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National
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Victorian Winter Crop Summary

2016

Economic Development,
Jobs, Transport
and Resources

AGRICULTURE VICTORIA

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Cover photo by Bethany Hallam and Kevin Murray, DEDJTR. This collection of commercial and wild relative pulse seeds from the Australian Grains Genebank, Horsham Victoria, was assembled to celebrate 2016: the International Year of Pulses.



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VICTORIAN WINTER CROP SUMMARY 2016

Department of Economic Development,
Jobs, Transport and Resources

Editors

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This guide can be downloaded to your computer or tablet at
www.grdc.com.au/NVT-Victorian-Winter-Crop-Summary

Remember to update it each March

Figure 1: 2015 Victorian rainfall deciles for the pre-season (January to March). *Source: Bureau of Meteorology.*

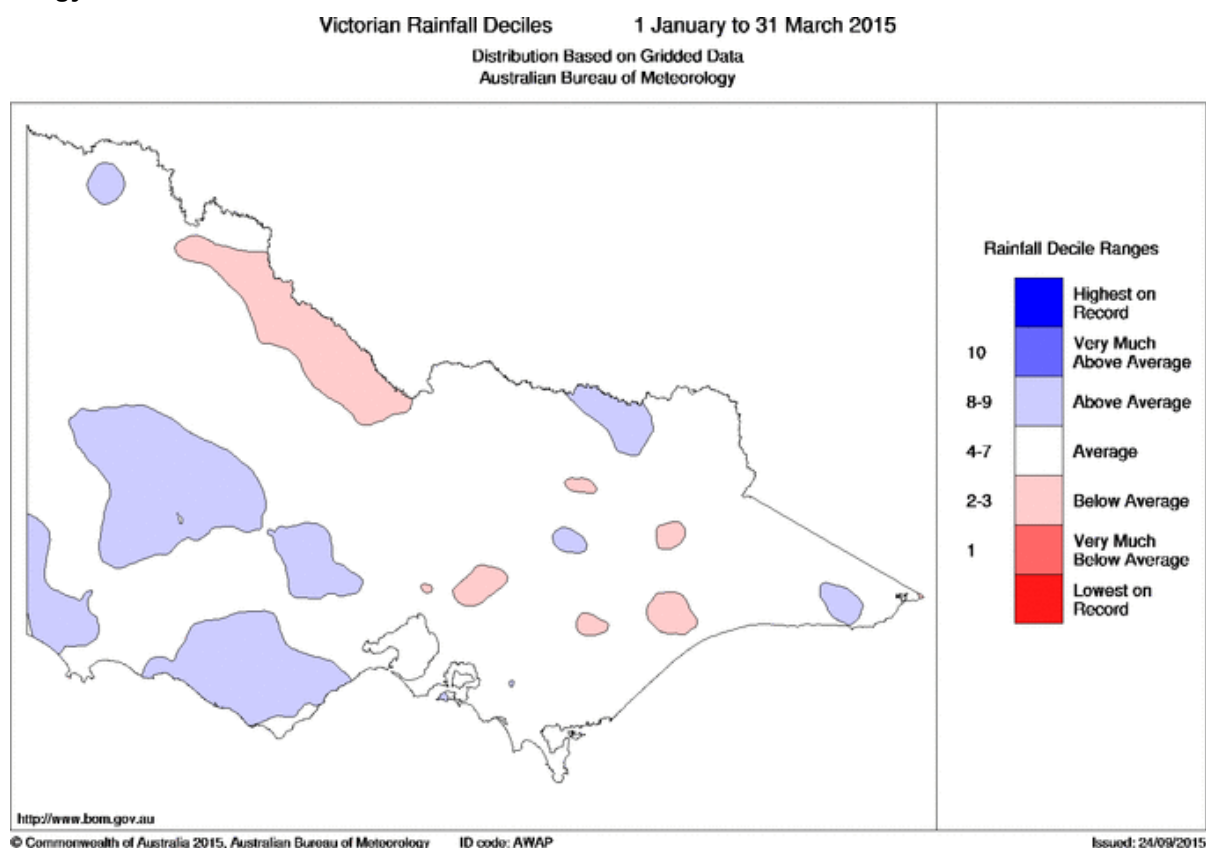
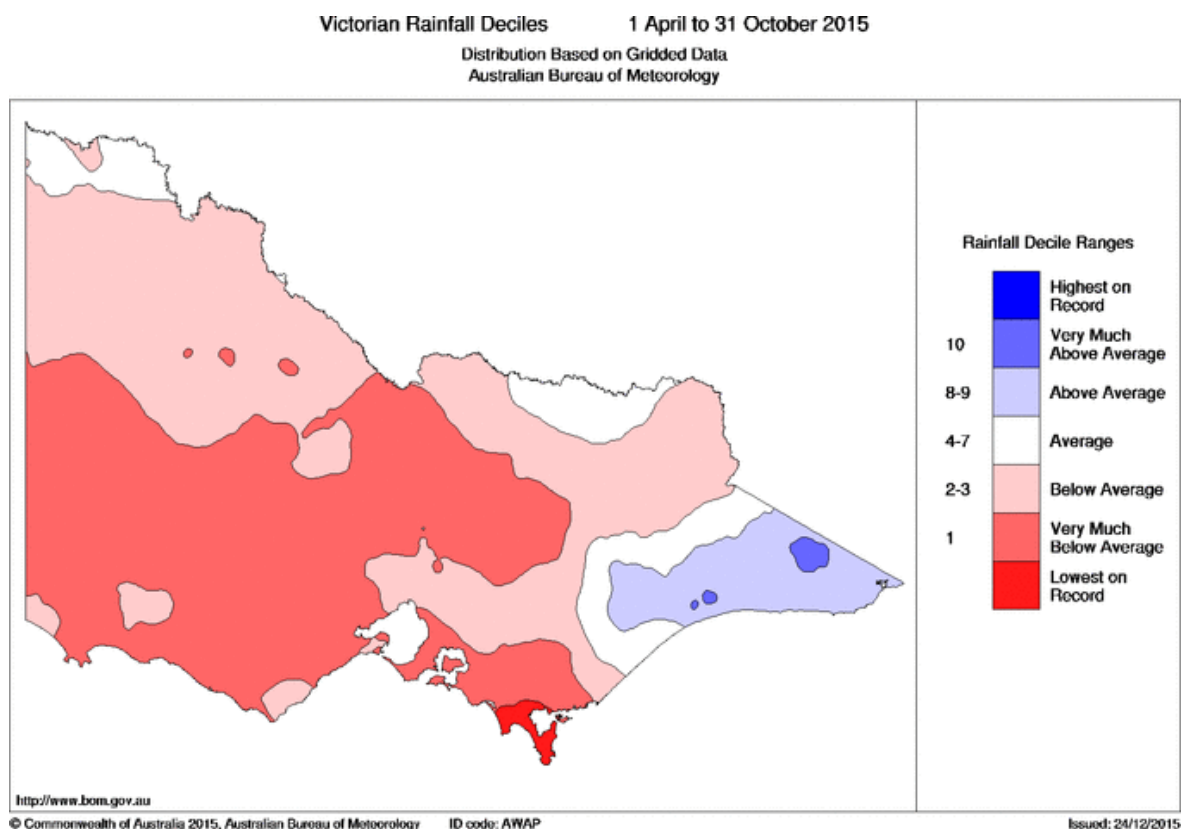


Figure 2: 2015 Victorian rainfall deciles for the growing season (April to October). *Source: Bureau of Meteorology.*



INTRODUCTION

INTRODUCTION

THE SEASON

Season 2015

The northern Mallee, eastern North East Victoria and Gippsland cropping regions received summer rain in January and February that proved invaluable with dry spring conditions (Figure 1). All other areas started 2015 with minimal stored soil moisture. Rainfall for the 2015 growing season in the lowest 30% on record for most of the state (Figure 2).

The season began in April in the northern Mallee and North East Victoria but most other areas started in mid to late May.

It was another year where early maturing varieties outperformed later maturing varieties in most dryland areas. Crops sown into fallow or those that picked up some storm rainfall performed better.

Frost was not as widespread in 2015 as in 2014. However, a five day run of hot weather at the start of October combined with no soil moisture in many areas meant a reduced flowering period, flower loss, reduced grain fill and an early finish to the 2015 season. Maximum temperatures for the month of October were the highest on record for most of Victoria. Grain size of nearly all crop types was affected but barley in particular suffered with high screenings. Northern crops that were part-way through grain fill coped best with these high temperatures.

Crops with sufficient biomass were cut for hay in October in the Wimmera, Mallee and North Central, in some areas exceeding 50 per cent of the cropped area. Cutting crops for hay was at least as profitable, or more profitable, than taking crops to grain, with the added benefit of reducing the weed burden.

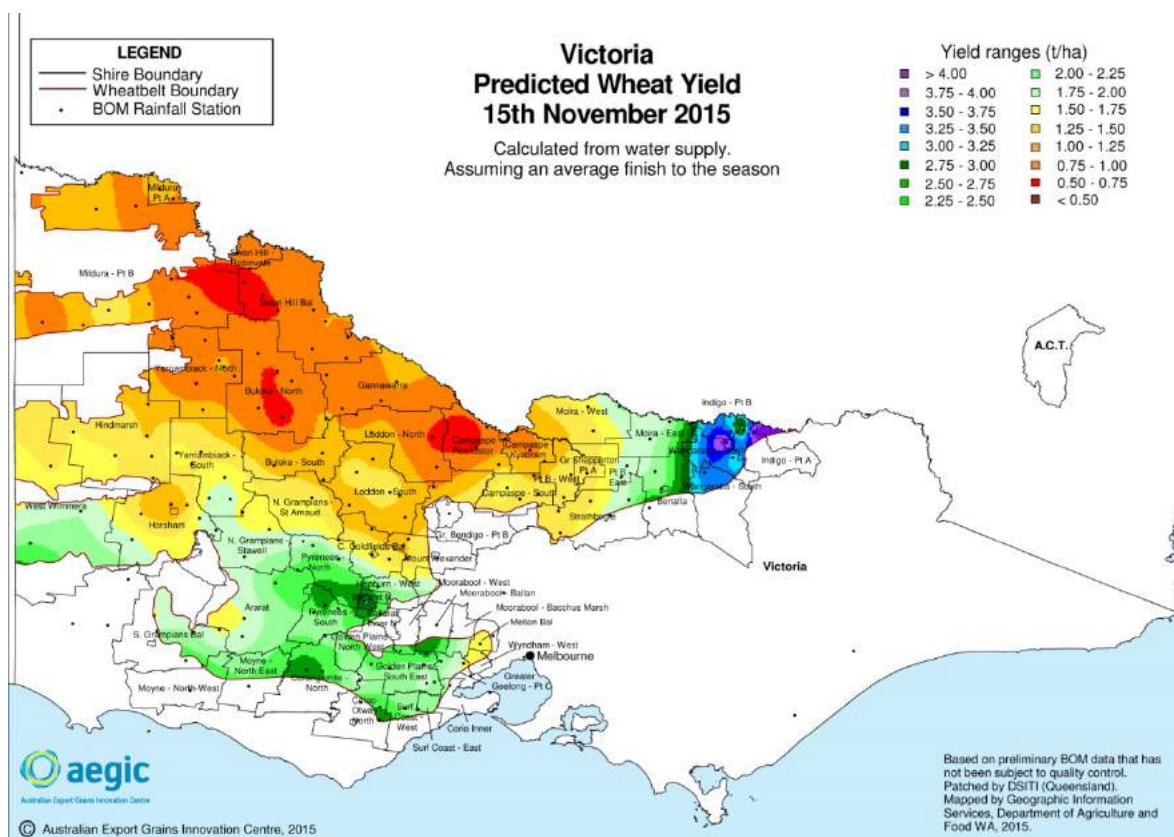
Dry conditions throughout the season resulted in low disease pressure across the state.

Late November rain fell too late for most crops except for some of the later maturing varieties in the North East, South West and Gippsland. It instead provided a delay to harvest and an unfortunate boost to summer weeds. Some seed quality may also have been affected, with the possibility of sprouting where rainfall totals were high.

Strong winds in November caused lodging in some of the heavier irrigated crops and damaged both canola windrows and canola to be direct harvested, particularly in the South West.

For the second year in a row much of the Mallee finished harvest before December with other regions finishing before Christmas, three to four weeks ahead of usual. Yields were average in the northern Mallee, eastern North East, parts of the South West and Gippsland. All other areas had lower than average yields. The southern Mallee and northern Wimmera yielded the poorest due to a combination of no stored moisture, late germination and a poor spring. The Australian Export Grains Innovation Centre modelled map (Figure 3) gives an indication of the spatial variability of yield across the state.

Figure 3: Predicted wheat yield for Victoria at 15th November 2015. Source: Australian Export Grains Innovation Centre.



Looking forward to 2016

Summer rain will mean summer weed control is important, helping to preserve soil moisture and save nutrients.

Sourcing quality seed for sowing will be the major challenge for growers for 2016. Smaller grain generally performs poorly with lower germination rates. Seed that was rain damaged at harvest will be more vulnerable to sprouting or other degradation during storage. Growers will need to conduct germination tests to identify the best seed to use. Careful attention will need to be paid to pre-emergent herbicides, seed dressings, coleoptile length, vigour and sowing depth to prevent poor establishment.

Growers should remember while there is a natural desire to get everything in the ground while the weather is warm and the soil moist, spreading sowing time is a useful technique to minimise risk. Likewise, growers are encouraged to use varieties with a range of maturities and frost sensitivities to minimise damage.

Frost susceptibility rankings – Coming in 2016

Frost susceptibility rankings for wheat and barley varieties will be published on the NVT website in March 2016 in the format of relative frost values. Growers will be able to select a set of either wheat or barley, relative to their production region, to display graphically using an interactive tool. This will enable growers to manage the frost risk of new varieties based on how known varieties of similar ranking are currently managed.

The rankings are not due to difference in phenology/flowering time, and refer to the relative susceptibility of varieties flowering at the same time during a frost event. They do not take into account the frost risk associated with a particular variety flowering on a certain sowing date. Selecting an appropriate maturity for a particular sowing time is still the best option in limiting damage resulting from frost. Hence the reproductive frost ranking needs to be considered in relation to the relative time of sowing and flowering time prediction.

No current wheat varieties are frost tolerant. Under severe frost (for example -8°C) or multiple minor frosts (several nights of -2° to -4°C) all varieties tested to date are equally susceptible, resulting in up to 100 per cent sterility in flowering heads.

Growers should continue to select varieties based on the best yield, maturity, agronomic and disease performance from various sources such as regional agronomy trials and NVT. Once a variety has been adopted, use the preliminary reproductive frost susceptibility rankings to fine tune frost risk management based on how known varieties are currently managed with a similar rating.

For example Wyalkatchem, which is more susceptible to frost than Yitpi is managed differently in terms of sowing date, position in landscape and the associated frost risk, thereby trying to maximise production while also minimising frost risk. Ensuring that flowering occurs within the optimum flowering window to minimise frost, heat and terminal drought continues to be critical and the reproductive frost rankings need to be used within this context.

This research has been funded as part of the GRDC's multidisciplinary National Frost Initiative.

THE WINTER CROP SUMMARY

This publication summarises information on current varieties of the major winter crops grown in Victoria. Sources of additional information are listed in each chapter. Local advisers are also a key resource for information relevant to individual localities.

This publication aims to prompt growers to ask themselves, 'Am I growing the best variety for my situation?' Use it as a guide for discussion with consultants, advisers and marketing agents.

Thank you to the Grains Research and Development Corporation (GRDC) for its support in making this guide available to Victoria.

More information

Additional information on the National Variety Trials (NVT) is available from NVT Online at www.nvtonline.com.au.

The Winter Crop Summary can be downloaded to your computer or tablet at www.grdc.com.au/NVT-Victorian-Winter-Crop-Summary.

National Variety Trials (NVT)

The majority of variety trials presented in this book are sourced from the NVT program. NVT also provide data from some breeding trials to add to the information available. In Victoria, NVTs are fully funded by the GRDC and in 2015 were contracted to two Service Providers: Agrisearch Services Pty Ltd and South Australian Research and Development Institute (SARDI).

NVTs provide independent information on varieties for growers. The aim of each NVT is to document a ranking of new and widely adopted varieties in terms of grain yield and to provide grain quality information relevant to delivery standards. NVTs are also used by pathologists to determine disease resistance ratings used in the Winter Crop Summary.

Conducted to a set of predetermined protocols, NVTs are sown and managed as close as possible to local best practice such as sowing time, fertiliser application, weed management and pest and disease control, including fungicide application. NVTs are not designed to grow varieties to their maximum yield potential.

It is acknowledged that an ongoing project of this type would not be possible without the co-operation of farmers prepared to contribute sites and who often assist with the management of trials on their property.

New NVT Long Term Yield Reports App

The National Variety Trials has launched the NVT Long Term Yield Reports App to provide growers and advisors with an easy-to-use means of accessing and interpreting the data from the NVT program.


The App is designed for tablets and computers (not phones) and is available online at www.nvtonline.com.au/apps/

Australian Field Crop Disease Guide App

The National Variety Trials has developed the Australian Field Crop Disease Guide App. This national App is based on, and intended to replace, the Victorian Crop Disease App. It allows users to select their state to access local varieties, ratings and descriptions.

The App is suitable for phones and is available online at www.nvtonline.com.au/apps/

Plant Breeding Rights (PBR)

Varieties subject to Plant Breeding Rights at the time of printing are annotated with the symbol . It should be noted that 'Unauthorised commercial propagation or any sale, conditioning, export, import or stocking of propagation material of these varieties is an infringement under the Plant Breeders Rights Act 1994 and that any breaching of PBR law is punishable by a maximum \$50, 000 fine for each offence'.

End Point Royalties (EPR's)

EPR's payable for 2016-17 are quoted from www.varietycentral.com.au and are quoted ex-GST. Compliance with EPR systems is vital to assure the future of the Australian grains industry through the funding of new varieties and long-term productivity gains.

WHEAT

WHEAT

REVIEW OF 2015

Season

Limited summer rainfall meant only the Northern Mallee and North East had good soil moisture for sowing. Dry conditions throughout the season meant crops remained water limited and did not produce any more heads than they could fill. Late frosts and well above average heat during October contributed to grain development issues. Many crops were unable to withstand the early October heat and substantial areas of crop were cut for hay, up to 50% in some areas.

Rain during November would have only benefitted the later maturing crops in the South West. In other areas it provided only a short delay to harvest and was unlikely to have caused damage to quality. Irrigated crops in the North East and North Central were the exception, where some larger crops were lodged by high winds in November.

The difficult season resulted in high screenings and increased protein along with reduced yields in the Mallee. Very little of the Victorian wheat crop was classified as APH, H, APW or ASW. The South West appeared to have little penalty for lower rainfall and higher temperatures, with yields coming in around the anticipated mark.

Disease

Due to dry conditions across Victoria in 2015 diseases were a minor issue for most wheat growers.

Yellow leaf spot was common however did not progress due to dry conditions in 2015.

Septoria tritici blotch (STB) has continued to increase in importance in the high rainfall regions with many varieties now rated as susceptible or worse. The importance of this disease is compounded by the presence of strains with reduced sensitivity to many common fungicides.

Crown rot, which caused widespread white heads in wheat crops, was favoured by the dry conditions and was the most important root disease during 2015.

LOOKING FORWARD TO 2016

New varieties

The new wheat varieties added this year are Beckom, Cutlass, DS Darwin, DS Pascal, Hatchet CL Plus, LRPB Flanker and Scepter. Sunlamb is new feed wheat.

Elders are currently bulking up Steel and Tenfour for the 2017 season. Steel is a mid-maturing wheat for the NC, NE and irrigation. Tenfour is an early-maturing wheat for the SW, NE and irrigation.

Disease

Disease management following failed cereal crops is important for growers to consider moving into the 2016 season. Despite low disease pressure in 2015, if suitable conditions occur during 2016 disease levels could increase rapidly.

A new strain of leaf rust was detected at multiple locations in Victoria during 2014. Therefore, many cultivars are now more susceptible than before and should conditions be suitable for leaf rust to occur, growers will need to be more

vigilant with its control. Please consult the disease resistance ratings in Table 2 for changes to ratings for leaf rust and other diseases.

Recent summer rainfall will increase the opportunity for rust carryover on volunteer cereals (the 'green bridge'). Given suitable conditions rust can increase rapidly, particularly where susceptible varieties are grown. Growers must therefore have a plan to manage rusts in susceptible varieties. Avoiding susceptible varieties will reduce rust pressure and chance of yield loss.

To control rust growers should remove volunteer cereals by late-March. Avoid growing rust susceptible varieties, use fungicides on seed or fertiliser prior to sowing, and watch crops with a view to timely fungicide sprays if required.

Yellow leaf spot is best controlled by avoiding sowing susceptible varieties into paddocks with infected stubble present. Dry conditions will have reduced stubble breakdown, consequently increasing inoculum carryover from 2014 wheat stubbles. The pressure from yellow leaf spot will be greatly reduced if susceptible (S) and very susceptible varieties (VS) are replaced with those rated moderately susceptible (MS) or better. Complete resistance is not needed to achieve sustainable control of this disease.

To slow the development of more serious mutations of **Septoria tritici blotch (STB)** it is important to mix and/or alternate different azole fungicides. Not all azole fungicides are affected equally by mutations of the STB fungus. Growers must always follow directions for use contained on the individual product labels and ensure maximum residue limits are adhered to.

It is critical that an integrated approach is used to manage STB. Control needs to combine variety (avoiding susceptible cultivars - see Table 2) and paddock selection (avoid infected wheat stubble) with the timely use of fungicides. Should a foliar fungicide be needed it should be applied early in disease development.

Bunts and smuts must be controlled every year. Seed treatments provide cheap and effective control of bunt and smut diseases. Seed should be treated every year with a fungicide. Without treatment bunt and smut can increase rapidly, resulting in unsaleable grain. Good product coverage of seed is essential for control.

Note that fertiliser treatments do not control bunt and smuts, so additional seed treatments are required. Clean seed should be sourced if a seed lot is infected.

To identify the potential risk from **root disease**, a PreDictaB soil test can be used prior to sowing. Test results can identify potential root disease issues before they affect crop yield. Contact your local agronomist to organise testing.

Most cereal root and crown diseases (take-all, crown rot, cereal cyst and root lesion nematode) can be controlled with a one or two year break from susceptible hosts. Due to dry conditions in 2015, the break may need to be increased by a year. It is important that break crops are kept free of grass weeds to be effective.

Frost

The frost susceptibility rankings will be available in March on the NVT website. These rankings are explained in more detail in the Introductory chapter of this book.

MORE INFORMATION

www.nvtonline.com.au

Detailed NVT trial results and links to variety information.

www.nvtonline.com.au/apps

- Australian Field Crop Disease Guide app
- NVT Long Term Yield Reports app


agriculture.vic.gov.au/agriculture/grains-and-other-crops

- [AG0508 Growing wheat](#)
- [AG1160 Cereal disease guide](#)

VARIETY DESCRIPTIONS

Information about each variety is presented as overview statements, then as comparison tables of yield, crop growth and disease reaction characteristics. Wheat quality is for the Southern Zone.

Abbreviations used are:

	denotes that Plant Breeder Rights apply
CCN	Cereal Cyst Nematode
BYDV	Barley Yellow Dwarf Virus
RLN	Root Lesion Nematode
APH	Australian Prime Hard (min protein 13%)
AH	Australian Hard (min protein 11.5%)
APW	Australian Premium White (min protein 10%)
ASW	Australian Standard White
ADR	Australian Premium Durum
ASWN	Australian Standard Noodle (Protein 9.2–11%)
APNW	Australian Premium Noodle (Protein 10–11.5%)
ASFT	Australian Soft (Protein 9.5%)
FEED	Australian Feed
*	denotes default classification

End Point Royalty (EPR) 2016-17 quoted \$/tonne ex-GST.

Bread wheat – AXE

AH quality. Semi-dwarf awned wheat with early maturity. Stem rust MS, stripe rust RMR, leaf rust SVS, CCN S and yellow leaf spot S. MSS to *Pratylenchus neglectus*. Good yield under terminal drought stress, large grains and SVS to pre-harvest sprouting. Released 2007 and marketed by AGT. EPR \$2.50.

NEW Bread wheat – BECKOM

AH quality. Semi-dwarf awned wheat with mid season maturity and wide adaptation across Victoria. Stem rust MR, stripe rust MRMS, leaf rust S, CCN R and yellow leaf spot MSS. Short height, tolerant to acid soils and boron. Released 2015, tested as V06008-14 and marketed by AGT. EPR \$3.25.

Bread wheat – BOLAC

AH quality. Fully awned, mid to late season maturity suited to high rainfall zones. Stem rust MRMS, stripe rust RMR, leaf rust S, CCN S and yellow leaf spot S. Bolac is a high yielding milling wheat for south-west Victoria with small grain size. Released 2006 and marketed by Seednet. EPR \$2.10.

Bread wheat – CHARA

AH quality. White grained and suited to medium to high rainfall zones. Stem rust MRMS, stripe rust MSS, leaf rust S, CCN R and yellow leaf spot MSS. Performs well on the moderately acid soils of central and north-eastern Victoria and southern NSW and irrigation where high yields are possible. Good straw strength. Has a reputation for water logging tolerance. Seednet. EPR \$1.

Bread wheat – CONDO

AH quality. A very early maturing variety. Excellent yield potential in North Central, North Eastern Vic and Southern NSW. Stem rust RMR, stripe rust MSS, leaf rust S. MR to CCN and MS to yellow leaf spot. MT to aluminium, large grain size, low screenings and intermediate for sprouting tolerance. Released 2014, tested as VX1634, Marketed by AGT. EPR \$3.25

Bread wheat – CORACK

APW quality. An early to mid-maturing short semi-dwarf variety with good straw strength. Stem rust MR, stripe rust MS, leaf rust SVS, CCN RMR and yellow leaf spot MR#. High yield potential, good wheat on wheat option with large grain and low screenings. Marketed by AGT. EPR \$3.

Bread wheat – CORRELL

AH quality. Fully awned with mid season maturity. Stem rust MRMS, stripe rust MRMS, leaf rust MSS, CCN MR and yellow leaf spot SVS. Tolerant of boron toxicity, SVS to pre-harvest sprouting, low test weights and MS to screenings. Marketed by AGT. EPR \$2.

Bread wheat – COSMICK

AH quality. Fully awned with early to mid season maturity. Stem rust MS, stripe rust MSS, leaf rust SVS, CCN MS and yellow leaf spot MRMS. Good wheat on wheat option where CCN is managed. Excellent yield, good test weight and MS to screenings. Released 2014, tested as IGW3423 and marketed by InterGrain. EPR \$3.85.

NEW Bread wheat – CUTLASS

APW quality. Mid-late maturing variety with a flexible sowing time like Yitpi. Stem rust Rp, stripe rust MS_p, leaf rust RMR_p, CCN R and yellow leaf spot MSS_p. Boron tolerant. Released 2015, tested as RAC2069 and marketed by AGT. EPR \$3.

Bread wheat – DERRIMUT

AH quality. Semi-dwarf early to mid season variety widely adapted in Victoria. Stem rust MR, stripe rust MSS, leaf rust MSS, CCN R and yellow leaf spot S. Moderately tolerant of boron toxicity and MS to screenings. Released 2007 and marketed by Nuseed. EPR \$2.95.

NEW Bread wheat – DS DARWIN

AH quality. Early to mid season maturity suited to medium and high rainfall zones. Stem rust MR, stripe rust MR, leaf rust SVS, CCN MSS and yellow leaf spot S. MR for black point. Wide sowing window with large grain and low screenings. Released 2015, tested as ADV03.0056 and marketed by Dow Seeds. EPR \$4.25.

NEW Bread wheat – DS PASCAL

APW quality. Mid to late season maturity suited to high rainfall zones and irrigation. Stem rust MSS, stripe rust MR, leaf rust MS, CCN MS and yellow leaf spot MRMS. Excellent sprouting and lodging tolerance. Released 2015, tested as ADV08.0062 and marketed by Dow Seeds. EPR \$4.25.

Bread wheat – EGA GREGORY 

APW* quality. Early to mid season variety with medium to slow maturity suited to north eastern Victoria. Stem rust MR, stripe rust MR, leaf rust MR, CCN S and yellow leaf spot S. MSS to black point. Low screenings and MS to lodging. Released 2004 and marketed by Pacific Seeds. EPR \$2.10.

Bread wheat – EGA WEDGETAIL 

APW* quality. A mid to long season dual-purpose winter wheat. Developed for early sowing, suited to medium-high rainfall areas. Has a similar maturity to Rosella. Stem rust MRMS, stripe rust MS, leaf rust MS, CCN S and yellow leaf spot MSS. Tolerant of acid soils and suitable for early winter grazing. Registered 2002 and marketed by Seednet. EPR \$1.45.

Bread wheat – ELMORE CL PLUS 

AH quality. Mid maturing variety with similar adaptation to Janz best suited to moderate to high yielding areas. Stem rust MR, stripe rust MRMS, leaf rust RMR, CCN S and yellow leaf spot S. A two gene Clearfield variety tolerant to label rates of Intervix® herbicide. Developed and marketed by AGT. EPR \$3.55.

Bread wheat – EMU ROCK 

AH quality. An awned semi-dwarf early season variety that is best suited to medium to low rainfall environments. Produces large grain with good test weight, has a low susceptibility to screenings. Stem rust MRMS, stripe rust MRMS, leaf rust S, CCN S and yellow leaf spot MRMS. Offers partial crown rot resistance (MS). Bred and marketed by InterGrain. EPR \$3.50.

Bread wheat – ESTOC 

APW quality. A mid to late season variety, slightly earlier flowering than Yitpi. Stem rust MR, stripe rust MRMS, leaf rust MSS, CCN MR and yellow leaf spot MSS. Has a long coleoptile and flexibility in sowing time similar to Yitpi. Has outperformed Yitpi in dry seasons. Tolerant of boron and MRMS pre-harvest sprouting. Marketed by AGT. EPR \$3.

Bread wheat – FORREST 

APW quality. Awned semi-dwarf long season variety suited to the high rainfall zones for early April to early May sowing. Stem rust RMR, stripe rust RMR, leaf rust MS, CCN S and yellow leaf spot MRMS. Possesses resistance/tolerance to Wheat Streak Mosaic Virus. Released 2011. Bred by Advantage Wheats and marketed by Seednet. EPR \$3.50.

Bread wheat – GLADIUS 

AH quality. Fully awned semi-dwarf mid season variety. Stem rust MR, stripe rust MRMS, leaf rust MS, CCN MS and yellow leaf spot MS. Gladius has performed well in a range of environments and seasons and was specifically bred to assist managing in-season drought risks. SVS to pre-harvest sprouting. Marketed by AGT. EPR \$2.50.

Bread wheat – GRENADE CL PLUS 

AH quality. Fully awned early-mid season variety. Two gene tolerance to label rates of Intervix® herbicide and a sister line to Justica CL Plus. Stem rust MR, stripe rust MRMS, leaf rust S, CCN MR and yellow leaf spot S. Tolerant to boron and acid soils. Released 2012 and marketed by AGT. EPR \$3.80.

NEW Bread wheat – HATCHET CL PLUS 

AH quality. Semi-dwarf awned wheat with very early maturity, 1-2 days earlier than Axe. Two gene tolerance to label rates of Intervix® herbicide. Stem rust MS, stripe rust MRMS, leaf rust SVS, CCN MR and yellow leaf spot S. Fast maturity can allow extra time to manage weeds prior to sowing, SVS to pre-harvest sprouting. Released 2015, tested as RAC1843 and marketed by AGT. EPR \$4.05.

Bread wheat – KIORA 

AH quality. Mid to late season maturity best suited to medium to high rainfall areas. Stem rust RMR, stripe rust RMR, leaf rust MRMS, CCN MS, yellow leaf spot MSS and black point MSp. Released 2014, tested as VX2485 and marketed by AGT. EPR \$3.25.

Bread Wheat – KORD CL PLUS 

AH quality. Fully awned semi-dwarf with mid season maturity. Two gene tolerance to label rates of Intervix® herbicide. Stem rust MR, stripe rust MRMS, leaf rust MS, CCN MR and yellow leaf spot MSS. Based on Gladius with very similar adaptation. SVS to pre-harvest sprouting. Released 2011 and marketed by AGT. EPR \$3.55.

Bread wheat – LRPB COBRA 

AH quality. Short semi-dwarf early-mid season variety suited to medium to high yield potential environments on both acid and alkaline soils. Stem rust RMR, stripe rust MSS, leaf rust MR, CCN MRMS and yellow leaf spot MRMS. Compact plant height, moderately resistant to lodging, but SVS to pre-harvest sprouting. Released 2012 and marketed by Pacific Seeds. EPR \$3.50.

Bread wheat – LRPB DART 

AH quality. Very early maturing suited to acid soils in north central and north east Victoria. Short to medium plant height will assist in short finishing seasons. Long coleoptile. Stem rust MR, stripe rust MR, leaf rust SVS, CCN S and yellow leaf spot MS. Released 2012 and marketed by Pacific Seeds. EPR \$4.

NEW Bread wheat – LRPB FLANKER 

Quality to be confirmed in Southern Zone but APH in NSW. Early to mid season variety with medium to slow maturity suited to medium to high rainfall areas in North East Victoria. Stem rust RMR, stripe rust RMR, leaf rust MRMS and yellow leaf spot MSS. Susceptible to lodging. Released 2015, tested as LPB10-2555 and marketed by Pacific Seeds. EPR \$4.25

Bread wheat – LRPB GAUNTLET 

APW quality. A mid to late season variety suited to acid soils in North Central and North East Victoria. Short to medium plant height with good early vigour. Stem rust RMR, stripe rust MRMS, leaf rust MS, CCN MRMS and yellow leaf spot MS. Released 2012 and marketed by Seednet. EPR \$3.

Bread wheat – LRPB LANCER 

APW* quality. Mid-long season variety for early planting. Short semi-dwarf with awns suited to medium to high rainfall areas. Stem rust R, stripe rust MR, leaf rust RMR, CCN S and yellow leaf spot MS. Compact plant height and moderate lodging resistance. Released 2013 and marketed by Pacific Seeds. EPR \$4.25.

Bread wheat – LRPB LINCOLN 

AH quality. Mid season variety, semi-dwarf with awns suited to medium to high rainfall areas. Stem rust MR, stripe rust RMR, leaf rust S, CCN S and yellow leaf spot MSS. MS to lodging and SVS to pre-harvest sprouting. Best suited to North Central and North East Victoria. Released 2007 and marketed by Pacific Seeds. EPR \$2.50.

Bread wheat – LRPB MERLIN 

AH quality. An early to mid season variety suited to North Central and North East Victoria. Large grain. Stem rust MR, stripe rust MR, leaf rust MS, CCN MS and yellow leaf spot S. Released 2012 and marketed by Pacific Seeds. EPR \$3.80.

Bread wheat – LRPB PHANTOM 

AH quality. A mid to late season variety tolerant of boron and acid soils. Stem rust MS, stripe rust MR, leaf rust S, CCN MRMS, yellow leaf spot SVS and black point MRMS. MS to lodging and susceptible to pre-harvest sprouting. Released 2012 and marketed by Pacific Seeds. EPR \$3.80.

Bread wheat – LRPB SCOUT 

AH quality. An awned white chaff variety with mid season maturity and has wide adaptation across Victoria. Stem rust MR, stripe rust MS, leaf rust MS, CCN R, yellow leaf spot SVS and black point S. Adapted to alkaline soils. Marketed by Pacific Seeds. EPR \$2.80.

Bread wheat – LRPB TROJAN 

APW quality. Mid-long season variety. Semi-dwarf with awns suited to medium to high rainfall areas. Stem rust MRMS, stripe rust MR, leaf rust MRMS, CCN MS and yellow leaf spot MSS. MR to lodging and MT to boron and aluminium. Released 2013 and marketed by Pacific Seeds. EPR \$4.

Bread wheat – LRPB VIKING 

Quality to be confirmed in Southern Zone but APH in NSW. An awned semi-dwarf mid to long season variety suited to medium to high rainfall areas. Stem rust MRMS, stripe rust MR, leaf rust MRMS, CCN MS and yellow leaf spot MSS. Similar early growth habit to Chara, but taller at maturity and SVS to sprouting. Released 2014, tested as LPB08-1799 and marketed by Pacific Seeds. EPR \$4.25.

Bread wheat – MACE 

AH quality. An awned variety of medium height. Stem rust MR, stripe rust SVS, leaf rust MSS, CCN MRMS and yellow leaf spot MRMS. Tolerant of boron. Growers of Mace must implement a comprehensive fungicide strategy to control stripe rust. Released 2008, marketed by AGT. EPR \$3.

Bread wheat – MAGENTA 

APW quality. An awned semi-dwarf mid to long season variety suited to medium to high yield potential environments. Stem rust RMR, stripe rust MS, leaf rust MRMS and CCN S and yellow leaf spot MRMS. Has a long coleoptile with good early vigour and tillering capacity. Moderate grain size. Released 2007 and marketed by InterGrain. EPR \$3.

NEW Bread wheat – SCEPTER 

AH quality. Early to mid season maturity of medium height. Stem rust MRp, stripe rust MSSp, leaf rust MSSp, CCN MRMS and yellow leaf spot MRMSp. Tolerant of boron. Intended to replace Mace, it flowers two days later. It has improved resistance to leaf and stripe rust but growers will still need to manage stripe rust. Released 2015, tested as RAC2182 and marketed by AGT. EPR \$3.25.

Bread wheat – SENTINEL^{3R} 

ASW quality. Mid to long season variety of medium height suited to medium to high rainfall zones. Stem rust RMR, stripe rust RMR, leaf rust R, CCN S and yellow leaf spot MS. Acid soil tolerant. Released 2006 and marketed by Seednet. EPR \$1.80.

Bread wheat – SHIELD 

AH quality. A white fully awned early-mid season variety. Stem rust RMR, stripe rust MR, leaf rust R, CCN MR and yellow leaf spot MSS. Short to medium plant height with a short coleoptile. Moderate tolerance to acid soils. Released 2012 and marketed by AGT. EPR \$3.25.

Bread wheat – SUNTOP 

AH quality. A white fully awned variety suited to North Central and North East Victoria. Stem rust MR, stripe rust MR, leaf rust MRMS, CCN S and yellow leaf spot MSS. Medium plant height. Tolerance to acid soils, but SVS to pre-harvest sprouting and MS to screenings. Released 2012 and marketed by AGT. EPR \$3.25.

Bread wheat – WALLUP 

AH quality. Mid season maturity fully awned white variety suited to medium rainfall environments. Stem rust MRMS, stripe rust MRMS, leaf rust SVS, CCN MR, yellow leaf spot MSS and black point MS. MR to lodging. Released 2011. Marketed by AGT. EPR \$3.

Bread wheat – YITPI 

AH quality. White fully awned semi-dwarf which has dominated production in low rainfall areas of Victoria due to its high flexibility of sowing time, adaptation to stress and good physical grain quality. Stem rust S, stripe rust MRMS, leaf rust S, CCN MR and yellow leaf spot SVS. Boron tolerant, large grain and low screenings, Yitpi suits low – medium rainfall areas. Marketed by Seednet. EPR \$1.

Biscuit wheat – LRPB GAZELLE 

ASF1 quality. Mid-late season variety suited to medium-high rainfall zones and irrigation. Stem rust MR, stripe rust RMR, leaf rust MR, CCN S and yellow leaf spot MSS. Released 2012 and marketed by Pacific Seeds. EPR \$4.00.

Biscuit wheat – LRPB IMPALA 

ASF1 quality. Early-mid season variety suited to medium rainfall zones in Victoria. Stem rust RMR, stripe rust MR, leaf rust SVS, CCN S and yellow leaf spot MSS. Released 2012 and marketed by Pacific Seeds. EPR \$3.50.

Biscuit wheat – YENDA 

ASF1 quality. Awned mid to late season variety suited to medium to high rainfall zones or irrigation. Stem rust R, stripe rust S, CCN S and yellow leaf spot MRMS. High lodging tolerance. Released 2006 by AGT and marketed by Seednet. EPR \$2.

Durum – CAPAROI

ADR quality. Mid season semi-dwarf type developed for durum zones interstate. Stem rust R, stripe rust MR, leaf rust RMR and yellow leaf spot MR. Strong seedling vigour, strong straw and lodging and shedding resistance. Released 2008 and marketed by Seednet. EPR \$2.60.

Durum – DBA Aurora

ADR quality. A mid season, very high yielding variety. Stem rust R, stripe rust R, leaf rust RMR and yellow leaf spot MRMS. Good grain size, with good early vigour and weed competitiveness. Bred by Durum Breeding Australia (as UAD0951096), released 2014 and marketed by SA Durum Growers Association. EPR \$3.

Durum – HYPERNO

ADR quality. An awned mid season white chaffed variety adapted to medium rainfall zones. Stem rust RMR, stripe rust MR, leaf rust R, CCN MS and yellow leaf spot MRMS. Performs well in high yielding environments but is intolerant of boron. Released 2008 and marketed by AGT. EPR \$3.

Durum – TJILKURI

ADR quality. A mid season fully-awned variety. Stem rust MR, stripe rust MR, leaf rust R and yellow leaf spot MRMS. Tolerant to Boron. Released 2010 and marketed by SA Durum Growers Association. EPR \$3.

Durum – WID802

ADR quality. A mid season variety. Stem rust RMR, stripe rust MR, leaf rust R, CCN MS and yellow leaf spot MRMS. High yielding, but may have low protein if nitrogen is limiting. Likely to produce high screenings in short finishes. Released 2012 and marketed by SA Durum Growers Association. EPR \$3.

Durum – YAWA

ADR quality. A mid season variety. Stem rust RMR, stripe rust MR, leaf rust R, CCN MS and yellow leaf spot MRMS. High yielding, but may have low protein if nitrogen is limiting. Likely to produce high screenings in short finishes. Released 2012 and marketed by SA Durum Growers Association. EPR \$3.

Feed – BEAUFORT

FEED quality. An awnless red grained mid to long season variety suited to high rainfall zones of southern Australia. Stem rust SVS, stripe rust RMR, leaf rust MSS, CCN S and yellow leaf spot MRMS. Strong straw suited to early-mid season sowing with aluminium tolerance. A comprehensive fungicide strategy is required to control stem rust. Marketed by GrainSearch. EPR \$3.

Feed/Dual purpose – MANNING

FEED quality. Dual purpose white grain wheat suited to longer growing season zones and irrigation. Stem rust MR, stripe rust RMR, leaf rust MRMS, CCN S and yellow leaf spot MRMS. Resistant to BYDV. Bred by CSIRO/GRDC (as CS9274.33), released 2013 and marketed by GrainSearch. EPR \$3.50.

Feed/Dual purpose – NAPAROO

FEED quality. A white grained awnless long season winter wheat suited to hay production or grazing. Stem rust RMR, stripe rust R, leaf rust S and yellow leaf spot MS. Marketed by AGT. EPR \$2.50.

Feed – PRESTON

FEED quality with white grain. An awned semi-dwarf mid to late season variety with high yield potential suited to the high rainfall zone. Stem rust SVS, stripe rust RMR, leaf rust SVS, CCN S and yellow leaf spot MSS. A comprehensive fungicide strategy is required to control stem rust. Released 2009 and marketed by Seednet. EPR \$2.20.

Feed/Dual purpose – SF ADAGIO

FEED quality. An awned red winter wheat. It is a mid to long season variety for high rainfall zones and irrigation. Adagio is suitable for dual purpose applications when early sowing is possible. Stem rust SVS, stripe rust RMR, leaf rust MSS, CCN S and yellow leaf spot MRMS. A comprehensive fungicide strategy is required to control stem rust. Released 2014, marketed by AGF Seeds. EPR \$3.60.

Feed/Dual purpose – SF OVALO

FEED quality. Awnless red winter wheat. It is a long season variety for high rainfall zones and irrigation. Ovalo is suitable for dual purpose applications when early sowing is possible. Stem rust S, stripe rust RMR, leaf rust MSS and yellow leaf spot MR. Bred by AGT, released 2014 and marketed by Seedforce. EPR \$4.

Feed/Dual purpose – SF SCENARIO

FEED quality. Awnless red winter wheat. It is a long season variety with similar maturity to Frelon and a direct replacement for Frelon and Amaro. Stem rust MSS, stripe rust RMR, leaf rust MSS, CCN S and yellow leaf spot MS. Bred by RAGT, released 2013 and marketed by AGF Seeds. EPR \$3.60.

Feed/Dual purpose – SQP REVENUE

FEED quality. A red grained awnless winter wheat suited to longer growing season zones and irrigation. Stem rust RMR, stripe rust R, leaf rust SVS, CCN S and yellow leaf spot MS. Has good early vigour and stands well with good head retention. Bred by AusGrainz and CSIRO (as CSIRO 95102.1), released 2009 and marketed by GrainSearch. EPR \$3.50.

NEW Feed/Dual purpose – SUNLAMB

FEED quality. A white grained long season spring variety suited to the medium to high rainfall zone and irrigation. It is best sown early to mid April. Slow maturing and suitable for dual purpose applications. Stem rust R, stripe rust MR, leaf rust MRMS, CCN MR and yellow leaf spot. Released 2015, tested as SUN521C and marketed by AGT. EPR \$2.75.

Table 1: Wheat variety agronomic guide.

	Maximum Quality Southern Zone	Rainfall			Screenings	Maturity	Height	Coleop length	Lodging	Sprouting	Head type		Soil tolerance	
		Low <400 mm	Med 4-500 mm	High >500 mm							Colour	Awn	Boron	Acid
Bread wheat														
Axe	AH	✓			MR	E	M-S	S	MR	SVS	W	A	I	I
Beckom	AH	✓	✓	✓	MRMS	M	S	M	MRMS	MSS	W	A	MT	MT
Bolac	AH		✓	✓	S	M-L	M	M	MR	S	W	A	I	I
Chara	AH	✓	✓	✓	MR	M-L	M	MS	MR	S	W	A	MI	MI
Condo	AH	✓	✓		R	E	MT	M	MS	S	W	A	I	MT
Corack	APW	✓	✓		R	E-M	S	MS	MR	S	W	A	I	T
Correll	AH	✓	✓		MS	M	M	ML	MS	SVS	W	A	MT	MT
Cosmick	AH	✓	✓		MS	E-M	M	L	MRMS		W	A		
Cutlass	APW	✓	✓		MRMS	M-L	MT	ML	MRMS	S	W	A	MT	MT
Derrimut	AH	✓	✓		MS	E-M	MS	MS	MRMS	S	W	A	MT	
DS Darwin	AH		✓	✓	MR	M	M		MR		W	A		
DS Pascal	APW			✓		M-L	M		MR	MR(P)	W	A		
EGA Gregory	APW*		✓	✓	MR	M-L	MT		MS	S	W	A		MT
EGA Wedgetail	APW*			✓	MR	ML (+W)	M	MS	MR	S	W	A	I	MT
Elmore CL Plus	AH		✓		MS	M	M	M	MRMS	S	W	A	I	I
Emu Rock	AH	✓	✓		R	E	S	M	R	S	W	A		
Estoc	APW	✓	✓			M-L	M	ML	MR	MRMS	W	A	MT	MT
Forrest	APW		✓	✓	MR	L	M	S-M		S	W	A		
Gladius	AH	✓	✓		MR	M	M	M	MRMS	SVS	W	A	MT	MT
Grenade CL Plus	AH		✓		MR	EM	MT	ML		S	W	A	MT	MT
Hatchet CL Plus	AH	✓			MR	E	T	S		SVS	W	A	MI	MT
Kiora	AH		✓	✓	MS	M-L	M	M	MR	S	W	A	MI	MI
Kord CL Plus	AH	✓	✓		MR	M	M	S		SVS	W	A	MT	MT
LRPB Cobra	AH	✓	✓	✓	MRMS	E-M	S		MR	SVS	W	A	I	MT
LRPB Dart	AH	✓	✓		MRMS	E	SM	L	MR	S	W	A	I	MT
LRPB Flanker	TBC		✓	✓	MR	M-L	MT		MS	S	W	A	I	MT-MI
LRPB Gauntlet	APW		✓	✓	MRMS	M-L	SM	M	MS	S	W	A	I	MT
LRPB Lancer	APW*		✓	✓	MR	M-L	S	M	MR	S	W	A	I	MI-I
LRPB Lincoln	AH	✓	✓	✓	MR	M	M	MS	MS	SVS	W	A	I	MT
LRPB Merlin	AH		✓		MR	E-M	M		MRMS	MS	W	A	I	
LRPB Phantom	AH		✓	✓	MR	M-L	MT		MS	S	W	A	MT	MT
LRPB Scout	AH	✓	✓	✓	MR	M	M	ML	MRMS	MS	W	A	MI	MT
LRPB Trojan	APW		✓	✓	MR	ML	M	M	MR	MSS	W	A	MT	MT-MI
LRPB Viking	TBC		✓	✓		ML	MT	MS	MS	SVS	W	A	I	MT-MI
Mace	AH	✓	✓		MR	E	M	MS	MR	S	W	A	MT	MT
Magenta	APW	✓	✓		MS	M-L	M	L	MRMS	S	W	A	I	MT
Scepter	AH	✓	✓		MR	E-M	M	MS	MR	S	W	A	MT	MT
Sentinel 3R	ASW		✓	✓	MRMS	ML	M	S	MRMS	S	W	A		MT
Shield	AH	✓	✓		MR	EM	SM	S		S	W	A	I	MT
Suntop	AH	✓	✓	✓	MS	M	M	M	MR	SVS	W	A	I	MT
Wallup	AH		✓		MR	M	M	MS	MR	S	W	A	I	I
Yitpi	AH	✓	✓		MR	M	MT	ML	MS	MS	W	A	MT	MT
Biscuit wheat														
LRPB Gazelle	ASF1		✓	✓	MRMS	M-L	M		MR	S	W	A	I	MT
LRPB Impala	ASF1	✓	✓	✓	MR	E-M	ML		MS	MSS	W	A	I	MT
Yenda	ASF1		✓	✓	MR	M-L	SM	S	RMR	S	W	A	MT	MT
Durum														
Caparoi	ADR		✓			M	S-M	S-M	MR	M				I
DBA Aurora	ADR		✓	✓	R	M	M		MR	MR	W	A	MT	
Hyperno	ADR		✓			M	M		MR	MR	W	A	I	
Tjilkuri	ADR				MS	M	M			S	W/B	A	T	
WID802	ADR				MS	E-M				MR				
Yawa	ADR				MS	E-M				MR				
Feed wheat														
Beaufort	Feed		✓	✓		ML	M		MR-MS	MR	R	AL		MT
Manning	Feed			✓		L (+W)					W	AL		
Naparoo	Feed			✓		L (+W)					W	A		
Preston	Feed			✓		L	S		MR			A		
SF Adagio	Feed		✓	✓		M-L (+W)					R	A		
SF Ovalo	Feed			✓		L (+W)					R	AL		
SF Scenario	Feed			✓		L (+W)					R	AL		
SQP Revenue	Feed			✓		L (+W)	S				R	AL		
Sunlamb	Feed		✓	✓	MR	L	M				W	AL		MI

Maturity: E = early, M = mid, L = late (+W) = Winter wheat

Coleoptile length; S = short, M = medium, L = long

Head Colour; W = white, B = black, R = red

Screening, lodging & sprouting resistance - see key used in Table 2

Height; S = short, M = medium, T = tall

Soil tolerance; I = intolerant, T = tolerant

Head type; A = awned, AL = awnless

Table 2: Wheat variety disease rating guide.

	Rust			Yellow Leaf Spot	Septoria tritici	CCN Res	Pratylenchus		Crown Rot	Common Root rot	Black Tip (black point)	Flag Smut
	Stem	Stripe	Leaf				P. neglectus resistance	P. thornei resistance				
Bread wheat												
Axe	MS	RMR	SVS	S	SVS	S	MSS	MS	S	MSS	S	S
Beaufort	SVS	RMR	MSS	MRMS	MSS	S	MS	MS	S	MSS	MRMS	R
Beckom	MR	MRMS	S	MSS	SVS	R	MSS	MS	S	MSS	-	MR
Bolac	MRMS	RMR	S	S	MSS	S	MSS	MRMS	S	MS	MSS	RMR
Condo	RMR	MSS	S	MS	S	MR	S	MRMS	S	MSS	MRp	S
Corack	MR	MS	SVS	MR#	SVS	RMR	MSS	S	S	MS	MSS	S
Correll	MRMS	MRMS	MSS	SVS	MSS	MR	MSS	S	S	MS	MS	R
Cosmick	MS	MSS	SVS	MRMS	S	MS	MSS	MSS	S	MSS	-	VS
Cutlass	Rp	MSp	RMRp	MSSp	MSSp	R	-	-	-	-	MS	-
Derrimut	MR	MSS	MSS	S	S	R	MSS	S	MSS	S	MSS	RMR
DS Darwin	MR	MR	SVS	S	SVS	MSS	MSS	S	S	MSS	MR	MR
DS Pascal	MSS	MR	MS	MRMS	MSS	MS	MSS	S	MSSp	MS	-	SVS
EGA Gregory	MR	MR	MR	S	MSS	S	MSS	MS	S	MSS	MSS	MSS
EGA Wedgetail	MRMS	MS	MS	MSS	MSS	S	S	S	S	-	MS	MRMS
Elmore CL Plus	MR	MRMS	RMR	S	S	S	S	S	S	MSS	MS	S
Emu Rock	MRMS	MRMS	S	MRMS	SVS	S	MSS	S	MS	MSS	MS	MS
Estoc	MR	MRMS	MSS	MSS	S	MR	S	S	MSS	MRMS	MS	MRMS
Forrest	RMR	RMR	MS	MRMS	MSS	S	S	SVS	SVS	MS	MR	MR
Gladius	MR	MRMS	MS	MS	S	MS	MS	S	S	MS	MS	MR
Grenade CL Plus	MR	MRMS	S	S	SVS	MR	MSS	S	S	MRMS	MS	MR
Hatchet CL Plus	MS	MRMS	SVS	S	SVS	MR	MS	MS	S	MS	-	RMR
Kiora	RMR	RMR	MRMS	MSS	S	MS	MSS	MRMS	S	MS	MSp	MRMS
Kord CL Plus	MR	MRMS	MS	MSS	S	MR	MSS	MS	S	MRMS	MRMS	MR
LRPB Cobra	RMR	MSS	MR	MRMS	MSS	MRMS	MSS	MSS	S	MSS	MS	S
LRPB Dart	MR	MR	SVS	MS	SVS	S	MSS	MS	MSS	MS	MRMSp	MS
LRPB Flanker	RMR	RMR	MRMS	MSS	MSS	S	MSS	MS	Sp	-	-	R
LRPB Gauntlet	RMR	MRMS	MS	MS	MSS	MRMS	S	MR	MSS	MSS	MS	MS
LRPB Lancer	R	MR	RMR	MS	MSS	S	S	MS	MSS	S	MRMSp	MSS
LRPB Lincoln	MR	RMR	S	MSS	S	S	MSS	SVS	SVS	MS	MR	RMR
LRPB Merlin	MR	MR	MS	S	SVS	MS	MS	MS	MSS	MSS	S	MRMS
LRPB Phantom	MS	MR	S	SVS	SVS	MRMS	S	S	MSS	MSS	MRMS	MRMS
LRPB Scout	MR	MS	MS	SVS	SVS	R	S	MS	S	S	S	MR
LRPB Trojan	MRMS	MR	MRMS	MSS	MSS	MS	MSS	MS	MS	MS	MRMS	SVS
LRPB Viking	MRMS	RMR	SVSp	MSS	MSS	Rp	S	MS	MSS	-	MRp	MSS
Mace	MR	SVS	MSS	MRMS	SVS	MRMS	MS	MS	S	MS	MS	S
Magenta	RMR	MS	MRMS	MRMS	S	S	MS	S	MSS	S	S	MSS
Scepter	MRp	MSSp	MSSp	MRMSp	Sp	MRMS	-	-	-	-	-	-
Sentinel 3R	RMR	RMR	R	MS	MRMS	S	S	MSS	MSS	S	MSS	MSS
Shield	RMR	MR	R	MSS	S	MR	MS	MSS	S	MRMS	MS	S
Suntop	MR	MR	MRMS	MSS	MSS	S	MSS	MR	MSS	MS	MRMS	R
Wallup	MRMS	MRMS	SVS	MSS	SVS	MR	MRMS	MRMS	S	MS	MS	SVS
Yitpi	S	MRMS	S	SVS	MSS	MR	MSS	S	S	MS	MS	MR
Biscuit wheat												
LRPB Gazelle	MR	RMR	MR	MSS	MSS	S	S	S	S	MSS	MSS	S
Impala	RMR	MR	SVS	MSS	SVS	S	S	S	S	S	MRMS	VS
Yenda	R	S	-	MRMS	-	S	MR	S	S	MSS	S	MR
Durum wheat												
Caparoi	R	MR	RMR	MR	RMR	MS	MSS	MR	VS	MS	MSS	R
DBA Aurora	R	RMR	R	MRMS	MR	MS	MS	RMR	VS	MRMS	MS	R
Hyperno	RMR	MR	R	MRMS	MR	MS	MS	RMR	SVS	MS	MS	R
Tjilkuri	MR	MR	R	MRMS	MRMS	MS	MS	MR	VS	MS	MSS	R
WID802	RMR	MR	R	MRMS	MR	MS	MS	MS	VS	MS	MSS	R
Yawa	RMR	MR	R	MRMS	MR	MS	MRMS	RMR	VS	MRMS	MRMS	R
Feed wheat												
Beaufort	SVS	RMR	MSS	MRMS	MSS	S	MS	MS	S	MSS	MRMS	R
Manning	MR	RMR	MRMS	MRMS	MR	S	MSS	S	VS	SVS	-	R
Naparoo	RMR	R	S	MS	MS	-	SVS	SVS	S	S	-	VS
Preston	SVS	RMR	SVS	MSS	MSS	S	MSS	MSS	S	MS	MRMS	S

Varieties marked may be more susceptible if alternative strains are present.

Resistance order from best to worst: R > RMR > MR > MRMS > MS > MSS > S > SVS > VS.

p = provisional ratings - treat with caution. R = resistant, M = moderately, S = susceptible, V = very.

Table 2 continued: Wheat variety disease rating guide.

	Rust			Yellow Leaf Spot	Septoria tritici	CCN Res	Pratylenchus		Crown Rot	Common Root rot	Black Tip (black point)	Flag Smut
	Stem	Stripe	Leaf				P. neglectus resistance	P. thornei resistance				
SF Adagio	SVS	RMR	MSS	MRMS	MR	S	MS	MS	SVS	MS	-	MS
SF Ovalo	S	RMR	MSS	MR	MR	-	MSS	MS	-	-	-	MRMS
SF Scenario	MSS	RMR	MSS	MS	MR	S	MSS	MS	SVSp	MS	-	RMR
SQP Revenue	RMR	R	SVS	MS	MS	S	MSS	MSS	S	SVS	MSS	S
Sunlamb	R	MR	MRMS	MRMS	MRMS	MR	MS	MS	MSSp	-	-	SVS

Table 3: Wheat time of sowing guide.

This table is a guide only and has been compiled from observations of departmental agronomists and plant breeders.

MALLEE	April			May			June			July		
Cutlass, DS Darwin, Estoc, LRPB Phantom, LRPB Trojan, Yitpi		>	X	X	X	X	X	<				
Beckom, Correll, Cosmick, Derrimut, Elmore CL Plus, Gladius, Grenade CL Plus, Janz, Kord CL Plus, LRPB Catalina, LRPB Lincoln, LRPB Scout, Mace, Peake, Scepter, Shield, Suntop			>	X	X	X	X	X	<	<		
Axe, Condo, Corack, Emu Rock, Hatchet CL Plus, LRPB Dart, Ventura, Wyalkatchem			>	>	X	X	X	X	X	<	<	
WIMMERA	April			May			June			July		
Bolac, Kiora		>	X	X	X	<						
Cutlass, DS Darwin, Estoc, LRPB Gazelle, LRPB Phantom, LRPB Trojan, Yitpi, Durum varieties			>	X	X	X	X	<				
Beckom, Chara, Cosmick, Correll, Derrimut, Elmore CL Plus, Frame, Gladius, Grenade CL Plus, Janz, Kord CL Plus, LRPB Catalina, LRPB Cobra, LRPB Impala, LRPB Lincoln, LRPB Merlin, LRPB Scout, Mace, Magenta, Peake, Scepter, Shield, Suntop, Wallup, Wyalkatchem				>	X	X	X	X	<	<		
Axe, Condo, Corack, Emu Rock, Hatchet CL Plus, LRPB Dart					>	X	X	X	X	<	<	<
NORTH CENTRAL	April			May			June			July		
Bolac, Kiora, Yenda		>	X	X	X	<						
Cutlass, Chara, Cosmick, DS Darwin, EGA Gregory, Estoc, LRPB Flanker, LRPB Gauntlet, LRPB Phantom, LRPB Trojan, LRPB Viking, Magenta, Yitpi			>	X	X	X	X	X	<	<		
Beckom, Correll, Derrimut, Elmore CL Plus, Gladius, Grenade CL Plus, Janz, Kord CL Plus, LRPB Cobra, LRPB Impala, LRPB Lincoln, LRPB Merlin, LRPB Scout, Mace, Peake, Scepter, Shield, Suntop, Ventura, Wallup, Wyalkatchem					>	X	X	X	X	<	<	
Axe, Condo, Corack, Emu Rock, Hatchet CL Plus, LRPB Dart						>	X	X	X	X	X	<
NORTH EAST	April			May			June			July		
MacKellar, Manning (Mar-Apr), SQP Revenue, Sunlamb	X	X	X	<								
EGA Wedgetail, Forrest,	>	X	X	X	X	X	X	<				
Bolac, DS Pascal, Kiora, Yenda		>	X	X	X	<						
Cutlass, Chara, DS Darwin, EGA Gregory, Estoc, LRPB Flanker, LRPB Gauntlet, LRPB Lancer, LRPB Phantom, LRPB Trojan, LRPB Viking, Magenta, Sentinel 3R, Yitpi			>	X	X	X	X	<	<			
Beckom, Cosmick, Elmore CL Plus, Grenade CL Plus, Janz, LRPB Cobra, LRPB Impala, LRPB Lincoln, LRPB Merlin, LRPB Scout, Mace, Scepter, Shield, Suntop, Ventura, Wyalkatchem,				>	X	X	X	X	<			
Condo, Corack, Emu Rock, Hatchet CL Plus, LRPB Dart					>	X	X	X	X	<		
SOUTH WEST	April			May			June			July		
Frelon, MacKellar, Manning (Mar-Apr), Naparoo, SQP Revenue, Sunlamb (early April)	X	X	X	X	X	X	X	<	<			
EGA Wedgetail, Forrest	>	X	X	X	X	X	X	X	<			
Beaufort, Bolac, DS Pascal, Kiora, Preston, Yenda			>	X	X	X	X	<				
Beckom, Chara, Derrimut, LRPB Phantom, LRPB Trojan, Sentinel 3R,			>	>	X	X	X	X	<	<		

>earlier than ideal, X optimum sowing time, < later than ideal but acceptable

Table 4: Victorian wheat varieties - Domestic Flours Millers Assessment.

Interpretation provided by David Hogan, Quality Operations Manager for Laucke Flour Mills.

HARD WHEAT			End product category		Comment	
Variety	Preferred grade	Max class grade	Plant bakery	Artisan breads		
Axe	AH	AH	1	1	Very poor water absorption, strong dough characteristics and long mix time.	
Beckom	AH	AH	2	2	Some interest. Marginal long mix time & tough dough.	
Bolac	AH	AH	2	2	Marginal AH - strong dough characteristics.	
Chara	AH	AH	1	2	Optimum value as separate segregation due to excess mix requirement.	
Condo	AH	AH	1	2	Marginal strong dough & mix time. Possible specialist application.	
Corack	APW	APW	2	1	Acceptable APW quality. Suit domestic mills.	
Correll	AH	AH	3	1	Acceptable AH quality.	
Cosmick	AH	AH	3	2	Acceptable AH for Domestic market.	
Cutlass	APW	APW	3	1	Suit Domestic application. Good WA & acceptable bake.	
Derrimut	AH	AH	3	1	Appears acceptable as AH quality to suit plant bakery.	
DS Darwin	AH	AH	2	1	Limited data available. High water absorption may suit domestic mills as blend.	
DS Pascal	APW	APW	2	1	Limited data available. Potentially limited domestic interest.	
EGA Gregory	APW*	APW*	2	1	Limited data, but indicate suitable for domestic APW.	
EGA Wedgetail	APW*	APW*	1	2	Over strong APW. Long mix requirement. Appears to suit specialist segregation.	
Elmore CL Plus	AH	AH	3	1	Good water absorption & acceptable bake performance. Acceptable AH quality.	
Emu rock	AH	AH	3	2	Acceptable AH. Marginal long mix requirement.	
Estoc	APW	APW	2	1	Marginal APW quality. Some interest from domestic mills.	
Forrest	APW	APW	2	1	Acceptable APW quality for Domestic market.	
Gladius	AH	AH	1	2	Very strong dough properties with excessive mix time.	
Grenade CL Plus	AH	AH	2	2	Marginal strong. Limited domestic interest.	
Hatchet CL Plus	AH	AH	2	2	Some domestic interest. Marginal strong dough.	
Kiora	AH	AH	2	2	Marginally strong dough. Some interest from Domestic market.	
Kord CL Plus	AH	AH	3	1	Appears suitable for domestic mills.	
LRPB Dart	AH	AH	2	1	Good dough & bakery performance, but low FN. Limited interest.	
LRPB Cobra	AH	AH	3	1	Appears acceptable. Some concerns over low viscosity and high yellow pigment.	
LRPB Flanker	AHJ	TBC	2	2	Some domestic interest. Marginal strong dough.	
LRPB Gauntlet	APW	APW	3	1	Appears acceptable. Good dough & bakery results.	
LRPB Lancer	APW*	APW*	2	1	Acceptable APW. Good water absorption & bake volume, but marginal long mix time.	
LRPB Lincoln	AH	AH	2	1	Appears to have limited suitability as domestic AH.	
LRPB Merlin	AH	AH	2	2	Strong dough, long mix. Possibly specialist applications.	
LRPB Phantom	AH	AH	3	1	Appears to suit domestic mills.	
LRPB Scout	AH	AH	2	1	Suitable AH, marginal long mix time.	
LRPB Trojan	APW	APW	2	1	Some interest from domestic mills. Marginal water absorption, long mix time but good bake volume.	
LRPB Viking	TBC			2	Limited data available. Early indication is that it has excessive strength & mix time.	
Mace	AH	AH	3	1	Suitable as domestic AH.	
Magenta	APW	APW	2	1	Marginally acceptable for plant bakeries.	
Scepter	AH	AH	2	1	Suit Domestic application. Acceptable AH quality.	
Sentinel 3R	ASW	ASW	1	1	Appears to have limited suitability for domestic mills.	
Shield	AH	AH	3	1	Marginal strong. Expect some domestic interest.	
Sunlamb	ASW	ASW	2	1	Limited interest. Poor extraction but acceptable rapid bake.	
Suntop	AH	AH	2	2	Strong AH. Good water absorption, but marginally long mix time.	
Wallup	AH	AH	1	2	Long mix requirement. Appears to suit specialist segregation. Limited interest from domestic millers.	
Yitpi	AH	AH	3	2	Acceptable AH quality.	
SOFT OR NOODLE WHEAT			End product category			
Variety	Preferred grade	Max Class grade	Biscuit	Cake	Hot plate goods	Comment
LRPB Gazelle	Soft	SF1	3	2	1	Acceptable Biscuit quality
LRPB Impala	Soft	SF1	3	2	1	Acceptable Biscuit quality

On the quality scale, a rating of 3 is preferred for a particular varietal end-use, 3 preferred, 2 suitable, 1 not suitable.

Table 5: Wheat disease guide.

Disease	Organism	Symptoms	Occurrence	Inoculum source	Control
FOLIAR					
Leaf rust	<i>Puccinia triticina</i>	Small orange-brown powdery pustules on leaf.	Develops in spring. Favoured by mild (15°C–22°C) moist weather.	Airborne spores from living wheat plants.	Resistant varieties, control volunteer summer-autumn wheat. Seed dressings and foliar fungicides.
Stem rust	<i>Puccinia graminis</i> f. sp. <i>tritici</i>	Red-brown, powdery, oblong pustules with tattered torn edges on leaf and stem.	Can develop from mid spring into summer. Favoured by warm (15–30°C) humid conditions.	Airborne spores from living plants (wheat, barley, durum and triticale).	Resistant varieties, control volunteer summer-autumn wheat and barley. Foliar fungicides.
Stripe rust	<i>Puccinia striiformis</i> f. sp. <i>tritici</i>	Yellow powdery pustules often in stripes on leaves.	Can develop throughout the growing season. Favoured by cool (8–15°C), moist weather.	Airborne spores from living wheat and barley grass plants.	Resistant varieties, fungicides (seed, fertiliser and foliar), control volunteer summer-autumn wheat.
Septoria nodorum blotch (Glume blotch)	<i>Stagonospora nodorum</i>	Leaf lesions with minute black spots, leaf death. Can infect the head.	More common in early sown crops and in wet springs	Initially airborne spores released from stubble, and then spread by rain splashed spores within crop.	Resistant varieties, foliar fungicides, seed treatments, stubble removal.
Septoria tritici blotch	<i>Zymoseptoria tritici</i>	Leaf lesions with minute black spots, leaf death.	More common in early sown crops and in wet springs.	Initially airborne spores released from stubble, and then spread by rain splashed spores within crop.	Resistant varieties, foliar fungicides, seed treatments, stubble removal.
Yellow spot	<i>Pyrenophora tritici-repentis</i>	Leaf lesions often with yellow border, leaf death.	More severe in close rotations, when wheat is sown into wheat stubble.	Ascospores from stubble infect plants. Then secondary spread is by airborne spores in spring.	Stubble removal, crop rotation, foliar fungicides, resistant varieties.
BYDV	Barley yellow dwarf virus	Yellowing, dwarfing of infected plants, interveinal chlorosis, reduced seed set.	Most common in perennial grass pastures and in early sown crops.	A virus transmitted by aphids from infected grasses and cereals.	Resistant varieties, seed treatments and/or insecticide treatments to control aphids
GRAIN					
Bunt	<i>Tilletia laevis</i> <i>T. tritici</i>	Seed contains a black, foul smelling mass of spores. Affected grain is not accepted at silos.	Potentially region wide.	Spores on seed coat infect seedling before it emerges.	Seed applied fungicide.
Flag smut	<i>Urocystis agropyri</i>	Stunted plants with black, powdery streaks in leaves.	Most likely in crops sown early in warm soils.	Soil and seedborne spores.	Resistant varieties, seed-applied fungicide.
Loose smut	<i>Ustilago tritici</i>	Black powdery heads on diseased plants.	Region wide.	Infected seed is the predominant source.	Seed-applied fungicide.
ROOT/CROWN					
Common root rot	<i>Bipolaris sorokiniana</i>	Browning of the roots, sub-crown internode and the stem base. Brown spots on leaves. White heads and pinched grain.	Scattered through crop.	Soil borne on grass and cereal residues. Also as spores in the soil.	Crop rotation, one year free from hosts.
Crown rot	<i>Fusarium pseudograminearum</i> , <i>F. culmorum</i>	Browning of stem bases, crown and sometimes roots. White heads and pinched grain.	More severe following a wet winter and dry spring, especially on heavy soils which are poorly drained	Soil borne on grass and cereal residues.	Crop rotation. Avoid highly susceptible varieties, especially durum wheat.
Cereal cyst nematode (CCN)	<i>Heterodera avenae</i>	Yellow, stunted plants with knotted roots, often in patches.	Light soils and well structured clays where cereals are common.	Present in most soils in the southern region of Australia.	Resistant varieties, two year break from susceptible cereals and grasses, in particular wild oats.
Rhizoctonia bare patch	<i>Rhizoctonia solani</i> (AG 8)	Patches of stunted plants with yellow-red erect leaves. Spear tipped roots.	Associated with reduced tillage and poor weed control in autumn. Discouraged by soils with high organic matter.	Fungus carries over in organic matter in the soil. Wide host range.	Pre-cropping weed control, chemical fallow, cultivation, modified sowing equipment. Group B herbicides may increase severity on some soil types. Read the label.
Root lesion nematode	<i>Pratylenchus thornei</i> and <i>Pratylenchus neglectus</i>	Reduced tillering, ill thrift; a lack of root branching and lesions on roots.	Favoured by wheat in rotation with chickpea, medic and vetch.	Survive as dormant nematodes in the soil.	Crop rotation using resistant crops and resistant varieties.
Take-all	<i>Gaeumannomyces graminis</i> var. <i>tritici</i>	Blackening of roots, stem bases and crown. Plant stunting with white heads and pinched grain.	Favoured by a wet spring with a dry finish.	Soil borne on grass hosts and cereal residues.	Crop rotation, at least one year free of hosts (cereals and grasses, especially barley grass). Fungicide applied to seed or fertiliser.

This table has been developed from information in the publications Wallwork H (2000) (Ed) Cereal Root and Crown Diseases (Grains Research and Development Corporation, SARDI) and Wallwork H (2000) (Ed) Cereal Leaf and Stem Diseases (Grains Research and Development Corporation, SARDI).

Table 6: Main season. Long term predicted wheat yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

Mean yield (t/ha)	Mallee 2.23	North Central 3.07	North East 4.33	Wimmera 3.01
AGT Katana	103 (24)	-	-	101 (6)
Axe	97 (40)	98 (11)	98 (14)	99 (18)
Barham	-	96 (11)	96 (14)	95 (18)
Beckom	109 (24)	110 (7)	110 (10)	106 (8)
Bolac	-	-	98 (7)	93 (4)
Bremer	101 (8)	-	-	-
Buchanan	91 (8)	-	101 (4)	90 (3)
Catalina	97 (24)	100 (7)	-	97 (14)
Chara	-	98 (7)	99 (11)	95 (5)
Clearfield Jnz	91 (16)	94 (4)	95 (6)	92 (10)
Clearfield Stl	96 (16)	99 (4)	100 (6)	94 (10)
Cobalt	-	108 (4)	109 (4)	111 (5)
Condo	95 (15)	105 (9)	104 (13)	99 (9)
Corack	107 (40)	106 (11)	105 (16)	108 (18)
Correll	102 (32)	103 (11)	102 (14)	99 (18)
Cosmick	108 (24)	105 (7)	105 (9)	107 (8)
Cutlass	106 (8)	-	107 (4)	106 (3)
Derrimut	100 (40)	98 (11)	97 (16)	101 (18)
DS Darwin	-	99 (4)	99 (13)	99 (3)
DS Newton	-	94 (4)	95 (10)	-
DS Pascal	-	-	96 (10)	-
EGA Gregory	-	101 (10)	101 (15)	-
Elmore CL Plus	99 (32)	100 (11)	100 (15)	97 (18)
Emu Rock	103 (40)	101 (11)	99 (14)	103 (18)
Espada	104 (16)	103 (6)	103 (9)	102 (10)
Estoc	101 (40)	101 (11)	99 (14)	99 (18)
Flanker	-	102 (4)	104 (5)	-
Forrest	-	-	94 (4)	-
Frame	91 (16)	93 (4)	94 (4)	90 (10)
Gascoigne	-	100 (9)	101 (15)	95 (13)
Gazelle	-	96 (7)	96 (10)	93 (9)
GBA Ruby	-	98 (4)	98 (4)	-
Gladius	99 (40)	99 (11)	98 (15)	99 (18)
Grenade CL Plus	99 (40)	98 (11)	95 (14)	98 (18)
Harper	102 (40)	100 (11)	99 (14)	99 (18)
Hatchet CL Plus	93 (24)	97 (7)	96 (3)	100 (8)
Hydra	111 (8)	106 (3)	106 (3)	109 (4)
Impala	-	102 (11)	102 (15)	100 (18)
Jade	95 (9)	-	-	94 (13)
Janz	-	-	-	93 (7)
Justica CL Plus	100 (40)	98 (11)	98 (14)	96 (18)
Kennedy	-	-	97 (3)	-
Kord CL Plus	103 (33)	101 (9)	99 (11)	100 (13)
Livingston	-	99 (4)	97 (8)	94 (4)
LRPB Cobra	96 (31)	105 (9)	107 (13)	100 (13)
LRPB Dart	95 (15)	98 (7)	96 (9)	99 (10)
LRPB Gauntlet	92 (7)	99 (11)	98 (15)	94 (9)
LRPB Lancer	-	-	94 (9)	93 (5)
LRPB Lincoln	97 (16)	97 (11)	98 (14)	96 (17)
LRPB Merlin	89 (7)	97 (10)	95 (14)	92 (10)
LRPB Phantom	98 (40)	102 (11)	102 (15)	100 (18)
LRPB Scout	102 (40)	104 (11)	104 (16)	104 (18)
LRPB Trojan	106 (40)	107 (9)	108 (13)	105 (13)
LRPB Viking	-	104 (4)	106 (7)	97 (4)
Mace	107 (31)	105 (7)	103 (10)	107 (13)
Magenta	106 (24)	100 (11)	102 (15)	99 (18)
Orion	-	97 (7)	100 (9)	93 (14)
Peake	98 (9)	-	99 (4)	100 (6)
QAL2000	-	100 (10)	102 (11)	-
Sabel CL Plus	102 (9)	-	98 (3)	100 (5)
Scepter	111 (8)	-	108 (4)	109 (3)
Sentinel	-	98 (4)	99 (6)	-
SF Ovalo	-	-	87 (3)	-
Shield	105 (40)	99 (3)	98 (4)	101 (18)
Sunguard	-	-	97 (3)	100 (5)

Table 6 continued: Main season, long term predicted wheat yield.

Mean yield (t/ha)	Mallee 2.23	North Central 3.07	North East 4.33	Wimmera 3.01
Sunmate	-	103 (6)	102 (10)	-
Suntop	-	105 (10)	105 (16)	-
Tenfour	-	-	-	112 (3)
Ventura	-	97 (4)	98 (4)	-
Wallup	96 (16)	99 (11)	100 (16)	98 (18)
Wyalkatchem	101 (40)	101 (3)	-	101 (18)
Yitpi	98 (33)	98 (9)	97 (11)	97 (13)
Young	93 (7)	-	97 (4)	97 (5)

Table 7: Long season. Long term predicted wheat yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

Mean yield (t/ha)	South West 4.98
Bolac	100 (6)
Brennan	97 (4)
DS Pascal	106 (6)
EGA Wedgetail	102 (6)
Einstein	99 (4)
Forrest	98 (6)
Gazelle	96 (4)
LRPB Lancer	96 (4)
LRPB Trojan	111 (4)
LRPB Viking	100 (4)
Mackellar	107 (6)
Manning	112 (6)
Mansfield	93 (4)
Naparoo	85 (6)
Rudd	98 (6)
SQP Revenue	105 (6)
Sunlamb	98 (4)
Suntime	88 (4)
Sunzell	87 (6)
Tennant	89 (6)
Wylah	95 (6)

Table 8: Durum wheat. Long term predicted yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

Mean yield (t/ha)	Wimmera 3.76
Caparoi	107 (4)
DBA-Aurora	109 (4)
EGA Bellaroi	96 (4)
Hyperno	107 (4)
Saintly	113 (4)
Tjilkuri	107 (4)
WID802	108 (4)
Yawa	117 (4)

Long term yield predictions provided in this report have been produced using the NVT Long Term MET (Multi Environment Trial) analysis. The analysis produces predictions or "Production Values" for every variety in every NVT trial across all years identified within the dataset. This report presents regional means for each variety which reduces the accuracy and reliability of the results. Varieties present in less than three trials per region have been omitted from this report and some rounding variation may be present when compared to other reporting methods. More detailed yield information can be found using the NVT Long Term Yield App or the Excel Reporting tools available on the NVT website (www.nvtonline.com.au).

The **2015 durum wheat** trial data was not provided. NVT do not publish data when sites are not harvested, yields are below the 0.3 t/ha limit or the CV is greater than 15%.

NVT trials are managed to minimise disease impact and this may include the use of seed dressings and post emergent fungicides.

Table 9: Suggested minimum levels of wheat disease resistance for the southern region.

Annual rainfall	Rust			Yellow leaf spot	Septoria tritici
	Stem	Stripe	Leaf		
Low < 350 mm	MSS	MS	MS	MSS	S
Medium 300-550 mm	MS	MRMS	MS	MSS	MS
High * > 500 mm	MR	MR	MR	MSS	MS

* unless a suitable program of disease control by fungicide applications can be planned and carried out.

Table 10: 2015 Mallee wheat yield (as a percentage of site mean yield). All trials experienced multiple frost and extreme heat conditions. Interpret data with caution.

Sowing Date	Birchip 20/5/15	Hopetoun 13/5/15	Manangatang 4/5/15	Merrinee 5/5/15	Murrayville 8/5/15	Ultima 22/5/15	Walpeup 7/5/15
Axe	125	86	105	104	107	109	108
Beckom	112	111	114	109	111	108	116
Buchanan	65	89	90	72	67	91	94
Corack	105	96	105	103	108	111	112
Cosmick	100	107	108	104	117	92	106
Cutlass	69	119	109	98	108	73	108
Derrimut	92	99	96	100	112	83	102
Elmore CL Plus	108	105	91	100	114	96	96
Emu Rock	128	90	122	123	116	109	109
Estoc	97	111	95	93	91	96	98
Gladius	103	94	79	85	90	101	83
Grenade CL Plus	105	94	98	104	106	100	110
Harper	97	104	96	100	100	91	100
Hatchet CL Plus	121	87	62	93	70	116	71
Justica CL Plus	82	101	107	97	109	84	97
Kord CL Plus	106	99	99	100	112	100	99
LPRB Cobra	100	83	97	105	82	96	106
LRPB Phantom	67	105	84	85	92	84	100
LRPB Scout	102	99	97	105	122	84	100
LRPB Trojan	90	114	102	89	100	95	99
Mace	105	99	90	100	94	111	103
Scepter	127	104	111	112	107	115	112
Shield	114	101	113	123	129	106	103
Wyalkatchem	107	100	101	91	73	96	95
Site Mean (t/ha)	1.19	2.12	2.06	1.66	1.75	0.90	2.18
CV (%)	6	4	6	5	4	3	6
LSD (%)	12	7	11	9	8	5	10

Table 11: 2015 Mallee wheat protein (%) and screenings. Screenings expressed as % of grain below a 2 mm sieve.

	Protein (%)							Screenings (%)						
	Birchip	Hopetoun	Manangatang	Merrinee	Murrayville	Ultima	Walpeup	Birchip	Hopetoun	Manangatang	Merrinee	Murrayville	Ultima	Walpeup
Axe	14.0	12.7	12.5	11.7	14.4	13.8	11.8	3.4	1.6	1.4	3.8	0.6	3.5	2.9
Beckom	14.3	11.1	12.1	12.1	14.3	13.6	11.5	5.2	2.9	1.3	4.2	0.4	7.1	1.7
Buchanan	15.1	11.5	13.4	12.5	16.1	15.5	12.1	8.0	2.0	1.4	3.9	1.8	5.7	1.1
Corack	14.5	11.8	12.5	11.0	14.8	13.1	11.4	6.6	2.2	1.3	5.7	0.3	3.6	1.5
Cosmick	14.0	10.8	11.8	10.9	14.0	13.5	11.2	9.9	3.2	4.5	6.8	1.7	12.2	4.6
Cutlass	16.0	11.1	12.5	12.4	15.0	15.5	12.3	3.7	2.8	1.7	4.1	0.6	1.7	1.8
Derrimut	15.3	11.6	12.8	12.2	14.3	15.0	11.9	5.9	2.9	2.3	5.9	0.9	5.8	2.7
Elmore CL Plus	15.8	11.6	13.2	11.7	14.7	14.9	12.5	8.2	2.6	2.4	7.1	0.9	9.4	2.0
Emu Rock	15.0	12.4	12.9	12.4	15.4	14.0	11.8	4.5	3.9	1.6	6.2	1.2	6.6	2.6
Estoc	15.4	12.2	14.2	13.4	16.2	15.7	13.5	5.4	1.6	1.0	2.7	0.3	5.8	0.9
Gladius	15.8	12.3	14.1	13.6	15.8	15.0	14.1	5.5	3.5	1.6	5.2	0.8	4.4	2.2
Grenade CL Plus	15.0	11.7	12.7	11.6	14.7	14.0	11.8	4.9	2.9	1.8	6.2	0.5	5.6	2.1
Harper	15.8	12.2	13.4	12.5	15.3	15.0	12.5	8.9	3.5	1.9	5.2	1.0	4.9	2.1
Hatchet CL Plus	15.3	14.2	15.3	12.9	16.3	14.4	14.7	3.3	1.7	1.1	2.8	0.4	2.9	1.4
Justica CL Plus	16.1	12.3	13.4	12.5	15.9	15.8	12.7	5.8	1.8	1.4	2.7	0.5	5.6	1.8
Kord CL Plus	15.8	12.3	13.4	12.5	15.5	14.7	13.0	5.6	4.0	2.2	7.3	1.3	6.9	3.0
LRPB Cobra	14.7	12.5	13.7	11.8	16.0	14.1	12.1	5.1	3.9	1.7	6.6	0.8	3.3	2.4
LRPB Phantom	15.8	11.6	14.2	12.5	15.3	15.6	12.1	7.0	2.6	1.4	5.5	0.8	3.0	1.9
LRPB Scout	15.0	11.8	12.9	12.4	14.4	14.4	12.0	9.3	2.3	1.6	4.0	0.7	5.4	1.3
LRPB Trojan	14.5	11.0	13.2	12.8	15.1	14.8	12.1	5.3	1.8	1.2	3.3	0.4	4.5	1.2
Mace	14.8	11.5	13.0	11.2	15.4	13.3	12.2	4.8	2.8	1.6	4.0	0.5	4.1	1.5
Scepter	14.6	10.9	12.7	10.6	14.8	13.0	11.0	5.0	4.5	2.3	7.7	1.0	7.2	2.9
Shield	15.5	11.7	12.4	11.2	13.6	14.0	11.8	6.2	4.7	3.4	8.2	1.1	6.8	4.2
Wyalkatchem	15.1	11.7	13.8	13.1	16.6	14.4	13.1	4.7	1.7	1.4	2.5	0.2	4.8	1.0
Yitpi	16.5	12.2	13.9	13.4	15.7	16.3	12.7	7.2	2.1	1.4	5.3	0.8	2.6	2.4

Table 12: 2015 North Central and Wimmera (main season) wheat yield (as a percentage of the site mean yield), protein (%) and screenings. Screenings expressed as % of grain below a 2 mm sieve. All trials experienced multiple frost and extreme heat conditions. Interpret data with caution.

Location & Sowing date	Yield (%)					Protein (%)					Screenings (%)				
	North Central		Wimmera			North Central		Wimmera			North Central		Wimmera		
	Diggora 22/5/15	Mitiamo 20/5/15	Horsham 21/5/15	Kaniva 11/5/15	Minyip 20/5/15	Diggora	Mitiamo	Horsham	Kaniva	Minyip	Diggora	Mitiamo	Horsham	Kaniva	Minyip
Axe	110	99	107	94	110	14.7	12.2	15.5	15.0	14.7	2.9	14.7	3.5	4.9	4.4
Barham	106	91	113	87	109	14.4	12.7	15.0	14.3	15.3	5.7	13.9	7.6	12.8	6.1
Beckom	81	104	120	121	112	14.1	11.6	14.5	15.8	15.2	3.6	17.4	4.7	6.5	3.3
Buchanan	77	94	68	85	59	15.2	12.6	16.9	15.9	16.8	3.1	11.6	4.3	10.1	4.6
Cobalt	84	94	-	-	-	15.1	12.1	-	-	-	3.6	13.1	-	-	-
Condo	123	99	-	-	-	14.3	12.3	-	-	-	4.5	19.5	-	-	-
Corack	107	103	118	109	115	14.4	11.6	14.8	14.8	14.9	5.1	14.3	6.8	5.3	5.3
Correll	95	107	73	102	69	14.6	12.6	16.8	16.1	15.7	4.4	21.0	5.4	7.8	6.6
Cosmick	93	99	91	109	100	13.9	12.4	15.8	14.4	15.1	7.9	20.5	8.4	10.1	8.5
Cutlass	92	90	97	83	78	14.8	12.5	15.9	16.0	16.4	2.2	14.9	4.8	3.3	3.7
Derrimut	74	100	102	91	93	14.6	12.4	16.2	15.6	15.6	6.5	16.9	5.8	9.8	6.4
DS Darwin	97	87	88	88	79	14.6	-	15.1	15.1	15.0	4.5	-	4.5	7.6	4.2
DS Newton	84	93	-	-	-	15.1	-	-	-	-	2.6	-	-	-	-
EGA Gregory	72	78	-	-	-	14.6	12.1	-	-	-	10.3	14.8	-	-	-
Elmore CL Plus	75	98	83	77	79	15.2	13.1	16.6	16.2	16.0	4.4	16.6	5.6	11.8	5.1
Emu Rock	130	110	108	76	117	14.5	12.0	15.1	16.2	14.9	6.5	19.3	8.9	6.1	7.7
Estoc	106	93	102	106	114	14.9	12.5	15.9	15.5	16.1	2.5	11.8	6.2	7.6	3.1
Gascoigne	91	97	81	110	79	14.9	12.7	16.7	15.4	16.4	5.7	14.1	5.3	8.3	5.1
Gladius	103	95	100	102	104	15.0	13.4	15.7	15.5	15.6	4.5	16.7	7.8	4.9	5.6
Grenade CL Plus	97	99	97	100	109	14.1	12.3	15.1	15.7	15.6	4.6	20.6	5.8	6.9	4.9
Harper	104	105	112	88	93	15.3	12.2	16.2	16.0	16.7	5.2	18.1	6.5	24.7	5.8
Hatchet CL Plus	129	110	143	93	124	13.6	12.9	14.4	15.9	14.4	4.2	11.8	4.2	4.1	4.3
Impala	110	100	114	103	106	13.8	12.0	15.1	15.2	14.9	4.2	11.6	8.3	13.3	10.5
Jade	85	84	64	76	70	14.9	13.7	16.8	16.2	16.6	6.6	22.1	7.9	8.2	6.2
Justica CL Plus	97	95	96	96	92	14.9	13.0	15.9	16.2	16.7	5.0	14.6	5.2	2.6	4.4
Kord CL Plus	115	107	112	105	108	14.9	12.2	15.4	15.5	14.9	8.7	18.7	10.6	6.6	9.3
LRPB Cobra	80	94	52	73	70	15.7	12.5	16.6	16.1	16.0	5.3	16.7	6.3	5.8	6.3
LRPB Flanker	83	95	63	94	71	14.2	12.4	16.1	15.3	15.3	4.7	11.7	3.6	3.7	4.1
LRPB Gauntlet	69	91	-	-	-	15.1	12.0	-	-	-	12.9	14.4	-	-	-
LRPB Lincoln	84	95	49	98	58	15.7	12.3	16.6	15.3	16.1	4.3	16.5	6.6	11.0	6.7
LRPB Merlin	101	98	-	-	-	16.6	13.4	-	-	-	3.3	15.3	-	-	-
LRPB Phantom	81	93	63	75	60	15.3	12.4	16.0	16.9	16.2	6.0	12.6	6.5	7.4	5.3
LRPB Scout	110	91	113	91	106	14.6	12.6	15.9	14.9	15.5	3.8	13.5	6.2	12.8	4.0
LRPB Spitfire	88	97	-	-	-	16.3	13.3	-	-	-	4.0	18.7	-	-	-
LRPB Trojan	93	99	97	101	95	14.8	12.4	15.7	15.1	15.4	2.9	16.2	3.6	8.8	2.4
LRPB Viking	70	98	76	83	57	16.1	12.7	16.8	16.4	17.3	4.6	18.9	5.2	7.1	5.0
Mace	110	111	115	112	114	14.1	11.7	15.0	14.5	14.4	4.3	16.7	5.2	5.9	4.4
Magenta	82	100	102	97	85	15.3	13.5	16.2	15.9	16.5	3.2	12.6	7.7	7.2	6.3
QAL2000	81	100	-	-	-	13.5	12.2	-	-	-	11.9	10.9	-	-	-
Scepter	121	114	126	134	142	13.6	11.0	14.1	13.9	13.3	6.5	22.0	8.9	5.9	6.8
Shield	-	-	114	97	114	-	-	15.8	16.3	15.5	-	-	12.7	17.3	4.2
Steel	98	102	-	-	-	14.9	12.4	-	-	-	4.0	18.5	-	-	-
Sunmate	89	98	-	-	-	14.4	12.8	-	-	-	8.7	17.1	-	-	-
Suntop	89	104	-	-	-	14.2	12.5	-	-	-	3.1	14.3	-	-	-
Tenfour	99	115	84	89	75	14.8	11.7	16.4	14.7	16.4	7.0	20.2	7.9	8.6	5.8
Wallup	92	98	88	109	90	15.7	13.0	16.4	15.5	15.9	2.6	13.7	3.0	5.0	2.6
Wyalkatchem	-	-	119	108	114	-	-	15.3	15.5	15.7	-	-	4.3	2.5	3.1
Yitpi	91	106	92	76	82	15.4	12.4	16.9	16.7	17.1	3.8	17.5	4.9	3.4	3.8
Site Mean (t/ha)	1.14	1.74	1.10	1.53	1.25										
CV (%)	12	7	6	7	7										
LSD (%)	20	12	11	13	12										

Table 13: 2015 North East (main season) wheat yield (as a percentage of the site mean yield), protein (%) and screenings. Screenings as the percentage of grain below a 2 mm sieve. Dookie and Wunghnu experienced multiple frost and extreme heat conditions. Interpret data with caution.

Location & Sowing date	Yield (%)				Protein (%)				Screenings (%)			
	Dookie 8/5/15	Numurkah 1/5/15	Wunghnu 12/5/15	Yarrawonga 11/5/15	Dookie	Numurkah	Wunghnu	Yarrawonga	Dookie	Numurkah	Wunghnu	Yarrawonga
Adagio	-	112	-	-	-	11.9	-	-	-	4.0	-	-
AGT Katana	-	100	-	-	-	12.7	-	-	-	0.9	-	-
Axe	100	-	104	102	-	-	11.7	12.8	-	-	5.4	11.8
Barham	85	-	91	86	-	-	12.0	12.7	-	-	10.5	15.4
Beaufort	-	114	-	-	-	11.8	-	-	-	2.6	-	-
Beckom	124	104	122	114	14.6	12.1	11.6	12.1	19.5	7.2	9.0	21.8
Buchanan	87	108	103	100	-	11.2	13.2	13.5	-	2.2	12.4	10.8
Chara	-	94	-	-	-	11.9	-	-	-	4.2	-	-
Cobalt	111	103	114	106	15.4	12.7	11.6	12.3	10.7	2.1	8.8	11.0
Condo	101	97	100	106	15.0	12.6	12.0	12.0	11.2	1.3	8.1	15.9
Corack	109	103	112	107	14.6	12.1	11.6	11.3	13.5	0.4	6.6	13.0
Correll	91	-	98	91	16.3	-	12.6	12.2	13.3	-	9.2	15.7
Cosmick	101	106	119	99	15.3	11.8	11.0	12.2	25.0	2.6	10.9	22.8
Cutlass	108	111	114	103	15.8	11.4	12.2	12.3	15.5	1.8	4.3	11.5
Derrimut	104	97	101	95	15.0	12.0	12.3	12.2	14.3	2.4	7.1	17.0
DS Darwin	100	99	91	97	-	11.9	-	11.8	-	0.8	-	10.5
DS Newton	100	121	91	87	15.5	12.2	12.9	12.8	8.3	1.4	7.7	7.3
DS Pascal	83	110	96	80	-	11.0	-	13.2	-	0.9	-	14.3
EGA Gregory	93	69	100	97	15.5	12.5	12.3	11.6	12.2	3.0	4.8	9.7
EGA Wedgetail	-	100	-	-	-	11.4	-	-	-	1.0	-	-
Einstein	-	95	-	-	-	11.3	-	-	-	5.0	-	-
Elmore CL Plus	91	93	114	100	16.8	11.9	12.2	12.1	21.0	1.0	7.9	11.7
Emu Rock	97	-	86	109	16.1	-	12.4	12.3	15.9	-	11.3	14.9
Estoc	101	-	110	100	17.1	-	12.9	12.2	29.3	-	12.3	13.9
Forrest	-	90	-	-	-	12.7	-	-	-	7.0	-	-
Gascoigne	109	104	85	106	15.0	12.8	12.5	12.3	16.7	0.9	9.5	11.0
Gazelle	-	101	-	-	-	9.7	-	-	-	1.6	-	-
Gladius	104	-	92	99	14.7	-	12.3	12.4	9.6	-	5.9	10.1
Grenade CL Plus	94	-	96	97	15.7	-	11.8	12.1	22.7	-	6.3	14.5
Harper	103	-	89	93	15.9	-	13.0	11.9	20.2	-	12.5	18.2
Impala	90	91	100	98	16.1	12.2	11.8	11.8	20.8	2.2	12.0	11.9
Justica CL Plus	91	-	92	88	16.3	-	13.0	13.1	20.9	-	6.6	14.5
Kiora	-	106	-	-	-	11.8	-	-	-	2.7	-	-
Kord CL Plus	101	-	103	101	16.2	-	11.9	12.3	14.5	-	6.4	15.1
Livingston	-	73	-	-	-	13.8	-	-	-	3.2	-	-
LRPB Cobra	105	106	96	107	15.4	12.2	12.7	12.3	15.3	3.8	7.0	16.0
LRPB Flanker	87	-	99	99	-	-	12.3	11.7	-	-	4.5	11.3
LRPB Gauntlet	101	93	81	106	15.1	12.5	12.7	12.4	9.7	1.6	3.4	7.5
LRPB Lancer	89	-	85	89	-	-	13.2	12.6	-	-	6.0	9.2
LRPB Lincoln	92	-	84	88	15.4	-	12.5	11.6	18.8	-	14.1	12.3
LRPB Merlin	95	-	94	102	16.5	-	12.6	12.8	23.3	-	12.5	15.8
LRPB Phantom	105	-	106	94	15.4	-	12.3	12.2	12.7	-	9.6	12.4
LRPB Scout	103	105	107	94	15.7	11.3	11.9	12.5	18.7	1.8	7.4	17.0
LRPB Spitfire	94	-	96	98	16.5	-	13.1	12.8	24.3	-	11.6	12.7
LRPB Trojan	107	96	108	105	15.9	11.8	12.4	12.6	21.2	1.5	8.0	11.2
LRPB Viking	89	104	96	92	16.9	11.7	13.1	12.8	22.1	2.5	8.7	12.8
Mace	110	100	111	110	-	12.0	11.5	11.6	-	1.6	9.9	15.7
Magenta	92	-	103	89	17.0	-	12.5	13.0	18.0	-	7.2	14.4
Manning	-	117	-	-	-	11.6	-	-	-	5.4	-	-
Merinda	-	78	-	-	-	12.0	-	-	-	2.2	-	-
Mitch	-	102	-	-	-	10.9	-	-	-	1.8	-	-
QAL2000	95	89	-	94	14.6	10.1	-	12.5	18.2	2.4	-	16.7
Scenario	-	95	-	-	-	11.8	-	-	-	5.4	-	-
Scepter	118	106	100	112	14.7	11.9	11.0	11.1	17.9	3.0	6.4	16.3
SQP Revenue	-	98	-	-	-	11.6	-	-	-	7.6	-	-
Steel	101	109	89	102	14.6	12.5	13.1	13.1	14.8	1.8	6.0	10.5
Sunmate	98	92	95	107	15.1	11.3	12.3	12.8	20.7	2.4	11.2	14.1
Suntop	106	88	91	112	14.9	11.8	13.1	13.2	14.9	4.0	11.8	11.4
Sunvale	-	80	-	-	-	13.3	-	-	-	2.8	-	-

Table 13 continued: North East (main season) 2015 wheat trials.

Location & Sowing date	Yield (%)				Protein (%)				Screenings (%)			
	Dookie 8/5/15	Numurkah 1/5/15	Wunghnu 12/5/15	Yarrawonga 11/5/15	Dookie	Numurkah	Wunghnu	Yarrawonga	Dookie	Numurkah	Wunghnu	Yarrawonga
Wallup	99	92	99	96	16.3	12.0	12.4	12.1	20.7	1.6	7.7	10.2
Wedin	-	101	-	-	-	10.9	-	-	-	2.4	-	-
Yitpi	93	-	96	91	-	-	12.4	12.4	-	-	7.5	14.3
Site Mean (t/ha)	2.69	7.16	2.15	2.90								
CV (%)	6	6	11	4								
LSD (%)	11	10	19	7								

Table 14: 2015 North East and South West (early season) wheat yield (as a percentage of the site mean yield), protein (%) and screenings. Screenings expressed as a percentage of grain below a 2 mm sieve. All trials experienced multiple frost and extreme heat conditions. Interpret data with caution.

Location & Sowing date	Yield (%)				Protein (%)				Screenings (%)			
	NE		South West		NE		South West		NE		South West	
	Rutherglen 22/4/15	Hamilton 22/5/15	Streatham 14/5/15	Teesdale 18/5/15	Rutherglen	Hamilton	Streatham	Teesdale	Rutherglen	Hamilton	Streatham	Teesdale
Adagio	109	100	108	107	9.7	10.6	15.5	12.3	14.3	5.0	5.0	3.3
Beaufort	-	109	112	107	-	11.6	15.4	12.0	-	2.6	5.5	2.6
Beckom	98	120	135	121	9.6	10.3	13.4	11.0	12.0	3.0	12.0	4.1
Bolac	96	100	100	101	10.3	11.9	14.9	12.7	13.1	3.9	9.6	2.9
Chara	102	111	103	111	9.4	11.0	14.3	12.4	11.7	2.7	8.0	2.4
Cutlass	96	105	120	110	9.7	10.4	13.6	11.3	15.4	3.0	10.0	3.4
DS Darwin	91	-	-	-	-	-	-	-	-	-	-	-
DS Newton	101	109	120	110	-	10.9	14.8	11.8	-	2.3	5.2	2.8
DS Pascal	107	115	119	110	-	-	14.7	11.6	-	-	4.6	2.7
EGA Gregory	76	-	-	-	9.5	-	-	-	13.7	-	-	-
EGA Wedgetail	102	93	100	100	9.6	10.8	14.2	12.8	11.9	3.1	5.2	2.8
Elmore CL Plus	93	107	93	101	10.4	10.9	15.4	12.4	12.9	2.0	18.6	3.3
Forrest	103	92	94	91	9.7	11.2	14.8	12.7	12.9	4.7	5.3	5.0
Gascoigne	98	102	110	89	10.3	11.1	13.8	11.7	14.2	2.5	10.1	3.9
Gazelle	103	107	109	107	9.4	10.1	14.1	11.0	9.6	4.1	13.1	4.0
Kellalac	102	96	99	93	9.8	11.2	15.9	12.3	10.9	2.5	2.9	2.9
Kiora	102	111	104	106	10.4	11.1	14.4	11.6	10.6	4.7	13.5	3.3
LRPB Flanker	89	-	-	-	9.1	-	-	-	11.6	-	-	-
LRPB Gauntlet	93	-	-	-	10.2	-	-	-	27.1	-	-	-
LRPB Lancer	96	-	-	-	10.2	-	-	-	10.9	-	-	-
LRPB Phantom	91	113	111	109	9.6	11.0	13.7	11.7	16.5	4.5	5.7	4.2
LRPB Scout	-	109	111	106	-	10.3	13.7	11.3	-	2.4	12.8	3.4
LRPB Trojan	108	120	118	109	9.7	10.3	13.9	10.6	22.4	4.3	11.6	4.8
LRPB Viking	84	96	93	83	9.6	11.2	15.6	11.5	14.8	3.0	11.9	3.4
Manning	90	105	68	93	9.2	10.0	14.7	11.3	16.0	2.8	3.8	4.6
Mansfield	81	72	52	82	10.6	11.9	16.6	12.9	14.4	4.6	4.3	4.1
Preston	118	109	104	108	9.9	11.1	14.4	12.4	13.4	2.8	3.4	2.4
QAL2000	103	107	113	115	8.9	10.1	13.3	10.5	14.7	2.6	7.6	3.8
Scenario	96	80	84	100	9.8	10.9	15.1	11.6	16.2	5.8	5.4	5.4
SF Ovalo	104	-	-	-	9.9	-	-	-	20.5	-	-	-
SQP Revenue	104	79	96	99	9.1	12.0	14.7	11.6	18.6	7.4	5.2	3.6
Sunlamb	95	-	-	-	10.5	-	-	-	15.5	-	-	-
Suntop	103	-	-	-	10.2	-	-	-	11.3	-	-	-
Site Mean (t/ha)	6.19	5.56	2.95	4.90								
CV (%)	8	3	7	5								
LSD (%)	13	6	11	8								

Table 15: 2015 South West (long season) wheat yield (as a percentage of the site mean yield), protein (%) and screenings. Screenings expressed as a percentage of grain below a 2 mm sieve. Both trials experienced multiple frost and extreme heat conditions. Interpret data with caution.

Sowing Date	Yield (%)		Protein (%)		Screenings (%)	
	Hamilton 14/4/15	Streatham 28/4/15	Hamilton	Streatham	Hamilton	Streatham
Adagio	115	120	11.4	14.7	7.2	4.6
Beaufort	112	139	10.8	13.5	8.5	6.5
Bolac	102	108	11.9	14.5	8.6	11.5
Brennan	85	96	12.1	14.7	10.2	7.0
DS Pascal	115	120	-	14.1	-	11.6
EGA Wedgetail	99	113	11.7	14.1	5.5	5.7
Einstein	96	34	11.4	15.5	8.8	7.8
Forrest	99	111	11.3	14.9	8.4	6.6
LRPB Trojan	124	141	10.2	12.6	6.7	11.0
Mackellar	103	106	11.3	14.8	17.8	21.0
Manning	115	78	10.6	14.1	4.9	5.0
Mansfield	86	61	12.8	16.9	9.3	4.0
Naparoo	43	83	11.3	14.5	8.3	10.9
Rudd	99	109	10.5	14.2	5.8	5.7
Scenario	96	92	11.6	17.0	11.1	2.9
SF Ovalo	97	58	11.6	17.4	14.4	6.2
SQP Revenue	109	119	10.3	14.4	10.0	4.7
Steel	86	65	13.6	16.7	4.6	7.8
Sunlamb	94	62	13.0	16.5	6.3	4.7
Sunzell	78	71	12.0	13.9	0.5	6.4
Tennant	81	58	11.4	15.6	6.7	5.0
Wylah	101	105	12.2	14.6	6.5	7.6
Site Mean (t/ha)	5.33	2.85				
CV (%)	4	8				
LSD (%)	7	14				

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BARLEY

BARLEY

REVIEW OF 2015

Season

Despite much of the state seeing above average summer rainfall, little subsoil moisture combined with dry conditions limited barley yield potential in 2015.

The dry season and hot October resulted in drought stress in many areas with below average grain yield and quality at harvest. Early maturing varieties generally performed better than late maturing varieties. However, many crops produced small grain with poor retention and high screenings. Screenings of greater than 50% were common. This led to the majority of grain being downgraded to Feed standard with many crops going F3 or F4.

The Wimmera and Mallee generally had below average yields with many areas suffering severe drought stress. The North East performed better as did parts of the South West where temperatures were slightly milder and some late spring rain fell.

Early maturing varieties such as Hindmarsh, LaTrobe, Fathom, Compass and the new variety Rosalind generally yielded better than varieties like Buloke, Scope and Gairdner which were more vulnerable to drought stress.

Disease

Spot form of net blotch (SFNB) was common throughout barley growing regions due to the frequency of residual barley stubble from 2014 in the cropping system. However, SFNB severity was very low in most areas due to the very dry season, which was unfavourable for crop development. The dry conditions were so unfavourable for foliar diseases that scald, net form of net blotch (NFNB), barley leaf rust and powdery mildew were almost undetected. In general, foliar diseases would not have caused any grain yield or quality loss during 2015.

LOOKING FORWARD TO 2016

New varieties

Spartacus-CL (IGB 1334T) is a new early maturing, CCN resistant, imi-tolerant barley variety that has been accepted in to the Barley Australia malt evaluation process.

Rosalind is a new mid-maturing, CCN resistant, feed variety that is broadly adapted with good yield stability.

Malt evaluation

In 2015 Flinders and LaTrobe received Barley Australia classification as malting quality varieties. Newly accredited malting varieties still need to gain market acceptance and growers are advised to consult with their marketer regarding the availability of segregation and pricing.

Barley Australia lists malting varieties that are preferred by its member marketing companies. These varieties are highlighted in the variety listings as "Malting barley (Preferred variety)". The level of demand for domestic and export markets in Victoria is shown in Table 3.

Disease

Stubble-borne diseases will need to be managed during 2016 due to carryover of inoculum on stubble from both 2014 and 2015 crops and reduced stubble breakdown during 2015. If diseased stubble is present, resistant

varieties should be selected if possible. Our experience following the 2002 drought was that minimal reduction in root disease levels occurred with break crops. Therefore, an additional year of break crop may be required to reduce root diseases to safe levels. If there is a potential for root disease issues, it is advisable to conduct a PreDictaB soil test prior to planting to avoid sowing cereals in high risk paddocks.

Some pathotype changes were detected during 2015 which have resulted in changes to the resistance ratings of some barley varieties for the 2016 growing season. These are listed in Table 2 and were mainly slight increases in susceptibility towards scald and spot form of net blotch. Compass is now very susceptible to leaf rust and should be managed accordingly.

Frost

The frost susceptibility rankings will be available in March on the NVT website. These rankings are explained in more detail in the Introductory chapter of this book.

MORE INFORMATION

www.nvtonline.com.au

Detailed NVT trial results and links to variety information.

- Australian Field Crop Disease Guide app
- NVT Long Term Yield Reports app

agriculture.vic.gov.au/agriculture/grains-and-other-crops

- [AG1160 Cereal disease guide](#)

www.barleyaustralia.com.au


Information includes:

- List of preferred malting barley varieties
- Update status of malting barley evaluation each March

VARIETY DESCRIPTIONS

Varieties have been listed according to quality classification grade and in alphabetical order and not in order of preference.

Abbreviations used are:

	denotes that Plant Breeder Rights apply
CCN	Cereal Cyst Nematode
BYDV	Barley Yellow Dwarf Virus
RLN	Root Lesion Nematode
NFNB	Net Form of Net Blotch
SFNB	Spot Form of Net Blotch

End Point Royalty (EPR) 2016-17 quoted \$/tonne ex-GST.

Malting barley (Preferred variety) - BAUDIN

A mid season maturing variety, Baudin is an alternative malting variety to Gairdner in 375-500 mm rainfall districts, but should not be grown in areas with greater than 500 mm due to leaf disease susceptibility. Scald SVS, SFNB MSS, NFNB MRMS/S, powdery mildew VS and leaf rust VS. Compared to Gairdner, Baudin has superior grain plumpness in years with hot, dry spring conditions. The variety is a shorter plant type than Gairdner, less likely to lodge and has excellent head retention. Now outclassed by newer varieties due to disease susceptibility, Baudin's delivery options are limited. Released 2004. Seed available from Seednet. EPR \$3 malt, \$1 feed.

Malting barley (Preferred variety) - BULOKE

An early to mid season maturing variety best adapted to regions with 325-450 mm annual rainfall. Moderately tall with moderately weak straw strength, similar to Gairdner, Buloke can be prone to significant head loss under unfavourable conditions post-maturation. Buloke has a similar level of tolerance to pre-harvest sprouting to Gairdner. Average grain plumpness is similar or slightly inferior to Baudin but superior to Gairdner. Scald S, SFNB S, NFNB MR, powdery mildew R and leaf rust S. Whilst Buloke yields well in Mallee environments; it should only be grown in CCN prone environments if the majority of other crops/varieties in the rotation are CCN resistant. In Victoria, Buloke is considered mid-season maturity earlier than Gairdner, but later than Hindmarsh. Buloke has export malt quality similar to Baudin. Released 2005. Seed available from Seednet. EPR \$2.

Malting barley (Preferred variety) - COMMANDER

A mid maturing variety best suited to 375-500 mm rainfall districts, particularly the Wimmera Mallee. It is broadly adapted and will out yield other varieties under favourable spring conditions. Commander is inherently lower in grain protein content like Buloke and Scope. It has moderately weak straw and can lodge under either high yield environments or if unfavourable conditions occur between grain filling and harvest. Grain size is superior to many other malting barley varieties but it is prone to low test weights in some seasons. Scald S, SFNB & NFNB MSS, powdery mildew MR# and leaf rust S. Commander is acceptable for domestic, Chinese, and SE Asian brewing markets. Growers should consult their grain marketers regarding markets and availability of segregation for this variety. Released 2008. Seed available from Seednet. EPR \$3.80.

Malting barley - FAIRVIEW

A moderately late maturing variety best suited to 400-600 mm rainfall districts. Yields are similar to Gairdner and Commander in these districts. The grain plumpness of Fairview is superior to Gairdner. Scald VS, SFNB SVS, NFNB S, powdery mildew R and leaf rust S. Limited seed is only available under contract through GrainSearch, Geelong. Released 2008. Fairview has an export malt quality profile and is marketed via closed loop supply chain through Malteurop. EPR \$3.

Malting barley - FLINDERS

A moderately late maturing variety. Moderately short with stiff, strong straw and good head retention. It has high levels of grain plumpness and good test weights. Scald SVS, SFNB SVS, NFNB MR/S, powdery mildew R and leaf rust MRMS. While not as high yielding as the earlier maturing LaTrobe or Compass, Flinders offers a replacement for Baudin and Gairdner with a longer season option and will be available pending final malt accreditation. Developed by InterGrain. Released 2012, and accredited as malt in March 2015. Seed available from Syngenta. EPR \$3.80.

Malting barley (Preferred variety) - GAIRDNER

A moderately late maturing variety best suited to 400-600 mm rainfall regions. In lower rainfall districts Gairdner can yield well in seasons with favourable spring finishes, however not necessarily within malting specifications. Scald SVS, SFNB S, NFNB MRMS, powdery mildew S and leaf rust S. Gairdner is known for high screenings in a dry spring, with levels of grain plumpness generally being inferior to all other malting varieties. Gairdner has moderately good head retention,

slightly inferior to Baudin. Gairdner is accepted by both domestic and export brewing markets. Released 1998. Seed available from Heritage Seeds. No EPR.

Malting barley - GRANGER

A mid to late maturing variety with strong straw, and good kernel plumpness and low screenings. Scald SVS, SFNB SVS, NFNB MRMS, powdery mildew R and leaf rust MR. Accredited as malting barley in 2013, export markets are yet to be established and growers are advised to consult with their grain marketer about segregation and pricing. Released 2013. Licenced by Limagrain and seed available from Heritage Seeds. EPR \$2.95.

Malting barley - LATROBE

An early maturing variety for the low to medium rainfall environments. A semi-dwarf plant type providing good lodging resistance and good head retention. The variety has a relatively short coleoptile and has relatively slow early growth if sown late or with poor nutrition. Good sprouting tolerance, excellent test weights and moderately good grain plumpness. Scald R-VS, SFNB SVS, NFNB MR, powdery mildew RMR# and leaf rust S. Developed by InterGrain (as IGB1101), and accredited as a malting variety in March 2015. Currently undergoing market development with an expectation that segregation options will become available for the 2016 season. Seed available from Syngenta. EPR \$4.

Malting barley (Preferred variety) – NAVIGATOR

A mid to late maturing variety similar to Gairdner but offering higher yield potential, significantly improved physical grain quality and an excellent disease resistance profile with the exception of being very susceptible to leaf rust. Scald S, SFNB MS, NFNB MR#, powdery mildew R# and leaf rust VS. Navigator is an accredited malting variety primarily suited for use by the domestic brewing industry. Due to the current small market size for Navigator as a malting variety, growers should seek advice from their grain marketer regarding availability of segregation and pricing prior to sowing this variety and will be best suited to growers with freight advantage to local malthouses. Released 2011. Seed available from Seednet. EPR \$3.80

Malting barley (Preferred variety) - SCOPE CL

A tall, early to mid season maturing barley with moderate to high yield potential across a range of medium rainfall environments. Its disease resistance profile is very similar to Buloke with the main concern being susceptibility to some leaf rust strains. Scald S, SFNB MSS, NFNB MR, powdery mildew R and leaf rust S. Scope shares the lodging, head loss, grain size and protein characteristics of Buloke. Scope is the only malting barley variety registered for the use of an appropriate Clearfield herbicide. Accredited as malting barley in 2013, export markets are yet to be established so growers are advised to consult with their grain marketer about segregation and pricing. Although developed from a Buloke mutation, Barley Australia have not authorised co-binning with Buloke. It is considered a different variety to Buloke and legally needs to be declared as such. In the longer term, Scope is expected to be accepted into those markets currently accepting Buloke. Released 2010. Seed is available from Seednet exclusively through re-sellers that have a current Clearfield accreditation. EPR \$3.50.

Malting barley (Preferred variety) - WESTMINSTER 

A mid to late maturity variety with medium to tall, stiff straw and improved head retention. Scald MRMS#, SFNB S, NFNB MSS, powdery mildew R# and leaf rust RMR. Accredited as malting barley in 2013, export markets are yet to be established and growers are advised to consult with their grain marketer about segregation and pricing. Bred by Limagrain, released 2009, and is marketed through GrainSearch. EPR \$3.

Feed barley - CAPSTAN 

Capstan is a high yielding feed variety recommended for 400mm plus rainfall regions. Capstan has short, stiff straw with excellent head retention and would be suitable for growers targeting very high yield potentials. It has very high screenings in lower rainfall districts. Scald S, SFNB MS, NFNB MSS, powdery mildew R# and leaf rust MSS. Released 2003. Seed available from Seednet.

Feed barley - FATHOM 

An early maturing variety with broad adaption and consistently high yields. It has very low screenings, similar to Maritime and a higher test weight than Fleet. Fathom has a long coleoptile and early vigour giving weed competitiveness and tolerance to deep planting and sandy soils. Fathom is well suited to wider row spacings and is an alternative to Hindmarsh particularly where more reliable establishment and improved early vigour are sought. Fathom is moderately tall with head loss and lodging resistance. Scald MS, SFNB MR, NFNB MS, powdery mildew R and leaf rust MRMS. Released 2011. Seed available from Seednet. EPR \$2.

Feed barley - FLEET 

Best suited to 325-400 mm rainfall regions as an alternative to Hindmarsh and Keel. Fleet has superior adaptation to deep sandy soils compared to Hindmarsh and Keel due to a relatively long coleoptile that makes Fleet more tolerant of deeper sowing. Scald SVS, SFNB MR, NFNB MRMS#, powdery mildew R and leaf rust MS. Some pathotypes of NFNB now show increased virulence on Fleet. Fleet has improved physical grain quality compared to Keel but has lower test weight than Hindmarsh. Fleet is highly prone to lodging but has good head retention. Released 2004. Seed available from Seednet. EPR \$1.50.

Feed / Food barley - HINDMARSH 

An early maturing semi-dwarf variety with exceptional yield potential, especially in drier years. It is recommended for the 325-450 mm rainfall regions. Hindmarsh has a relatively short coleoptile and deep sowing should be avoided to maximise crop establishment and yield potential. Scald R-VS, SFNB SVS, NFNB MR, powdery mildew R# and leaf rust S. Hindmarsh is free threshing and has good resistance to head loss. Hindmarsh has a high test weight amongst feed varieties. Released by the forerunner of DEDJTR in 2006. Seed available from Seednet. EPR \$1.50.

Feed barley - KEEL

A high yielding, very early maturing, feed variety recommended for the 325-400 mm rainfall regions. Due to Keel's very early maturity, it can be prone to frost damage if sown too early. It performs best on heavy soil types with low fertility. Keel is not suitable for sandy soils, where Fleet or Fathom are preferred. Keel produces plump grain similar to Fleet and Fathom, along with low screenings; however, similar to Fleet, Keel has low test weight. Keel is a shorter plant type compared to Fleet and Fathom, has good head retention and is free-threshing. Scald S, SFNB MR, NFNB

MR#, powdery mildew MRMS# and leaf rust VS. Released 1999. Seed available from Seednet. No EPR.

Feed barley - OXFORD

A feed variety best suited to medium to high rainfall regions (350-600 mm) and should not be planted after mid-June. Scald S, SFNB SVS, NFNB MRMS, powdery mildew R and leaf rust MR. Oxford was bred by Limagrain, released 2009 and seed is available from Heritage Seeds. EPR \$2.50.

NEW Feed barley - ROSALIND 

Broadly adapted mid maturing semi dwarf variety with good yield stability. Maturity is later than LaTrobe, but earlier than Buloke. Good straw strength and head retention. Scald S, SFNB SVS, NFNB MR, powdery mildew RMR# and leaf rust MR. Bred by InterGrain and tested as IGB1302. Released 2015. Seed available from Syngenta. EPR \$3.50.

VARIETIES CURRENTLY UNDERGOING MALT EVALUATION**Barley under evaluation - COMPASS** 

Compass is an early to mid maturing variety, agronomically similar to Commander but earlier flowering. It is very high yielding and broadly adapted, with excellent grain size and reasonable test weight. In higher yielding environments has a tendency to be tall and prone to lodging. Compass has been released as a feed variety for 2015 whilst undergoing malting evaluation trials with a decision expected in March 2018. The malting quality profile will be suited to domestic and export malting and brewing markets currently utilising Gairdner and Commander. Scald SVS, SFNB MSS, NFNB MR#, powdery mildew RMR# and leaf rust VS. Bred by the University of Adelaide and tested as WI4593. Seed available from Seednet. EPR \$3.80.

NEW Barley under evaluation – Spartacus CL  (IGB1334T)

Spartacus is an early maturing, CCN resistant, IMI tolerant, semi-dwarf variety suited to the low to medium rainfall regions. It is undergoing the early stages of malt and brewing evaluation. It is agronomically similar to LaTrobe with good straw strength, lodging resistance and sprouting tolerance, with reduced itchiness compared to Scope. It is registered for the use of an appropriate Clearfield herbicide and will be available commercially to growers in 2016 as a Clearfield variety. Scald R-VS, SFNB SVS, NFNB MR, powdery mildew MR# and leaf rust S. The variety has been accepted by Barley Australia into the malting variety accreditation system, with a decision expected in March 2018. Seed available from Syngenta. EPR \$4.25

Barley under evaluation - SY RATTLER 

SY Rattler is a late maturing variety recommended for the high rainfall, 450-600mm regions. Scald R-S, SFNB SVS, NFNB MR, powdery mildew RMR and leaf rust MR. SY Rattler is undergoing the early stages of malt and brewing evaluation with a decision expected in March 2017. Bred by Syngenta. Released in 2012. Seed available from GrainSearch. EPR \$3

Table 1: Barley time of sowing guide.

This table is a guide only and has been compiled from observations of the breeder and local departmental agronomists.

MALLEE	April			May				June			July		
Baudin, Gairdner			> X	X	X	X	X	<	<				
Commander, Fathom, Fleet			> X	X	X	X	X	X	<	<	<		
Buloke, Compass, Hindmarsh, Keel, LaTrobe, Rosalind, Scope, Spartacus			> >	X	X	X	X	X	<	<			
WIMMERA	April			May				June			July		
Flinders, Gairdner, GrangeR, Navigator, Oxford				>	X	X	X	X	X	<	<		
Keel				>	>	X	X	X	X	X	X	<	<
Baudin, Fleet				>	>	X	X	X	X	X	X	<	<
Fathom, Hindmarsh, LaTrobe, Rosalind, Spartacus				>	X	X	X	X	X	X	X	<	<
Buloke, Commander, Compass, Scope					>	X	X	X	X	X	X	<	<
NORTH CENTRAL	April			May				June			July		
Flinders, Gairdner, GrangeR, Navigator			>	>	X	X	X	X	X	X	<	<	
Fleet				>	>	>	X	X	X	X	X	<	<
Buloke, Commander, Compass, Scope				>	>	X	X	X	X	X	X	<	<
Fathom, Hindmarsh, LaTrobe, Rosalind, Spartacus				>	X	X	X	X	X	X	X	X	<
Keel					>	>	X	X	X	X	X	X	<
NORTH EAST	April			May				June			July		
Flinders, Gairdner, GrangeR, Navigator, Oxford			>	X	X	X	X	X	X	X	X	X	<
Baudin				>	X	X	X	X	X	X	X	X	<
Keel					>	>	X	X	X	X	X	X	<
Buloke, Commander, Compass, Scope					>	>	X	X	X	X	X	X	<
Fathom, Hindmarsh, LaTrobe, Rosalind, Spartacus					>	X	X	X	X	X	X	X	<
Fleet					>	>	X	X	X	X	X	X	<
SOUTH WEST	April			May				June			July		
Baudin, Capstan, Gairdner, GrangeR, Navigator, Oxford, Westminster			>	>	X	X	X	X	X	X	X	X	<
Commander, Compass, Fathom, Fleet, Hindmarsh, LaTrobe, Spartacus					>	>	X	X	X	X	X	X	<

>earlier than ideal, X optimum sowing time, < later than ideal but acceptable

Table 2: Barley variety disease reactions.

	Leaf scald	Spot form Net Blotch	Net form Net Blotch	Powdery mildew	Leaf rust	BYDV	CCN Res	Root lesion nematode		Barley grass stripe rust
								<i>P. neglectus</i> resistance	<i>P. thornei</i> resistance	
Malting barley										
Baudin	SVS	MSS	MRMS/S	VS	VS	MR	S	MR	-	R
Buloke	S	S	MR	R	S	MRMS	S	MRMS	MRMS	R
Commander	S	MSS	MSS	MR#	S	MRMS	R	MRMS	MRMS	R
Fairview	VS	SVS	S	R	S	MR	-	-	-	R
Flinders	SVS	SVS	MR/S	R	MRMS	MR	S	MRMS	MRMS	R
Gairdner	SVS	S	MRMS	S	S	S	S	MRMS	MS	R
GrangeR	SVS	SVS	MR-MS	R	MR	MRMS	R	MR	MR	R
LaTrobe	R-VS	SVS	MR	RMR#	S	S	R	MRMS	MRMS	R
Navigator	S	MS	MR#	R#	VS	S	R	MRMS	MRMS	R
Scope	S	MSS	MR	R	S	MR	S	MRMS	MRMS	R
Westminster	MRMS#	S	MSS	R#	RMR	MRMS	-	MRMS	MRMSp	R
Feed barley										
Capstan	S	MS	MSS	R#	MSS	S	R	-	-	MRMS
Fathom	MS	MR	MS	R	MRMS	MRMS	R	MRMS	MRMS	R
Fleet	SVS	MR	MRMS#	R	MS	MRMS	R	MRMS	MRMS	R
Hindmarsh	R-VS	SVS	MR	R#	S	S	R	MRMS	MRMS	R
Keel	S	MR	MR#	MRMS#	VS	S	R	-	-	MS
Oxford	S	SVS	MR-MS	R	MR	MS	S	MR	MRMS	R
Rosalind	S	SVS	MR	RMR#	MR					
Barley under malt evaluation										
Compass	SVS	MSS	MR#	RMR#	VS	MR	R	MR	MR	R
Spartacus CL	R-VS	SVS	MR	MR#	S	S	R	MRMS	MRMS	R
SY Rattler	R-S	SVS	MR	RMR	MR	S	-	RMR	MRMS	R

Varieties marked may be more susceptible if alternative strains are present.

Resistance order from best to worst: R > RMR > MR > MRMS > MS > MSS > S > SVS > VS.

p = provisional ratings - treat with caution. R = resistant, M = moderately, S = susceptible, V = very.

Table 3: Barley variety demand¹ for preferred malting varieties and agronomic guide.

	Domestic brewing industries ²	Export brewing industries	Height	Maturity	Head loss	Plump grain rating	Lodging
Malting barley							
Baudin		high	S	M	MR	7	R
Buloke		medium	MT	ME	MS	6	M
Commander	high	low	M	ME	M	8	M
Fairview			MS	ML	MR		R
Flinders		high	MS	ML	R	7	R
Gairdner	medium	medium	M	ML	MR	5	R
GrangeR			M	ML	MR		R
LaTrobe		developing	S-MS	E	MR	6	R-MR
Navigator	low		S-MS	ML	MR	7	R
Scope		medium	MT	ME	MS	6	M
Westminster	high	high	MT	ML	R		R
Feed barley							
Capstan			VS	ML	R	5	R
Fathom			MT	VE	MR	9	MR
Fleet			M	ME	MR	8	M
Hindmarsh			S-MS	VE	MR	6	R-MR
Keel			M	VE	M	6	MS
Oxford			S-MS	L	R	6	R
Rosalind			MS	M	R	6-7	R
Barley under malt evaluation							
		Target accreditation date					
Compass		2017	M	ME	M	9	M
Spartacus CL		2018	MS	E	R	6-7	R
SY Rattler		2018	M	M	-	-	MR

¹Demand in Victoria is determined by marketing companies who are members of Barley Australia.

²Domestic demand by Australian malting companies: malt produced may be used by the domestic brewing industry or exported.

Height; T = tall, MT = moderately tall, M = medium, MS = moderately short, S = short

Maturity; VE = very early, E = early, ME = moderately early, M = mid season, L = late

Head loss and lodging: see Table 2 for key. Plump grain: relative scale: 1=small or unreliable grain size; 9=large or reliable grain size

Table 4: Barley disease guide.

Disease	Organism	Symptoms	Occurrence	Inoculum source	Control
FOLIAR					
Scald	<i>Rhynchosporium secalis</i>	Water soaked areas on leaves. Lesions appear grey/green then bleached with brown margins.	Years with frequent rain, and early sown crops.	Residues of barley and barley grass. Can be seedborne. Spores spread by rainsplash.	Resistant varieties, clean seed, manage barley and barley grass debris. Seed and foliar fungicides
Net blotch spot form	<i>Pyrenophora teres</i> f. <i>maculata</i>	Dark brown spots to 10 mm, with yellow margins.	Infection from stubble especially in wet autumn conditions.	Barley and barley grass stubble, also airborne spores from infected crops.	Control barley grass and manage barley stubble. Avoid very susceptible varieties. Foliar fungicides.
Net blotch net form	<i>Pyrenophora teres</i> f. <i>teres</i>	Small brown spots that develop into dark brown streaks on leaf blades that have net like appearance.	Spores can be produced for over 2 years on stubble. Moist conditions, temperatures in the 15-25°C range.	Survives on infected barley and barley grass residues. Wind borne spores.	Resistant varieties, crop rotation and stubble management.
Powdery mildew	<i>Blumeria graminis</i> f.sp. <i>hordei</i>	White powdery spores on upper leaf surfaces, underside of leaves turn yellow to brown.	Favoured by high humidity and temperature of 15-22°C. Worse in high fertility paddocks and early sown crops.	Volunteer barley, barley grass and crop residue. Airborne spores.	Resistant varieties. Seed and foliar fungicides.
Leaf rust	<i>Puccinia hordei</i>	Small circular orange pustules on upper leaf surface.	Moist conditions with temperatures in the range 15-22°C.	Living plant hosts including barley, barley grass and Star of Bethlehem.	Use resistant varieties and control volunteer barley and barley grass over summer/autumn
Stem rust	<i>Puccinia graminis</i>	Large red-brown pustules. Rupture of leaf and stem surface.	Infection requires temperatures in the 15-30°C range and moist conditions.	Living plant hosts including volunteer cereals (wheat, barley, triticale and rye).	Use resistant varieties and control volunteer wheat, triticale and barley over summer/autumn.
BGSR (Barley grass stripe rust)	<i>Puccinia striiformis</i>	Yellow powdery pustules in stripes on the leaves	Can develop throughout the growing season.	Barley grass and susceptible barley varieties.	Avoid susceptible varieties

Table 4 continued: Barley disease guide.

Disease	Organism	Symptoms	Occurrence	Inoculum source	Control
BYDV (Barley yellow dwarf virus)	Barley yellow dwarf virus	Yellow stripes between leaf veins, some leaves red. Sterile heads and dwarfing plants.	Virus is transmitted by aphids.	Hosts include all cereals and many grasses.	Resistant varieties. Chemical control of aphids may be suitable for high value crops.
Wirrega blotch	<i>Drechslera wirreganensis</i>	Brown blotches often with hole in centre.	Minor occurrence.	Range of grass weeds and cereal stubble.	Crop rotation. Avoid growing susceptible varieties, control grass weeds
Ringspot	<i>Drechslera campanulata</i>	Small brown rimmed spots on leaves.	Common and widespread in southern Australia.	Wide range of cereals and grass weeds. Barley seed in crop residue infected with fungus.	Crop rotation and weed control.
Halo spot	<i>Pseudoseptoria stomaticola</i>	Small white-brown lesions.	Cool, moist conditions.	Residues of barley and grasses. Rainsplash.	Disease is not of economic importance.
GRAIN					
Covered smut	<i>Ustilago segetum</i> var. <i>hordei</i>	Dark, compacted heads, grain replaced by smut balls.	Spores germinate in infected grain when temperatures are between 14-25°C.	Infected seed.	Use disease free seed, resistant varieties, seed treatments.
Loose smut	<i>Ustilago tritici</i>	Dark brown powdery spores replace grain.	Moist conditions at flowering and when temperatures are between 16-22°C.	Infected seed	Use disease free seed and seed treatments. Avoid susceptible varieties.
ROOT/CROWN					
Crown rot	<i>Fusarium pseudograminearum</i> , <i>F. culmorum</i>	'Whiteheads' or deadheads most obvious after flowering, pink discolouration under leaf sheaths.	Most common on heavy or poorly drained soils Favoured by moist, humid conditions with temperatures between 15-30°C.	Survives in infected stubble residue for up to 2 years. Hosts include wheat, barley, triticale and some grasses.	Crop rotation, stubble removal, cultivation.
Pythium root rot (Damping off)	<i>Pythium</i> spp.	Stunted seedlings, reduced tillering, pale stunted or stubby roots with light brown tips.	Favoured by wet conditions. Increased risk where high rainfall occurs after sowing.	Spores survive in soil or plant debris for up to 5 years.	Avoid deep sowing into cold wet soils, especially when direct drilling. Ensure good nutrient levels.
Common root rot	<i>Bipolaris sorokiniana</i>	Brown discolouration of roots, sub-crown internode and crown. Plant stunting, brown spots on leaves and reduced tillers.	Scattered through crop.	Wheat, barley, triticale and rye.	Crop rotation.
Cereal cyst nematode (CCN)	<i>Heterodera avenae</i>	Yellow, stunted plants. Knotted roots.	Light soils and well structured clays where cereals are commonly grown.	Present in most soils in the southern region.	Resistant varieties, break from susceptible cereals and grasses, particularly wild oat.
Root lesion nematode	<i>Pratylenchus thornei</i> & <i>Pratylenchus neglectus</i>	Reduced tillering, ill thrift; lesions on roots, lack of branching of root system.	Favoured by cereals in rotation with chickpea, medic and vetch.	Survives as dormant nematodes in the soil.	Crop rotation using resistant crops and resistant varieties.
Take-all	<i>Gaeumannomyces graminis</i> var. <i>tritici</i> (Ggt)	Stunted or yellowing plants, 'whiteheads' at heading.	Fungus thrives under warm, damp conditions.	Fungus survives over summer in crowns and roots of wheat, barley and grass plants.	Crop rotations, at least one year free of hosts (cereals and grasses, especially barley grass). Fungicide applied to seed or fertiliser.

This table has been developed from information in the publications Wallwork H (2000) (Ed) *Cereal Root and Crown Diseases* (Grains Research and Development Corporation, SARDI) and Wallwork H (2000) (Ed) *Cereal Leaf and Stem Diseases* (Grains Research and Development Corporation, SARDI).

Table 5: Long term predicted barley yield 2009-2015 expressed as a percentage of mean yield. Number of site years in brackets.

Mean yield (t/ha)	Main season				Long season
	Mallee 2.69	North Central 3.05	North East 3.57	Wimmera 3.24	South West 5.10
Malting barley					
Bass	100 (37)	99 (11)	99 (5)	101 (20)	102 (12)
Baudin	94 (18)	93 (14)	91 (6)	96 (25)	-
Buloke	102 (44)	100 (14)	101 (6)	102 (25)	-
Charger	-	114 (11)	114 (5)	111 (10)	104 (12)
Commander	104 (44)	106 (14)	104 (6)	106 (25)	105 (14)
Fairview	-	105 (9)	103 (6)	99 (17)	108 (14)
Flagship	98 (37)	94 (14)	96 (6)	96 (25)	-
Flinders	100 (40)	101 (11)	102 (5)	99 (21)	98 (12)
Gairdner	95 (41)	98 (14)	98 (6)	93 (25)	95 (14)
Granger	103 (44)	109 (11)	107 (5)	104 (25)	106 (12)
La Trobe	113 (34)	107 (9)	108 (4)	115 (18)	-
Macquarie	-	102 (5)	100 (6)	93 (23)	99 (12)
Navigator	-	91 (11)	88 (5)	90 (19)	101 (12)
Schooner	92 (44)	84 (14)	87 (6)	89 (25)	-
Scope	102 (44)	101 (14)	101 (6)	101 (25)	-
Vlamingh	101 (10)	102 (6)	-	102 (7)	103 (11)
Westminster	-	102 (14)	101 (6)	92 (24)	102 (14)
Wimmera	99 (10)	105 (14)	104 (4)	99 (25)	103 (14)
Feed barley					
Alestar	-	107 (6)	106 (3)	103 (14)	108 (9)
Barque	100 (30)	-	-	-	-
Capstan	-	108 (9)	104 (3)	107 (11)	111 (13)
Fathom	112 (40)	106 (11)	107 (5)	113 (21)	-
Fleet	108 (44)	108 (8)	106 (3)	110 (21)	-
Hindmarsh	112 (44)	104 (14)	106 (6)	114 (25)	-
Keel	105 (44)	94 (8)	-	105 (11)	-
Lockyer	111 (4)	114 (3)	-	113 (4)	-
Maltstar	99 (7)	107 (6)	105 (3)	101 (18)	108 (9)
Maritime	98 (27)	-	-	97 (14)	95 (11)
Oxford	98 (44)	112 (14)	107 (6)	100 (25)	112 (12)
Roe	99 (4)	91 (3)	-	99 (4)	-
Rosalind	121 (14)	118 (3)	-	125 (6)	112 (5)
Shepherd	97 (10)	98 (8)	-	95 (11)	-
Skipper	109 (30)	103 (10)	104 (4)	110 (18)	-
Urambie	-	-	-	-	101 (9)
Barley under malt evaluation					
Compass	120 (27)	117 (6)	117 (3)	123 (14)	105 (7)
Spartacus CL	114 (14)	106 (3)	-	117 (6)	103 (3)
SY Rattler	100 (27)	101 (14)	102 (6)	99 (24)	98 (14)

Long term yield predictions provided in this report have been produced using the NVT Long Term MET (Multi Environment Trial) analysis. The analysis produces predictions or "Production Values" for every variety in every NVT trial across all years identified within the dataset. This report presents regional means for each variety which reduces the accuracy and reliability of the results. Varieties present in less than three trials per region have been omitted from this report and some rounding variation may be present when compared to other reporting methods. More detailed yield information can be found using the NVT Long Term Yield App or the Excel Reporting tools available on the NVT website (www.nvtonline.com.au).

NVT trials are managed to minimise disease impact and this may include the use of seed dressings and post emergent fungicides.

Table 6: 2015 Mallee barley yield (as a percentage of site mean yield) and protein (%). All trials experienced multiple frosts and extreme heat conditions. Interpret data with caution.

Location & Sowing Date	Yield (%)							Protein (%)						
	Birchip 20/5/15	Hopetoun 13/5/15	Mananga- tang 4/5/15	Murrayville 8/5/15	Rainbow 18/5/15	Ultima 22/5/15	Walpeup 7/5/15	Birchip	Hopetoun	Mananga- tang	Murrayville	Rainbow	Ultima	Walpeup
Malting barley														
Bass	80	85	93	105	83	80	89	18.2	10.4	13.0	17.3	10.8	13.8	11.1
Buloke	106	99	98	97	99	114	98	16.4	10.5	12.2	16.3	9.7	12.5	9.9
Commander	65	106	79	98	89	85	88	17.5	9.7	12.9	16.9	9.3	13.2	10.2
Flagship	95	89	98	102	95	91	94	16.7	10.5	11.3	17.4	10.3	13.1	10.2
Flinders	92	90	97	112	97	97	92	17.7	10.7	12.3	16.6	10.6	13.4	10.6
Gairdner	76	85	89	100	82	92	79	16.9	10.5	12.6	16.3	10.3	13.8	11.0
Granger	68	88	84	77	94	85	88	19.5	10.4	12.0	17.7	10.1	14.1	10.0
LaTrobe	137	111	119	111	107	130	101	15.3	9.3	11.5	17.1	9.4	11.2	9.5
Schooner	96	87	89	94	86	83	93	18.5	10.8	12.4	17.9	11.0	14.3	10.0
Scope	99	98	99	96	102	110	105	16.2	10.3	12.1	16.3	9.7	13.1	10.1
Feed barley														
Fathom	125	99	108	120	99	117	104	15.5	10.0	11.9	16.1	9.2	11.5	10.0
Fleet	80	104	94	101	81	93	99	18.3	9.5	12.6	16.8	9.6	13.0	10.4
Hindmarsh	149	108	111	108	115	135	112	15.4	10.1	11.7	17.2	9.3	11.4	9.9
Keel	109	105	115	110	111	93	109	14.6	10.0	11.2	14.2	9.0	11.0	9.5
Oxford	17	87	67	67	76	48	76	18.1	10.3	12.2	17.5	10.5	15.3	10.5
Rosalind	146	113	129	117	119	133	122	15.8	9.1	11.3	15.1	8.7	10.7	9.3
Barley under malt evaluation														
Compass	149	111	124	100	123	129	117	14.7	9.2	10.5	16.3	9.0	11.2	9.6
Spartacus CL	154	108	116	96	116	134	115	16.2	9.5	12.0	17.8	9.1	11.3	9.9
SY Rattler	84	87	92	97	92	76	91	17.1	10.3	11.9	16.3	9.7	13.3	9.6
Site Mean (t/ha)	1.17	2.57	2.36	2.13	1.99	0.86	2.90							
CV (%)	7	3	6	6	6	6	5							
LSD (%)	13	5	10	11	11	10	8							

Table 7: 2015 Mallee barley plump grain and screenings. Plump grain is the percentage of grain above a 2.5 mm sieve and screenings the percentage below a 2 mm sieve.

	Plump grain (%)							Screenings (%)						
	Birchip	Hopetoun	Mananga- tang	Murrayville	Rainbow	Ultima	Walpeup	Birchip	Hopetoun	Mananga- tang	Murrayville	Rainbow	Ultima	Walpeup
Malt barley														
Bass	2	83	20	17	56	14	43	79	1	15	8	3	25	4
Buloke	2	54	6	19	46	9	24	46	2	29	8	4	19	8
Commander	16	83	26	36	52	22	49	25	2	20	11	6	19	9
Flagship	2	39	6	5	19	5	18	70	4	35	24	10	38	14
Flinders	2	64	18	33	44	8	50	64	2	13	4	4	29	3
Gairdner	1	60	6	11	32	10	16	87	3	31	16	9	26	16
Granger	1	54	7	18	31	10	29	83	4	38	12	8	32	7
LaTrobe	3	80	32	31	50	17	40	57	2	9	4	3	9	6
Schooner	2	65	9	7	31	6	41	46	2	19	14	6	29	5
Scope	5	67	11	36	64	13	38	38	2	19	4	1	17	4
Feed barley														
Fathom	10	81	48	73	52	15	68	20	2	6	1	3	15	3
Fleet	9	80	43	57	46	19	55	31	1	8	3	4	20	3
Hindmarsh	4	75	37	28	50	20	53	51	2	9	6	4	10	6
Keel	4	87	44	51	73	18	64	48	2	8	3	3	18	4
Oxford	2	41	5	8	26	9	12	70	5	50	31	8	35	22
Rosalind	2	70	46	51	52	9	72	57	2	8	4	4	27	3
Barley under malt evaluation														
Compass	18	93	72	75	81	27	84	17	1	3	1	2	11	2
Spartacus CL	4	88	40	20	70	39	60	41	1	6	4	2	4	3
SY Rattler	2	40	10	25	16	3	27	58	7	24	13	17	59	11

Table 8: 2015 North Central, North East and Wimmera barley yield (as a percentage of site mean yield) and protein (%).
All trials experienced multiple frosts and extreme heat conditions. Interpret data with caution.

Location & Sowing date	Yield (%)					Protein (%)				
	North Central	North East	Wimmera			North Central	North East	Wimmera		
	Colbinabbin 13/5/15	Wunghnu 13/5/15	Horsham 21/5/15	Kaniva 11/5/15	Minyip 20/5/15	Colbinabbin	Wung-hnu	Horsham	Kaniva	Minyip
Malting barley										
Bass	96	97	-	106	104	12.2	13.6	-	17.4	16.0
Baudin	85	81	95	87	97	13.2	13.5	16.0	17.2	15.4
Buloke	98	101	114	92	88	12.2	12.5	14.8	16.3	16.0
Charger	103	118	118	106	113	12.2	12.2	14.9	16.6	15.4
Commander	104	88	100	91	108	11.4	12.5	15.6	16.7	14.9
Fairview	-	78	46	-	15	-	13.9	19.6	-	18.9
Flagship	99	98	103	106	103	12.2	12.1	16.9	17.2	16.6
Flinders	87	97	92	92	62	13.7	13.1	16.9	17.9	17.6
Gairdner	96	93	99	89	72	12.6	13.6	16.2	18.0	16.7
Granger	100	92	85	87	98	11.6	13.1	17.7	19.1	16.7
LaTrobe	102	118	144	116	177	11.7	11.8	13.2	15.7	13.1
Macquarie	-	81	97	101	88	-	11.7	16.9	18.3	16.1
Navigator	101	77	47	57	49	11.1	14.2	19.6	20.1	18.1
Schooner	97	98	123	113	141	13.4	13.6	16.7	18.1	16.3
Scope	96	105	106	106	80	12.5	12.3	15.5	16.6	16.6
Westminster	95	89	49	68	8	12.8	13.9	19.1	18.7	19.3
Wimmera	75	-	45	83	26	13.6	-	20.1	18.7	20.1
Feed barley										
Alestar	106	97	73	84	64	11.1	12.8	16.4	17.6	16.6
Fathom	108	126	154	117	174	11.9	11.8	13.4	16.2	14.0
Fleet	-	-	111	82	143	-	-	16.2	17.5	15.3
Hindmarsh	101	119	137	130	172	12.9	11.4	14.3	16.3	13.8
Keel	-	-	-	-	-	-	-	-	-	-
Maltstar	94	88	78	90	45	11.4	12.0	15.9	15.9	16.5
Oxford	97	84	34	47	7	13.0	13.5	18.4	17.8	18.5
Rosalind	104	133	146	136	81	11.0	11.7	13.9	16.1	16.6
Barley under malt evaluation										
Compass	113	129	154	143	173	10.8	10.7	13.5	15.2	13.9
Spartacus CL	111	116	151	126	185	12.0	11.9	13.9	16.1	13.7
SY Rattler	92	104	84	86	78	11.4	12.6	16.3	16.9	15.9
Site Mean (t/ha)	2.37	2.42	1.47	1.81	1.19					
CV (%)	8	7	7	12	8					
LSD (%)	15	12	12	21	13					

Table 9: 2015 North Central, North East and Wimmera barley plump grain and screenings. Plump grain is the percentage of grain above a 2.5 mm sieve and screenings the percentage below a 2 mm sieve.

	Plump grain (%)					Screenings (%)				
	North Central	North East	Wimmera			North Central	North East	Wimmera		
	Colbinabbin	Wunghnu	Horsham	Kaniva	Minyip	Colbinabbin	Wunghnu	Horsham	Kaniva	Minyip
Malting barley										
Bass	70	5	-	6	19	4	56	-	58	21
Baudin	24	1	3	6	2	15	75	57	90	41
Buloke	42	1	13	5	6	10	68	74	57	23
Charger	41	2	10	6	6	14	67	60	49	47
Commander	44	5	43	6	30	16	58	47	35	16
Fairview	-	1	7	-	6	-	83	65	-	36
Flagship	25	1	2	6	1	20	68	37	83	72
Flinders	51	3	7	6	5	9	50	73	55	28
Gairdner	28	2	7	6	7	18	75	57	76	46
Granger	55	3	16	6	11	7	69	62	70	43
LaTrobe	28	2	8	5	7	15	66	67	70	28
Macquarie	-	2	13	6	10	-	67	54	52	24
Navigator	56	8	32	6	20	7	35	58	45	18
Schooner	27	4	9	6	4	17	55	75	59	26
Scope	49	4	13	5	6	9	50	74	51	23
Westminster	61	3	16	6	6	5	54	66	35	25
Wimmera	54	-	12	6	4	8	-	61	57	48
Feed barley										
Alestar	44	3	25	6	8	11	66	53	44	38
Fathom	6	4	3	6	29	22	50	62	43	24
Fleet	-	-	29	6	17	-	-	63	46	22
Hindmarsh	20	3	8	6	5	24	51	60	76	31
Keel	-	-	-	-	-	-	-	-	-	-
Maltstar	17	1	6	5	2	25	86	57	77	64
Oxford	33	2	16	6	6	19	63	61	45	35
Rosalind	29	11	13	4	3	19	44	57	44	43
Barley under malt evaluation										
Compass	61	22	40	5	34	9	28	49	37	16
Spartacus CL	39	6	15	5	11	14	42	63	58	19
SY Rattler	22	1	3	6	2	26	80	44	68	63

Table 10: 2015 South West (long season) barley yield (as a percentage of the site mean yield), protein (%), plump grain and screenings. Plump grain is the percentage of grain above a 2.5 mm sieve and screenings the percentage below a 2 mm sieve. All trials experienced multiple frosts and extreme heat conditions. Interpret data with caution.

Location & Sowing date	Yield (%)			Protein (%)			Plump grain (%)			Screenings (%)		
	Hamilton 22/5/15	Streatham 15/5/15	Teesdale 18/5/15	Hamilton	Streatham	Teesdale	Hamilton	Streatham	Teesdale	Hamilton	Streatham	Teesdale
Malt barley												
Bass	106	115	102	11.6	12.4	11.0	97	23	90	1	21	1
Charger	97	97	88	11.1	13.4	11.0	86	7	69	4	53	6
Commander	94	99	99	10.9	12.2	10.2	93	11	75	2	35	6
Fairview	106	104	101	10.9	12.2	11.5	89	21	85	2	22	2
Flinders	100	106	97	12.3	12.9	11.2	94	15	90	1	29	1
Gairdner	87	94	88	11.5	13.4	11.7	71	6	44	7	56	10
Granger	99	110	89	11.5	12.9	10.7	92	16	84	2	28	3
Macquarie	94	99	95	11.4	13.9	11.1	63	4	44	9	63	11
Navigator	103	103	96	10.9	12.6	10.3	93	28	83	2	18	2
Westminster	89	80	87	11.2	13.4	10.9	91	23	92	2	20	1
Wimmera	97	79	94	11.6	14.5	11.4	88	19	75	2	34	3
Feed barley												
Alestar	104	100	101	10.4	11.7	10.3	87	9	70	3	39	4
Capstan	101	93	103	11.6	15.0	11.4	63	2	32	11	68	20
Maltstar	101	98	105	10.5	12.2	10.1	61	3	54	11	62	9
Oxford	103	83	106	10.4	14.5	10.6	79	8	68	4	38	5
Rosalind	106	130	112	10.6	11.6	9.7	90	21	83	2	30	3
Urambie	96	101	97	11.4	12.0	10.8	48	5	30	10	54	15
Barley under malt evaluation												
Compass	91	108	100	10.3	11.2	10.0	93	36	84	2	16	3
Spartacus CL	99	119	112	11.3	11.6	10.3	92	18	85	2	24	2
SY Rattler	90	69	86	10.6	13.5	10.9	79	4	36	4	63	15
Site Mean (t/ha)	6.50	4.06	6.09									
CV (%)	3	8	3									
LSD (%)	5	13	5									

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OAT

OAT

REVIEW OF 2015

Season

A poor start to the season saw biomass production limited. Most oat crops were cut for hay or grazed out before the October heatwave, and those that weren't had much lower hay yields.

Oat yields were highest in the South West and protein across the state was higher than average. Yields in the west were limited by the dry conditions and heat. High screenings as a result of dry conditions made it difficult to make milling grade.

Disease

Dry conditions meant the incidence of rust and red leather leaf were low in 2015. The exception being the high rainfall zone where red leather leaf and bacterial blight were common. The incidence of barley yellow dwarf virus was half of that recorded in 2014 in the high rainfall zone.

LOOKING FORWARD TO 2016

New varieties

No new varieties released for the 2016 season.

Breeders are preparing for the release of WA02Q309-9 (yet to be named) bred by the National Oat Breeding Program in spring 2016 with seed available for 2017. This is a moderately tall variety with good lodging and shattering resistance and good early vigour. It is a week earlier than any other variety released from the program and offers grain yield similar to the tall varieties Carrolup and Yallara with excellent quality.

Disease

It is important that growers understand the resistance ratings of their varieties to the diseases of importance in their region and plan management strategies accordingly. Managing the green bridge will be important after summer rain events.

Quality

Variety selection should be based on agronomic traits, potential grain quality and marketing or end use options. Oats are grown for human consumption or animal feed as grain or hay. Grain quality traits for the milling industry include high groat per cent, high β -glucan, low screenings, and high hectolitre weight. Grain quality traits for improved animal feed include low hull lignin, high groat percentage, and high oil content, resulting in high grain digestibility. Important hay quality traits are high digestibility, high water soluble carbohydrates, low fibre and high protein.

The option of oats for hay is increasing in popularity where growers have identified it as profitable, as a tool to manage herbicide resistance and to spread risk. Variety performance for hay yield and quality is available in the Oat Newsletter at aexco.com.au. Earlier versions of the Oat Newsletter (2012-14) can be found at www.pir.sa.gov.au.

Royalties

Where applicable, growers selling oat seed or export hay will pay an End Point Royalty (EPR). An export hay EPR of \$2/tonne (ex GST) applies on all oat varieties bred by the National Oat Breeding Program. Refer to aexco.com.au for further information on hay, grain and seed royalties.

MORE INFORMATION

www.nvtonline.com.au

Detailed NVT trial results and links to variety information.

www.nvtonline.com.au/apps

- Australian Field Crop Disease Guide app
- NVT Long Term Yield Reports app

agriculture.vic.gov.au/agriculture/grains-and-other-crops

- [AG1160 Cereal disease guide](#)

VARIETY DESCRIPTIONS

 denotes Plant Breeders Rights apply.

End Point Royalty (EPR) for grain and hay and seed royalty for 2016-17 season quoted \$/tonne ex-GST.

Milling oat – BANNISTER

A dwarf milling variety with wide adaption. Compared to Mitika it is about 13cm taller and flowers 3-4 days later. Similar to Mitika for groat percentage. R to leaf rust. Very susceptible and intolerant to CCN. Bred by the National Oat Breeding Program. Released in eastern Australia in 2013 via Seednet. EPR \$2.30.

Milling oat – DUNNART

A dwarf potential milling variety with mid maturity. It is 10-15 cm taller than Mitika, Possum and Wombat. Dunnart has improved plant colour compared to Mitika and Wombat. It is MR to leaf rust, R and MT to CCN, and MR to barley yellow dwarf virus. Bred by SARDI (SV98146-26), released 2012.

Milling oat – MITIKA

An early maturing dwarf variety with some resistance to common rusts. Suited to high rainfall areas, it has around 73 per cent groat yield and provides excellent feed value. It is not suited to areas where CCN is a problem. Released 2005 and marketed by Heritage Seeds. EPR \$2.

Milling oat – POSSUM

A dwarf variety to replace Echidna for milling in medium to high rainfall regions with improved grain quality. Late sowing may result in yield penalty. Bred by SARDI, released 2002 and marketed by Seednet. EPR \$1.70.

Milling Oat – WILLIAMS

A medium to tall milling oat suited to medium to high rainfall zones. It is 15cm taller than Mitika, 5cm taller than Bannister and 15cm shorter than Yallara. A higher yielding variety, similar to Bannister but with slightly inferior grain quality. Produces high screenings when grown in low rainfall areas. S to stem rust, but R to leaf rust and S & I to CCN. MS to septoria. Bred by the National Oat Breeding Program (WA2332). Released 2015. Marketed by Heritage Seeds. EPR \$2.30.

Milling Oat – WOMBAT

A dwarf mid season variety that flowers about six days later than Mitika. It is the first dwarf milling variety with CCN resistance and tolerance. Intended to replace Mitika and Possum where CCN and stem nematode are limiting yield, but may have higher screenings. Bred by SARDI (SV97181-12) released 2011 and marketed by Seednet. EPR \$2.

Milling oat – YALLARA 

Medium to tall similar to Euro, which it is intended to replace. S to stem rust, MS to leaf rust and MS to septoria. Resistant but intolerant to CCN. Suited to drier areas. Bred by SARDI, released in 2009 and marketed by Seednet. EPR \$2.

Feed oat – ECHIDNA

A widely adapted, high yielding, semi-dwarf variety for milling and feed. Echidna is outclassed by Possum and Mitika for milling quality. Released 1984 by SARDI.

Feed/hay oat – QUOLL

High yielding semi-dwarf variety suitable for feed grain with potential to use for hay production in high rainfall areas where lodging is a problem in taller varieties. Released 1998.

Hay/feed oat – MULGARA 

A mid season tall oat targeted as a replacement for Wintaroo but with better resistance to leaf rust and lodging. Has excellent hay colour with quality similar to Wintaroo. Bred by SARDI, released 2009 and marketed by AEXCO. EPR \$2.

Hay/feed oat – TAMMAR 

Late season tall hay oat variety for medium and high rainfall zones which provides a slightly later cutting time than Tungoo and Kangaroo. S to stem rust, MS to leaf rust, and MR & MT to CCN. Bred by SARDI, released 2010 and marketed by AEXCO. EPR \$2.

Hay/grazing/feed oat – BRUSHER 

Early to mid season tall oat, well suited to low rainfall areas. S to stem and leaf rust. Resistant but moderately

intolerant to CCN and MRMS to *P. neglectus* nematodes. Bred by SARDI, released 2002 and marketed by AEXCO. EPR \$2.

Hay/grazing/feed oat – WINTAROO 

Tall, mid-season variety for all rainfall zones. Susceptible to leaf and stem rust. Resistant and moderately tolerant to CCN and MRMS to *P. neglectus* nematodes. Bred by SARDI, released 2001 and marketed by AEXCO. EPR \$2.

Hay oat – FORESTER 

A medium height late hay variety adapted to high rainfall and irrigated cropping regions. It has excellent lodging and shattering resistance. S to stem rust and MS to leaf rust. It has excellent hay qualities, but is MS & MI to CCN. Bred by SARDI, released 2011 and marketed by AGF Seeds. EPR \$2.

Hay oat - GLIDER

A late maturity variety suited to high rainfall regions. S to stem and leaf rust. MS and intolerant to CCN. Bred by SARDI and released 1999.

Hay oat – KANGAROO 

A mid to late season moderately tall oat, a later flowering time makes it less suited to low rainfall environments. S to rusts. Resistant and moderately tolerant to CCN. Released 2003. Bred by SARDI, marketed by AEXCO. EPR \$2.

Hay oat - TUNGOO 

A medium to tall variety. S to stem rust and MS to leaf rust. Resistant and moderately tolerant to CCN and stem nematode. Hay yield similar to Kangaroo but grain yield poor. Released 2008. Bred by SARDI, marketed by AEXCO. EPR \$2.

Table 1: Oat variety agronomic guide and disease reactions.

Oat disease reactions provided by Pamela Zwer, SARDI.

	End use	Height	Maturity	Hectolitre weight	Stem Rust	Leaf Rust	CCN Res	CCN Tol	BYDV	Septoria	Bacterial blight	Red Leather Leaf
Milling Oats												
Bannister	M	TD	M	H	S	R	VS	I	MS	S	S	MS
Dunnart	M	TD	M	H	S	MR	R	MT	MR	MS	S	MS
Mitika	M	D	E	H	S	S	VS	I	S	S	MR	S
Possum*	M	D	EM	H	-	-	-	-	-	-	-	-
Williams	M	MT	E	H	S	R	S	I	MS	MS	R	MS
Wombat	M	D	EM	H	S	MS	R	T	MR	MS	MS	MS
Yallara	M	MT	EM	H	S	MS	R	I	MS	MS	MS	MS
Feed Oats												
Echidna*	M/F	D	EM	M	-	-	-	-	-	-	-	-
Quoll*	F	TD	EM	ML	-	-	-	-	-	-	-	-
Hay/Grazing/Feed												
Brusher	H/G/F	T	EM	M	S	S	R	MI	MS	MS	MS	MS
Forester	H	MT	VL	L	S	MS	MS	MI	S	MR	S	RMR
Glider	H	MT	L	ML	S	S	MS	I	S	MR	R	R
Kangaroo	H	MT	ML	M	S	S	R	MT	S	MS	MS	MS
Mulgara	H	T	EM	M	MS	MS	R	MT	MS	MS	MR	MSS
Tammar	H	MT	LM	L	S	MS	MR	MT	MS	MR	MR	R-MS
Tungoo	H	MT	ML	L	S	MS	R	MT	MS	MR	MR	R
Wintaroo	H/G	T	EM	M	S	S	R	MT	MRMS	MS	MS	MS

End use: M = milling, F = feed grain, G = grazing, H = hay Hectolitre weight: H = heavy, M = medium, L = light

Plant height: D = dwarf, TD = tall dwarf, T = tall, ST = short tall, MT = moderate tall

Maturity: E = early, EM = early mid, M = mid season, ML = mid late season, LM = late mid season, L = late, VL=very late

Disease resistance order from best to worst: R > RMR > MR > MRMS > MS > MSS > S > SVS > VS.

p = provisional ratings - treat with caution. R = resistant, M = moderately, S = susceptible, V = very.

Disease tolerance: T = tolerant, MT = moderately tolerant, MI = moderately intolerant, I = intolerant

* Disease ratings on these older varieties are not current and have not been included.

Table 2: Oat disease guide.

Disease	Organism	Symptoms	Occurrence	Hosts	Control
FOLIAR					
Leaf rust	<i>Puccinia coronata</i> f.sp. <i>avenae</i>	Small circular orange pustules on upper leaf surface.	More severe during moist conditions with temperatures between 15-22°C.	Volunteer oats and wild oats.	Resistant varieties. Control volunteer and wild oats over the summer.
Stem rust	<i>Puccinia graminis</i> f.sp. <i>avenae</i>	Large red-brown pustules, rupture in leaf surface.	Infection requires warm (15-30°C) moist conditions.	Volunteer oats and wild oats.	Resistant varieties. Control volunteer and wild oats over summer.
Septoria blotch	<i>Phaeosphaeria avenaria</i>	Dark brown purple spots on leaves, sheaths & stems. Head and grain may become infected.	Prefers cool rainy weather, especially coastal districts.	Spores spread in autumn by raindrop splashes from oat residues.	Resistant varieties. Crop rotation, bury or graze infected stubble. Avoid early sowing in high rainfall areas.
BYDV	Barley yellow dwarf virus	Leaf tip and margins turn red with interveinal chlorosis, mottling and stunting.	Transmitted by aphids.	Hosts include all cereals and grasses, including pastures.	Resistant varieties. Chemical control of insects may be suitable for high value crops.
Halo blight	<i>Pseudomonas syringae</i> pv. <i>coronafaciens</i>	Light green, yellow or brown halo spot on leaves and sheaths. Leaves may wither and die.	Moist weather provides ideal conditions.	Bacteria on seed and crop debris are spread by rain splash, direct leaf contact, or aphids.	Avoid susceptible varieties, use clean seed in clean paddocks. Destroy infected oat stubble.
Stripe blight	<i>Pseudomonas syringae</i> pv. <i>striaefaciens</i>	Spots on leaves lengthen to form brown stripes on leaves & sheaths. Leaves may wither & die.	Moist weather provides ideal conditions.	Bacteria on seed and crop debris are spread by rainsplash, direct leaf contact, or aphids.	Avoid susceptible varieties, use clean seed in clean paddocks, and destroy infected oat stubble.
Powdery mildew	<i>Blumeria graminis</i> f.sp. <i>avenae</i>	White powdery spores on upper leaf surfaces. Underside of leaves turn yellow to brown.	Favoured by high humidity and temperatures between 15-22°C.	Volunteer oats, oat stubble, windborne spores.	Avoid very susceptible varieties.
Red leather leaf	<i>Spermospora avenae</i>	Long reddish lesions with buff centres. Leaves may look and feel leathery.	High rainfall provides ideal conditions.	Stubble and rain splash.	Avoid susceptible varieties and rotate crops. Remove infected oat stubble.
GRAIN					
Smut	<i>Ustilage segetum</i> var. <i>hordei</i> . and <i>Ustilage avenae</i>	Grain replaced with dark brown-black powdery spores.	Moist conditions at flowering and temperatures between 15-25°C.	Air borne spores lodge in hulls, glumes or seed coats.	Clean seed and use seed treatment. Avoid susceptible varieties.
ROOT / CROWN					
Cereal cyst nematode (CCN)	<i>Heterodera avenae</i>	Yellow or pale green patches in crop. Stunted, weak plants with knotted root systems.	Can survive in soil between susceptible cereal crops for up to 2 years.	Cereals and some grasses, especially wild oats.	Resistant or tolerant varieties, crop rotation, weed control.
Stem nematode	<i>Ditylenchus dipsaci</i>	Swollen base of plant, stunted & numerous tillers.	Encouraged by moist conditions & can reproduce 4-5 times per season.	Wide host range including peas, beans, wild oats and many weeds. Nematode spread in infected hay.	Crop rotation and weed control. Avoid susceptible varieties.
Root lesion nematode	<i>Pratylenchus thornei</i> & <i>Pratylenchus neglectus</i> .	Reduced tillering, ill thrift; lack of branching of root system, lesions on roots.	Favoured by wheat in rotation with wheat chickpea, medic and vetch.	Survives as dormant nematodes in the soil.	Crop rotation using resistant crops.

This table has been developed from information in the publications Wallwork H (2000) (Ed) Cereal Root and Crown Diseases (Grains Research and Development Corporation, SARDI) and Wallwork H (2000) (Ed) Cereal Leaf and Stem Diseases (Grains Research and Development Corporation, SARDI).

Table 3: Oat time of sowing guide.

This table is a guide only and has been compiled from observations of the breeder and local departmental agronomists.

MALLEE	April				May				June				July			
Milling: Bannister, Dunnart, Echidna, Mitika, Yallara, Wombat				>	X	X	X	X	X	X	<	<				
Feed: Quoll				>	X	X	X	X	X	X	<	<				
Hay: Kangaroo, Mulgara, Wintaroo, Forester				>	X	X	X	X	X	X	<	<				
Grazing: Wintaroo				>	X	X	X	X	X	X	<	<				
WIMMERA	April				May				June				July			
Milling: Bannister, Dunnart, Echidna, Mitika, Possum, Yallara, Wombat					>	>	X	X	X	X	X	<	<	<		
Feed: Mulgara, Quoll					>	>	X	X	X	X	X	<	<	<		
Hay: Brusher, Glider, Kangaroo, Mulgara, Wintaroo, Forester				>	>	X	X	X	X	X	X	X	<	<	<	
Grazing: Wintaroo				>	>	X	X	X	X	X	X	X	<	<	<	
NORTH CENTRAL	April				May				June				July			
Milling: Bannister, Dunnart, Echidna, Mitika, Possum, Yallara, Wombat					>	>	X	X	X	X	X	<	<	<		
Feed: Mulgara, Quoll					>	>	X	X	X	X	X	<	<	<		
Hay: Glider, Kangaroo, Mulgara, Wintaroo, Forester				>	X	X	X	X	X	X	X	X	<	<	<	
NORTH EAST	April				May				June				July			
Milling: Bannister, Dunnart, Echidna, Possum, Yallara, Wombat					>	>	X	X	X	X	<	<				
Feed: Mulgara, Quoll, Tammar					>	>	X	X	X	X	<	<				
Hay: Glider, Mulgara, Tammar, Tungo, Wintaroo, Forester				>	X	X	X	X	X	<						
Grazing: Tungoo			>	X	X	X	<	<								
SOUTH WEST	April				May				June				July			
Milling: Bannister, Dunnart, Echidna, Mitika, Yallara, Wombat			>	X	X	X	X	X	X	X	X	<	<	<		
Possum			>	X	X	X	X	X	X	X	<					
Feed: Quoll, Tammar			>	X	X	X	X	X	X	X	X	<	<	<		
Hay: Glider, Tammar, Tungoo, Forester			>	X	X	X	X	X	X	X	X	X	<	<	<	

Varietal choice determines time to grazing or cutting for hay

>earlier than ideal, X optimum sowing time, < later than ideal but acceptable

Table 4: Long term predicted oat yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

Mean yield (t./ha)	North Central 2.89		North East 2.98		South West 3.86	
Bannister	121	(9)	120	(13)	122	(6)
Carrolup	-		102	(3)	-	
Dunnart	114	(9)	110	(13)	110	(6)
Echidna	110	(6)	109	(6)	110	(5)
Euro	106	(3)	107	(4)	-	
Kojonup	-		114	(3)	-	
Mitika	105	(9)	102	(13)	109	(6)
Numbat	61	(4)	82	(5)	-	
Possum	106	(9)	103	(13)	110	(6)
Potoroo	-		118	(4)	-	
Quoll	119	(5)	114	(6)	-	
Williams	121	(9)	126	(13)	120	(6)
Wombat	110	(9)	113	(13)	114	(6)
Yallara	104	(9)	101	(13)	96	(6)

Long term yield predictions provided in this report have been produced using the NVT Long Term MET (Multi Environment Trial) analysis. The analysis produces predictions or "Production Values" for every variety in every NVT trial across all years identified within the dataset. This report presents regional means for each variety which reduces the accuracy and reliability of the results. Varieties present in less than three trials per region have been omitted from this report and some rounding variation may be present when compared to other reporting methods. More detailed yield information can be found using the NVT Long Term Yield App or the Excel Reporting tools available on the NVT website (www.nvtonline.com.au).

NVT trials are managed to minimise disease impact and this may include the use of seed dressings and post emergent fungicides.

Table 5: 2015 oat yield (as a percentage of the site mean yield). All trials experienced multiple frosts and extreme heat conditions. Interpret data with caution.

Sowing Date	North Central	North East		South West	
	Diggora 22/5/15	Dookie 8/5/15	Yarrawonga 11/5/15	Hamilton 22/5/15	Streatham 15/5/15
Bannister	94	97	100	122	109
Dunnart	100	86	68	94	99
Echidna	70	97	75	96	107
Mitika	65	121	116	92	97
Possum	114	108	125	99	107
Potoroo	108	102	96	89	96
Williams	125	108	96	115	95
Wombat	82	100	99	108	94
Yallara	94	80	102	102	76
Site Mean (t/ha)	0.71	2.53	2.27	4.64	2.69
CV (%)	13	8	10	6	7
LSD (%)	21	13	17	10	12

Table 6: 2015 oat protein (%).

	North Central	North East		South West	
	Diggora	Dookie	Yarrawonga	Hamilton	Streatham
Bannister	11.6	12.4	12.8	10.6	13.7
Dunnart	11.9	12.6	13.8	11.2	13.7
Echidna	12.9	13.1	14.1	11.5	15.3
Mitika	12.1	13.5	13.6	12.7	15.3
Possum	13.6	13.7	14.0	12.5	14.8
Potoroo	13.0	13.5	13.8	11.9	15.2
Williams	12.8	13.4	14.5	11.7	15.0
Wombat	12.2	13.8	14.0	12.4	15.4
Yallara	12.2	12.8	13.0	11.3	13.1

Table 7: 2015 oat screenings and test weight (kg/hectolitre). Screenings expressed as a percentage of grain below a 2 mm sieve.

	Screenings (%)					Test weight (kg/hectolitre)				
	North Central	North East		South West		North Central	North East		South West	
	Diggora	Dookie	Yarrawonga	Hamilton	Streatham	Diggora	Dookie	Yarrawonga	Hamilton	Streatham
Bannister	33.9	36.5	42.9	11.5	20.1	43.6	46.0	50.0	56.6	45.1
Dunnart	15.1	30.3	43.1	14.0	13.1	44.2	43.6	53.0	52.2	47.7
Echidna	36.5	42.3	43.4	26.0	24.8	48.4	43.0	50.6	51.8	44.8
Mitika	28.9	23.8	31.3	14.0	10.0	49.6	47.0	53.4	54.2	48.3
Possum	28.7	33.3	45.5	17.6	15.0	52.0	47.4	55.6	56.4	48.0
Potoroo	38.5	36.4	62.6	27.0	34.8	45.4	44.0	48.8	49.8	40.0
Williams	39.4	49.1	53.1	24.6	33.0	44.4	42.0	46.6	55.2	44.8
Wombat	30.6	46.8	86.4	14.3	19.7	48.2	46.6	52.8	57.2	46.1
Yallara	28.1	36.4	33.2	11.4	15.6	47.6	47.2	55.8	61.6	45.4

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TRITICALE

TRITICALE

Triticale, a cross between wheat and cereal rye, has a niche on farms across Victoria due to several attributes. It has a reputation for tolerance to harsh soil conditions such as acid and alkaline soils and soils of low trace element fertility. It is a tall crop bred for strong straw strength which can be useful in rocky paddocks or circumstances where crops have been known to lodge.

REVIEW OF 2015

Season

The area sown to triticale has declined substantially in recent years as growers favour wheat or barley.

As with most other crops the dry finish favoured shorter season triticale varieties and led to an increase in screenings across the state. Yields were also significantly lower across the state in 2015 due to dry conditions.

Disease

Triticales are noted for their resistance to a range of diseases and there were no reports of disease issues in this crop for 2015.

LOOKING FORWARD TO 2016

New varieties

Astute is a new mid-season triticale that is an alternative to Hawkeye. Bison, first listed last year, will be fully available in 2016.

Disease

When selecting varieties up to date rust resistance ratings should be consulted as previous ratings may have changed due to new rust strains becoming established. The important diseases to consider are stripe rust and CCN.

MORE INFORMATION

www.nvtonline.com.au

Detailed NVT trial results and links to variety information.

www.nvtonline.com.au/apps

- Australian Field Crop Disease Guide app
- NVT Long Term Yield Reports app

agriculture.vic.gov.au/agriculture/grains-and-other-crops

- [AGO497 Growing triticale](#)
- [AG1160 Cereal disease guide](#)

VARIETY DESCRIPTIONS

 denotes Plant Breeders Rights apply

End Point Royalty (EPR) 2016-17 quoted \$/tonne ex-GST.

NEW ASTUTE

A mid season fully-awned variety suited to medium-high yielding environments and alternative to Hawkeye. Stem rust RMR, stripe rust RMR# and leaf rust RMR. Bred by AGT (as TSA0466) and registered 2015. Marketed by AGT. EPR \$2.75.

BERKSHIRE

A mid-season awned variety with good straw strength. Stem rust R, stripe rust MRMS# and leaf rust R. Has been purpose bred for feed quality traits for pigs by the University of Sydney and Pork CRC, registered 2009. Marketed by Waratah Seed Co.

NEW BISON

An early to mid season reduced awn variety best suited to low-medium yielding environments. Intended as a replacement for Rufus. Stem rust RMR, stripe rust R# and leaf rust RMR. Bred by AGT (as TSA0451) and registered 2014. Marketed by AGT. EPR \$2.75.

CANOBOLAS

Early to mid-season awned variety with stiff straw, shorter than Tahara. A widely adapted spring variety with acid soil tolerance. Stem rust R, stripe rust MRMS# and leaf rust RMR. Bred by the University of New England, registered 2009. Marketed by Seednet.

CHOPPER

An early maturing, awned semi dwarf variety which resists lodging in high yielding environments. Has good grain quality and performs best in short growing seasons or late sowing situations. Stem rust MR, MRMS# to stripe rust and leaf rust R. Released in 2010 and marketed by AGT. EPR \$3.

FUSION

A mid-season variety (similar to Tahara), fully awned grain only triticale. A moderately tall variety that yields well in dry or sudden finishes. Stem rust R, stripe rust RMR#, leaf rust R and resistant to CCN. Released in 2012 and marketed by AGT. EPR \$3.

GOANNA

An early to mid-season, fully awned grain only triticale. Stem rust R, stripe rust RMR#, leaf rust R and resistant to CCN. Released in 2011 by Cooper & Elleway.

KM10

A fast growing early to mid season variety with good early production of forage. Tends to smaller grain and is ideally suited to short season environments. Stem rust R, stripe rust R#, leaf rust MRMS but susceptible to CCN. Released in 2014 by Cooper & Elleway.

TAHARA

A variety that has been widely grown for many years because of its reliability across a range of environments, but now outclassed by newer options. It may lodge in high yielding situations. Stem rust R, stripe rust MRMS#, leaf rust R and resistant to CCN. Suited to most districts with rainfall up to 550mm. Released 1987 by the Victorian Department of Agriculture.

YOWIE

A medium to tall mid-season grain variety that is fully awned and white-chaffed. Stem rust R, stripe rust MR#, leaf rust R and resistant to CCN. Released in 2010, seed available from Cooper & Elleway.

DUAL-PURPOSE TRITICALES

These varieties can be grazed early and then allowed to produce grain or cut for hay.

ENDEAVOUR 

Long season variety with similar maturity to Breakwell. Semi-awnless with excellent dry matter production and grain recovery after grazing. Stem rust R, stripe rust RMR#, leaf rust R. Registered 2008 and marketed by Waratah Seed Co.

RUFUS

A mid-season maturing variety, with a tall growth habit and reduced awns which is favoured for hay production. Stem rust R, stripe rust MRMS#, leaf rust R and resistant to CCN. Grain yields in higher rainfall regions have been superior to Tahara but may also cause lodging. Released in 2005 by University of New England. Seed available from Cooper & Elleway.

TOBRUK 

With a strong winter habit Tobruk is a dual purpose or long season grain only variety with excellent grain yield. Stem rust R, stripe rust MR#, leaf rust R. Earlier flowering than Breakwell and Endeavour. Released 2007 and marketed by Waratah Seed Co.

TUCKERBOX

Tuckerbox is a late-medium season, tall, high tillering variety with reduced awn head type, which may be grown for forage or grain. Stem rust MR, stripe rust MR#, leaf rust R. Released in 2009 and marketed by Yankalilla Seeds.

Table 1: Triticale time of sowing guide.

This table is a guide only and has been compiled from observations of the breeder and local departmental agronomists.

MALLEE	April				May				June				July			
Berkshire, Bison, Chopper, Fusion, KM10, Rufus, Tahara, Goanna, Yowie				>	>	X	X	X	X	X	<	<				
WIMMERA	April				May				June				July			
Astute, Berkshire, Bison, Fusion, Rufus, Tahara, Goanna, Yowie						>	>	X	X	X	X	X	X	<		
Chopper, KM10							>	>	X	X	X	X	X	X	<	
NORTH CENTRAL	April				May				June				July			
Astute, Berkshire, Bison, Credit, Fusion, , Rufus, Tahara, Goanna, Yowie					>	>	X	X	X	X	<	<				
Chopper, KM10						>	>	X	X	X	<	<				
NORTH EAST	April				May				June				July			
Jackie	X	X	X	X	X	X	<									
Abacus				>	X	X	X	<	<							
Astute, Berkshire, Bison, Credit, Fusion, Tahara, Goanna, Yowie					>	X	X	X	<							
Chopper						>	X	X	X	<						
SOUTH WEST	April				May				June				July			
Endeavour, Jackie				>	X	X	X	X	X	X	<	<				
Abacus, Prime 322					>	>	X	X	X	X	X	X	<	<		
Astute, Berkshire, Bison, Credit, Fusion, Kosciuszko, Tahara, Tobruk						>	>	X	X	X	X	X	<	<		

>earlier than ideal, X optimum sowing time, < later than ideal but acceptable

Table 2: Triticale variety agronomic guide and disease reaction.

Variety	Maturity	Height	Head colour	Stem rust	Stripe rust	Leaf rust	Yellow leaf spot	Septoria tritici	CCN resistance	<i>Pratylenchus neglectus</i> resistance	<i>Pratylenchus thornei</i> resistance
Astute	M	M-T	W	RMR	RMR#	RMR	MRMS	-	R	RMR	MS
Berkshire	E-M	T	W	R	MRMS#	R	MR	RMR	-	MR	MS
Bison	M	T	W	RMR	R#	RMR	MR	MR	R	MR	RMR
Canobolas	E-M	M-T	W	R	MRMS#	RMR	MR	RMR	-	MR	MSS
Chopper	E	S-M	W	MR	MRMS#	R	MR	RMR	R	MRMS	MSS
Endeavour	L		W	R	RMR#	R	MR	R	-	MR	SVS
Fusion	M	M-T	W	R	RMR#	R	MRMS	R	R	RMR	MS
Goanna	E-M	T	W	R	RMR#	R	MR	R	R	MRMS	SVS
KM10	E-M			R	R#	MRMS	MRMS	MR	-	MR	MSP
Rufus	M	T	W	R	MRMS#	R	MR	RMR	R	MSS	MSS
Tahara	M	T	W	R	MRMS#	R	MR	RMR	R	MR	S
Tobruk	M-L	-	W	R	MR#	R	MR	R	-	MR	SVS
Tuckerbox	M	T	W	MR	MR#	R	MR	RMR	-	MRMS	S
Yowie	M	M-T	W	R	MR#	R	MR	RMR	R	MR	MSS

Maturity: E = early, M = mid season, L = late, VL = very late

Height: M = medium, T = tall

Colour: W = white, Br = brown

Disease resistance order from best to worst: R > RMR > MR > MRMS > MS > MSS > S > SVS > VS.

p = provisional ratings - treat with caution. R = resistant, M = moderately, S = susceptible, V = very.

Varieties marked may be more susceptible if alternative strains are present.

Table 3: Long term predicted triticale yield 2008-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

Mean yield (t/ha)	Mallee 2.22	North East 4.00	South West 4.06
Abacus	-	-	76 (9)
Astute	108 (6)	114 (6)	119 (3)
Berkshire	102 (12)	104 (16)	104 (13)
Bison	109 (6)	113 (6)	113 (3)
Bogong	103 (15)	106 (16)	106 (14)
Canobolas	100 (15)	104 (16)	105 (13)
Chopper	103 (15)	101 (16)	95 (12)
Crackerjack	-	97 (4)	88 (7)
Credit	-	-	67 (4)
El Alamein	-	-	109 (9)
Endeavour	-	-	100 (10)
Fusion	110 (12)	113 (12)	113 (10)
Goanna	100 (10)	98 (10)	98 (7)
Hawkeye	102 (15)	105 (16)	109 (23)
Jaywick	99 (15)	102 (16)	108 (13)
KM10	101 (4)	-	-
Rufus	100 (15)	97 (16)	96 (13)
Speedee	94 (3)	82 (4)	-
Tahara	99 (15)	96 (16)	94 (15)
Tickit	101 (5)	-	-
Tobruk	-	99 (4)	99 (16)
Tuckerbox	-	87 (14)	90 (19)
Yowie	95 (12)	96 (12)	100 (15)
Yukuri	-	-	93 (21)

Long term yield predictions provided in this report have been produced using the NVT Long Term MET (Multi Environment Trial) analysis. The analysis produces predictions or "Production Values" for every variety in every NVT trial across all years identified within the dataset. This report presents regional means for each variety which reduces the accuracy and reliability of the results. Varieties present in less than three trials per region have been omitted from this report and some rounding variation may be present when compared to other reporting methods. More detailed yield information can be found using the NVT Long Term Yield App or the Excel Reporting tools available on the NVT website (www.nvtonline.com.au).

NVT trials are managed to minimise disease impact and this may include the use of seed dressings and post emergent fungicides.

Table 4: 2015 triticale yield (as a percentage of the site mean yield) and protein (%). All trials except Yarrowonga experienced multiple frosts and extreme heat conditions. Interpret data with caution.

Sowing Date	Yield (%)					Protein (%)				
	Mallee		North East		South West	Mallee		North East		South West
	Ultima	Walpeup	Ruther-glen	Yarra-wonga	Streatham	Ultima	Walpeup	Ruther-glen	Yarra-wonga	Streatham
	22/5/15	7/5/15	13/5/15	11/5/15	15/5/15					
Astute	106	127	93	107	115	12.4	11.3	-	12.5	14.9
Berkshire	108	70	107	102	98	13.4	12.4	9.9	14.4	16.2
Bison	114	131	106	113	110	12.5	11.2	9.3	13.4	15.5
Bogong	99	95	109	108	105	13.1	11.1	9.5	13.2	14.6
Canobolas	82	97	97	109	99	13.7	11.7	9.6	14.4	16.2
Chopper	112	97	91	104	-	11.9	11.7	9.9	12.7	-
Endeavour	-	-	95	92	-	-	-	10.0	13.7	-
Fusion	100	99	100	106	116	12.5	11.3	9.4	13.6	14.4
Goanna	102	93	102	95	93	13.3	11.7	9.7	13.4	17.1
Hawkeye	95	109	106	91	107	13.4	11.3	9.5	13.6	16.5
Jaywick	78	105	98	98	85	14.0	11.6	9.1	13.6	17.3
KM10	83	55	-	-	-	12.4	12.0	-	-	-
Rufus	109	86	90	91	73	12.8	12.7	10.0	14.4	17.0
Tahara	90	96	91	86	94	13.3	12.0	10.1	14.0	15.8
Tuckerbox	-	-	85	86	85	-	-	9.8	12.9	16.4
Yowie	79	102	100	89	93	13.4	11.9	9.5	13.5	15.9
Yukuri	-	-	-	-	74	-	-	-	-	16.0
Site Mean (t/ha)	0.67	1.50	5.86	2.25	3.08					
CV (%)	5	8	7	8	7					
LSD (%)	9	13	12	13	11					

Table 5: 2015 triticale screenings and test weight (kg/hectolitre). Screenings expressed as a percentage of grain below a 2 mm sieve.

	Screenings (%)					Test weight (kg/hectolitre)				
	Mallee		North East		South West	Mallee		North East		South West
	Ultima	Walpeup	Ruther-glen	Yarra-wonga	Streatham	Ultima	Walpeup	Ruther-glen	Yarra-wonga	Streatham
Astute	11.2	3.0	-	14.8	7.8	71.2	71.1	-	69.2	68.6
Berkshire	20.5	11.9	11.0	16.0	11.9	76.2	71.1	75.4	71.2	71.9
Bison	8.9	3.6	9.5	14.3	6.1	67.7	67.3	71.4	64.8	65.7
Bogong	12.3	9.5	13.1	19.1	7.5	75.3	73.0	73.4	69.8	71.5
Canobolas	11.5	6.7	11.8	19.6	9.2	73.6	73.0	73.6	69.4	72.4
Chopper	6.5	5.4	12.0	20.1	-	70.0	66.2	70.8	64.4	-
Endeavour	-	-	10.0	14.1	-	-	-	71.2	68.0	-
Fusion	16.4	9.7	14.7	22.7	7.5	71.2	69.4	71.2	67.0	69.2
Goanna	11.3	6.9	6.6	22.9	13.5	73.8	75.4	74.6	69.4	70.6
Hawkeye	14.9	3.6	10.2	20.2	8.2	72.0	72.6	72.2	67.6	69.4
Jaywick	11.4	3.1	9.4	21.8	10.9	70.9	71.2	73.8	65.8	64.5
KM10	11.6	12.8	-	-	-	72.7	65.7	-	-	-
Rufus	7.5	5.0	11.3	20.8	10.0	71.6	68.3	70.2	67.6	67.8
Tahara	11.1	5.6	9.7	26.5	8.9	71.6	69.8	70.8	65.6	67.5
Tuckerbox	-	-	10.7	31.4	13.1	-	-	71.4	68.4	67.4
Yowie	12.1	4.8	8.4	32.7	11.8	73.0	72.3	73.2	67.2	69.3
Yukuri	-	-	-	-	18.7	-	-	-	-	69.8

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CANOLA

CANOLA

REVIEW OF 2015

Season

A poor subsoil moisture profile and limited rain over the summer saw many growers move away from canola in 2015. The exception was in the North East where a timely break ensured the area of canola sown was similar to previous years.

Many crops were stunted due to poor growing conditions throughout the season and had low yield potential prior to the October heatwave. As with other crops growers chose to graze or cut substantial areas of canola for hay.

Again early maturing varieties fared better in both yield and quality than later maturing varieties.

Hot conditions at the end of the season reduced canola oil levels in later maturing varieties, below 40% in many cases. Oil percentages were better in the North East and closer to 40% in the South West.

Yields were best in the South West and parts of the North East with crops in the Wimmera, Mallee and North Central yielding well below average. Oil percentage followed this trend.

Windy conditions at harvest caused substantial losses through shattering in both dispersed windrows and crops that were direct harvested.

Disease and pest issues

Blackleg

There were two important blackleg issues for canola growers in 2015 – upper canopy blackleg cankers and fungicide tolerance.

A study of upper canopy blackleg cankers/lesions has indicated that this is not a new form of blackleg. It is probably caused by canola crops being sown earlier in the growing season or even sown dry, which allows crops to elongate and flower substantially earlier in the late winter. This means that infection occurring in late winter infects branches directly rather than the leaves as occurs in later developing crops.

In 2015 the first large-scale Australian fungicide tolerance survey found that 14% of Victorian paddocks had a high tolerance to triazole fungicides. Growers are reliant on one type of fungicide, the triazoles. At this point in time it is recommended that growers continue to use these fungicides but to review the integrated pest management options in the Blackleg Management Guide.

White leaf spot

White leaf spot was again present in 2015 but dry conditions prevented the spread of the initial infection. The Hamilton NVT site had severe infection with potential to cause yield loss if wet cool conditions had prevailed. Yield loss is caused by loss of leaf area.

Sclerotinia infection was limited due to the dry spring. The North East was the only area affected.

Alternaria was not observed in Victoria in 2015. *Alternaria* is only prevalent when rainfall occurs post podding. Yield

loss results from infected pods shattering prematurely and retained seed from infected pods causing seedling death.

Aphid numbers were low in 2015 and Beet western yellows virus (BWYV) did not cause damage in 2015.

LOOKING FORWARD TO 2016

New varieties

The new listings for 2016 are:

- Clearfield - Banker CL, Rimfire CL
- Triazine tolerant - ATR Mako, DG 560TT, Pioneer 45T01 (TT), SF Turbine TT
- Triazine tolerant high stability - Monola 416TT
- Roundup Ready - Nuseed GT-42, Hyola 504RR, DG 460RR
- Roundup Ready high stability - Monola G11, Victory® V5003RR
- Roundup Ready & Triazine tolerant – 3000 TR

Varieties removed this year are:

- Conventional - Hyola 50
- Clearfield - Pioneer 44C79, Pioneer 44Y84
- Triazine tolerant high stability - Monola 605TT
- Roundup Ready - Hyola 400RR, Hyola 500RR, Hyola 505RR, IH50RR

Disease and pest management

Beet western yellows virus and Green peach aphid

Due to the dry finish of 2014 and continued dry conditions of 2015 there was a very limited green bridge in most areas. This helped to reduce inoculum and aphid numbers through the year. While BWYV was not an important disease in 2015, it is always important to prevent aphid build up. Growers should manage weeds over summer and sow into standing stubble. Use seed dressings that are suitable for aphid control to provide protection for the first 4-5 weeks and monitor aphid numbers throughout the season.

Slugs

Slugs can be a major problem in the high rainfall zone where stubble is retained. Canola is one of the more susceptible crops to slugs particularly at the seedling stage. Summer rain and weed growth mean it is important to implement an integrated management plan.

Mice

The spring 2015 survey suggests mouse abundance is generally low across Victoria. Monitoring for the presence of mice is key for canola sown into cereal stubble. Relatively low mice populations can have a significant impact on crop establishment and baiting should be considered if mice are present pre-sowing.

Retaining seed

Research in South Australia has shown that newly purchased commercial hybrid seed yields 7-17% better than sowing retained hybrid seed. Oil content is also significantly better for newly purchased seed.

Sowing retained seed of open pollinated varieties is not recommended following a poor season. Poor spring weather may produce poor quality seed. If considering retaining seed from open-pollinated varieties, growers should be aware of the costs associated with germination

testing, grading, storage and potential weed and disease problems.

Dual purpose canola

Southern Farming Systems trials have shown that long season 'dual purpose' winter canola for grazing and grain production have performed well in the high rainfall zone. In autumn, established plants were more able to weather attacks from slugs and waterlogging. While in the dry spring the more robust root system was better able to access subsoil moisture. These dual purpose varieties are sown in late spring or early summer and grazed until autumn. Consult the GRDC factsheet: Spring sown winter canola.

Specialty canola (HOLL)

Specialty canola hybrids have a particular trait that produces an oil profile (High Oleic, Low Linoleic or 'HOLL') which offers customers extended frying life and improved shelf stability. Specialty canola may be grown under contract with a premium paid to growers. Specialty canola typically requires additional attention to quality but is grown similarly to commodity canola.

MORE INFORMATION

www.nvtonline.com.au

Detailed NVT trial results and links to variety information.

www.nvtonline.com.au/apps

- Australian Field Crop Disease Guide app
- NVT Long Term Yield Reports app

agriculture.vic.gov.au/agriculture/grains-and-other-crops

- [AG0750 Growing canola](#)
- [AG1352 Blackleg of canola](#)
- [AG1354 Canola diseases](#)

www.grdc.com.au

- BOOK: Canola best practice guide for south-eastern Australia
- FACTSHEET: Blackleg Management Guide updated in March and September.
- FACTSHEET: Resistance management strategy for the green peach aphid in Australian grains
- Tips & Tactics: Reducing aphid and virus risk in 2015

www.eXtensionAUS.com.au

- Blackleg monitoring summaries

www.cesaraustralia.com

- Insecticide resistance in GPA across southern Australia

VARIETY DESCRIPTIONS

 denotes Plant Breeders Rights apply

End Point Royalty (EPR) 2016-17 quoted \$/tonne ex-GST.

Blackleg ratings: R = resistant, M = moderately, S = susceptible, p = provisional ratings - treat with caution. est = estimate by marketing company (yet to be rated) Resistance order from best to worst: R > RMR > MR > MRMS > MS > MSS > S

CONVENTIONAL VARIETIES

Conventional – AV-ZIRCON

Mid maturity variety of medium height. Good early vigour. Blackleg rating MR. NVT tested 2011-15. Nuseed.

Hybrid Conventional – NUSEED DIAMOND

Early to mid maturing hybrid of medium height suited to medium rainfall zones. Blackleg rating R-MR. NVT tested 2012-15. Released 2013. Nuseed.

Conventional – SF Brazzil

Late maturing winter dual purpose open-pollinated variety suited to early sowing and winter grazing in very high rainfall zones. Blackleg rating R-MR. NVT tested 2014. Seed Force. EPR \$7.

Hybrid Conventional – SF Sensation

Very late maturing winter dual purpose hybrid suited to early sowing and winter grazing in very high rainfall areas. Blackleg rating R-MR. NVT tested 2014. Seed Force.

CONVENTIONAL HIGH STABILITY VARIETIES

Hybrid High Stability Oil – VICTORY® V3002

Early to mid maturing conventional specialty hybrid. Cargill indicate high yield potential and oil content. Blackleg rating R-MR. NVT tested 2011-15. Bred by Cargill. Marketed by AWB under contract with premium.

CLEARFIELD VARIETIES

Hybrid Clearfield – ARCHER

Mid to late maturing hybrid, slightly longer than 46Y83, suited to mid to longer growing seasons. Heritage Seeds indicate Archer will have very high yield potential with high to very high oil content. Blackleg rating MR-MS. NVT tested 2011-14 as SMHC105. Released 2012 and marketed by Heritage Seeds.

NEW Hybrid Clearfield – BANKER CL

Mid maturing hybrid, later than Rimfire/Carbine and earlier than Archer, suited to medium rainfall areas or later sowing in the HRZ. Blackleg rating MR. NVT tested 2014-15 as HC-134. Released 2015 and marketed by Heritage Seeds.

Hybrid Clearfield - CARBINE

Early to mid maturing hybrid. High oil content. Medium plant height. Blackleg rating MR-MS. NVT tested 2011-13. Marketed by Heritage Seeds.

Hybrid Clearfield – HYOLA® 474CL

A mid to early hybrid with wide adaptation across medium-low to high rainfall zones, including irrigation. Pacific Seeds indicate medium height and excellent standability, very good vigour and excellent flowering uniformity. Blackleg rating R. NVT tested 2011-15. Pacific Seeds.

Hybrid Clearfield – HYOLA® 575CL

Mid to mid-early hybrid. Adapted for medium to very high rainfall zones. Medium to tall with good vigour and excellent flowering uniformity. Blackleg rating R. NVT tested 2010-15. Pacific Seeds.

Hybrid Clearfield – HYOLA® 577CL

Mid maturing hybrid. Adapted for high rainfall zones. Medium-tall height. Blackleg rating R. NVT tested 2013-15. Released 2014. Pacific Seeds.

Hybrid Clearfield - HYOLA® 970CL

Long season winter dual purpose hybrid. Adapted to high to very high rainfall zones (>550 mm). Pacific Seeds indicate tall with excellent early biomass and excellent flowering uniformity. High yield and oil content. Blackleg rating R-MR. Released 2014. Pacific Seeds.

Hybrid Clearfield – PIONEER® 44Y87(CL)

Early to mid maturing hybrid for medium rainfall zones and irrigation. Excellent early vigour. Short to medium height. Blackleg rating MR. NVT tested 2014. Released 2013. Pioneer Hi-Bred.

Hybrid Clearfield - PIONEER® 44Y89(CL)

Early to mid maturing variety. Suited to low to medium rainfall zones. Short in height with excellent standability and harvest ease. Blackleg rating R-MR. NVT tested 2013-15. Released 2014. Pioneer Hi-Bred.

Hybrid Clearfield – PIONEER® 45Y86(CL)

Early-mid to mid maturing hybrid. Excellent early vigour, high yield and very high oil content. Adapted to medium to high rainfall zones. Blackleg rating MR-MS. NVT tested 2010-15. Released 2012. Pioneer Hi-Bred.

Hybrid Clearfield – PIONEER® 45Y88(CL)

A mid maturing hybrid for high rainfall zones and irrigation. Medium height and excellent harvestability. Blackleg rating MR. NVT tested 2012-15. Released 2013. Pioneer Hi-Bred.

NEW Hybrid Clearfield – RIMFIRE CL

Early to mid maturing hybrid of medium height suited to low to medium rainfall areas. A direct replacement for Carbine. Blackleg rating R-MR. NVT tested 2013-15 as HSHC133 (CL). Released 2015 and marketed by Heritage Seeds.

Hybrid Clearfield – SF EDIMAX CL*

*Currently undergoing Clearfield accreditation
Late maturing winter dual purpose hybrid. Suited to early sowing and spring sowing in high rainfall areas. Seed Force indicate very high biomass with excellent yield and oil content. Blackleg rating R-MR. NVT tested 2014. Released 2014. Seed Force.

TRIAZINE TOLERANT VARIETIES**Triazine Tolerant – ATR-BONITO**

Early to early-mid maturing variety for low to medium rainfall zones. Short to medium height. Alternative to Crusher or Hyola 559TT. Blackleg rating MR. NVT tested 2012-15. Released 2013. Nuseed. EPR \$5.

Triazine Tolerant – ATR-GEM

Early to mid maturity. Good vigour and short to medium height. Blackleg rating MR. NVT tested 2011-15. Nuseed.

Triazine Tolerant – ATR-MAKO

Early to mid maturing variety for low to medium rainfall zones. Alternative to ATR-Gem or Crusher. Blackleg rating MR. NVT tested 2014-15 as NT0252. Released 2015. Bred and marketed by Nuseed. EPR \$5.

Triazine Tolerant – ATR-STINGRAY

An early maturing variety. Nuseed indicate good vigour with uniform short to medium height and a compact pod set. Blackleg rating MR. NVT tested 2010-15. Bred by AgSeed Research and the forerunner of DEDJTR. Nuseed.

Triazine Tolerant – ATR-WAHOO

Mid maturing variety for medium to high rainfall zones and irrigation. Medium height. Alternative to Crusher or Thumper. Blackleg rating MR. NVT tested 2012-15. Released 2013. Nuseed. EPR \$5

NEW Hybrid Triazine Tolerant – DG 560TT

Early to mid maturing hybrid. Suited to medium rainfall zones. Medium height and moderate oil content. No blackleg rating published. NVT tested 2015 as SFR65-008TT. Released 2015. Landmark.

Hybrid Triazine Tolerant – HYOLA® 450TT

Early to mid maturing hybrid. Suited to low to medium-high rainfall zones. Excellent flowering and uniform medium height. Blackleg rating R. NVT tested 2012-15. Released 2013. Pacific Seeds.

Hybrid Triazine Tolerant – HYOLA® 559TT

Mid maturing hybrid. Suited to low to high rainfall zones including irrigation. Good seedling vigour, medium height and excellent flowering uniformity. High oil content. Blackleg rating MR. NVT tested 2011-15. Released 2012. Pacific Seeds.

Hybrid Triazine Tolerant – HYOLA® 650TT

Mid to late hybrid. Suited to high to very high rainfall zones including irrigation. Good seedling vigour, medium to tall height and excellent flowering uniformity. High oil content. Blackleg rating R. NVT tested 2013-15. Released 2013. Pacific Seeds.

NEW Hybrid Triazine Tolerant - PIONEER® 45T01 TT

The first of Pioneer's T-series hybrids. Mid maturing and suited to medium to high rainfall zones. Pioneer indicate excellent early vigour, medium to tall height and very high oil content. Blackleg rating MR-MS. NVT tested 2013-15 as CB1302TT. Released 2015. Bred by NPZA, marketed by Pioneer Hi-Bred.

Triazine Tolerant – PIONEER® STURT TT

Early maturing variety. Suited to low to medium rainfall areas. Good early vigour with short to medium plant height. Suited to direct heading. Moderate oil content. Blackleg resistance rating MS (company rating). NVT tested 2011-14. Released 2012. Pioneer Hi-Bred. EPR \$5.

NEW Hybrid Triazine Tolerant - SF TURBINE TT

Early-mid maturing hybrid. Suited to medium rainfall zones. Medium height and moderate oil content. No blackleg rating published. NVT tested 2015 as SFR65-009TT. Bred by NPZ Australia. Marketed by Seed Force.

TRIAZINE TOLERANT HIGH STABILITY VARIETIES**High Stability Oil - MONOLA® 314TT**

Early to mid maturity for low to medium rainfall zones. Medium height. Blackleg rating R-MR. NVT tested 2013-15. Released 2014. Nuseed.

NEW High Stability oil – MONOLA® 416TT

Early-mid maturity for low to medium rainfall zones. Blackleg rating R-MR (company rating). NVT tested 2014-15 as NL0852. Released 2015. Nuseed.

High Stability oil – MONOLA® 515TT

Mid maturity for medium to high rainfall zones. Medium height. Blackleg rating R-MR. NVT tested 2014-15 as Monola 415TT. Released 2014. Nuseed.

ROUNDUP READY® VARIETIES

NEW Hybrid Roundup Ready – DG 460RR

Mid to mid maturing hybrid. Blackleg rating of R-MR. Short plant height. High oil content. NVT tested 2014-15 as SN-ACL 12-1586. Released 2016. Landmark.

Hybrid Roundup Ready - DG 550RR

Mid maturing hybrid. Suited to medium to high rainfall zones. High oil content and medium plant height. Blackleg rating MR. NVT tested 2013-15 as VT-WZ 11-2685. Released 2015. Landmark.

Hybrid Roundup Ready - NUSEED GT-41

Early maturing variety. Nuseed indicate high yielding with good early vigour and high oil content. Blackleg rating R-MR. NVT tested 2012-15. Released 2012. Nuseed.

NEW Hybrid Roundup Ready - NUSEED GT-42

Early to mid maturing variety. Medium height. Blackleg rating R. NVT tested 2014-15 as NCH13G055. Released 2015. Bred and marketed by Nuseed.

Hybrid Roundup Ready - NUSEED GT-50

Early-mid maturing variety. Nuseed indicate high yielding with good early vigour and high oil content. Blackleg rating R-MR. NVT tested 2011-15. Released 2012. Nuseed.

Hybrid Roundup Ready - HYOLA® 404RR

Early to early-mid season hybrid. Widely adapted to medium low to high rainfall zones including irrigation. Medium height, excellent early vigour, flowering uniformity and oil content. Blackleg rating R-MR. NVT tested 2010-15. Pacific Seeds.

NEW Hybrid Roundup Ready - HYOLA® 504RR

Mid maturing hybrid. Medium height. Anticipated blackleg rating R (company rating). NVT tested 2014-15 as M26120. Released 2015. Pacific Seeds.

Hybrid Roundup Ready - HYOLA® 600RR

Mid to late hybrid. Suited to high to very high rainfall zones including irrigation. Medium-tall height with excellent seedling vigour and flowering uniformity. High oil. Excellent shatter tolerance and standability. Blackleg rating R. NVT tested 2014-15. Released 2014. Pacific Seeds.

Hybrid Roundup Ready – IH30 RR

Early flowering and maturity. Suited to low to medium rainfall zones. Blackleg resistance rating MR. NVT tested 2012-15. Released 2013. Bayer.

Hybrid Roundup Ready – IH51 RR

Mid maturing variety. Suited to medium to high rainfall zones. PodGuard™ technology makes it suitable for direct heading and reduced harvest losses when shattering occurs. Blackleg rating R-MR. NVT tested 2014-15. Released 2014. Bayer.

Hybrid Roundup Ready – IH52 RR

Mid maturing variety. Suited to medium to high rainfall zones. Medium height and consistent maturity. Blackleg rating R-MR. NVT tested 2013-15. Released 2014. Bayer.

Hybrid Roundup Ready - Pioneer® 43Y23(RR)

Early maturing hybrid. Wide adaptation, but best suited to Mallee and Wimmera districts. Excellent vigour, high yield potential and excellent shatter tolerance. Blackleg rating R-MR. NVT tested 2011-15. Released 2012. Pioneer Hi-Bred.

Hybrid Roundup Ready - PIONEER® 44Y24(RR)

Early to mid maturing variety for medium to high rainfall zones. Medium height and high yield. Consistent over a wide range of environments and seasons. Blackleg rating R-MR. NVT tested 2011-15. Released 2013. Pioneer Hi-Bred.

Hybrid Roundup Ready - PIONEER® 44Y26(RR)

Early to mid maturing variety. Suited to medium to high rainfall zones. Blackleg rating R-MR. NVT tested 2013-15. Released 2014. Pioneer Hi-Bred.

Hybrid Roundup Ready - PIONEER® 45Y25(RR)

Mid maturing variety. Suited to medium to high rainfall zones and irrigation. Short plant height with high oil content. Blackleg rating R-MR. NVT tested 2012-15. Released 2014. Pioneer Hi-Bred.

ROUNDUP READY® HIGH STABILITY VARIETIES

NEW Hybrid Roundup Ready High Stability Oil - MONOLA® G11

Early to early-mid maturing hybrid monola. Medium height. Blackleg rating MR. NVT tested 2013-15 as Monola 515HGT. Released 2015. Nuseed.

Roundup Ready High Stability Oil - MONOLA® 513GT

Mid maturing open pollinated monola. Medium height. Blackleg rating MR. NVT tested 2012-15. Released 2012. Nuseed.

Hybrid Roundup Ready High Stability Oil – VICTORY® V5002RR

Mid maturing RR specialty (high oleic, low linoleic oil) hybrid canola. High yield potential and oil content. Blackleg rating MR. NVT tested 2011-15. Bred by Cargill and the forerunner to DEDJTR. Marketed by AWB under contract with premium.

NEW Hybrid Roundup Ready High Stability Oil - VICTORY® V5003RR

Mid maturing RR specialty (high oleic, low linoleic oil) hybrid) variety. High yield potential and oil content. No published blackleg rating. Due for release 2016. NVT tested 2013-2015 as 10H4061. Bred by Cargill and the forerunner to DEDJTR. Marketed by AWB under contract with premium.

DUAL-HERBICIDE TOLERANT VARIETIES

NEW Hybrid Roundup Triazine tolerant - 3000 TR

Early maturing hybrid suited to low-medium rainfall zones. Anticipated blackleg rating of MS (company rating). NVT tested 2015 as PJTT1. Released 2015. Bayer.

Hybrid Roundup Triazine tolerant - HYOLA® 525RT®

A mid maturing hybrid. Medium height. High oil content, excellent shatter tolerance and standability. Blackleg rating R-MR. NVT tested 2013-15. Released 2013. Pacific Seeds.

Hybrid Roundup Triazine tolerant - HYOLA® 725RT®

Mid to late maturing hybrid. Suited to high to very high rainfall zones including irrigation. High biomass variety with medium tall height, excellent seedling vigour and flowering uniformity. Extremely high oil. Excellent shatter tolerance and standability. Blackleg rating R-MR. NVT tested 2014-15. Released 2014. Pacific Seeds.

Table 1: Canola disease guide summary.

Disease	Organism	Symptoms	Occurrence	Inoculum source	Control
Blackleg	<i>Leptosphaeria maculans</i>	Leaf lesions, which may develop into canker on stem at or near ground level, plant death.	Spores from canola stubble are released in autumn to infect leaves of the new crop.	Canola stubble.	Resistant cultivars. Avoid sowing next to last year's canola stubble. Fungicides can be used.
Sclerotinia stem rot	<i>Sclerotinia</i> spp.	White fluffy growth on the stem, causing plant parts above this point to die. Affected area greyish white, sclerotia form on and inside the stems.	Favoured by damp humid spring weather during flowering.	Survives as sclerotia in the soil.	Fungicides
Damping off	<i>Rhizoctonia</i> spp., <i>Pythium</i> spp. and <i>Fusarium</i> spp.	Pre-emergence rot and seedlings fail to emerge. Post emergent plants collapse at ground level with leaves turning orange/purple.	In soils that have not been cultivated post opening rains. During cold wet periods.	Hyphal growth in the soil.	Seed dressings. Cultivation after the break of the season.
Alternaria leaf spot and black spot	<i>Alternaria brassicae</i>	Dark target like round spots which initially appear on leaves. Can spread to stems and pods and cause pod shattering.	Infection spreads with wet humid weather during spring.	Canola stubble.	Use clean seed. Use seed dressings if seed is infected.

Table 2: Canola time of sowing guide.

This table is a guide only and has been compiled from observations of the breeder and local departmental agronomists. Note, early season varieties are not recommended to be sown in the Wimmera, North Central and North East but in a late sowing when soils are very wet they may be an option.

MALLEE	April				May				June				July			
Early Season			X	X	X	X	<	<	*							
WIMMERA	April				May				June				July			
Early Season							<	<	<	*	*		*	*	*	
Early-Mid Season			>	>	X	X	X	<	<	<	*	*				
Mid Season			>	X	X	X	<	<	<	<						
NORTH CENTRAL	April				May				June				July			
Early Season							<	<	<	*	*		*	*	*	
Early-Mid Season			>	>	X	X	X	<	<	<	*	*				
Mid Season			>	X	X	X	<	<	<	<						
NORTH EAST	April				May				June				July			
Early Season							<	<	<	*	*		*	*	*	
Early-Mid Season			>	>	X	X	X	<	<	<	*	*				
Mid Season			>	X	X	X	<	<	<	<						
SOUTH WEST	April				May				June				July			
Early Season							>	>	>	X	X		X	X	X	<
Early-Mid Season							>	>	>	X	X		X	<		
Mid Season				>	X	X	X	X	X	X	X		<	<	<	
Mid-Late Season				>	X	X	X	X	X	X	X	<	<	<	<	
NORTHERN IRRIGATION	April				May				June				July			
Early Season				X	X	X	X	<	*	*						
Early-Mid Season				>	X	X	<	<	*							
Mid Season				>	X	X	<	<	*							

>earlier than ideal (or a later maturing variety is preferred), X optimum sowing time, < later than ideal but acceptable, * only an acceptable option if very good subsoil moisture is available at sowing.

Table 3: Canola variety blackleg ratings (GRDC Blackleg Management Guide, Spring 2015). Ratings will be updated in March.

Variety	Maturity	Year of release	Blackleg resistance rating bare seed	Blackleg resistance rating + Jockey®	Blackleg resistance group	Open pollinated or hybrid	Marketer
Conventional varieties							
AV-Zircon	mid-late	2011	MR		A	open	Nuseed
Nuseed Diamond	early-mid	2013	R-MR		A, B, F	hybrid	Nuseed
SF Brazzil	late	2013	R-MR		B, C	open	Seed Force
SF Sensation	very late	2013	R-MR		B	hybrid	Seed Force
Conventional high stability							
Victory V3002	early-mid	2011	R-MR	R	A, B, F	hybrid	AWB
Herbicide tolerant Clearfield varieties							
Archer	mid	2012	MR-MS	R-MR		hybrid	Heritage Seeds
Banker CL	mid	2015	MR	R-MR	A	hybrid	Heritage Seeds
Carbine	early-mid	2012	MR-MS	R-MR	A	hybrid	Heritage Seeds
Hyola 474CL	mid-early	2011	R		B, F	hybrid	Pacific Seeds
Hyola 575CL	mid	2010	R		B, F	hybrid	Pacific Seeds
Hyola 577CL	mid	2013	R		unclear	hybrid	Pacific Seeds
Hyola 970CL	late	2014	R-MR		H	hybrid	Pacific Seeds
Pioneer 44Y87(CL)	early-mid	2013	MR	R-MR	A	hybrid	Pioneer Hi-Bred
Pioneer 44Y89(CL)	early-mid	2014	R-MR	R	B, C	hybrid	Pioneer Hi-Bred
Pioneer 45Y86(CL)	mid- mid early	2012	MR-MS	MR	A, B	hybrid	Pioneer Hi-Bred
Pioneer 45Y88(CL)	mid	2013	MR	R-MR	A	hybrid	Pioneer Hi-Bred
Rimfire CL	early-mid	2015	R-MR	R	A, B	hybrid	Heritage Seeds
SF Edimax CL*	late	2014	R-MR		C	hybrid	Seed Force
Triazine tolerant varieties							
ATR-Bonito	early- early mid	2013	MR		A	open	Nuseed
ATR-Gem	early-mid	2011	MR		A	open	Nuseed
ATR-Mako	early-mid	2015	MR	R	A	open	Nuseed
ATR-Stingray	early	2011	MR		C	open	Nuseed
ATR-Wahoo	mid	2013	MR		A	open	Nuseed
DG 560TT	early-mid	2015				hybrid	Landmark
Hyola 450TT	early-mid	2013	R		A, B, D	hybrid	Pacific Seeds
Hyola 559TT	mid	2012	R		A, B, D	hybrid	Pacific Seeds
Hyola 650TT	mid-late	2013	R		A, B, E	hybrid	Pacific Seeds
Pioneer 45T01 TT	mid	2015	MR-MS (est)			hybrid	Pioneer Hi-Bred
Pioneer Sturt TT	early	2012	MS			open	Pioneer Hi-Bred
SF Turbine TT	early	2015				hybrid	Seed Force
Triazine tolerant high stability varieties							
Monola 314TT	early-mid	2013	R-MR		unclear	open	Nuseed
Monola 416TT	early-mid	2015	R-MR	R	unclear	open	Nuseed
Monola 515TT	mid	2015	R-MR	R	unclear	open	Nuseed
Roundup Ready varieties							
DG 460RR	early-mid	2016	R-MR	R	A	Hybrid	Landmark
DG 550RR	mid	2014	MR	R	A, B	hybrid	Landmark
GT-41	early	2012	R-MR		A, B, F	hybrid	Nuseed
GT-42	early-mid	2015	R	R	unclear	hybrid	Nuseed
GT-50	early-mid	2012	R-MR		A, B, F	hybrid	Nuseed
Hyola 404RR	early-mid	2010	R-MR		A, B, D	hybrid	Pacific Seeds
Hyola 504RR	Mid	2015	R (est)			hybrid	Pacific Seeds
Hyola 600RR	mid-late	2014	R		A, B, D	hybrid	Pacific Seeds
IH30 RR	early	2013	MR	R	A, B	hybrid	Bayer
IH51 RR	mid	2014	R-MR	R-MR	A	hybrid	Bayer
IH52 RR	mid	2014	R-MR	R	A, B	hybrid	Bayer
Pioneer 43Y23 (RR)	early	2012	R-MR	R	B	hybrid	Pioneer Hi-Bred
Pioneer 44Y24 (RR)	mid-early	2013	R-MR	R	C	hybrid	Pioneer Hi-Bred
Pioneer 44Y26 (RR)	early-mid	2014	R-MR	R	A, B, S	hybrid	Pioneer Hi-Bred
Pioneer 45Y25 (RR)	mid	2014	R-MR	R	B, C	hybrid	Pioneer Hi-Bred
Roundup Ready high stability varieties							
Monola G11	early- early mid	2015	MR	R-MR	A, B, S	hybrid	Nuseed
Monola 513GT	mid	2012	MR		A	open	Nuseed
VICTORY V5002RR	mid	2011	MR	R	A, B	hybrid	AWB
VICTORY V5003RR	mid	2016	MR (est)	R (est)	B	hybrid	AWB

Table 3 continued: Canola blackleg ratings.

Variety	Maturity	Year of release	Blackleg resistance rating bare seed	Blackleg resistance rating + Jockey®	Blackleg resistance group	Open pollinated or hybrid	Marketer
Roundup Ready and Triazine Tolerant							
3000 TR	early	2015	MS (est)			hybrid	Bayer
Hyola 525RT	mid	2013	R-MR		A, B, D	hybrid	Pacific Seeds
Hyola 725RT	mid-late	2014	R-MR		A, B, D	hybrid	Pacific Seeds

Resistance order from best to worst: R > RMR > MR > MRMS > MS > MSS > S

R = resistant, M = moderately, S = susceptible, p = provisional ratings - treat with caution.

est = estimate by marketing company (yet to be rated)

Table 4: Mallee canola (early season). Long term predicted yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

N.B. These trials were not structured to allow comparisons between different chemistry types.

IMI tolerant		Triazine tolerant		Roundup Ready	
Mean yield (t/ha)	0.92	Mean yield (t/ha)	0.92	Mean yield (t/ha)	0.92
Archer	97 (5)	ATR Bonito	98 (9)	CB Eclipse RR	100 (6)
Carbine	107 (8)	ATR Cobbler	86 (6)	CB Status RR	103 (5)
Hyola 474CL	102 (12)	ATR Gem	94 (5)	GT Cobra	103 (8)
Hyola 575CL	102 (10)	ATR Snapper	95 (6)	GT Scorpion	80 (3)
Pioneer 43C80 (CL)	90 (6)	ATR Stingray	98 (12)	GT Taipan	91 (3)
Pioneer 43Y85 (CL)	99 (11)	Bonanza TT	72 (7)	GT Viper	91 (8)
Pioneer 44C79 (CL)	86 (3)	CB Junee HT	100 (6)	Hyola 400RR	114 (6)
Pioneer 44Y84 (CL)	106 (8)	CB Mallee HT	86 (3)	Hyola 404RR	123 (12)
Pioneer 44Y87 (CL)	103 (9)	CB Nitro HT	107 (2)	Hyola 505RR	105 (3)
Pioneer 44Y89 (CL)	113 (5)	Crusher TT	97 (2)	IH30 RR	120 (9)
Pioneer 45Y82 (CL)	103 (3)	Hyola 444TT	92 (3)	IH50 RR	105 (3)
Pioneer 45Y88 (CL)	91 (3)	Hyola 450TT	106 (6)	Monola 513GT	100 (5)
Rimfire CL	94 (4)	Hyola 525RT	101 (4)	Nuseed GT-41	122 (8)
Xceed Oasis CL	81 (8)	Hyola 555TT	112 (6)	Pioneer 43Y23 (RR)	122 (12)
		Hyola 559TT	109 (9)	Pioneer 44Y24 (RR)	119 (9)
		Jackpot TT	88 (3)	Pioneer 44Y26 (RR)	96 (4)
		Monola 314TT	98 (2)	Pioneer 45Y21 (RR)	105 (3)
		Monola 413TT	91 (5)	Victory V5001RR	106 (3)
		Pioneer 45T01TT	97 (3)	Victory V5002RR	103 (6)
		Pioneer Atomic TT	103 (4)	VT 525 G	78 (5)
		Pioneer Sturt TT	100 (8)		
		Tawriffic TT	73 (3)		
		Telfer	94 (8)		

Long term yield predictions provided in this report have been produced using the NVT Long Term MET (Multi Environment Trial) analysis. The analysis produces predictions or "Production Values" for every variety in every NVT trial across all years identified within the dataset. This report presents regional means for each variety which reduces the accuracy and reliability of the results. Varieties present in less than three trials per region have been omitted from this report and some rounding variation may be present when compared to other reporting methods. More detailed yield information can be found using the NVT Long Term Yield App or the Excel Reporting tools available on the NVT website (www.nvtonline.com.au).

NVT trials are managed to minimise disease impact and this may include the use of seed dressings and post emergent fungicides.

Table 5: Conventional canola (mid season). Long term predicted yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

N.B. These trials were not structured to allow comparisons between different chemistry types.

Mean yield (t/ha)	North Central 2.35	North East 1.97	South West 2.67	Wimmera 1.30
AV Garnet	102 (5)	101 (5)	105 (3)	103 (4)
AV Zircon	100 (5)	100 (5)	99 (3)	100 (4)
CB Agamax	103 (3)	102 (3)	-	105 (2)
CB Tango C	98 (3)	99 (3)	-	99 (2)
Hyola 50	107 (4)	109 (4)	106 (3)	111 (3)
Hyola 635CC	104 (2)	-	-	-
Nuseed Diamond	113 (4)	114 (4)	-	119 (3)
Victory V3001	100 (2)	-	-	101 (2)
Victory V3002	105 (5)	106 (3)	-	107 (4)
Victory V3003	96 (2)	98 (2)	99 (2)	92 (2)

Table 6: IMI Tolerant canola (mid season). Long term predicted yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

N.B. These trials were not structured to allow comparisons between different chemistry types.

Mean yield (t/ha)	North Central 1.83	North East 2.21	South West 2.18	Wimmera 1.68
Archer	103 (7)	104 (8)	105 (10)	104 (5)
Banker CL	110 (2)	110 (3)	119 (2)	113 (2)
Carbine	100 (6)	100 (6)	97 (7)	101 (4)
Hyola 474CL	97 (9)	100 (10)	99 (9)	97 (8)
Hyola 575CL	97 (9)	100 (10)	100 (10)	97 (8)
Hyola 577CL	98 (5)	101 (6)	103 (6)	98 (4)
Pioneer 44Y84 (CL)	101 (6)	100 (6)	97 (7)	101 (5)
Pioneer 44Y87 (CL)	102 (5)	102 (6)	102 (3)	103 (5)
Pioneer 44Y89 (CL)	104 (4)	105 (4)	-	106 (3)
Pioneer 45Y82 (CL)	100 (4)	101 (4)	99 (4)	101 (4)
Pioneer 45Y86 (CL)	104 (9)	104 (10)	104 (8)	105 (8)
Pioneer 45Y88 (CL)	104 (7)	105 (8)	110 (8)	105 (6)
Pioneer 46Y83 (CL)	100 (2)	99 (2)	92 (2)	99 (2)
Rimfire CL	101 (4)	103 (5)	101 (4)	102 (3)

Table 7: Triazine Tolerant canola (mid season). Long term predicted yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

N.B. These trials were not structured to allow comparisons between different chemistry types.

Mean yield (t/ha)	North Central 1.83	North East 2.21	South West 2.18	Wimmera 1.68
ATR Bonito	103 (7)	100 (8)	105 (8)	103 (6)
ATR Cobbler	87 (4)	82 (4)	73 (4)	82 (4)
ATR Gem	100 (9)	98 (9)	101 (10)	99 (8)
ATR Mako	102 (3)	101 (4)	104 (3)	102 (3)
ATR Snapper	95 (4)	90 (4)	84 (4)	92 (4)
ATR Stingray	96 (9)	95 (6)	96 (7)	94 (8)
ATR Wahoo	101 (6)	99 (8)	104 (8)	100 (3)
Bonanza TT	84 (4)	82 (4)	-	78 (4)
CB Henty HT	-	100 (6)	100 (5)	-
CB Jardee HT	97 (6)	95 (6)	89 (7)	95 (5)
CB Junee HT	94 (4)	90 (4)	82 (4)	91 (4)
CB Mallee HT	88 (2)	86 (2)	-	84 (2)
CB Nitro HT	99 (3)	98 (4)	-	-
CB Scaddan	84 (2)	80 (2)	68 (2)	78 (2)
Crusher TT	104 (6)	101 (6)	107 (7)	104 (5)
DG 560TT	-	104 (2)	-	-
Hyola 444TT	92 (2)	92 (2)	88 (2)	89 (2)
Hyola 450TT	97 (5)	99 (4)	96 (3)	97 (5)
Hyola 525RT	99 (5)	98 (6)	97 (6)	98 (4)
Hyola 555TT	102 (6)	103 (6)	106 (7)	103 (5)
Hyola 559TT	104 (8)	105 (8)	106 (9)	106 (6)
Hyola 650TT	101 (4)	103 (5)	107 (5)	101 (3)
Hyola 656TT	102 (4)	102 (4)	105 (5)	102 (3)
Hyola 725RT	-	100 (3)	99 (3)	-
Hyola 751TT	101 (2)	103 (2)	107 (2)	102 (2)
Jackpot TT	99 (2)	97 (2)	101 (2)	97 (2)
Monola 314TT	93 (5)	90 (6)	85 (2)	90 (3)
Monola 413TT	93 (4)	88 (4)	84 (5)	89 (3)
Monola 416TT	95 (3)	94 (4)	94 (2)	94 (2)
Monola 506TT	86 (4)	85 (4)	77 (4)	81 (4)
Monola 515TT	89 (3)	89 (4)	85 (2)	85 (3)
Monola 605TT	87 (5)	85 (5)	80 (6)	82 (5)
Monola 707TT	81 (2)	80 (2)	71 (2)	-
Monola 76TT	86 (2)	83 (2)	75 (2)	81 (2)
Monola 77TT	88 (2)	87 (2)	82 (2)	84 (2)
Pioneer 45T01TT	103 (4)	101 (5)	101 (3)	103 (3)
Pioneer Atomic TT	104 (6)	101 (6)	102 (3)	104 (6)
Pioneer Sturt TT	95 (6)	93 (4)	-	93 (5)
SF Turbine TT	-	105 (2)	-	-
Tawriffic TT	90 (2)	90 (2)	83 (2)	87 (2)
Telfer	89 (6)	-	-	84 (5)
Thumper TT	92 (5)	92 (6)	96 (7)	89 (4)

Table 8: Roundup Ready canola (mid season). Long term predicted yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

N.B. These trials were not structured to allow comparisons between different chemistry types.

Mean yield (t/ha)	North Central 1.83	North East 2.21	South West 2.18	Wimmera 1.67
CB Eclipse RR	96 (4)	97 (4)	-	98 (4)
CB Frontier RR	99 (6)	102 (6)	102 (7)	100 (5)
CB Status RR	90 (4)	88 (2)	-	90 (3)
DG 460RR	-	106 (2)	111 (2)	-
DG 550RR	99 (4)	102 (5)	103 (5)	100 (3)
GT Cobra	101 (6)	99 (6)	100 (7)	100 (5)
GT Cougar	94 (2)	93 (2)	94 (2)	92 (2)
GT Mustang	93 (2)	93 (2)	93 (2)	92 (2)
GT Scorpion	88 (2)	85 (2)	80 (2)	85 (2)
GT Taipan	89 (2)	82 (2)	77 (2)	83 (2)
GT Viper	94 (6)	90 (6)	85 (7)	92 (5)
Hyola 400RR	102 (4)	104 (4)	105 (2)	104 (4)
Hyola 404RR	106 (9)	107 (10)	108 (9)	109 (9)
Hyola 500RR	101 (4)	105 (4)	105 (5)	104 (4)
Hyola 504RR	-	106 (4)	108 (3)	-
Hyola 505RR	101 (5)	104 (5)	104 (7)	103 (5)
Hyola 525RT	-	-	97 (2)	-
Hyola 600RR	106 (2)	108 (4)	110 (3)	107 (4)
IH30 RR	104 (7)	104 (2)	-	106 (7)
IH50 RR	101 (8)	102 (8)	102 (6)	102 (8)
IH51 RR	103 (3)	103 (4)	102 (3)	104 (4)
IH52 RR	103 (4)	105 (5)	107 (5)	104 (4)
Monola 513GT	99 (6)	98 (8)	97 (5)	99 (3)
Monola G11	106 (3)	106 (5)	103 (2)	-
Nuseed GT-41	103 (7)	102 (4)	-	105 (7)
Nuseed GT-42	104 (2)	-	-	-
Nuseed GT-50	111 (8)	110 (10)	118 (9)	113 (8)
Pioneer 43Y23 (RR)	109 (6)	111 (4)	114 (5)	113 (7)
Pioneer 44Y24 (RR)	109 (9)	110 (10)	116 (10)	111 (9)
Pioneer 44Y26 (RR)	108 (3)	107 (4)	110 (3)	108 (3)
Pioneer 45Y22 (RR)	104 (6)	106 (6)	112 (7)	104 (5)
Pioneer 45Y25 (RR)	111 (7)	113 (7)	122 (7)	112 (6)
Pioneer 46Y20 (RR)	97 (2)	98 (2)	93 (2)	95 (2)
Victory V5001RR	97 (2)	97 (2)	-	94 (2)
Victory V5002RR	104 (9)	105 (9)	108 (6)	103 (9)
VT 525 G	90 (2)	-	-	86 (2)

The **2015 Mallee Early season canola** trial data was not provided. NVT do not publish data when sites are not harvested, yields are below the 0.3 t/ha limit or the CV is greater than 15%.

Table 9: 2015 Conventional canola (mid season) yield (as a percentage of the site mean yield) and oil content (%). All trials experienced multiple stress events from frost and heat. Interpret data with caution.

Sowing Date*	Yield (%)			Oil Content (%)		
	North Central Diggora 16/6/15	North East Wunghnu 30/4/15	Wimmera Minyip 29/4/15	North Central Diggora	North East Wunghnu	Wimmera Minyip
AV Garnet	80	83	83	39.0	39.2	34.5
AV Zircon	78	83	78	39.7	39.2	35.0
Nuseed Diamond	120	121	130	38.4	37.8	34.4
Victory V3002	93	91	85	37.8	40.5	35.0
Site Mean (t/ha)	0.77	1.47	0.79			
CV (%)	7	6	9			
LSD (%)	11	10	14			

* Germination Rain Date

Table 10: 2015 IMI tolerant canola (mid season) yield (as a percentage of the site mean yield). All trials experienced multiple stress events from frost and heat. Possible herbicide damage at Yarrawonga. Interpret data with caution.

Sowing Date*	North Central	North East	South West		Wimmera
	Diggora 16/6/15	Wunghnu 30/4/15	Hamilton 1/5/15	Teesdale 7/5/15	Minyip 29/4/15
Archer	87	84	89	66	87
Banker CL	98	105	121	138	107
Hyola 474CL	80	96	88	66	71
Hyola 575CL	77	85	84	52	70
Hyola 577CL	71	74	94	73	74
Pioneer 44Y87 (CL)	106	98	-	-	107
Pioneer 44Y89 (CL)	126	125	-	-	110
Pioneer 45Y86 (CL)	111	100	-	-	96
Pioneer 45Y88 (CL)	87	98	118	95	82
Rimfire CL	109	97	78	100	96
Site Mean (t/ha)	0.66	1.13	1.97	0.91	0.60
CV (%)	8	8	6	12	11
LSD (%)	13	13	10	17	18

* Germination Rain Date

Table 11: 2015 IMI tolerant canola (mid season) oil content (%).

	North Central	North East	South West		Wimmera
	Diggora	Wunghnu	Hamilton	Teesdale	Minyip
Archer	36.5	37.3	44.3	35.2	33.4
Banker CL	36.6	36.6	45.6	34.9	34.1
Hyola 474CL	37.1	35.6	44.3	36.7	35.5
Hyola 575CL	38.2	35.8	44.9	37.2	34.9
Hyola 577CL	37.1	37.0	46.1	39.4	35.7
Pioneer 44Y87 (CL)	35.7	35.4	-	-	32.9
Pioneer 44Y89 (CL)	36.7	36.5	-	-	34.4
Pioneer 45Y86 (CL)	38.1	35.4	-	-	34.5
Pioneer 45Y88 (CL)	35.3	35.3	42.6	32.2	32.5
Rimfire CL	36.3	37.4	43.6	33.8	33.9

Table 12: 2015 Triazine tolerant canola (mid season) yield (as a percentage of the site mean yield) and oil content (%). All trials experienced multiple stress events from frost and heat - interpret data with caution.

Sowing Date*	Yield (%)				Oil Content (%)			
	North Central	North East		Wimmera	North Central	North East		Wimmera
	Diggora	Wunghnu	Yarra-wonga	Minyip	Diggora	Wunghnu	Yarra-wonga	Minyip
	16/6/15	30/4/15	29/4/15	29/4/15	Diggora	Wunghnu	Yarra-wonga	Minyip
ATR Bonito	126	107	97	105	40.1	37.0	39.6	34.8
ATR Gem	110	94	95	94	39.3	37.5	40.5	35.8
ATR Mako	90	101	109	105	37.6	37.0	38.6	34.6
ATR Stingray	99	-	-	99	38.5	-	-	32.8
ATR Wahoo	98	92	104	-	39.5	38.1	41.5	-
Bayer 3000 TR	-	-	-	119	-	-	-	33.7
DG 560TT	114	117	104	135	36.2	35.1	37.7	33.0
Hyola 450TT	96	-	-	79	38.4	-	-	35.6
Hyola 525RT	116	97	96	119	39.5	36.2	41.8	35.2
Hyola 559TT	129	106	108	123	39.3	37.1	41.3	35.6
Hyola 650TT	96	99	102	84	37.6	37.4	40.7	33.2
Hyola 725RT	-	79	97	-	-	36.2	42.8	-
Monola 314TT	89	106	92	87	36.8	35.0	37.5	34.5
Monola 416TT	72	94	98	73	37.5	36.5	41.2	34.7
Monola 515TT	51	76	88	49	37.1	36.2	40.4	32.5
Pioneer 45T01TT	113	103	105	120	38.2	36.5	42.0	34.6
Pioneer Atomic TT	-	-	-	94	-	-	-	32.9
SF Turbine TT	111	124	114	113	36.4	35.7	37.0	32.7
Site Mean (t/ha)	0.71	1.02	2.08	0.72				
CV (%)	8	9	4	9				
LSD (%)	13	15	7	16				

* Germination Rain Date

Table 13: 2015 Roundup Ready canola (mid season) yield (as a percentage of the site mean yield). All trials except *Neuarpurr* experienced multiple stress events from frost and heat. Possible herbicide damage at Yarrawonga. Interpret data with caution.

Sowing Date*	North Central	North East		South West	Wimmera	
	Diggora 16/6/15	Wunghnu 30/4/15	Yarrawonga 29/4/15	Hamilton 1/5/15	Minyip 29/4/15	Neuarpurr 26/5/15
DG 460RR	106	89	99	102	86	105
DG 550RR	77	84	88	93	73	79
Hyola 404RR	123	115	94	101	111	109
Hyola 504RR	95	81	95	99	90	95
Hyola 600RR	-	81	99	100	105	86
IH30 RR	129	114	-	-	132	122
IH51 RR	100	94	102	92	110	117
IH52 RR	94	114	95	100	79	94
Monola 513GT	61	92	90	-	-	-
Monola G11	121	111	94	-	-	-
Nuseed GT-41	121	-	-	-	114	109
Nuseed GT-42	89	-	-	-	89	113
Nuseed GT-50	116	108	111	106	111	106
Pioneer 43Y23 (RR)	-	-	-	-	125	-
Pioneer 44Y24 (RR)	106	103	109	106	124	109
Pioneer 44Y26 (RR)	110	89	94	107	-	106
Pioneer 45Y25 (RR)	86	104	105	104	100	79
Victory V5002RR	83	80	99	97	78	76
Site Mean (t/ha)	0.69	1.28	2.32	2.61	0.61	1.02
CV (%)	8	7	4	5	11	10
LSD (%)	13	12	6	8	18	16

* Germination Rain Date

Table 14: 2015 Roundup Ready canola (mid season) oil content (%).

	North Central	North East		South West	Wimmera
	Diggora	Wunghnu	Yarrawonga	Hamilton	Minyip
DG 460RR	38.7	40.9	43.4	46.9	35.8
DG 550RR	36.6	39.2	41.6	44.6	34.6
Hyola 404RR	40.3	41.5	43.1	45.9	37.4
Hyola 504RR	39.0	37.9	41.6	44.9	35.2
Hyola 600RR	-	39.0	42.9	46.4	36.8
IH30 RR	37.6	39.5	-	-	34.8
IH51 RR	36.6	36.7	38.3	42.5	33.6
IH52 RR	36.0	38.4	40.3	44.2	33.7
Monola 513GT	38.8	40.6	44.6	-	-
Monola G11	40.2	40.4	43.8	-	-
Nuseed GT-41	38.2	-	-	-	34.2
Nuseed GT-42	36.4	-	-	-	33.7
Nuseed GT-50	37.6	39.4	39.4	44.3	35.0
Pioneer 43Y23 (RR)	-	-	-	-	34.3
Pioneer 44Y24 (RR)	36.5	37.6	39.3	43.6	34.1
Pioneer 44Y26 (RR)	37.9	39.0	41.2	46.0	-
Pioneer 45Y25 (RR)	38.2	39.8	41.0	46.1	36.3
Victory V5002RR	38.5	40.1	43.8	46.9	36.6

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FIELD PEA

FIELD PEA

REVIEW OF 2015

Season

Despite low rainfall throughout 2014, high prices at the start of the 2015 season meant field pea production expanded further into the northern Mallee. Dry conditions in many regions left growers sowing dry or holding off planting pulses. Sowing late into still unfavourable conditions in 2015 meant herbicide damage (Groups B, C and I) was common in the early phase of the season.

Very low rainfall and cold overnight temperatures (including several frosts) in July, August and September slowed the growth of peas. However, a heat wave in the first week of October caused significant flower and pod loss further reducing the limited yield potential.

Yields in the northern Mallee and North East were reasonable but declined further south and across to the Central region where soil moisture levels were lower at sowing. In the Mallee PBA Pearl and PBA Oura were the best performers. In the Wimmera, PBA Pearl, PBA Percy, PBA Oura, PBA Twilight, PBA Wharton and Sturt were the best performers. PBA Wharton has proven to be the Kasper type pea to beat with excellent early vigour and standability, a good disease profile and the ability to perform well in short seasons.

The overall visual quality of grain was very good although seed size was smaller than usual.

Again, the short 2015 season experienced in most parts of the state emphasised the importance of growers upgrading from older varieties like Kasper to the newer and more reliable releases such as PBA Wharton and PBA Oura.

Disease and insects

2015 was a very dry season resulting in no disease pressures. Timely warning messages of heliothis flights were broadcasted to various regions resulting in no grub damage to field pea crops.

LOOKING FORWARD TO 2016

New varieties

There are no new pea varieties for 2016.

Disease

It is important to source seed that is tested free of pea seed borne mosaic virus (PSbMV).

Seed dressings are a simple and cost effective way to protect emerging crops from insect attack in the early growth stages. Seed treatments are a cheap and effective method for suppressing some diseases though growers need to be aware that the P-Pickle-T seed treatment has caused phytotoxic responses in treated field peas, particularly white and blue types. Also, fungicide seed treatments do not combine well with rhizobium bacteria used for inoculation. Likewise, growers should consider the use of fungicides to control powdery mildew when applying insecticides at early pod stage, particularly if mildew is present.

Growers in bacterial blight prone regions should update to the more resistant varieties PBA Oura and PBA Percy. PBA Percy has higher tolerance to this disease than PBA

Oura, but both are significantly lower risk than other varieties. In addition, growers should try to avoid sowing infected seed and extend crop rotations from infected paddocks. When bacterial blight occurs, growers should minimise in crop traffic. Sowing into heavy cereal stubble appears to increase the disease severity and should be avoided in frost prone regions.

Field peas play an important role in crop rotations, in particular with root lesion nematode control. However, current research has shown that Kasper is not as resistant to *Pratylenchus thornei* as some other field pea varieties. In 2016 provisional root lesion nematode resistance ratings have been provided for most field pea varieties. Most field pea varieties are more resistant than cereals and provide useful nematode control, however, some varieties are more susceptible. Resistant varieties will on average reduce nematode densities or maintain them at low levels. Susceptible varieties will increase nematode densities or maintain them at levels which will cause yield loss in subsequent intolerant varieties. For detailed information consult the definitions on the NVT website.

Marketing

The majority of field pea grain is exported for human consumption (between 70-90%) with the rest sold for stockfeed. The market demands for field pea vary according to type. Dun peas are segregated from white and blue peas and further separated from Dun 'Kasper' Type.

Over 90 per cent of Australian production is from dun types (i.e. grain that has a coloured seed coat) of which more than 85 per cent is now 'Kasper type' (e.g. Kasper, PBA Gunyah, PBA Twilight and PBA Wharton). Kasper type grain is preferred for snack food in southern India over other pea grain types and attracts a price premium. To avoid limiting the marketing of Kasper type grain for export, growers should avoid sowing seed contaminated with Parafield or other dun types.

Most field pea markets in India traditionally buy the 'Kasper' type as it is easier to remove the seed coat from a round seed over a dimple seed shape (e.g. PBA Oura). There are markets in India and Sri Lanka that will buy the Dun type field pea. White field pea markets are further developing into China and Sri Lanka.

Domestically all field pea varieties 'Dun' and 'Kasper' types are sought after for the splitting market including PBA Pearl, PBA Twilight, PBA Oura and PBA Gunyah.

MORE INFORMATION

www.nvtonline.com.au

Detailed NVT trial results and links to variety information.

www.nvtonline.com.au/apps

- Australian Field Crop Disease Guide app
- NVT Long Term Yield Reports app

agriculture.vic.gov.au/agriculture/grains-and-other-crops

- [Growing field pea](#)
- [AG1347 Pulse disease guide](#)

www.pulseaus.com.au

Pulse Australia information on growing pulses including:

- Field pea disease management strategy

VARIETY DESCRIPTIONS

Ⓓ denotes Plant Breeders Rights apply.

End Point Royalty (EPR) 2016-17 quoted \$/tonne ex-GST.

Semi-dwarf dun seeded – KASPA Ⓓ

A late flowering, semi-dwarf field pea which produces spherical dun type grain. Kasper is the bench mark for field peas with its broad adaption and high yield potential. Kasper is better suited to longer growing season environments. Kasper is MR to downy mildew (Parafield strain). Kasper will need to be managed for blackspot, bacterial blight, PSbMV, powdery mildew and downy mildew (Kasper strain) in disease prone areas. Kasper has fair lodging resistance at maturity and pods are resistant to shattering. Released 2002. Seednet. EPR \$2.

Semi-dwarf dun seeded – PBA COOGEE Ⓓ

A new dual purpose pea that can be left for grain production or cut early for forage in case of drought or frost. A mid-late flowering and late maturing conventional trailing dun pea similar to Parafield, but with increased early growth, more branching and longer vines. A long season variety with high plant biomass by early to mid-spring. It is resistant to powdery mildew and PSbMV, but will need to be managed for blackspot, bacterial blight and downy mildew. It has high tolerance to soil boron and salinity. Released 2013 (OZP1103). Seednet. EPR \$2.60.

Semi-dwarf dun seeded – PBA GUNYAH Ⓓ

An early flowering, semi-dwarf field pea which produces Kasper type grain. PBA Gunyah is broadly adapted and has high yield potential. PBA Gunyah is better suited to shorter growing season environments. Resistant to downy mildew (Parafield strain). PBA Gunyah will need to be managed for blackspot, bacterial blight, PSbMV, BLRV and powdery mildew in disease prone areas. PBA Gunyah has fair lodging resistance at maturity and pods are resistant to shattering. Released 2010. Seednet. EPR \$2.50.

Semi-dwarf dun seeded – PBA OURA Ⓓ

An early to mid flowering, semi-dwarf, erect growing field pea which produces Australian dun type grain. PBA Oura has high yield potential and is broadly adapted. PBA Oura is MRMS to bacterial blight and was released for regions prone to this disease. PBA Oura is MR to downy mildew (Parafield strain) and BLRV, but will need to be managed for blackspot, PSbMV and powdery mildew. PBA Oura has fair lodging resistance at maturity and has moderate non-sugar-pod resistance to shattering. Released 2011. Seednet. EPR \$2.60.

Semi-dwarf white seeded - PBA PEARL Ⓓ

An early to mid flowering, semi-dwarf field pea. PBA Pearl has high yield potential and is broadly adapted. It produces medium white grain that can be marketed for human consumption or for stockfeed. PBA Pearl has good resistance to bean leaf roll virus and downy mildew (Parafield strain). It is MS to bacterial blight and will need to be managed for blackspot, PSbMV, powdery mildew and downy mildew (Kasper strain) in disease prone areas. PBA Pearl has good lodging resistance at maturity and has moderate non-sugar-pod resistance to shattering. Released 2012. Seednet. EPR \$2.70.

Semi-dwarf dun seeded – PBA TWILIGHT Ⓓ

An early flowering, semi-dwarf field pea which produces Kasper type grain. PBA Twilight is broadly adapted and has high yield potential. Better suited to short growing season environments. PBA Twilight is resistant to downy mildew (Parafield strain). It will need to be managed for bacterial blight, blackspot, PSbMV, powdery mildew and downy mildew, (Kasper strain) in disease prone areas. PBA Twilight has fair lodging resistance at maturity and pods are resistant to shattering. Released 2010. Seednet. EPR \$2.50.

Semi-dwarf dun seeded – PBA WHARTON Ⓓ

An early-mid flowering, semi-dwarf field pea which produces Kasper type grain. PBA Wharton is widely adapted across short to medium growing season environments and is a suitable variety for crop topping when sowing is delayed. PBA Wharton is resistant to downy mildew (Parafield strain) powdery mildew and PSbMV and BLRV. It will need to be managed for blackspot and bacterial blight and downy mildew (Kasper strain). PBA Wharton has improved tolerance to soil boron and sugar-pod resistance to shattering. Released 2013 (OZP0805). Seednet. EPR \$2.60.

Semi-dwarf blue seeded – EXCELL

An early to mid-season flowering, semi-dwarf pea which produces medium sized, spherical, smooth blue seed suitable for premium human consumption markets. Excell has lower grain yield potential compared to new variety releases and is best suited to medium rainfall environments of Victoria and southern NSW. Excell is moderately resistant to downy mildew (Parafield strain). Excell will need to be managed for blackspot, bacterial blight, PSbMV and powdery mildew in disease prone areas. Excell has good lodging resistance. Pods are susceptible to shattering. Released 1998. Can be freely marketed.

Tall field pea – MORGAN Ⓓ

A tall, late flowering, semi-leafless pea, which produces small Australian dun type grain. Morgan has lower grain yield potential than other varieties, but was released for the lower rainfall regions of Central and Western NSW as a dual purpose pea that could be used for forage in drought years. Morgan is MR to downy mildew (Parafield strain). Morgan will need to be managed for blackspot, bacterial blight, PSbMV, powdery mildew, downy mildew (Kasper strain) and BLRV in disease prone areas. Pods are susceptible to pod shattering. Grain size is small and less suitable for human consumption markets. Released 1998. Hart Bros Seeds.

Tall field pea – PARAFIELD

A tall, mid to late season flowering pea, which produces large Australian dun type grain. Parafield has lower yield potential compared to recent variety releases. PBA Percy is now a superior option for growers wanting to grow a conventional dun field pea. Parafield will need to be managed for all diseases in disease prone areas. Parafield has poor lodging resistance and will require specialised pea pickup fronts for harvesting. Has moderate non-sugar-pod resistance to shattering. Released 1998. Can be freely marketed.

Tall field pea - PBA HAYMAN 

A new type of field pea bred for forage use such as hay or silage production or for manuring. This variety grows vigorously and produces large quantities of dry matter over spring. Total dry matter produced is significantly greater than regular field pea varieties (20% more than Morgan) and comparable to vetch. PBA Hayman produces leafy plants with a high number of basal branches that grow vigorously. Plants have very long vines (can be over 3m) that remain semi-erect to maturity. PBA Hayman flowers very late in the growing season and is resistant to powdery mildew. It produces small pods and very small seed that will reduce the cost of sowing. The grain is soft seeded and therefore suitable for cropping rotations with other broad leaf crops. Grain yield potential can vary but is generally between 30 to 80% of a normal field pea crop and is suitable for stockfeed. Developed by PBA (OZP0902). Released 2013. Seednet.

Tall field pea- PBA PERCY 

A very early flowering and maturing conventional pea (similar to Parafield) which produces Australian dun type grain. PBA Percy has high yield potential and is broadly adapted. PBA Percy is MR to bacterial blight and was released for regions prone to this disease. PBA Percy will need to be managed for blackspot, PSbMV, downy and powdery mildew and BLRV. PBA Percy has poor lodging resistance and will require specialised pea pickup fronts for harvesting. Released 2011. Seednet. EPR \$2.60.

Tall field pea – STURT

A tall, early to mid season flowering pea, which produces medium to small, spherical, smooth white seed. Sturt is broadly adapted, but is best suited to low rainfall environments and has higher tolerance to frost at podding. Sturt will need to be managed for bacterial blight, blackspot, PSbMV, BLRV, powdery mildew and downy mildew in disease prone areas. Sturt has poor lodging resistance and will require specialised pea pickup fronts for harvesting. Pods are susceptible to shattering. Released 2004. Premier Seeds.

POTENTIAL NEW VARIETIES from Pulse Breeding Australia.**OZP1101**

OZP1101 is a mid to late flowering semi-dwarf field pea variety. This potential release has high yield potential and produces 'Kaspa type' grain. It possesses superior bacterial blight resistance to other Kaspa type releases and will be marketed toward areas that are particularly prone to this disease. OZP1101 will need to be managed for blackspot, PSbMV and powdery mildew in disease prone areas.

Table 1: Agronomic characteristics of field pea varieties.

Variety	Plant habit	Plant vigour, Early season	Flowering time	Maturity time	Plant lodging resistance at maturity	Pod shattering at maturity	Boron tolerance	Salinity tolerance
Yellow or Blue pea grain type								
Excell	SD-SL	high	early	early-mid	good	S: NSP	S	S
PBA Hayman	Multi-branched	moderate	very late	very late	poor	MR: NSP	MS	MS
PBA Pearl	SD-SL	moderate	early-mid	early-mid	good	MR: NSP	MS	MS
Sturt	C	high	early-mid	mid	poor	MR: NSP	S	MS
Kaspa grain type								
Kaspa	SD-SL	moderate	late	mid	fair-good	R: SP	S	S
OZP1101	SD-SL	high	mid-late	mid	good	R; SP	S	S
PBA Gonyah	SD-SL	high	early-mid	early	fair-good	R: SP	S	SMS
PBA Twilight	SD-SL	high	early	early	fair-good	R: SP	S	S
PBA Wharton	SD-SL	moderate	early-mid	early	fair-good	R: SP	MT	MT
Australian dun grain type								
Morgan	Tall-SL	high	late	late	poor-fair	MR: NSP	S	S
Parafield	C	high	mid	mid	poor	MR: NSP	S	MS
PBA Coogee	C	high	mid-late	mid	poor	MR: NSP	T	MT
PBA Oura	SD-SL	moderate	early-mid	early	fair-good	MR: NSP	MS	S
PBA Percy	C	high	early	early	poor	MR: NSP	S	MT

SD=semi-dwarf, C=conventional, SL= semi-leaffless, S=susceptible, MS=moderately susceptible, MR=moderately resistant, R=resistant, SP=sugar pod type pod, NSP=non sugar pod type, I=intolerant, MI=moderately intolerant

Table 2: Field pea time of sowing guide.

This table is a guide only and has been compiled from observations of the breeder and local departmental agronomists.

MALLEE	April			May			June			July		
PBA Coogee, PBA Hayman		>	>	>	X	X	X	X	<	<	<	
Kaspa, Parafield, PBA Gunyah, PBA Oura, PBA Percy, PBA Twilight, PBA Wharton, Sturt		>	>	>	>	X	X	X	X	<	<	
WIMMERA												
PBA Hayman						>	X	X	X	X	<	<
Kaspa, Parafield, PBA Coogee, PBA Gunyah, PBA Oura, PBA Percy, PBA Twilight, PBA Wharton, Sturt.							>	X	X	X	X	<
NORTH CENTRAL												
PBA Coogee, PBA Hayman					>	X	X	X	X	<	<	
Kaspa, Parafield, PBA Gunyah, PBA Oura, PBA Percy, PBA Twilight, PBA Wharton, Sturt.						>	X	X	X	X	<	<
NORTH EAST												
PBA Hayman						>	X	X	X	X	<	<
Kaspa, Parafield, PBA Coogee PBA Gunyah, PBA Oura, PBA Percy, PBA Twilight, PBA Wharton, Sturt.							>	X	X	X	X	<
SOUTH WEST	April			May			June					
Kaspa, PBA Coogee PBA Gunyah, PBA Hayman, PBA Oura, PBA Percy, PBA Twilight, PBA Wharton						*	X	X	X	X	*	
SOUTH WEST spring sowing				July			August			September		
Above varieties for spring sowing					*	*	*	X	X	X	X	X

>earlier than ideal, X optimum sowing time, < later than ideal but acceptable, * if conditions allow (e.g. raised beds, dry season, non-waterlogging paddocks).

Table 3: The most suitable field pea varieties for Victorian cropping regions for grain production (Ticked).

	Southern Wimmera	Northern Wimmera	Southern Mallee	Northern Mallee	South West
Yellow/White or Blue pea grain type					
Excell		✓	✓		
PBA Hayman	✓	✓	✓	✓	✓
PBA Pearl	✓	✓	✓	✓	✓
Sturt	✓	✓	✓	✓	
Kaspa grain type					
Kaspa	✓	✓			✓
PBA Gunyah	✓	✓	✓		✓
PBA Twilight			✓	✓	
PBA Wharton	✓	✓	✓	✓	✓
Australian Dun grain type					
Morgan			✓	✓	
Parafield				✓	
PBA Coogee	✓	✓	✓	✓	✓
PBA Oura	✓	✓	✓	✓	✓
PBA Percy	✓	✓	✓	✓	

Table 4: Disease resistance characteristics of field pea varieties.

Variety	Blackspot (Ascochyta)	Bacterial blight (Field rating)	Downy mildew (Kaspa strain)	Downy mildew (Parafield strain)	Powdery mildew	PSbMV virus	BLRV virus (Field rating)	<i>P. neglectus</i>	<i>P. thornei</i>
Yellow pea grain type									
PBA Hayman	Sp	MR _p		RMR	R				
PBA Pearl	MS	MS	S	R	S	S	R	MRMS	MRMS
Sturt	MS	MS	S	MS	S	S	MS	MS _p	MR
Kaspa grain type									
Kaspa	MS	S	S	MR	S	S	S	MRMS	MRMS
OZP1101	MS	MRMS _p	MS	R	S	S	S	MRMS	MRMS
PBA Gunyah	MS	S	S	R	S	S	S	MR	MRMS
PBA Twilight	MS	S	S	R	S	S	S	MRMS _p	MRMS
PBA Wharton	MS	S	S	R	R	R	R	MRMS _p	MR _p
Australian Dun grain type									
Morgan	MS	MS	S	MR	S	S	Sp	RMR _p	MR _p
Parafield	MS	MS	S	S	S	S	S	MRMS	MR _p
PBA Coogee	S	MRMS _p		Sp	R		Sp	MRMS _p	MR _p
PBA Oura	MRMS _p	MRMS	MRMS	MR	S	S	MR	MRMS _p	MRMS _p
PBA Percy	MS	MR	S	S	S	S	S	MRMS	RMR _p

PSbMV = pea seed borne mosaic virus, BLRV = bean leaf roll virus

Resistance order from best to worst: R > RMR > MR > MRMS > MS > MSS > S > SVS > VS.

p = provisional ratings - treat with caution. R = resistant, M = moderately, S = susceptible, V = very.

Table 5: Field pea disease guide.

Disease	Organism	Symptoms	Occurrence	Hosts	Control
Ascochyta blight (Blackspot)	<i>Mycosphaerella pinodes</i> , <i>Phoma pinodella</i> , <i>Ascochyta pisi</i> .	Most obvious on stems and lower leaves. Purplish-black discolouration of lower stem. Dark brown spotting of pods and leaves. Blackening of stem base and upper tap root.	Common in all pea growing regions; most crops are affected to some extent. Favoured by wet conditions. Most damage in early sown crops.	Peas and most legumes.	Crop rotation. Later sowing. Fungicidal seed dressings. Disease free seed.
Bacterial blight	<i>Pseudomonas syringae</i> pv, <i>pisii</i> , <i>P. syringae</i> pv <i>syringae</i> .	Water-soaked spots on leaflets and stipules. Yellowish brown fan-shaped lesion on stipules.	Sporadic in wetter regions. Most severe in early sown crops already damaged by frost or heavy rain.	Peas.	Crop rotation. Late sowing. Disease free seed.
Downy mildew	<i>Peronospora viciae</i> .	Brown blotches on upper leaf surface. Underside of leaves covered by masses of fluffy 'mouse-grey' spores.	Sporadic in all regions. Damage most severe in wetter districts.	Peas.	Resistant varieties. Fungicidal seed dressings.
Powdery mildew	<i>Erysiphe polygoni</i> .	Leaves covered by a film of powdery white spores. Infected plants have a blue-white colour.	Can occur in most regions towards the end of the season. Most common in late-sown crops.	Peas.	Resistant varieties. Avoid late sowing. Foliar fungicide application at flowering is an economic option for disease prone areas.
Septoria leaf blotch	<i>Septoria pisi</i> .	Straw coloured blotches on leaves, stems and tendrils. Pin-head size black spots within lesions.	Present in most pea growing regions. Damage most severe on short, semi-leafless cultivars.	Peas.	Destroy crop residue. Most varieties are moderately susceptible. Crop rotation.
VIRUS DISEASES					
PSbMV	Pea seedborne mosaic virus	Downward curling of leaves, mosaic, stunting.	Present in all pea growing regions.	Host range limited to <i>Fabaceae</i>	This virus is highly seed borne in peas. Virus free seed is recommended
BLRV	Bean leaf roll virus	Yellowing and stunting	Present in all pea production areas.	Host range limited to <i>Fabaceae</i>	Managing aphids and weeds, resistant varieties.

Table 6: Long term predicted field pea yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

Mean yield (t/ha)	Mallee 1.48	Wimmera 2.05
Excell	91 (3)	-
Kaspa	93 (26)	93 (17)
Morgan	93 (3)	-
Parafield	89 (18)	86 (9)
PBA Gunyah	96 (25)	96 (16)
PBA Oura	101 (26)	99 (17)
PBA Pearl	108 (26)	106 (17)
PBA Percy	99 (25)	97 (14)
PBA Twilight	94 (25)	94 (16)
PBA Wharton	101 (26)	103 (17)
Sturt	102 (10)	102 (5)
Yarrum	97 (6)	-

Long term yield predictions provided in this report have been produced using the NVT Long Term MET (Multi Environment Trial) analysis. The analysis produces predictions or "Production Values" for every variety in every NVT trial across all years identified within the dataset. This report presents regional means for each variety which reduces the accuracy and reliability of the results. Varieties present in less than three trials per region have been omitted from this report and some rounding variation may be present when compared to other reporting methods. More detailed yield information can be found using the NVT Long Term Yield App or the Excel Reporting tools available on the NVT website (www.nvtonline.com.au).

NVT trials are managed to minimise disease impact and this may include the use of seed dressings and post emergent fungicides.

Table 7: 2015 field pea yield (as a percentage of the site mean yield) in NVT and DEDJTR breeding (B) trials. All NVT trials experienced multiple frosts and extreme heat conditions. Interpret data with caution. Information not provided for breeding trials.

Sowing Date	Mallee				Wimmera	
	Hopetoun (B)	Hopetoun (B)	Rainbow	Ultima	Horsham (B)	Tarranyurk
	11/5/15	11/5/15	18/5/15	21/5/15	2/6/15	2/6/15
Kaspa	94	67	25	77	80	79
Parafield	-	-	45	87	-	90
PBA Gunyah	-	93	63	120	84	99
PBA Oura	113	144	166	116	95	95
PBA Pearl	123	135	187	105	105	106
PBA Percy	-	139	148	125	107	101
PBA Twilight	-	93	88	121	111	104
PBA Wharton	105	113	118	89	106	-
Sturt	-	125	-	-	125	-
Site Mean (t/ha)	0.71	0.65	0.37	0.49	0.87	0.48
CV (%)	12	13	13	7	12	10
LSD (%)	20	21	21	11	18	16

B = Breeding trials

Table 8: 2015 field pea grain weight (g/100 seeds).

	Mallee		Wimmera
	Rainbow	Ultima	Tarranyurk
Kaspa	12.5	13.5	16.1
Parafield	12.5	11.5	17.0
PBA Gunyah	13.6	14.6	16.5
PBA Oura	13.8	15.9	16.8
PBA Pearl	12.7	14.2	17.2
PBA Percy	15.9	18.1	17.6
PBA Twilight	14.2	14.5	14.9
PBA Wharton	12.6	12.8	15.9

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LENTIL

LENTIL

REVIEW OF 2015

Season

Historically high lentil prices at the commencement of the 2015 planting year encouraged new and emerging areas of lentil production across southern Australia despite the very dry 2014/15 season.

Lentil prices reached further historical highs (\$1400/t) during the 2015/16 season due to short supply of grain as a result of drought conditions in Australia and the India subcontinent.

No 'true' rainfall break occurred in autumn resulting in many growers sowing dry or stalling pulse planting for several weeks, only then to sow grain late into unfavourable dry conditions. Many lentil growers experienced crop establishment issues due to residual herbicide (Groups B, C and I).

Very low rainfall and cold overnight temperatures (including several frosts) in July, August and September caused many crops to remain stunted for a period of time. Furthermore, a heat wave in the first week of October further crushed any hope of average yield potential.

Harvest was one of the earliest ever experienced for lentils, commencing the second week of October in the Mallee and the first week of November in the Wimmera.

Overall yields ranged from 0 to 0.8t/ha and in very isolated areas 1.2t/ha. Crops on sandier soils, sown in stubble with wide row spacings generally yielded better. Despite the low yields, high prices meant that a 0.2t/ha crop could still be profitable. In areas where lentils have grown well including in the Mallee good prices may have rendered them the highest gross margin crop in 2015.

Disease and insects

A number of crops showed some evidence of root disease, which is typical of drier years. These are a reminder that root diseases are present and do need to be managed in case conditions are conducive to damage. There were some nematodes around the central and northern Mallee.

Dry conditions meant that ascochyta blight and botrytis grey mould (BGM) were not major issues in Victoria in 2015, despite several early reports of ascochyta blight, particularly in PBA Flash.

LOOKING FORWARD TO 2016

New varieties

There are no new lentil varieties for 2016.

Sowing after a dry season

Dry conditions in 2015 will mean residual herbicides are more likely to persist into 2016. Despite summer rainfall growers may need to take this into consideration when selecting paddocks and varieties for 2016. Some growers may be tempted to resow lentils into the same paddock after a failed crop. This is not recommended. Lentils benefit considerably from being sown into standing cereal stubble that can provide support and protection.

Disease

Ascochyta blight can manifest rapidly and depending on the variety sown, should be factored into management plans for 2016.

Where there is high risk of BGM growers using susceptible varieties need to apply fungicides before canopy closure. Variety choice, delayed time of sowing and wider row spacing can assist in minimising BGM.

To develop a suitable virus management strategy it is important to test seed for cucumber mosaic virus (CMV) and alfalfa mosaic virus (AMV) if symptoms were observed in the seed crop. Aphids multiply rapidly in lentil crops. Seed treatment, an early insecticide application, continued monitoring and action may be needed to avoid rapid aphid build up and virus spread both within the crop and to nearby chickpea crops. Thin crop stands are more attractive to aphids. Control of Heliothis and Etiella to prevent damage to grain remains important.

In 2016 provisional root lesion nematode resistance ratings have been provided for most lentil varieties. Most lentil varieties are more resistant than cereals and provide useful nematode control; however some varieties are more susceptible to *P. neglectus*. Resistant varieties will on average reduce nematode densities or maintain them at low levels. Susceptible varieties will increase nematode densities or maintain them at levels which will cause yield loss in subsequent intolerant varieties. For detailed information consult the definitions on the NVT website.

Marketing

Variety purity is critical in lentils with a restriction of 1 per cent maximum contamination by different varieties. This is of particular concern when growing varieties with different seed coat colour and/or different cotyledon colour. Be aware of the potential for contamination from volunteer or 'escaped' lentils in paddocks when changing to new varieties with different seed coat colours i.e. PBA Flash to PBA Bolt.

Some lentil varieties also have normal genetic variation in coat colour. A change to lentil standards has now enabled a 1 per cent maximum "contrasting seed coat colours" to be added to assist in the delivery and marketing of varieties like PBA Blitz, PBA Herald-XT and PBA Hurricane XT that have low levels of genetic variation in their seed coat colours.

Growers should be aware of possible price swings; despite record high prices for lentils in 2015 the long term price is between \$500 and \$600/t.

MORE INFORMATION

www.nvtonline.com.au

Detailed NVT trial results and links to variety information.

www.nvtonline.com.au/apps

- Australian Field Crop Disease Guide app
- NVT Long Term Yield Reports app

agriculture.vic.gov.au/agriculture/grains-and-other-crops

- [Growing lentil](#)
- [AG1347 Pulse disease guide](#)

www.pulseaus.com.au

Pulse Australia information on growing pulses including:

- Lentil disease management strategy

VARIETY DESCRIPTIONS

Ⓢ denotes Plant Breeder Rights apply

End Point Royalty (EPR) 2016-17 quoted \$/tonne ex-GST.

Red lentil – ALDINGA

Aldinga has medium-large seed with good milling characteristics. Aldinga is MRMS to foliar ascochyta blight but MS to seed infection. It is MS to BGM and lodges more than other varieties. It has been a preferred variety for some farmers using no till systems. Released 1994. AFCA. No market restrictions.

Red lentil – NIPPER Ⓢ

Nipper is similar to Northfield in many characteristics, including relatively short height and seed shape, but it has a grey seed coat. Nipper is MRMS to foliar ascochyta blight, MR to seed ascochyta and R to BGM. It is also R to the exotic disease Fusarium wilt, has improved salinity tolerance and generally lodges less than other varieties. Nipper is well established in markets, and has attracted a premium price in some years. Released 2005. Seednet. EPR \$5.

Red lentil – NUGGET

Nugget is a mid season variety with a medium size seed and a grey seed coat. It is MRMS to foliar ascochyta blight, MR to seed ascochyta and R to BGM. Nugget is not grown much anymore as it has now been superseded by PBA Ace and PBA Bolt. Released 1999. Heritage Seeds. EPR \$5.

Red lentil – PBA ACE Ⓢ

PBA Ace is a medium sized red lentil with grey seed. A mid-season lentil that has been the highest yielding across all areas, though it can be lower yielding in dry years or high temperatures. PBA Ace is best suited to longer season areas replacing Nugget and PBA Jumbo. It is R to ascochyta and MRMS to BGM. It is intolerant to salinity and boron. High milling quality. Released 2012. PB Seeds. EPR \$5.

Red lentil - PBA BLITZ Ⓢ

PBA Blitz is a medium sized red lentil with a grey seed coat that is early flowering and is suited to short growing seasons. It has improved early vigour and an erect growth habit which is suited to no-till and inter-row sowing. PBA Blitz is MR to foliar ascochyta, MRMS to seed ascochyta and MR to BGM. PBA Blitz is intolerant of soil boron and salinity. It has demonstrated similar but generally improved milling characteristics compared to Nugget. Released 2010. PB Seeds. EPR \$5.

Red lentil – PBA BOLT Ⓢ

PBA Bolt is a medium sized red lentil with grey seed, adapted to the Mallee and northern Wimmera. While similar to PBA Flash with early-mid maturity and salinity tolerance, it is better in the southern Mallee as it is MR to foliar ascochyta blight and R to seed ascochyta blight. Its susceptibility to BGM makes it less suited to medium-high rainfall areas in wetter years and with early sowing. Like PBA Flash, PBA Bolt is a good variety for timely crop topping to control weeds. An erect habit and good lodging resistance make it easier to harvest in dry conditions. Released 2012. PB Seeds. EPR \$5.

Red lentil – PBA FLASH Ⓢ

PBA Flash is an early maturing, high yielding red lentil with a medium seed size and is suited to all current lentil growing areas but particularly shorter season growing areas. It has improved tolerance to boron and salinity compared to Nugget, which along with its height and erectness, has contributed to its popularity in the Mallee. Like PBA Bolt, PBA Flash is a good variety for timely crop topping to control weeds. It is MS to foliar and seed ascochyta blight, and MRMS to BGM. PBA Flash has improved standing ability at maturity relative to other lentil varieties which may make it more prone to pod drop in windy environments, timely harvest is required. It is well suited to medium red lentil grain markets, particularly for splitting. Released 2009. PB Seeds. EPR \$5.

Red lentil – PBA HERALD XT Ⓢ

PBA Herald XT is a small red seeded lentil best adapted to longer growing seasons with medium to higher rainfall. It was the first lentil with improved tolerance to imazethapyr with an interim permit for pre or post-emergent application to 2017. It has improved tolerance to the herbicide flumetsulam plus reduced sensitivity to some sulfonylurea and imidazolinone herbicide residues. *It is important to note that growers must adhere to product label rates, plant back periods and all label directions for use.* PBA Herald XT has been outclassed by the new PBA Hurricane XT. PBA Herald XT is R to foliar and seed ascochyta and BGM. Disease resistance will assist in achieving high grain quality. Released 2011. PB Seeds. EPR \$5.

Red lentil – PBA HURRICANE XT Ⓢ

PBA Hurricane XT is a small red seeded lentil with mid flowering and maturity. Like PBA Herald XT it has tolerance to imazethapyr with an interim permit for pre or post-emergent application to 2017. It has improved tolerance to the herbicide flumetsulam plus reduced sensitivity to some sulfonylurea and imidazolinone herbicide residues. *It is important to note that growers must adhere to product label rates, plant back periods and all label directions for use.* PBA Hurricane XT is the highest yielding small red lentil available in Australia and has improved yields over PBA Herald XT, Nipper and Nugget, but lower than PBA Ace. It is MR to foliar ascochyta, R to seed ascochyta and MS to BGM. Released 2013 (CIPAL1101). PB Seeds. EPR \$5.

Red lentil – PBA JUMBO Ⓢ

PBA Jumbo is a high yielding large seeded red lentil with a grey seed coat. It is mid flowering with a maturity similar to Nugget. Suited to no-till inter-row sowing into standing stubble. It is MRMS to foliar ascochyta blight and S to seed ascochyta and MS to BGM. Tolerance to soil boron is similar to PBA Flash. PBA Jumbo is suited to medium to high rainfall regions where it produces uniform larger seed size for the premium large red split markets, but will be outclassed by PBA Jumbo2. Released 2010. PB Seeds. EPR \$5.

Red lentil – PBA JUMBO2 Ⓢ

PBA Jumbo2 is the highest yielding large seeded red lentil, approximately 10% higher than PBA Jumbo. It is a direct replacement for Jumbo and Aldinga. It has a similar seed size to Jumbo and Aldinga with a grey seed coat. It is mid flowering and has a maturity similar to PBA Jumbo. It is well suited to no-till inter-row sowing into standing stubble. It is R to ascochyta and BGM. Tolerance to soil boron is similar to PBA Flash. PBA Jumbo2 is suited to medium to high rainfall regions where it produces uniform larger seed size well suited to premium large red split markets. Released 2014 (CIPAL1203). PB Seeds. EPR \$5.

Green lentil - BOOMER

Boomer is a large seeded green lentil that is tall, bulky and vigorous but can lodge when growing conditions are favourable. Sowing early can increase lodging and result in smaller seed. Boomer is MR to foliar ascochyta blight and MRMS to seed ascochyta blight and BGM. Early harvest is important to prevent shattering and produce good coloured seed. Boomer is expected to be superseded by PBA Giant. Released 2005. Seednet. EPR \$5.

Green lentil – PBA GIANT

The largest seeded green lentil in Australia with an average seed diameter of 5.8 mm (approximately 7 g/100 seeds). PBA Giant is broadly adapted but best-suited to the medium rainfall lentils growing regions. It has similar yield and improved shattering resistance to Boomer, though timely harvest is still required to minimise shattering. It is more susceptible to lodging at maturity than Boomer. It is MR to foliar ascochyta, and MS to seed ascochyta and BGM. Released 2014 (CIPAL1207). PB Seeds. EPR \$5.

Green lentil – PBA GREENFIELD

The highest yielding green lentil variety with yields similar to PBA Ace. PBA Greenfield is a medium-sized green lentil broadly adapted but best-suited to the medium rainfall lentils growing regions. With improved tolerance to salinity and resistance to shattering, although timely harvest is still required. It is MRMS to foliar and seed ascochyta and MR to BGM. Released 2014 (CIPAL1104). PB Seeds. EPR \$5.

Table 1: Lentil time of sowing guide.

Take variety flowering & maturity status into account when choosing a sowing date. In the Wimmera, the highest yields are from sowing in early May to mid June. However early sowing increases the risk of yield and quality losses from botrytis grey mould and ascochyta blight. Early sowing also increases the likelihood of crop lodging. This table is a guide only and has been compiled from experimental data and observations of the breeder and local departmental agronomists.

MALLEE/Northern WIMMERA	April				May				June			
Aldinga, Boomer, Nugget, PBA Ace, PBA Bolt, PBA Bounty, PBA Blitz, PBA Flash, PBA Greenfield, PBA Giant, PBA Hurricane XT, PBA Jumbo, PBA Jumbo 2			>	>	X	X	X	<				
WIMMERA	April				May				June			
Aldinga, Boomer, Nipper, Nugget, PBA Ace, PBA Bolt, PBA Bounty, PBA Blitz, PBA Flash, PBA Greenfield, PBA Giant, PBA Herald XT, PBA Hurricane XT, PBA Jumbo, PBA Jumbo 2					>	X	X	X	X	X	<	

>earlier than ideal, X optimum sowing time, < later than ideal but acceptable

Table 2: Lentil variety agronomic guide (may vary with sowing time and location).

Variety	Grain type	Seed coat	Seed size (%) [*]	Flowering time	Maturity	Lodging	Shattering	Salinity	Boron
Small red seed									
Nipper	red	grey	75-80	mid/late	mid	MR	MR	MT	I
PBA Herald XT	red	grey	75	mid/late	mid/late	MRMS	MR	I	I
PBA Hurricane XT	red	grey	85	mid	mid	MR	R	I	I
Medium red seed									
Nugget	red	grey	100	mid	mid/late	MS	R	I	I
PBA Ace	red	grey	100	mid	mid	MRMS	MRMS	I	I
PBA Blitz	red	grey	115-120	early	early	MR	MR	I	I
PBA Bolt	red	grey	100	early/mid	early/mid	R	R	MI	MI
PBA Flash	red	green	100-110	early/mid	early/mid	MR	MR	MI	MI
Large red seed									
Aldinga	red	green	120	mid	mid	S	MRMS	MI	I
PBA Jumbo	red	grey	120	mid	mid	MS	MR	I	MI
PBA Jumbo2	red	grey	120	mid	mid	MRMS	R	I	MI
Medium green lentil									
PBA Greenfield	yellow	green	130	mid	mid/late	MS	MR	MI	I
Large green lentil									
Boomer	yellow	green	150	mid	mid/late	S	S	I	MI
PBA Giant	yellow	green	170	mid	mid/late	MS	MRMS	I	MI

R = resistant, MR=moderately resistant, MS=moderately susceptible, S=susceptible, VS=very susceptible, I=intolerant, MT=moderately tolerant, MI= moderately intolerant. * ratings relative to Nugget. Can flower and mature relatively earlier if sown early.

Table 3: Disease rating for current lentil varieties.

Disease ratings from Pulse Breeding Australia, January 2015. No variety with a Resistant rating is immune to disease, and fungicide application may be required under severe disease pressure.

Variety	Ascochyta blight Foliar	Ascochyta blight Seed/pod	Botrytis grey mould (BGM)	<i>P. neglectus</i> (provisional)	<i>P. thornei</i> (provisional)
Small red seed					
Nipper	MRMS	MR	R	RMR _p	MR _p
PBA Bounty	MRMS	MS	MS		
PBA Herald XT	R	R	R	MRMS _p	MR _p
PBA Hurricane XT	MR	R	MS	MRMS _p	MR _p
Medium red seed					
Nugget	MRMS	MRMS	MRMS	MRMS _p	MR _p
PBA Ace	R	R	MRMS	MR _p	MR _p
PBA Blitz	MR	MRMS	MR	MRMS _p	MR _p
PBA Bolt	MR	R	S	MR _p	MR _p
PBA Flash	MS	MS	MRMS	MS _p	MR _p
Large red seed					
Aldinga	MRMS	MS	MS		
PBA Jumbo	MRMS	S	MS	MR _p	MR _p
PBA Jumbo2	R	R	R	MS _p	MR _p
Medium green lentil					
PBA Greenfield	MRMS	MRMS	MR		
Large green lentil					
Boomer	MR	MRMS	MRMS		MR _p
PBA Giant	MR	MS	MS	MR _p	MR _p

Resistance order from best to worst: R > RMR > MR > MRMS > MS > MSS > S > SVS > VS.

p = provisional ratings - treat with caution. R = resistant, M = moderately, S = susceptible, V = very.

Table 4: Lentil disease guide.

Disease	Organism	Symptoms	Occurrence	Hosts	Control
Ascochyta blight	<i>Ascochyta lentis</i>	Leaves: small round whitish grey lesions with brown margins. Lesions contain small black fruiting bodies of the fungus. Lesions can also form on stems causing premature death. Pod infection can ultimately result in dark discolourations on seed.	Common in all lentil growing regions in southern Australia. All varieties except Northfield and Nipper are at risk of seed infection by ascochyta blight. Damage is most likely in wet seasons.	Lentils – seed, stubble and self sown plants.	Fungicidal seed dressings. Resistant varieties. Foliar fungicides. Crop rotation. Avoid early sowing.
Botrytis grey mould	<i>Botrytis cinerea</i> and <i>Botrytis fabae</i>	Leaves: white round lesions/spots without black fruiting bodies as in ascochyta blight. Stems: Pale brown grey lesions form on stems that are covered with fluffy grey mould. Botrytis grey mould can cause branches to die and cause discoloured and shrivelled seed. In severe cases large brown patches can form in the crop.	Most likely to occur in dense, lodged crops when there is frequent rain late in spring.	Most legumes including chickpeas, faba bean and vetch.	Fungicidal seed dressings. Low plant density. Avoid early sowing. Foliar fungicides. Crop rotation. Resistant varieties.
VIRUS DISEASES					
AMV	Alfalfa mosaic virus	Tip necrosis. Young leaves are pale green, small, twisted and distorted. A faint mosaic pattern may appear.	Prevalent in lentil production regions with high aphid numbers	Wide host range including most pulses, some horticultural plants and weeds	Virus free seed, management of weeds, resistant varieties.
CMV	Cucumber mosaic virus	Yellowing, stunting. Young leaves are pale green, small, twisted and distorted. A faint mosaic pattern may appear.	Common in all lentil growing areas with high aphid numbers	Wide host range including most pulses, some horticultural plants and weeds	Virus free seed, management of weeds, resistant varieties.
BWYV	Beet western yellows virus	Yellowing, stunting. Produces the most severe symptoms of the all the viruses. Patches of crop resemble root disease or herbicide residue damage.	Present in all lentil production areas with high aphid numbers.	Wide host range including most pulses, some horticultural plants and weeds	Managing weeds and aphids, resistant varieties.

Table 5: Long term predicted lentil yield 2009-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

Mean yield (t/ha)	Mallee 1.03	Wimmera 1.60
Aldinga	91 (8)	90 (9)
Boomer	95 (18)	87 (21)
Digger	89 (7)	87 (7)
Nipper	80 (29)	91 (23)
Northfield	80 (13)	87 (14)
Nugget	92 (29)	95 (23)
PBA Ace	115 (29)	104 (23)
PBA Blitz	87 (29)	92 (23)
PBA Bolt	112 (29)	104 (23)
PBA Bounty	99 (16)	101 (17)
PBA Flash	98 (29)	101 (23)
PBA Giant	104 (5)	93 (10)
PBA Greenfield	107 (10)	100 (14)
PBA Herald XT	85 (29)	88 (23)
PBA Hurricane XT	106 (23)	102 (17)
PBA Jumbo	90 (29)	95 (23)
PBA Jumbo2	117 (18)	109 (14)

Long term yield predictions provided in this report have been produced using the NVT Long Term MET (Multi Environment Trial) analysis. The analysis produces predictions or "Production Values" for every variety in every NVT trial across all years identified within the dataset. This report presents regional means for each variety which reduces the accuracy and reliability of the results. Varieties present in less than three trials per region have been omitted from this report and some rounding variation may be present when compared to other reporting methods. More detailed yield information can be found using the NVT Long Term Yield App or the Excel Reporting tools available on the NVT website (www.nvtonline.com.au).

The **2015 lentil** trial data was not provided. NVT do not publish data when sites are not harvested, yields are below the 0.3 t/ha limit or the CV is greater than 15%. Instead we have included results from the DEDJTR agronomy trial program.

NVT trials are managed to minimise disease impact and this may include the use of seed dressings and post emergent fungicides.

Table 6: Lentil yield (t/ha) - 2015 Agriculture Victoria (DEDJTR) agronomy trial. NVT trial results not available. Sites affected by heat.

	Yield (t/ha)	
	Mallee	
	Curyo	Kulwin
CIPAL0901	0.66	0.84
CIPAL1405	0.45	0.31
Nipper	0.36	
PBA Ace	0.40	0.59
PBA Bolt		0.51
PBA Flash	0.63	0.57
PBA Giant	0.28	
PBA Greenfield	0.31	0.32
PBA HurricaneXT		0.64
PBA Jumbo2	0.63	0.74
CV%	3.3	8.9
LSD (t/ha, p<0.05)	0.06	0.14

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FABA BEAN

FABA BEAN

There are varying sizes and colours of faba bean seeds that are identified by different names. Small to medium seeded types (*Vicia faba* var. minor) may be called faba bean or tickbean and are commonly used for human consumption and animal feed. Large size seed types (*V. faba* var. major) may be called broad bean and are used more commonly as a dry broad bean or as a green bean for human consumption.

REVIEW OF 2015

Season

Faba bean area increased by 30% across Victoria in 2015 reaching record production area as a response to historically high prices. Particular areas of expansion included the North East, North Central and South West regions.

Crops in the Wimmera were either not harvested or cut for silage from east of Horsham to the SA border due to very dry seasonal conditions. This is not a common practice in the Wimmera, a consistently strong production region for faba beans.

Yields were slightly above average for irrigated central crops, however the dry winter and hot spring winds decimated dryland yields in the central and south west areas.

Grain that was harvested varied in quality from average to below average and seed size was small. If it wasn't for strong global demand of the commodity it would have been very difficult for growers to move grain classified as faba bean Number 2 or Number 3 according to Grain Trade Australia specifications.

The total area sown to faba beans is continuing to grow with improved understanding of agronomy and disease management along with excellent commodity prices. In recent years some growers using wide row, no-till cropping have found faba beans profitable as the lower pods are able to fill properly.

Disease and insects

Ascochyta pathotype 2 has been identified on some faba bean crops, particularly in South Australia in the last two seasons. This new pathotype has not been observed in Victoria, but crops and trials are being monitored for its presence. Pathotype 1 is widely distributed in the Southern Region. PBA Samira and Nura are resistant to both pathotypes.

There was some sclerotinia in faba bean crops in the South West, particularly those sown after canola. Some rhizoctonia and pythium in the South West caused blackness.

Aphid and virus damage were limited.

LOOKING FORWARD TO 2016

New varieties

PBA Zahra is a new variety suited to the longer growing season of the high rainfall zone or irrigation areas. An alternative to PBA Rana, it is expected to offer yield advantages of at least 10% in its main areas of adaptation.

Inoculation

Faba beans are very responsive to inoculation and this is particularly important on acid soils (pH<6).

Pod set

Sowing early does not necessarily result in greater pod set, but wider row spacings may help sunlight to penetrate the canopy and increase podding. Sow in areas away from canola paddocks to avoid bees being diverted to the stronger odour of canola. Sow away from field pea crops to minimise aphid transmission of viruses, particularly pea seed borne mosaic virus (PSBMV).

Disease

Growers need to be prepared for a shift in virulence as the new strain of ascochyta spreads from South Australia to Victoria. To minimise the risk of yield and grain quality loss growers are encouraged to use a strategic fungicide applications and regularly monitor crops for symptoms.

If 2016 provides good sowing conditions with adequate rainfall during the grain fill period, it is highly recommended that growers spray bean crops for disease control. The 6-8 week and 15 week growth stages are important timing to minimise ascochyta blight, cercospora leaf spot and chocolate spot in order to maximise yield and harvest disease free seed. All current varieties are susceptible to cercospora leaf spot. Prompt harvest when the crop is initially ripe is also important to retain grain quality.

Marketing

Faba beans grown in Australia are predominately exported to the human consumption export market of North Africa and the Middle East. These markets demand high visual quality standards to meet market specifications.

Until 2014, Australia competed with the United Kingdom and the European Union, particularly France, for a share of the 300,000 tonne North African market. In 2015, with historically high prices being paid globally for faba beans, the Baltic States, Eastern Europe and North America entered the international faba bean market for the first time. These emerging global suppliers are also targeting the Middle Eastern market that Australia, the United Kingdom and European Union have traditionally supplied.

The relatively small global market demand from the Middle East and Northern Africa is consistent and has been for the last 10 years. If there is a surplus of product produced globally expect to see a slide in price.

MORE INFORMATION

www.nvtonline.com.au

Detailed NVT trial results and links to variety information.

www.nvtonline.com.au/apps

- Australian Field Crop Disease Guide app
- NVT Long Term Yield Reports app

agriculture.vic.gov.au/agriculture/grains-and-other-crops

- [AG0083 Growing faba bean](#)
- [AG1347 Pulse disease guide](#)

www.pulseaus.com.au

Pulse Australia has detailed information on growing pulses.

VARIETY DESCRIPTIONS

♻ denotes Plant Breeder Rights apply

End Point Royalty (EPR) 2016-17 quoted \$/tonne ex-GST.

Broad bean - AQUADULCE

Tall late flowering broad bean with some tolerance to waterlogging as well as iron and manganese deficiencies. Best suited to high rainfall districts (>450mm). MS to ascochyta blight (P1), chocolate spot and rust. Released 1982.

Broad bean - PBA KAREEMA ♻

PBA Kareema is a direct replacement for Aquadulce. PBA Kareema requires a long growing season similar to Aquadulce and rainfall greater than 450mm. It is RMR to ascochyta blight (P1) and MS to chocolate spot. PBA Kareema is only recommended for the south west region of Victoria. Released 2009. PGG Wrightson Seeds. EPR \$4.

Faba bean - FARAH ♻

Farah is similar to Fiesta but has good resistance to ascochyta blight pathotype 1, which reduces grain staining from ascochyta at harvest. The yield of Farah is similar to Fiesta across southern Australia and performs best in medium rainfall environments. Released 2004. Heritage Seeds. EPR \$3.

Faba bean - FIESTA VF

A medium sized bean, Fiesta has good yields and wide adaptation throughout southern Australia. It has good seedling vigour and is of medium height. Fiesta is MRMS to foliar ascochyta blight and S to chocolate spot. Released 1998.

Faba bean - NURA ♻

Nura is shorter than Fiesta and Farah and less likely to lodge, however the bottom pods are closer to the ground. Nura is RMR to both pathotypes of ascochyta blight, MS to chocolate spot and rust. Nura needs to be sown early as it flowers about seven days later than Fiesta, but it matures at a similar time. Released 2005. Seednet. EPR \$3.

Faba bean - PBA RANA ♻

Relatively late flowering and maturing variety suited to higher rainfall, long season regions. Seed is larger than current varieties and is considered high quality by the major Egyptian market. Resistant to ascochyta blight (P1), but MRMS to P2 and MS to chocolate spot. Seednet. EPR \$3.50.

Faba bean - PBA SAMIRA ♻

A high yielding variety with wide adaptation. Excellent disease resistance and later flowering means it can take advantage of late rainfall in longer season environments. Seed is a slightly larger than Fiesta and Farah and is suited to Middle East markets. Ascochyta resistance being R to both pathotypes and MS to chocolate spot and rust. Developed by PBA (as AF05069-2). Released 2015. Seednet. EPR \$3.50.

NEW Faba bean – PBA ZAHRA ♻

A new higher yielding breeding line. A later flowering and maturing variety that has performed very well in longer season environments. Seed is larger than Fiesta and Farah and similar to PBA Rana and should be suited to Middle East markets. Good overall response to diseases, resistant to ascochyta blight (P1), but MRMS to P2, MS to chocolate spot. Developed by PBA (as AF05095-1). Released 2016. Seednet. EPR \$3.50.

Table 1: Faba bean variety agronomic and disease guide.

Variety	Seed size	Seed colour	Plant height	Flowering time	Maturity	Lodging	Ascochyta blight Pathotype 1 (P1)	Ascochyta blight Pathotype 2 (P2)	Chocolate spot	Cercospora	Rust	PSbMV seed staining
Aquadulce	large	light buff	tall	late	mid-late	MS	MS	-	MS	S	MS	S
PBA Kareema	large	light brown	tall	late	late	MS	RMR	-	MS	S	MRMS	S
Farah	medium	light brown - brown	medium	early-mid	early-mid	MS	RMR	S	S	S	S	S
Fiesta VF	medium	light brown - brown	medium	early-mid	early-mid	MS	MRMS	-	S	S	S	S
Nura	small-med	light buff	short	mid	early-mid	MR	RMR	RMR	MS	S	MS	VS
PBA Rana	med-large	light brown	med/tall	mid	mid	MR	R	MRMS	MS	S	MS	MR
PBA Samira	medium	light brown	medium	mid	mid	MR	R	R	MS	S	MS	S
PBA Zahra	med-large	light brown	med/tall	mid	mid-late	MR	R	MRMS	MS	S	MS	S

Disease ratings from Pulse Breeding Australia.

Resistance order from best to worst: R > RMR > MR > MRMS > MS > MSS > S > SVS > VS.

p = provisional ratings - treat with caution. R = resistant, M = moderately, S = susceptible, V = very.

Table 2: Faba bean disease guide summary.

Disease	Organism	Symptoms	Occurrence	Hosts	Control
Ascochyta blight	<i>Ascochyta fabae</i>	Large, light tan to grey lesions on leaves. Small black fruiting bodies develop within lesions. Centres of lesions may fall out, leaving holes in leaves. Sunken lesions on stem similar in colour to leaf lesions. Brown-black discolouration of grain.	Common in all faba bean growing areas in southern Australia. Most severe in wet seasons. Spores spread by wind and rain. Infected seed.	Faba bean, vetch.	Foliar fungicides. Resistant varieties. Crop rotation. Control volunteer plants. Clean seed.
Chocolate spot	<i>Botrytis fabae</i> <i>Botrytis cinerea</i>	Passive phase: small chocolate covered spots scattered over leaves. Aggressive phase: tissue around spots turns dark grey and black. Leaves die and blacken.	Occurs in all areas where beans are grown. Disease usually becomes established in late winter and becomes more severe as day temperatures increase during spring. Spores spread by wind and rain. Can destroy unprotected crops in wet seasons.	Faba bean, vetch, lentil, chickpea.	Foliar fungicides. Resistant varieties. Crop rotation. Control volunteer plants.
Cercospora leaf spot	<i>Cercospora zonata</i>	Irregular black lesions, with a distinct margin on the leaf. Easily confused with Ascochyta or Chocolate spot but distinguished by the concentric pattern within lesions.	Occurs in all areas where beans are grown.	Faba bean, vetch.	Foliar fungicides.
Rust	<i>Uromyces viciae-fabae</i>	Numerous small, orange-brown rust pustules, surrounded by a light yellow halo on the leaves of infected plants.	Most prevalent in northern Australia. Crops usually affected late in the season.	Faba bean, vetch.	Foliar fungicides. Crop rotation. Control volunteer plants.
Sclerotinia stem rot	<i>Sclerotinia trifoliorum</i> var. <i>fabae</i> , <i>Sclerotinia sclerotiorum</i>	Infection usually begins close to ground level and slimy wet rot extends into stem and down into the roots. Plants easily pulled from soil and have blackened base covered with cottony, white fungus growth. Usually isolated plants that suddenly wilt and collapse. Sclerotia on surface and within stem turn from white to black.	Rapid development of disease in wet, cool conditions. Foliar form of disease spread by air-borne spores. Fungus survives in the soil for many years.	Wide host range.	Crop rotation. Lower seeding rates, wider row spacing and good weed control.
Stem nematode	<i>Ditylenchus dipsaci</i>	Patches of malformed and stunted plants with curling leaves and water-soaked spots. Stem may die back, turning reddish-brown colour.	Most severe in wet seasons. Nematode can survive many years in seed, straw or soil.	Faba bean, pea, oat, wild oat. Infected seed straw or soil.	Seed test. Crop rotation.
VIRUS DISEASES					
SCSV	Subterranean clover stunt virus	Stunting, tip yellowing, small and thick leaves.	Prevalent in all bean growing areas, symptoms appear early on faba bean.	Sub clover, faba bean, lupin, lentil, chickpea, lucerne, soybean.	Managing aphids and weeds.
BLRV	Bean leaf roll virus	Interveinal yellowing, leaf rolling, stunting, leathery leaves.	Occurs in all bean growing areas.	The host range is limited to <i>Fabaceae</i> .	Managing aphids.
PSbMV	Pea seedborne mosaic virus	Can be symptomless or systemic dark and light green leaf mottle, leaf margins upright leaf blade reduced in size. Seeds have brown rings or line patterns on surface.	Occurs in all bean growing areas.	Host range is limited to <i>Fabaceae</i>	Virus free seed is recommended. Managing aphids.

Table 3: Faba bean time of sowing guide.

This table is a guide only and has been compiled from observations of the breeder and local departmental agronomists.

MALLEE	April			May			June		
Farah, Fiesta, PBA Samira	>	X	X	X	<	<			
WIMMERA									
Aquadulce, Farah, Fiesta, Nura, PBA Samira, PBA Zahra	>	>	X	X	X	X	<	<	
NORTH CENTRAL - 1 week earlier for irrigation									
Aquadulce, Farah, Fiesta, Nura, PBA Samira, PBA Zahra	>	>	X	X	X	X	<	<	
NORTH EAST									
Aquadulce, Farah, Fiesta, Nura, PBA Samira, PBA Zahra		>	X	X	X	<			
SOUTH WEST									
Aquadulce, PBA Kareema, Farah, Fiesta, PBA Rana, PBA Samira, PBA Zahra		>	>	X	X	X	X	<	<

>earlier than ideal, X optimum sowing time, < later than ideal but acceptable

Table 4: Long term predicted faba bean yield 2008-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

Mean yield (t/ha)	North Central 4.97	North East 2.58	South West 3.45	Wimmera 2.33
Aquadulce	-	-	88 (4)	-
Doza	-	87 (3)	-	97 (8)
Farah	96 (6)	102 (8)	100 (6)	100 (28)
Fiesta VF	96 (6)	103 (8)	102 (6)	100 (22)
Fiord	-	-	-	99 (6)
Nura	96 (6)	101 (8)	99 (6)	96 (28)
PBA Kareema	-	-	91 (4)	-
PBA Rana	91 (3)	99 (8)	101 (6)	94 (28)
PBA Samira	103 (4)	108 (4)	109 (4)	104 (14)
PBA Zahra	106 (4)	111 (4)	109 (4)	104 (14)

Long term yield predictions provided in this report have been produced using the NVT Long Term MET (Multi Environment Trial) analysis. The analysis produces predictions or "Production Values" for every variety in every NVT trial across all years identified within the dataset. This report presents regional means for each variety which reduces the accuracy and reliability of the results. Varieties present in less than three trials per region have been omitted from this report and some rounding variation may be present when compared to other reporting methods. More detailed yield information can be found using the NVT Long Term Yield App or the Excel Reporting tools available on the NVT website (www.nvtonline.com.au).

NVT trials are managed to minimise disease impact and this may include the use of seed dressings and post emergent fungicides.

Table 5: 2015 faba bean yield (as a percentage of the site mean yield) and 100 grain weight (g/100 seeds) in NVT and DEDJTR breeding (B) trials. All NVT trials experienced multiple frosts and extreme heat conditions. Interpret data with caution. Information not provided for breeding trials.

Sowing Date	Yield (%)					100 grain weight (g) Wimmera Kaniva
	North Central	North East	South West	Wimmera		
	Kerang (B)	Dookie	Lake Bolac (B)	Kaniva	Kaniva (B)	
	4/5/15	27/4/15	22/4/15	15/4/15	15/4/15	
Farah	105	92	99	111	97	45.7
Fiesta VF	103	101	99	99	-	50.7
Nura	101	104	95	109	88	46.0
PBA Rana	-	86	101	75	82	51.6
PBA Samira	110	95	94	117	101	51.3
PBA Zahra	101	108	106	96	78	51.1
Site Mean (t/ha)	5.39	1.60	2.95	0.63	0.69	
CV (%)	7	9	10	14	13	
LSD (%)	11	14	14	23	24	

B = Breeding trial

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LUPIN

LUPIN

There are two species of lupin used in broadacre crop production, the more commonly grown narrow-leaved lupins (*Lupinus angustifolius*) and the large seeded broad-leaved types (*Lupinus albus*). Narrow-leaved types have been generally used as a high protein stock feed either for sale or supplementary feeding on farm, but more recently are being promoted as a food ingredient. The albus types may fit into human food and aquaculture markets as well as high protein stock feed markets, however are the less preferred lupin for stock feed manufacturing. Albus lupins are also more susceptible to dry conditions than narrow leaf lupins.

REVIEW OF 2015

Season

The above average price for lupins throughout 2014 led to a slight increase in the area sown to lupins across the South West and North East regions of Victoria.

A 'true' start to the 2015 season never really occurred across Victoria with sporadic rainfall events resulting in low rainfall particularly across the southern Mallee, Wimmera and South West cropping regions. Lupin crops sown early into moisture were able to produce good quantities of biomass and high yield potential. However, consecutive bouts of hot, dry weather during the plants reproductive and full flower crop stages decimated yield potential of all lupin crops across Victoria.

Crops sown early this year produced reasonable yields in sandy soils although those later sown crops, hit by the hot, dry finish had mediocre yields. Albus lupins in the South West suffered from lack of rainfall and hot windy spring conditions.

The high biomass from vigorous early growing plants meant that lupins made a good contribution to soil nitrogen for 2016. With the opportunity for weed control prior to sowing, lupins will have made an excellent broadleaf crop rotation for 2015.

Disease

Dry conditions meant there were limited reports of fungal diseases in 2015.

Some areas reported aphids early in the growing season although this was not significant.

Surveys confirm that Victoria remains free of anthracnose.

LOOKING FORWARD TO 2016

New varieties

PBA Jurien is a new high yielding narrow leaf lupin that was released in WA in spring 2015. PBA Jurien has similar agronomic characteristics to PBA Gunyidi and is best suited to the Wimmera, Mallee and central regions of Victoria. PBA Jurien will be commercially available across Victoria and South Australia for 2016.

Disease

Most narrow leaf varieties are susceptible to brown leaf spot. Fungicide seed dressings and agronomic management are required to reduce impact of this disease.

Virus diseases remain a potential issue for 2016. Seed testing is recommended to confirm freedom from CMV and

other viruses, and resistant varieties are recommended. Avoid sowing lupins adjacent to legume crops or pasture (e.g. lucerne) to reduce virus risk. Monitoring and managing aphids may also assist to manage viruses. Jenabillup and Quilnock offer the best available resistance to BYMV and black pod syndrome among currently available narrow leafed varieties.

Most current varieties have resistance to phomopsis, slowing development of the fungus and reducing toxin production. However, when significant rainfall occurs on maturing plants or after harvest disease development can still occur and care must be taken when grazing lupin stubbles or feeding infected seed to avoid lupinosis.

Anthrachnose is present in WA and SA commercial lupin crops and it is important that seed is obtained from reputable sources to prevent accidental introduction into Victoria. Albus lupin varieties are very susceptible to anthracnose. Standard hygiene practice should apply when dealing with equipment, material or people from infected states.

MORE INFORMATION

www.nvtonline.com.au

Detailed NVT trial results and links to variety information.

www.nvtonline.com.au/apps

- Australian Field Crop Disease Guide app
- NVT Long Term Yield Reports app

agriculture.vic.gov.au/agriculture/grains-and-other-crops

- [Growing lupin](#)
- [AG1347 Pulse disease guide](#)

www.pulseaus.com.au

Pulse Australia has detailed information on growing pulses.

VARIETY DESCRIPTIONS

 denotes Plant Breeder Rights apply

End Point Royalty (EPR) 2016-17 quoted \$/tonne ex-GST.

Narrow leaf lupin – JENABILLUP

Tall mid flowering narrow leaf lupin with early vigour. A high yielding variety more suited to the medium to higher rainfall areas, with MR to lodging. It has a longer flowering window compared to Mandelup, making it less suitable for crop topping. It is MR to aphid colonisation and has the best tolerance available in narrow leaf varieties for both Brown spot (MRMS), BYMV and black pod syndrome (MR). It has poor anthracnose tolerance (S) and stem phomopsis (MS) but has good pod phomopsis resistance (R). Poor tolerance of foliar Metribuzin. Released 2007. Seednet. EPR \$2.30.

Narrow leaf lupin – JINDALEE

Tall, mid flowering and late maturing variety suited to early sowing in high rainfall, long season areas. Does not handle a dry finish, and because of its vernalisation requirement can flower too late in warmer areas. Susceptible to anthracnose but resistant to phomopsis. Medium size speckled seed with medium seed alkaloid levels. Developed by NSW DPI. Released 2000.

Narrow leaf lupin – MANDELUP

A tall, early flowering and maturing variety with high yield suited to low to medium rainfall zones. Suitable for crop topping. Mandelup may lodge in high rainfall zones. Resistant to aphids and good disease resistance package being MR to anthracnose, R to stem phomopsis, MRMS to pod phomopsis and MS to brown spot. Good tolerance to Metribuzin. Pod shatter with delayed harvest and poorer seed germination rate with rain before harvest and poorer establishment have been issues with Mandelup. Released 2004. Heritage Seeds are the commercial partner for this variety. Seednet. EPR \$2.30.

Narrow leaf lupin – PBA BARLOCK

Resistant to anthracnose, PBA Barlock is an early variety with slightly later flowering and maturing than Mandelup with a greater yield potential and more resistance to pod shatter. Resistant to aphids. Strong diseases resistance profile, R to anthracnose and pod phomopsis, MR to stem phomopsis, RMR to CMV and MS to Brown leaf spot. Similar metribuzin tolerance to that of Mandelup and better than Wonga. Released in WA in 2013 and eastern states in 2014. Seednet. EPR \$2.50

Narrow leaf lupin – PBA GUNYIDI

PBA Gunyidi is a slightly later flowering and maturing variety than Mandelup. PBA Gunyidi has proven widely adapted to a range of environments, and is considered an alternative to Mandelup, but with greater resistance to pod shattering. It is not as tall as Mandelup, and generally considered comparable to it for yield. Resistant to aphids. Strong disease resistance profile, MR to anthracnose, R to phomopsis and MS to Brown leaf spot. It is only available in limited supply in eastern Australia and likely to be adopted only by those who are dissatisfied with Mandelup. Developed by PBA. Released 2011. Seednet. EPR \$2.50.

NEW Narrow leaf lupin – PBA JURIE

An early maturing, early flowering variety, flowering slightly earlier than PBA Barlock. Very strong disease resistance profile being resistant to anthracnose, phomopsis and grey spot and having tolerance of BYMV and black pod syndrome similar to Jenabillup. Seed dressings are still recommended to reduce the risk of seed borne anthracnose infections. PBA Jurie is similar in height to Mandelup and is MS to lodging in high rainfall regions. Tolerance to Metribuzin is better than Mandelup. The seed size is similar to Mandelup and the alkaloid content is similar to PBA Gunyidi. Some reduced seed germination has been experienced when rain before harvest has affected seed quality. Developed by PBA. Released 2015 (WALAN2385). Seednet. EPR \$2.50.

Narrow leaf lupin – QUILNOCK

SVS to anthracnose. It is early flowering for low to medium rainfall areas. Poorer phomopsis resistance than most varieties, MRMS to stem phomopsis and MS to pod phomopsis. Poor tolerance to Metribuzin. Released 1999. Limited quantities grown in eastern states due to anthracnose susceptibility. DAFWA. EPR \$0.95.

Narrow leaf lupin – WONGA

Resistant to anthracnose and phomopsis with medium height and lodging resistance. Best suited to medium rainfall districts, particularly when resistance to anthracnose phomopsis is required. Poor tolerance of Metribuzin. Released 1997.

Albus lupin – KIEV MUTANT

Once the most widely grown *albus* variety, but now superseded. It is of moderate height, grows vigorously, flowers early but matures late compared with narrow leaf lupins. Requires rainfall higher than 450mm to yield well. Does not handle waterlogged conditions. Alkaloid testing of seed is required.

Albus lupin – LUXOR

A newer release to replace Kiev Mutant, but with resistance to Pleiochaeta root rot. Slightly taller than Kiev Mutant and suitable for lower to medium rainfall regions and high rainfall regions where Pleiochaeta root rot is a problem. Luxor is 100 per cent sweet and should not be grown within 2 km of other *albus* varieties to avoid bitter contamination. Released 2008. Seednet. EPR \$2.80.

Albus lupin – ROSETTA

A release selected for improved yield and Pleiochaeta root rot resistance compared to Kiev Mutant. It is late flowering, making it suitable for medium and higher rainfall regions although has compared well with other *albus* varieties in the Mallee. It is tall and 100 per cent sweet, so should not be grown near other *albus* varieties. Very little is grown in the eastern states. Released 2007.

Bitter, large seeded albus lupin - LUPINI bean

Varieties are Lago Azzurro, Mount Beauty and Murphy. They must be grown in complete isolation from sweet *albus* varieties due to the high alkaloid content of the seed and the potential to cross or contaminate sweet *albus* varieties. *Production is for a niche market.*

Table 1: Optimal lupin sowing times for rainfall zones and soil types.

Rainfall zone	Optimum sowing time	
	Average mm per year	Sands Shallow sand over clay, sandy loams, loams
Below 350 mm	mid April to early May	late April to early May
350 - 450 mm	early to mid May	mid May
Above 450 mm	mid May	late May

Table 2: Lupin variety agronomic and disease guide.

	Flower- ing time	Height	Lodging	Pod shattering	Drought tolerance	Aphid resist	Brown leaf spot	Pleiochaeta root rot	CMV seed transmit	Anthrax- nose	Phomopsis	Stem	Pod
Narrow leaf													
Jenabillup	M	T	MR	MS	MR	MR	MRMS	R	MRMS	S	MS	R	
Jindalee	M-L	M	R	MR	MS		MRMS	R	MS	S	R	R	
Mandelup	VE	T	MS	MS	MR	R	MS	R	MS	MR	R	MRMS	
PBA Barlock	E	M	MR	R		R	MS		RMR	R	MR	R	
PBA Gunyidi	VE	M	MS	R	MR	R	MS	R	MRMS	MR	R	R	
PBA Jurien	VE	T	MS	MR		R	MS		MRMS	R	R	MR	
Quilinoch	E	S	MS	MR	MR	MS	MRMS	R	MS	SVS	MRMS	MS	
Wonga	E-M	M	MR	R	MS	R	MS	R	R	R	R	R	
Albus lupin													
Kiev Mutant	E	M	R		MS	S	MS	VS	Immune	VS	MR	S	
Luxor	E-M	M-T	R		MS	S	MR	R	Immune	VS	MR	S	
Rosetta	M-L	T	R		MS	S	MR	MR	Immune	VS	MR	S	

Flowering time; VE=very early, E=early, M=mid, L=late

Height; S=short, M=medium, T=tall

Lodging and disease reactions; R = Resistant RMR = Resistant to moderately resistant MR = Moderately resistant

MRMS = Moderately resistant to moderately susceptible MS = Moderately susceptible MSS = Moderately susceptible to susceptible S = Susceptible SVS = Susceptible to very susceptible VS = Very susceptible

Table 3: Lupin sowing guide.

This table is a guide only and has been compiled from observations of the breeder and local departmental agronomists.

MALLEE	April				May				June				July			
Narrow leaf																
Jenabillup, Mandelup, PBA Barlock, PBA Gunyidi, PBA Jurien, Quilinoch, Wonga			>	X	X	X	X	<	<							
Albus lupin																
Kiev Mutant, Luxor, Rosetta			>	X	X	X	X	<	<							
WIMMERA	April				May				June				July			
Narrow leaf																
Jenabillup, Mandelup, PBA Barlock, PBA Gunyidi, PBA Jurien, Quilinoch, Wonga			>	>	X	X	X	X	<	<						
Albus lupin																
Kiev Mutant, Luxor, Rosetta			>	>	X	X	X	X	<	<						
NORTH CENTRAL	April				May				June				July			
Narrow leaf																
Jenabillup, Jindalee, Mandelup, PBA Barlock, PBA Gunyidi, PBA Jurien, Quilinoch, Wonga			>	>	X	X	X	X	<	<						
Albus lupin																
Kiev Mutant, Luxor, Rosetta			>	>	X	X	X	X	<	<						
NORTH EAST	April				May				June				July			
Narrow leaf																
Jenabillup, Jindalee, PBA Barlock, PBA Gunyidi, PBA Jurien, Quilinoch, Wonga			>	X	X	X	X	<	<							
Albus lupin																
Kiev Mutant, Luxor, Rosetta			>	X	X	X	X	<	<							
SOUTH WEST	April				May				June				July			
Narrow leaf																
Jenabillup, Jindalee, PBA Barlock, PBA Gunyidi, PBA Jurien, Quilinoch, Wonga			>	X	X	X	X	<	<							
Albus lupin																
Kiev Mutant, Luxor, Rosetta			>	X	X	X	X	X	<							

>earlier than ideal, X optimum sowing time, < later than ideal but acceptable

Table 4: Lupin disease guide.

Disease	Organism	Symptoms	Occurrence	Inoculum source	Control
FUNGAL DISEASES					
Brown leaf spot	<i>Pleiochaeta setosa</i>	Dark spots on leaves and pods, often web like on leaves, infected leaves drop off, lesions may girdle stem.	Very common but losses usually minor in dry areas, yield loss can be significant in cool damp areas.	Spores survive in soil and lupin trash. Rain splash and windblown rain spread the disease.	Fungicide seed dressings, crop rotation, variety selection, early sowing, sow into cereal stubble.
Pleiochaeta root rot	<i>Pleiochaeta setosa</i>	Browning and rotting of tap and lateral roots, seedling plant death.	Serious reduction in lupin plant density and vigour.	Spores in soil infecting roots usually at seedling stage, spread also by rain splash.	Minimum 4 year rotation between lupins, sowing 4-5 cm deep to avoid spore layer, fungicide seed dressings.
Rhizoctonia	<i>Rhizoctonia spp.</i>	Bare patches in crop, spear tipped root ends or hypocotyl rot and stain.	Can be severe in isolated patches, reduces stand density, favoured by minimum tillage, wet soils and mild conditions.	Soil borne infection with wide host range, survives as fungal fragments in soil and plant debris.	Tillage prior and during sowing below seed depth, rotation has no effect.
Anthrachnose	<i>Colletotrichum lupini</i>	Dark brown lesions containing pink/orange spore masses on stems, pods and occasionally leaves. Lesions cause bending and twisting of stems and pods and occur in crook of bend.	Severe infections can result in severing of stems or total pod abortion resulting in complete crop failure.	Seed-borne infection. Spread in crop by rain splash and wind.	Clean seed and machinery, resistant varieties, fungicide seed dressings.
Sclerotinia	<i>Sclerotinia sclerotiorum</i>	White fungal growth containing black sclerotia in upper stem, branches or colonising pods. Stem death above lesion. Sclerotia contaminating harvested seed.	Most common in higher rainfall or wetter regions, particularly in canola growing regions.	Sclerotia survive in soil and trash for several years. Wide host range in broad leaf crops.	Avoid lupins following broad leaf crops or pasture (particularly canola). <u>No</u> variety resistance.
VIRUS DISEASES					
CMV	Cucumber mosaic virus	Leaves are pale, bunched, and down curled with faint mosaic pattern.	Early widespread infection severely reduces yield. Minor infections prevent use of harvested grain as seed.	Seed borne infection in narrow leaf lupin, aphid vectored in crop.	Sow clean seed, use a seed test, high sowing rates and cereal barriers around crops reduce aphid transmission.
BYMV Black pod syndrome	Bean yellow mosaic virus	Brown necrotic streaks as plant dies back from growing point of stem, shepherd crook of stem, pods blackened and flat, leaves yellow, plants wilt and die.	Can be severe in higher rainfall areas, usually transmitted from pasture.	Aphid vectored, many hosts (including pasture legumes), seed borne in <i>L. albus</i> .	High plant density, cereal barrier, control weed and volunteer lupins, avoid sowing adjacent to legume pastures.

Table 5: Long term predicted lupin yield 2009-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

Mean yield (t/ha)	Mallee 1.18	North Central 2.10
Coromup	93 (10)	96 (6)
Jenabillup	98 (14)	100 (6)
Jindalee	83 (4)	-
Mandelup	104 (14)	103 (6)
PBA Barlock	101 (12)	98 (5)
PBA Gunyidi	100 (14)	101 (5)
PBA Jurien	103 (10)	104 (4)
Quilinock	96 (10)	-
Wonga	92 (14)	86 (6)

Long term yield predictions provided in this report have been produced using the NVT Long Term MET (Multi Environment Trial) analysis. The analysis produces predictions or "Production Values" for every variety in every NVT trial across all years identified within the dataset. This report presents regional means for each variety which reduces the accuracy and reliability of the results. Varieties present in less than three trials per region have been omitted from this report and some rounding variation may be present when compared to other reporting methods. More detailed yield information can be found using the NVT Long Term Yield App or the Excel Reporting tools available on the NVT website (www.nvtonline.com.au).

NVT trials are managed to minimise disease impact and this may include the use of seed dressings and post emergent fungicides.

Table 6: 2015 lupin yield (as a percentage of the site mean yield) and 100 grain weight (g/100 seeds). All trials experienced multiple frosts and extreme heat conditions. Interpret data with caution.

Sowing Date	Mallee			
	Yield (%)		Grain weight (g/100 seeds)	
	Hopetoun 29/4/15	Walpeup 24/5/15	Hopetoun	Walpeup
Coromup	77	90	11.3	12.4
Jenabillup	97	97	10.6	11.7
Jindalee	59	77	9.3	10.2
Mandelup	114	98	11.6	12.5
PBA Barlock	92	94	10.5	10.7
PBA Gunyidi	109	105	9.4	11.4
PBA Jurien	100	105	11.5	11.9
Quilinock	115	94	11.3	12.4
Wonga	76	94	10.2	10.6
Site Mean (t/ha)	0.61	1.21		
CV (%)	12	9		
LSD (%)	19	14		

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CHICKPEA

CHICKPEA

REVIEW OF 2015

Season

A dry start to the season and poor pricing signals at sowing meant that the area sown to chickpeas was reduced in Victoria compared to 2014.

The 2015 season was a challenge for chickpea crops, like all commodities. Growers in the Wimmera, the traditional chickpea region of Victoria, either sowed dry or planted late into a decile 1 season, off the back of a decile 1 spring in 2014. Chickpea crops sown early (late April to mid-May) had the potential to yield better than late sown crops.

As with all pulses there were establishment issues caused by herbicide residues and dry conditions, particularly from Groups B, C and I.

The significant heat stress event in October combined with another decile 1 spring decimated yield potential to well below average, with some crops not being harvested. Growers that had stored grain from previous seasons or harvested in 2015 were able to take advantage of rising grain prices throughout the season.

Early sowing (within the sowing window, see Table 1) remains an important management technique for chickpeas although consideration of cold temperatures, frost risk and adequate disease management is required for success.

Disease and insects

Dry conditions and less frequent sowings minimised inoculum levels of ascochyta, and the disease was not a major issue for growers in 2015.

Following isolated field reports of ascochyta blight in Genesis™ 090 and other resistant varieties in 2013 and 2014, the disease was observed in a field trial in 2015 and some commercial crops. This appears to be a change in reaction for the previously resistant Genesis™ 090 and other resistant types such as Genesis™ 079, Ambar, Neelam and PBA Slasher.

There was some evidence of root disease which is typical of drier years.

LOOKING FORWARD TO 2016

There are no new varieties being released for 2016.

Disease

Management of fungal diseases remains the most important priority for sowing. Source seed from a paddock where ascochyta was not detected or was well managed and treat with a fungicide seed dressing to minimise ascochyta blight and botrytis grey mould (BGM). Sow into a paddock more than 500 metres away from last year's chickpea crop.

Due to observations of foliar ascochyta blight infection on Genesis™ 090 at multiple sites in SA and Victoria in 2015 all ratings are currently under review. All varieties should be monitored for foliar ascochyta blight infection during the growing season and sprayed if disease is detected to prevent spread to pods until further understanding of variety resistance is available. Any ascochyta blight found on R or MR varieties should be reported to CropSafe. In

high risk ascochyta blight areas a preventative early vegetative application (6-8 weeks after emergence) is suggested to prevent yield loss as the pathogen is continually evolving with increased selection pressure towards isolates capable of infecting and reproducing on the dominant varieties in the region.

Herbicides and their residues can increase susceptibility to disease. Growers need to consult with cropping advisors to maintain an awareness of the products and rates registered for use on chickpeas and the plant back time for chemicals used previously.

In 2016 provisional root lesion nematode resistance ratings have been provided. Most chickpea varieties are susceptible to *P. thornei* and will increase nematode densities in most seasons. However, in the southern region avoiding the most susceptible varieties should reduce nematode multiplication if resistant crops or varieties are used in rotation. Resistant varieties will reduce nematode densities or maintain them at low levels. Susceptible varieties will increase nematode densities or maintain them at levels which will cause yield loss in subsequent intolerant varieties. For detailed information consult the definitions on the NVT website.

MORE INFORMATION

www.nvtonline.com.au

Detailed NVT trial results and links to variety information.

www.nvtonline.com.au/apps

- Australian Field Crop Disease Guide app
- NVT Long Term Yield Reports app

agriculture.vic.gov.au/agriculture/grains-and-other-crops

- [Growing chickpea](#)
- [AG1347 Pulse disease guide](#)

www.pulseaus.com.au

Pulse Australia has detailed information on growing pulses including:

- Chickpea disease management strategy

VARIETY DESCRIPTIONS

(b) denotes plant breeders rights apply.

End Point Royalty (EPR) 2016-17 quoted \$/tonne ex-GST.

*All ascochyta blight ratings are currently under review following infection on Genesis™ 090 at multiple sites in SA and Victoria in 2015. Ascochyta ratings in text below are based on pre 2015 data and may not reflect potential new resistance ratings.

Desi type – AMBAR *(b)*

Has good ascochyta resistance* and is likely to require only one fungicide application during podding. Ambar is an early flowering and maturing variety suitable for short season environments. Seed is smaller than Howzat and PBA Slasher but has a uniform grain size and tan-brown colour that assists marketing. Released 2012. Heritage Seeds. EPR \$4.

Desi type – HOWZAT

Susceptible to ascochyta blight, strategic application of fungicides is required. Initially prostrate rather than erect, standing ability improves towards maturity. Mid flowering with tan grain of medium size. The variety has excellent adaptation to most chickpea growing regions. Released 2000. Australian Agricultural Crop Technologies.

Desi type – NEELAM

Good resistance to ascochyta blight*. Mid flowering and mid maturing variety. Seed is smaller than Howzat and PBA Slasher. Released 2012. Heritage Seeds. EPR \$4.

Desi type – PBA MAIDEN

MR to ascochyta blight* and when grown in Victoria will require at least one fungicide application during the vegetative phase (8-10 weeks after sowing) and an additional spray at podding. Large angular seed size, yellow-tan in colour, is suitable for the whole seed market. Early-mid flowering and mid maturity, is S to BGM. Growers are advised to investigate delivery and marketing options prior to growing this variety due to its unique and favourable seed characteristics. Released 2013. Seednet. EPR \$4.

Desi type – PBA SLASHER

Good resistance to infection by ascochyta* and is likely to require only one fungicide application during podding. PBA Slasher has mid flowering and maturity. Seed is medium size tan-brown which has excellent milling quality, suitable for both split and whole seed markets. It is susceptible to BGM, similar to Genesis™ varieties. Released 2009. Seednet. EPR \$4.

Desi type – PBA STRIKER

MR to ascochyta blight* and when grown in Victoria will require at least one fungicide application during the vegetative phase (8-10 weeks after sowing), and an additional spray at podding. Excellent adaptation to short season environments due to early flowering and maturity. Medium seed size with excellent milling quality. Released 2012. Seednet. EPR \$4.

Kabuli type – ALMAZ

MS to ascochyta blight. Almaz will require at least 3 fungicide applications to be successfully grown in Victorian growing conditions. Seed size is similar to PBA Monarch (8-9 mm) but smaller than Genesis™ Kalkee. Yield is lower than PBA Monarch. Best adapted to the traditional kabuli growing areas. Released 2005. Seednet. EPR \$6.50.

Kabuli type – GENESIS™ 079

Good resistance to ascochyta blight*, Genesis™ 079 is likely to only require one fungicide application during podding. It is a high yielding small seeded type (6-7mm) with relatively high yields in short season environments. Genesis™ 079 is the earliest flowering and maturing kabuli variety available. Released 2009. Australian Agricultural Crop Technologies. EPR \$5.

Kabuli type – GENESIS™ 090

Ascochyta blight was observed on Genesis™ 090 in some commercial crops in 2015 and the resistance in this variety is under review. This variety should be regularly monitored and fungicides applied as soon as lesions are observed. Podding sprays are essential ahead of rainfall. It has shown wide adaptation and excellent yield stability, including in drier environments. Genesis™ 090 has a small seed (7-8 mm), approximately 1 mm smaller than Almaz or PBA Monarch. It has the potential to be grown as a good alternative to desi chickpeas or as a higher yielding but lower value alternative (smaller seed) to kabuli's such as Almaz, PBA Monarch and Genesis™ Kalkee. Released 2005. Australian Agricultural Crop Technologies. EPR \$5.

Kabuli type – GENESIS™ KALKEE

MS to ascochyta blight and when grown in Victoria is likely to require strategic fungicide applications (2-4 sprays) throughout the growing season. Seed size is larger than Kaniva and Almaz (predominantly 9 mm) with an erect plant habit. Released 2012. Australian Agricultural Crop Technologies. EPR \$5.

Kabuli type – PBA MONARCH

MS to ascochyta blight and when grown in Victoria is likely to require strategic fungicide applications (2-4 sprays) throughout the growing season. Particularly suited to shorter season environments. Medium seed size (8-9 mm) is larger than Genesis™ 090 and similar to Almaz. Highest yielding medium sized kabuli. A semi-spreading plant similar to PBA Slasher with some susceptibility to lodging particularly when biomass is high. Released 2013. Seednet. EPR \$6.50.

Table 1: Chickpea time of sowing guide.

This table is a guide only and has been compiled from observations of the breeder and local departmental agronomists.

MALLEE	April			May			June			July		
Desi												
Ambar, PBA Maiden, PBA Slasher, PBA Striker		>	>	X	X	X	<	<	<			
Kabuli												
Genesis 079, Genesis 090, PBA Monarch		>	>	X	X	X	<	<	<			
WIMMERA	April			May			June			July		
Desi												
Ambar, PBA Maiden, PBA Slasher, PBA Striker				>	X	X	X	X	<	<	<	
Kabuli												
Genesis 079, Genesis 090				>	X	X	X	X	<	<	<	
Almaz, Genesis Kalkee, PBA Monarch				>	>	X	X	X	X	<	<	
NORTH CENTRAL	April			May			June			July		
Desi												
Ambar, PBA Maiden, PBA Slasher, PBA Striker		>	>	X	X	X	<	<	<			
Kabuli												
Genesis 079, Genesis 090, PBA Monarch		>	>	X	X	X	<	<	<			

>earlier than ideal, X optimum sowing time, < later than ideal but acceptable

Table 2: Chickpea disease guide summary.

Disease	Organism	Symptoms	Occurrence	Hosts	Control
Ascochyta blight	<i>Ascochyta rabiei</i> .	Pale brown lesions on leaves, stems and pods. Lesions may have a grey centre containing small black fruiting bodies. Infected stems wither and break.	Occurs in all regions. Affects both kabuli and desi types. Most severe in spring.	Chickpea.	Fungicide seed dressing, foliar fungicides, rotation, avoid susceptible varieties, avoid early sowing.
Botrytis grey mould	<i>Botrytis cinerea</i> .	Poor emergence and death of young plants. Soft rot at the base of the stem. Grey mould growth on leaves, stems and pods. Lodging of plants in dense crops. Discolouration of seed with grey mould.	Occurs in all regions. Affects both kabuli and desi types. Most severe in wet seasons. Dense crops are more likely to be affected.	Chickpea, most pulses, including lentil and faba bean.	Fungicide seed dressings, lower plant densities, avoid early sowing.
Sclerotinia	<i>Sclerotinia sclerotiorum</i> .	Scattered dead plants within a crop. Cottony white fungal growth on the lower stems of dead plants. Soft rot and white mould on stems and pods.	Occurs in all chickpea growing regions. Most severe in wet seasons where chickpea is planted in fields recently cropped to chickpea.	Most pulses, oilseeds and broadleaf weeds.	Crop rotation. (Seed dressings of no benefit.)
Damping-off	<i>Pythium</i> spp.	Poor crop establishment under wet conditions. Seed rotting in the ground. Sudden death of young seedlings.	Problem in all regions, particularly in soils that become very wet just after sowing. More severe on kabuli than desi chickpea.	Chickpea, most pulses.	Fungicide seed dressings, avoid poorly drained soils.
Phytophthora	<i>Phytophthora megasperma</i> .	Plants suddenly wither and die, particularly after waterlogging. Dark brown to black discolouration of the tap root.	Most serious disease in northern Australia. May be a problem in poorly drained soils in southern Australia under wet conditions.	Chickpea, lucerne.	Resistant varieties.
Phoma blight	<i>Phoma medicaginis</i> var. <i>pinodella</i> .	Blackening of the stem near ground level. Dark, tan coloured lesions on leaves, stems and pods.	Common in most chickpea growing regions. Most severe in wet seasons.	Most legumes.	Crop rotation.
Root lesion nematode	<i>Pratylenchus thornei</i> and <i>Pratylenchus neglectus</i> .	Ill-thrift, lack of branching of root system, small dark stripes on roots.	Favoured by wheat in rotation with chickpea, medic and vetch.	Wheat, chickpea, medic, vetch, narbon bean.	Crop rotation (predictive soil test available).
VIRUS DISEASES					
AMV	Alfalfa mosaic virus	Tip necrosis. The leaves and stems of Desi varieties become red/brown. The leaves and stems of Kabuli varieties turn yellow.	Occurs in all chickpea growing areas. Seasons and districts with major aphid flights.	Wide host range including most pulses, some horticultural plants and weeds	Virus-free seed Resistant varieties
CMV	Cucumber mosaic virus	Yellowing, stunting, offshoots. The leaves and stems of Desi varieties become red/brown. The leaves and stems of Kabuli varieties turn yellow.	Prevalent in chickpea growing regions. Seasons and districts with major aphid flights.	Very wide host range, including most pulses, pastures, horticultural crops and weeds	Virus-free seed Resistant varieties
BWYV	Beet western yellows virus	Yellowing, stunting, offshoots. The internal tissues of the main stem at the base turn brown.	Occurs in all chickpea growing areas. Seasons and districts with major aphid flights.	Very wide host range, including most pulses, brassicas and weeds	Managing aphids and weeds, resistant varieties

Table 3: Chickpea variety agronomic guide.

Variety	Ave 100 seed wt (g)	Seed size group	Early growth	Flowering	Maturity	Height	Lodging resistance
DESI							
Ambar	16	small	poor-mod	early	early	short-mid	MS
Howzat	20	medium	poor-mod	mid	mid	mid	MS
Neelam	17	medium	mod	mid	mid	short-mid	MS
PBA Maiden	24	med-large	mod	mid	mid	short-mid	MS
PBA Slasher	18	medium	poor-mod	mid	mid	short-mid	MS
PBA Striker	22	medium	good	early	early	short-mid	MS
KABULI							
Almaz	38	medium	mod	mid-late	late	mid-tall	MR
Genesis 079	24	small	good	early	early	short	MR
Genesis 090	31	small	good	mid	mid-late	mid	MR
Genesis Kalkee	45	large	good	late	late	tall	R
PBA Monarch	40	medium	poor-mod	early	early	mid	MS

Lodging resistance - see key used in Table 4

Table 4: Chickpea variety disease guide.

* Due to observations of foliar ascochyta blight infection on Genesis™ 090 at multiple sites in SA and Victoria in 2015 these ratings are currently under review. All varieties rated as R or MR should monitored for foliar ascochyta blight infection during the growing season and sprayed if disease is detected to prevent spread to pods until further understanding of variety resistance is available.

Variety	Botrytis grey mould	Ascochyta blight Foliage /Stem*	Ascochyta blight Pod	<i>P. thornei</i> (provisional)
DESI				
Ambar	S	R*	S	
Howzat	MS	S	S	MSp
Neelam	S	R*	S	
PBA Maiden	S	MR*	S	
PBA Slasher	S	R*	S	MRMS
PBA Striker	S	MR*	S	
KABULI				
Almaz	S	MS	S	VS
Genesis 079	S	R*	S	MR
Genesis 090	S	R*	S	S
Genesis Kalkee	S	MS	S	MS
PBA Monarch	S	MS	S	MS

Disease ratings from Pulse Breeding Australia.

R = Resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible, VS = very susceptible, p = provisional

Table 5: Long term predicted chickpea yield 2011-2015 expressed as a percentage of the mean yield. Number of site years in brackets.

Mean yield (t/ha)	Desi		Kabuli	
	Mallee 0.92	Wimmera 1.39	Mallee 0.89	Wimmera 1.46
Ambar	103 (15)	102 (11)	Almaz	87 (15)
Genesis 079	109 (19)	105 (16)	Genesis 079	112 (15)
Genesis 090	102 (19)	108 (16)	Genesis 090	107 (15)
Genesis 509	98 (4)	97 (9)	Genesis 114	93 (9)
Genesis 836	98 (4)	99 (9)	Genesis 425	-
Howzat	100 (4)	97 (9)	Genesis Kalkee	99 (15)
Neelam	108 (18)	105 (12)	PBA Monarch	111 (15)
PBA Boundary	101 (4)	102 (9)		
PBA HatTrick	96 (4)	98 (9)		
PBA Maiden	107 (19)	102 (16)		
PBA Slasher	110 (19)	108 (16)		
PBA Striker	111 (19)	102 (16)		

Long term yield predictions provided in this report have been produced using the NVT Long Term MET (Multi Environment Trial) analysis. The analysis produces predictions or "Production Values" for every variety in every NVT trial across all years identified within the dataset. This report presents regional means for each variety which reduces the accuracy and reliability of the results. Varieties present in less than three trials per region have been omitted from this report and some rounding variation may be present when compared to other reporting methods. More detailed yield information can be found using the NVT Long Term Yield App or the Excel Reporting tools available on the NVT website (www.nvtonline.com.au).

NVT trials are managed to minimise disease impact and this may include the use of seed dressings and post emergent fungicides.

Table 6: 2015 Desi chickpea yield (as a percentage of the site mean yield) and grain weight (g/100 seeds) in NVT and DEDJTR breeding (B) trials. All NVT trials experienced multiple frosts and extreme heat conditions. Interpret data with caution. Information not provided for breeding trials.

Sowing Date	Mallee Rainbow		Wimmera	
	Yield	Grain weight (g/100 seeds)	Horsham Yield (%)	Tarranyurk (B) Yield (%)
	18/5/15		3/6/15	2/6/15
Ambar	84	13.5	72	72
Genesis 079	91	18.2	90	97
Genesis 090	75	22.3	76	104
Genesis 509	-		89	-
Genesis 836	-		102	-
Howzat	-		90	-
Neelam	92	15.9	91	78
PBA Boundary	-		79	-
PBA HatTrick	-		92	-
PBA Maiden	94	18.5	92	107
PBA Slasher	99	17.3	107	104
PBA Striker	112	17.6	127	117
Site Mean (t/ha)	0.47		0.70	0.34
CV (%)	7		14	11
LSD (%)	12		24	17

B = Breeding trial

Table 7: 2015 Kabuli chickpea yield (as a percentage of the site mean yield) and grain weight (g/100 seeds) in NVT and DEDJTR breeding (B) trials. Trial experienced multiple frosts and extreme heat conditions. Interpret data with caution.

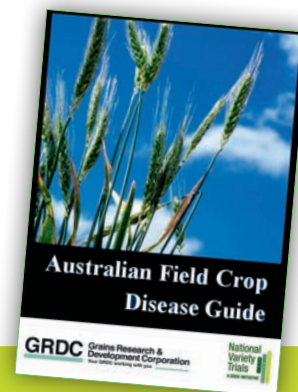
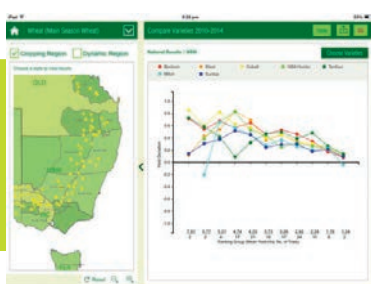
Sowing Date	Mallee Rainbow	
	Yield (%)	Grain weight (g/100 seeds)
	18/5/15	
Almaz	40	24.2
Genesis 079	157	18.4
Genesis 090	119	23.1
Genesis Kalkee	72	26.1
PBA Monarch	89	30.3
Site Mean (t/ha)	0.34	
CV (%)	10	
LSD (%)	16	

ACKNOWLEDGEMENTS

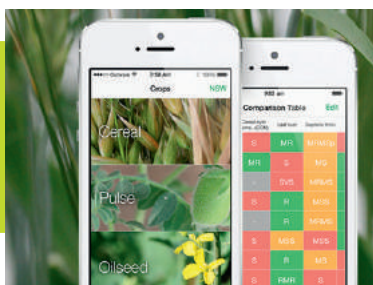
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NVT apps

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The NVT LONG-TERM YIELD REPORTS provide Australian growers and advisers with the best available tool for making variety selection decisions based on crop yield. Information is available for all cropping regions in Australia for 10 crops: wheat, barley, canola, oats, triticale, chickpeas, field peas, faba beans, lentils and lupins.



The CROP DISEASE AU application has been developed by the Australian National Variety Trials program (NVT) and funded by the GRDC. It provides access to up-to-date variety information from the NVT database, as well as current disease-resistance ratings, disease information and an extensive disease image library.

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