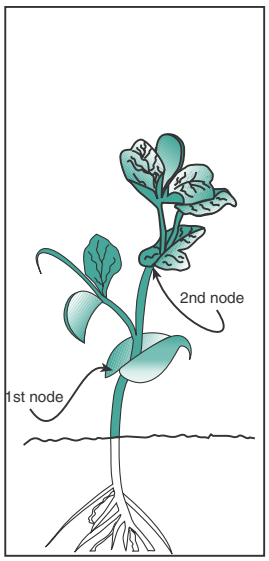
For more information consult the NSW DPI publication, *Weed Control in Winter Crops*.

Early stages of field pea development



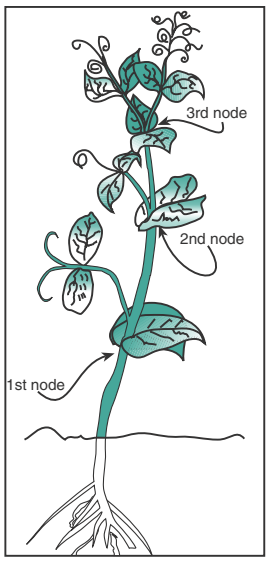
Vegetative stage

First node



Vegetative stage

Second node
Stipule and second leaf at second node fully unfolded with 1 pair of leaflets, simple tendrils



Vegetative stage

Third node
Third leaf fully unfolded at third node with one pair of leaflets, complex tendrils

Disease Management

Powdery mildew is the major disease threat to field pea production in the northern half of NSW. The disease is much more sporadic south and west of Dubbo where it causes only occasional problems. It is capable of causing significant yield loss if early infection occurs. Varietal resistance is the best method of control, with Yarrum having complete resistance. Fungicide options are available for the control of powdery mildew; however timing is critical for fungicide effectiveness and yield recovery from the disease (see Pulse Point 14).

Photo: Di Carpenter

Powdery mildew appears as a white fungal growth on the upper surface of leaves.

Photo: Di Carpenter

Bacterial blight is first seen as a brown watermark where the leaf joins the stem.

Photo: Eric Armstrong

Viral yellowing often occurs sporadically and is sometimes isolated to individual plants.

Pea weevil on flower

Photo: Eric Armstrong

Heliothis larvae on pea pod

Photo: Eric Armstrong

Bacterial blight is a highly infectious disease which can be easily spread by movement through the crop. It is caused by a bacterium which can be both seed borne, and carried on infected plant trash (including stubble). Frost damage accompanied by winds and frequent rain encourages the disease, especially in early sown crops. Mechanical damage caused by machinery moving through the crop may also increase the incidence of the disease.

Since all field pea varieties are susceptible to bacterial blight, control options rely on management strategies which aim to prevent the disease (see Pulse Point 13). Field inspection is considered the most effective means of detecting the presence of bacterial blight in a field pea crop. Several varieties (Yarrum, Moonlight, Kaspa, Excell and Alma) have been included as part of a pilot scheme to produce 'Industry Recommended Field Pea Seed'. This field pea seed is from a field that was inspected during the flowering / pod fill stage of growth, by an independent Pulse Australia or AgriQuality inspector, and the visual symptoms of bacterial blight were not detected at the time of the inspection. If using retained or uncertified seed, only use seed from visibly clean crops or parts of crops. This seed should also be tested to determine disease presence. Removal of pea trash and volunteer pea plants reduce carryover of the disease in the paddock. If problems are anticipated, delay sowing by up to two weeks.

Viral yellowing is caused by a group of viruses which are spread by aphids. They have caused severe problems in north-west NSW for several years, and are of increasing importance in the central region. Whilst varietal resistance is an important option, many new varieties are of unknown status. Sowing field pea crops into standing cereal stubble provides the easiest management tool, as aphids are deterred from entering the crop.

Insect pests

The two main insects which pose a threat to field peas are pea weevil and heliothis (*Helicoverpa* spp). There is no varietal resistance to either pest.

Pea weevils are seed-borne small black chunky beetles about 5 mm long. Since they depend on pea pollen for survival, they actively seek pea crops from first flowering onwards. Control must occur during the first few weeks of flowering and before eggs are laid on the pods (see Pulse Point 4). Growers should only sow certified seed produced in NSW, or seed which has been properly fumigated. In traditional growing areas where pea weevils have established, insecticides can be applied as a border spray of about 40 m wide. Harvested seed should be fumigated with phosphine in a sealed silo straight after harvest to control any pea weevil in the seed.

Heliothis larvae attack a wide range of crops from early spring through summer. The crop should be monitored weekly once flowering commences, through pod formation and dry down. Threshold levels differ depending on end product use (human or stock food) of the crop. However, control of heliothis is almost always needed. The most effective control is achieved when larvae are small (< 10 mm in size), and before they bore into the pod. Sometimes more than one spray may be required. Note: care should be taken to fit pesticide use with regional Insecticide Resistance Management Strategy guidelines.

For detailed information on insecticides refer to the NSW DPI publication, *Insect and Mite Control in Field Crops*.

Haymaking

Field pea can be made into good quality hay and provides another market option to grain. Alternatively crops can be made into silage or ploughed in as green manure. Green manuring is the least profitable option and provides no significant yield benefit over hay or silage making to a following cereal crop. Profitability of hay or silage making will depend on accessing a secure market for the product.

Photo: Kathi Hertel

Field pea makes good quality hay.

Haymaking is a valuable tool to prevent weed seed set in problem weeds, especially herbicide resistant weeds. Weed seeds can be spread by the hay, so buyers and sellers need to be fully aware of the possible problems arising from weed seed contamination. Haymaking can also be used to salvage a financial return from diseased, frosted or drought affected crops. Cutting the crop for hay effectively extends the fallow period and hence increases fallow moisture for subsequent cereal crops.

All varieties will make good quality hay, but varieties with rapid early growth and high dry matter production are best. Morgan is preferred where grown specifically for hay as its dry matter production is higher than any other variety. To maximise dry matter, field peas should be sown in the early part of the sowing window.

Haycutting should take place at the end of flowering / early podding to maximise hay yield and quality. Hay

Photo: Di Carpenter

An even, clean crop on level rock-free ground makes harvest easier.

quality declines after this time as the crop approaches maturity. Hay yields of 5 t/ha are possible where the crop otherwise may have yielded 2 t/ha of grain.

Desiccation

Desiccation of field pea crops prior to harvest can greatly improve timeliness of harvest and grain quality, and greatly reduce soil and trash contamination of the sample. Pea maturity can be advanced by 7 to 10 days. Harvest problems, caused by late weed growth or irregular ripening, can be minimised. Yield losses from potential shattering, wet weather delays or hail damage are reduced. Less seed damage is likely to occur from late insect attack or disease blemishes. Spraytopping can be used to prevent weed seed set in herbicide resistant weeds, provided the weed seed is at the correct stage.

Information on correct timing of desiccation is provided in Pulse Point 5. Both Reglone® and Roundup PowerMAX® are registered for desiccation, whilst Gramoxone® and Roundup PowerMAX® are registered for spraytopping. The reason for desiccation will determine which product is most suitable for use. For example some crops may only require the removal of green material to reduce moisture content in the sample, whilst in other crops a very quick desiccation will speed up maturity as a harvest aid. However, it should be noted that pre-harvest withholding periods for some products may restrict their use. Up-to-date product registrations are contained in the NSW DPI publication *Weed Control in Winter Crops*.

Windrowing

Windrowing has generally not been recommended as a pre-harvest option because the field pea windrows are too easily moved by wind. However, several growers have been able to successfully use this technique as a pre-harvest aid. Windrowing is preferable only where there is standing stubble (i.e. the previous year's wheat stubble), and where there is a reasonable size crop, to stop wind picking up the windrows. Timing is the same as that for desiccation. In very heavy crops it is best to avoid windrowing too early, as the bottom of the row is slower to dry.

Windrowing of field pea crops has similar benefits to desiccation. It helps to even up crop maturity, eliminates late weeds causing harvesting difficulties, decreases the amount of dirt in the sample, speeds up harvest, and decreases harvest losses. Whilst the windrows can be blown around in strong winds, grower experience suggests that field pea windrows are as safe as canola windrows, provided the crop is anchored in standing cereal stubble.

Harvesting

Harvest of field pea crops normally occurs well before wheat is ready, and should start as soon as seed moisture falls to 14%. Delays lead to seed quality loss, harvest clashes with other crops, greater soil contamination, increased pod shattering, emergence of pea weevil in the field, problems with late weed growth, more severe crop lodging, and increased crop vulnerability to damage by late rain and hail.

Rolling after sowing reduces pick-up of rocks and clods at harvest. Crops sown into cereal stubble have considerably less soil contamination of the seed. Use contour-following crop lifters. Seed to be kept for sowing should be harvested first when moisture content is higher, and damage caused by the header is least. Grain damage can be minimised by adjusting header settings; in particular low drum speeds should be used. The good standing, semi-leafless varieties such as Kaspa or Yarrum are easier to feed into headers with table augers than those with draper-type fronts. For the latter types, fitting cross-augers along the back of the header front greatly improves flow of the cut crop. Fit a perforated screen under both the clean grain and repeats elevator of the header, to drop out any dirt from the sample. Perforated screens can also be fitted to field augers. Try to minimise subsequent handling of the grain.

Marketing

Most peas are sold following harvest when grain quality can be assessed. However, traders may offer forward contracts to growers to supply their specialty markets. Growers should ensure they understand the contract requirements to suit the needs of the three types of peas grown.

Dun peas are the most robust of the pea types with both food and stock feed market opportunities. Localised feed markets in the south west utilise most of the peas grown in that region. Dun peas are the preferred field pea type for export to the Indian subcontinent, with Australia having the competitive edge of producing the bulk of dun peas in the world. Quality is still a problem, particularly from pea weevil

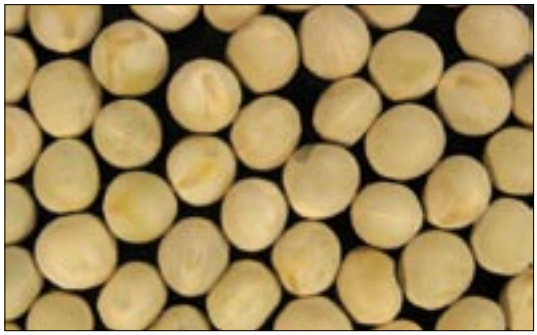


Photo: Di Carpenter

Field pea seed ready for market – no blemishes or contaminants.

and heliothis damage, and the amount of dirt in samples. Varieties with improved standability should overcome this problem.

The Australian white pea market is continuing to develop human consumption markets, although there is strong competition from Canada. The stock feed industry has started to accept white peas, and will underpin the white pea industry in the short term.

The Australian blue pea market still supplies a small domestic market and niche export markets. Quality is vital. Seed size, colour bleaching, pea weevil and heliothis damage, and contamination from other pea types, are major problems that need to be addressed by growers.

Niche markets accept generally smaller volumes of higher quality grain that commands a premium to the grower. These include sprouting peas, which mostly use scrambling dun types with high germination and no dirt; and birdseed markets which accept machine dressed dun peas. Field peas are also in demand to replace bone and meat meal previously used in animal feed products.

Growers should be able to store their field peas to obtain better prices when markets are variable.

FURTHER INFORMATION

NSW DPI publications:

Winter Crop Variety Sowing Guide

Weed Control in Winter Crops

Insect and Mite Control in Field Crops

Agnote DPI 446 – *The right pulse in the right paddock at the right time* (1st edition, 2003) C. Mullen

Pulse Point 4 – *Managing Pea Weevil* (3rd edition)

Pulse Point 5 – *Desiccation and harvest of field peas* (2nd edition)

Pulse Point 13 – *Strategies to minimise bacterial blight in field peas*

Pulse Point 14 – *Powdery mildew in field peas*

Website addresses:

NSW DPI: www.dpi.nsw.gov.au

Pulse Australia: www.pulseaus.com.au

Disclaimer

Authors

Leigh Jenkins, District Agronomist, NSW DPI, Warren

Peter Matthews, District Agronomist, NSW DPI, Temora

Barry Haskins, District Agronomist, NSW DPI, Hillston

Kathi Hertel, District Agronomist, NSW DPI, Dubbo

Greg Brooke, District Agronomist, NSW DPI, Nyngan

Eric Armstrong, Research Agronomist, NSW DPI, Wagga Wagga

Don McCaffery, Technical Specialist (Pulses & Oilseeds), NSW DPI, Orange

Garry Lane, Senior Agronomist, Agrigrain, Narromine

Acknowledgments

Col Mullen, former District Agronomist, NSW DPI

John Slatter, Program Manager – Crop Support, Pulse Australia

This planting guide has been produced with the financial assistance of the Central NSW Pulse Group of Pulse Australia.

PULSE AUSTRALIA

GRDC
Grains Research & Development Corporation

Job 5646
February 2005