

KEY FEATURES

- Moonlight is no longer covered by PBR, and is not widely available from seed retailers.
- It is a white flowering, semi-leafless pea similar to Kaspera in many attributes.
- It has large, round, white seeded grain is suited to splitting and human food markets.
- It is best suited to longer growing season environments, but faces competition from the variety Bundi[Ⓛ], a similar, but earlier flowering and maturing variety.
- Extreme care during harvest and handling is critical to ensure seed viability for sowing.
- Moonlight has fair lodging resistance at maturity and is resistant to shattering at harvest.
- High plant populations and early sowing has proved beneficial.
- Downy mildew control may now be required in susceptible areas where a new strain has developed.
- Like Kaspera[Ⓛ], Moonlight is more susceptible to Bacterial Blight than conventional pea types, and needs to be managed for blackspot and powdery mildew in disease prone areas.
- Moonlight is susceptible to Pea Seed-borne Mosaic Virus and seed testing is recommended

Where Moonlight fits into the farming system

Moonlight is tall, erect, semi-leafless, white seeded pea that is similar to Kaspera, but slightly lower yielding. It has a fit where growers want to produce a white seeded pea to service either niche human consumption markets or feed markets. It does however have to be considered against alternative varieties in low rainfall areas, in areas prone to early high temperatures and drought stress, or in areas prone to frequent and severe vegetative frosts that are likely to exacerbate bacterial blight infection and spread.

Breeding

Moonlight (90-166*30-5) was developed by the Australian Coordinated Field Pea Improvement Program (now Pulse Breeding Australia) and released in 2003 after evaluations in Vic, SA and NSW.

Agronomic Characteristics

Moonlight is a semi-leafless, downy mildew resistant field pea. It produces large, round, white seed suited to splitting and human food markets. Its combination of erect vigorous growth, medium height and shatter resistant pods greatly assists harvest and eliminates seed losses either during maturation or harvest. Moonlight is mid-flowering - about 11 days earlier than Kaspera and 5 days later than Snowpeak when sown in early June at Wagga.

Moonlight has pod shatter resistance (sugar pod) that helps reduce grain loss if harvest is delayed or poor conditions exist at maturity. It produces a uniform large rounded white pea that is preferred by many markets.

Agronomic Features & Disease Resistance

	Seed Type	Leaf Type	Plant height	Relative flowering time	Maturity	Standing at maturity	Pod shatter resistance	Black Spot	Downy Mildew		Powdery mildew	*Bacterial Blight (<i>P. Syringae pv. syringae</i>)	PSbMV#
									(1)	(2)			
Kaspera [Ⓛ]	Dun	SL	M	Late	Late	Fair	R	MS-MR	MR	S	S	S	S
Parafield [Ⓛ]	Dun	C	T	Mid-Late	Late	Poor	S	S	S	S	S	MR-MS	S
Yarrum [Ⓛ]	Dun	SL	M-S	Mid	Late	Fair	S	S-MS	S	S	R	MS-MR	R/R#
Morgan [Ⓛ]	Dun	SL	T	Late	Late	Poor	S	MS-MR	S	R	S	MR	S
Moonlight	White	SL	M	Late	Late	Fair	R	MS-MR	MR	S	S	S	S
Bundi [Ⓛ]	White	SL	M	Early	Early	Fair	R	MS-MR	R	MS-MR	MS	S	S/R#
SWCeline [Ⓛ]	White	SL	M	Early	Early	Good	S	S	MS-MR	-	S	S	-
Sturt [Ⓛ]	White	C	T	Mid	Mid	Poor	S	MS	MS	S	S	MR-MS	S
Excell [Ⓛ]	Blue	SL	M	Early-Mid	Mid-Late	Good	VS	MS	MR	S-MR	S	S	S

*Bacterial Blight testing is based on screening over the last 2 years for *Pseudomonas syringae* pv. *syringae* and further screening trials will continue. # is variation depending on pathovar.

R = resistant; MR = moderately resistant; MS= moderately susceptible; S = susceptible.
Leaf type: C = conventional, SL = semi-leafless.

Yield and Adaptation

Moonlight was released as being suited to areas where growers are seeking a large white seeded field pea with good yield, erect growth and shatter resistant pods. Its adaptation should be similar to that of Kaspas[®], but its adoption has tended to be mainly in the better rainfall areas of southern NSW. Some growers have struggled to achieve acceptable plant establishment with Moonlight, probably because its large, white seed is more vulnerable to mechanical damage during harvest, handling and seeding. Moonlight appears also to be less suited to cold, frosty environments that have bacterial blight problems in field peas.

Moonlight has ceased being evaluated in Field Pea variety trials since 2006,

National Variety Trials – Long Term Yields as % of Kaspas: to 2005

	NSW		Vic		SA				
	South-east 1999-2005	Central & West 1999-2005	Mallee 1997-2003	Wimmera 1997-2003	<400mm 1998-2005	400-450mm 1998-2005	450-500mm 1998-2005	>500mm 1998-2005	
White Peas									
Sturt ⁽¹⁾	w	99	102	106	103	97	96	96	95
Moonlight⁽¹⁾	w	92	91	90	96	89	90	92	93
Snowpeak ⁽¹⁾	w	89	87	93	98	85	86	89	90
Mukta	w	98	98	93	97	89	91	94	92
Dun & Blue Peas									
Kaspas ⁽¹⁾	d	100	100	100	100	100	100	100	100
Parafield ⁽¹⁾	d	101	102	100	100	93	93	94	94
Excell ⁽¹⁾	b	88	84	87	96	83	86	89	91
Kaspas Yield (t/ha)		2.65	1.74	1.64	1.90	2.06	2.72	3.51	3.76

Yield data courtesy DPI NSW, DPI Vic, SARDI.

Quality Characteristics

- Moonlight produces large spherical white seed which could attract a premium in some niche markets
- Desiccation advances maturity and can assist with quality
- Heliothis and pea weevil damaged grain is unacceptable for the human food markets
- Its large white peas have a thinner seed coat and can be more susceptible to damage than dun types
- Even if seed is not visually damaged, its abnormal seedling count could be high, leading to poor establishment when used as sowing seed.

Management Package

(Consult local grower guides for more detailed information)

This VMP updates and reinforces those management issues with Moonlight peas that may be different to other pea varieties. Refer to existing guides for other general pea management issues.

Seeding Rate

Target 40 – 50 plants/sqm - similar to Kaspas (110-150kg/ha, subject to seed size & germination test)

- Use higher sowing rates with later sowings, See Pulse Point 20 “Germ testing & seed rate calculation”
- Always request a germination test report with commercially bought seed & test own kept seed after grading.
- Seed can be damaged with rough handling and from high velocity air flow through airseeders during sowing

Do not reduce seeding rates to allow a more open canopy for crop-topping. Early canopy closure is critical for controlling herbicide resistant ryegrass.

Sowing Date

The sowing date to target for Moonlight is similar to Parafield or Kaspas[®] in most areas, aimed at:

- Minimising black spot and other diseases. Early sowing is possible with Moonlight, but the potential for disease is increased.
- Consult regional publications and the “Blackspot Manager” computer model for recommended sowing times in your district see: http://www.agric.wa.gov.au/content/PW/PH/DIS/crop_disease_forecast.htm.
- Moonlight is more sensitive than Parafield to yield loss when sowing is delayed and has shown greater yield response to being sown early in recent years because of dry springs and Moonlight’s greater susceptibility to them.
- In frost prone areas Moonlight can be sown one to three weeks later than Parafield to avoid late frosts during flowering and early pod fill. Its yield potential is reduced because of the subsequent shorter flowering duration and greater exposure to the risk of late heat stress.

Row Spacing

Recent NSW DPI trials have shown it is safe to widen field pea row spacing to 30 cm, however at the wider (50 cm) rows yields were lower and lodging may be greater with an erect variety such as Kaspas[®] or Moonlight.

Herbicide Sensitivity

Herbicide screening at Wagga (acidic red earths) over 4 years shows Moonlight to be safe with commonly used herbicides except metribuzin which caused significant damage in both 2002 & 2003.

Disease Management

Moonlight is likely to no longer be resistant to Downy Mildew because a new strain has developed. A metal-axyl seed dressing is now required in susceptible areas.

Greater emphasis on Bacterial Blight prevention and control is needed in Moonlight than with Parafield and other conventional pea varieties. Sow clean seed, and avoid damaging the crop with herbicides or physical practices such as rolling or wheel tracks during cold, frosty or wet periods.

To minimise yield losses from Black spot, Bacterial blight and Powdery mildew follow best management guidelines for your region (see 'Other reading' below).

Rolling

Moonlight paddocks may still need to be rolled post sowing to enhance harvest efficiency, or avoid contamination with dirt, stones etc, particularly in areas or seasons where pod height is low or lodging occurs. Beware of rolling after emergence as crop damage can increase bacterial blight risk.

Insect Control

Monitoring and early budworm control is more critical with Moonlight because of its later flowering time and short flowering duration. Higher moth numbers are present, and grub pressure is usually higher at this time compared with varieties with earlier flowering and longer duration.

Sweep netting is more difficult in a semi leafless pea because of tendrils and their erect biomass. Threshold levels may need to be lowered, or use of a beat-sheet to be more accurate in assessing actual grub numbers and size.

Frost and Heat

The later flowering of Moonlight and its short flowering and podding duration can often help escape normal frost periods, however a late frost or heat event may cause more significant yield loss than in conventional varieties such as Parafield or Sturt[®].

Impact of frost in the vegetative stages can be exaggerated by the presence of bacterial blight in conjunction with crop stress or physical damage.

Crop Topping

Moonlight matures early enough to be crop-topped to prevent weed seed set, particularly ryegrass. Even in high yielding bulky crops, ryegrass seed heads will emerge above the canopy. Deep penetration of the desiccant into bulky, erect canopies can be an issue. Dense stands of Moonlight are more competitive with ryegrass later in the season compared to scrambling types.

Windrowing

Windrowing has been successful with Kaspas[®], aided by its tendrils, but with similar flow problems and modification solutions perhaps being required to belt front harvesters. Windrows must be rolled immediately after swathing.

Desiccation and Harvest

Desiccate when seed moisture drops to around 30%. To collect seed for this, randomly pick 10-20 stems or more across the paddock. See Pulse Point 5 "*Desiccation and Harvest of Field Peas*" at <http://www.dpi.nsw.gov.au/agriculture/field/field-crops/pulses/peas/field-peas>.

Harvest Moonlight as soon as seed moisture falls to 14% and avoid cool damp conditions. Its non-shattering trait reduces the comparative risk of seed loss before and during harvest, but delayed harvest leads to seed quality decline. Harvest crops being kept for seed first, gently and the correct moisture content. Moonlight seeds appear to be more vulnerable to mechanical damage during harvest, handling, storage and seeding operations than other pea types.

Crop lifters are usually not required for harvesting Moonlight, unless the crop is very short. A flex front is ideal. In very dense crops, side cutters or coulters may be needed to 'break open' the crop to prevent yield loss. Harvesting problems with Moonlight are mostly associated with draper fronts or excessive ground speed.

A raised cross auger with paddles fitted above broad elevator intake can be fitted on draper fronts to greatly help crop intake. Lupin breakers on the cross and/or table auger will keep material flowing. Pea pluckers can throw Moonlight peas over the back of the comb, guards or backward facing rods can be fitted.

See <http://www.agric.wa.gov.au/content/fcp/lp/fp/cp/harvsemileafless.pdf> or view the DVD "Successfully harvesting semi-leafless field pea" available from DAFWA.

Marketing

Segregation from small white peas and dun types is likely for specific food markets. Moonlight does not have an End Point Levy.

Seed Availability and PBR

Moonlight is no longer protected by Plant Breeders Rights which means that its seed can be freely traded from grower to grower. Seed was originally obtainable through AustWest Seeds who were the original marketers of Moonlight peas under sub-licence to Premier Seeds. Seed is unlikely to be obtainable from them now, so growers must either purchase from a grower or retain their own seed their own use as seed.

**Moonlight
Seed Supply
enquiries:**



Auswest Seeds were the original marketers of the variety Moonlight, under sub-licence to **Premier Seeds.**
Phone 02 6852 1500

Agronomic Enquiries

Wayne Hawthorne (Pulse Aust) 0429 647455
Alan Meldrum (Pulse Aust) 0427 384 760
Larn McMurray (SARDI) 08 8842 6265
Peter Matthews, I&I NSW. 02 6977 3333

Trevor Bray (Pulse Aust) 0428 606 886
Tony Leonforte (Vic DPI) 03 5362 2111
Jason Brand DPI Vic 03 5362 2341
Ian Pritchard, DAFWA 08 9368 3515

Other Reading:

 For field pea management guidelines see:

- Grain Legume Handbook 2008
- Pulse Australia publications: "Field pea disease management strategy for southern region GRDC" and supplements, and "Pulse seed treatments and foliar fungicides" (www.pulseaus.com.au)
- SARDI fact sheet "Field pea variety sowing guide 2009" www.sardi.sa.gov.au/pdfserve/fieldcrops/research_info/sowing_guide/peas.pdf)
- I&I NSW publications (www.agric.nsw.gov.au): "Winter Crop Variety Sowing Guide 2009" ; Pulse Point 20 "Germination testing and seed rate calculation"; "Weed Control in Winter Crops 2009"; "Insect and Mite Control in Winter Crops"; "Desiccation and harvest of field peas".
- Vic DPI "Winter Crop Summary 2009" and fact sheets (www.dpi.vic.gov.au).

Acknowledgements

The contribution of the following people to either the extensive field testing, or the production of this or the original publication is gratefully acknowledged: Larn McMurray, Pulse Research Agronomist, SARDI; Jason Brand, Pulse Research Agronomist, Vic DPI; Eric Armstrong, Pulse Research Officer, I&I NSW; Jenny Davidson; Plant Pathologist, SARDI; Mark Seymour, Research Agronomist, Dept. Agric and Food, WA; Trevor Bretag, formerly Plant Pathologist, DPI Vic; Sandra Nitsche, formerly Research Agronomist, SARDI; Tony Leonforte, Plant Breeder (Peas), DPI Vic; Ian Pritchard, Agronomist, Dept. Agric. WA; Wayne Hawthorne, Trevor Bray and Alan Meldrum, Pulse Australia.

Disclaimer: Recommendations have been made from information available to date and considered reliable, and will be updated as further information comes to hand. Readers who act on this information do so at their own risk. No liability or responsibility is accepted for any actions or outcomes arising from use of the material contained in this publication.

This VMP has been jointly prepared by: Wayne Hawthorne, Pulse Australia; Tony Leonforte and Jason Brand, Vic DPI; Larn McMurray, SARDI on information and data from, SARDI, DPI Victoria, I&I NSW, DAFWA and NVT.

Reproduction of this VMP in any edited form must be approved by Pulse Australia © 2005.



Department of
Primary Industries



Department of
Agriculture and Food



Industry &
Investment