

# 2020 VICTORIAN CROP SOWING GUIDE



**GRDC**

GRAINS RESEARCH  
& DEVELOPMENT  
CORPORATION

**VICTORIA**  
NOVEMBER 2019



**ARE YOU GROWING THE BEST  
VARIETY FOR YOUR SITUATION?**

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**Title:**

2020 Victorian Crop Sowing Guide

This publication summarises information on current varieties of the major winter crops grown in Victoria. 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.

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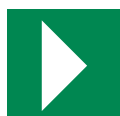
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[www.grdc.com.au/NVT-Victorian-Winter-Crop-Summary](http://www.grdc.com.au/NVT-Victorian-Winter-Crop-Summary)  
 Remember to update it each November.

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## THE VICTORIAN CROP SOWING GUIDE

The *Victorian Crop Sowing Guide* outlines information on current varieties of the major winter crops grown in Victoria. The publication aims to prompt growers to ask themselves, 'Am I growing the best variety for my situation?'

The *Victorian Crop Sowing Guide* is compiled by Agriculture Victoria, with sources of additional information listed in each chapter. Local advisers are also a key resource for information relevant to individual localities. Growers are encouraged to use this publication as a guide for discussion with consultants, advisers and marketing agents.

The sowing guide has once again been published in spring, a timely release to assist growers in making variety choices for the 2020 season. It will be important for growers and advisers to review disease resistance ratings in March 2020 in the cereal and pulse disease guides to ensure they know the current resistance ratings of varieties. The latest 2019 National Variety Trials (NVT) data will also be available early in 2020 via the NVT website and Long Term Yield Reporting tool.

The *Victorian Crop Sowing Guide* is a joint investment between the Grains Research and Development Corporation (GRDC) and Agriculture Victoria. Thank you to GRDC and all contributors for making this publication available to Victoria.

## INTERPRETING CEREAL RESISTANCE CLASSIFICATIONS

Below is an explanation of the resistance ratings used in this guide for foliar diseases, and how they should be interpreted.

- R** Resistant: the disease will not multiply or cause any damage on this variety.
- MR** Moderately resistant: the disease may be visible and will multiply slightly, but will not cause significant loss.
- MS** Moderately susceptible: the disease may cause losses up to 15% or more in very severe cases.
- S** Susceptible: the disease can be severe on this variety and losses of 15 to 50% can occur.
- VS** Very susceptible: this variety should not be grown in areas where a disease is likely to be a problem. Losses greater than 50% are possible and the build-up of inoculum will create problems for other growers.

## INTERPRETING PULSE RESISTANCE CLASSIFICATIONS

NB: These classifications are only a guide, and yield losses will depend on the environment and seasonal conditions. No pulse crops or varieties are immune to disease and fungicide application may be required under severe disease pressure. Below is an explanation of the resistance ratings used in this guide for foliar diseases, and how they should be interpreted.

- R** Resistant: the disease will not multiply or cause any damage on this variety. However, under severe disease pressure, fungicide applications may be required.
- MR** Moderately resistant: the disease may be visible and will multiply slightly, but it will not cause significant loss. However, under severe disease pressure, fungicide applications may be required.
- MS** Moderately susceptible: the disease will cause yield losses in conducive seasons.
- S** Susceptible: the disease will be severe on this variety and cause significant yield losses in conducive seasons.
- VS** Very susceptible: this variety should not be grown in areas where a disease is likely to be a problem. Significant yield losses can be expected without control and the increase in inoculum will create problems for other growers.

## NEMATODE RESISTANCE RATINGS

Below is an explanation of the resistance ratings used in this guide for **nematodes for both cereals and pulses**, and how they should be interpreted.

- R** Resistant: nematode numbers will decrease when this variety is grown.
- MR** Moderately resistant: nematode numbers will slightly decrease when this variety is grown.
- MS** Moderately susceptible: nematode numbers will slightly increase when this variety is grown.
- S** Susceptible: nematode numbers will increase greatly in the presence of this variety.
- VS** Very susceptible: a large increase in nematode numbers can occur when this variety is grown, and this will cause problems to a following intolerant crop.

These classifications are only a guide and yield losses will depend on the environment and seasonal conditions.

## DISEASE RATING COLOUR RANGE

VS	SVS	S	MSS	MS	MRMS	MR	RMR	R
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# INTRODUCTION

## NATIONAL VARIETY TRIALS (NVT)

The variety trials presented in this guide are sourced from the NVT program. NVT also provides data from some breeding trials to add to the information available. In Victoria, NVTs are fully funded by GRDC and in 2019 field trial management was contracted to three service providers: Eurofins, Birchip Cropping Group and Southern Farming Systems.

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 this sowing guide.

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 cooperation of farmers prepared to contribute sites, and who often assist with the management of trials on their property.

## PLANT BREEDING RIGHTS (PBR)

Varieties subject to Plant Breeding Rights at the time of printing are annotated with the symbol (b). 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 Breeder's Rights Act 1994* and that any breaching of PBR law is punishable by a maximum \$50,000 fine for each offence'.

## END POINT ROYALTIES (EPRS)

EPRs payable for 2019-20 are quoted from [www.varietycentral.com.au](http://www.varietycentral.com.au) and are quoted ex-GST. Compliance with EPR systems is vital to ensure the future of the Australian grains industry through the funding of new varieties and long-term productivity gains. EPRs for 2020-21 harvest will become available early in 2020 on the Variety Central website.

## SELECTION CRITERIA

When selecting a variety, farmers need to make their selection based on the available information, including yield, crop quality attributes, disease and pest resistance, individual farm and paddock situation, the access and availability of target markets, and storage and handling facilities.

## COMPROMISED TRIALS

It is important to note, trials in the NVT are sometimes subject to seasonal or management issues. Trials that do not meet the quality requirement for publication through the NVT reporting tools are published within the NVT quarantined trials reports. Quarantine reports include trials which have been compromised and should not be used to make variety selection decisions. These trials may have been affected by frost, drought, animals or spray drift. The purpose of the NVT is to allow growers to make informed variety selections and compromised trials can be misleading and result in poor variety selection.



## INTERPRETING LONG-TERM YIELD DATA

The long-term yield data presented in this sowing guide is an output of NVT Long Term Multi Environment Trial (MET) analysis. NVT runs trials in all cropping regions of Victoria (for example Wimmera, Mallee, South West, North East and North Central) and other states across Australia, and uses a five-year rolling dataset in the MET analysis.

Historically, NVT used a variance component analysis model to produce long-term yield predictions on a regional 'mean' basis. In Australia, this model has been found to be inadequate in modelling variety-by-environment interaction (GxE) and reporting at a regional level often masked important GxE interactions. This meant that good and bad years were 'averaged' together, making it difficult to understand the strengths and weaknesses of each variety when trialled in different environments.

Now, a factor analytic (FA) mixed-model approach is used in the MET analysis, using expertise from the GRDC-supported Statistics for the Australian Grains Industry (SAGI) program. This approach generates long-term MET predictions for varieties at an individual trial level. A prediction is generated for every variety in every trial in the entire dataset, regardless of whether the variety was actually tested at every location. Using the FA model, NVT can provide a yield prediction for every situation. For instance, if the yield of five varieties were ranked in a similar order at multiple trials (sites A, B, C and D), but variety X was not grown at site D – the relative ranking of X against the other varieties can be used to predict the yield of variety X at site D.

The output used in this sowing guide presents the MET data on a region-by-year basis across the five years used in the MET dataset. The analysis, and subsequent reporting systems, have allowed NVT to bring together very large datasets and make more refined, relevant and robust predictions about the relative performance of each variety across different locations and seasons. Readers can now use this more detailed data to better understand a variety's performance over several years – rather than just a single averaged value.

Readers can further interrogate the data online to better understand the performance of varieties under a range of situations using the NVT Long Term Yield Reporting tool. The FA method is a very powerful and accurate predictor of performance, and the yield predictions are best viewed at the individual trial/environment level. However, these detailed datasets are too large for printed sowing guides or quick reference summaries, such as the *Victorian Crop Sowing Guide*.

NVT has developed a system for viewing the complex dataset based on individual user preferences. Users can choose to view data in year or yield-based groupings and can tailor site or region selections to their own needs, for instance by viewing METs only for sites where varieties were present in the trials (default option). In this sowing guide, we present results in year groupings and only for varieties present in trials. The NVT Long Term Yield Reporting tool is designed to run on all web-browsing platforms on computers, tablets and phones, and is available online at <https://app.nvtonline.com.au>.

# WHEAT

Wheat variety selection is based on a number of considerations, including grain yield and quality, disease resistance, maturity, adaptation to the environment (rainfall, elevation, temperature, soil type) and, in some cases, grazing suitability. This chapter aims to provide information regarding these attributes to assist with variety selection.

## NEW VARIETIES

The new wheat varieties added this year are bread wheats Catapult<sup>®</sup>, LRPB Hellfire<sup>®</sup>, LRPB Nighthawk<sup>®</sup>, and RockStar<sup>®</sup>, and durum wheats Bitalli<sup>®</sup>, DBA Spes<sup>®</sup> and Westcourt<sup>®</sup>.

## QUALITY CHANGES

Wheat Quality Australia (WQA) made no changes to any variety standards in Southern Zone for 2019-20. At the time of publication LRPB Nighthawk<sup>®</sup> was still undertaking grain quality evaluation, with a decision expected by November 2019.

## KEY DISEASE CONSIDERATIONS

Variety selection plays a critical part in the effective management of disease. Where possible, using the disease ratings provided in Table 3, efforts can be made to avoid varieties that are highly susceptible to locally important diseases. If it is not possible to avoid highly susceptible cultivars, then the ratings can be used to inform paddock selection and chemical disease control. Table 1 provides some minimum disease targets for varieties in the low, medium and high rainfall zones.

## MORE INFORMATION

**[nvtonline.com.au](http://nvtonline.com.au)**

■ Detailed NVT trial results and links to variety information.

**[nvtonline.com.au/apps](http://nvtonline.com.au/apps)**

■ Crop Disease Au App  
■ NVT Long Term Yield Reports App

**[communities.grdc.com.au](http://communities.grdc.com.au)**

■ Expert support on crop nutrition and field crop diseases at your fingertips

**[grdc.com.au/resources-and-publications/grownotes](http://grdc.com.au/resources-and-publications/grownotes)**

■ GrowNotes™ Wheat Southern Region

**[agriculture.vic.gov.au/agriculture/grains-and-other-crops](http://agriculture.vic.gov.au/agriculture/grains-and-other-crops)**

■ Agriculture Victoria 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:

(b)	Denotes that Plant Breeder Rights apply
<b>CCN</b>	Cereal Cyst Nematode
<b>BYDV</b>	Barley Yellow Dwarf Virus
<b>RLN</b>	Root Lesion Nematode
<b>APH</b>	Australian Prime Hard (min protein 13%)
<b>AH</b>	Australian Hard (min protein 11.5%)
<b>APW</b>	Australian Premium White (min protein 10%)
<b>ASW</b>	Australian Standard White
<b>ADR</b>	Australian Premium Durum
<b>ANW</b>	Australian Noodle Wheat (protein 9.5–11.5%)
<b>ASFT</b>	Australian Soft (protein 9.5%)
<b>FEED</b>	Australian Feed

\* Denotes default classification

# Varieties marked may be more susceptible if more virulent strains are present.

End Point Royalty (EPR) 2019-20 quoted \$/tonne ex-GST.

## BREAD WHEAT

### AXE<sup>Ⓢ</sup>

AH quality. Semi-dwarf awned wheat with early maturity. Stem rust MS, stripe rust MR, leaf rust SVS, yellow leaf spot S, septoria SVS, powdery mildew MS, CCN S, and S to *P. neglectus* (company ratings). Released 2007. Bred and marketed by AGT. EPR \$2.50.

### BECKOM<sup>Ⓢ</sup>

AH quality. Semi-dwarf awned wheat with mid-season maturity. Stem rust MRMS, stripe rust MRMS, leaf rust MSS, yellow leaf spot MSS, septoria S, powdery mildew S and CCN R. Short height, tolerant to acid soils and boron. Released 2015. Bred and marketed by AGT. EPR \$3.25.

### BOLAC<sup>Ⓢ</sup>

AH quality. Fully awned, mid to late season maturity suited to high rainfall zones. Stem rust MRMS, stripe rust RMR, leaf rust S, yellow leaf spot S, septoria MSS and CCN S (company ratings). Released 2006. Bred by AGT and marketed by Seednet. EPR \$2.10.

### NEW – CATAPULT<sup>Ⓢ</sup>

AH quality. A flexible mid to late season maturity with a high yield potential across a range of conditions and environments. Closely related to Scepter<sup>Ⓢ</sup> with similar grain quality, high test weight and low screenings. Stem rust MR, stripe rust MRMS, leaf rust S, yellow leaf spot MRMS, septoria MSS, powdery mildew S and CCN MR. NVT tested 2018. Released 2019 (tested as RAC2484). Bred and marketed by AGT. EPR \$3.25.

### CHIEF CL PLUS<sup>Ⓢ</sup>

APW quality. A mid-maturing variety with good early vigour. Clearfield Plus<sup>®</sup> wheat registered for label rates of Intervix<sup>®</sup> herbicide. Stem rust MR, stripe rust S, leaf rust MR, yellow leaf spot MRMS, septoria MSS, powdery mildew SVS and CCN MS. Released 2016. Marketed by InterGrain. EPR \$4.25.

### COBALT<sup>Ⓢ</sup>

APW quality. An early-mid maturity variety suited across a wide range of environments. Stem rust SVS, stripe rust RMR, leaf rust MSS, yellow leaf spot MSS, septoria S, powdery mildew MRMS and CCN MSS. Released 2018. Marketed by Elders. EPR \$3.00.

### CONDO<sup>Ⓢ</sup>

AH quality. A very early maturing variety best suited to North Central and North East regions. Stem rust MR, stripe rust MSS, leaf rust S, yellow leaf spot MS, septoria S, powdery mildew MS and CCN MR. Released 2015. Bred and marketed by AGT. EPR \$3.25.

### COOLAH<sup>Ⓢ</sup>

AH quality. Mid to late season maturity suitable for end of April/early May sowing. Stem rust MR, stripe rust RMR, leaf rust MR, yellow leaf spot MSS, septoria MSS, powdery mildew MSS and CCN S. Released 2016. Bred and marketed by AGT. EPR \$3.50.

### CORACK<sup>Ⓢ</sup>

APW quality. An early to mid-maturing short semi-dwarf variety. Stem rust MR, stripe rust MS, leaf rust SVS, yellow leaf spot MR#, septoria S, powdery mildew SVS and CCN RMR. Released 2011. Bred and marketed by AGT. EPR \$3.00.

### COSMICK<sup>Ⓢ</sup>

AH quality. Fully awned, early to mid-season maturity. Stem rust MS, stripe rust MSS, leaf rust SVS, yellow leaf spot MRMS, septoria S, powdery mildew S and CCN S. Released 2015. Marketed by InterGrain. Free to trade. EPR \$3.85.

### CUTLASS<sup>Ⓢ</sup>

APW quality. Mid-late maturing variety with a flexible sowing time like Yitpi<sup>Ⓢ</sup>. Stem rust RMR, stripe rust MS, leaf rust R, yellow leaf spot MSS, septoria MSS, powdery mildew MSS and CCN MR. Released 2015. Bred and marketed by AGT. EPR \$3.00.

### DS BENNETT<sup>Ⓢ</sup>

ASW quality. Tall awnless winter wheat suited to medium to high rainfall zones. Stem rust MRMS, stripe rust R#, leaf rust S, yellow leaf spot MRMS, septoria MSS, powdery mildew R and CCN S. Released 2018. Bred by Dow Seeds and marketed by Seednet. EPR \$4.25.

### DS DARWIN<sup>Ⓢ</sup>

AH quality. Early to mid-season maturity and suited to low-medium rainfall zones. Stem rust MRMS, stripe rust MR, leaf rust S, yellow leaf spot S, septoria S, powdery mildew MS and CCN MSS. Released 2015. Bred by Dow Seeds and marketed by Seednet. EPR \$4.25.



**DS PASCAL<sup>Ⓛ</sup>**

APW quality. Mid to late season maturity suited to medium to high rainfall zones and irrigation. Stem rust MSS, stripe rust RMR, leaf rust MS, yellow leaf spot MS, septoria MSS, powdery mildew R and CCN S. Released 2015. Bred by Dow Seeds and marketed by Seednet. EPR \$4.25.

**EGA GREGORY<sup>Ⓛ</sup>**

APW\* quality. Mid to late season variety with medium to slow maturity suited to north eastern Victoria. Stem rust MR, stripe rust MR#, leaf rust MR, yellow leaf spot S, septoria MSS, powdery mildew MS and CCN S. Released 2004. Marketed by Pacific Seeds. EPR \$2.10.

**EGA WEDGETAIL<sup>Ⓛ</sup>**

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

**EG TITANIUM**

AH quality. A full season variety targeted for early planting in medium to high rainfall zones. Insufficient data to publish independent disease resistance ratings. Estimated MR to stripe rust and leaf rust and R to stem rust (company ratings). Released 2018. Marketed by Elders. EPR \$3.00.

**ELMORE CL PLUS<sup>Ⓛ</sup>**

AH quality. Two gene tolerance to label rates of Intervix® herbicide. Mid-maturing variety best suited to moderate to high yielding areas. Stem rust MR, stripe rust MRMS, leaf rust RMR, yellow leaf spot S, septoria MSS, powdery mildew MS and CCN S. Released 2011. Bred and marketed by AGT. EPR \$3.55.

**EMU ROCK<sup>Ⓛ</sup>**

AH quality. An awned semi-dwarf early maturing variety, best suited to low to medium rainfall environments. Stem rust MS, stripe rust MRMS, leaf rust SVS, yellow leaf spot MRMS, septoria SVS, powdery mildew MSS and CCN S. Released 2011. Bred and marketed by InterGrain. Free to trade. EPR \$3.50.

**ESTOC<sup>Ⓛ</sup>**

APW quality. A mid to late season variety, slightly earlier flowering than Yitpi<sup>Ⓛ</sup>. Stem rust MR, stripe rust MRMS, leaf rust S, yellow leaf spot S, septoria S and CCN MR (company ratings). Tolerant of boron. Released 2010. Bred and marketed by AGT. EPR \$3.00.

**FORREST<sup>Ⓛ</sup>**

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 S, yellow leaf spot MRMS, septoria MSS, powdery mildew MS and CCN S. Possesses resistance/tolerance to Wheat Streak Mosaic Virus. Released 2011. Bred by HRZ Wheats and marketed by Seednet. EPR \$3.50.

**GRENADE CL PLUS<sup>Ⓛ</sup>**

AH quality. Two gene tolerance to label rates of Intervix® herbicide. Fully awned early-mid season variety. Stem rust MR, stripe rust MRMS, leaf rust S, yellow leaf spot S, septoria S, powdery mildew MSS and CCN R. Released 2012. Bred and marketed by AGT. EPR \$3.80.

**HATCHET CL PLUS<sup>Ⓛ</sup>**

AH quality. Two gene tolerance to label rates of Intervix® herbicide. Semi-dwarf awned wheat with very early maturity, 1-2 days earlier than Axe. Stem rust MS, stripe rust MRMS, leaf rust SVS, yellow leaf spot S, septoria SVS, powdery mildew MS and CCN MR. Released 2015. Bred and marketed by AGT. EPR \$3.80.

**ILLABO<sup>Ⓛ</sup>**

AH quality. A mid to long season dual-purpose winter wheat, 2-3 days quicker to maturity than EGA Wedgetail<sup>Ⓛ</sup>. Developed for early sowing and winter grazing. Stem rust MS, stripe rust RMR, leaf rust S, yellow leaf spot MS, septoria MSS, powdery mildew MRMS and CCN MS. Released 2018. Bred and marketed by AGT. EPR \$3.50.

**KIORA<sup>Ⓛ</sup>**

AH quality. Mid to late season maturity best suited to medium to high rainfall areas. Stem rust MR, stripe rust RMR, leaf rust MRMS, yellow leaf spot MSS, septoria MSS, powdery mildew MS, CCN MS. Released 2014. Bred and marketed by AGT. EPR \$3.25.

INTRO

WHEAT

BARLEY

OAT

TRITICALE

CANOLA

FIELD PEA

LENTIL

FABA BEAN

LUPIN

CHICKPEA

VETCH

**KORD CL PLUS<sup>Ⓢ</sup>**

AH quality. Two gene tolerance to label rates of Intervix® herbicide. Fully awned semi-dwarf with mid-season maturity. Stem rust MR, stripe rust MRMS, leaf rust MS, yellow leaf spot MSS, septoria MSS, powdery mildew MSS and CCN MR. Released 2011. Bred and marketed by AGT. EPR \$3.55.

**LRPB ARROW<sup>Ⓢ</sup>**

AH quality. mid maturity, 3-4 days later than Mace<sup>Ⓢ</sup> with short canopy. Stem rust S, stripe rust S, leaf rust SVS, yellow leaf spot MRMS, septoria S, powdery mildew SVS and CCN MS. Released 2016. Marketed by Pacific Seeds. EPR \$3.00.

**LRPB COBRA<sup>Ⓢ</sup>**

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 MR, stripe rust MSS, leaf rust MR, yellow leaf spot MRMS, septoria MSS, powdery mildew MSS and CCN MS. Released 2011. Marketed by Pacific Seeds. EPR \$3.50.

**LRPB HAVOC<sup>Ⓢ</sup>**

AH quality. Early to mid-season variety with quicker maturity and faster grain filling than its Mace<sup>Ⓢ</sup> parent. Suited to low to medium rainfall areas. Stem rust S, stripe rust MR, leaf rust S, yellow leaf spot MRMS, septoria S, powdery mildew S and CCN S. Released 2017. Marketed by Pacific Seeds. EPR \$4.00.

**NEW – LRPB HELLFIRE<sup>Ⓢ</sup>**

AH Quality. Early-mid maturing high yielding main season variety with high protein accumulation and good early vigour. Stem rust MR, stripe rust MR, leaf rust MSS, yellow leaf spot MSS, septoria S and powdery mildew MS (provisional ratings). Released 2019. Bred by LRPB (tested as LPB14-3634) and marketed by Pacific Seeds. EPR \$4.25.

**LRPB KITTYHAWK<sup>Ⓢ</sup>**

AH quality. Mid to long season dual-purpose winter wheat with similar maturity to EGA Wedgetail<sup>Ⓢ</sup>. Developed for early sowing, suited to medium to high rainfall areas. Stem rust MRMS, stripe rust RMR, leaf rust MS, yellow leaf spot MRMS, septoria MRMS, powdery mildew MS and CCN S. Suitable for early winter grazing. Released 2017. Marketed by Pacific Seeds. EPR \$4.25.

**LRPB LANCER<sup>Ⓢ</sup>**

AH 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, yellow leaf spot MRMS, septoria MS, powdery mildew MS and CCN S. Released 2013. Marketed by Pacific Seeds. EPR \$4.25.

**NEW – LRPB NIGHTHAWK<sup>Ⓢ</sup>**

Quality TBC (AH classification in south eastern zone). Slow maturing spring wheat with a unique set of maturity holds which allow it to be planted earlier in systems which don't suit traditional winter wheat types. Demonstrated high yields throughout the April sowing window. Stem rust RMR, stripe rust MRMS, leaf rust MSS, yellow leaf spot MS, septoria MSS and powdery mildew MS (provisional ratings). Released 2019 (NVT tested 2018 as LPB14-0392). Bred by LRPB and marketed by Pacific Seeds. EPR \$4.25.

**LRPB PHANTOM<sup>Ⓢ</sup>**

AH quality. A mid to late season variety tolerant of boron and acid soils. Stem rust MSS, stripe rust MR, leaf rust S, yellow leaf spot SVS, septoria SVS, CCN MS and black point MRMS. Released 2012. Marketed by Pacific Seeds. EPR \$3.80.

**LRPB SCOUT<sup>Ⓢ</sup>**

AH quality. An awned white chaff variety with mid-season maturity with wide adaptation. Stem rust MRMS, stripe rust MS, leaf rust MS, yellow leaf spot SVS, septoria S, powdery mildew MRMS and CCN R. Adapted to alkaline soils. Released 2009. Marketed by Pacific Seeds. EPR \$2.80.

**LRPB TROJAN<sup>Ⓢ</sup>**

APW quality. Mid-long season variety suited to medium to high rainfall areas. Stem rust MRMS, stripe rust MR#, leaf rust MR, yellow leaf spot MSS, septoria MS, powdery mildew S and CCN MS. Released 2013. Marketed by Pacific Seeds. EPR \$4.00.

**MACE<sup>Ⓢ</sup>**

AH quality. An early maturity awned variety of medium height. Stem rust MRMS, stripe rust SVS, leaf rust MSS, yellow leaf spot MRMS, septoria S, powdery mildew MSS and CCN MRMS. A comprehensive fungicide strategy is required to control stripe rust. Tolerant of boron. Released 2008. Bred and marketed by AGT. EPR \$3.00.

**RAZOR CL PLUS<sup>Ⓛ</sup>**

ASW quality. Early maturing variety derived from Mace<sup>Ⓛ</sup>. Two gene tolerance to label rates of Intervix<sup>®</sup> herbicide. Stem rust MRMS, stripe rust MS, leaf rust S, yellow leaf spot MSS, septoria SVS, powdery mildew MSS and CCN MR. Released 2018. Bred and marketed by AGT. EPR \$3.30.

**NEW – ROCKSTAR<sup>Ⓛ</sup>**

AH quality. High yielding, mid-late flowering variety. Good grain size, moderate plant height, similar to Mace<sup>Ⓛ</sup>. Stem rust MR, stripe rust MRMS, leaf rust S, yellow leaf spot MRMS, septoria MSS and powdery mildew R (provisional ratings). Released 2019 (tested as IGW4341). Bred and marketed by InterGrain. Available for planting in 2020. EPR \$3.50.

**SCEPTER<sup>Ⓛ</sup>**

AH quality. Early-mid season maturity of medium height. Intended to replace Mace<sup>Ⓛ</sup>, flowering two days later. Stem rust MRMS, stripe rust MSS, leaf rust MSS, yellow leaf spot MRMS, septoria S, powdery mildew SVS and CCN MRMS. It has improved resistance to stripe rust however growers will need to manage accordingly. Released 2015. Bred and marketed by AGT. EPR \$3.25.

**SHERIFF CL PLUS<sup>Ⓛ</sup>**

APW quality. High yielding Clearfield<sup>®</sup> Plus wheat with good yield stability. Mid-late flowering variety registered for label rates of Intervix<sup>®</sup> herbicide. Stem rust MS, stripe rust MSS, leaf rust SVS, yellow leaf spot MRMS, septoria S, powdery mildew SVS and CCN MS. Released 2018. Bred and marketed by InterGrain. Available through resellers and InterGrain Seedclub members. EPR \$4.25.

**SHIELD<sup>Ⓛ</sup>**

AH quality. A white fully awned early-mid season variety. Short to medium plant height. Stem rust RMR, stripe rust MR, leaf rust R, yellow leaf spot MSS, septoria S, powdery mildew MS and CCN MRMS. Moderate tolerance to acid soils. Released 2012. Bred and marketed by AGT. EPR \$3.25.

**SUNLAMB<sup>Ⓛ</sup>**

ASW quality. A white grained long season spring variety suited for dual purpose applications. It is best sown early to mid-April. Stem rust R, stripe rust MRMS, leaf rust MS, yellow leaf spot MRMS, septoria MRMS and CCN MR. Released 2015. Bred and marketed by AGT. EPR \$2.75.

**SUNTOP<sup>Ⓛ</sup>**

AH quality. A white fully awned variety suited to North Central and North East Victoria. Medium plant height. Stem rust MRMS, stripe rust MRMS, leaf rust MRMS, yellow leaf spot MSS, septoria MSS, and CCN S. Released 2012. Bred and marketed by AGT. EPR \$3.25.

**VIXEN<sup>Ⓛ</sup>**

AH quality. High yielding, early-mid flowering wheat suited to mid-May onwards sowing with moderate plant height. Stem rust MRMS, stripe rust MRMS, leaf rust SVS, yellow leaf spot MRMS, septoria S, powdery mildew SVS and CCN S. Released 2018. Bred and marketed by InterGrain. Free to trade. EPR \$3.50.

**WALLUP<sup>Ⓛ</sup>**

AH quality. Mid-season maturity fully awned variety suited to medium rainfall areas. Stem rust MRMS, stripe rust MRMS, leaf rust SVS, yellow leaf spot MSS, septoria S and CCN MR. Released 2011. Bred and marketed by AGT. EPR \$3.00.

**YITPI<sup>Ⓛ</sup>**

AH quality. White fully awned semi-dwarf suited to low to medium rainfall areas. Stem rust S, stripe rust MRMS, leaf rust S, yellow leaf spot SVS, septoria MSS, powdery mildew MS and CCN MR. Boron tolerant. Released 2000. Marketed by Seednet. EPR \$1.00.

**BISCUIT WHEAT****LRPB IMPALA<sup>Ⓛ</sup>**

ASFT quality. Early-mid season variety suited to medium rainfall zones in Victoria. Stem rust MR, stripe rust MR, leaf rust SVS, yellow leaf spot MSS, septoria SVS, powdery mildew MR and CCN MSS. Released 2011. Marketed by Pacific Seeds. EPR \$3.50.

**DURUM WHEAT****NEW – BITALLI<sup>Ⓛ</sup>**

ADR quality. An early-mid season maturing variety with very high yield potential. Produces low screenings and high test weight. Stem rust MR, stripe rust RMR, leaf rust MR, yellow leaf spot MRMS, septoria MRMS, powdery mildew S and CCN MS. Released 2019 (tested as AGTD088). Bred and marketed by AGT. EPR \$3.50.

**DBA AURORA<sup>Ⓛ</sup>**

ADR quality. A mid-season variety with good early vigour and weed competitiveness. Stem rust RMR, stripe rust RMR, leaf rust R, yellow leaf spot MRMS, septoria MRMS, powdery mildew MR and CCN MSS. Released 2014. Bred by Durum Breeding Australia and marketed by SADGA. EPR \$3.00.

**NEW – DBA SPES<sup>Ⓛ</sup>**

ADR quality. A mid-season maturing variety, with a high relative yield. Comparable or slightly better screenings to DBA Aurora<sup>Ⓛ</sup> with good grain size and acceptable protein average with appropriate N management. Stem rust R, stripe rust RMR, leaf rust RMR, yellow leaf spot MRMS, septoria MRMS, powdery mildew S and CCN R. NVT tested 2017-18. Released 2018 (tested as UAD1154192). Bred by Durum Breeding Australia and marketed by SADGA. EPR \$3.00.

**DBA VITTAROI<sup>Ⓛ</sup>**

ADR quality. An early-mid maturing variety suited to irrigation zones and dryland cultivation. Stem rust MR, stripe rust MR, leaf rust MR, yellow leaf spot MRMS, septoria MRMS and CCN MSS. Released 2017. Bred by Durum Breeding Australia and marketed by Seednet. EPR \$3.30.

**NEW – WESTCOURT<sup>Ⓛ</sup>**

ADR quality. A mid-season maturing variety with a robust grain package of low screenings and high test weight. Stem rust RMR, stripe rust RMR, leaf rust RMR, yellow leaf spot MRMS, septoria MRMS, powdery mildew MS. Released 2019 (tested as AGTD090). Bred and marketed by AGT. EPR \$3.50.

**WID802<sup>Ⓛ</sup>**

ADR quality. A mid-season variety. Likely to produce high screenings in short finishes. Stem rust RMR, stripe rust MR, leaf rust RMR, yellow leaf spot MRMS, septoria MRMS and CCN MS. WID802 may have low protein if nitrogen is limiting. Released 2012. Marketed by SA Durum Growers Association. EPR \$3.00.

**FEED****BEAUFORT<sup>Ⓛ</sup>**

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, yellow leaf spot MRMS, septoria MSS and CCN S (company ratings). A comprehensive fungicide strategy is required to control stem rust. Released 2008. Marketed by GrainSearch. EPR \$3.00.

**LONGSWORD<sup>Ⓛ</sup>**

FEED quality. A quick maturing dual purpose winter wheat suited to low to medium rainfall areas. Suits April sowing and offers grazing potential. Stem rust MR, stripe rust RMR, leaf rust MSS, yellow leaf spot MRMS, septoria MSS, powdery mildew MRMS and CCN MRMS. Released 2017. Bred and marketed by AGT. EPR \$2.75.

**FEED/DUAL PURPOSE****MANNING<sup>Ⓛ</sup>**

FEED quality. Dual purpose white grain wheat suited to longer growing season zones and irrigation. Stem rust MR, stripe rust RMR, leaf rust MS, yellow leaf spot MRMS, septoria MRMS, powdery mildew MSS and CCN S. Released 2014. Bred by CSIRO and GRDC and marketed by GrainSearch. EPR \$3.50.

**RGD ACCROC**

FEED quality. An awned red grained winter wheat. It is a mid to long season variety for high rainfall zones and irrigation. Suitable for dual purpose applications when early sowing is possible. Stem rust MS, stripe rust R, leaf rust S, yellow leaf spot MRMS, septoria MS, powdery mildew MRMS and CCN S. Released 2017. Bred by RAGT Semences and marketed by Seed Force. EPR \$4.00.

**RGD CALABRO**

FEED quality. An awned red grain winter wheat with mid to late maturity suited to the high rainfall zone. Stem rust MS, stripe rust RMR, leaf rust MSS, yellow leaf spot MRMS, septoria MRMS, powdery mildew MR and CCN S. Released 2017. Bred by RAGT Semences and marketed by Seed Force. EPR \$4.00.

**RGD ZANZIBAR**

FEED quality. Fully awned variety suited to North Central, North East and South West. Stem rust VS, stripe rust R, leaf rust SVS, yellow leaf spot MS, septoria S and CCN MSS. A comprehensive fungicide strategy is required to control stem rust. Released 2017. Bred by RAGT Semences and marketed by Seed Force. EPR \$4.00.

**SF ADAGIO**

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

**SF SCENARIO**

FEED quality. Long season awnless red grained winter wheat. Stem rust MSS, stripe rust R, leaf rust S, yellow leaf spot MS, septoria MRMS and CCN S. Released 2014. Bred by RAGT Semences and marketed by AGF Seeds.

**SQP REVENUE<sup>Ⓛ</sup>**

FEED quality. A red grained awnless winter wheat suited to longer growing season zones and irrigation. Stem rust RMR, stripe rust R, leaf rust VS, yellow leaf spot MS, septoria S, powdery mildew R and CCN S. Released 2010. Bred by AusGrainz and CSIRO and marketed by GrainSearch. EPR \$3.50.

**TENFOUR<sup>Ⓛ</sup>**

FEED quality. TenFour<sup>Ⓛ</sup> is an early maturing wheat for the South West, North East and irrigation zones. Stem rust SVS, stripe rust SVS, leaf rust S, yellow leaf spot MRMS, septoria SVS, powdery mildew S and CCN MS. A comprehensive fungicide strategy is required to control rusts. Released 2015. Marketed by Elders. EPR \$3.00.

**TABLE 1 Suggested minimum levels of wheat disease resistance for the southern region.**

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

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

SOURCE: AGRICULTURE VICTORIA DISEASE RATINGS (2019)

**TABLE 2 Wheat variety agronomic guide.**

The agronomic characteristics in this table are provided as a guide only and have been compiled from observations of the breeders, National Variety Trials and seed companies. Maximum quality for the Southern Zone has been sourced from Grain Trade Australia, Wheat Trading Standards (2019).

	Maximum quality southern zone	Rainfall			Screenings	Maturity	Height	Coleoptile length	Lodging	Sprouting	Head type		Soil tolerance	
		Low <350mm	Med 350-550mm	High >550mm							Colour	Awn	Boron	Acid
BREAD WHEAT														
Axe <sup>Ⓓ</sup>	AH	✓			MR	E	MS	S	MR	SVS	W	A	I	I
Beckom <sup>Ⓓ</sup>	AH	✓	✓	✓	MRMS	M	S	M	MRMS	MSS	W	A	MT	MT-T
Bolac <sup>Ⓓ</sup>	AH		✓	✓	S	M-L	M	M	MR	S	W	A	I	I
Catapult <sup>Ⓓ</sup>	AH	✓	✓	✓	MR	M-L	M	-	MR	MSS	W	A	MT	MT-T
Chief CL Plus <sup>Ⓓ</sup>	APW	✓	✓	✓	MR	M	M	M	MR	S	W	A	-	-
Cobalt <sup>Ⓓ</sup>	APW	✓	✓	✓	MR	E-M	M	M	MR	MR	W	A	-	MT
Condo <sup>Ⓓ</sup>	AH	✓	✓		R	E	MT	M	MS	S	W	A	I	MT-T
Coolah <sup>Ⓓ</sup>	AH		✓	✓	MR	M-L	MT	M	MRMS	S	W	A	I	MT
Corack <sup>Ⓓ</sup>	APW	✓	✓		R	E-M	S	MS	MR	S	W	A	I	MT-T
Cosmick <sup>Ⓓ</sup>	AH	✓	✓		MS	E-M	M	L	MRMS	S-SVSp	W	A	-	-
Cutlass <sup>Ⓓ</sup>	APW	✓	✓		MRMS	M-L	MT	ML	MRMS	S	W	A	MT	MT-T
DS Bennett <sup>Ⓓ</sup>	ASW		✓	✓	-	L (+W)	T	-	-	-	W	AL	-	-
DS Darwin <sup>Ⓓ</sup>	AH	✓	✓		MR	E-M	M	S	MR	SVSp	W	A	-	-
DS Pascal <sup>Ⓓ</sup>	APW		✓	✓	MR	M-L	M	S	MR	MRp	W	A	-	-
EGA Gregory <sup>Ⓓ</sup>	APW*		✓	✓	MR	M-L	T	M	MS	S	W	A	-	MT
EGA Wedgetail <sup>Ⓓ</sup>	APW*		✓	✓	MR	M-L (+W)	M	MS	MR	S	W	A	I	MT-T
EG Titanium	AH		✓	✓	R	M-L	S	M	R	MR	W	A	-	MT-T
Elmore CL Plus <sup>Ⓓ</sup>	AH		✓		MS	M	M	M	MRMS	S	W	A	I	I
Emu Rock <sup>Ⓓ</sup>	AH	✓	✓		R	E	S	M	R	S	W	A	-	-
Estoc <sup>Ⓓ</sup>	APW	✓	✓		-	M-L	M	ML	MR	MRMS	W	A	MT	MT-T
Forrest <sup>Ⓓ</sup>	APW		✓	✓	MR	L	M	SM	-	S	W	A	-	-
Grenade CL Plus <sup>Ⓓ</sup>	AH		✓		MR	E-M	M	ML	-	S	W	A	MT	MT-T
Hatchet CL Plus <sup>Ⓓ</sup>	AH	✓			MR	E	S	S	-	SVS	W	A	MI	MT

TABLE 2, cont. next page



**(CONTINUED) TABLE 2 Wheat variety agronomic guide.**

	Maximum quality southern zone	Rainfall			Screenings	Maturity	Height	Coleoptile length	Lodging	Sprouting	Head type		Soil tolerance	
		Low <350mm	Med 350-550mm	High >550mm							Colour	Awn	Boron	Acid
BREAD WHEAT														
Illabo <sup>db</sup>	AH	✓	✓	✓	MR <sub>p</sub>	M-L (+W)	Sp	-	MR <sub>p</sub>	Sp	W	A	Ip	MT <sub>p</sub>
Kiora <sup>db</sup>	AH		✓	✓	MS	M-L	M	M	MR	S	W	A	MI	MI
Kord CL Plus <sup>db</sup>	AH	✓	✓		MR	M	M	S	-	SVS	W	A	MT	MT
LRPB Arrow <sup>db</sup>	AH	✓	✓	✓	MR	M	S	M	MR	S	W	A	I	MT-MI
LRPB Cobra <sup>db</sup>	AH	✓	✓	✓	MRMS	E-M	S	M	MR	SVS	W	A	I	MT
LRPB Havoc <sup>db</sup>	AH	✓	✓		MR	E-M	S	M	MR	S	W	A	I	MT
LRPB Hellfire <sup>db</sup>	AH	✓	✓		MR	M	M	M	MR	MS	W	A	MI	MT-MI
LRPB Kittyhawk <sup>db</sup>	AH		✓	✓	MR	M-L (+W)	M	MS	MR	S	W	A	I	MT-MI
LRPB Lancer <sup>db</sup>	AH		✓	✓	MR	M-L	S	M	MR	S	W	A	I	MI-I
LRPB Nighthawk <sup>db</sup>		✓	✓		-	L	MT	-	MR	-	W	A	-	-
LRPB Phantom <sup>db</sup>	AH		✓	✓	MR	M-L	MT	MS	MS	MSS	W	A	MT	MT
LRPB Scout <sup>db</sup>	AH	✓	✓	✓	MR	M	M	ML	MRMS	MS	W	A	MI	MT-T
LRPB Trojan <sup>db</sup>	APW		✓	✓	MR	M-L	M	M	MR	MSS	W	A	MI	MT-MI
Mace <sup>db</sup>	AH	✓	✓		MR	E	M	MS	MR	MSS	W	A	MT	MT-T
Razor CL Plus <sup>db</sup>	ASW	✓	✓		MR	E	M	-	MR	MSS <sub>p</sub>	W	A	MT	MT-T
RockStar <sup>db</sup>	AH	✓	✓	✓	MR	M-L	M	M	MR	-	W	A	-	-
Scepter <sup>db</sup>	AH	✓	✓		MR	M	M	MS	MR	MSS	W	A	MT	MT-T
Sheriff CL Plus <sup>db</sup>	APW		✓	✓	MR	M-L	M	M	MR	-	W	A	-	-
Shield <sup>db</sup>	AH	✓	✓		MR	E-M	M	S	-	S	W	A	I	MT-T
Sunlamb <sup>db</sup>	ASW		✓	✓	MR	L	M	M	MR	MS <sub>p</sub>	W	AL	I	MI
Suntop <sup>db</sup>	AH	✓	✓	✓	MS	M	MT	M	MR	SVS	W	A	I	MT
Vixen <sup>db</sup>	AH	✓	✓	✓	MR	E-M	M	M	MR	-	W	A	-	-
Wallup <sup>db</sup>	AH		✓		MR	M	M	MS	MR	S	W	A	I	I
Yitpi <sup>db</sup>	AH	✓	✓		MR	M	T	ML	MS	MS	W	A	MT	MT-T
BISCUIT WHEAT														
LRPB Impala <sup>db</sup>	ASFT		✓		MR	E-M	ML	M	MS	MSS	W	A	I	MT
DURUM WHEAT														
Bitalli <sup>db</sup>	ADR	✓	✓	✓	MR	E-M	M	-	-	-	W	A	-	-
DBA Aurora <sup>db</sup>	ADR		✓	✓	R	M	M	ML	MR	MR	W	A	MT	-
DBA Spes <sup>db</sup>	ADR		✓	✓	R	M	-	-	-	-	W	A	-	-
DBA Vittaroi <sup>db</sup>	ADR	✓	✓	✓	R	E-M	S	-	-	-	W	A	-	-
Westcourt <sup>db</sup>	ADR	✓	✓	✓	MR	M	T	-	-	-	W	A	-	-
WID802 <sup>db</sup>	ADR				MS	M	-	ML	-	MR	-	-	-	-
FEED WHEAT														
Beaufort <sup>db</sup>	Feed		✓	✓	-	M-L	M	-	MRMS	MR	R	AL	-	MT
Longsword <sup>db</sup>	Feed	✓	✓	✓	MR	M-L (+W)	M	-	MR	-	W	A	MT <sub>p</sub>	MT <sub>p</sub>
Manning <sup>db</sup>	Feed			✓	-	L (+W)	-	-	-	MSS <sub>p</sub>	W	AL	-	-
RGT Accroc	Feed			✓	-	M-L (+W)	-	-	-	-	R	A	-	-
RGT Calabro	Feed			✓	-	M-L (+W)	-	-	-	-	R	A	-	-
RGT Zanzibar	Feed	✓	✓	✓	-	M	MT	-	-	-	R	A	-	-
SF Adagio	Feed		✓	✓	-	M-L (+W)	-	-	-	R <sub>p</sub>	R	A	-	-
SF Scenario	Feed			✓	-	L (+W)	-	-	-	R <sub>p</sub>	R	AL	-	-
SQP Revenue <sup>db</sup>	Feed			✓	-	L (+W)	S	-	-	R <sub>p</sub>	R	AL	-	-
Tenfour <sup>db</sup>	Feed		✓	✓	MR	E	M	M	R	Sp	W	A	-	MT

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

Height: S = short, M = medium, T = tall.

Coleoptile length: S = short, M = medium, L = long.

Soil tolerance: I = intolerant, T = tolerant.

Head colour: W = white, B = black, R = red.

Head type: A = awned, AL = awnless.

Screening, lodging and sprouting resistance = see key used in Table 3.

TABLE 3 Wheat variety disease rating guide.

	Rust			Yellow Leaf Spot	Septoria tritici	Powdery mildew	CCN Res	Root Lesion Nematode		Crown Rot	Common Root rot	Black Tip (black point)	Flag Smut
	Stem	Stripe	Leaf					P. neglectus	P. thornei				
BREAD WHEAT													
Beckom <sup>db</sup>	MRMS	MRMS	MSS	MSS	S	S	R	S	MSS	S	MSS	MRMS	MRMS
Catapult <sup>db</sup>	MR <sub>p</sub>	MRMS <sub>p</sub>	Sp	MRMS <sub>p</sub>	MSS <sub>p</sub>	Sp	MR <sub>p</sub>	-	-	-	-	MSS <sub>p</sub>	-
Chief CL Plus <sup>db</sup>	MR	S	MR	MRMS	MSS	SVS	MS	MS <sub>p</sub>	MS	MSS	MS	MS	SVS
Cobalt <sup>db</sup>	SVS	RMR	MSS	MSS	S	MRMS	MSS	S	S	S	MSS	MRMS	RMR
Condo <sup>db</sup>	MR	MSS	S	MS	S	MS	MR	S	MS	S	MSS	MS	MSS
Coolah <sup>db</sup>	MR	RMR	MR	MSS	MSS	MSS	S	MSS	MRMS	MSS	S	S	R
Corack <sup>db</sup>	MR	MS	SVS	MR#	S	SVS	RMR	MSS	MSS	S	MS	S	S
Cosmick <sup>db</sup>	MS	MSS	SVS	MRMS	S	S	S	MSS	MSS	S	MSS	MS	SVS
Cutlass <sup>db</sup>	RMR	MS	R	MSS	MSS	MSS	MR	MSS	MSS	S	MS	MR	MS
DS Bennett <sup>db</sup>	MRMS	R#	S	MRMS	MSS	R	S	-	-	SVS	S	-	SVS
DS Darwin <sup>db</sup>	MRMS	MR	S	S	S	MS	MSS	S	S	S	MSS	MS	MR
DS Pascal <sup>db</sup>	MSS	RMR	MS	MS	MSS	R	S	S	S	S	MS	MS	S
EGA Gregory <sup>db</sup>	MR	MR#	MR	S	MSS	MS	S	S	MSS	S	MSS	MSS	MSS#
Elmore CL Plus <sup>db</sup>	MR	MRMS	RMR	S	MSS	MS	S	S	MSS	S	S	MS	MSS
Emu Rock <sup>db</sup>	MS	MRMS	SVS	MRMS	SVS	MSS	S	MSS	S	MSS	MS	MS	MS#
Forrest <sup>db</sup>	RMR	RMR	S	MRMS	MSS	MS	S	VS	SVS	SVS	MS	MR	MR
Grenade CL Plus <sup>db</sup>	MR	MRMS	S	S	S	MSS	R	MSS	S	S	MRMS	MSS	MR
Hatchet CL Plus <sup>db</sup>	MS	MRMS	SVS	S	SVS	MS	MR	MSS	MSS	S	MS	S	RMR
Illabo <sup>db</sup>	MS	RMR	S	MS	MSS	MRMS	MS <sub>p</sub>	-	-	S	MSS	-	R
Kiora <sup>db</sup>	MR	RMR	MRMS	MSS	MSS	MS	MS	S	MRMS	S	MS	MS	MRMS#
Kord CL Plus <sup>db</sup>	MR	MRMS	MS	MSS	MSS	MSS	MR	MSS	MSS	S	MRMS	MRMS	MR
LRPB Arrow <sup>db</sup>	S	S	SVS	MRMS	S	SVS	MS	MRMS	MRMS	S	MS	MRMS	MS
LRPB Cobra <sup>db</sup>	MR	MSS	MR	MRMS	MSS	MSS	MS	MSS	MSS	S	MS	MSS	S
LRPB Havoc <sup>db</sup>	S	MR	S	MRMS	S	S	S	S	MSS	S	MS	MS	MS
LRPB Hellfire <sup>db</sup>	MR <sub>p</sub>	MR <sub>p</sub>	MSS <sub>p</sub>	MSS <sub>p</sub>	Sp	MS <sub>p</sub>	-	-	-	MSS <sub>p</sub>	-	MSS <sub>p</sub>	-
LRPB Kittyhawk <sup>db</sup>	MRMS	RMR	MS	MRMS	MRMS	MS	S	MSS	S	S	S	MS	RMR
LRPB Lancer <sup>db</sup>	R	MR	RMR	MRMS	MS	MS	S	S	MS	MSS	S	MS	MSS
LRPB Nighthawk <sup>db</sup>	RMR <sub>p</sub>	MRMS <sub>p</sub>	MSS <sub>p</sub>	MS <sub>p</sub>	MSS <sub>p</sub>	MS <sub>p</sub>	-	-	-	SVSp	-	MSS <sub>p</sub>	-
LRPB Scout <sup>db</sup>	MRMS	MS	MS	SVS	S	MRMS	R	S	MSS	MSS	S	S	MR
LRPB Trojan <sup>db</sup>	MRMS	MR#	MR	MSS	MS	S	MS	MSS	MSS	MS	MS	MRMS	SVS
Mace <sup>db</sup>	MRMS	SVS	MSS	MRMS	S	MSS	MRMS	MS	MS	S	MS	MRMS	S
Razor CL Plus <sup>db</sup>	MRMS	MS	S	MSS	SVS	MSS	MR	-	-	S	MS	-	RMR
RockStar <sup>db</sup>	MR <sub>p</sub>	MRMS <sub>p</sub>	Sp	MRMS <sub>p</sub>	MSS <sub>p</sub>	R <sub>p</sub>	-	-	-	-	-	-	-
Scepter <sup>db</sup>	MRMS	MSS	MSS	MRMS	S	SVS	MRMS	S	MSS	S	MS	MS	MSS
Sheriff CL Plus <sup>db</sup>	MS	MSS	SVS	MRMS	S	SVS	MS	-	-	S	MSS	-	S
Shield <sup>db</sup>	RMR	MR	R	MSS	S	MS	MRMS	MSS	MSS	S	MRMS	MSS	S
Sunlamb <sup>db</sup>	R	MRMS	MS	MRMS	MRMS	-	MR	MSS	MS	MSS <sub>p</sub>	MS	MS	S
Suntop <sup>db</sup>	MRMS	MRMS	MRMS	MSS	MSS	-	S	S	MRMS	MSS	MS	MS	R
Vixen <sup>db</sup>	MRMS	MRMS	SVS	MRMS	S	SVS	S	-	-	S	MS <sub>p</sub>	-	SVS
Wallup <sup>db</sup>	MRMS	MRMS	SVS	MSS	S	-	MR	MRMS	MRMS	S	MS	MSS	SVS
Yitpi <sup>db</sup>	S	MRMS	S	SVS	MSS	MS	MR	MSS	S	S	MS	MS	MR
BISCUIT WHEAT													
Impala <sup>db</sup>	MR	MR	SVS	MSS	SVS	MR	MSS	SVS	S	MSS	MSS	MS	S
DURUM WHEAT													
Bitalli <sup>db</sup>	MR	RMR	MR	MRMS	MRMS	S	MS	S	RMR	S	MS	MRMS	R
DBA Aurora <sup>db</sup>	RMR	RMR	R	MRMS	MRMS	MR	MSS	MRMS	RMR	VS	MRMS	MSS	R
DBA Spes <sup>db</sup>	R	RMR	RMR	MRMS	MRMS	S	R	-	-	-	-	-	R
DBA Vittaroj <sup>db</sup>	MR	MR	MR	MRMS	MRMS	-	MSS	MS	MRMS	-	-	-	R
Westcourt <sup>db</sup>	RMR	RMR	RMR	MRMS	MRMS	MS	-	-	-	-	-	-	-
WID802 <sup>db</sup>	RMR	MR	RMR	MRMS	MRMS	-	MS	MRMS	MS	VS	MS	MS	R

TABLE 3, cont. next page

**(CONTINUED) TABLE 3 Wheat variety disease rating guide.**

	Rust			Yellow Leaf Spot	Septoria tritici	Powdery mildew	CCN Res	Root Lesion Nematode		Crown Rot	Common Root rot	Black Tip (black point)	Flag Smut
	Stem	Stripe	Leaf					P. neglectus	P. thornei				
FEED WHEAT													
Longsword <sup>db</sup>	MR	RMR	MSS	MRMS	MSS	MRMS	MRMS	MRMS	MR	S	MRMS	MRMS	MRMS#
Manning <sup>db</sup>	MR	RMR	MS	MRMS	MRMS	MSS	S	MSS	S	VS	SVS	SVS	R
RGT Accroc	MS	R	S	MRMS	MS	MRMS	S	S	MSS	SVS	S	MRMS	SVS
RGT Calabro	MS	RMR	MSS	MRMS	MRMS	MR	S	S	MSp	SVS	MSS	MS	RMR
RGT Zanzibar	VS	R	SVS	MS	S	-	MSS	MSS	MSp	S	S	RMR	SVS
SF Adagio	SVS	RMR	S	MRMS	MRMS	MSS	S	MS	MSS	SVS	MS	MR	MS#
SF Scenario	MSS	R	S	MS	MRMS	-	S	S	S	SVSp	MS	MRMS	RMR
SQP Revenue <sup>db</sup>	RMR	R	VS	MS	S	R	S	S	S	S	SVS	MS	S
TenFour <sup>db</sup>	SVS	SVS	S	MRMS	S	S	MS	S	S	MSS	MS	MS	MR

SOURCE: AGRICULTURE VICTORIA CEREAL DISEASE GUIDE (2019), NVT DISEASE RATINGS (2019)

# Varieties marked may be more susceptible if more virulent strains are present. p = These ratings are provisional – treat with caution.

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 4 Wheat time of sowing guide.**

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

<b>MALLEE</b>	March				April				May				June			
Winter Mid Maturity																
Winter Early Maturity																
Mid-Late Maturity																
Mid Maturity																
Early-Mid Maturity																
Early Maturity																
<b>WIMMERA</b>	March				April				May				June			
Winter Mid Maturity																
Winter Early Maturity																
Late Maturity																
Mid-Late Maturity																
Mid Maturity																
Early-Mid Maturity																
Early Maturity																
<b>NORTH CENTRAL</b>	March				April				May				June			
Winter Mid Maturity																
Winter Early Maturity																
Late Maturity																
Mid-Late Maturity																
Mid Maturity																
Early-Mid Maturity																
Early Maturity																
<b>NORTH EAST</b>	March				April				May				June			
Winter Mid Maturity																
Winter Early Maturity																
Late Maturity																
Mid-Late Maturity																
Mid Maturity																
Early-Mid Maturity																
Early Maturity																
<b>SOUTH WEST</b>	March				April				May				June			
Winter Late Maturity																
Winter Mid Maturity																
Late Maturity																
Mid-Late Maturity																
Mid Maturity																
Early-Mid Maturity																
Early Maturity																

Yellow = earlier than ideal.

Green = optimum sowing time.

Red = later than ideal.

TABLE 5 Victorian wheat varieties – Domestic Flour Millers Assessment.

HARD WHEAT	Preferred grade	Max class grade	End product category		Comment	
			Plant bakery	Artisan breads		
Axe <sup>db</sup>	AH	AH	1	1	Very poor water absorption, strong dough characteristics and long mix time.	
Beckom <sup>db</sup>	AH	AH	2	2	Some interest. Marginal long mix time and tough dough.	
Bolac <sup>db</sup>	AH	AH	2	2	Marginal AH – strong dough characteristics.	
NEW Catapult <sup>db</sup>	AH	AH	2	2	Suit domestic Mills. Good balanced dough. Acceptable bakery water absorption and performance.	
Chief CL Plus <sup>db</sup>	APW	APW	2	1	Acceptable APW. Low water absorption, short mix time. Acceptable rapid bake performance.	
Condo <sup>db</sup>	AH	AH	1	2	Marginal strong dough and mix time. Possible specialist application.	
Coolah <sup>db</sup>	APW	AH	2	2	Acceptable for domestic mills. Acceptable water absorption, marginal long mix requirement and strong dough resistance, acceptable bake performance.	
Corack <sup>db</sup>	APW	APW	2	1	Acceptable APW quality. Suit domestic mills.	
Cosmick <sup>db</sup>	AH	AH	3	2	Acceptable AH for domestic market.	
Cutlass <sup>db</sup>	APW	APW	3	1	Suit domestic application. Good water absorption and acceptable bake.	
Derrimut <sup>db</sup>	AH	AH	3	1	Appears acceptable as AH quality to suit plant bakery.	
DS Bennett <sup>db</sup>	ASW	ASW	2	1	Acceptable ASW. Low water absorption and dough strength, acceptable mix time and marginal bake performance.	
DS Darwin <sup>db</sup>	AH	AH	2	1	Limited data available. High water absorption may suit domestic mills as blend.	
DS Pascal <sup>db</sup>	APW	APW	2	1	Limited data available. Potentially limited domestic interest.	
EGA Gregory <sup>db</sup>	APW*	APW*	2	1	Limited data but indicate suitable for domestic APW.	
EGA Wedgetail <sup>db</sup>	APW*	APW*	1	2	Over strong APW. Long mix requirement. Appears to suit specialist segregation.	
EG Titanium	AH	AH	2	2	Suit domestic mills. Marginal long mix requirement. Acceptable water absorption.	
Elmore CL Plus <sup>db</sup>	AH	AH	3	1	Good water absorption and acceptable bake performance. Acceptable AH quality.	
Emu Rock <sup>db</sup>	AH	AH	3	2	Acceptable AH. Marginal long mix requirement.	
Estoc <sup>db</sup>	APW	APW	2	1	Marginal APW quality. Some interest from domestic mills.	
Forrest <sup>db</sup>	APW	APW	2	1	Acceptable APW quality for domestic market.	
Grenade CL Plus <sup>db</sup>	AH	AH	2	2	Marginal strong. Limited domestic interest.	
Hatchet CL Plus <sup>db</sup>	AH	AH	2	2	Some domestic interest. Marginal strong dough.	
Illabo <sup>db</sup>	AH	AH	1	2	Strong dough characteristics. Long mix requirement in bakery. Suit specialist bakery application only.	
Kiora <sup>db</sup>	AH	AH	2	2	Marginally strong dough. Some interest from domestic market.	
Kord CL Plus <sup>db</sup>	AH	AH	3	1	Appears suitable for domestic mills.	
LRPB Arrow <sup>db</sup>	AH	AH		2	Acceptable for domestic mills. Low water absorption and marginal extensibility. Good (short) mix time, good bake performance.	
LRPB Cobra <sup>db</sup>	AH	AH	3	1	Appears acceptable. Some concerns over low viscosity and high yellow pigment.	
LRPB Havoc <sup>db</sup>	AH	AH	3	1	Acceptable AH. Suit plant bakery.	
NEW LRPB Hellfire <sup>db</sup>	AH	AH	1	2	Some domestic interest. Acceptable water absorption but long mix requirement. Strong dough. Acceptable bake performance.	
LRPB Kittyhawk <sup>db</sup>	AH	AH	2	2	Acceptable for domestic mills. Good water absorption and strong doughs. Acceptable bake performance.	
LRPB Lancer <sup>db</sup>	AH	AH	2	1	Acceptable APW. Good water absorption and bake volume, but marginal long mix time.	
NEW LRPB Nighthawk <sup>db</sup>	APW*		3	1	Suit domestic mills. Good water absorption, short mix requirement. Acceptable bake performance.	
LRPB Phantom <sup>db</sup>	AH	AH	3	1	Appears to suit domestic mills.	
LRPB Scout <sup>db</sup>	AH	AH	2	1	Suitable AH, marginal long mix time.	
LRPB Trojan <sup>db</sup>	APW	APW	2	1	Some interest from domestic mills. Marginal water absorption, long mix time but good bake volume.	
Mace <sup>db</sup>	AH	AH	3	1	Suitable as domestic AH.	
Razor CL Plus <sup>db</sup>	ASW	ASW	2	1	Acceptable ASW. Good water absorption, short mix time, short dough extensibility and low dough strength.	
NEW RockStar <sup>db</sup>	AH	AH	2	2	Suit domestic mills. Marginal bakery water absorption but acceptable bakery performance.	
Scepter <sup>db</sup>	AH	AH	2	1	Suit domestic application. Acceptable AH quality.	
Sheriff CL Plus <sup>db</sup>	APW	APW	1	1	Suit domestic mills. Acceptable APW. Marginal water absorption and extraction. Short mix time, marginal extensibility and acceptable bake performance.	
Shield <sup>db</sup>	AH	AH	3	1	Marginal strong. Expect some domestic interest.	
Sunlamb <sup>db</sup>	ASW	ASW	2	1	Limited interest. Poor extraction but acceptable rapid bake.	
Suntop <sup>db</sup>	AH	AH	2	2	Strong AH. Good water absorption, but marginally long mix time.	
Vixen <sup>db</sup>	AH	AH	3	2	Suit domestic mills. Acceptable AH. Good extraction, good water absorption and balanced dough. Acceptable bake performance.	
Wallup <sup>db</sup>	AH	AH	1	2	Long mix requirement. Appears to suit specialist segregation. Limited interest from domestic millers.	
Yitpi <sup>db</sup>	AH	AH	3	2	Acceptable AH quality.	
SOFT OR NOODLE WHEAT	Preferred grade	Max class grade	End product category			
			Biscuit	Cake	Hot plate goods	
LRPB Impala <sup>db</sup>	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.  
 Interpretation provided by David Hogan, Quality Operations Manager for Laucke Flour Mills (2019).

**TABLE 6 Wheat diseases.**

Disease	Organism	Symptoms	Occurrence	Inoculum source	Control
<b>FOLIAR</b>					
Leaf rust	<i>Puccinia triticin</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 f. sp. 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°C–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 f. sp. tritici</i>	Yellow powdery pustules often in stripes on leaves.	Can develop throughout the growing season. Favoured by cool (8°C–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 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.
<b>GRAIN</b>					
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 seed-borne 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.
<b>ROOT/CROWN</b>					
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> , <i>P. 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.

Source: 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 7 Mallee and Wimmera wheat (main season). NVT long-term predicted yield expressed as a percentage of mean yield.**

		MALLEE						WIMMERA					
Year			2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)			2.49	1.59	4.04	3.2	1		2.81	1.29	6.76	4.82	1.92
	Quality	No. trials	9	6	6	7	4	No. trials	1	3	4	5	1
BREAD WHEAT													
Axe <sup>db</sup>	AH	32	94	104	89	94	106	14	95	112	91	95	102
Beckom <sup>db</sup>	AH	32	111	109	108	107	106	14	110	113	107	107	105
Catapult <sup>db</sup>	AH	4	-	-	-	-	111	1	-	-	-	-	112
Chief CL Plus <sup>db</sup>	APW	19	99	-	89	-	99	11	106	-	93	105	90
Cobalt <sup>db</sup>	APW	4	-	-	-	-	105	1	-	-	-	-	100
Coolah <sup>db</sup>	AH	0	-	-	-	-	-	1	-	-	-	-	101
Corack <sup>db</sup>	APW	32	103	108	93	106	108	14	111	123	100	108	101
Correll <sup>db</sup>	AH	15	103	-	102	-	-	8	94	100	96	-	-
Cosmick <sup>db</sup>	AH	32	108	106	109	102	104	14	104	107	105	102	106
Cutlass <sup>db</sup>	APW	23	-	103	107	104	100	13	-	101	101	101	99
Derrimut <sup>db</sup>	AH	21	102	100	103	-	-	14	96	97	99	97	101
DS Darwin <sup>db</sup>	AH	17	-	-	95	96	94	13	-	85	98	96	96
Elmore CL Plus <sup>db</sup>	AH	32	100	98	103	94	98	14	91	90	97	93	101
Emu Rock <sup>db</sup>	AH	32	100	106	99	98	107	14	101	112	101	100	108
Estoc <sup>db</sup>	APW	32	101	99	100	100	99	14	99	100	98	99	99
Gladius <sup>db</sup>	AH	32	100	99	97	96	102	14	96	103	95	96	101
Grenade CL Plus <sup>db</sup>	AH	32	99	100	95	95	103	14	94	103	95	95	102
Harper <sup>db</sup>	APW	21	103	101	104	-	-	8	96	98	98	-	-
Hatchet CL Plus <sup>db</sup>	AH	28	90	96	94	91	-	13	92	104	93	94	-
Justica CL Plus <sup>db</sup>	APW	21	101	97	102	-	-	8	93	95	97	-	-
Kord CL Plus <sup>db</sup>	AH	32	102	102	94	96	104	14	95	109	91	95	100
LRPB Arrow <sup>db</sup>	AH	23	-	103	101	105	103	13	-	110	104	106	102
LRPB Cobra <sup>db</sup>	AH	32	91	93	104	99	93	14	98	79	109	101	100
LRPB Flanker <sup>db</sup>	AH	0	-	-	-	-	-	7	-	79	88	-	-
LRPB Havoc <sup>db</sup>	AH	17	-	-	91	104	104	10	-	-	99	107	98
LRPB Lincoln <sup>db</sup>	AH	0	-	-	-	-	-	13	-	77	93	92	92
LRPB Phantom <sup>db</sup>	AH	32	98	97	105	96	96	14	93	88	98	94	99
LRPB Scout <sup>db</sup>	AH	32	102	103	110	98	101	14	98	95	107	98	108
LRPB Trojan <sup>db</sup>	APW	32	107	103	110	106	100	14	108	101	109	106	102
LRPB Viking <sup>db</sup>	AH	0	-	-	-	-	-	8	88	76	94	-	-
Mace <sup>db</sup>	AH	32	105	106	95	106	108	14	110	122	100	107	101
Magenta <sup>db</sup>	APW	15	105	-	108	-	-	8	97	94	100	-	-
Razor CL Plus <sup>db</sup>	ASW	11	-	-	-	104	110	6	-	-	-	106	111
Scepter <sup>db</sup>	AH	23	-	118	106	112	116	13	-	141	107	113	109
Sheriff CL Plus <sup>db</sup>	APW	10	-	-	102	-	103	5	-	-	103	-	100
Shield <sup>db</sup>	AH	32	106	107	102	99	106	14	99	111	97	98	105
Tungsten <sup>db</sup>	AH	4	-	-	-	-	99	0	-	-	-	-	-
Vixen <sup>db</sup>	AH	17	-	-	114	109	118	10	-	-	114	112	117
Wallup <sup>db</sup>	AH	4	-	-	-	-	94	14	94	88	96	97	95
Wyalkatchem <sup>db</sup>	APW	21	98	98	94	-	-	8	103	104	98	-	-
Yitpi <sup>db</sup>	AH	32	99	98	100	97	96	14	94	93	94	95	96
BISCUIT WHEAT													
Barham	ASFT	0	-	-	-	-	-	8	91	94	91	-	-
LRPB Impala <sup>db</sup>	ASFT	0	-	-	-	-	-	14	92	97	96	93	102
FEED WHEAT													
RGT Zanzibar	FEED	0	-	-	-	-	-	9	-	-	105	95	-
Tenfour <sup>db</sup>	FEED	4	-	-	-	-	103	13	-	103	112	108	106
Buchanan <sup>db</sup>	FEED	6	-	89	-	-	-	3	-	76	-	-	-
Impress CL Plus <sup>db</sup>	FEED	6	-	-	72	-	-	4	-	-	82	-	-
Jade	FEED	0	-	-	-	-	-	7	-	76	95	-	-
LRPB Mustang <sup>db</sup>	FEED	0	-	-	-	-	-	10	-	-	93	95	93

SOURCE: NATIONAL VARIETY TRIALS (2014–2017)

**TABLE 8 North Central and North East wheat (main season). NVT long-term predicted yield expressed as a percentage of mean yield.**

		NORTH CENTRAL					NORTH EAST				
Year			2014	2015	2016	2017		2014	2015	2016	2017
Mean yield (t/ha)			3.61	1.44	7.27	3.53		5.88	3.69	6.83	4.79
	Quality	No. trials	2	2	2	2	No. trials	3	4	4	4
BREAD WHEAT											
Axe <sup>db</sup>	AH	8	98	107	86	99	13	88	95	83	98
Beckom <sup>db</sup>	AH	8	107	105	107	111	15	110	108	107	111
Chara <sup>db</sup>	AH	0	-	-	-	-	2	103	97	-	-
Chief CL Plus <sup>db</sup>	APW	2	104	-	-	-	2	105	-	-	-
Cobalt <sup>db</sup>	APW	6	-	102	108	109	12	-	107	110	108
Condo <sup>db</sup>	AH	8	103	107	99	101	15	99	104	96	102
Coolah <sup>db</sup>	AH	4	-	-	100	106	9	-	97	105	101
Corack <sup>db</sup>	APW	8	100	116	101	107	15	98	106	97	109
Correll <sup>db</sup>	AH	6	100	104	98	-	9	97	97	97	-
Cosmick <sup>db</sup>	AH	8	102	99	104	103	14	106	103	105	104
Cutlass <sup>db</sup>	APW	6	-	100	106	106	12	-	105	107	107
Derrimut <sup>db</sup>	AH	8	97	102	100	98	15	97	99	98	99
DS Bennett <sup>db</sup>	ASW	2	-	-	-	97	8	-	-	114	96
DS Darwin <sup>db</sup>	AH	8	96	99	98	98	15	96	101	96	100
DS Newton	APW	4	95	97	-	-	7	95	99	-	-
DS Pascal <sup>db</sup>	APW	6	93	-	102	87	15	95	99	101	90
EG Jet <sup>db</sup>	APW	2	-	93	-	-	4	-	99	-	-
EGA Gregory <sup>db</sup>	APW*	8	103	89	96	100	14	104	91	100	96
Elmore CL Plus <sup>db</sup>	AH	8	100	96	99	97	14	99	97	100	96
Emu Rock <sup>db</sup>	AH	6	95	108	97	-	9	94	102	94	-
Estoc <sup>db</sup>	APW	8	94	104	101	101	13	97	101	100	104
Gladius <sup>db</sup>	AH	8	94	107	98	97	14	91	100	95	98
Grenade CL Plus <sup>db</sup>	AH	8	92	104	95	96	13	90	95	93	97
Harper <sup>db</sup>	APW	6	95	103	101	-	9	98	100	99	-
Hatchet CL Plus <sup>db</sup>	AH	8	93	109	91	92	3	84	-	-	-
Justica CL Plus <sup>db</sup>	APW	6	93	106	98	-	9	89	99	95	-
Kord CL Plus <sup>db</sup>	AH	8	95	108	96	99	13	91	98	93	100
Livingston <sup>db</sup>	AH	0	-	-	-	-	2	92	94	-	-
LRPB Arrow <sup>db</sup>	AH	6	-	110	101	102	12	-	105	98	106
LRPB Cobra <sup>db</sup>	AH	8	106	98	105	102	15	108	108	106	103
LRPB Flanker <sup>db</sup>	AH	8	106	92	101	102	12	108	96	105	98
LRPB Gauntlet <sup>db</sup>	APW	6	99	96	93	-	10	96	94	94	-
LRPB Havoc <sup>db</sup>	AH	4	-	-	97	104	7	-	-	95	105
LRPB Kittyhawk <sup>db</sup>	AH	0	-	-	-	-	2	-	-	92	85
LRPB Lancer <sup>db</sup>	AH	0	-	-	-	-	14	100	92	97	94
LRPB Lincoln <sup>db</sup>	AH	8	95	103	100	92	13	93	102	96	95
LRPB Merlin <sup>db</sup>	AH	6	93	103	93	-	9	91	96	92	-
LRPB Phantom <sup>db</sup>	AH	8	101	96	103	100	13	104	102	104	101
LRPB Scout <sup>db</sup>	AH	8	104	96	104	102	15	107	103	106	102
LRPB Spitfire <sup>db</sup>	AH	8	93	99	93	95	14	91	96	92	97
LRPB Trojan <sup>db</sup>	APW	8	105	102	106	105	15	107	106	106	106
LRPB Viking <sup>db</sup>	AH	6	106	88	101	-	11	108	97	105	-
Mace <sup>db</sup>	AH	8	100	113	100	105	15	97	105	97	106
Magenta <sup>db</sup>	APW	6	98	102	101	-	10	97	100	100	-
QAL2000	AGP*	6	99	93	104	-	8	103	99	106	-
Razor CL Plus <sup>db</sup>	ASW	2	-	-	-	105	4	-	-	-	106
Scepter <sup>db</sup>	AH	6	-	120	109	112	12	-	112	105	114
Sunmate <sup>db</sup>	AH	2	-	103	-	-	5	-	98	-	94
Suntop <sup>db</sup>	AH	8	104	98	96	105	15	102	97	99	102
Vixen <sup>db</sup>	AH	2	-	-	-	110	4	-	-	-	114
Wallup <sup>db</sup>	AH	8	97	95	96	98	15	98	100	96	101
Yitpi <sup>db</sup>	AH	8	93	101	98	98	13	95	96	96	100

TABLE 8, cont. next page

**(CONTINUED) TABLE 8 North Central and North East wheat (main season). NVT long-term predicted yield expressed as a percentage of mean yield.**

		NORTH CENTRAL					NORTH EAST				
Year			2014	2015	2016	2017		2014	2015	2016	2017
Mean yield (t/ha)			3.61	1.44	7.27	3.53		5.88	3.69	6.83	4.79
	Quality	No. trials	2	2	2	2	No. trials	3	4	4	4
BISCUIT WHEAT											
Barham	ASFT	6	96	94	98	-	9	95	90	100	-
LRPB Impala <sup>db</sup>	ASFT	8	100	102	102	101	13	100	99	103	99
FEED WHEAT											
DS Faraday	FEED	2	-	-	-	100	7	-	-	99	96
Buchanan <sup>db</sup>	FEED	2	-	90	-	-	4	-	104	-	-
DS Tull <sup>db</sup>	FEED	2	-	-	-	98	8	-	-	102	94
Gascoigne	FEED	4	100	101	-	-	6	99	102	-	-
Jade	FEED	4	-	91	98	-	0	-	-	-	-
LRPB Beaufort <sup>db</sup>	FEED	2	-	-	-	101	5	111	106	-	101
LRPB Mustang <sup>db</sup>	FEED	4	-	-	99	102	8	-	-	97	103
LRPB Oryx <sup>db</sup>	FEED	4	-	102	-	100	6	-	102	-	99
LRPB Reliant <sup>db</sup>	FEED	8	104	99	93	102	12	99	90	95	96
RGT Calabro	FEED	0	-	-	-	-	2	-	-	106	93
RGT Zanzibar	FEED	4	-	-	109	102	8	-	-	117	101
SEA Condamine	FEED	2	-	-	-	100	4	-	-	-	101
Steel	FEED	4	-	103	89	-	8	-	99	86	-
Tenfour <sup>db</sup>	FEED	6	-	113	105	109	0	-	-	-	-

NOTE: 2018 North Central and North East data not published as a result of compromised trials.

SOURCE: NATIONAL VARIETY TRIALS (2014–2017)

**TABLE 9 North East and South West wheat (early season). NVT long-term predicted yield expressed as a percentage of mean yield.**

Year	NORTH EAST					SOUTH WEST					
			2015	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)			6.2	5.78	2.71		5.3	4.29	7.23	5.97	5.09
	Quality	No. trials	1	1	1	No. trials	3	3	3	2	2
BREAD WHEAT											
Beckom <sup>db</sup>	AH	3	108	104	120	10	-	116	101	109	103
Bolac <sup>db</sup>	AH	3	100	98	100	13	99	101	99	99	99
Catapult <sup>db</sup>	AH	1	-	-	124	2	-	-	-	-	112
Chara <sup>db</sup>	AH	3	100	99	107	13	102	104	97	101	98
Coolah <sup>db</sup>	AH	3	101	110	107	13	101	104	103	103	103
Cutlass <sup>db</sup>	APW	3	107	108	112	10	-	112	106	107	107
DS Bennett <sup>db</sup>	ASW	2	-	108	92	7	-	-	116	107	113
DS Darwin <sup>db</sup>	AH	3	95	93	104	3	98	-	-	-	-
DS Newton	APW	1	97	-	-	6	98	104	-	-	-
DS Pascal <sup>db</sup>	APW	3	107	100	107	13	105	112	103	104	106
EGA Gregory <sup>db</sup>	APW*	3	89	101	94	3	90	-	-	-	-
EGA Wedgetail <sup>db</sup>	APW*	3	98	94	86	13	97	93	101	96	100
Elmore CL Plus <sup>db</sup>	AH	3	96	103	101	13	95	97	97	96	98
Forrest <sup>db</sup>	APW	3	98	98	91	13	94	97	100	94	101
Illabo <sup>db</sup>	AH	2	-	93	100	7	-	-	105	107	105
Kellalac	ASW	1	97	-	-	6	96	95	-	-	-
Kiora <sup>db</sup>	AH	3	104	101	106	13	103	107	101	103	102
LRPB Flanker <sup>db</sup>	AH	3	93	107	99	0	-	-	-	-	-
LRPB Gauntlet <sup>db</sup>	APW	1	94	-	-	0	-	-	-	-	-
LRPB Kittyhawk <sup>db</sup>	AH	3	99	91	88	10	-	94	99	96	98
LRPB Lancer <sup>db</sup>	AH	3	101	97	110	0	-	-	-	-	-
LRPB Nighthawk <sup>db</sup>	AH	1	-	-	95	2	-	-	-	-	105
LRPB Phantom <sup>db</sup>	AH	3	98	110	108	13	98	102	100	100	101
LRPB Scout <sup>db</sup>	AH	0	-	-	-	11	103	105	98	103	-
LRPB Trojan <sup>db</sup>	APW	3	107	109	116	13	108	113	104	109	105
LRPB Viking <sup>db</sup>	AH	1	95	-	-	9	97	96	97	-	-
QAL2000	AGP*	1	103	-	-	9	100	108	103	-	-
Scepter <sup>db</sup>	AH	1	-	-	116	2	-	-	-	-	104
Sunlamb <sup>db</sup>	ASW	3	94	95	82	0	-	-	-	-	-
Suntop <sup>db</sup>	AH	2	103	99	-	0	-	-	-	-	-
BISCUIT WHEAT											
LRPB Gazelle <sup>db</sup>	ASFT	1	101	-	-	9	98	107	100	-	-
FEED WHEAT											
DS Faraday <sup>db</sup>	FEED	2	-	101	94	0	-	-	-	-	-
DS Tull <sup>db</sup>	FEED	2	-	101	104	0	-	-	-	-	-
Gascoigne	FEED	1	96	-	-	6	99	100	-	-	-
Longsword <sup>db</sup>	FEED	2	-	94	101	7	-	-	102	106	101
LRPB Beaufort <sup>db</sup>	FEED	2	-	117	102	13	108	109	117	110	115
Manning <sup>db</sup>	FEED	2	105	92	-	13	101	90	112	99	108
Mansfield	FEED	1	88	-	-	3	-	72	-	-	-
Preston	FEED	1	106	-	-	9	107	106	103	-	-
RGT Accroc	FEED	3	116	106	84	13	111	105	124	110	119
RGT Calabro	FEED	3	114	98	74	10	-	97	122	109	116
RGT Zanzibar	FEED	2	-	111	105	7	-	-	119	115	117
SF Adagio	FEED	3	111	98	83	13	108	101	116	106	112
SF Ovalo	FEED	1	98	-	-	2	96	-	-	-	-
SF Scenario	FEED	1	102	-	-	9	99	88	105	-	-
SQP Revenue <sup>db</sup>	FEED	1	105	-	-	13	101	91	114	100	109

NOTE: North East 2014 and 2016 data not published as a result of compromised trials.

SOURCE: NATIONAL VARIETY TRIALS (2014–2017)

**TABLE 10 South West wheat (long season). NVT long-term predicted yield expressed as a percentage of mean yield.**

SOUTH WEST							
Year			2014	2015	2016	2017	2018
Mean yield (t/ha)			5.77	3.76	7.45	5.05	5.29
	Quality	No. trials	2	2	2	1	2
BREAD WHEAT							
Bolac <sup>db</sup>	AH	6	98	105	-	-	-
Cutlass <sup>db</sup>	APW	1	-	-	-	105	-
DS Bennett <sup>db</sup>	ASW	5	-	-	123	116	112
DS Pascal <sup>db</sup>	APW	11	104	124	103	102	98
EGA Wedgetail <sup>db</sup>	APW*	10	99	98	95	99	98
Forrest <sup>db</sup>	APW	11	99	103	91	97	94
Illabo <sup>db</sup>	AH	5	-	-	102	102	99
LRPB Kittyhawk <sup>db</sup>	AH	9	100	105	96	98	97
LRPB Lancer <sup>db</sup>	AH	4	92	-	-	-	-
LRPB Nighthawk <sup>db</sup>	AH	2	-	-	-	-	98
LRPB Trojan <sup>db</sup>	APW	9	104	129	111	102	99
LRPB Viking <sup>db</sup>	AH	4	96	-	-	-	-
Sunlamb <sup>db</sup>	ASW	9	94	86	93	97	99
Sunzell	AH	8	85	75	73	-	-
Wylah	APW*	8	98	98	89	-	-
BISCUIT WHEAT							
LRPB Gazelle <sup>db</sup>	ASFT	4	97	-	-	-	-
FEED WHEAT							
Brennan <sup>db</sup>	FEED	9	98	90	99	96	100
Einstein	FEED	9	103	85	111	97	109
Longsword <sup>db</sup>	FEED	5	-	-	92	89	92
LRPB Beaufort <sup>db</sup>	FEED	7	-	119	126	108	109
Mackellar	FEED	8	107	103	109	-	-
Manning <sup>db</sup>	FEED	11	113	105	124	107	113
Mansfield	FEED	4	-	79	-	-	-
Naparoo <sup>db</sup>	FEED	11	84	63	66	98	88
RGT Accroc	FEED	7	-	114	129	123	116
RGT Calabro	FEED	7	-	107	124	113	113
RGT Zanzibar	FEED	5	-	-	120	112	106
Rudd	FEED	8	102	93	102	-	-
SF Adagio	FEED	7	-	111	117	112	110
SF Ovalo	FEED	5	-	88	113	104	-
SF Scenario	FEED	4	-	95	109	-	-
SQP Revenue <sup>db</sup>	FEED	11	109	107	123	106	110
Steel	FEED	4	-	76	49	-	-
Sunmax <sup>db</sup>	FEED	5	-	90	85	104	-
Suntime <sup>db</sup>	FEED	4	89	-	-	-	-
Tennant	FEED	8	94	74	97	-	-

SOURCE: NATIONAL VARIETY TRIALS (2014–2017)



**TABLE 11 Wimmera wheat (durum). NVT long-term predicted yield expressed as a percentage of mean yield.**

WIMMERA				
Year			2017	2018
Mean yield (t/ha)			5.73	4.16
	Quality	No. trials	1	1
DURUM WHEAT				
Bitalli <sup>db</sup>	ADR	2	107	107
Caparoi <sup>db</sup>	ADR	2	97	98
DBA Aurora <sup>db</sup>	ADR	2	103	103
DBA Spes <sup>db</sup>	ADR	2	103	103
DBA Vittaro <sup>db</sup>	ADR	1	-	95
EGA Bellaro <sup>db</sup>	ADR	2	93	96
Hyperno <sup>db</sup>	ADR	2	102	102
Saintly <sup>db</sup>	ADR	2	101	100
Tjilkuri <sup>db</sup>	ADR	2	99	101
Westcourt <sup>db</sup>	ADR	1	-	107
WID802 <sup>db</sup>	ADR	2	107	108
FEED WHEAT				
DBA Bindaro <sup>db</sup>	FEED	1	-	98

SOURCE: NATIONAL VARIETY TRIALS (2014–2017)

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# BARLEY

Barley growers in Victoria have access to many different barley varieties. Identifying the variety that is best suited to a region and will give the greatest return requires consideration of several factors including relative yield, disease resistance, marketing options and the probability of achieving particular quality grades. The decision to grow either a malting or non-malting variety may depend on one or more factors, including: the difference in payments between malting and non-malting grades related to yield differences; the probability of producing a malting-grade barley; availability of malting storage segregations in storage facilities, and disease resistance and agronomic considerations. It is important that growers contact grain marketers to discuss market demand. Malting barley is grown, stored and sold on a variety-specific basis and it is important to ascertain if the variety chosen can be stored and marketed in your area.

## NEW VARIETIES

Leabrook (W14896) is a new mid-maturing medium-tall barley variety, bred by the University of Adelaide (PBR 2017/197), with yield and agronomic data now available from the National Variety Trials website. It has similar plant type and disease resistance to Compass<sup>®</sup> with generally higher yield, higher plump grain percentage and lower screening percentage. Leabrook<sup>®</sup> will be released as a feed variety in 2020 and is being evaluated for malting and brewing, having passed stage 1 malt accreditation in March 2019 and now in stage 2. It is being marketed by Seednet.

## QUALITY CHANGES

Grain Trade Australia has decided on a change in name regarding feed barley for the 2019/20 season:

- “The grade names will change from Feed1 and Feed2 to Barley1 and Barley2 respectively.
- The grade name change reflects the multiple use of existing specifications and is recognised in the market-driven price of the specifications.
- The change is not expected to impact the existing interpretation of the price for existing grades, given the existing tolerances and standards for those two grades is not expected to alter.”

## INDUSTRY UPDATE

IMI (imidazolinone herbicide) tolerant barley varieties (Spartacus CL<sup>®</sup> or Scope CL<sup>®</sup>) may incur market access restrictions in some important export destinations, including Japan and South Korea. This potential restriction is due to the existing maximum residue limits (MRLs) in those destination markets being below the residues allowed in Australia for IMI chemicals. All grain exported must meet the importing country regulatory requirements, including MRLs for individual chemicals that may be listed under the IMI category.

Growers are encouraged to speak with their relevant bulk handling companies and grain buyers to keep updated with their plans for handling IMI-tolerant barley treated with herbicides registered for use on these varieties (for example Intervix<sup>®</sup>, Intercept<sup>®</sup> and Sentry<sup>®</sup>). Growers are also encouraged to speak to their agronomists or advisers. Information will be updated regularly at [barleyaustralia.com.au/ba-industry-updates](http://barleyaustralia.com.au/ba-industry-updates).

## MALT EVALUATION

In 2019 RGT Planet<sup>®</sup> received Barley Australia malt accreditation. 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.

At the time of publication, Banks<sup>®</sup> was still undergoing evaluation with a decision expected in November 2019. Bottler<sup>®</sup> and Buff<sup>®</sup> (WA acid soil-tolerant varieties) were undergoing stage 1 of evaluation. Leabrook<sup>®</sup> and Alestar<sup>®</sup> advanced to stage 2 of evaluation in 2019 with a decision expected in March 2020. New variety Biere<sup>®</sup> passed stage 1 evaluation in 2018, however due to insufficient grain, stage 2 assessment has been held over until 2020. The outcome of malt evaluation of these varieties will be updated on [barleyaustralia.com.au](http://barleyaustralia.com.au) in March 2020.

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 2.

## KEY DISEASE AND PEST CONSIDERATIONS

Diseases have the potential to cause significant issues if not managed effectively. Avoiding sowing susceptible varieties into infected stubble, controlling the green bridge and applying fungicides and insecticides proactively are all important management considerations.

Stubble-borne diseases, spot form of net blotch (SFNB), net form of net blotch (NFNB), and scald can be present in paddocks due to carry-over from previous seasons. Seed treatments provide effective control of bunt and smut diseases and should be applied every year with good coverage. Bunt and smut infection can develop rapidly and result in significant yield losses or unsaleable grain. Infected seed lots should not be used.

## MORE INFORMATION

**[nvtonline.com.au](http://nvtonline.com.au)**

- Detailed NVT trial results and links to variety information

**[nvtonline.com.au/apps](http://nvtonline.com.au/apps)**

- Crop Disease Au App
- NVT Long Term Yield Reports App

**[agriculture.vic.gov.au/agriculture/grains-and-other-crops](http://agriculture.vic.gov.au/agriculture/grains-and-other-crops)**

- Agriculture Victoria Cereal Disease Guide

**[barleyaustralia.com.au](http://barleyaustralia.com.au)**

Information includes:

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

**[grdc.com.au](http://grdc.com.au)**

- GRDC GrowNotes™ Barley Southern Region

**[communities.grdc.com.au](http://communities.grdc.com.au)**

- Expert support on crop nutrition and field crop diseases at your fingertips

## VARIETY DESCRIPTIONS

Varieties have been listed according to quality classification grade and in alphabetical order and not in order of preference. The agronomic characteristics in these descriptions are provided as a guide only and have been compiled from observations of the breeder, NVT, agronomic research projects or seed companies.

### Abbreviations used are:

(b) 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

# Varieties marked may be more susceptible if more virulent strains are present.

End Point Royalty (**EPR**) 2019-20 quoted \$/tonne ex-GST.

## MALTING BARLEY

### COMMANDER<sup>®</sup>

A mid-maturing variety best suited to 350–550mm rainfall districts, particularly the Wimmera Mallee. It is broadly adapted and is high yielding under favourable spring conditions. Commander<sup>®</sup> is inherently lower in grain protein content like Scope<sup>®</sup>. It has moderately weak straw and can lodge under either high yield environments or if unfavourable conditions occur between grain fill and harvest. Grain size is generally excellent compared to other varieties, but it is prone to low test weights in some seasons. Scald SVS, SFNB MS and NFNB MSS, powdery mildew MRMS, leaf rust S and CCN R. Commander<sup>®</sup> is suitable for domestic, Chinese and SE Asian brewing markets. Growers should consult their grain marketers regarding markets and availability of segregation. Released 2008. Marketed by Seednet. EPR \$3.80.

### COMPASS<sup>®</sup>

Compass<sup>®</sup> is an early to mid-season maturing variety. It is closely related to Commander<sup>®</sup> but is significantly higher yielding and earlier flowering with typical May sowing. Compass<sup>®</sup> has relatively weak straw strength and is prone to lodging in high yielding environments. Compass<sup>®</sup> has excellent physical grain quality with high retention, low screenings and moderate test weight. Scald SVS, SFNB MSS and NFNB MRMS, powdery mildew MS, leaf rust VS and CCN R. Bred by Adelaide University. Released 2013. Seed available from Seednet. EPR \$3.80.

### FAIRVIEW<sup>®</sup>

A moderately late maturing variety best suited to 400–600mm rainfall districts. Yields are similar to Gairdner and Commander<sup>®</sup> in these districts. The grain plumpness of Fairview<sup>®</sup> is superior to Gairdner. Scald SVS, SFNB S and NFNB VS, powdery mildew R and leaf rust S. Limited seed is available under contract with Malteurop. Fairview<sup>®</sup> has an export malt quality profile and is marketed via closed loop supply chain through Malteurop. Released 2008. EPR \$3.00.

### GAIRDNER

A moderately late maturing variety best suited to 400–600mm rainfall districts. In lower rainfall districts Gairdner can yield well in seasons with favourable spring finishes, however not necessarily within malting specifications. Gairdner is known for high screenings in a dry spring, with levels of grain plumpness generally being inferior to all other malting varieties. Scald SVS, SFNB S and NFNB MRMS, powdery mildew S, leaf rust S and CCN S (NVT ratings). Gairdner is accepted by both domestic and export brewing markets. Released 1998. Free to trade. No EPR.

### GRANGER<sup>®</sup>

A mid to late maturing variety. 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. Scald S, SFNB S and NFNB MSS, powdery mildew R, leaf rust S and CCN R (NVT ratings). Released 2013. Licensed by Nickerson, seed available from Heritage Seeds. EPR \$2.95.

### LA TROBE<sup>®</sup>

An early maturing variety for low to medium rainfall environments. A semi-dwarf plant type providing medium lodging resistance and a medium head loss risk. The variety has a short coleoptile and sowing depth should be considered. Good sprouting tolerance, excellent test weights and moderately good grain plumpness. Scald SVS, SFNB S and NFNB MR#, powdery mildew MS#, leaf rust S and CCN R. It is classed as a 'preferred' malting variety for Graincorp in the Graincorp areas of the North East, Central, Swan Hill, southern Mallee and Wimmera in Victoria. Developed by InterGrain. Released 2013. Free to trade. EPR \$4.00.

### RGT PLANET<sup>®</sup>

RGT Planet<sup>®</sup> is a mid-flowering, early-late maturing variety, with elastic maturity making it suited from low to high rainfall regions. Seed Force suggest RGT Planet<sup>®</sup> is high yielding with good straw strength, head retention, test weight and low screenings. Scald S, SFNB S and NFNB SVS, powdery mildew R, leaf rust MRMS and CCN R. Bred by RGT Semences. Released 2016. Seed available from Seed Force. EPR \$4.00.

INTRO

WHEAT

BARLEY

OAT

TRITICALE

CANOLA

FIELD PEA

LENTIL

FABA BEAN

LUPIN

CHICKPEA

VETCH

**SCOPE CL<sup>Ⓛ</sup>**

A tall, early to mid-season maturing barley with moderate to high yield potential across a range of medium rainfall environments. Scope CL<sup>Ⓛ</sup> can be prone to head loss and lodging under certain environmental conditions. Scope CL<sup>Ⓛ</sup> has moderate grain size and inherently low grain protein. It is registered for the use of an appropriate imidazolinone herbicide. Accredited as malting barley in 2013, growers are advised to consult with their grain marketer about segregation and pricing. Scope CL<sup>Ⓛ</sup> is accepted into those markets previously accepting Buloke<sup>Ⓛ</sup>. Scald S, SFNB MSS and NFNB MR, powdery mildew RMR, leaf rust S and CCN S. Released 2010. Marketed by Seednet, exclusively through resellers that have a current imidazolinone accreditation. EPR \$3.50.

**SPARTACUS CL<sup>Ⓛ</sup>**

Spartacus CL<sup>Ⓛ</sup> is an early maturing, CCN resistant, Clearfield® barley. It is a semi-dwarf and is ideally suited to the low to medium rainfall regions. It is agronomically similar to La Trobe<sup>Ⓛ</sup> but has slightly improved lodging tolerance with a low head loss risk and has a short rachilla hair length, reducing itchiness. It is registered for the use of an appropriate imidazolinone herbicide. Scald SVS, SFNB SVS and NFNB MS, powdery mildew S, leaf rust S and CCN R. Accredited as a malting barley in 2018, export market demand is developing. Growers are advised to consult with their grain marketer about segregation and pricing. Seed available from InterGrain Seedclub members. EPR \$4.25.

**WESTMINSTER<sup>Ⓛ</sup>**

A mid to late maturing variety with medium to tall, stiff straw and good head retention. This variety continues to have good market demand in Victoria and is an ideal fit into the higher rainfall areas in southern Victoria. Accredited as malting barley in 2013 with domestic and export demand. Scald MRMS, SFNB S and NFNB MR#, powdery mildew R and leaf rust MRMS. Bred by Nickerson. Released 2009. Seed available from GrainSearch. EPR \$3.00.

**FOOD GRADE BARLEY****HINDMARSH<sup>Ⓛ</sup>**

A very early maturing semi-dwarf variety recommended for the 325–450mm rainfall regions. Hindmarsh<sup>Ⓛ</sup> has a relatively short coleoptile and deep sowing should be avoided to maximise crop establishment and yield potential. Hindmarsh<sup>Ⓛ</sup> is free threshing with good resistance to head loss and high test weight among non-malting varieties. Scald SVS, SFNB SVS and NFNB MR#, powdery mildew MS#, leaf rust S and CCN R. It has a high demand as a food barley and is still sought after by the export malting markets at a price discount to other malting varieties. Released 2006. Seed available from Seednet. EPR \$1.50.

**NON-MALTING BARLEY****FATHOM<sup>Ⓛ</sup>**

An early maturing variety with broad adaption. It has low screenings, similar to Maritime<sup>Ⓛ</sup>. Fathom<sup>Ⓛ</sup> has a long coleoptile and excellent early vigour, giving weed competitiveness and tolerance to deep planting, especially on sandy soils. Fathom<sup>Ⓛ</sup> is well suited to wider row spacings and is an alternative to Hindmarsh<sup>Ⓛ</sup>, particularly where more reliable establishment and improved early vigour are sought. Fathom<sup>Ⓛ</sup> is moderately tall, possesses good head loss tolerance but is prone to lodging in high yield environments. Scald S, SFNB RMR and NFNB MRMS#, powdery mildew MRMS, leaf rust MRMS and CCN R. Developed by Adelaide University. Released 2011. Seed available from Seednet. EPR \$2.00.

**OXFORD**

Mid-late maturity non-malting variety, best suited to medium to high rainfall regions (350–600mm) and should not be planted after mid-June. Scald S, SFNB S and NFNB S, powdery mildew R, leaf rust MS and CCN S (NVT ratings). Bred by Nickerson, released 2009. Seed available from Heritage Seeds. EPR \$2.50.

**ROSALIND<sup>Ⓛ</sup>**

A very broadly adapted mid-maturing semi-dwarf, feed variety with good yield stability. Maturity is typically later than La Trobe<sup>Ⓛ</sup>, but earlier than Scope CL<sup>Ⓛ</sup>. It is ideally suited to May sowings. Rosalind<sup>Ⓛ</sup> has good straw strength and head retention. Scald MS, SFNB S and NFNB MR, powdery mildew S, leaf rust MR and CCN R. Bred by InterGrain. Released 2015. Free to trade and available from InterGrain Seedclub members. EPR \$3.50.



## VARIETIES CURRENTLY UNDERGOING MALT EVALUATION

### ALESTAR<sup>Ⓢ</sup>

Alestar<sup>Ⓢ</sup> is a mid-maturing variety, with maturity similar to Commander<sup>Ⓢ</sup>, suited to the medium to high rainfall regions. It is undergoing Barley Australia malt accreditation with a decision expected in 2020. Elders suggest good straw strength, head retention, and test weight. Scald S, SFNB MRMS and NFNB S, powdery mildew RMR, leaf rust MS and CCN R (NVT ratings). Bred by Elders. Released 2017. Seed available from Elders. EPR \$3.00.

### BANKS<sup>Ⓢ</sup>

Banks<sup>Ⓢ</sup> is a mid-late maturing variety ideally suited to medium to high rainfall environments. Banks<sup>Ⓢ</sup> is suited to late April to early May sowings. It is undergoing Barley Australia malt accreditation with a decision expected in November 2019. Scald S, SFNB S and NFNB MR, powdery mildew MRMS, leaf rust S and CCN S. Released 2018 (tested as IGB1305). Bred and marketed by InterGrain with grain available from Seedclub members and resellers. EPR \$4.00.

### BOTTLER<sup>Ⓢ</sup>

A mid-maturing variety suited to medium to high rainfall environments. Bottler<sup>Ⓢ</sup> is an export malt type grain. It is undergoing Barley Australia malt accreditation with a decision expected in 2021. Scald SVS, SFNB S and NFNB MS, powdery mildew R and leaf rust MS (NVT ratings). Bred by Sejet. Released 2018 (tested as HV16). Seed available from GrainSearch. EPR \$4.00.

### NEW – BUFF<sup>Ⓢ</sup>

Early maturing variety suited to acid soils, with good early vigour and an erect plant type. It is undergoing Barley Australia malt accreditation with the earliest possible accreditation decision expected in 2021. Available in 2019 as a feed variety. S to scald, MS to SFNB and S to NFNB, powdery mildew S and leaf rust MSS (provisional ratings). Released 2018 (tested as IGB 1506). Bred and marketed by InterGrain. For more information on availability contact InterGrain. EPR \$3.50.

### NEW – LEABROOK<sup>Ⓢ</sup>

Leabrook<sup>Ⓢ</sup> is a new mid-maturing medium tall barley variety, with similar plant type and disease resistance to Compass<sup>Ⓢ</sup> with generally higher yield, higher plump grain percentage and lower screenings. Released as a feed variety in 2020 and is undergoing Barley Australia malt accreditation with a decision expected in 2020. Scald SVS, SFNB MS and NFNB MRMS, powdery mildew MRMS, leaf rust SVS and CCN R (provisional ratings). Released 2019 (tested as WI4896). Bred by University of Adelaide, marketed by Seednet. EPR \$3.80.

INTRO

WHEAT

BARLEY

OAT

TRITICALE

CANOLA

FIELD PEA

LENTIL

FABA BEAN

LUPIN

CHICKPEA

VETCH

**TABLE 1 Barley time of sowing guide.**

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

<b>MALLEE</b>	<b>April</b>				<b>May</b>				<b>June</b>				<b>July</b>			
Mid-Late Maturity																
Mid Maturity																
Mid-Early Maturity																
Early Maturity																
Very Early Maturity																
<b>WIMMERA</b>	<b>April</b>				<b>May</b>				<b>June</b>				<b>July</b>			
Mid-Late Maturity																
Mid Maturity																
Mid-Early Maturity																
Early Maturity																
Very Early Maturity																
<b>NORTH CENTRAL</b>	<b>April</b>				<b>May</b>				<b>June</b>				<b>July</b>			
Mid-Late Maturity																
Mid Maturity																
Mid-Early Maturity																
Early Maturity																
Very Early Maturity																
<b>NORTH EAST</b>	<b>April</b>				<b>May</b>				<b>June</b>				<b>July</b>			
Mid-Late Maturity																
Mid Maturity																
Mid-Early Maturity																
Early Maturity																
Very Early Maturity																
<b>SOUTH WEST</b>	<b>April</b>				<b>May</b>				<b>June</b>				<b>July</b>			
Mid-Late Maturity																
Mid Maturity																
Mid-Early Maturity																
Early Maturity																
Very Early Maturity																

Yellow = earlier than ideal.

Green = optimum sowing time.

Red = later than ideal.

**TABLE 2 Barley variety demand<sup>1</sup> for preferred malting varieties and agronomic guide.**

The agronomic characteristics in this table are provided as a guide only and have been compiled from observations of the breeders and seed companies. Domestic and export market demand has been sourced from Barley Australia (2019).

Variety	Domestic brewing industries <sup>2</sup>	Export brewing industries	Height	Maturity	Head loss	Plump grain rating	Lodging
MALTING BARLEY							
Commander <sup>db</sup>	medium	low	M	M	M	8	M
Compass <sup>db</sup>	medium	medium	MT	EM	M	9	M
Fairview <sup>db*</sup>	-	-	MS	ML	MR	-	R
Gairdner	low	low	M	ML	MR	5	R
GrangeR <sup>db</sup>	-	-	M	ML	MR	-	R
La Trobe <sup>db</sup>	-	high	S-MS	E	MR	6	R-MR
RGT Planet <sup>db</sup>	developing	developing	M	EML	R	7	R
Scope CL <sup>db</sup>	-	low	MT	EM	MS	6	M
Spartacus CL <sup>db</sup>	developing	developing	MS	E	R	6-7	R
Westminster <sup>db</sup>	high	high	M	ML	R	-	R
NON-MALTING BARLEY							
Fathom <sup>db</sup>	-	-	MT	E	MR	9	MR
Hindmarsh <sup>db</sup>	-	-	S-MS	VE	MR	6	R-MR
Oxford	-	-	S-MS	ML	R	6	R
Rosalind <sup>db</sup>	-	-	MS	M	R	6-7	R
BARLEY UNDER MALT EVALUATION							
Variety	Target accreditation date		Height	Maturity	Head loss	Plump grain rating	Lodging
Alestar <sup>db</sup>	2020		M	M	R	8	R
Banks <sup>db</sup>	2019		MS	ML	-	6-7	-
Bottler <sup>db</sup>	2021		-	M	-	-	-
Buff <sup>db</sup>	2021		M	E	-	-	S
Leabrook <sup>db</sup>	2021		MT	M	-	9	M

<sup>1</sup> Demand in Victoria is determined by marketing companies who are members of Barley Australia. <sup>2</sup> Domestic demand by Australian malting companies: malt produced may be used by the domestic brewing industry or exported. \* Closed loop variety.

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 3 for key. Plump grain relative scale: 1 = small or unreliable grain size; 9 = large or reliable grain size

**TABLE 3 Barley variety disease reactions.**

Variety	Leaf scald	Spot form net blotch	Net form net blotch	Powdery mildew	Leaf rust	CCN resistance	Root lesion nematode	
							<i>P. neglectus</i> resistance	<i>P. thornei</i> resistance
MALTING BARLEY								
Commander <sup>db</sup>	SVS	MS	MSS	MRMS	S	R	MRMS	MRMS
Compass <sup>db</sup>	SVS	MSS	MRMS	MS	VS	R	MRMS	MR
Fairview <sup>db</sup>	SVS	S	VS	R	S	-	MRMS	MR
Gairdner	SVS	S	MRMS	S	S	S	MRMS	MSS
GrangeR <sup>db</sup>	S	S	MSS	R	S	R	MRMS	MRMS
La Trobe <sup>db</sup>	SVS	S	MR#	MS#	S	R	MRMS	MRMS
RGT Planet <sup>db</sup>	S	S	SVS	R	MRMS	Rp	MRMS	RMR
Scope CL <sup>db</sup>	S	MSS	MR	RMR	S	S	MRMS	MRMS
Spartacus CL <sup>db</sup>	SVS	SVS	MS	S	S	R	MRMS	MRMS
Westminster <sup>db</sup>	MRMS	S	MR#	R	MRMS	-	MRMS	MS
NON-MALTING BARLEY								
Fathom <sup>db</sup>	S	RMR	MRMS#	MRMS	MRMS	R	MRMS	MR
Hindmarsh <sup>dbf</sup>	SVS	SVS	MR#	MS#	S	R	MRMS	MRMS
Oxford	S	S	S	R	MS	S	MR	MR
Rosalind <sup>db</sup>	MS	S	MR	S	MR	R	MRMS	MRMS
BARLEY UNDER MALT EVALUATION								
Alestar <sup>db</sup>	S	MRMS	S	RMR	MS	R	MR	MR
Banks <sup>db</sup>	S	S	MR	MRMS	S	S	MR	MR
Bottler <sup>db</sup>	SVS	S	MS	R	MS	-	MRMS	R
Buff <sup>db</sup>	Sp	MSp	Sp	Sp	MSSp	-	MRMS	MRMS
Leabrook <sup>db</sup>	SVSp	MSp	MRMSp	MRMSp	SVSp	R	MR	RMR

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

SOURCE: AGRICULTURE VICTORIA CEREAL DISEASES GUIDES (2019), NVT DISEASE RATINGS (2019)

f = Food grade barley p = provisional ratings – treat with caution. 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 4 Barley diseases.**

Disease	Organism	Symptoms	Occurrence	Inoculum source	Control
<b>FOLIAR</b>					
Scald	<i>Rhynchosporium commune</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 seed borne. Spores spread by rain splash.	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 10mm, 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 two 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.
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. Rain splash.	Disease is not of economic importance.
<b>GRAIN</b>					
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.
<b>ROOT/CROWN</b>					
Crown rot	<i>Fusarium pseudo-graminearum</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 two 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 five 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>P. 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.

Source: 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 Mallee barley (main season). NVT long-term predicted yield expressed as a percentage of mean yield.**

MALLEE						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		2.40	2.01	4.83	3.96	1.94
	No. trials	7	7	4	3	6
MALTING BARLEY						
Bass <sup>db</sup>	27	101	97	97	98	100
Buloke <sup>db</sup>	18	99	101	96	-	-
Commander <sup>db</sup>	27	95	98	102	101	103
Compass <sup>db</sup>	27	121	126	91	103	117
Flagship <sup>db</sup>	11	-	99	85	-	-
Flinders <sup>db</sup>	18	98	96	95	-	-
Gairdner	27	93	89	89	87	90
GrangeR <sup>db</sup>	21	96	94	101	98	-
La Trobe <sup>db</sup>	27	115	119	95	103	112
RGT Planet <sup>db</sup>	13	-	-	116	114	105
Schooner	21	97	97	85	88	-
Scope CL <sup>db</sup>	27	99	100	95	96	100
Spartacus CL <sup>db</sup>	27	116	123	94	103	111
NON-MALTING BARLEY						
Fathom <sup>db</sup>	27	114	113	100	107	120
Fleet Australia <sup>db</sup>	21	103	103	99	102	-
Hindmarsh <sup>db</sup>	27	117	121	93	102	112
Keel	14	114	114	-	-	-
Oxford	21	83	79	109	98	-
Rosalind <sup>db</sup>	27	120	122	103	111	114
SY Rattler	18	96	95	93	-	-
Topstart	14	84	82	-	-	-
BARLEY UNDER MALT EVALUATION						
Banks	20	-	110	102	105	107
Biere <sup>db</sup>	20	-	108	82	89	97
Buff <sup>db</sup>	6	-	-	-	-	114
Leabrook <sup>db</sup>	20	-	121	100	107	115
Maltstar <sup>db</sup>	6	-	-	-	-	96

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

**TABLE 6 Wimmera barley (main season). NVT long-term predicted yield expressed as a percentage of mean yield.**

WIMMERA						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		2.10	1.70	6.87	5.14	3.85
	No. trials	4	3	3	4	3
MALTING BARLEY						
Bass <sup>db</sup>	16	110	101	100	98	98
Baudin <sup>db</sup>	17	99	90	99	97	98
Buloke <sup>db</sup>	10	98	104	95	-	-
Charger <sup>db</sup>	17	120	111	102	99	98
Commander <sup>db</sup>	17	90	99	98	100	104
Compass <sup>db</sup>	17	121	152	91	100	100
Fairview <sup>db</sup>	12	91	59	107	98	-
Flagship <sup>db</sup>	7	100	108	-	-	-
Flinders <sup>db</sup>	17	101	93	96	95	93
Gairdner	17	103	89	90	90	88
GrangeR <sup>db</sup>	17	96	84	102	99	97
La Trobe <sup>db</sup>	17	115	137	94	101	101
Macquarie	7	102	84	-	-	-
Navigator <sup>db</sup>	10	84	62	105	-	-
RGT Planet <sup>db</sup>	10	-	-	122	113	111
Schooner	7	105	110	-	-	-
Scope CL <sup>db</sup>	17	101	104	94	96	97
Spartacus CL <sup>db</sup>	17	110	139	91	101	100
Westminster <sup>db</sup>	10	85	57	101	-	-
Wimmera	7	98	80	-	-	-
NON-MALTING BARLEY						
Bottler <sup>db</sup>	10	-	-	109	104	103
Explorer <sup>db</sup>	10	-	-	108	103	99
Fathom <sup>db</sup>	17	124	136	103	103	107
Fleet Australia <sup>db</sup>	14	111	120	99	100	-
Hindmarsh <sup>db</sup>	17	115	140	92	100	99
Oxford	17	79	52	109	101	99
Rosalind <sup>db</sup>	17	118	135	106	108	106
SY Rattler	10	94	83	93	-	-
Topstart	17	77	53	110	103	100
BARLEY UNDER MALT EVALUATION						
Alestar <sup>db</sup>	17	91	79	104	101	99
Banks <sup>db</sup>	13	-	115	103	104	104
Biere <sup>db</sup>	10	-	121	85	90	-
Buff <sup>db</sup>	3	-	-	-	-	109
Leabrook <sup>db</sup>	13	-	136	97	105	106
Maltstar <sup>db</sup>	17	95	79	111	104	104

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)



**TABLE 7 North Central and North East barley (main season). NVT long-term predicted yield expressed as a percentage of mean yield.**

Year		NORTH CENTRAL					NORTH EAST			
		2014	2015	2016	2017	2018	2014	2015	2016	
Mean yield (t/ha)		4.26	2.47	6.07	4.64	3.78	5.54	2.43	7.28	
	No. trials	2	1	2	2	1	No. trials	1	1	1
MALTING BARLEY										
Bass <sup>db</sup>	8	103	98	96	98	100	3	101	100	100
Baudin <sup>db</sup>	8	102	96	96	96	99	3	99	92	99
Buloke <sup>db</sup>	5	97	100	99	-	-	3	97	99	97
Charger <sup>db</sup>	8	104	100	95	100	100	3	103	108	101
Commander <sup>db</sup>	8	99	103	104	99	110	3	97	93	99
Compass <sup>db</sup>	8	91	111	104	102	115	3	100	126	98
Fairview <sup>db</sup>	0	-	-	-	-	-	3	101	80	101
Flagship <sup>db</sup>	3	91	96	-	-	-	2	92	97	-
Flinders <sup>db</sup>	8	98	94	94	95	90	3	99	98	97
Gairdner	8	98	91	88	87	93	3	95	91	93
GrangeR <sup>db</sup>	3	101	95	-	-	-	3	101	97	101
La Trobe <sup>db</sup>	8	94	108	104	102	111	3	100	119	99
Macquarie	0	-	-	-	-	-	2	95	82	-
Navigator <sup>db</sup>	5	109	93	96	-	-	3	98	73	100
RGT Planet <sup>db</sup>	5	-	-	106	117	95	1	-	-	111
Schooner	3	94	97	-	-	-	2	92	95	-
Scope CL <sup>db</sup>	8	97	99	98	95	103	3	97	99	97
Spartacus CL <sup>db</sup>	8	90	109	105	103	108	3	99	122	98
Westminster <sup>db</sup>	5	105	87	91	-	-	3	98	78	98
Wimmera	3	103	92	-	-	-	0	-	-	-
NON-MALTING BARLEY										
Explorer <sup>db</sup>	5	-	-	99	106	87	1	-	-	104
Fathom <sup>db</sup>	8	103	110	104	104	123	3	103	114	102
Hindmarsh <sup>db</sup>	8	92	108	103	102	108	3	100	122	98
Oxford	8	107	90	97	100	80	3	101	80	103
Rosalind <sup>db</sup>	8	99	110	107	113	104	3	107	126	105
SY Rattler	5	94	90	92	-	-	3	98	99	97
Topstart	8	106	90	99	102	78	3	102	82	104
BARLEY UNDER MALT EVALUATION										
Alestar <sup>db</sup>	8	102	95	99	101	87	3	101	94	102
Banks	6	-	105	105	106	104	2	-	110	102
Biere <sup>db</sup>	5	-	96	89	91	-	2	-	114	93
Bottler <sup>db</sup>	5	-	-	100	104	93	1	-	-	104
Buff <sup>db</sup>	5	-	-	106	103	120	1	-	-	101
Leabrook <sup>db</sup>	6	-	111	109	106	114	2	-	118	101
Maltstar <sup>db</sup>	8	108	97	101	104	95	3	103	91	104

NOTE: 2017 and 2018 North East data were not published as a result of compromised trials.

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

**TABLE 8 South West barley (long season). NVT long-term predicted yield expressed as a percentage of mean yield.**

SOUTH WEST					
Year		2014	2015	2016	2017
Mean yield (t/ha)		6.67	5.31	7.3	5.03
	No. trials	3	3	3	3
MALTING BARLEY					
Bass <sup>db</sup>	17	103	105	96	92
Charger <sup>db</sup>	17	96	97	97	105
Commander <sup>db</sup>	17	97	99	93	100
Compass <sup>db</sup>	17	91	96	88	103
Fairview <sup>db</sup>	17	101	102	103	98
Flinders <sup>db</sup>	17	100	100	94	95
Gairdner	17	92	92	85	96
GrangeR <sup>db</sup>	17	99	99	96	107
Macquarie	7	-	95	-	-
Navigator <sup>db</sup>	12	98	95	96	94
RGT Planet <sup>db</sup>	6	-	-	115	110
Spartacus CL <sup>db</sup>	9	-	106	93	100
Vlamingh <sup>db</sup>	7	94	-	-	-
Westminster <sup>db</sup>	17	93	88	98	95
Wimmera	17	101	101	95	90
NON-MALTING BARLEY					
Capstan	14	104	102	110	104
Explorer <sup>db</sup>	12	102	103	103	97
Maritime <sup>db</sup>	7	88	-	-	-
Oxford	17	103	100	111	104
Rosalind <sup>db</sup>	12	105	110	105	110
SY Rattler	14	91	86	91	-
Topstart	17	104	101	114	108
Urambie <sup>db</sup>	17	101	101	95	90
BARLEY UNDER MALT EVALUATION					
Alestar <sup>db</sup>	17	101	101	103	102
Bottler <sup>db</sup>	6	-	-	109	109
Leabrook <sup>db</sup>	9	-	105	96	109

NOTE: 2018 South West data not published as a result of compromised trials.

SOURCE: NATIONAL VARIETY TRIALS (2014-2017)

**ACKNOWLEDGEMENTS**

Mark McLean      Agriculture Victoria, Horsham  
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 Ash Brooks      InterGrain

# OAT

Oats are an important crop for grain, hay and fodder and demand is increasing domestically and internationally.

## NEW VARIETIES

There are two new oat varieties available for sowing in 2020.

Bilby<sup>®</sup> is an early-mid season potential milling variety with excellent grain yield and improved grain quality when compared to other similar varieties. Koorabup<sup>®</sup> is a mid-tall, early-mid season hay variety with improved disease and grain quality compared to other current hay varieties. Both new varieties have been developed by the National Oat Breeding Program, are covered by PBR and were released in spring 2019.

## INDUSTRY UPDATE

In spring 2019 InterGrain announced a world's first imidazolinone (IMI) tolerant oat variety, Kingbale. A mid-flowering, single gene IMI-tolerant oaten hay variety with improved tolerance to soil residual imidazolinone herbicides. This makes it an ideal variety for use where there are concerns of IMI residue from previous crops. Preliminary data shows Kingbale to have a similar agronomic profile to Wintaroo<sup>®</sup>. Full chemical registration is expected for oaten hay use by March 2021, subject to 2019 field testing results. Seed will be available for planting in 2021.

## QUALITY

Variety selection should be based on agronomic traits, potential grain quality and marketing or end-use options. Grain quality traits for the milling industry include high groat percentage, high  $\beta$ -glucan, low screenings and high hectolitre weight. Grain quality traits for improved animal feed include low hull lignin, high groat percentage, high protein 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 them as profitable and as a tool to manage herbicide resistance and to spread risk. Variety performance for hay yield and quality is available in the Oat Breeding Newsletter at [aexco.com.au](http://aexco.com.au) released in November.

## KEY DISEASE CONSIDERATIONS

Red leather leaf and bacterial blight are common foliar diseases of oats. To reduce severity and loss from these stubble-borne diseases, growers should avoid sowing into oat stubble. Some varieties are resistant, reducing the likelihood of loss. Where red leather leaf infection develops, foliar fungicide application at tillering and stem elongation has been found to provide effective suppression. Currently, there are no foliar treatment options for bacterial blight.

## 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](http://aexco.com.au) for further information on hay, grain and seed royalties.

## MORE INFORMATION

**nvtonline.com.au**

- Detailed NVT trial results and links to variety information

**nvtonline.com.au/apps**

- Crop Disease Au App
- NVT Long Term Yield Reports App

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

- Agriculture Victoria Cereal Disease Guide

**aexco.com.au**

- Producing Quality Oat Hay booklet
- SARDI Oat Breeding Newsletter

**communities.grdc.com.au**

- Expert support on crop nutrition and field crop diseases at your fingertips

## VARIETY DESCRIPTIONS

(<sup>‡</sup>) Denotes that Plant Breeder Rights apply

End Point Royalty (**EPR**) for grain and hay and seed royalty for 2019-20 season quoted \$/tonne ex-GST.

## MILLING OAT

### BANNISTER<sup>‡</sup>

A tall dwarf milling variety with wide adaption. Compared to Mitika<sup>‡</sup> it is about 13cm taller and flowers 3-4 days later. Similar to Mitika<sup>‡</sup> for groat percentage. Stem rust S, leaf rust R, septoria S and CCN VS. Released 2013. Bred by the National Oat Breeding Program and marketed by Seednet. EPR \$2.30.

### NEW – BILBY<sup>‡</sup>

A dwarf, early-mid season potential milling oat. Excellent grain yield, similar to Williams<sup>‡</sup> and Bannister<sup>‡</sup>, with improved grain quality, low screenings and high groat percentage. Stem rust MSS, leaf rust R, septoria MSS and CCN S. Released 2019. Bred by the National Oat Breeding Program (tested as 06204-16) and marketed by Heritage Seeds. EPR \$2.50.

### DURACK<sup>‡</sup>

Early maturing tall variety widely adaptable to low-medium rainfall zones and late planting in high rainfall regions. Good early vigour and good lodging resistance with low screenings. Stem rust S, leaf rust S, septoria S and CCN R. Released 2016. Bred by SARDI and marketed by Heritage Seeds. EPR \$2.30.

### KOWARI<sup>‡</sup>

An early maturing dwarf potential milling variety, slightly taller than Mitika<sup>‡</sup> and suited to medium to high rainfall zones. It has good grain quality, improved  $\beta$ -glucan content and low screenings. Stem rust S, leaf rust R, septoria S and CCN VS. Released 2017. Bred by the National Oat Breeding Program and marketed by Heritage Seeds. EPR \$2.50.

### MITIKA<sup>‡</sup>

An early maturing dwarf variety 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. Stem rust S, leaf rust S, septoria S and CCN VS. Released 2005. Marketed by Heritage Seeds. EPR \$2.00.

**WILLIAMS<sup>Ⓛ</sup>**

A short-tall milling oat suited to medium to high rainfall zones. It is 15cm taller than Mitika<sup>Ⓛ</sup>, 5cm taller than Bannister<sup>Ⓛ</sup> and 15cm shorter than Yallara<sup>Ⓛ</sup>. A higher yielding variety, similar to Bannister but with slightly inferior grain quality. Produces high screenings when grown in low rainfall areas. Stem rust S, leaf rust R, septoria MS and CCN S. Released 2013. Bred by the National Oat Breeding Program and marketed by Heritage Seeds. EPR \$2.30.

**YALLARA<sup>Ⓛ</sup>**

Medium to tall, early to mid-season variety. Stem rust S, leaf rust MS, septoria MS and CCN R. Suited to drier areas. Released 2009. Bred by SARDI and marketed by Seednet. EPR \$2.00.

**DUAL-PURPOSE OAT****Hay/grazing/feed – BRUSHER<sup>Ⓛ</sup>**

Early to mid-season tall oat, well suited to low and medium rainfall areas. Stem rust S, leaf rust S, septoria MS and CCN R. Released 2003. Bred by SARDI and marketed by AEXCO. EPR \$2.00.

**Hay/feed – MULGARA<sup>Ⓛ</sup>**

Early to mid-season tall oat. Excellent hay colour and quality similar to Wintaroo<sup>Ⓛ</sup> with good grain yield. Stem rust MS, leaf rust MS, septoria MS and CCN R. Released 2009. Bred by SARDI and marketed by AEXCO. EPR \$2.00.

**Hay/feed – TAMMAR<sup>Ⓛ</sup>**

Late season tall hay oat variety for medium and high rainfall zones which provides a slightly later cutting time than Tungoo<sup>Ⓛ</sup> and Kangaroo. Stem rust MR, leaf rust MR, septoria MR and CCN R (SARDI ratings). Released 2010. Bred by SARDI and marketed by AEXCO. EPR \$2.00.

**Hay/grazing/feed – WINTAROO<sup>Ⓛ</sup>**

Tall, mid-season variety for all rainfall zones. Stem rust S, leaf rust S, septoria MS and CCN R. Released 2003. Bred by SARDI and marketed by AEXCO. EPR \$2.00.

**HAY OAT****FORESTER<sup>Ⓛ</sup>**

A medium height, very late hay variety adapted to high rainfall and irrigated cropping regions. It has excellent lodging and shattering resistance. Stem rust S, leaf rust MS, septoria MR and CCN MS. Released 2012. Bred by SARDI and marketed by AEXCO. EPR \$2.00.

**NEW – KOORABUP<sup>Ⓛ</sup>**

Mid-tall potential hay oat with early-mid to mid-season maturity. Similar height, grain yield and stem diameter to Yallara<sup>Ⓛ</sup>, but has a later maturity of 2-4 days. Hay quality is similar to Wintaroo<sup>Ⓛ</sup>. Stem rust S, leaf rust MSS, septoria MRMS and CCN MS. Released 2019 (tested as 05096-32). Bred by National Oat Breeders and marketed by AEXCO. EPR \$2.00.

**TUNGOO<sup>Ⓛ</sup>**

A medium to tall variety. Stem rust S, leaf rust MS, septoria MR and CCN R. Hay yield similar to Kangaroo but grain yield poor. Released 2012. Bred by SARDI and marketed by AEXCO. EPR \$2.00.

**TABLE 1 Oat time of sowing guide.**

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

MALLEE	March	April	May	June	July
Mid-Late Maturity					
Mid Maturity					
Early-Mid Maturity					
Early Maturity					
WIMMERA	March	April	May	June	July
Mid-Late Maturity					
Mid Maturity					
Early-Mid Maturity					
Early Maturity					
NORTH CENTRAL	March	April	May	June	July
Mid-Late Maturity					
Mid Maturity					
Early-Mid Maturity					
Early Maturity					
NORTH EAST	March	April	May	June	July
Mid-Late Maturity					
Mid Maturity					
Early-Mid Maturity					
Early Maturity					
SOUTH WEST	March	April	May	June	July
Very Late Maturity					
Mid-Late Maturity					
Mid Maturity					
Early-Mid Maturity					
Early Maturity					

Varietal choice determines time to grazing or cutting for hay

Yellow = earlier than ideal.

Green = optimum sowing time.

Red = later than ideal.

**TABLE 2 Oat variety agronomic guide and disease reactions.**

The agronomic characteristics in this table are provided as a guide only and have been compiled from observations of the breeder, National Oat Breeding Program and seed companies. Disease reactions have been sourced from Agriculture Victoria Cereal Disease Guide (2019).

	End use	Height	Maturity	Hectolitre weight	Stem rust	Leaf rust	CCN		BYDV	Septoria avenae	Bacterial blight	Red Leather leaf
							Res	Tol				
<b>MILLING OATS</b>												
Bannister <sup>db</sup>	M	TD	M	H	S	R	VS	I	MS	S	S	MS
Bilby <sup>db</sup>	M	D	EM	H	MSS	R	S	-	MSS	MSS	MS	S
Durack <sup>db</sup>	M	T	E	H	S	S	R	MI	S	S	S	S
Kowari <sup>db</sup>	M	D	E	H	S	R	VS	-	S	S	MR	MS
Mitika <sup>db</sup>	M	D	E	H	S	S	VS	I	S	S	MR	S
Williams <sup>db</sup>	M	ST	E	H	S	R	S	I	MS	MS	R	MS
Wombat	M	D	M	H	S	MS	R	T	MR	MS	MS	MS
Yallara <sup>db</sup>	M	MT	EM	H	S	MS	R	I	MS	MS	MS	S
<b>HAY/GRAZING/FEED OATS</b>												
Brusher <sup>db</sup>	H/G/F	T	EM	M	S	S	R	MI	MS	MS	MS	MS
Forester <sup>db</sup>	H	MT	VL	L	S	MS	MS	MI	S	MR	S	MRMS
Koorabup <sup>db</sup>	H	MT	EM	VH	S	MSS	MS	-	MSS	MRMS	MR	MS
Mulgara <sup>db</sup>	H/F	T	EM	M	MS	MS	R	MT	MS	MS	MR	S
Tungoo <sup>db</sup>	H	MT	ML	L	S	MS	R	MT	MS	MR	MR	MS
Wintaroo <sup>db</sup>	H/G	T	M	M	S	S	R	MT	MS	MS	MS	S

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, L = late, VL = very late

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

p = provisional ratings – treat with caution.



TABLE 3 Oat diseases.

Disease	Organism	Symptoms	Occurrence	Inoculum source	Control
FOLIAR					
Leaf rust	<i>Puccinia coronata f.sp. 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 f.sp. 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 and 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 pv. 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 pv. striafaciens</i>	Spots on leaves lengthen to form brown stripes 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, and destroy infected oat stubble.
Powdery mildew	<i>Blumeria graminis f.sp. 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 var. 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.	Airborne 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 two 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 and numerous tillers.	Encouraged by moist conditions and 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>P. 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.

Source: 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 4 North Central oat variety trial results. NVT long-term predicted yield expressed as a percentage of mean yield.**

NORTH CENTRAL						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		4.17	0.75	5.91	3.76	0.62
	No. trials	2	2	2	2	2
Bannister <sup>db</sup>	10	113	112	128	116	120
Bilby <sup>db</sup>	10	109	125	112	106	120
Dunnart <sup>db</sup>	6	108	97	117	-	-
Durack <sup>db</sup>	10	96	110	80	97	100
Echidna <sup>db</sup>	10	106	76	118	99	101
Koorabup <sup>db</sup>	10	94	79	82	101	91
Kowari <sup>db</sup>	10	104	119	100	100	112
Mitika <sup>db</sup>	10	101	107	95	94	104
Possum	10	101	110	105	102	103
Potoroo	4	-	110	115	-	-
Williams <sup>db</sup>	10	108	108	118	115	111
Wombat	8	103	88	121	103	-
Yallara <sup>db</sup>	10	96	96	86	105	98

**TABLE 5 North East oat variety trial results. NVT long-term predicted yield expressed as a percentage of mean yield.**

NORTH EAST						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		3.73	2.37	6.34	4.05	1.89
	No. trials	2	2	1	1	1
Bannister <sup>db</sup>	7	112	97	128	108	117
Bilby <sup>db</sup>	7	106	111	115	108	106
Dunnart <sup>db</sup>	5	107	91	117	-	-
Durack <sup>db</sup>	7	93	106	85	102	96
Echidna <sup>db</sup>	7	107	84	115	91	102
Koorabup <sup>db</sup>	7	100	82	89	96	105
Kowari <sup>db</sup>	7	100	110	103	104	99
Mitika <sup>db</sup>	7	97	107	97	99	94
Possum	7	96	108	101	102	97
Potoroo	3	-	91	122	-	-
Williams <sup>db</sup>	7	114	95	121	110	119
Wombat	6	104	94	113	98	-
Yallara <sup>db</sup>	7	95	93	89	100	103

**TABLE 6 South West oat variety trial results. NVT long-term predicted yield expressed as a percentage of mean yield.**

SOUTH WEST						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		5.60	3.41	6.16	3.11	3.85
	No. trials	2	2	2	2	1
Bannister <sup>db</sup>	9	118	109	137	105	102
Bilby <sup>db</sup>	9	116	108	121	111	98
Dunnart <sup>db</sup>	6	109	100	125	-	-
Durack <sup>db</sup>	9	91	93	82	95	96
Echidna <sup>db</sup>	9	110	97	125	107	108
Koorabup <sup>db</sup>	9	86	89	85	92	98
Kowari <sup>db</sup>	9	107	101	107	105	99
Mitika <sup>db</sup>	9	103	98	100	105	100
Possum	9	102	101	104	95	102
Potoroo	4	-	97	136	-	-
Williams <sup>db</sup>	9	111	111	119	106	97
Wombat	8	107	105	116	100	-
Yallara <sup>db</sup>	9	87	89	89	84	99

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

**ACKNOWLEDGEMENTS**

Mark McLean      Agriculture Victoria, Horsham  
 Sue Hoppo        South Australian Research and Development Institute  
 Denis McGrath    AEXCO

# TRITICALE

Triticale is no longer evaluated as part of the GRDC National Variety Trials (NVT) program. Variety descriptions, agronomic information and disease reactions will continue to be presented in this publication.

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 availability. It is a tall crop bred for greater straw strength which can be useful in rocky paddocks or circumstances where crops have been known to lodge.

## NEW VARIETIES

Cartwheel<sup>®</sup> is a new, awned variety of triticale, with an optimal sowing window of mid-March to mid-April, though it can be sown beginning of March. Earlier sowings may need to be grazed pre-tillering to stop early head initiation as grazing immature heads will reduce grain yield. Early sowing and higher seeding rates will improve forage production (see *NSW DPI Winter Crop Variety Sowing Guide* chapter 'Managing Grazing Cereals'). Straw strength is good and it is shorter in stature than Tobruk<sup>®</sup> and Endeavour<sup>®</sup>, usually by 10cm. Grain yield is equivalent to Tobruk<sup>®</sup> in southern NSW dual-purpose mixed-cereal trials. Cartwheel<sup>®</sup> was bred by University of Sydney and marketed by Waratah Seeds.

## MORE INFORMATION

[www.nvtonline.com.au](http://www.nvtonline.com.au)

- Detailed NVT trial results up to 2015 and links to variety information.

[www.nvtonline.com.au/apps](http://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](http://agriculture.vic.gov.au/agriculture/grains-and-other-crops)

- Growing Triticale
- Agriculture Victoria Cereal Disease Guide

[communities.grdc.com.au](http://communities.grdc.com.au)

- Expert support on crop nutrition and field crop diseases at your fingertips

[nvtonline.com.au/crop-guides/nsw/](http://nvtonline.com.au/crop-guides/nsw/)

- NSW DPI *Winter Crop Variety Sowing Guide*

## VARIETY DESCRIPTIONS

(1) Denotes that Plant Breeder Rights apply  
End Point Royalty (EPR) 2019-20 quoted \$/tonne ex-GST.

**ASTUTE<sup>Ⓛ</sup>**

A mid-season fully awned variety suited to medium to high yielding environments. An alternative to Hawkeye<sup>Ⓛ</sup>. Stem rust RMR, stripe rust RMR, leaf rust RMR and CCN R. Released 2015. Bred and marketed by AGT. EPR \$2.75.

**BISON<sup>Ⓛ</sup>**

An early to mid-season reduced awn variety best suited to low to medium yielding environments. Stem rust RMR, stripe rust R, leaf rust RMR and CCN R. Released 2015. Bred and marketed by AGT. EPR \$2.75.

**NEW – CARTWHEEL<sup>Ⓛ</sup>**

A long-season dual-purpose triticale suitable for grazing and grain. Recovery from grazing is excellent in the colder winter months. Grain yield is equivalent to Tobruk<sup>Ⓛ</sup> in southern NSW dual-purpose mixed-cereal trials. Stem rust R, stripe rust R, leaf rust R, and CCN R. Released 2017. Bred by University of Sydney. Marketed by Waratah Seeds. Area point royalty of \$7/ha.

**FUSION<sup>Ⓛ</sup>**

A mid-season, fully awned grain only triticale variety. A moderately tall variety that yields well in dry or sudden finishes. Stem rust R, stripe rust RMR, leaf rust R and CCN R. Effectively reduces *Pratylenchus neglectus* (root lesion nematode sp.) in the soil. Released 2012. Bred and marketed by AGT. EPR \$3.00.

**GOANNA**

An early to mid-season, fully awned grain-only triticale. Stem rust R, stripe rust RMR, leaf rust RMR and CCN R. 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 RMR, leaf rust MRMS and CCN S. Released 2015 by Cooper & Elleway.

**WONAMBI**

A later maturing spring or facultative type variety suitable for grazing, forage conservation and grain production. Stem rust RMR, stripe rust MRp, leaf rust R and CCN MSp. Released 2018 by Cooper & Elleway and marketed by Naracoorte Seeds.

**TABLE 1** Triticale time of sowing guide.

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

MALLEE	April				May				June				July			
Late Maturity																
Mid-Late Maturity																
Mid Maturity																
Early-Mid Maturity																
WIMMERA	April				May				June				July			
Late Maturity																
Mid-Late Maturity																
Mid Maturity																
Early-Mid Maturity																
NORTH CENTRAL	April				May				June				July			
Late Maturity																
Mid-Late Maturity																
Mid Maturity																
Early-Mid Maturity																
NORTH EAST	April				May				June				July			
Late Maturity																
Mid-Late Maturity																
Mid Maturity																
Early-Mid Maturity																
SOUTH WEST	April				May				June				July			
Late Maturity																
Mid-Late Maturity																
Mid Maturity																
Early-Mid Maturity																

Yellow = earlier than ideal.

Green = optimum sowing time.

Red = later than ideal.

**TABLE 2** Triticale variety agronomic guide and disease reaction.

The agronomic characteristics in this table are provided as a guide only and have been compiled from observations of the breeder. Disease reactions have been sourced from Agriculture Victoria Cereal Disease Guide (2019).

Variety	Maturity	Height	Head colour	Stem rust	Stripe rust	Leaf rust	Yellow leaf spot	<i>Septoria tritici</i>	CCN resistance
Astute <sup>Ⓛ</sup>	M	M-T	W	RMR	RMR	RMR	MRMS	RMR	R
Bison <sup>Ⓛ</sup>	E-M	T	W	RMR	R	RMR	MR	RMR	R
Cartwheel <sup>Ⓛ</sup>	L	-	W	R	R	R	RMR	R	R
Fusion <sup>Ⓛ</sup>	M	M-T	W	R	RMR	R	MRMS	MRMS	R
Goanna <sup>Ⓛ</sup>	E-M	T	W	R	RMR	RMR	MR	MR	R
KM10	E-M	-	W	R	RMR	MRMS	MRMS	MR	S
Wonambi	L	T	W	RMR	MR <sub>p</sub>	R	MR	RMR	MS <sub>p</sub>

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

Height: M = medium, T = tall

Colour: W = white, Br = brown

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.

*p* = provisional ratings – treat with caution.

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

## ACKNOWLEDGEMENTS

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# CANOLA

Vivid yellow flowers in spring make canola the most distinctive of Victoria's winter crops. Canola is grown for its seed which is crushed for the oil used in margarine, cooking oils, salad oils and edible oil blends. After the oil is extracted, the by-product is a protein-rich meal used by the intensive livestock industries.

## NEW VARIETIES

Several new canola varieties have been released and marketing companies have indicated there will be seed commercially available for sowing in 2020. It is important to note for both new and older varieties where seed remains available, not all varieties have been tested in recent years. Hence NVT-tested years are provided in the variety descriptions.

The new listings for 2020 are:

- Clearfield®-tolerant hybrid – Phoenix CL
- Clearfield® specialty hybrid – VICTORY® V75-03CL
- Triazine tolerant hybrids – HyTTec® Trident
- Triazine-tolerant OP – ATR-Flathead
- TruFlex® dual herbicide varieties – Hyola® 410XX, Hyola® 530XT, Hyola® 540XC, InVigor R 4022P, Xseed™ Raptor.

Varieties removed this year are:

- Roundup Ready® varieties – IH51 RR, InVigor R 4020P, NUSEED GT-41.

## DUAL-PURPOSE CANOLA

Research trials have shown that long-season 'dual-purpose' winter hybrid canola for grazing and grain production have performed well in the high rainfall zone. In autumn, established plants were more able to defend against attacks from slugs and waterlogging. In a dry spring, the more robust root system was better able to access subsoil moisture. These dual-purpose hybrid varieties are sown in late spring or early-mid summer and grazed until autumn; or sown in autumn or early winter. Winter-type canola varieties are currently not evaluated through the NVT program. Consult the GRDC factsheet: *Spring-Sown Winter Canola*.

## SPECIALTY CANOLA (HOLL)

Specialty canola hybrids have a particular trait that produces a high-stability 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 when the grain meets specifications. Specialty canola typically requires additional attention to quality but, agronomically, it is grown similarly to commodity canola.

## TRUFLEX® CANOLA

TruFlex® canola, developed by Bayer, offers farmers greater flexibility through an extended glyphosate application window up to first flower and an opportunity to apply Roundup Ready® herbicides at higher rates for enhanced weed control. TruFlex® canola has been launched in the 2019 season. Further information on TruFlex® canola can be found at [truflex.com.au](http://truflex.com.au)

## KEY DISEASE CONSIDERATIONS

Varietal resistance to blackleg is reported each year in the BlacklegCM App and the Blackleg Management Guide. It is crucial to use the latest guide as some cultivars may have reduced resistance status due to the blackleg fungus overcoming resistance. These guides also report the blackleg group for each variety. If your current canola variety has reduced resistance over time, it may be prudent to change to a variety which is from a different resistance group.

BlacklegCM App has all varietal blackleg ratings and resistance groups. The App will predict yield losses and enable you to explore different management and fungicide options to protect your crop.

There is no known varietal resistance to sclerotinia in Australia. Sclerotinia will be determined by region, seasonal conditions and bloom stage when conducive conditions occur. The SclerotiniaCM App will predict yield losses and provide probable returns from fungicide applications.

## MORE INFORMATION

**[nvtonline.com.au](http://nvtonline.com.au)**

- Detailed NVT trial results and links to variety information

**[nvtonline.com.au/apps](http://nvtonline.com.au/apps)**

- Crop Disease Au App
- NVT Long Term Yield Reports App

**[agriculture.vic.gov.au/agriculture/grains-and-other-crops](http://agriculture.vic.gov.au/agriculture/grains-and-other-crops)**

- Growing canola
- Blackleg of canola
- Canola diseases

**[grdc.com.au](http://grdc.com.au)**

- GrowNotes™ Canola Southern Region
- Fact Sheet: Blackleg Management Guide updated in March and September
- Tips & Tactics: Better Mouse Management

**BlacklegCM App**

- Decision support tool for profitable management of blackleg. Not available on iPhone

**SclerotiniaCM App**

- A forecasting model to assist canola growers with fungicide application decisions. Not available on iPhone

**[communities.grdc.com.au](http://communities.grdc.com.au)**

- Expert support on crop nutrition and field crop diseases at your fingertips

## VARIETY DESCRIPTIONS

(b) Denotes that Plant Breeder Rights apply

End Point Royalty (EPR) 2019-20 quoted \$/tonne ex-GST.

**Abbreviations used are:**

**OP** = Open pollinated

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

**Blackleg ratings:**

**R** = resistant,

**MR** = moderately resistant,

**S** = susceptible,

**p** = provisional ratings – treat with caution.

\* Hybrid was screened in 2017, but not in 2018.

It was therefore not exposed to the most recent pathogen populations.

Resistance order from highest to lowest:

**R > R-MR > MR > MR-MS > MS > MSS > S**

## CONVENTIONAL VARIETIES

**OP – AV-GARNET<sup>(b)</sup>**

Mid-maturing variety of medium height. Blackleg rating MS. NVT tested 2006-19. Bred by Agriculture Victoria. Marketed by Nuseed.

**Hybrid – NUSEED DIAMOND**

Early maturing hybrid of medium height suited to medium rainfall zones. Blackleg rating MR. NVT tested 2012-19. Marketed by Nuseed.

**Hybrid – NUSEED QUARTZ**

Mid-maturing hybrid variety of medium height bred to replace AV-Garnet. Suited to medium to high rainfall zones. Blackleg rating R. NVT tested 2016-19. Released 2017. Marketed by Nuseed.

## CONVENTIONAL SPECIALTY HYBRID VARIETIES

**Hybrid Specialty Oil – VICTORY® V3002**

Early-mid maturing conventional specialty hybrid. Blackleg rating R-MR. NVT tested 2011-18. Bred by Cargill. Marketed by AWB under contract.

## CLEARFIELD® HYBRID VARIETIES

**Hybrid – BANKER CL**

Mid-maturing hybrid, later than Carbine and earlier than Archer, suited to medium rainfall areas or later sowing in high rainfall zones. Blackleg rating MR. NVT tested 2014-18. Marketed by Heritage Seeds.

**Hybrid – HYOLA® 575CL**

Mid to mid-early hybrid. Adapted for low to very high rainfall zones. Medium to tall height. Blackleg rating R. NVT tested 2010-19. Bred and marketed by Advanta Seeds.

**Hybrid – HYOLA® 970CL**

Long-season winter dual-purpose hybrid with tall height. Adapted to high to very high rainfall zones (>500mm). Blackleg rating R. Not tested in NVT trials. Marketed by Advanta Seeds.

**NEW – Hybrid – PHOENIX CL**

Late maturing winter variety, slightly quicker to flower than other varieties. Blackleg rating R. Not tested in NVT trials. Released 2019. Marketed by AGF Seeds.

**Hybrid – PIONEER® 43Y92 CL**

Early maturing hybrid variety suited to low to medium rainfall zones. Blackleg rating R-MR. NVT tested 2016-19. Released 2017. Marketed by Pioneer Seeds.

**Hybrid – PIONEER® 44Y90 CL**

Early-mid maturing hybrid. Suited to low to medium rainfall zones. Blackleg rating R-MR. NVT tested 2015-19. Marketed by Pioneer Seeds.

**Hybrid – PIONEER® 45Y91 CL**

Mid-maturing hybrid variety. Suited to medium to high rainfall zones. Unique phenology allows for early planting and grazing potential. Blackleg rating MR. NVT tested 2014-19. Marketed by Pioneer Seeds.

**Hybrid – PIONEER® 45Y93 CL**

Early flowering mid-maturing hybrid variety. Suited to medium to high rainfall and irrigation zones. Blackleg rating R-MR\*. Medium-tall height. NVT tested 2017-19. Released 2018. Marketed by Pioneer Seeds.

**Hybrid – SAINTLY CL**

Mid to mid-early maturing hybrid. Medium plant height. Blackleg rating MR. NVT tested 2016-19. Released 2017. Marketed by Heritage Seeds.

**Hybrid – SF EDIMAX CL**

Late maturing dual-purpose winter graze and grain hybrid. Seed Force indicate very high biomass with excellent yield and oil content. Suited to early sowing and spring sowing in high rainfall areas. Blackleg rating R-MR. Not tested in NVT trials. Marketed by Seed Force.

**CLEARFIELD® SPECIALTY HYBRID****Victory® Specialty Hybrid – VICTORY® V7001CL**

Late maturing specialty (high oleic, low linoleic oil) hybrid. Blackleg rating + Jockey® R. Not tested in NVT trials. Bred by Cargill. Marketed by AWB under contract.

**Victory® Specialty Hybrid – VICTORY® V7002CL**

Early-mid maturing specialty (high oleic, low linoleic oil) hybrid. Blackleg rating + Jockey® R. NVT tested 2017-19. Bred by Cargill. Marketed by AWB under contract.

**NEW – VICTORY® Specialty Hybrid – V75-03CL**

Mid maturing specialty (high oleic, low linoleic oil) hybrid. Blackleg rating + Jockey® R. NVT tested 2017-19 as 16MH6004. Commercial in 2020. Bred by Cargill. Marketed by AWB under contract.

**TRIAZINE-TOLERANT VARIETIES****OP – ATR-BONITO<sup>®</sup>**

Early-mid maturing variety for low to medium rainfall zones. Short to medium height. Alternative to ATR Stingray<sup>®</sup> or ATR Gem<sup>®</sup>. Blackleg rating MS. NVT tested 2012-19. Bred and marketed by Nuseed. EPR \$5.00.

**NEW – OP – ATR-FLATHEAD**

Early maturing variety. Replacement for ATR Stingray<sup>®</sup>. Short-medium height. Suited to low-medium rainfall areas. Estimated blackleg rating of MR (company rating). NVT tested 2019. Marketed by Nuseed. EPR \$5.00.

**OP – ATR-MAKO<sup>®</sup>**

Early-mid maturing variety for low to medium rainfall zones. Comparable yield to ATR Bonito<sup>®</sup>. Blackleg rating MR-MS. NVT tested 2014-18. Bred and marketed by Nuseed. EPR \$5.00.

**OP – ATR-STINGRAY<sup>®</sup>**

An early maturing variety. Short to medium height. Blackleg rating MR-MS. NVT tested 2010-19. Bred by AgSeed Research and Agriculture Victoria. Marketed by Nuseed.

**OP – ATR-WAHOO<sup>®</sup>**

Mid-maturing variety for medium to high rainfall zones and irrigation. Medium height. Blackleg rating MS. NVT tested 2013-19. Bred and marketed by Nuseed. EPR \$5.00.

**Hybrid – DG 670TT**

Mid-late maturing hybrid variety suited to high rainfall zones. Medium to tall height. Blackleg rating MR. NVT tested 2015-19. Marketed by Landmark and Seednet.

**Hybrid – HYOLA® 350TT**

Early maturing hybrid variety suited to low through to high rainfall zones. Short to medium plant height. Blackleg rating R. NVT tested 2016-2019. Released 2017. Bred and marketed by Advanta Seeds.

**Hybrid – HYOLA® 550TT**

Early-mid maturing hybrid variety suited to low through to high rainfall zones. Short-medium height. Blackleg rating R-MR. NVT tested 2018-19. Released 2018. Bred and marketed by Advanta Seeds.

**Hybrid – HYOLA® 559TT**

Early-mid maturing hybrid. Suited to low through to high rainfall zones including irrigation. Blackleg rating MR. NVT tested 2011-18. Bred and marketed by Advanta Seeds.

**Hybrid – HYOLA® 650TT**

Mid to late maturing hybrid. Suited to high to very high rainfall zones including irrigation. Blackleg rating R. NVT tested 2013-18. Bred and marketed by Advanta Seeds.

**NEW – Hybrid – HyTTec® TRIDENT**

An early maturity hybrid canola. Medium tall plant height. Blackleg rating R. Released 2019. NVT tested 2017-19. Bred and marketed by Nuseed. EPR \$10.00.

**Hybrid – HyTTec® TROPHY**

Early to early-mid maturing hybrid variety. Medium tall plant height. Blackleg rating R-MR. NVT tested 2017-19. Released 2017. Marketed by Nuseed. EPR \$10.00.

**Hybrid – InVigor® T 3510**

Early to early mid-maturity hybrid. Particularly suited to early season areas. Blackleg rating MS. NVT tested 2017-19. Marketed by BASF.

**Hybrid – InVigor® T 4510**

Early-mid maturing hybrid variety. Medium-tall plant height. Suited to low to medium rainfall zones. Blackleg rating MR-MS. NVT tested 2016-19. Marketed by BASF.

**Hybrid – PIONEER® 44T02 TT**

Early-mid maturing hybrid suited to low to medium rainfall areas. Blackleg rating R-MR. NVT tested 2015-19. Marketed by Pioneer Seeds.

**Hybrid – PIONEER® 45T03 TT**

Mid maturing hybrid variety. Suited to high rainfall and irrigation zones. Medium-tall height. Blackleg rating R-MR. NVT tested 2018-19. Released 2018. Marketed by Pioneer Seeds.

**Hybrid – SF IGNITE TT**

Mid-maturing hybrid. Suited to medium to high rainfall zones. Medium plant height. Blackleg rating MR. NVT tested 2016-19. Marketed by Seed Force.

**Hybrid – SF SPARK TT**

Early maturing hybrid. Suited to low to medium rainfall areas. Medium plant height. Blackleg rating R-MR. NVT tested 2018-19. Released 2018. Marketed by Seed Force.

**Hybrid – SF TURBINE TT**

Early-mid maturing hybrid. Excellent early vigour with a moderate height. Moderate oil content. Suited to medium rainfall areas. Blackleg rating MR-MS. NVT tested 2015-19. Marketed by Seed Force.

**TRIAZINE-TOLERANT SPECIALTY VARIETIES****OP Specialty Oil – Monola® 416TT**

Early-mid maturity for low to medium rainfall zones. Blackleg rating MR. NVT tested 2014-19. Marketed under closed loop contract through Nuseed.

**OP Specialty Oil – Monola® 515TT**

Mid-maturity for medium to high rainfall zones. Medium height. Blackleg rating MR. NVT tested 2014-18. Marketed under closed loop contract through Nuseed.

**ROUNDUP READY® HYBRID VARIETIES****Hybrid – DG 408RR**

Early to mid-maturing hybrid variety suited to low to medium rainfall zones. Medium plant height with good adaptability. Blackleg rating MS. NVT tested 2016-19. Marketed by Landmark and Seednet.

**Hybrid – HYOLA® 404RR**

Early to early-mid season hybrid. Suited to medium to high rainfall zones including irrigation. Medium to tall height. Blackleg rating MR. NVT tested 2010-19. Bred and marketed by Advanta Seeds.

**Hybrid – HYOLA® 506RR**

Early-mid maturing hybrid variety. Medium to tall plant height. Blackleg rating R. NVT tested 2016-19. Released 2017. Marketed by Advanta Seeds.

**Hybrid – InVigor® R 3520**

Early maturing hybrid variety. Suited to early season areas or later planting. Medium plant height. Blackleg rating MR. NVT tested 2016-19. Released 2017. Bred and marketed by BASF.

**Hybrid – InVigor® R 5520P**

Mid-maturing hybrid variety suited to medium to high rainfall areas. PodGuard™ technology makes it suitable for flexible windrow timing or direct heading with reduced harvest losses. Blackleg rating MR. NVT tested 2015-19. Bred and marketed by BASF.

**Hybrid – NUSEED GT-42**

Early-mid maturing variety. Medium height. Blackleg rating R. NVT tested 2014-18. Marketed by Nuseed.

**Hybrid – NUSEED GT-53**

Mid-maturing hybrid variety. Medium-tall height. Blackleg rating R. NVT tested 2014-19. Marketed by Nuseed.

**Hybrid – PIONEER® 43Y23 RR**

Early maturing hybrid best suited to Mallee and Wimmera districts. Blackleg rating MR. NVT tested 2011-18. Bred and marketed by Pioneer Seeds.

**Hybrid – PIONEER® 43Y29 RR**

Early maturing hybrid variety. Suited to low-medium rainfall zones. Blackleg rating of MR\*. Medium height. NVT tested 2017-19. Released 2018. Marketed by Pioneer Seeds.

**Hybrid – PIONEER® 44Y27 RR**

Early-mid season hybrid variety. Ideally suited to low to medium rainfall zones. Blackleg rating MR. NVT tested 2016-19. Marketed by Pioneer Seeds.

**Hybrid – PIONEER® 45Y25 RR**

Mid-maturing variety. Suited to medium to high rainfall zones and irrigation. Medium-tall plant height. Blackleg rating MR\*. NVT tested 2012-19. Bred and marketed by Pioneer Seeds.

**Hybrid – PIONEER® 45Y28 RR**

Mid-maturing hybrid variety. Blackleg rating of R-MR. Medium-tall height. NVT tested 2017-18. Released 2018. Marketed by Pioneer Seeds.

**ROUNDUP READY® HIGH-STABILITY VARIETIES****Hybrid Specialty Oil – Monola® G11**

Early to early-mid maturing hybrid Monola®. Medium-tall plant height. Blackleg rating MR. NVT tested 2013-18. Marketed under closed loop contract through Nuseed.

**Hybrid Specialty Oil – VICTORY® V5003RR**

Mid-maturing specialty (high oleic, low linoleic oil) hybrid variety. Blackleg rating R-MR. NVT tested 2013-19. Bred by Cargill. Marketed by AWB under contract.

**DUAL HERBICIDE-TOLERANT VARIETIES****Hybrid Roundup®/Triazine Tolerant – BASF 3000 TR**

Early maturing hybrid suited to low-medium rainfall zones. Blackleg rating MS-S. NVT tested 2015-19. Marketed by BASF.

**Hybrid Clearfield®/Triazine Tolerant – HYOLA® 580CT**

Early-mid hybrid variety suited to medium to high rainfall zones. Medium height. Blackleg rating R. NVT tested 2017-19. Released 2018. Bred and marketed by Advanta Seeds.

**TRUFLEX® CANOLA VARIETIES****NEW – Hybrid – HYOLA® 410XX**

Early-mid maturity TruFlex® hybrid variety suited to low to high rainfall zones including irrigation. Estimated blackleg rating of R (company rating). NVT tested 2019 as Hyola® 410XX. Bred and marketed by Advanta Seeds.

**NEW – Hybrid – InVigor® R 4022P**

Early-mid maturing TruFlex® hybrid with PodGuard®. Suited to low to medium rainfall zones. Estimated blackleg rating of R with Jockey® (company rating). NVT tested 2019 as InVigor® R 4022P. Bred and marketed by BASF.

**NEW – Hybrid – Xseed™ Raptor**

Early-mid maturing TruFlex® hybrid. Short to medium height. Estimated blackleg rating of MR (company rating). Tested in Bayer group regulated trials 2018-19 as Xseed™ Raptor. Marketed by Nuseed.

**TRUFLEX® DUAL HERBICIDE VARIETIES****NEW – Hybrid – HYOLA® 530XT**

Mid-maturity TruFlex® and triazine-tolerant hybrid variety. Medium plant height. Estimated blackleg rating of RMR (company rating). NVT tested 2019 as Hyola® 530XT. Bred and marketed by Advanta Seeds.

**NEW – Hybrid – HYOLA® 540XC**

Mid-early maturity TruFlex® and Clearfield® hybrid variety of medium-high height. Estimated blackleg rating of R (company rating). NVT tested 2019 as Hyola® 540XC. Bred and marketed by Advanta Seeds.



**TABLE 1 Canola time of sowing guide.**

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

MALLEE	April				May				June			
Early Season												
WIMMERA	April				May				June			
Mid Season												
Early-Mid Season												
Early Season												
NORTH CENTRAL	April				May				June			
Mid Season												
Early-Mid Season												
Early Season												
NORTH EAST	April				May				June			
Mid Season												
Early-Mid Season												
Early Season												
SOUTH WEST	April				May				June			
Mid-Late Season												
Mid Season												
Early-Mid Season												
Early Season												
NORTHERN IRRIGATION	April				May				June			
Mid Season												
Early-Mid Season												
Early Season												

Yellow = earlier than ideal.

Green = optimum sowing time.

Red = later than ideal.

**TABLE 2 Canola diseases.**

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. Lesions on flowers, pods and branches in the upper canopy.	Spores from canola stubble are released in autumn and after subsequent rainfall events. Spores infect leaves of the new crop and the upper canopy later in the season.	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.	Sow clean seed and isolate from last year's infected paddocks. Fungicides applied during early bloom.
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. Surviving plants stunted.	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 throughout season. Severe pod infection if wet during spring.	Canola stubble.	Use clean seed. Use seed dressings if seed is infected.

SOURCE: MARCROFT GRAINS PATHOLOGY (2019)



**TABLE 3 Canola variety blackleg ratings. Ratings will be updated in March 2020.**

Variety	Maturity	Year of release	Blackleg resistance rating bare seed	Blackleg resistance rating + Jockey®	Blackleg resistance group	Open pollinated or hybrid	Marketer
<b>CONVENTIONAL CANOLA</b>							
AV-Garnet®	mid	2007	MS	MR	A	open	Nuseed
Nuseed Diamond	early	2013	MR	R	ABF	hybrid	Nuseed
Nuseed Quartz	mid	2017	R	R	ABD	hybrid	Nuseed
<b>CONVENTIONAL SPECIALTY CANOLA</b>							
VICTORY® V3002	early-mid	2012	R-MR	R	ABF	hybrid	AWB
<b>CLEARFIELD®-TOLERANT CANOLA</b>							
Banker CL	mid	2015	MR	R	A	hybrid	Heritage Seeds
Hyola® 575CL	mid	2010	R		BF	hybrid	Advanta Seeds
Hyola® 970CL	late	2014	R		H	hybrid	Advanta Seeds
Phoenix CL	late	2019	R		B	hybrid	AGF Seeds
Pioneer® 43Y92 CL	early	2017	R-MR		B	hybrid	Pioneer Seeds
Pioneer® 44Y90 CL	early-mid	2016	R-MR		B	hybrid	Pioneer Seeds
Pioneer® 45Y91 CL	mid	2016	MR		B	hybrid	Pioneer Seeds
Pioneer® 45Y93 CL	mid	2018	R-MR*		BC	hybrid	Pioneer Seeds
Saintly CL	early-mid	2017	MR	R	B	hybrid	Heritage Seeds
SF Edimax CL	late	2014	R-MR		C	hybrid	Seed Force
<b>CLEARFIELD® SPECIALTY HYBRID CANOLA</b>							
VICTORY® V7001CL	late	2016	MR	R	ABF	hybrid	AWB
VICTORY® V7002CL	early-mid	2017	R-MR	R	ABF	hybrid	AWB
VICTORY® V75-03CL	mid	2019	R-MR	R	AB	hybrid	AWB
<b>TRIAZINE-TOLERANT CANOLA</b>							
ATR-Bonito <sup>h</sup>	early-mid	2013	MS	MR	A	open	Nuseed
ATR-Mako <sup>h</sup>	early-mid	2015	MR-MS	R-MR	A	open	Nuseed
ATR-Stingray <sup>h</sup>	early	2011	MR-MS	R-MR	C	open	Nuseed
ATR-Wahoo <sup>h</sup>	mid	2013	MS	R-MR	A	open	Nuseed
DG 670TT	mid-late	2017	MR	R	BF	hybrid	Seednet
Hyola® 350TT	early	2017	R		ABDF	hybrid	Advanta Seeds
Hyola® 550TT	early-mid	2018	R-MR		ABDF	hybrid	Advanta Seeds
Hyola® 559TT	early-mid	2012	MR	R	ABD	hybrid	Advanta Seeds
Hyola® 650TT	mid-late	2013	R		ABD	hybrid	Advanta Seeds
HyTec® Trident	early	2019	R	R	ABDF	hybrid	Nuseed
HyTec® Trophy	early-mid	2017	R-MR	R	ABD	hybrid	Nuseed
InVigor® T 3510	early	2019	MS	MR	BF	hybrid	BASF
InVigor® T 4510	early-mid	2016	MR-MS	R-MR	BF	hybrid	BASF
Pioneer® 44T02 TT	early-mid	2016	R-MR		ABD	hybrid	Pioneer Seeds
Pioneer® 45T03 TT	mid	2018	R-MR		ABD	hybrid	Pioneer Seeds
SF Ignite TT	mid	2016	MR	R-MR	BF	hybrid	Seed Force
SF Spark TT	early	2018	R-MR	R	ABDF	hybrid	Seed Force
SF Turbine TT	early-mid	2015	MR-MS	R-MR	BF	hybrid	Seed Force
<b>TRIAZINE-TOLERANT SPECIALTY CANOLA</b>							
Monola® 416TT	early-mid	2015	MR	R	B	open	Nuseed
Monola® 515TT	mid	2015	MR	R	unknown	open	Nuseed
<b>ROUNDUP READY® CANOLA</b>							
DG 408RR	early-mid	2017	MS	R-MR	AC	hybrid	Seednet
Hyola® 404RR	early-mid	2010	MR	R	ABD	hybrid	Advanta Seeds
Hyola® 506RR	early-mid	2017	R		ABD	hybrid	Advanta Seeds
InVigor® R 3520	early	2017	MR	R	unknown	hybrid	BASF
InVigor® R 5520P	mid	2016	MR	R	AC	hybrid	BASF
Nuseed GT-42	early-mid	2015	R	R	ABDF	hybrid	Nuseed
Nuseed GT-53	mid	2016	R	R	ABDF	hybrid	Nuseed
Pioneer® 43Y23 RR	early	2012	MR		BC	hybrid	Pioneer Seeds
Pioneer® 43Y29 RR	early	2018	MR*		BC	hybrid	Pioneer Seeds
Pioneer® 44Y27 RR	early-mid	2017	MR		B	hybrid	Pioneer Seeds
Pioneer® 45Y25 RR	mid	2014	MR*		BC	hybrid	Pioneer Seeds
Pioneer® 45Y28 RR	mid	2018	R-MR		B	hybrid	Pioneer Seeds
<b>ROUNDUP READY® SPECIALTY CANOLA</b>							
Monola® G11	early-mid	2015	MR	R	ABS	hybrid	Nuseed
VICTORY® V5003RR	mid	2015	R-MR	R	A	hybrid	AWB
<b>DUAL HERBICIDE-TOLERANT CANOLA</b>							
BASF 3000 TR	early	2015	MS-S	MR	B	hybrid	BASF
Hyola® 580CT	early-mid	2018	R	R	BC	hybrid	Advanta Seeds

\* Hybrid was screened in 2017, but not in 2018. It was therefore not exposed to the most recent pathogen populations.

SOURCE: GRDC BLACKLEG MANAGEMENT GUIDE, SPRING (2019)

Resistance order from highest to lowest: R > R-MR > MR > MR-MS > MS > MS-S > S R = resistant, M = moderately, S = susceptible, p = provisional ratings – treat with caution.  
unknown = yet to undergo resistance screening.

**TABLE 4 Mallee canola (early season). NVT long-term predicted yield expressed as a percentage of mean yield.**

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

IMIDAZOLINONE-TOLERANT CANOLA						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		0.54	0.44	2.72	1.45	1.19
	No. trials	2	1	3	3	2
Banker CL	7	-	137	120	115	-
Hyola® 575CL	5	105	100	97	-	-
Hyola® 970CL	11	106	90	92	95	93
Pioneer® 43Y85 CL	2	92	-	-	-	-
Pioneer® 43Y92 CL	8	-	-	108	108	117
Pioneer® 44Y87 CL	3	97	87	-	-	-
Pioneer® 44Y89 CL	6	111	102	99	-	-
Pioneer® 44Y90 CL	9	-	118	109	110	120
Rimfire CL	3	91	104	-	-	-
Saintly CL	4	-	119	-	110	-
VICTORY® V7002CL	5	-	-	-	96	101
TRIAZINE-TOLERANT CANOLA						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		0.54	0.44	2.73	1.45	1.17
	No. trials	2	1	3	3	2
ATR-Bonito <sup>db</sup>	11	101	97	98	98	97
ATR-Stingray <sup>db</sup>	11	109	100	92	98	98
BASF 3000 TR	9	-	91	89	97	102
Hyola® 350TT	5	-	-	-	110	117
Hyola® 450TT	6	106	83	94	-	-
Hyola® 525RT	6	100	86	96	-	-
Hyola® 559TT	8	109	104	104	-	111
HyTTec® Trident	2	-	-	-	-	143
HyTTec® Trophy	5	-	-	-	108	120
InVigor® T 3510	2	-	-	-	-	108
InVigor® T 4510	8	-	-	110	107	114
Monola® 416TT	1	-	-	104	-	-
Pioneer® 44T02 TT	9	-	110	107	107	114
Pioneer® 45T01 TT	2	99	-	-	-	-
Pioneer® Atomic TT	3	107	79	-	-	-
SF Spark TT	1	-	-	-	-	122
SF Turbine TT	6	-	-	104	102	-
ROUNDUP READY® CANOLA						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		0.54	0.44	2.72	1.47	1.19
	No. trials	2	1	3	3	2
DG 408RR	8	-	-	99	99	102
Hyola® 400RR	2	102	-	-	-	-
Hyola® 404RR	11	108	87	94	96	96
Hyola® 506RR	2	-	-	-	-	100
IH30 RR	6	116	85	91	-	-
InVigor® R 3520	8	-	-	103	109	120
InVigor® R 4020P	2	-	-	-	-	108
Nuseed GT-41	3	113	108	-	-	-
Nuseed GT-42	5	-	94	100	97	-
Nuseed GT-53	1	-	-	102	-	-
Pioneer® 43Y23 RR	11	114	99	97	101	106
Pioneer® 43Y29 RR	2	-	-	-	112	-
Pioneer® 44Y24 RR	6	105	109	106	-	-
Pioneer® 44Y26 RR	2	82	-	-	-	-
Pioneer® 44Y27 RR	8	-	-	113	113	125

SOURCE: NATIONAL VARIETY TRIALS (2014-2018)

**TABLE 5 North Central and North East canola (mid-season). NVT long-term predicted yield expressed as a percentage of mean yield.**

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

CONVENTIONAL CANOLA												
Year	NORTH CENTRAL						NORTH EAST					
		2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)		2.91	0.7	3.67	2.22	0.82		2.97	1.19	3.07	1.97	
	No. trials	1	1	1	1	1	No. trials	1	1	1	1	
AV-Garnet <sup>®</sup>	5	99	69	100	95	83	4	91	80	99	92	
AV-Zircon	2	98	65	-	-	-	2	89	75	-	-	
Hyola <sup>®</sup> 50	1	101	-	-	-	-	2	101	-	-	102	
Hyola <sup>®</sup> 635CC	1	96	-	-	-	-	1	100	-	-	-	
Nuseed Diamond	4	99	117	95	-	110	3	101	119	96	-	
Nuseed Quartz	3	-	-	108	107	114	2	-	-	108	109	
VICTORY <sup>®</sup> V3002	4	98	87	-	87	86	3	96	82	-	86	
IMIDAZOLINONE-TOLERANT CANOLA												
Year	NORTH CENTRAL						NORTH EAST					
		2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)		2.91	0.7	3.75	2.64	0.82		2.95	1.71	3.12	1.75	1.4
	No. trials	1	1	2	2	1	No. trials	2	2	2	2	1
Archer	2	99	92	-	-	-	4	98	93	-	-	-
Banker CL	7	103	101	110	107	110	7	104	108	109	112	111
Hyola <sup>®</sup> 474CL	3	99	89	97	-	-	5	94	96	94	-	-
Hyola <sup>®</sup> 575CL	7	98	91	94	96	93	9	94	95	92	96	95
Hyola <sup>®</sup> 577CL	2	100	82	-	-	-	5	97	96	101	-	-
Pioneer <sup>®</sup> 43Y92 CL	5	-	-	104	107	117	4	-	-	105	113	-
Pioneer <sup>®</sup> 44Y87 CL	2	97	101	-	-	-	4	96	95	-	-	-
Pioneer <sup>®</sup> 44Y89 CL	4	98	112	93	-	-	4	98	104	-	-	-
Pioneer <sup>®</sup> 44Y90 CL	6	-	110	110	108	113	5	-	111	-	111	113
Pioneer <sup>®</sup> 45Y86 CL	2	97	102	-	-	-	4	95	97	-	-	-
Pioneer <sup>®</sup> 45Y88 CL	4	101	91	105	-	-	6	100	98	104	-	-
Pioneer <sup>®</sup> 45Y91 CL	6	102	-	107	105	107	6	103	-	106	108	108
Pioneer <sup>®</sup> 45Y93 CL	2	-	-	-	109	-	3	-	-	-	112	111
Rimfire CL	2	96	106	-	-	-	4	96	94	-	-	-
Saintly CL	5	-	120	104	107	117	7	-	114	105	114	119
VICTORY <sup>®</sup> V7002CL	3	-	-	-	95	90	3	-	-	-	89	88
TRIAZINE-TOLERANT CANOLA												
Year	NORTH CENTRAL						NORTH EAST					
		2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)		2.91	0.7	3.75	2.65	0.82		2.95	1.73	3.12	1.75	1.4
	No. trials	1	1	2	2	1	No. trials	2	2	2	2	1
ATR-Bonito <sup>®</sup>	7	100	93	100	99	97	9	99	98	100	99	97
ATR-Gem <sup>®</sup>	4	99	87	100	-	-	6	97	94	99	-	-
ATR-Mako <sup>®</sup>	6	99	98	98	98	97	9	99	97	99	96	96
ATR-Stingray <sup>®</sup>	7	99	87	99	101	97	0	-	-	-	-	-
ATR-Wahoo <sup>®</sup>	2	101	79	-	-	-	9	99	93	104	96	90
BASF 3000 TR	4	-	-	92	97	102	0	-	-	-	-	-
DG 560TT	6	-	110	99	101	105	7	-	104	100	102	105
DG 670TT	3	-	-	116	-	107	4	-	-	116	107	105
Hyola <sup>®</sup> 350TT	3	-	-	-	106	114	4	-	-	106	110	114
Hyola <sup>®</sup> 450TT	4	99	111	96	-	-	2	101	-	-	-	-
Hyola <sup>®</sup> 525RT	4	99	111	95	-	-	6	101	99	97	-	-
Hyola <sup>®</sup> 550TT	1	-	-	-	-	112	1	-	-	-	-	110
Hyola <sup>®</sup> 559TT	7	101	118	103	103	110	9	107	107	106	103	108
Hyola <sup>®</sup> 580CT	1	-	-	-	101	-	3	-	-	-	99	99
Hyola <sup>®</sup> 650TT	2	103	103	-	-	-	8	107	102	110	100	101
Hyola <sup>®</sup> 725RT	0	-	-	-	-	-	5	101	96	100	-	-
HyTec <sup>®</sup> Trident	2	-	-	-	115	132	0	-	-	-	-	-

NOTE: 2018 North East conventional canola data was not published as a result of compromised trials.

TABLE 5, cont. next page

**(CONTINUED) TABLE 5 North Central and North East canola (mid-season). NVT long-term predicted yield expressed as a percentage of mean yield.**

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

TRIAZINE-TOLERANT CANOLA												
Year	NORTH CENTRAL						NORTH EAST					
		2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)		2.91	0.7	3.75	2.65	0.82		2.95	1.73	3.12	1.75	1.4
	No. trials	1	1	2	2	1	No. trials	2	2	2	2	1
HyTtec® Trophy	3	-	-	-	111	119	3	-	-	-	113	117
InVigor® T 3510	1	-	-	-	-	114	4	-	-	-	113	109
InVigor® T 4510	5	-	-	114	109	116	5	-	-	116	112	114
Monola® 314TT	2	95	83	-	-	-	4	86	89	-	-	-
Monola® 416TT	7	99	82	99	100	93	9	94	96	96	101	96
Monola® 515TT	4	96	74	91	-	-	8	88	85	87	89	83
Pioneer® 44T02 TT	6	-	121	101	103	113	4	-	110	-	107	-
Pioneer® 45T01 TT	3	100	103	101	-	-	6	101	102	101	-	-
Pioneer® 45T03 TT	1	-	-	-	-	106	1	-	-	-	-	108
Pioneer® Atomic TT	1	98	-	-	-	-	2	96	-	-	-	-
SF Ignite TT	5	-	-	118	109	108	5	-	-	117	110	107
SF Spark TT	1	-	-	-	-	110	0	-	-	-	-	-
SF Turbine TT	6	-	111	107	106	112	7	-	110	107	111	113
ROUNDUP READY® CANOLA												
Year	NORTH CENTRAL						NORTH EAST					
		2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)		2.91	0.7	3.75	2.61	0.82		2.95	1.71	3.12	1.75	1.4
	No. trials	1	1	2	2	1	No. trials	2	2	2	2	1
DG 408RR	5	-	-	101	102	107	2	-	-	-	104	106
DG 460RR	5	-	93	102	100	97	7	-	98	102	99	97
DG 550RR	2	99	83	-	-	-	4	96	92	-	-	-
Hyola® 400RR	1	100	-	-	-	-	2	100	-	-	-	-
Hyola® 404RR	7	98	112	91	97	101	9	98	101	93	97	101
Hyola® 500RR	1	99	-	-	-	-	2	100	-	-	-	-
Hyola® 504RR	1	-	100	-	-	-	4	102	93	-	-	-
Hyola® 506RR	1	-	-	-	-	104	4	-	-	104	102	103
Hyola® 600RR	1	100	-	-	-	-	5	102	95	101	-	-
IH30 RR	4	96	116	86	-	-	3	96	101	88	-	-
IH50 RR	1	100	-	-	-	-	2	98	-	-	-	-
IH51 RR	6	98	100	92	97	-	8	94	99	91	100	-
IH52 RR	4	100	91	101	-	-	6	99	97	100	-	-
InVigor® R 3520	3	-	-	88	-	108	2	-	-	90	-	-
InVigor® R 4020P	1	-	-	-	-	115	1	-	-	-	-	116
InVigor® R 5520P	5	-	-	104	104	106	7	-	105	104	107	107
Monola® 513GT	2	96	86	-	-	-	4	89	93	-	-	-
Monola® G11	5	95	121	83	95	103	9	94	103	84	99	105
Nuseed GT-41	2	97	111	-	-	-	0	-	-	-	-	-
Nuseed GT-42	6	99	106	98	98	99	5	-	-	99	95	97
Nuseed GT-50	4	102	110	104	-	-	6	105	105	105	-	-
Nuseed GT-53	7	102	115	105	102	107	7	-	104	109	99	103
Pioneer® 43Y23 RR	5	100	-	100	103	109	0	-	-	-	-	-
Pioneer® 43Y29 RR	2	-	-	-	106	-	2	-	-	-	110	-
Pioneer® 44Y24 RR	4	102	105	106	-	-	6	104	106	106	-	-
Pioneer® 44Y26 RR	2	100	97	-	-	-	4	99	100	-	-	-
Pioneer® 44Y27 RR	5	-	-	106	107	117	4	-	-	107	113	117
Pioneer® 45Y25 RR	7	103	95	112	105	102	9	106	102	112	102	100
Pioneer® 45Y28 RR	3	-	-	-	106	111	3	-	-	-	108	109
VICTORY® V5002RR	2	100	80	-	-	-	4	97	91	-	-	-
VICTORY® V5003RR	7	99	90	98	96	90	9	98	92	98	91	89

NOTE: 2018 North East conventional canola data was not published as a result of compromised trials.

SOURCE: NATIONAL VARIETY TRIALS (2014-2018)

**TABLE 6 South West and Wimmera (mid-season). NVT long-term predicted yield expressed as a percentage of mean yield.**

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

CONVENTIONAL CANOLA												
Year	SOUTH WEST						WIMMERA					
		2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)				2.62	2.47	2.5		1.1	0.66	4.38	3.67	
	No. trials			1	1	1	No. trials	1	1	1	1	
AV-Garnet <sup>®</sup>	3			103	101	94	4	89	62	96	95	
AV-Zircon	0			-	-	-	2	86	56	-	-	
Hyola <sup>®</sup> 50	0			-	-	-	1	101	-	-	-	
Hyola <sup>®</sup> 635CC	0			-	-	-	1	88	-	-	-	
Nuseed Diamond	2			92	-	100	3	112	125	101	-	
Nuseed Quartz	3			112	106	110	2	-	-	108	108	
VICTORY <sup>®</sup> V3002	3			86	90	90	3	88	79	-	94	
CLEARFIELD <sup>®</sup> -TOLERANT CANOLA												
Year	SOUTH WEST						WIMMERA					
		2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)		1.97	1.52	2.76	2.83	2.54		1.12	0.66	3.57	3.07	1.91
	No. trials	1	2	3	3	3	No. trials	2	1	2	2	1
Archer	3	100	88	-	-	-	3	92	87	-	-	-
Banker CL	8	-	116	118	112	-	5	108	105	116	-	105
Hyola <sup>®</sup> 474CL	2	-	85	-	-	-	5	97	88	99	-	-
Hyola <sup>®</sup> 575CL	12	89	83	91	95	93	8	96	90	95	95	93
Hyola <sup>®</sup> 577CL	6	95	87	106	-	-	3	95	79	-	-	-
Pioneer <sup>®</sup> 43Y92 CL	3	-	-	110	-	-	5	-	-	112	105	105
Pioneer <sup>®</sup> 44Y87 CL	1	94	-	-	-	-	3	96	100	-	-	-
Pioneer <sup>®</sup> 44Y89 CL	1	92	-	-	-	-	5	107	117	99	-	-
Pioneer <sup>®</sup> 44Y90 CL	8	-	125	-	112	113	6	-	115	114	109	108
Pioneer <sup>®</sup> 45Y86 CL	1	92	-	-	-	-	3	98	102	-	-	-
Pioneer <sup>®</sup> 45Y88 CL	6	102	98	107	-	-	5	97	89	104	-	-
Pioneer <sup>®</sup> 45Y91 CL	9	-	-	112	108	109	6	106	-	111	105	103
Pioneer <sup>®</sup> 45Y93 CL	3	-	-	-	115	-	3	-	-	-	111	110
Rimfire CL	3	93	88	-	-	-	3	96	105	-	-	-
Saintly CL	11	-	126	109	110	111	5	-	130	112	105	105
VICTORY <sup>®</sup> V7002CL	0	-	-	-	-	-	3	-	-	-	96	98
TRIAZINE-TOLERANT CANOLA												
Year	SOUTH WEST						WIMMERA					
		2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)		1.97	1.52	2.76	2.85	2.54		1.12	0.66	3.62	3.09	1.91
	No. trials	1	2	3	3	3	No. trials	2	1	2	2	1
ATR-Bonito <sup>®</sup>	6	98	94	101	-	-	8	97	92	100	100	99
ATR-Gem <sup>®</sup>	6	97	87	99	-	-	5	93	83	98	-	-
ATR-Mako <sup>®</sup>	7	100	96	96	97	-	7	97	96	96	98	99
ATR-Stingray <sup>®</sup>	0	-	-	-	-	-	8	100	88	106	99	93
ATR-Wahoo <sup>®</sup>	12	103	88	109	102	102	8	85	99	100	101	99
BASF 3000 TR	0	-	-	-	-	-	5	-	117	92	95	98
DG 560TT	6	-	-	99	101	-	6	-	112	100	100	102
DG 670TT	9	-	-	125	113	115	4	-	-	115	111	110
Hyola <sup>®</sup> 350TT	4	-	-	109	-	109	3	-	-	-	105	107
Hyola <sup>®</sup> 450TT	0	-	-	-	-	-	5	103	113	95	-	-
Hyola <sup>®</sup> 525RT	6	103	103	90	-	-	5	100	111	91	-	-
Hyola <sup>®</sup> 550TT	3	-	-	-	-	109	1	-	-	-	-	109
Hyola <sup>®</sup> 559TT	12	110	121	103	103	104	8	107	122	101	103	107
Hyola <sup>®</sup> 580CT	6	-	-	-	101	102	3	-	-	-	102	103
Hyola <sup>®</sup> 650TT	12	114	114	111	105	106	5	100	102	103	-	108
Hyola <sup>®</sup> 725RT	6	104	97	95	-	-	0	-	-	-	-	-
HyT Tec <sup>®</sup> Trident	1	-	-	-	122	-	1	-	-	-	-	122

NOTE: 2014 and 2015 South West and 2018 Wimmera data not published as a result of compromised trials.

SOURCE: NATIONAL VARIETY TRIALS (2014-2018)

TABLE 6, cont. next page

**(CONTINUED) TABLE 6 South West and Wimmera (mid-season). NVT long-term predicted yield expressed as a percentage of mean yield.**

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

TRIAZINE-TOLERANT CANOLA												
Year	SOUTH WEST						WIMMERA					
		2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)		1.97	1.52	2.76	2.85	2.54		1.12	0.66	3.62	3.09	1.91
	No. trials	1	2	3	3	3	No. trials	2	1	2	2	1
HyTtec® Trophy	6	-	-	-	116	119	3	-	-	-	113	115
InVigor® T 3510	0	-	-	-	-	-	1	-	-	-	-	105
InVigor® T 4510	6	-	-	-	114	117	5	-	-	116	111	112
Monola® 314TT	0	-	-	-	-	-	3	92	80	-	-	-
Monola® 416TT	10	-	82	102	101	100	7	96	80	104	98	93
Monola® 515TT	9	-	61	86	90	87	5	86	67	90	-	-
Pioneer® 44T02 TT	2	-	122	-	-	-	6	-	128	103	102	105
Pioneer® 45T01 TT	5	-	104	101	-	-	5	101	104	101	-	-
Pioneer® 45T03 TT	3	-	-	-	-	110	1	-	-	-	-	102
Pioneer® Atomic TT	0	-	-	-	-	-	3	98	100	-	-	-
SF Ignite TT	9	-	-	129	116	118	5	-	-	120	112	109
SF Turbine TT	0	-	-	-	-	-	6	-	117	112	106	106
ROUNDUP READY® CANOLA												
Year	SOUTH WEST						WIMMERA					
		2014	2015	2016	2017	2018		2014	2015	2016	2017	2018
Mean yield (t/ha)		1.97	1.52	2.76	2.84	2.54		1.27	0.66	3.62	3.07	1.91
	No. trials	1	2	3	3	3	No. trials	3	1	2	2	1
DG 408RR	0	-	-	-	-	-	4	-	-	102	102	104
DG 460RR	11	-	97	103	101	101	6	-	91	101	101	100
DG 550RR	3	96	82	-	-	-	3	92	78	-	-	-
Hyola® 400RR	0	-	-	-	-	-	3	98	-	-	-	-
Hyola® 404RR	2	-	100	-	-	-	9	104	115	91	95	97
Hyola® 500RR	1	101	-	-	-	-	3	99	-	-	-	-
Hyola® 504RR	3	109	96	-	-	-	1	-	93	-	-	-
Hyola® 506RR	8	-	-	104	103	103	3	-	-	-	102	103
Hyola® 600RR	6	107	97	95	-	-	4	95	95	-	-	-
IH30 RR	0	-	-	-	-	-	6	106	120	88	-	-
IH50 RR	1	93	-	-	-	-	3	103	-	-	-	-
IH51 RR	9	88	89	90	96	-	8	102	101	97	95	-
IH52 RR	6	99	93	101	-	-	6	96	89	100	-	-
InVigor® R 3520	0	-	-	-	-	-	3	-	-	94	-	97
InVigor® R 4020P	0	-	-	-	-	-	1	-	-	-	-	106
InVigor® R 5520P	11	-	109	109	106	107	5	-	-	109	104	102
Monola® G11	3	-	-	75	90	-	0	-	-	-	-	-
Nuseed GT-41	0	-	-	-	-	-	4	102	112	-	-	-
Nuseed GT-42	3	-	-	94	96	-	4	-	104	93	98	102
Nuseed GT-50	6	107	115	106	-	-	6	104	112	104	-	-
Nuseed GT-53	11	-	121	105	102	104	6	-	115	99	105	110
Pioneer® 43Y23 RR	0	-	-	-	-	-	6	108	119	105	-	-
Pioneer® 43Y29 RR	2	-	-	-	110	-	2	-	-	-	107	-
Pioneer® 44Y24 RR	6	105	114	111	-	-	6	104	108	109	-	-
Pioneer® 44Y26 RR	6	99	98	102	-	-	3	99	-	-	-	-
Pioneer® 44Y27 RR	4	-	-	111	110	-	5	-	-	112	106	106
Pioneer® 45Y25 RR	12	113	111	117	108	110	9	97	92	109	108	108
Pioneer® 45Y28 RR	5	-	-	-	110	112	3	-	-	-	108	109
VICTORY® V5002RR	3	98	82	-	-	-	4	90	74	-	-	-
VICTORY® V5003RR	12	100	86	94	94	94	9	92	84	92	97	98

NOTE: 2014 and 2015 South West and 2018 Wimmera data not published as a result of compromised trials.

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

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# FIELD PEA

Kaspa-type varieties such as PBA Gunyah<sup>®</sup> and PBA Wharton<sup>®</sup> are the dominant varieties grown across cropping regions of Victoria. In the dun pea types PBA Butler<sup>®</sup>, released in 2017, provides a high yielding 'Kaspa-type' field pea with improved resistance to bacterial blight and downy mildew over Kaspa<sup>®</sup>. PBA Butler<sup>®</sup> is broadly adapted across all field pea production zones. In the lower yielding environments PBA Percy<sup>®</sup>, a dimpled dun type, can still be the highest yielding dun type in field pea variety trials.

Given current dry conditions in some cropping regions, growers are urged to check plant-back intervals as residual herbicides may persist into 2020. Growers will need to take this into consideration when selecting paddocks and varieties for 2020.

## NEW VARIETIES

There are no new field pea varieties available for sowing in 2020.

## INOCULATION

Applying rhizobia inoculant (Group E/F) to field peas is recommended on all soil types and essential where peas have not been grown within the last five years. Peat-based products applied as a slurry to seed or as a granule through a small seed box, placed below seed, have proved most reliable. Further information Field Pea Southern – GRDC GrowNotes™.

## KEY DISEASE AND VIRUS CONSIDERATIONS

The key diseases in Victoria that affect field peas are blackspot, bacterial blight, Turnip yellows virus (TuYV) and Pea seed-borne mosaic virus (PSbMV). The main source of infection for blackspot and bacterial blight in crops is through the spread of infected stubble. A three to four-year break between field pea crops should be implemented to allow stubble breakdown and field pea crops should be planted greater than 500m from last year's stubble to avoid windborne spread of diseases. Viruses are mainly spread by aphids but PSbMV is also seed borne, therefore seed health and sowing virus-free seeds is important as it will reduce disease incidence.

Choosing a more resistant variety will reduce the chance of yield loss. There is little variation in blackspot resistance, but PBA Pearl<sup>®</sup> is providing a higher level of resistance than most varieties. For bacterial blight, PBA Percy<sup>®</sup> and PBA Butler<sup>®</sup> have greater levels of resistance, but may still be severely affected in some seasons.

Sowing early can maximise yield but sowing later may prevent blackspot and bacterial blight. The blackspot risk reduces with more rainfall. Early sown peas are also more vulnerable to frost injury, therefore sowing later may reduce the risk of bacterial blight which can be caused by frost injury to plants.

There are no in-crop management options for bacterial blight, therefore sowing clean seed and keeping crops away from paddocks where infected stubble is present is essential for prevention. Seed can be tested to ensure you are sowing clean seed.

Blackspot risk can be predicted based on your growing district, and therefore the appropriate control strategy can be implemented. These predictions are released weekly via SMS or email during the sowing season and can be obtained through 'Blackspot Manager' via the internet



([agric.wa.gov.au/crops/grains/pulses/field-peas](http://agric.wa.gov.au/crops/grains/pulses/field-peas)) or by subscribing to the free SMS service. Text 'Blackspot' with your name and nearest weather station or location to 0475 959 932, or email your name, phone number and nearest weather station or location to [BlackspotManager@dpird.wa.gov.au](mailto:BlackspotManager@dpird.wa.gov.au)

Turnip yellows virus (TuYV) and Pea seed-borne mosaic virus (PSbMV) are viruses commonly observed in field pea.

To reduce virus incidence in field peas, it is recommended to use virus-resistant cultivars and virus-free seeds (e.g. for PSbMV) when possible, control weeds and self-sown volunteer crops' plants, monitor aphids and apply insecticide when aphid numbers are high. Use of a seed-applied insecticide e.g. Imidocloprid can give 3-4 weeks protection against aphids.

## MORE INFORMATION

### **[nvtonline.com.au](http://nvtonline.com.au)**

- Detailed NVT trial results and links to variety information

### **[nvtonline.com.au/apps](http://nvtonline.com.au/apps)**

- Crop Disease Au App
- NVT Long Term Yield Reports App

### **[agriculture.vic.gov.au/agriculture/grains-and-other-crops/crop-production](http://agriculture.vic.gov.au/agriculture/grains-and-other-crops/crop-production)**

- Growing Field Pea
- Agriculture Victoria Pulse Disease Guide

### **[communities.grdc.com.au](http://communities.grdc.com.au)**

- Expert support on crop nutrition and field crop diseases at your fingertips

### **[pulseaus.com.au](http://pulseaus.com.au)**

Pulse Australia information on growing pulses including:

- Field Pea Disease Management Strategy
- Current emergency and minor use chemical permits

### **GRDC Resources**

- Field Pea Southern – GRDC GrowNotes™

## VARIETY DESCRIPTIONS

(<sup>Ⓛ</sup>) Denotes that Plant Breeder Rights apply

End Point Royalty (EPR) 2019-20 quoted \$/tonne ex-GST.

## KASPA SEED TYPE

### **PBA BUTLER<sup>Ⓛ</sup>**

PBA Butler<sup>Ⓛ</sup> is a mid to late flowering semi-dwarf field pea variety. PBA Butler<sup>Ⓛ</sup> has high yield potential and produces 'Kaspa-type' grain adapted better to regions with relatively higher yield potential (at least medium rainfall). Grains are similar to PBA Gunyah<sup>Ⓛ</sup> in colour and size. Downy mildew (Kaspa strain) MS, downy mildew (Parafield strain) S, powdery mildew S. PBA Butler<sup>Ⓛ</sup> will need to be managed for blackspot and PSbMV in disease-prone areas. Released 2017. Seed available from Seednet. EPR \$2.70.

### **PBA GUNYAH<sup>Ⓛ</sup>**

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

### **KASPA<sup>Ⓛ</sup>**

A late flowering, semi-dwarf field pea which produces spherical dun type grain. Kaspa<sup>Ⓛ</sup> is the benchmark for field peas with its broad adaption and high yield potential. Kaspa<sup>Ⓛ</sup> is better suited to longer growing season environments. Moderately resistant to downy mildew (Parafield strain) but will need to be managed for blackspot, bacterial blight, PSbMV, powdery mildew and downy mildew (Kaspa strain) in disease-prone areas. Kaspa<sup>Ⓛ</sup> has fair lodging resistance at maturity and pods are resistant to shattering. Released 2002. Seed available from Seednet. EPR \$2.00.

### **PBA TWILIGHT<sup>Ⓛ</sup>**

An early flowering and early maturing, semi-dwarf field pea which produces 'Kaspa-type' grain, better suited to short growing season environments and low rainfall zones. Resistant to downy mildew (Parafield strain). PBA Twilight<sup>Ⓛ</sup> will need to be managed for bacterial blight, blackspot, PSbMV, powdery mildew and downy mildew (Kaspa strain) in disease-prone areas. PBA Twilight<sup>Ⓛ</sup> has fair lodging resistance at maturity and pods are resistant to shattering. Released 2010. Seed available from Seednet. EPR \$2.50.

**PBA WHARTON<sup>®</sup>**

An early-mid flowering and early maturity, semi-dwarf field pea which produces 'Kaspa-type' grain. PBA Wharton<sup>®</sup> is adapted across short to medium growing season environments and is a suitable variety for crop topping when sowing is delayed. Powdery mildew R, PSbMV R and BLRV R. It will need to be managed for blackspot, bacterial blight and downy mildew (Kaspa strain). PBA Wharton<sup>®</sup> has improved tolerance to soil boron and pods are resistant to shattering. Released 2013. Seed available from Seednet. EPR \$2.60.

**WHITE TYPES****PBA PEARL<sup>®</sup>**

An early to mid-flowering, semi-dwarf field pea. PBA Pearl<sup>®</sup> is broadly adapted and produces medium white grain that can be marketed for human consumption or for stockfeed. PBA Pearl<sup>®</sup> has good resistance to BLRV. It will need to be managed for bacterial blight, blackspot, PSbMV, powdery mildew and downy mildew (Kaspa and Parafield strains) in disease-prone areas. PBA Pearl<sup>®</sup> has good lodging resistance at maturity and has moderate non-sugar-pod resistance to shattering. Released 2012. Seed available from Seednet. EPR \$2.70.

**PBA HAYMAN**

A 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 per cent more than Morgan<sup>®</sup>) 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. Moderately susceptible to blackspot and downy mildew (Parafield strain) RMR. It produces small pods and very small seed that will reduce the cost of sowing. PBA Hayman is suitable for cropping rotations with other broadleaf crops. Grain yield potential can vary but is generally between 30 to 80 per cent of a normal field pea crop and is suitable for stockfeed. Developed by PBA. Released 2013. Seed available from Seednet.

**DUN SEED TYPE****MORGAN<sup>®</sup>**

A tall, late flowering, semi-leafless pea, which produces small dun-type grain. Morgan<sup>®</sup> 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. Moderately resistant to downy mildew (Parafield strain). Morgan<sup>®</sup> will need to be managed for blackspot, bacterial blight, powdery mildew and downy mildew (Kaspa strain) in disease-prone areas. Has moderate non-sugar-pod resistance to shattering. Grain size is small and less suitable for human consumption markets. Released 1998. Can be freely marketed.

**PBA OURA<sup>®</sup>**

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

**PBA PERCY<sup>®</sup>**

A very early flowering and maturing conventional pea (similar to Parafield) which produces dun-type grain. PBA Percy<sup>®</sup> has high yield potential and is broadly adapted. It will need to be managed for blackspot, PSbMV, downy and powdery mildew and BLRV. Moderately resistant to bacterial blight and is moderately tolerant to salinity. PBA Percy<sup>®</sup> has poor lodging resistance and will require specialised pea pickup fronts for harvesting. Released 2011. Seednet. EPR \$2.60

**TABLE 1 Field pea time of sowing guide.**

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

MALLEE	May				June				July			
Very Late Maturity												
Mid Maturity												
Early-Mid Maturity												
Early Maturity												
WIMMERA	May				June				July			
Very Late Maturity												
Mid Maturity												
Early-Mid Maturity												
Early Maturity												
NORTH CENTRAL	May				June				July			
Very Late Maturity												
Mid Maturity												
Early-Mid Maturity												
Early Maturity												
NORTH EAST	May				June				July			
Very Late Maturity												
Mid Maturity												
Early-Mid Maturity												
Early Maturity												
SOUTH WEST	May				June				July			
Very Late Maturity												
Mid Maturity												
Early-Mid Maturity												
Early Maturity												
SOUTH WEST Spring sowing	July				August				September			
Above varieties for spring sowing												

Yellow = earlier than ideal.

Green = optimum sowing time.

Red = later than ideal.

Orange = if conditions allow (e.g. raised beds, dry season, non-waterlogging paddocks).

**TABLE 2 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
WHITE GRAIN TYPE								
PBA Hayman	multi-branched	moderate	very late	very late	poor	MR: NSP	MI	MI
PBA Pearl <sup>Ⓛ</sup>	SD-SL	moderate	early-mid	early-mid	good	MR: NSP	MI	MI
KASPA GRAIN TYPE								
Kaspa <sup>Ⓛ</sup>	SD-SL	moderate	late	mid	fair-good	R: SP	I	I
PBA Butler <sup>Ⓛ</sup>	SD-SL	high	mid-late	mid	good	R: SP	I	I
PBA Gunyah <sup>Ⓛ</sup>	SD-SL	high	early-mid	early	fair-good	R: SP	I	IMI
PBA Twilight <sup>Ⓛ</sup>	SD-SL	high	early	early	fair-good	R: SP	I	I
PBA Wharton <sup>Ⓛ</sup>	SD-SL	moderate	early-mid	early	fair-good	R: SP	MT	MT
DUN GRAIN TYPE								
Morgan <sup>Ⓛ</sup>	Tall-SL	high	late	late	poor-fair	MR: NSP	I	I
PBA Oura <sup>Ⓛ</sup>	SD-SL	moderate	early-mid	early	fair-good	MR: NSP	MI	I
PBA Percy <sup>Ⓛ</sup>	C	high	early	early	poor	MR: NSP	I	MT

SOURCES: NATIONAL PULSE DISEASE RATINGS (2019); SOUTHERN PULSE AGRONOMY WIMMERA FIELD DAY GUIDE (2018)

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

**TABLE 3 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)	Root lesion nematodes	
								<i>Pratylenchus neglectus</i>	<i>Pratylenchus thornei</i>
WHITE GRAIN TYPE									
PBA Hayman	MS	-	-	RMR	R	-	-	-	-
PBA Pearl <sup>(b)</sup>	MRMS <sub>p</sub>	MS <sub>p</sub>	S	MS	S	S	R	MRMS	MRMS
KASPA GRAIN TYPE									
Kaspa <sup>(b)</sup>	MS	S	MS	MR	S	S	S	MRMS	MRMS
PBA Butler <sup>(b)</sup>	MS	MRMS	MS	S	S	S	S	MRMS	MRMS
PBA Gunyah <sup>(b)</sup>	MS	S	S	R	S	S	S	MR	MRMS
PBA Twilight <sup>(b)</sup>	MS	S	S	R	S	S	-	MRMS	MRMS
PBA Wharton <sup>(b)</sup>	MS	S	S	R <sub>p</sub>	R	R	R	MRMS	MR
DUN GRAIN TYPE									
Morgan <sup>(b)</sup>	MS	MS	S	MR	S	-	-	RMR	MR
PBA Oura <sup>(b)</sup>	MS	MRMS	MRMS <sub>p</sub>	MR <sub>p</sub>	S	S	R	MRMS	MRMS
PBA Percy <sup>(b)</sup>	MS	MR	S	S	S	S	S	MRMS	RMR

SOURCE: NATIONAL PULSE DISEASE RATINGS (2019); SOUTHERN PULSE AGRONOMY WIMMERA FIELD DAY GUIDE (2018)

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

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.

*p* = provisional ratings – treat with caution.

No variety with a R resistance rating is immune to disease and a fungicide application may be required under severe disease pressure.

**TABLE 4 Field pea diseases summary.**

Disease	Organisms	Symptoms	Occurrence	Host	Control
Ascochyta blight (blackspot)	<i>Didymella pinodes</i> (synonym: <i>Mycosphaerella pinodes</i> ), <i>Phoma medicaginis</i> var. <i>pinodella</i> , <i>Phoma koolunga</i> and <i>Didymella 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>pisi</i> and <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 for pv. <i>pisi</i> and alternate hosts for pv. <i>syringae</i> .	Crop rotation. Disease-free seed. Resistant varieties.
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. Seed fungicidal treatment.
Powdery mildew	<i>Erysiphe pisi</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. Apply foliar fungicide application at flowering as 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 varieties.	Peas	Destroy crop residue. Most varieties are moderately susceptible. Crop rotation.
VIRUS DISEASES					
Pea seed-borne mosaic virus (PSbMV)	Virus	Downward curling of leaves, mosaic, stunting.	Present in all pea growing regions.	The host range limited to Fabaceae.	This virus is highly seed-borne in peas. Virus-free seed is recommended.
Bean leaf roll virus (BLRV)	Virus	Yellowing, stunting and leaf rolling.	Present in all pea production areas.	Host range limited to Fabaceae.	Managing aphids and weeds, resistant varieties.

SOURCE: IDENTIFICATION AND MANAGEMENT OF FIELD CROP DISEASES IN VICTORIA (2018)

**TABLE 5 Mallee NVT long-term predicted field pea yield expressed as a percentage of mean yield.**

MALLEE						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		0.95	0.46	2.71	1.57	0.93
	No. trials	4	4	4	6	3
PBA Butler <sup>Ⓛ</sup>	21	97	88	122	109	105
PBA Gunyah <sup>Ⓛ</sup>	20	85	101	94	96	101
Kaspa <sup>Ⓛ</sup>	21	68	77	87	92	95
PBA Oura <sup>Ⓛ</sup>	21	117	142	99	99	103
Parafield	12	87	93	79	86	92
PBA Pearl <sup>Ⓛ</sup>	21	118	156	111	104	101
PBA Percy <sup>Ⓛ</sup>	20	108	149	98	98	115
PBA Twilight <sup>Ⓛ</sup>	12	85	109	81	91	96
PBA Wharton <sup>Ⓛ</sup>	21	105	118	80	92	96

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

**TABLE 6 Wimmera NVT long-term predicted field pea yield expressed as a percentage of mean yield.**

WIMMERA						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		1.68	0.42	2.62	2.62	2.82
	No. trials	3	2	3	3	2
PBA Butler <sup>Ⓛ</sup>	13	100	89	116	99	92
PBA Gunyah <sup>Ⓛ</sup>	13	96	95	98	95	92
Kaspa <sup>Ⓛ</sup>	13	89	77	100	87	86
PBA Oura <sup>Ⓛ</sup>	13	100	120	87	99	94
Parafield	8	76	78	79	73	77
PBA Pearl <sup>Ⓛ</sup>	13	108	126	102	102	89
PBA Percy <sup>Ⓛ</sup>	13	90	117	77	91	81
PBA Twilight <sup>Ⓛ</sup>	8	98	102	91	96	96
PBA Wharton <sup>Ⓛ</sup>	13	104	116	86	105	110

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

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# LENTIL

Lentil is predominantly grown in the semi-arid regions of South Australia and Victoria. Australia is a significant producer of red lentil. Lentil can be a highly profitable crop, but the 2017 and 2018 seasons have reminded us that there are still many challenges to ensure long-term reliability.

In 2020 growers are encouraged to continue sowing pulses in the optimal sowing window and avoid delayed sowing unless there is a strategic management advantage, for example disease or weed control, or they are being sown in a frost-prone region. In the long-term, from a Victorian perspective, early sowing has generally proved profitable. Delayed sowing is problematic as heat events and rapidly drying soil occur almost every year during late spring – in the flowering and podding phase – causing significant yield loss.

## NEW VARIETIES

There is one new lentil variety being released for 2020. PBA Highland XT (tested as CIPAL1621) is a herbicide-tolerant, medium red lentil variety that has performed well in drier regions such as the Victorian Mallee and in South Australia.

CIPAL1721 is a new IMI-tolerant lentil that will be available to growers in 2021.

## INOCULATION

Applying rhizobium inoculant (Group F) to lentil is always recommended on acidic soils (calcium pH less than 6.0) and on other soil types where well-nodulated lentil/bean/pea/vetch have not been grown within the last five years. Peat-based products applied as a slurry to seed or as a granule through a small seed box, placed with seed, have proved most reliable. Further information GRDC GrowNotes™ Lentil, Section 4.9.

## KEY DISEASE AND VIRUS CONSIDERATIONS

Growers need to consider residual herbicides and take this into consideration when selecting paddocks and varieties for 2020. Some growers may be tempted to re-sow 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.

Sclerotinia white mould was found in lentil crops in several districts throughout the Victorian Mallee during 2019. The prolonged damp conditions throughout winter favoured disease development. Sclerotia forms on infected plants which enables the fungus to survive into the following seasons. Individual seeds can be contaminated with the fungus and/or sclerotia may be present in the seed sample. Sclerotia can remain viable in the soil for up to eight years. Soil-borne sclerotia are the most important disease source for establishing disease in following crops and seasons. Seeds infected with sclerotinia can be the cause of disease establishment in otherwise sclerotinia-free areas. Long-term management options include using clean seed to reduce the spread of sclerotinia and rotating paddocks into least susceptible hosts.

Cucumber mosaic virus (CMV), Alfalfa mosaic virus (AMV) and Turnip yellows virus (TuYV) (previously known as Beet western yellows virus) are commonly detected in lentil crops, although during the last couple of years high levels of CMV were detected in crops and seed lots. Using virus-free seed is recommended.

## MORE INFORMATION

### **nvtonline.com.au**

- Detailed NVT trial results and links to variety information

### **nvtonline.com.au/apps**

- Crop Disease Au App
- NVT Long Term Yield Reports App

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

- Growing Lentil
- Agriculture Victoria Pulse Disease Guide

### **communities.grdc.com.au**

- Expert support on crop nutrition and field crop diseases at your fingertips

### **pulseaus.com.au**

Pulse Australia information on growing pulses including:

- Lentil Disease Management Strategy
- Minor use and emergency permits for chemicals

### **GRDC resources**

- Lentil Southern Region – GRDC GrowNotes™

## VARIETY DESCRIPTIONS

(<sup>Ⓛ</sup>) Denotes that Plant Breeder Rights apply  
End Point Royalty (EPR) 2019-20 quoted \$/tonne ex-GST.

## RED LENTIL

### **PBA ACE<sup>Ⓛ</sup>**

PBA Ace<sup>Ⓛ</sup> is a vigorous medium sized, mid-season red lentil with grey seed. PBA Ace<sup>Ⓛ</sup> is best suited to longer season areas replacing Nugget<sup>Ⓛ</sup> and PBA Jumbo<sup>Ⓛ</sup>. Resistant to ascochyta blight and BGM MRMS. Intolerant to salinity and boron. High milling quality. Released 2012. Seed available from PB Seeds. EPR \$5.00.

### **PBA BLITZ<sup>Ⓛ</sup>**

PBA Blitz<sup>Ⓛ</sup> is a medium sized red lentil with a grey seed coat. PBA Blitz<sup>Ⓛ</sup> 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. Moderately resistant to foliar ascochyta blight, seed ascochyta blight MRMS and BGM MR. PBA Blitz<sup>Ⓛ</sup> is intolerant of soil boron and salinity. It has demonstrated similar but generally improved milling characteristics compared to Nugget<sup>Ⓛ</sup>. Released 2010. Seed available from PB Seeds. EPR \$5.00.

### **PBA BOLT<sup>Ⓛ</sup>**

PBA Bolt<sup>Ⓛ</sup> is a medium sized red lentil with grey seed, adapted to the Mallee and northern Wimmera. It's similar to PBA Flash<sup>Ⓛ</sup> with early-mid maturity and improved boron and salinity tolerance. Its susceptibility to BGM makes it less suited to medium to high rainfall areas in wetter years and with early sowing. Like PBA Flash<sup>Ⓛ</sup>, PBA Bolt<sup>Ⓛ</sup> 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 seasons. Released 2012. Seed available from PB Seeds. EPR \$5.00.

### **PBA FLASH<sup>Ⓛ</sup>**

PBA Flash<sup>Ⓛ</sup> is an early-mid maturing, red lentil with a medium seed size suited to all current lentil growing areas but particularly shorter season growing areas. It has improved tolerance to boron and salinity compared to Nugget<sup>Ⓛ</sup>. Like PBA Bolt<sup>Ⓛ</sup>, PBA Flash<sup>Ⓛ</sup> is a good variety for timely crop topping to control weeds. Moderately susceptible to foliar and seed ascochyta blight, and BGM MRMS. PBA Flash<sup>Ⓛ</sup> has improved standing ability at maturity, 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. Seed available from PB Seeds. EPR \$5.00.



**PBA HALLMARK XT<sup>®</sup>**

PBA Hallmark XT<sup>®</sup> is a mid-season variety with a medium seed size and grey seed coat. PBA Hallmark XT<sup>®</sup> has greater early vigour and improved ratings to BGM compared to PBA Hurricane XT<sup>®</sup>. Moderately resistant in Victoria to foliar and seed ascochyta blight and BGM RMR. It has improved tolerance to the herbicide flumetsulam plus reduced sensitivity to some sulfonylurea and imidazolinone herbicide residues. As a medium red lentil this variety can provide an alternative market class option to the popular small red lentil PBA Hurricane XT<sup>®</sup>. Released 2018. Seed available from PB Seeds. EPR \$5.40.

**NEW – PBA HIGHLAND XT<sup>®</sup>**

PBA Highland XT<sup>®</sup> (evaluated as CIPAL1621) is a herbicide-tolerant, medium red lentil variety which will complement other tolerant varieties such as PBA Hallmark XT<sup>®</sup> and PBA Hurricane XT<sup>®</sup>. It is an early-mid maturing variety as a point of difference to other Group B tolerant lines and has performed well in drier regions such as the Victorian Mallee and in South Australia. Its key features include high early vigour and early flowering traits. It has improved resistance to ascochyta blight MRp and maintains this level of resistance against an increasingly prevalent pathogen isolate that is virulent on other Group B tolerant varieties. Botrytis grey mould MRMS. These features together with its high yielding capability, particularly in drier seasons, will make PBA Highland XT<sup>®</sup> a good alternative herbicide-tolerant medium sized lentil variety. Released 2019. See available from PB Seeds. EPR \$5.40.

**PBA HURRICANE XT<sup>®</sup>**

PBA Hurricane XT<sup>®</sup> is a small red seeded lentil with mid-flowering and mid-maturity. It has tolerance to imazethapyr, 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<sup>®</sup> is the highest yielding small red lentil available in Australia and has improved yields over Nipper<sup>®</sup> and Nugget<sup>®</sup>, but lower than PBA Ace<sup>®</sup> and PBA Bolt<sup>®</sup>. Foliar ascochyta blight MR, seed ascochyta blight MRp and BGM MRMS. Released 2013. Seed available from PB Seeds. EPR \$5.00.

**PBA JUMBO<sup>®</sup>**

PBA Jumbo<sup>®</sup> is a large seeded red lentil with a grey seed coat. It is mid-flowering with a maturity similar to Nugget<sup>®</sup>. Suited to no-till inter-row sowing into standing stubble. Foliar ascochyta blight MRMS, seed ascochyta blight S and BGM MS. Tolerance to soil boron is similar to PBA Flash<sup>®</sup>. PBA Jumbo<sup>®</sup> is suited to medium to high rainfall regions where it produces uniform larger seed size for the premium large red split markets but has been outclassed by PBA Jumbo2<sup>®</sup>. Released 2010. Seed available from PB Seeds. EPR \$5.00.

**PBA JUMBO2<sup>®</sup>**

PBA Jumbo2<sup>®</sup> is the highest yielding large seeded red lentil, approximately 9-13 per cent higher than PBA Jumbo<sup>®</sup>. It is a direct replacement for Jumbo<sup>®</sup> and Aldinga. It has a similar seed size to Jumbo<sup>®</sup> and Aldinga with a grey seed coat. It is mid-flowering and has a maturity similar to PBA Jumbo<sup>®</sup>. It is well suited to no-till inter-row sowing into standing stubble. Foliar and seed ascochyta blight R and BGM RMR. Tolerance to soil boron is similar to PBA Flash<sup>®</sup>. PBA Jumbo2<sup>®</sup> 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. Seed available from PB Seeds. EPR \$5.00.

**GREEN LENTIL****PBA GIANT<sup>®</sup>**

The largest seeded green lentil in Australia with an average seed diameter of 5.8mm (about 7g/100 seeds). PBA Giant<sup>®</sup> is broadly adapted but is best suited to the medium rainfall lentil growing regions. It has similar yield and improved shattering resistance to Boomer, though timely harvest is still required to minimise shattering. It is less susceptible to lodging at maturity than Boomer. Moderately resistant to foliar ascochyta blight, seed ascochyta blight MS and BGM MS. Released 2014. Seed available from PB Seeds. EPR \$5.00.

**PBA GREENFIELD<sup>®</sup>**

The highest yielding green lentil variety with yields similar to PBA Ace<sup>®</sup>. PBA Greenfield<sup>®</sup> is a medium sized green lentil broadly adapted but best suited to the medium rainfall lentil growing regions. It has improved salinity tolerance and resistance to shattering, although timely harvest is still required. Foliar and seed ascochyta blight MRMS and BGM MR. Released 2014. Seed available from PB Seeds. EPR \$5.00.

**TABLE 1 Lentil time of sowing guide.**

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

MALLEE/Northern WIMMERA	April				May				June			
PBA Ace <sup>Ⓛ</sup> , PBA Bolt <sup>Ⓛ</sup> , PBA Blitz <sup>Ⓛ</sup> , PBA Flash <sup>Ⓛ</sup> , PBA Greenfield <sup>Ⓛ</sup> , PBA Giant <sup>Ⓛ</sup> , PBA Highland XT <sup>Ⓛ</sup> , PBA Hurricane XT <sup>Ⓛ</sup> , PBA Jumbo <sup>Ⓛ</sup> , PBA Jumbo2 <sup>Ⓛ</sup>												
WIMMERA	April				May				June			
PBA Ace <sup>Ⓛ</sup> , PBA Bolt <sup>Ⓛ</sup> , PBA Blitz <sup>Ⓛ</sup> , PBA Flash <sup>Ⓛ</sup> , PBA Greenfield <sup>Ⓛ</sup> , PBA Giant <sup>Ⓛ</sup> , PBA Highland XT <sup>Ⓛ</sup> , PBA Hurricane XT <sup>Ⓛ</sup> , PBA Jumbo <sup>Ⓛ</sup> , PBA Jumbo2 <sup>Ⓛ</sup>												
NORTH CENTRAL	April				May				June			
PBA Ace <sup>Ⓛ</sup> , PBA Bolt <sup>Ⓛ</sup> , PBA Blitz <sup>Ⓛ</sup> , PBA Flash <sup>Ⓛ</sup> , PBA Greenfield <sup>Ⓛ</sup> , PBA Giant <sup>Ⓛ</sup> , PBA Highland XT <sup>Ⓛ</sup> , PBA Hurricane XT <sup>Ⓛ</sup> , PBA Jumbo <sup>Ⓛ</sup> , PBA Jumbo2 <sup>Ⓛ</sup>												

Yellow = earlier than ideal.

Green = optimum sowing time.

Red = later than ideal.

**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 <sup>Ⓛ</sup>	red	grey	75-80	mid/late	mid	MR	MR	MT	I
PBA Hurricane XT <sup>Ⓛ</sup>	red	grey	85	mid	mid	MR	R	I	I
MEDIUM RED SEED									
PBA Ace <sup>Ⓛ</sup>	red	grey	100	mid	mid	MRMS	MRMS	I	I
PBA Blitz <sup>Ⓛ</sup>	red	grey	115-120	early	early	MRMS	MRMS	I	I
PBA Bolt <sup>Ⓛ</sup>	red	grey	100	early/mid	early/mid	R	R	MI	MI
PBA Flash <sup>Ⓛ</sup>	red	green	100-110	early/mid	early/mid	MR	MR	MI	MI
PBA Hallmark XT <sup>Ⓛ</sup>	red	grey	100	mid	mid	MR	R	MI	I
PBA Highland XT <sup>Ⓛ</sup>	red	grey	100	early	early/mid	MR	MR	MI	I
LARGE RED SEED									
PBA Jumbo <sup>Ⓛ</sup>	red	grey	120	mid	mid	S	MR	I	MI
PBA Jumbo2 <sup>Ⓛ</sup>	red	grey	120	mid	mid	MRMS	R	I	MI
MEDIUM GREEN LENTIL									
PBA Greenfield <sup>Ⓛ</sup>	yellow	green	130	mid	mid/late	MS	MR	MI	I
LARGE GREEN LENTIL									
PBA Giant <sup>Ⓛ</sup>	yellow	green	170	mid	mid/late	S	MRMS	I	MI

SOURCES: NATIONAL PULSE DISEASE RATINGS (2019); SOUTHERN PULSE AGRONOMY WIMMERA FIELD DAY GUIDE (2018)

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

p = provisional ratings – treat with caution. R = resistant, RMR = resistant to moderately resistant, MR = moderately resistant, MRMS = moderately resistant to moderately susceptible, MS = moderately susceptible, S = susceptible, VS = very susceptible.

I=intolerant, MT= moderately tolerant, MI= moderately intolerant.

**TABLE 3 Disease ratings for current lentil varieties.**

Variety	Ascochyta blight		Botrytis grey mould (BGM)	Root lesion nematode ( <i>Pratylenchus</i> )	
	Foliar	Seed/pod		<i>P. neglectus</i>	<i>P. thornei</i>
SMALL RED					
Nipper <sup>Ⓛ</sup>	MRMS <sub>p</sub>	MR	RMR	–	MR
PBA Hurricane XT <sup>Ⓛ</sup>	MR	MR <sub>p</sub>	MRMS	MRMS	MRMS
MEDIUM RED					
PBA Ace <sup>Ⓛ</sup>	R	R	MRMS	MR	MRMS
PBA Blitz <sup>Ⓛ</sup>	MR	MRMS	MR	MR	MRMS
PBA Bolt <sup>Ⓛ</sup>	MR	RMR	S	MR	MR
PBA Flash <sup>Ⓛ</sup>	MS	MS	MRMS	MR	MRMS
PBA Hallmark XT <sup>Ⓛ</sup>	MR	MR	RMR	MR	MRMS
PBA Highland XT <sup>Ⓛ</sup>	MR <sub>p</sub>	MR <sub>p</sub>	MRMS	–	–
LARGE RED					
PBA Jumbo <sup>Ⓛ</sup>	MRMS	S	MS	MR	MRMS
PBA Jumbo2 <sup>Ⓛ</sup>	R	R	RMR	MR	MRMS
MEDIUM GREEN					
PBA Greenfield <sup>Ⓛ</sup>	MRMS	MRMS	MR	MR	MR
LARGE GREEN					
PBA Giant <sup>Ⓛ</sup>	MR	MS	MS	MR	MRMS

SOURCE: NATIONAL PULSE DISEASE RATINGS (2019)

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

*p* = provisional ratings – treat with caution. R = resistant, RMR = resistant to moderately resistant, MR = moderately resistant, MRMS = moderately resistant to moderately susceptible, MS = moderately susceptible, S = susceptible, VS = very susceptible.

No variety with a R resistance rating is immune to disease and a fungicide application may be required under severe disease pressure.

**TABLE 4 Lentil disease guide summary.**

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. Two disease resistance ratings are provided, one for foliar and one for seed/pod infection. The two ratings may vary between varieties. 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> <i>B. 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.
<b>VIRUS DISEASES</b>					
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.	Very wide host range including most pulses, pastures, some horticultural plants and weeds.	Virus-free seed, management of weeds, resistant varieties.
TuYV (previously BWYV)	Turnip yellows virus (previously known as Beet western yellows virus)	Yellowing, stunting. Produces the most severe symptoms of all the viruses. Patches of crop resemble root disease or herbicide residue damage.	Present in all lentil production areas with high aphid numbers.	Very wide host range including most pulses and brassicas, some horticultural plants and many weed species.	Managing weeds and aphids, resistant varieties.

SOURCE: IDENTIFICATION AND MANAGEMENT OF FIELD CROP DISEASES IN VICTORIA (2018)

**TABLE 5 Mallee NVT long-term predicted lentil yield expressed as a percentage of mean yield.**

MALLEE						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		0.72	0.29	2.87	1.45	0.48
	No. trials	3	4	4	5	4
PBA Ace <sup>db</sup>	20	106	97	94	115	117
PBA Blitz <sup>db</sup>	12	81	102	100	96	84
PBA Bolt <sup>db</sup>	20	112	119	96	104	106
PBA Flash <sup>db</sup>	20	101	103	99	109	108
PBA Giant <sup>db</sup>	4	-	82	84	-	-
PBA Greenfield <sup>db</sup>	7	-	69	99	111	107
PBA Hallmark XT <sup>db</sup>	20	110	103	101	98	103
PBA Highland XT <sup>db</sup>	15	-	131	107	106	103
PBA Hurricane XT <sup>db</sup>	20	107	97	98	95	102
PBA Jumbo <sup>db</sup>	20	79	84	88	105	96
PBA Jumbo2 <sup>db</sup>	20	100	100	117	113	107
Nipper <sup>db</sup>	12	71	52	85	70	72

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

**TABLE 6 Wimmera NVT long-term predicted lentil yield expressed as a percentage of mean yield.**

WIMMERA						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		1.09	0.28	2.68	2.57	1.52
	No. trials	3	2	4	3	3
PBA Ace <sup>db</sup>	15	102	93	103	106	112
PBA Blitz <sup>db</sup>	10	87	110	102	95	86
PBA Bolt <sup>db</sup>	15	107	106	94	102	102
PBA Flash <sup>db</sup>	15	99	97	95	102	100
PBA Giant <sup>db</sup>	7	90	86	97	-	-
PBA Greenfield <sup>db</sup>	10	89	85	113	103	108
PBA Hallmark XT <sup>db</sup>	15	109	105	110	103	110
PBA Highland XT <sup>db</sup>	11	-	-	108	104	103
PBA Hurricane XT <sup>db</sup>	15	105	95	99	100	105
PBA Jumbo <sup>db</sup>	15	83	92	98	97	94
PBA Jumbo2 <sup>db</sup>	15	101	108	116	106	107
Nipper <sup>db</sup>	10	80	76	96	86	87

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

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Phil Bowden	Pulse Australia
Simon Crane	Seednet

# FABA BEAN

The southern region grows 70 per cent of Australia's faba bean by area sown. More recently the area planted has increased, with improved varieties with better disease management packages and better market prices. In addition, growers now recognise the contribution of pulses to managing weeds and diseases in the overall rotation.

## NEW VARIETIES

There is one new variety of faba bean being released for sowing in 2020. PBA Amberley<sup>®</sup> (tested as AF11023) is the first variety with moderate resistance to chocolate spot and has resistance to pathotype 1 and 2 of ascochyta blight.

## QUALITY CHANGES

Pulse Australia have agreed on the following changes to their grain standards on the allowance for total defective grain for the 2019/20 season:

- Total defective tolerance in CSP 5.1.2 Faba Beans – submission indicated the current tolerance of total defectives by weight of 1.5% is difficult to achieve.
- The committee agreed to change these standards for tolerance of total defectives from 1.5% by weight to 3.0% by weight for the 2019/20 season.

## INOCULATION

Applying rhizobium inoculant (Group E/F) to faba beans is strongly recommended on all soil types and essential where beans have not been grown within the last five years. Peat-based products applied as a slurry to seed or as a granule through a small seed box, placed below seed, have proved most reliable. For more information refer to Faba Bean Southern – GRDC GrowNotes™.

## KEY DISEASE CONSIDERATIONS

Pathotype 2 of ascochyta blight in faba beans has become dominant in Victoria, where previously it was only identified in South Australia and around the Kaniva region in Victoria. The varieties Farah<sup>®</sup>, PBA Marne<sup>®</sup>, PBA Zahra<sup>®</sup> and PBA Rana<sup>®</sup> are now all more susceptible to ascochyta blight, while PBA Bendoc<sup>®</sup> and PBA Amberley<sup>®</sup> will remain resistant (see rating tables).

There were reports of increased ascochyta blight infection during 2018 and 2019 in resistant bean lines, such as PBA Samira<sup>®</sup>. This serves as a reminder to plant seed bulk up of new varieties such as PBA Bendoc<sup>®</sup>, PBA Marne<sup>®</sup> and PBA Amberley<sup>®</sup> away from existing faba bean crops to prevent outcrossing with current varieties. Ascochyta disease samples collected off crops of PBA Samira<sup>®</sup>, did not infect pure PBA Samira<sup>®</sup> indicating outcrossing has occurred in the paddock.

Growers need to monitor faba bean crops closely. If you observe unusual levels of disease on resistant varieties, please send lesioned samples to Agriculture Victoria at:

**Agriculture Victoria – Pulse Pathology**  
**Isolate Collection**  
**Reply Paid 69952**  
**Horsham VIC 3400**

Ph: 03 4344 3111

Email: [joshua.fanning@agriculture.vic.gov.au](mailto:joshua.fanning@agriculture.vic.gov.au)

## MORE INFORMATION

### **nvtonline.com.au**

- Detailed NVT trial results and links to variety information

### **nvtonline.com.au/apps**

- Crop Disease Au App
- NVT Long Term Yield Reports App

### **agriculture.vic.gov.au/agriculture/grains-and-other-crops/crop-production**

- Growing Faba Bean
- Agriculture Victoria Pulse Disease Guide

### **communities.grdc.com.au**

- Expert support on crop nutrition and field crop diseases at your fingertips

### **pulseaus.com.au**

- Pulse Australia has detailed information on growing pulses and lists all current emergency and minor use chemical permits

### **GRDC Resources**

- Faba Bean Southern Region – GRDC GrowNotes™

## VARIETY DESCRIPTIONS

(<sup>Ⓛ</sup>) Denotes that Plant Breeder Rights apply

End Point Royalty (EPR) 2019-20 quoted \$/tonne ex-GST.

## BROAD BEAN VARIETIES

### **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). Moderately susceptible to both ascochyta blight pathotypes, chocolate spot MS and rust MR. Released 1982.

### **PBA KAREEMA**

PBA Kareema is a direct replacement for variety Aquadulce. It requires a long growing season similar to Aquadulce and is best suited to high rainfall districts (>450mm). Moderately resistant to both ascochyta blight pathogens, chocolate spot MS and rust MRMS. PBA Kareema is only recommended for the South West region. Released 2010. Seed available from PGG Wrightson. EPR \$4.00.

## FABA BEAN VARIETIES

### **NEW – PBA AMBERLEY<sup>Ⓛ</sup>**

PBA Amberley<sup>Ⓛ</sup> is a new PBA variety being released for sowing in 2020. It is the first variety with moderate resistance to chocolate spot and is mid-flowering and mid-maturing. It has resistance to pathotype 1 and 2 of ascochyta blight and has good standing ability and a low level of 'necking'. PBA Amberley<sup>Ⓛ</sup> has a yield advantage over current varieties in high rainfall regions and its grain size is similar to Samira<sup>Ⓛ</sup>. Released 2019 (tested as AF11023). Seed available from Seednet. EPR \$3.50.

### **PBA BENDOC<sup>Ⓛ</sup>**

PBA Bendoc<sup>Ⓛ</sup> is the first faba bean line with improved tolerance to some Group B herbicides. This not only increases the in-crop options for broadleaf weed control, but also enables the variety to be grown where some Group B (including the sulfonylureas) herbicide residues persist from applications to the previous crop. It is important to note that growers must adhere to product label rates, plant-back periods and all label directions for use. It has a medium sized seed suited to the Middle East markets. Resistant to moderately resistant to both ascochyta blight pathotypes, chocolate spot S, cercospora leaf spot S and rust S. Developed by PBA. Released 2018. Seed available from Seednet. EPR \$3.90.

### **FARAH<sup>Ⓛ</sup>**

Farah<sup>Ⓛ</sup> is a selection from Fiesta VF. It has similar agronomic traits and yield but has more uniform seed size. Farah<sup>Ⓛ</sup> performs best in medium rainfall environments. Ascochyta blight pathotype 1 RMR, pathotype 2 S and chocolate spot S. Released 2003. Seed available from Heritage Seeds. EPR \$3.00.

## FIESTA VF

A medium sized bean, Fiesta VF has good yields and wide adaptation throughout southern Australia. It is medium height with good seedling vigour. Ascochyta blight pathotype 1 MS and pathotype 2 S, chocolate spot S and rust S. Released 1998.

## PBA MARNE<sup>Ⓛ</sup>

PBA Marne<sup>Ⓛ</sup> is an early-mid flowering, high yielding faba bean that has shown adaptation to the lower rainfall and short season areas throughout southern Australia, where yield is generally greater than current varieties. PBA Marne<sup>Ⓛ</sup> offers the potential to expand faba bean production into areas that are currently considered marginal and to improve reliability in established areas during below average rainfall seasons. Seed is light brown and medium in size and suitable for co-mingling with the current faba bean varieties for export to the major food markets in the Middle East. Ascochyta blight pathotype 1 RMR, pathotype 2 MRMS, chocolate spot S, cercospora leaf spot S, rust MR and PSbMV seed stain MR. Developed by PBA. Released 2018. Seed available from Seednet. EPR \$3.50.

## NURA<sup>Ⓛ</sup>

Nura<sup>Ⓛ</sup> is shorter than Fiesta VF and Farah<sup>Ⓛ</sup> and less likely to lodge, however the bottom pods are closer to the ground. Nura<sup>Ⓛ</sup> is RMR to both pathotypes of ascochyta blight, MS to chocolate spot and rust. Nura<sup>Ⓛ</sup> needs to be sown early as it flowers about seven days later than Fiesta, but it matures at a similar time. Released 2005. Seed available from Seednet. EPR \$3.00.

## PBA RANA<sup>Ⓛ</sup>

Mid-flowering and maturing variety suited to higher rainfall, long season regions. Seed is med-large and is considered high quality by the major Egyptian market. Resistant to ascochyta blight pathotype 1, but pathotype 2 MRMS, cercospora leaf spot S and chocolate spot MS. Developed by PBA. Released 2011. Seed available from Seednet. EPR \$3.50.

## PBA SAMIRA<sup>Ⓛ</sup>

A high yielding variety with wide adaptation. Later flowering means it can take advantage of late rainfall in longer season environments. Seed is slightly larger than Farah<sup>Ⓛ</sup> and is suited to Middle East markets. Resistant to moderately resistant to both pathotypes of ascochyta blight, chocolate spot MS, rust MS and cercospora leaf spot S. Developed by PBA. Released 2014. Seed available from Seednet. EPR \$3.50.

## PBA ZAHRA<sup>Ⓛ</sup>

A high yielding, later flowering and maturing variety that has performed very well in longer season environments. Seed is larger than Farah<sup>Ⓛ</sup> and similar to PBA Rana<sup>Ⓛ</sup> and suited to Middle East markets. Good overall response to diseases, ascochyta blight pathotype 1 R, pathotype 2 MRMS, chocolate spot MS and rust MS. Developed by PBA. Released 2016. Seed available from Seednet. EPR \$3.50.

**TABLE 1 Faba bean time of sowing guide.**

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

MALLEE	April				May				June			
Farah <sup>Ⓛ</sup> , Fiesta VF, PBA Marne <sup>Ⓛ</sup> , PBA Samira <sup>Ⓛ</sup>												
WIMMERA	April				May				June			
PBA Amberley <sup>Ⓛ</sup> , Aquadulce, PBA Bendoc <sup>Ⓛ</sup> , Farah <sup>Ⓛ</sup> , Fiesta VF, Nura <sup>Ⓛ</sup> , PBA Marne <sup>Ⓛ</sup> , PBA Samira <sup>Ⓛ</sup> , PBA Zahra <sup>Ⓛ</sup>												
NORTH CENTRAL – 1 WEEK EARLIER FOR IRRIGATION	April				May				June			
PBA Amberley <sup>Ⓛ</sup> , Aquadulce, PBA Bendoc <sup>Ⓛ</sup> , Farah <sup>Ⓛ</sup> , Fiesta VF, Nura <sup>Ⓛ</sup> , PBA Marne <sup>Ⓛ</sup> , PBA Samira <sup>Ⓛ</sup> , PBA Zahra <sup>Ⓛ</sup>												
NORTH EAST	April				May				June			
PBA Amberley <sup>Ⓛ</sup> , Aquadulce, PBA Bendoc <sup>Ⓛ</sup> , Farah <sup>Ⓛ</sup> , Fiesta VF, Nura <sup>Ⓛ</sup> , PBA Marne <sup>Ⓛ</sup> , PBA Samira <sup>Ⓛ</sup> , PBA Zahra <sup>Ⓛ</sup>												
SOUTH WEST	April				May				June			
PBA Amberley <sup>Ⓛ</sup> , Aquadulce, PBA Bendoc <sup>Ⓛ</sup> , PBA Kareema, Farah <sup>Ⓛ</sup> , Fiesta VF, PBA Rana <sup>Ⓛ</sup> , PBA Samira <sup>Ⓛ</sup> , PBA Zahra <sup>Ⓛ</sup>												

Yellow = earlier than ideal.

Green = optimum sowing time.

Red = later than ideal.



**TABLE 2 Agronomic characteristics of faba bean varieties.**

Variety	Seed size	Seed colour	Plant height	Flowering time	Maturity	Lodging resistance
<b>BROAD BEAN</b>						
Aquadulce	large	light buff	tall	late	mid-late	MS
PBA Kareema	large	light brown	tall	late	late	MS
<b>FABA BEAN</b>						
PBA Amberley <sup>db</sup> (AF11023)	med-large	light brown	medium	mid	mid-late	MR
PBA Bendoc <sup>db</sup>	medium	light brown	medium	mid	early-mid	MS
Farah <sup>db</sup>	medium	light brown/brown	medium	early-mid	early-mid	MS
Fiesta VF	medium	light brown/brown	medium	early-mid	early-mid	MS
PBA Marne <sup>db</sup>	medium	light brown	medium	early-mid	early-mid	MR
Nura <sup>db</sup>	small-med	light buff	short	mid	early-mid	MR
PBA Rana <sup>db</sup>	med-large	light brown	med/tall	mid	mid	MR
PBA Samira <sup>db</sup>	medium	light brown	medium	mid	mid	MR
PBA Zahra <sup>db</sup>	med-large	light brown	med/tall	mid	mid-late	MR

SOURCES: NATIONAL PULSE DISEASE RATINGS (2019); SOUTHERN PULSE AGRONOMY WIMMERA FIELD DAY GUIDE (2018)

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

p = provisional ratings – treat with caution. R = resistant, RMR = resistant to moderately resistant, MR = moderately resistant, MRMS = moderately resistant to moderately susceptible, MS = moderately susceptible, S = susceptible, VS = very susceptible.

**TABLE 3 Diseases resistance characteristics of faba bean varieties.**

Variety	Ascochyta blight*		Chocolate spot (botrytis)	Cercospora	Rust	PSbMV seed staining	Root lesion nematode ( <i>Pratylenchus</i> )	
	Pathotype 1 (P1)	Pathotype 2 (P2)					<i>P. thornei</i>	<i>P. neglectus</i>
BROAD BEAN								
Aquadulce	MS	MS	MS	S	MR	S	MS	MR
PBA Kareema	MR	MR	MS	S	MRMS	S	–	–
FABA BEAN								
PBA Amberley <sup>db</sup> (AF11023)	R	R	MR	MS	S	–	–	–
PBA Bendoc <sup>db</sup>	RMR	RMR	S	S	S	S	MS	MR
Farah <sup>db</sup>	RMR	S	S	S	S	S	MS	MR
Fiesta VF	MS	S	S	S	S	S	MS	MR
Nura <sup>db</sup>	RMR	RMR	MS	S	MS	VS	MS	MR
PBA Marne <sup>db</sup>	RMR	MRMS	S	S	MR	MR	MS	MR
PBA Rana <sup>db</sup>	R	MRMS	MS	S	MS	MR	MS	MR
PBA Samira <sup>db</sup>	RMR	RMR	MS	S	MS	S	MRMS	MR
PBA Zahra <sup>db</sup>	R	MRMS	MS	S	MS	S	MS	MR

SOURCES: NATIONAL PULSE DISEASE RATINGS (2019); SOUTHERN PULSE AGRONOMY WIMMERA FIELD DAY GUIDE (2018)

PSbMV = pea seed-borne mosaic virus

\*Pathotype 2 of ascochyta blight in faba bean has become dominant in Victoria. Crops and trials continue to be monitored for pathotype changes and distribution.

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

p = provisional ratings – treat with caution. R = resistant, RMR = resistant to moderately resistant, MR = moderately resistant, MRMS = moderately resistant to moderately susceptible, MS = moderately susceptible, S = susceptible, VS = very susceptible.

TABLE 4 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 spots. 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. Usually the first disease present in new crops. Most severe in wet seasons.	Faba bean, vetch. Spores spread by wind and rain. Infected seed.	Foliar fungicides. Resistant varieties. Crop rotation. Control volunteer plants. Clean seed.
Chocolate spot	<i>Botrytis fabae</i> <i>B. 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. Can destroy unprotected crops in wet seasons.	Faba bean. Spores spread by wind and rain.	Foliar fungicides. Resistant varieties. Crop rotation. Control volunteer plants.
Cercospora leaf spot	<i>Cercospora zonata</i>	Dark irregular lesions, with a distinct margin on the leaf. Easily confused with ascochyta blight 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	Foliar fungicides. Crop rotation. Control volunteer plants.
Sclerotinia stem rot	<i>Sclerotinia trifoliorum</i> var. <i>fabae</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.	Wide host range. Foliar form of disease spread by air-borne spores. Fungus survives in the soil for many years.	Crop rotation. Lower sowing 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.	Faba bean, pea, oat, wild oat. Infected seed straw or soil. Nematode can survive many years in seed, straw or soil.	Seed test. Crop rotation.
VIRUS DISEASES					
Subterranean clover stunt virus (SCSV)	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.
Bean leaf roll virus (BLRV)	Virus	Interveinal yellowing, leaf rolling, stunting, leathery leaves.	Occurs in all bean growing areas.	The host range is limited to Fabaceae.	Managing aphids.
Pea seed-borne mosaic virus (PSbMV)	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 Fabaceae.	Virus-free seed is recommended. Managing aphids.

SOURCE: IDENTIFICATION AND MANAGEMENT OF FIELD CROP DISEASES IN VICTORIA (2018)

**TABLE 5 North Central NVT long-term predicted faba bean yield expressed as a percentage of mean yield.**

NORTH CENTRAL							NORTH EAST			
Year		2014	2015	2016	2017	2018		2014	2015	2018
Mean yield t/ha		5.3	5.39	6.19	7.39	6.2		2	1.59	0.75
	No. Trials	2	2	2	2	2	No. Trials	2	2	2
PBA Amberley <sup>db</sup> (AF11023)	4	-	95	119	105	100	2	-	100	111
PBA Bendoc <sup>db</sup>	4	-	-	-	91	99	2	-	-	100
Farah <sup>db</sup>	10	90	102	91	95	96	6	96	96	95
Fiesta VF	8	90	101	96	96	-	6	100	96	99
PBA Marne <sup>db</sup>	10	103	100	98	103	103	6	102	110	100
PBA Nasma <sup>db</sup>	2	-	-	103	-	-	0	-	-	-
Nura <sup>db</sup>		-	-	-	-	-	6	94	95	85
PBA Rana <sup>db</sup>		-	-	-	-	-	6	94	84	90
PBA Samira <sup>db</sup>	10	104	100	106	101	100	6	102	98	104
PBA Zahra <sup>db</sup>	10	103	106	100	98	102	6	99	96	102

**TABLE 6 South West NVT long-term predicted faba bean yield expressed as a percentage of mean yield.**

SOUTH WEST						
Year		2014	2015	2016	2017	2018
Mean yield t/ha		2.47	2.95	5.58	4.61	3.36
	No. Trials	2	2	2	2	4
PBA Amberley <sup>db</sup> (AF11023)	5	-	107	116	106	112
PBA Bendoc <sup>db</sup>	8	-	-	93	108	103
Farah <sup>db</sup>	12	101	98	93	105	100
Fiesta VF	6	103	101	90	-	-
PBA Marne <sup>db</sup>	12	101	102	98	90	93
Nura <sup>db</sup>	12	96	92	107	100	93
PBA Rana <sup>db</sup>	12	100	96	103	103	100
PBA Samira <sup>db</sup>	12	99	101	105	104	105
PBA Zahra <sup>db</sup>	12	97	98	107	104	103

**TABLE 7 Wimmera NVT long-term predicted faba bean yield expressed as a percentage of mean yield.**

WIMMERA						
Year		2014	2015	2016	2017	2018
Mean yield t/ha		1.51	0.67	3.37	4.66	2.65
	No. Trials	10	4	8	6	8
PBA Amberley <sup>db</sup> (AF11023)	16	102	97	108	99	100
PBA Bendoc <sup>db</sup>	22	-	-	88	102	102
Doza <sup>db</sup>	2	-	-	91	-	-
Farah <sup>db</sup>	36	99	104	90	98	99
Fiesta VF	24	101	109	91	96	98
Fiord	4	-	-	100	98	-
PBA Marne <sup>db</sup>	32	104	102	107	102	101
PBA Nasma <sup>db</sup>	2	-	-	104	-	-
Nura <sup>db</sup>	36	94	93	88	101	101
PBA Rana <sup>db</sup>	36	88	83	95	92	96
PBA Samira <sup>db</sup>	36	99	98	102	100	100
PBA Warda <sup>db</sup>	2	-	-	105	-	-
PBA Zahra <sup>db</sup>	36	97	96	99	103	102

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

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Phil Bowden	Pulse Australia
Simon Crane	Seednet

# LUPIN

Narrow-leafed lupin (*Lupinus angustifolius*) suits acidic, sandy or low fertility soils whereas albus lupin (*L. albus*) is best suited to fertile, well-drained and heavier soils. Narrow-leafed lupin has major advantages as a rotational break crop in cereal cropping systems, including contributing to nitrogen (N) fixation, offering a quality stock feed product option and having potential for sale into existing high-value export markets.

## NEW VARIETIES

There are no new lupin varieties available for sowing in Victoria for 2020.

There is a new variety which was released in August 2019 and available to growers in Western Australia in 2020 – Coyote (tested as WALAN2546). Coyote is the first narrow-leaf lupin variety to be released by AGT. Seed will not be available in Victoria for 2020.

## INOCULATION

Applying rhizobium inoculant (Group G) to lupin is strongly recommended on all soil types and essential where lupins have not been grown within the last five years. Peat-based products applied as a slurry to seed or as a granule through a small seed box, placed below seed, have proved most reliable. Further information Lupin Southern Region – GRDC GrowNotes™, Section 2.

## KEY DISEASE AND VIRUS CONSIDERATIONS

Even though many of the newer varieties of lupin have better disease resistance, it is still a good idea to have seed tested for viruses such as cucumber mosaic virus (CMV).

Agriculture Victoria reminds growers that the following restrictions for lupin seed entering Victoria must be complied with to avoid a lupin anthracnose outbreak.

Lupin seed for planting must originate from a state with a current area freedom certificate for lupin anthracnose or be certified as being tested free from the disease.

Growers wanting to import packages used with lupins, seed or plants or lupin diagnostic samples (including seed etc) must first obtain a permit from an Agriculture Victoria Plant Standards Officer by telephoning 136 186.

Businesses receiving stock feed containing lupins from states affected by lupin anthracnose should immediately implement best practice biosecurity measures to reduce the risk of inadvertently spreading the disease in Victoria.

Best practice biosecurity measures include not planting lupin crops in paddocks where the material containing lupins was fed to stock in the previous season and managing volunteer plants in subsequent seasons.

**Statement on machinery:** Growers wanting to import agricultural machinery used for lupins must first obtain a permit from an Agriculture Victoria Plant Standards Officer by telephoning 136 186.

## MORE INFORMATION

**nvtonline.com.au**

- Detailed NVT trial results and links to variety information

**nvtonline.com.au/apps**

- Crop Disease Au app
- NVT Long Term Yield Reports app

**agriculture.vic.gov.au/agriculture/  
grains-and-other-crops/crop-production**

- Growing Lupin
- Agriculture Victoria Pulse Disease Guide

**communities.grdc.com.au**

- Expert support on crop nutrition and field crop diseases at your fingertips

**pulseaus.com.au**

- Pulse Australia has detailed information on growing pulses and lists all current emergency and minor use chemical permits

**GRDC resources**

- Lupin Southern Region – GRDC GrowNotes™.

## VARIETY DESCRIPTIONS

(<sup>Ⓛ</sup>) Denotes that Plant Breeder Rights apply  
End Point Royalty (EPR) 2019-20 quoted \$/tonne ex-GST.

## NARROW-LEAFED LUPIN VARIETIES

### PBA BARLOCK<sup>Ⓛ</sup>

PBA Barlock<sup>Ⓛ</sup> is an early variety with slightly later flowering and maturity than Mandelup<sup>Ⓛ</sup> with a greater yield potential, reduced lodging and good resistance to pod shatter. Resistant to anthracnose. Stem phomopsis MR, CMV MR and brown leaf spot MS. Similar metribuzin tolerance to that of Mandelup<sup>Ⓛ</sup> and better than Wonga. Released 2014. Seed available from Seednet. EPR \$2.50.

### PBA BATEMAN<sup>Ⓛ</sup>

Tall, early-flowering lupin variety with improved virus resistance. It offers significant yield improvements over current varieties in areas where virus infection from CMV and BYMV can cause significant yield loss to susceptible varieties when seasonal conditions are conducive to high aphid numbers. Well suited to high rainfall zones. PBA Bateman<sup>Ⓛ</sup> has similar harvest grain loss risk and resistance to pod shatter to PBA Barlock<sup>Ⓛ</sup>. PBA Bateman<sup>Ⓛ</sup> has similar tolerance to metribuzin as PBA Jurien<sup>Ⓛ</sup>, PBA Barlock<sup>Ⓛ</sup> and PBA Gunyidi<sup>Ⓛ</sup>. Anthracnose MRMS, stem phomopsis MR, brown leaf spot MS, CMV MR. Released 2017. Seed available from Seednet. EPR \$2.60.

### NEW – COYOTE

Coyote (tested WALAN2546) is the first narrow-leaf lupin variety to be released by AGT. Coyote is slightly higher yielding than PBA Jurien<sup>Ⓛ</sup> and has performed well across a very broad range of soil types, rainfall zones and yield potentials. Brown leaf spot MS<sub>p</sub>, BYMV and black pod syndrome MRMS<sub>p</sub>, anthracnose R<sub>p</sub>, stem phomopsis MS<sub>p</sub>. Released 2019. Seed will not be available in Victoria for 2020. Developed by AGT. EPR \$3.00.

### JENABILLUP<sup>Ⓛ</sup>

Tall mid-flowering narrow-leaf lupin with early vigour. A high yielding variety that is MR to lodging and more suited to the medium to higher rainfall areas. It has a longer flowering window compared to Mandelup<sup>Ⓛ</sup>, making it less suitable for crop topping. Aphid colonisation MR, brown leaf spot MS, anthracnose MS, stem phomopsis S and pod/seed phomopsis MR. Poor tolerance of foliar metribuzin. Released 2007. Seed available from Seednet. EPR \$2.30.

### PBA JURIE<sup>Ⓛ</sup>

An early maturing, early flowering variety, flowering slightly earlier than PBA Barlock<sup>Ⓛ</sup>. Aphid resistance R, anthracnose R, stem phomopsis R and pod/seed MRMS. PBA Jurien<sup>Ⓛ</sup> is similar in height to Mandelup<sup>Ⓛ</sup> and is MS to lodging in high rainfall regions. Tolerance to metribuzin is better than Mandelup<sup>Ⓛ</sup>. PBA Jurien<sup>Ⓛ</sup> has medium to large seed, similar to Mandelup<sup>Ⓛ</sup> and the alkaloid content is similar to PBA Gunyidi<sup>Ⓛ</sup>. Developed by PBA. Released 2015. Seed available from Seednet. EPR \$2.50.

### MANDELUP<sup>Ⓛ</sup>

A tall, slightly early flowering and maturing variety with high yield suited to low to medium rainfall zones. Suitable for crop topping. Mandelup<sup>Ⓛ</sup> may lodge in high rainfall zones. Anthracnose MR, stem phomopsis R, pod/seed phomopsis MRMS, brown leaf spot MS and CMV seed transmission MS. Moderately resistant to aphids but less tolerant than PBA Jurien<sup>Ⓛ</sup> or Wonga. Can produce unacceptable levels of seed phomopsis under high disease pressure. Good tolerance to metribuzin. Pod shatter with delayed harvest and poorer seed germination rate and establishment with rain before harvest have been issues with Mandelup<sup>Ⓛ</sup>. Released 2004. Seed available from Heritage Seeds. EPR \$2.30.

## WONGA

Early-flowering, medium height, narrow-leafed lupin. Very good disease resistance profile with anthracnose R, stem phomopsis R, pod/seed phomopsis MR and CMV seed transmission R. Medium lodging resistance. Best suited to medium rainfall districts, particularly when resistance to anthracnose and phomopsis is required. Very poor tolerance of metribuzin. Released 1997.

**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 350mm	mid-April to early May	late April to early May
350 – 450mm	early to mid-May	mid May
Above 450mm	mid May	late May

## ALBUS LUPIN VARIETIES

### LUXOR<sup>®</sup>

Resistant to pleiochaeta root rot (the cause of many seedling deaths in older varieties). Luxor<sup>®</sup> is earlier flowering than its sister line Rosetta. Released in 2005. Seed available from Seednet. EPR is \$2.80.

### MURRINGO<sup>®</sup>

Murringo<sup>®</sup> is an early-mid flowering albus lupin suited to medium to high rainfall zones. It has a slightly longer maturity time to Luxor<sup>®</sup>. The suitable sowing time is the normal albus sowing window of late-April to mid-May. Murringo<sup>®</sup> should not be grown within one kilometre of other albus varieties to avoid contamination. Brown leaf spot MR, anthracnose VS, stem phomopsis MS and pod/seed phomopsis S. Moderately resistant to pleiochaeta root rot. Released 2017. Seed available from Seednet. EPR \$3.20

### ROSETTA

Moderately resistant to pleiochaeta root rot (less resistant than Luxor<sup>®</sup>). Later flowering and taller than Luxor<sup>®</sup>, it is especially suited to higher rainfall areas. Released in 2005. Seed available from Seednet.

**TABLE 2 Lupin sowing guide.**

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

MALLEE	April				May			
Narrow-leaf: Jenabillup <sup>®</sup> , Mandelup <sup>®</sup> , PBA Barlock <sup>®</sup> , PBA Jurien <sup>®</sup>								
Albus lupin: Murringo <sup>®</sup>								
WIMMERA	April				May			
Narrow-leaf: Jenabillup <sup>®</sup> , Mandelup <sup>®</sup> , PBA Barlock <sup>®</sup> , PBA Jurien <sup>®</sup> , Wonga								
Albus lupin: Murringo <sup>®</sup>								
NORTH CENTRAL	April				May			
Narrow-leaf: Jenabillup <sup>®</sup> , Mandelup <sup>®</sup> , PBA Barlock <sup>®</sup> , PBA Jurien <sup>®</sup> , Wonga								
Albus lupin: Murringo <sup>®</sup>								
NORTH EAST	April				May			
Narrow-leaf: Jenabillup <sup>®</sup> , PBA Barlock <sup>®</sup> , PBA Jurien <sup>®</sup> , Wonga								
Albus lupin: Murringo <sup>®</sup>								
SOUTH WEST	April				May			
Narrow-leaf: Jenabillup <sup>®</sup> , PBA Barlock <sup>®</sup> , PBA Jurien <sup>®</sup> , Wonga								
Albus lupin: Murringo <sup>®</sup>								

Yellow = earlier than ideal.

Green = optimum sowing time.

Red = later than ideal.

**TABLE 3 Agronomic characteristics of lupin varieties.**

The agronomic characteristics in this table are provided as a guide only and have been compiled from observations of the breeder, National Variety Trials, agronomic research projects and seed companies.

Variety	Flowering time	Height	Lodging	Pod shattering	Aphid resistance
<b>NARROW-LEAF</b>					
PBA Barlock <sup>db</sup>	E	S	MR	R	R
PBA Bateman <sup>db</sup>	VE-E	T	MRMS	MRMS	R
Coyote	E	-	-	-	-
Jenabillup <sup>db</sup>	M	T	MR	MS	MR
PBA Jurien <sup>db</sup>	VE	M	MS	MR	R
Mandelup <sup>db</sup>	VE	T	MS	MS	MR
Wonga	E-M	M	MR	R	R
<b>ALBUS LUPIN</b>					
Luxor <sup>db</sup>	E-M	M-T	R	R	-
Murring <sup>db</sup>	E-M	M	R	MR	-
Rosetta	M	T	R	R	-

SOURCE: DEPARTMENT OF PRIMARY INDUSTRIES AND REGIONAL DEVELOPMENT

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

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

No variety with a R resistance rating is immune to disease and a fungicide application may be required under severe disease pressure.

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, VS = very susceptible

**TABLE 4 Disease resistance characteristics of lupin varieties.**

Variety	Brown leaf spot	Pleiochaeta root rot	Cucumber mosaic virus (CMV) (seed transmitted)	Anthraco	Phomopsis Stem	Phomopsis Pod/Seed
<b>NARROW-LEAF</b>						
PBA Barlock <sup>db</sup>	MS	-	MR	R	MR	MR
PBA Bateman <sup>db</sup>	MS	-	MR	MRMS	MR	MRMS
Coyote	MS <sub>p</sub>	-	MR <sub>p</sub>	R <sub>p</sub>	MS <sub>p</sub>	-
Jenabillup <sup>db</sup>	MRMS	R	MS	MS	S	MR
PBA Jurien <sup>db</sup>	MS	-	MS	R	R	MRMS
Mandelup <sup>db</sup>	MS	R	MS	MR	R	MRMS
Wonga	MS	R	R	R	R	MR
<b>ALBUS LUPIN</b>						
Luxor <sup>db</sup>	MR	R	Immune	VS	MR	S
Murring <sup>db</sup>	MR	MR	Immune	VS	MS	S
Rosetta	R	MR	Immune	VS	R	-

SOURCE: NATIONAL PULSE DISEASE RATINGS (2019)

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

<sub>p</sub> = provisional ratings – treat with caution. R = resistant, RMR = resistant to moderately resistant, MR = moderately resistant, MRMS = moderately resistant to moderately susceptible, MS = moderately susceptible, S = susceptible, VS = very susceptible.

No variety with a R resistance rating is immune to disease and a fungicide application may be required under severe disease pressure.



TABLE 5 Lupin disease guide summary.

Disease	Organism	Symptoms	Occurrence	Inoculum source	Control
FUNGAL DISEASES					
Brown leaf spot	<i>Pleiochaeta setosa</i>	Dark brown spots on cotyledons leaves and pods, often net-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 in soil and lupin trash, rain-splash and windblown.	Fungicide seed dressings, crop rotations, resistant varieties selection, early sowing.
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.	Minimum 4-year rotation between lupins, sowing 4-5cm deep to avoid spore layer, fungicide seed dressings.
Rhizoctonia	<i>Rhizoctonia spp.</i>	Bare patches in crop, spear tipped root ends, 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.	Rotation of crops with other pulses, tillage can help, increased seedling rate.
Anthrachnose	<i>Colletotrichum lupini</i>	Stems/branches bend over, brown lesions with pink/orange spore masses in crook bend, dark lesions with pink/orange spores on flower spike and pods.	Severe infections can result in severing of stems or total pod abortion resulting in complete crop failure.	Seed-borne disease, infected seed produces infected seedlings. Spread in crop by rain-splash and wind.	Clean seed and machinery, destroy infected regrowth, resistant varieties, fungicide seed dressings reduce seedling infection.
Phomopsis stem and pod blight	<i>Diaporthe toxica</i>	Dark purplish lesions that bleach with age and contain black fruiting bodies and can cause plants to lodge. Severe lesions may girdle the stem and kill the plant.  Saprophytic growth of fungus in stubble and seed produces mycotoxin which causes lupinosis in grazing animals.	Can infect stems, leaves, pods and seeds of lupins. Prematurely dying plants after pod set can be seen in crops, particularly in parts of the paddock stressed by drought, frost or herbicides.	Fungus can survive on lupin trash and seed, rain-splash and windblown.	Crop rotation and increasing the break between lupin crops, variety selection, seed treatment.
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 with dense canopies. More likely with canola in the rotation but can affect several broad leaf crops.	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). No variety resistance.
VIRUS DISEASES					
Cucumber mosaic virus (CMV)	Virus	All growth after infection is dwarfed, leaflets are yellowed and bunched.	Early widespread infection severely reduces yield. Minor infections prevent use of harvested grain as seed.	Seed-borne infection in narrow-leaf lupin, aphids transmit the disease within a crop. Wide host range.	Sow clean seed, use a seed test, high sowing rates and cereal barriers around crops reduce aphid transmission.
Bean yellow mosaic virus (BYMV) Black pod syndrome	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.	Occurs in all lupin growing areas. Can be severe in higher rainfall areas.	Seed-borne in albus but not narrow-leafed lupin, aphid spread in crop, many host species.	Sow virus-free seed. High plant density, cereal buffer.

SOURCE: IDENTIFICATION AND MANAGEMENT OF FIELD CROP DISEASES IN VICTORIA (2018)

**TABLE 6 NVT long-term predicted lupin yield expressed as a percentage of mean yield.**

Year	MALLEE						NORTH CENTRAL	
		2014	2015	2016	2017	2018		2014
Mean Yield (t/ha)		1.04	0.91	1.69	1.06	0.9		2.33
	No. trials	2	2	1	1	1	No. trials	1
PBA Barlock <sup>db</sup>	6	100	102	98	111	-	1	111
PBA Bateman <sup>db</sup>	4	-	100	120	-	114	0	-
Coyote	5	-	104	119	157	129	0	
Jenabillup <sup>db</sup>	7	95	96	102	140	107	1	97
PBA Jurien <sup>db</sup>	6	104	104	98	107	-	1	114
Mandelup <sup>db</sup>	6	114	98	99	125	-	1	93
Wonga	7	88	86	90	116	99	1	93

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

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# CHICKPEA

There are two groups of chickpeas grown in Australia, desi and kabuli, mainly distinguished by seed size, shape and colour. They also have different growth requirements, markets and end-users. Chickpeas are well suited to well-drained, non-acidic soils of a medium to heavy texture.

Chickpea often attracts a premium price over other pulse species due to demand, driven by human consumption. Chickpeas also contribute to crop rotations by fixing nitrogen (N), and by providing a disease and weed break for cereal crops.

## NEW VARIETIES

There is one new chickpea variety released for sowing in Victoria in 2020. PBA Royal (tested as CICA1156) is a larger seed size and higher yield than Genesis™ 090 in medium rainfall Victorian environments (yield >2t/ha). It will be commercialised by Seednet. For further information contact Seednet.

A further kabuli line from the Pulse Breeding Australia Chickpea program is being multiplied for anticipated variety release in 2020 and commercial production in 2021. CICA1352 is a large seeded kabuli (larger seed size and higher yield than Genesis™ Kalkee) with higher yield than Genesis™ Kalkee. It will be commercialised by PB Seeds. Both lines are expected to have a moderately susceptible (MS) rating to southern ascochyta blight isolates, similar to Genesis™ 090.

## INOCULATION

The strain of rhizobia used for inoculating chickpeas is highly specific (Group N, CC1192). Inoculation is essential for effective nodulation and will result in a crop that is self-sufficient for N and provide soil health benefits in subsequent seasons. Further information in GRDC GrowNotes™ Chickpea Southern Region, Section 3.1.

## KEY DISEASE CONSIDERATIONS

The 2019 season is progressing to be a reasonable season in most areas and there have been numerous reports of ascochyta infection across Victoria. Late seasonal rainfall within the Wimmera resulted in some pod infection which can result in disease carryover into the next season, particularly without seed treatments.

Growers are encouraged to annually review their integrated disease management (IDM) strategies, including cultivar selections for pulses in their farming system. To help protect the industry from loss of disease resistance, implement a 3-4 year break between crops of the same type, revise cultivar selections and avoid sowing paddocks in close proximity to previous years' crops. Growers should monitor crops for signs of disease and ensure fungicide applications are applied ahead of rain fronts.

If seed was retained from paddocks infected with ascochyta blight during 2019, seed testing is recommended to reduce carryover of disease inoculum into 2020.

## MORE INFORMATION

### **nvtonline.com.au**

- Detailed NVT trial results and links to variety information

### **nvtonline.com.au/apps**

- Crop Disease Au App
- NVT Long Term Yield Reports App

### **agriculture.vic.gov.au/agriculture/grains-and-other-crops/crop-production**

- Growing Chickpea
- Agriculture Victoria Pulse Disease Guide

### **pulseaus.com.au**

Pulse Australia has detailed information on growing pulses including:

- Chickpea Disease Management Strategy
- Current emergency and minor use chemical permits

### **communities.grdc.com.au**

- Expert support on crop nutrition and field crop diseases at your fingertips

### **GRDC resources**

- Chickpea Southern Region – GRDC GrowNotes™

## VARIETY DESCRIPTIONS

(<sup>Ⓛ</sup>) Denotes that Plant Breeder Rights apply

End Point Royalty (EPR) 2019-20 quoted \$/tonne ex-GST.

## DESI-TYPE VARIETIES

### **PBA MAIDEN<sup>Ⓛ</sup>**

Susceptible to ascochyta blight, will require regular strategic application of fungicides (every 2-3 weeks) throughout the growing season. Treat seed with a Thiram-based fungicide to prevent seed transmission of ascochyta blight on to the emerging seedlings. Med-large angular seed size, yellow-tan in colour, is suitable for the whole seed market. Mid-flowering and mid-maturity. Growers are advised to investigate delivery and marketing options prior to growing this variety due to its unique and favourable seed characteristics compared to other southern desi varieties. Released 2013. Seed available from Seednet. EPR \$4.00.

### **PBA SLASHER<sup>Ⓛ</sup>**

Susceptible to ascochyta blight, strategic fungicide applications (3-4 sprays) required throughout the growing season. Treat seed with a Thiram-based fungicide to prevent seed transmission of ascochyta blight on to the emerging seedlings. PBA Slasher<sup>Ⓛ</sup> has mid-flowering and maturity. Seed is medium sized, tan-brown in colour which has excellent milling quality, suitable for both split and whole seed markets. Released 2009. Seed available from Seednet. EPR \$4.00.

### **PBA STRIKER<sup>Ⓛ</sup>**

Susceptible to ascochyta blight, will require regular strategic application of fungicides (every 2-3 weeks) throughout the growing season. Treat seed with a Thiram-based fungicide to prevent seed transmission of ascochyta blight on to the emerging seedlings. Excellent adaptation to short season environments due to early flowering and maturity. Medium seed size with excellent milling quality. Released 2012. Seed available from Seednet. EPR \$4.00.

## KABULI-TYPE VARIETIES

### **ALMAZ<sup>Ⓛ</sup>**

Ascochyta blight (foliage) MS and ascochyta blight (pod) S. Strategic fungicide applications (3-4 sprays) required throughout the growing season. Treat seed with a Thiram-based fungicide to prevent seed transmission of ascochyta blight on to the emerging seedlings. Almaz<sup>Ⓛ</sup> will require at least three fungicide applications to be successfully grown in Victorian growing conditions. Seed size is similar to PBA Monarch<sup>Ⓛ</sup> (8-9mm). Yield is lower than PBA Monarch<sup>Ⓛ</sup> and Genesis™ 090. Best adapted to the traditional kabuli growing areas. Released 2005. Seed available from Seednet. EPR \$6.50.

**GENESIS™ 090**

Ascochyta blight (foliar) MS and ascochyta blight (pod) S. Requires strategic fungicide applications (3-4 sprays) throughout the growing season. Treat seed with a Thiram-based fungicide to prevent seed transmission of ascochyta blight on to the emerging seedlings. Genesis™ 090 has a small seed (7-8mm), approximately 1mm smaller than Almaz<sup>®</sup> or PBA Monarch<sup>®</sup>. 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 kabulis such as Almaz<sup>®</sup>, PBA Monarch<sup>®</sup> and Genesis™ Kalkee. Released 2005. Seed available from PB Seeds. EPR \$5.00.

**GENESIS™ KALKEE**

Ascochyta blight (foliar) MS and ascochyta blight (pod) S, will require strategic fungicide applications (3-4 sprays) throughout the growing season. Treat seed with a Thiram-based fungicide to prevent seed transmission of ascochyta on to the emerging seedlings. Genesis™ Kalkee has late flowering and maturity with seed size larger than PBA Monarch<sup>®</sup> and Almaz<sup>®</sup> (predominantly 9mm) with an erect plant habit. Released 2012. Seed available from PB Seeds. EPR \$5.00.

**PBA MONARCH<sup>®</sup>**

Ascochyta blight S, will require regular strategic application of fungicides (every 2-3 weeks) throughout the growing season. Treat seed with a Thiram-based fungicide to prevent seed transmission of ascochyta on to the emerging seedlings. Particularly suited to shorter season medium rainfall environments due to improved adaptation through earlier flowering and maturity compared to Genesis™ 090, Almaz<sup>®</sup> and Genesis™ Kalkee. Medium seed size (8-9mm) is larger than Genesis™ 090 and similar to Almaz<sup>®</sup>. Highest yielding medium sized kabuli. A semi-spreading plant similar to PBA Slasher<sup>®</sup> with some susceptibility to lodging particularly when biomass is high. Released 2013. Seed available from Seednet. EPR \$6.50.

**TABLE 1 Chickpea time of sowing guide.**

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

MALLEE	April				May				June				July			
Desi: PBA Maiden <sup>®</sup> , PBA Slasher <sup>®</sup> , PBA Striker <sup>®</sup>																
Kabuli: Genesis™ 090, PBA Monarch <sup>®</sup>																
WIMMERA	April				May				June				July			
Desi: PBA Maiden <sup>®</sup> , PBA Slasher <sup>®</sup> , PBA Striker <sup>®</sup>																
Kabuli: Genesis™ 090																
Kabuli: Almaz <sup>®</sup> , Genesis™ Kalkee, PBA Monarch <sup>®</sup>																
NORTH CENTRAL	April				May				June				July			
Desi: PBA Maiden <sup>®</sup> , PBA Slasher <sup>®</sup> , PBA Striker <sup>®</sup>																
Kabuli: Genesis™ 090, PBA Monarch <sup>®</sup>																

Yellow = earlier than ideal.

Green = optimum sowing time.

Red = later than ideal.

**TABLE 2 Chickpea variety agronomic guide.**

The agronomic characteristics in this table are provided as a guide only and have been compiled from observations of the breeder, National Variety Trials, agronomic research projects and seed companies.

Variety	Ave 100 seed weight (g)	Seed size group	Vigour	Flowering	Maturity	Height	Lodging resistance
<b>DESI</b>							
PBA Maiden <sup>db</sup>	24	med-large	mod	mid	mid	short-mid	MS
PBA Slasher <sup>db</sup>	18	medium	poor-mod	mid	mid	short-mid	MS
PBA Striker <sup>db</sup>	22	medium	good	early	early	short-mid	MS
<b>KABULI</b>							
Almaz <sup>db</sup>	38	medium	mod	mid-late	late	mid-tall	MR
Genesis™ 090	31	small	good	mid	mid-late	mid	MR
Genesis™ Kalkee	45	large	good	late	late	tall	R
PBA Monarch <sup>db</sup>	40	medium	poor-mod	early	early	mid	S
PBA Royal CICA1156	36	medium	mod	mid	mid	mid	MR

SOURCES: NATIONAL PULSE DISEASE GUIDE (2019); SOUTHERN PULSE AGRONOMY WIMMERA FIELD DAY GUIDE (2018)

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

R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible.

**TABLE 3 Disease resistance characteristics of chickpea varieties.**

All chickpea varieties are rated as S or MS to foliar ascochyta blight infection. Chickpea crops will require multiple fungicide applications to control ascochyta blight in most seasons. Varieties should be sprayed with fungicide prior to rain events to protect new growth as per label directions. Susceptible varieties may need regular fungicide applications throughout the growing season, with application frequency dependent on fungicide active. All varieties are susceptible to pod infection and will require protection during podding to prevent seed staining and abortion.

Variety	Botrytis grey mould	Ascochyta blight foliage/stem	Ascochyta blight pod	Phytophthora root rot	Root lesion nematode ( <i>Pratylenchus</i> )	
					<i>P. thornei</i>	<i>P. neglectus</i>
DESI						
PBA Maiden <sup>db</sup>	S	S	S	VS	MRMS	MRMS
PBA Slasher <sup>db</sup>	S	S	S	VS	MRMS	MRMS
PBA Striker <sup>db</sup>	S	S	S	VS	-	MRMS
KABULI						
Almaz <sup>db</sup>	S	MS	S	VS	VS	MRMS
Genesis™ 090	S	MS	S	VS	MS	MRMS
Genesis™ Kalkee	S	MS	S	VS	MS	MRMS
PBA Monarch <sup>db</sup>	S	S	S	VS	MSS	MRMS
PBA Royal CICA1156	S	MS	S	-	-	-

SOURCES: NATIONAL PULSE DISEASE RATINGS (2019); SOUTHERN PULSE AGRONOMY WIMMERA FIELD DAY GUIDE (2018)

Note: subject to change with additional data.

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

p = provisional ratings – treat with caution. 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, VS = very susceptible.

No variety with a R resistance rating is immune to disease and a fungicide application may be required under severe disease pressure.

TABLE 4 Chickpea diseases guide summary.

Disease	Organism	Symptoms	Occurrence	Host	Control
FUNGAL DISEASES					
Ascochyta blight	<i>Phoma rabiei</i> (formerly known as <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 spp.</i>	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> , <i>P. 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.
TuYV (previously BWYV)	Turnip yellows virus (previously Beet western yellows virus)	Yellowing, stunting, offshoots. 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.	Very wide host range, including most pulses, brassicas and weeds.	Managing aphids and weeds, resistant varieties.



**TABLE 5 Mallee NVT long-term predicted chickpea yield expressed as a percentage of mean yield.**

MALLEE						
DESI CHICKPEA						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		0.71	0.35	1.51	1.8	0.59
	No. trials	4	2	2	3	3
Genesis™ 090	12	106	117	112	105	108
PBA HatTrick <sup>db</sup>	3	93	87	-	95	-
PBA Maiden <sup>db</sup>	14	105	104	109	101	98
PBA Slasher <sup>db</sup>	14	104	107	112	104	102
PBA Striker <sup>db</sup>	14	115	123	116	101	105
KABULI CHICKPEA						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		0.72	0.4	1.51	1.55	0.52
	No. trials	3	1	2	2	2
Almaz <sup>db</sup>	10	78	68	114	100	83
Genesis™ 090	10	104	113	112	107	107
Genesis™ Kalkee	10	96	90	86	96	101
PBA Monarch <sup>db</sup>	10	116	126	114	97	101

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

**TABLE 6 Wimmera NVT long-term predicted chickpea yield expressed as a percentage of mean yield.**

WIMMERA						
DESI CHICKPEA						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		0.81	0.56	1.94	2.01	1.48
	No. trials	3	1	2	1	2
Genesis™ 090	7	106	115	118	117	-
PBA Maiden <sup>db</sup>	9	99	99	96	83	99
PBA Slasher <sup>db</sup>	9	103	105	115	110	105
PBA Striker <sup>db</sup>	9	101	115	87	70	99
KABULI CHICKPEA						
Year		2014	2015	2016	2017	2018
Mean yield (t/ha)		1.04	0.56	1.94	2.01	1.48
	No. trials	2	1	2	1	2
Almaz <sup>db</sup>	8	86	73	117	115	103
Genesis™ 090	8	104	115	118	117	106
Genesis™ 425	4	94	94	100	101	-
Genesis™ Kalkee	8	99	97	91	100	97
PBA Monarch <sup>db</sup>	8	97	112	75	57	95

SOURCE: NATIONAL VARIETY TRIALS (2014–2018)

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 Janine Sounness              PB Seeds

# VETCH

Vetch is a multi-purpose crop grown mostly as a disease break crop, in rotation with cereals. It grows in a wide range of soil types from light sands to heavier clay soils. The versatility of common vetch varieties (Languedoc, Blanchefleur, Morava<sup>®</sup>, Rasina<sup>®</sup>, Volga<sup>®</sup> and Timok<sup>®</sup>) allows cropping for grain or hay production, early grazing as green pasture or for dry grazing or green manure.

Grain vetches are grown in lower to mid-rainfall cereal areas of southern Australia and their grain yields are similar to pea yields in these areas. Note that vetch grain is not used for human consumption.

Grain from Morava<sup>®</sup>, Rasina<sup>®</sup>, Volga<sup>®</sup> and Timok<sup>®</sup> can be used without limit to feed all ruminants and as up to 20% in the diet of pigs. These four varieties possess less toxin in grain (<0.65%) compared with Blanchefleur (0.95%) and Languedoc (1.65%).

Forage vetches are used for hay, green manure or mid to late winter feed for grazing. There are purple vetch (*Vicia benghalensis*) variety Popany, or woolly pod vetches (*V. villosa* ssp. – varieties Namoi, Capello<sup>®</sup>, Haymaker Plus<sup>®</sup> and RM4<sup>®</sup>). Forage vetches can grow successfully in areas of 400 to 650mm of annual rainfall. Grain from woolly pod vetch varieties cannot be used to feed any livestock.

Vetch is valued for its benefits to subsequent cereal and oilseed crops in the rotation. These benefits are usually greater than from other pulses, particularly in lower rainfall areas. On sandy soils vetches provide better soil protection than peas and provide better stubble retention in the soil.

## NEW VARIETIES

There are no new vetch varieties for sowing in 2020.

## INOCULATION

Inoculation (Group E) is generally recommended. It is especially important on acidic soils prone to waterlogging and poorly structured soils with low organic matter where survival of rhizobia is poor. For further information refer to Vetch Southern Region – GRDC GrowNotes™.

## KEY DISEASE CONSIDERATIONS

Morava<sup>®</sup>, Rasina<sup>®</sup>, Volga<sup>®</sup> and Timok<sup>®</sup> are resistant to rust and are the preferred varieties for grain in areas prone to rust infections. Disease management is critical when growing a vetch crop, regardless of the end use. Where possible disease-resistant varieties should be planted as a preference.

Ascochyta blight occurs in earlier stages of the vetch crop and can reduce grain and dry matter production, but not to the extent of a heavy infestation of botrytis grey mould (BGM) in cool/wet growing seasons with high amounts of vegetative growth. There is little difference between vetch varieties in their resistance to BGM; varieties like Morava<sup>®</sup>, which produce greater levels of vegetative growth and denser canopies, will be more prone to this disease in higher rainfall areas.

## MORE INFORMATION

[agriculture.vic.gov.au/agriculture/grains-and-other-crops/crop-production](http://agriculture.vic.gov.au/agriculture/grains-and-other-crops/crop-production)

■ Agriculture Victoria Pulse Disease Guide

[communities.grdc.com.au](http://communities.grdc.com.au)

■ Expert support on crop nutrition and field crop diseases at your fingertips.

### GRDC Resources

■ Vetch Southern Region – GRDC GrowNotes™

## VARIETY DESCRIPTIONS

(b) Denotes that Plant Breeder Rights apply

There are no vetch varieties with EPR.

## COMMON VETCH (*VICIA SATIVA*)

### LANGUEDOC

Languedoc is an early flowering and maturing variety recommended for low rainfall areas although it can lodge severely making harvest difficult under certain conditions. Languedoc generally exceeds Blanchefleur's grain yield in areas with less than 350mm rainfall. Its hard seed content is generally around 5-10%. Highly susceptible to rust. Languedoc grains possess 1.0-1.6% of anti-nutritional level (BCN).

### BLANCHEFLEUR

Prior to the release of Morava<sup>®</sup>, Blanchefleur had been the preferred grain variety in areas above 350mm rainfall in SA. Blanchefleur has mid-maturity, white flowers and reddish brown/mottled seed with orange cotyledons. Very susceptible to rust. Blanchefleur is well suited to medium to high rainfall areas where rust is not a regular problem. Both vetch and lentils are on the prescribed grain list of AQIS due to the vetch-lentil substitution issue. This has meant export markets of orange cotyledon varieties like Blanchefleur are limited to small bird seed markets in Europe, and seed for grazing and green manure crops only. Blanchefleur grains possess 0.9-1.6% of anti-nutritional level (BCN).

### MORAVA<sup>®</sup>

Morava is a rust resistant late flowering vetch variety with 100% soft seeds. Grain yield is superior to other vetches in the high rainfall areas and to Blanchefleur and Languedoc in all other areas in the presence of rust. It is larger seeded and more resistant to shattering than other vetch varieties. The anti-nutritional level (BCN) of Morava is 0.65%, which is 50% lower than Blanchefleur and Languedoc. Morava<sup>®</sup> produces higher herbage yields than all other common vetch varieties. Morava<sup>®</sup> is later flowering and maturing than Blanchefleur and grain yield will be reduced in environments with dry finishes. Susceptible to ascochyta blight and BGM VS. Morava<sup>®</sup> produces very high biomass in wet/cool zones. Available from Heritage Seeds.

### RASINA<sup>®</sup>

Rasina is a soft seeded vetch and replaces Languedoc and Blanchefleur in low to medium rainfall areas for grain production. Rasina<sup>®</sup> is 5-10 days earlier than Blanchefleur and 10-15 days earlier than Morava<sup>®</sup>. A significant advantage over Languedoc and Blanchefleur is Rasina<sup>®</sup>'s resistance to rust. Moderately susceptible to ascochyta blight and BGM S. However, Rasina<sup>®</sup> is not expected to replace Morava<sup>®</sup> in higher rainfall districts or for hay production. The level of anti-nutritional factors is 0.6-0.8% compared to 0.9-1.6% in Blanchefleur and Languedoc, respectively. Rasina<sup>®</sup> possesses a distinctive uniform, dark brown speckled seed coat with dark beige cotyledons. Available from Heritage Seeds.

### VOLGA<sup>®</sup>

Volga<sup>®</sup> is a high yielding grain/seed variety for low and mid-rainfall areas. It is particularly suited to shorter season areas where the growing season finishes sharply. Volga<sup>®</sup> has good initial establishment, is rust resistant, and earlier flowering and maturing than Blanchefleur and Rasina<sup>®</sup>. It will improve the reliability of vetch and economic production in crop rotations, especially in low and mid-rainfall areas, 330-380mm per year. Earlier maturing equates to earlier nodule development. Volga<sup>®</sup> has high grain and herbage yields and is well adapted to all areas where vetch is currently grown. Volga<sup>®</sup> is well suited to situations where the season finishes sharply (dry September and October, a common issue in many low to mid-rainfall areas) because of its early flowering and maturing characteristics. It can be successfully grown in many Australian soil types, from non-wetting sand to heavy clay loam with pH 5.8–9.4, like other common vetch varieties. Volga is moderately susceptible to ascochyta blight. The early maturity of Volga<sup>®</sup> may limit yield potential relative to longer growing season varieties like Morava<sup>®</sup> in high rainfall areas. Toxin levels in the grain are around 0.54% lower compared to Morava<sup>®</sup> at 0.65% and Blanchefleur 0.95%. Volga<sup>®</sup> seed size is very similar to Morava<sup>®</sup> seeds (100 seeds weight 7.82g). Available from Heritage Seeds.

**TIMOK<sup>®</sup>**

Timok<sup>®</sup> was bred to complement Morava<sup>®</sup> in mid/high rainfall areas for grain/seed and especially for hay/silage production. Timok<sup>®</sup> yielded more grain than Rasina<sup>®</sup>, Morava<sup>®</sup> and Blanchefleur by 9%, 18% and 21%, respectively over five years at five sites and a range of rainfalls in South Australia. Timok<sup>®</sup> has better initial establishment than Morava<sup>®</sup>, and will improve the reliability of vetch and economic production in crop rotations especially in mid and high rainfall areas, 350-450mm/yr. Morava<sup>®</sup> will still be the preferable variety for hay/silage in rainfall areas with greater than 450mm per year. Timok<sup>®</sup> is a high yielding common vetch variety, rust R, ascochyta blight MS, BGM S, has good early establishment, and is a soft seeded variety. Timok<sup>®</sup> matures between Rasina<sup>®</sup> and Morava<sup>®</sup> (100-105 days from seeding to full flowering). Timok<sup>®</sup> is very well adapted for grain production in rainfall areas >380mm/yr, and dry matter production is similar to Morava<sup>®</sup> in high rainfall regions (>400mm), but 19% higher than Morava<sup>®</sup> in low to medium rainfall regions (330-380mm). Timok<sup>®</sup> is a multipurpose variety – can be used for grain, hay/silage, grazing or green/brown manure. Toxin levels in the grain are around 0.57%. Seed weight is 6.88g per 100 seeds, similar size to Rasina<sup>®</sup> 6.92g/100seeds. Herbicide tolerance: no differences between these varieties to registered herbicides to control broad leaf weeds. Also, no differences between varieties to registered herbicides for grass weed control. Available from Pasture Genetics.

**PURPLE VETCH (*VICIA BENGHALENSIS*)****POPANY**

Popany (*V. benghalensis*) is a purple vetch. Grain yield is significantly lower than yields from common vetch varieties, but seeds are smaller than seeds from common vetch varieties therefore the seeding rate are lower at approximately 30-35kg/ha. Grain from this variety can be used as a bird feed in mix with other recommended grains. Popany is a late maturity variety, >125 days from seeding to podding. It is a good variety in mid to high rainfall areas for hay/silage. Popany possesses 5-10% hard seeds. Resistant to rust, ascochyta blight S and BGM VS. Seed coat is black with distinctive white hilum. Popany has the best tolerance of all vetches to waterlogging. Flumetsulam herbicides can be used to control some broad leaf weeds in Popany. All herbicides registered for use on crops must be used according to the label.

**WOOLLY POD VETCHES (*VICIA VILLOSA*)****CAPELLO<sup>®</sup> AND HAYMAKER<sup>®</sup>**

Capello<sup>®</sup> and Haymaker<sup>®</sup> (*Vicia villosa* ssp.) are woolly pod vetches, which are lower in grain yield compared with common vetches but are much higher in dry matter production than common vetch varieties in rainfall areas >450mm/yr. Grain from these varieties cannot be used to feed any livestock. These varieties can only be grazed from the 10-node stage to podding stage. It is not recommended that grazing occur earlier and also once plants begin to develop seeds in pods. These two varieties are very good for hay/silage production in areas >400mm of rainfall annually. Haymaker<sup>®</sup> and Capello<sup>®</sup> are selected soft seed varieties from Namoi. In last few years these two varieties have become prone to hard/dormant seeds. Both varieties are owned and available through Heritage Seeds.

**RM4<sup>®</sup>**

RM4<sup>®</sup> (*Vicia villosa* ssp.) is a high producer of dry matter, has good early establishment. Moderately resistant to ascochyta blight and BGM VS. It is considered a soft seed variety, with >94% emergence in 15-20 days in soil, although the small percentage that do not emerge may be dormant. RM4<sup>®</sup> is earlier in maturity than Haymaker<sup>®</sup> or Capello<sup>®</sup> by 10-15 days. Significantly higher in dry matter production in mid/low rainfall areas (<380mm/yr) than Haymaker<sup>®</sup> or Capello<sup>®</sup>. Also, this variety is suitable for higher rainfall areas >400-650mm/yr. RM4<sup>®</sup> is a multipurpose variety- that can be used for hay/silage, grazing, green/brown manure or for seeds. RM4<sup>®</sup> can be successfully grown, like other woolly pod varieties, in many Australian soil types. Like other vetches it is excellent for soil fertility/structure and nitrogen fixation. Graze from 10 nodes up to finish flowering. For hay/silage, cut in full flowering for the best balance of feed value. RM4<sup>®</sup> performs better in grain production than other woolly pod varieties when the season finishes sharply. RM4<sup>®</sup> was not sensitive to any herbicides recommended/registered for use in woolly pod vetch varieties. RM4<sup>®</sup> is susceptible in early growth stages to redlegged earth mite and lucerne flea, like other woolly pod vetch varieties. Also, RM4<sup>®</sup> is susceptible to blue green and cowpea aphids from early growth through to pod maturity, as well as to native budworm during pod formation and filling.

**TABLE 1 Vetch grain variety rainfall zones (mm).**

<350	350-400	400-450	450-600	>600
Volga <sup>db</sup>	Rasina <sup>db</sup>	Rasina <sup>db</sup>	Morava <sup>db</sup>	Timok <sup>db</sup>
Timok <sup>db</sup>	Blanchefleur	Blanchefleur	Rasina <sup>db</sup>	Morava <sup>db</sup>
Rasina <sup>db</sup>	Morava <sup>db</sup>	Morava <sup>db</sup>	Timok <sup>db</sup>	
	Volga <sup>db</sup>	Volga <sup>db</sup>		
	Timok <sup>db</sup>	Timok <sup>db</sup>		

**TABLE 2 Vetch hay/silage/grazing and green manuring variety selection rainfall zones (mm).**

<350	350-400	400-450	450-600	>600
Rasina <sup>db</sup>	Rasina <sup>db</sup>	Capello <sup>db</sup>	RM4 <sup>db</sup>	Timok <sup>db</sup>
Blanchefleur	Blanchefleur	Morava <sup>db</sup>	Timok <sup>db</sup>	Morava <sup>db</sup>
Morava <sup>db</sup>	Morava <sup>db</sup>	Volga <sup>db</sup>	Morava <sup>db</sup>	Capello <sup>db</sup>
Volga <sup>db</sup>	Volga <sup>db</sup>	Timok <sup>db</sup>	Popany	Haymaker <sup>db</sup>
Timok <sup>db</sup>	Timok <sup>db</sup>	RM4 <sup>db</sup>	Capello <sup>db</sup>	Popany
RM4 <sup>db</sup>	RM4 <sup>db</sup>	Popany	Haymaker <sup>db</sup>	RM4 <sup>db</sup>
	Popany	Haymaker <sup>db</sup>		

**TABLE 3 Agronomic characteristics of vetch varieties.**

Variety	Maturity	Yield potential	Dry matter	Flower colour	% of pod shattering	% of hard seeds	Rust	Ascochyta blight	Botrytis grey mould
<b>COMMON VETCH VARIETIES</b>									
Blanchefleur	mid	high	mod	white	5-10	5-10	VS	MS	S
Morava <sup>db</sup>	late	high	high	purple	0	0	R	S	VS
Rasina <sup>db</sup>	early-mid	high	mod	purple	0-2	0	R	MS	S
Volga <sup>db</sup>	early	very high	high	purple	0-2	2-5	R	MS	S
Timok <sup>db</sup>	mid	high	very high	purple	0-2	0-2	R	MS	S
<b>PURPLE VETCH VARIETIES</b>									
Popany	very late	low	high	purple	20-30	5-10	R	S	VS
<b>WOOLY POD VETCH VARIETIES</b>									
Haymaker <sup>db</sup>	late	low	very high	purple	5-10	20-30	R	S	VS
Capello <sup>db</sup>	late	low	very high	purple	5-10	15-20	R	S	VS
RM4 <sup>db</sup>	mid	mod	very high	purple	2-5	2-5	R	MR	VS

SOURCE: SOUTH AUSTRALIAN CROP SOWING GUIDE (2019)

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

p = provisional ratings – treat with caution. R = resistant, RMR = resistant to moderately resistant, MR = moderately resistant, MRMS = moderately resistant to moderately susceptible, MS = moderately susceptible, S = susceptible, VS = very susceptible.

No variety with a R resistance rating is immune to disease and a fungicide application may be required under severe disease pressure.

**TABLE 4 2010–14 grain and dry matter yield for common vetch varieties.**

(5 sites*5years)				
Variety	Grain yield (t/ha)	% of Blanchefleur	Dry matter yield (t/ha)	% of Morava
Blanchefleur <sup>db</sup>	2.15	100	4.03 (2009-13)	80
Rasina <sup>db</sup>	2.37	110	4.70 (2009-13)	93
Morava <sup>db</sup>	2.16	100	5.06	100
Volga <sup>db</sup>	2.75	128	5.51	109
Timok <sup>db</sup>	2.48	115	5.26	104
Mean yield	2.38		4.91	

**TABLE 5 2010–14 grain and dry matter yield for woolly pod vetch varieties.**

Variety	Dry matter (t/ha)	% of Capello
Capello <sup>db</sup>	6.23	100
Haymaker <sup>db</sup>	6.26 (2009-12)	100.4
RM4 <sup>db</sup>	6.71	107.7
Mean yield	6.4	
Purple vetch variety		
Popany	5.28 (2009-12)	84.75

**TABLE 6 Plant density and recommended seeding rates for vetch.**

End use	Common vetch varieties		Woolly pod vetch varieties		Purple vetch variety	
	Plant density (plants per sq.m.)	Sowing rate (kg/ha)	Plant density (plants per sq.m.)	Sowing rate (kg/ha)	Plant density (plants per sq.m.)	Sowing rate (kg/ha)
Grain	40-60	40-50	40-50	25-40	40-50	25-40
Hay/silage	50-70	50-60	50-60	30-45	50-60	30-45
Grazing	50-70	50-60	50-60	30-45	50-60	30-45
Green manure	60-70	55-65	60-70	45-50	50-60	30-45

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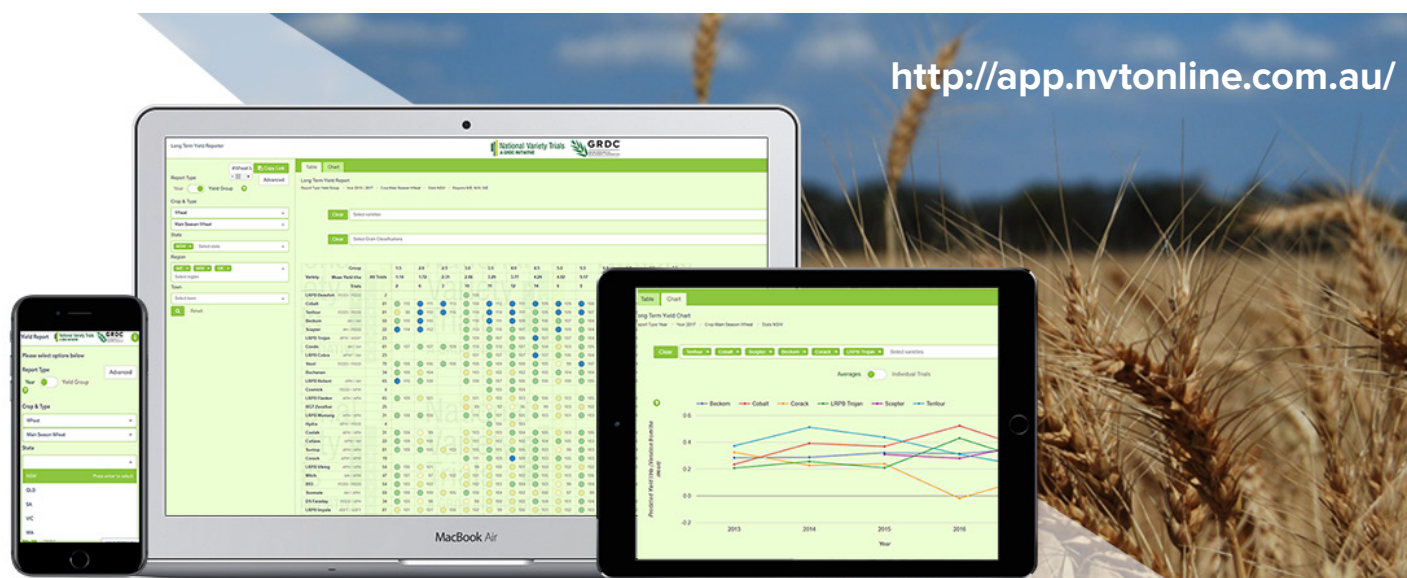


# NVTtools

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