

KEY FEATURES

- Highest yielding variety in 2010 NVT
- Ascochyta blight resistance is rated as (R) Resistant
- Mid flowering and mid maturity, adapted to most growing regions of southern Australia
- Medium/tall plant height, taller than PBA Slasher[♠]
- Seed size is 17g/100g, marginally larger than GenesisTM836

Name and synonyms

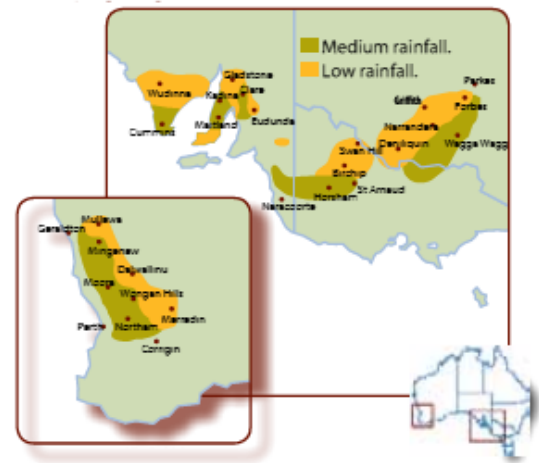
Neelam[♠] is a hindi/urdu word (the most widely spoken languages in the Indian Subcontinent) meaning the gem -Blue Sapphire. This follows the WA convention of naming chickpea varieties in the language of the target market and referring to gems or precious metals found in Australia.

Neelam[♠] has been tested as WACPE2155, 99-451A-WAD7 and 99-451A-WAD007.

Area of Adaptation

Neelam[♠] is well adapted to most areas of southern Australia consistently ranking in the top yielding varieties ranking higher than PBA Slasher[♠] and GenesisTM836. Limited trials in NSW and Queensland show Neelam[♠] yields competitively.

Map of adaptation



Variety Characteristics

Breeding:

This variety has been developed by Dr Tanveer Khan (former DAFWA Plant Breeder), Winthrop Professor Kadambot Siddique (The University of Western Australia) and the Pulse Breeding Team of DAFWA. The cross (8511-19/ICC 13729) was made in 1999 at Tamworth and then transferred as F4 generation to WA. The segregating population was grown at Merredin 2003 and subjected to ascochyta blight epidemic. A single plant showing ascochyta blight resistance and desirable agronomic trait was harvested individually and progeny grown in 2004, again at Merredin along with other single plant selections. This line was then observed as genetically fixed and tested at multi-location breeding trials until 2011.

Agronomic Characteristics:

The agronomy of growing Neelam[♠] is similar to all current Australian chickpea varieties. Neelam[♠] has the following agronomic characteristics.

- Plant height is higher than most Australian varieties but slightly lower than GenesisTM836
- Mid flowering similar to GenesisTM836
- Lodging has not been seen in any trial in WA, including trials where Neelam[♠] has yielded more than 4 t/ha
- Neelam[♠] is a mid-maturity variety similar to PBA Slasher[♠] and GenesisTM836
- Neelam[♠] is resistant to ascochyta blight, as found over several years of testing in WA and in variable environments in India and NSW.

Agronomic features & disease resistance

Variety	Type	Seed Weight (g/100)	Seed colour	Flowering time	Maturity time	Plant height	Lodging	Ascochyta blight	Ascochyta rating*	Botrytis grey mould
Neelam [♠]	Desi	17	brown	Mid	Mid	Med-tall	MR	R	3.9	S
Ambar [♠]	Desi	16	light brown	Early	Early	Short-Med	MR	R	3.8	S
PBA Slasher [♠]	Desi	21	brown	Mid	Mid	Medium	MS	R	4.1	S
Genesis TM 836	Desi	17	light brown	Mid	Mid-Late	Tall	MR	MS	4.8	S

* Medina disease nursery 2008 - 2010

Yield & Adaptation

Neelam[Ⓢ] is well adapted to most of Southern Australia. Neelam[Ⓢ] yields are generally better than PBA Slasher[Ⓢ] and Genesis[™]836. In a significant number of NVT trials it is the top yielding or amongst the top yielding named varieties. It also yields well under low yielding, shorter growing season (low rainfall) environments making it particularly suited to Western Australia. Limited trials in NSW and Queensland show that it provides competitive yields.

National Variety Trials – Predicted Average Yields: 2005-2012.

Yield data courtesy of Aust Crop Accreditation System – National Variety Trials

Variety	South Australia				Victoria		Western Australia		
	South East	Mid North	Upper EP	Yorke Pen.	Mallee	Wimmera	Agzone 1	Agzone 2	Agzone 4
Neelam [Ⓢ]	2.04	2.11	0.94	2.07	1.44	1.41	1.45	1.24	1.11
Ambar [Ⓢ]	2.01	2.07	0.91	2.07	1.36	1.33	1.40	1.16	1.06
Genesis [™] 836	-	1.92	-	1.88	1.30	1.27	1.36	1.14	1.05
PBA Slasher [Ⓢ]	2.03	2.13	0.93	2.08	1.43	1.40	1.41	1.19	1.08

National Variety Trials – Yields as % of mean site yield: 2009 and 2012.

Yield data courtesy of Aust Crop Accreditation System – National Variety Trials.

Western Australia

Variety	Mingenew			Mullewa				Wongan Hills	Dalwallinu	Coorow	Muresk	Merredin
	2009	2011	2012	2009	2010	2011	2012	2012	2012	2011	2011	2011
Neelam [Ⓢ]	117	95	96	116	119	93	103	106	100	114	102	106
Ambar [Ⓢ]	116	90	107	98	97	104	102	105	101	95	108	94
Genesis 836	97	95	99	106	97	89	100	97	110	112	98	113
PBA Slasher [Ⓢ]	103	108	103	95	107	107	95	97	109	112	119	92
Site yield t/ha	1.38	2.83	0.79	1.18	0.58	2.68	0.83	0.94	0.99	2.08	2.75	0.79

South Australia

Variety	Riverton				Minlaton				Rudall			Yeelanna	
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2012	2011	2012
Neelam [Ⓢ]		113	98	103		114	100	96		140	105	106	100
Ambar [Ⓢ]	121	98	88		110	111	103		98	119		103	
PBA Slasher [Ⓢ]	107	101	106	99	97	104	99	103	115	99	106	98	114
Site yield t/ha	1.18	3.95	2.96	2.48	2.1	3.38	2.83	2.15	0.93	0.81	1.52	2.69	1.25

Victoria

Variety	Rainbow			Birchip			Ultima		
	2009	2011	2012	2010	2011	2012	2010	2011	2012
Neelam [Ⓢ]		95	93	111	101	105	116	106	106
Ambar [Ⓢ]	107	87		110	96		105	94	
PBA Slasher [Ⓢ]	107	101	103	99	96	112	99	103	101
Site yield t/ha	0.9	1.43	0.84	2.83	1.75	1.16	2.47	1.37	0.68

Management Package

(Consult local grower guides for more detailed information)

This VMP updates and reinforces general management issues with growing desi chickpea. Refer to the Pulse Australia and State Department websites for further information on chickpea management issues.

Paddock Selection

Select paddocks which have

- Well drained soils with a pH above 5.5 (CaCl₂), heavy deep clays, heavy loam, sandy loam and loamy sands. Avoid soils with a pH below 5.5 (CaCl₂), saline soils, high boron soils and acid (Wodjil) soils. Chickpea has poor tolerance of low pH, particularly where aluminium toxicity can be a problem
- A soil structure and slope which allows good drainage—avoid shallow soils
- Little or no risk of sulfonylurea carryover
- A low broad-leaf weed burden.
- Few rocks and roots and can be left relatively flat and even after sowing for harvest.

To minimise the risk of diseases, do not grow chickpea more often than one year in four in the same paddock and at least 500m from previous seasons chickpea stubble.

Sowing

- Target the sowing date used for desi chickpeas in your region. Gains in yield and grain quality can be made from timely sowing
- Sowing depth: aim for a sowing depth of 5cm. Chickpea will tolerate sowing to 8 cm with moist soil conditions
- Sowing rate: 40–45 plant/m² is the optimum plant density which corresponds to a sowing rate of between 90–100 kg/ha subject to seed size & germination test
- Row spacing: Trials and commercial experience indicate that there is little or no yield penalty with wide row spacing up to 60 cm.

Fertiliser

Chickpea is effective at extracting phosphorus and shows no yield response to additional P at soil levels above 20 mg/kg (Cowell test). If levels in the soil are between 10 mg/kg and 20 mg/kg, add at least 8kg P/ha. As a guide, approximately 3.2 kg of P is exported in one tonne of chickpea grain.

Inoculum

Inoculate with Group N Chickpea rhizobia inoculum at sowing. This applies regardless of the cropping history of the paddock, and inoculation is recommended in all circumstances.

All chickpea seed should receive a fungicide seed dressing (P-Pickle-T) to reduce ascochyta blight, however fungicide seed dressings are toxic to rhizobia. The pickle must be applied first (may be months in advance) and allowed to dry before inoculum is applied. Alternatively, use a granular Group N inoculum product.

Herbicide Sensitivity

Herbicide tolerance trials in Victoria and South Australia (Wimmera clay and alkaline sandy loam soils) show that herbicides commonly used in chickpea production can be used on Neelam[®] with the same degree of safety.

Severe seasonal effects on herbicide activity can occur and work is ongoing to validate findings under differing seasonal conditions.

Disease Management

To minimise yield losses to ascochyta blight, botrytis grey mould and phytophthora, follow local best management guidelines for your region, eg see disease management guides on www.pulseaus.com.au or State Department web sites. Use a seed dressing (containing thiram or thiabendazole plus thiram) for the control of ascochyta blight, botrytis grey mould and common root rots.

Ascochyta blight (AB) disease management with Neelam[®] is the same as with the other ascochyta resistant (R) varieties PBA Slasher[®] or Genesis[™]090:

- Fungicide sprays (a.i.chlorothalonil) are unlikely to be required before podding, but monitor crops for signs of disease.
- In WA, an early fungicide application is recommended 6-8 weeks after sowing to delay the development of AB.
- In all regions, monitor crops and use a foliar fungicide at early podding prior to rain to ensure pods are protected, and high quality, disease free grain is produced.
- Pods of Neelam[®] can be affected by ascochyta blight, and this can result in poor quality, discoloured grain or seed abortion and yield loss in severe disease situations.

All current varieties are susceptible to BGM.

There is a risk of Botrytis Grey Mould (BGM) infection in Neelam[®] if a dense, bulky canopy develops during a favourable growing season.

- Apply a fungicide prior to canopy closure in BGM prone areas and continue monitoring. Apply further fungicide applications if BGM is present.

Insect control

Chickpea is highly susceptible to native budworm. Crops need to be monitored from flowering through to pod fill. Small grubs less than 1 cm are damaging. Economic threshold for control can be as low as 1 grub in 20 sweeps.

Harvesting

The crop is ready to harvest when the stems and the majority of pods are light brown and the seed is hard and rattles within the pod. Seed moisture needs to be less than 14 %. Pods will be shed if harvest is delayed.

Suggested harvester settings are as follows;

Reel speed 1.0 x ground speed. Table auger 10-20mm. Drum or rotor speed 300–600 rpm. Concave clearance 10–25 mm (start at 10mm clearance). Fan speed 75-100% (start at 100%). Top sieve: 16–25 mm (start at 25mm). Bottom sieve: 8–16 mm (start at 16mm).

Agronomic enquiries

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Ian Pritchard	DAFWA 08 9368 3515	Jason Brand	DPI Vic 03 5362 2341

Marketing

Neelam[®] grain is a desi type chickpea suitable for the whole and splitting human food markets. Seed size of Neelam[®] similar to that of PBA Slasher[®]. However, its seed coat colour is lighter than PBA Slasher[®]. The seed size is very uniform and this coupled with seed colour make it attractive for marketing. Other quality attributes also compare well with current varieties.

Open marketing, provided an end-point royalty of \$4.40/t (including GST) is paid on Neelam[®] deliveries.
EPR = \$4.40/tonne

Seed Availability and PBR

Neelam[®] will be available for sowing in 2013, and is being commercialised through Heritage Seeds/ Seedmark.

Neelam[®]

Seed Supply enquiries:

AUSTRALIAN SEED & GRAIN P/L

Berkshire Valley Rd
PO Box 183, Moora, WA 6510
Chris Martin
Tel: 08 9651 1069
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EDSCO

(Eastern Districts Seed Cleaning Co)
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Ian Doncon
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Fax: 08 9045 4539

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This VMP has been jointly prepared by Ian Pritchard DAFWA, Tanveer Khan CLIMA (UWA), Alan Meldrum Pulse Australia; on information and data from, SARDI, DPI Victoria, NSW DPI, DAFWA and NVT.

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Neelam[®] – Desi chickpea