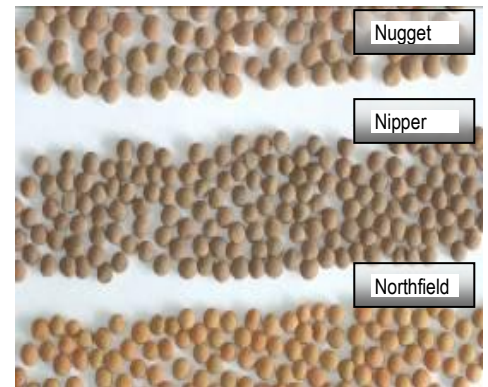


KEY FEATURES of Nipper[®]

- First variety in Australia with dual resistance to ascochyta blight and botrytis grey mould.
- Lower cost and disease risk alternative to other lentil varieties.
- Provides a low risk opportunity to sow lentils earlier to maximise grain yield.
- Long term yields have been higher than Northfield and similar to Nugget in reliable rainfall lentil growing areas but lower than Nugget in lower rainfall/short season years or areas.
- Nipper[®] is short to medium in height, mid-late flowering and mid maturing similar to Northfield.
- Has small, round seed similar to Northfield, but a grey seed coat like Nugget.
- Seed is suitability for a wide range of end uses.

Where Nipper[®] fits into the farming system:

- Nipper[®] provides a low botrytis grey mould and ascochyta blight risk variety for growers in traditional lentil areas of south-eastern Australia.
 - Resistance to disease will potentially reduce the need for fungicides and therefore costs.
 - A major benefit of disease resistance is the ability to sow Nipper[®] early and thereby maximise yield.
- Nipper[®] has many characteristics that are similar to Northfield. It is expected to replace Northfield in all areas and provide a disease resistant small seeded alternative to Nugget in medium and higher rainfall lentil growing areas, dependent upon marketing preferences.
- Because it is shorter and later flowering than Nugget, Nipper[®] is less suited to low rainfall areas, or drought years and late sowing in more favourable areas.



Variety Characteristics:

Breeding:

Nipper[®] (tested as CIPAL203) was bred by the Coordinated Improvement Program for Australian Lentils (CIPAL) led by Dr Michael Materne (DPI Victoria). It was produced from a cross between Indianhead and Northfield, and selected for its improved resistance to botrytis grey mould and ascochyta blight, and its small, round grey seed.



Agronomic characteristics:

- Nipper[®] is the first variety in Australia with dual resistance to ascochyta blight and botrytis grey mould.
- Nipper[®] is similar to Northfield in many characteristics such as height, flowering and maturity time, resistance to pod drop and seed shape.
- It flowers later than Nugget, but often matures slightly earlier.
- Nipper[®] is shorter than Nugget, but lodges less than other varieties and is more erect at harvest.
- Nipper[®] has improved salinity (NaCl) tolerance but similar intolerance to high soil boron and sodicity compared to other varieties.
- Indications are that Nipper[®] is more sensitive to double recommended rates of metribuzin than Nugget but has similar levels of tolerance to recommended rates of all commonly used herbicides. Note that metribuzin is used in most lentil trials from which yield data is presented.

Quality Characteristics

- Grain size and shape is similar to Northfield, but Nipper[®] has a grey seed coat.
- Feedback from importing countries indicates that seed of Nipper[®] is suitable for existing human-consumption markets for use as splits, footballs (whole seed with skin removed) and whole seed (skin intact). Nipper[®] has shown a higher football yield in laboratory testing compared with Northfield.
- Improved disease resistance should result in more consistent visual quality.

Agronomic features & disease resistance

Name	Ascochyta	Blight	Botrytis Grey Mould	Vigour	Plant height	Lodging	Pod Drop	Shattering	Flowering Time	Boron	Salt	Maturity
	Foliage	Seed										
Aldinga	MR	MS	MS	Moderate	Medium	S	MR	MR	Mid	I	I	Mid
Boomer [Ⓛ]	MR	MS	MR	Good	Tall	MS	MR	MS	Mid	I	I	Late
Digger	MS	MS	MR	Moderate	Medium	MS	MR	MR	Mid	I	I	Mid/Late
Nipper[Ⓛ]	R	R	R	Poor/Mod	Short	MR	MR	MR	Mid/Late	I	MT	Mid
Northfield	R	R	S	Poor/Mod	Short	MS	MR	MR	Mid/Late	I	MI	Mid
Nugget	MR	MS	MR*	Moderate	Medium	MS/MR	MR	MR	Mid	I	I	Mid/Late
PBA Bounty [Ⓛ]	MR	MR	MS	Moderate	Short/Med	MS	MR	MR	Mid/Late	I	MI	Mid
PBA Blitz [Ⓛ]	R	MR	MR	Mod/Good	Med/Tall	MR	MR	MR	Early/Mid	I	I	Early
PBA Flash [Ⓛ]	MS	MS	S	Moderate	Medium	MR	MR	MR	Mid	MI	MI	Early/Mid
PBA Jumbo [Ⓛ]	R	R	MS	Moderate	Medium	MS	MR	MR	Mid	MI	MI	Mid

Key: **S** = susceptible, **MS** = moderately susceptible, **MR** = moderately resistant, **R** = resistant, **I** = Intolerant, **MT** = moderately tolerant

Yield and adaptation

- Nipper[Ⓛ] can be grown in similar areas to current varieties but is best suited to medium rainfall (380-450mm annual) areas of SA and Victoria, particularly where there is a high risk of damage by ascochyta blight and grey mould.
- In these areas the yield of Nipper[Ⓛ] is similar to Nugget but the overall risk of disease and need for fungicide inputs are less.
- Nipper[Ⓛ] can also be sown early to maximise yield and pod height in most years with less risk of yield and quality losses from disease compared to other varieties.
- Late sowing should be avoided with Nipper[Ⓛ] as yields decrease and short plant and lower pod heights make harvesting more difficult.
- Nipper[Ⓛ] has been lower yielding than Nugget in drier shorter season areas such as the Mallee, lower rainfall lentil growing regions of SA and in WA. Nugget and Boomer[Ⓛ] are taller and earlier flowering than Nipper[Ⓛ] and are therefore more suited to low rainfall areas, late sowing dates and drought years in more favourable areas.
- Nipper[Ⓛ] is not suited to growing in Western Australia and northern NSW.
- The adaptation of Nipper[Ⓛ] is demonstrated by yield data from 2005, 2006 and 2007 in South Australia. Nipper[Ⓛ] was higher yielding than Nugget in 2005 when rainfall was above average in spring and foliar disease was present at some sites, but lower yielding in 2006 and 2007 when the growing season was dry and foliar disease was not a significant issue.

National Variety Trials – NSW, SA Long Term Yields as % of Nugget: 2004-2010

	NSW		SA				
	South-east	South-west [#]	Lower EP	Mid North	Yorke P	South East	Mallee
Boomer [Ⓛ]	102 (5)-	104 (3)	104 (7)	103 (20)	104 (24)	104 (7)	102 (3)-
Digger	97 (7)	95 (5)	96 (7)	- (-)	- (-)	95 (3)	- (-)
Nipper[Ⓛ]	97 (7)	96 (3)	99 (9)	100 (22)	98 (26)	98 (7)	98 (3)
Northfield	88 (7)	91 (5)	90 (9)	91 (20)	91 (23)	91 (6)	- (-)
Nugget	100 (7)	100 (5)	100 (9)	100 (22)	100 (26)	100 (7)	100 (3)
PBA Blitz [Ⓛ]	- (-)	- (-)	106 (5)	106 (13)	105 (17)	104 (4)	- (-)
PBA Bounty [Ⓛ]	102 (7)-	- (-)	103 (7)	103 (22)	103 (26)	101 (7)	102 (3)
PBA Flash [Ⓛ]	105 (7)	- (-)	108 (9)	108 (22)	106 (26)	107 (7)	109 (3)
PBA Jumbo [Ⓛ]	108 (7)	- (-)	108 (6)	110 (16)	111 (20)	109 (4)	- (-)
<i>Nugget yield (t/ha)</i>	<i>0.98 (7)</i>	<i>0.86 (5)</i>	<i>1.29 (9)</i>	<i>1.99 (22)</i>	<i>2.27 (26)</i>	<i>1.93 (7)</i>	<i>1.47 (3)</i>

Numbers in () = site years. * Yield data courtesy of National Variety Trials (NVT). [#] = 2000-2008
Data also courtesy of SARDI, DPI Vic, NSW DPI before 2005

National Variety Trials – Vic, WA Regional Long Term Yields as % of Nugget: 2004-2010

	Vic			WA
	Wimmera	Mallee	North-Central [#]	Agzone 4
Boomer [Ⓛ]	100 (20)	102 (12)	-	100 (3)1
Digger	95 (20)	96 (10)	95 (3)	96 (3)
Nipper[Ⓛ]	96 (24)	96 (15)	-	92 (3)
Northfield	89 (22)	89 (13)	92 (3)	-
Nugget	100 (24)	100 (15)	100 (3)	100 (3)
PBA Blitz [Ⓛ]	104 (16)	104 (9)	-	-
PBA Bounty [Ⓛ]	102 (24)	103 (15)	-	104 (3)
PBA Flash [Ⓛ]	104 (24)	103 (15)	-	108 (3)
PBA Jumbo [Ⓛ]	106 (18)	108 (11)	-	-
<i>Nugget yield (t/ha)</i>	<i>1.18 (24)</i>	<i>1.41 (15)</i>	<i>1.36 (3)</i>	<i>0.69 (3)</i>

Numbers in () = site years. Yield data courtesy of National Variety Trials (NVT). [#] = 2000-2007
Data also courtesy of SARDI, DPI Vic, NSW DPI before 2005.

Management Package

(Consult local grower guides for more detailed information)

This VMP updates and reinforces those management issues with Nipper^{db} lentils that may be different to other lentil varieties. Refer to existing guides for other general lentil management issues.

Maintain Purity of Seed Crops:

Nipper^{db} has a small round seed and grey seed coat unlike any current varieties. Do not let Nipper^{db} seed crops be contaminated with other lentil varieties that have different sizes and/or coloured seed coats. Ensure that there are no self-sown lentils in the crop, and avoid physical contamination through machinery, storage or handling facilities.

Sowing Date:

Target the same sowing date as for Nugget and Northfield or an earlier sowing date in lower rainfall/short growing season areas. The risk of yield and quality losses from disease in early sown Nipper^{db} is less than with Nugget and Northfield. More importantly, avoid sowing Nipper^{db} later than normal, particularly in lower rainfall/short season areas as plant height, harvestability and grain yield can be reduced.

Seeding rate: Nipper^{db} has small seeds, so target seeding rates to achieve standard plant densities of 120 plants/m² in Nipper^{db}, with adjustments for seed size and germination percentage.

Herbicide Sensitivity: Herbicide screening in SA and Victoria over 3-4 years has shown the tolerance of Nipper^{db} to commonly used herbicides in terms of grain yield is most often similar to Nugget. This has been on alkaline black cracking clay soils in the Victorian Wimmera and on calcareous alkaline sandy loam soils on Yorke Peninsula, SA.

In SA, similar yield losses have occurred in both Nugget and Nipper^{db} to Broadstrike® when damage has occurred. Evaluations at double-recommended herbicide rates have indicated Nipper^{db} has a lower safety margin than Nugget to metribuzin and other non-registered PSPE herbicides. Hence avoid application conditions which may exacerbate chemical injury with these herbicides on Nipper^{db}.

Virus Management: For viral diseases a threshold of <0.1% seed infection is recommended for sowing in high risk areas, and <0.5% seed infection for sowing in low risk areas. Use virus free seed where possible.

The spread of virus can be managed by controlling summer weed hosts for virus, ensuring the crop covers the ground quickly (sow early and avoid low sowing rates), the early application of insecticide to control aphids, and monitoring and control of aphids during the season.

Harvest parts of the crop that have no plants with virus symptoms for use as sowing seed in the following year.

Disease Management:

Ascochyta blight

- Nipper^{db} is resistant to ascochyta blight on seed and foliage, similar to Northfield. No fungicide seed dressing is needed for ascochyta blight.
- Unlike in Nugget or Boomer^{db}, sowing date of Nipper^{db} does not need to be delayed to avoid yield loss and seed infection by ascochyta blight.
- Nipper^{db} may get low levels of seed infection by ascochyta blight but levels are unlikely to cause issues with quality or using the seed for sowing.
- Ascochyta protection should not be required unless in an extreme disease risk situation.

Botrytis Grey Mould (BGM)

- Botrytis grey mould is most severe in seasons when rainfall occurs in spring and crops are large and lodged.
- Nipper^{db} is resistant to botrytis grey mould, having improved resistance compared to all current varieties. Infection can still occur by the disease under severe disease pressure conditions.
- Fungicide seed dressing is not needed for ascochyta blight, but it is beneficial for controlling seedling root rots and BGM to ensure good plant establishment.
- In high risk BGM situations, consider an application of recommended fungicide before canopy closure to protect against botrytis grey mould. Additional grey mould control or protection is unlikely, but monitor the need in extreme disease risk situations.

Rolling: Nipper^{db} paddocks need to level at harvest, hence they may 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 if the crop is brittle from frosts and cold conditions.

Crop topping: Nipper^{db} matures early enough to be crop-topped to prevent weed seed set, particularly ryegrass. It is a shorter variety, so may be able to be weed wiped if not too tall for ryegrass seed heads emerged above the canopy. Avoid all chemical withholding periods.

Windrowing: Windrowing has occasionally been successful with taller lentils, but they must be bulky windrows that are rolled immediately after swathing.

Desiccation and Harvest: Timely harvest is very important in all lentil varieties to prevent losses from pod drop and maximise seed quality.

Desiccation may assist with timely harvest but timing is critical to avoid producing immature seeds. See management guides, eg “Meeting lentil quality demanded by markets” www.pulseaus.com.au.

Delivery: To meet current National Pulse Receival Standards, few lentil varieties can be co-mingled for delivery. Nipper[®] grain should not be mixed with or contaminated by another lentil variety unless otherwise stated. Small seeded red lentil varieties like Nipper[®], PBA Bounty and Northfield should not be mixed. Green lentils must never be a contaminant of any red lentil.

Marketing:

Nipper[®] grain will be segregated from other varieties for human food markets.

Open marketing with an end-point royalty of \$5.50/t (including GST) on deliveries.

Seed Availability and PBR:

Nipper[®] is protected by PBR. Growers can retain seed from production of Nipper[®] for their own seed use. Seed is commercialised through Seednet and available through local seed suppliers.

Nipper[®] Seed Supply enquiries:	Seednet 	Phone (03) 5389 0150 admin@seednet.com.au www.seednet.com.au
-----------------------------------------------------	---------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------

Agronomic Enquiries: Contact:

Jason Brand, DPI Vic, (03) 5362 2341,
Michael Materne, DPI Vic, (03) 53622312;
Ian Pritchard DAFWA, (08) 9368 3515.

Wayne Hawthorne, Pulse Australia, (08) 8764 7455;

Larn McMurray, SARDI, (08) 8842 6265,
Peter Mathews NSW DPI, (02) 69773333,

Trevor Bray, Pulse Australia; (02) 6963 6926,.

Other Reading: For red lentil management guidelines, see:

- Grain Legume Handbook 2008
- Pulse Australia publications: “Meeting lentil quality demanded by markets”, “Lentil disease management strategy for southern region GRDC” and supplements, and “Pulse seed treatments and foliar fungicides” (www.pulseaus.com.au)
- SARDI fact sheet “Lentil variety sowing guide 2011”
www.sardi.sa.gov.au/pdfserve/fieldcrops/research_info/sowing_guide/lentilifs.pdf
- NSW DPI publications (www.agric.nsw.gov.au): “Winter Crop Variety Sowing Guide 2011” ; Pulse Point 20 “Germination testing and seed rate calculation”; “Weed Control in Winter Crops 2011”; “Insect and Mite Control in Winter Crops”;
- Vic DPI “Winter Crop Summary 2011” 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: Coordinated Improvement Program for Australian Lentils – Dr Michael Materne, Larn McMurray, Sandra Nitschke, Kerry Regan, Peter Mathews, Geoff Dene, Linda Heuke, Steve Murden, Bruce Holding, Dr Janbert Brouwer, Joe Panozzo, Dianne Noy, Kurt Lindbeck, Matt Dare & Trevor Bretag. Contribution of the following other people to either the extensive evaluation, or the production of this publication is gratefully acknowledged: Ashley Purdue (Vic DPI), Jenny Davidson, Rob Wheeler, Jim Egan (SARDI) Di Holding, Eric Armstrong, Peter Lockley (NSW DPI).

Information contained in this brochure is based on knowledge and understanding at the time of writing (14/7/2011). Growers should be aware of the need to regularly consult with their advisors on local conditions and currency of information.

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: Larn McMurray, SARDI; Michael Materne and Jason Brand, Vic DPI and Wayne Hawthorne, Pulse Australia; on information and data from, SARDI, DPI Victoria, NSW DPI, DAFWA and NVT. Reproduction of this VMP in any edited form must be approved by Pulse Australia © 2005 and Vic DPI.



Department of
Primary Industries



Department of
Agriculture and Food



Primary
Industries