# 2022 QUEENSLAND WINTER CROP SOWING GUIDE



QUEENSLAND OCTOBER 2021



# ARE YOU GROWING THE BEST VARIETY FOR YOUR SITUATION?

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# **TABLE OF CONTENTS**



This guide can be downloaded to your computer or tablet at: https://grdc.com.au/queensland-winter-crop-sowing-guide Remember to download a new one each November.

INTRODUCTION	4
WHEAT	9
BARLEY	19
CHICKPEA	25
NOTES	30



# INTRODUCTION

# INTRODUCTION

The 2022 Queensland Winter Crop Sowing Guide contains the latest information for wheat, barley and chickpea varieties. This guide draws on the advice, knowledge and experience of many people in the cropping industry. Its aim is to provide growers with relevant information that will allow them to make informed choices when deciding on what varieties of wheat, barley or chickpea to sow in their paddocks.

The guide covers released varieties that have undergone paddock evaluation in Queensland. Only varieties deemed suitable for conditions experienced in Queensland have been included. If a variety is not mentioned, there is either no commercial seed available or there is concern it may not carry robust disease resistance and may compromise the industry. However, if seed of varieties not mentioned in this guide is obtained, please ensure you are provided with current and reliable information by the vendor.

Three new varieties have been released in 2021 for growers to consider: one wheat from LongReach Plant Breeders named LongReach Raider<sup>()</sup>, one durum wheat from Durum Breeders Australia named DBA Mataroi<sup>()</sup>, and one barley from Australian Grain Technologies named Yeti<sup>()</sup>.

National Variety Trials (NVT) seek to collect the most relevant varieties for each region and test them alongside the elite lines from the breeding programs. For all the information on the released wheat, barley and chickpea varieties in the NVT trials conducted in Queensland, visit the website https://nvt.grdc.com.au.

Conducted to a set of predetermined protocols, trials are sown and managed to reflect local best practice such as sowing time, fertiliser application, weed management, pest/disease control and fungicide application. The trials are not designed to grow varieties to their maximum yield potential. GRDC acknowledges that an ongoing project of this type would not be possible without the cooperation of growers prepared to contribute sites and who often assist with the management of trials on their property.

## INTERPRETING LONG-TERM YIELD DATA

A factor analytic (FA) mixed model approach is used in the multi-environment trial (MET) analysis conducted by GRDC, supported by the Statistics for the Australian Grains Industry (SAGI) program. This approach generates long-term MET values for varieties at an individual trial level.

This format provides more detailed data to better understand a variety's performance over several years at the individual trial/environment level, rather than just a single averaged value.

In this 2022 Queensland Winter Crop Sowing Guide, results are presented for yield and quality in year groupings as designated. Further detailed interrogation of the NVT Online dataset using the NVT Long Term Yield Reporting Tool will provide more specific performance data on all varieties of each crop species in each NVT location.

# **END POINT ROYALTIES**

End point royalties (EPRs) are an essential income source for Australia's breeding programs. The collection of these royalties is evolving and now there are two main systems:

- automatic deduction of EPRs by grain traders buying from a grower; or
- royalty managers directly invoicing growers for EPRs.

More information: GRDC End Point Royalties Fact Sheet, www.grdc.com.au/GRDC-FS-EndPointRoyalty



# PLANT BREEDER'S RIGHTS

The *Plant Breeder's Rights Act 1994* gives variety owners the exclusive right to sell their varieties, including the right to collect royalties for commercial use. Plant Breeder's Rights (PBR) is a type of intellectual property right/set of rights. It is a protection that allows the breeder/owner of the variety to place restrictions on what growers and others can do with it.

Throughout this guide, varieties protected under PBR legislation are signified by the symbol <sup>(b)</sup>. Plant Breeder's Rights are exclusive commercial rights to a registered variety. In relation to propagating material of the registered variety, the breeder has exclusive rights to:

- produce or reproduce the material;
- condition the material for the purpose of propagation (conditioning includes cleaning, coating, sorting, packaging and grading);
- offer the material for sale;
- sell the material;
- import the material;
- export the material; and
- stock the material for any of the purposes described in the previous dot points.

In most instances the breeder will license these rights to a selected seed company (the licensee). Exceptions to PBR are the rights of growers to save seed for sowing future commercial crops. However, harvested material derived from farm-saved seed will be subject to the EPR applying to that variety. Where EPRs apply, growers will be required to enter arrangements with the breeder or licensee whereby royalties are paid on delivery of the grain. Some varieties may have a Seed Royalty (SR) paid on purchase of seed rather than an EPR. Royalties collected are used to support ongoing research and the breeding of new and improved varieties.

# **INTRICACIES OF SEED SHARING™**

Seed Sharing<sup>™</sup> (was first introduced as AGT Seed Sharing<sup>™</sup> and has become a generic term used by growers) provides a way to explore the potential that a new variety may offer to your overall farming system. Despite becoming more popular recently there are key features to be aware of.

 Breeding companies may have slightly different restrictions on seed sharing, so it is important to read the licensing agreement for each variety.

- Clearfield<sup>®</sup> varieties are not able to be purchased through a seed sharing arrangement.
- Seed Sharing<sup>™</sup> is an agreement between a licensed grower of a variety and another grower that has agreed to use the seed for the sole purpose of producing another generation of that variety.
- End point royalties are not required to be paid on any seed that is sold through a Seed Sharing<sup>™</sup> agreement. Since another generation is being created it is not an end point, as it would be if it were going to a feedlot, a domestic mill or for export.
- Retail agronomy businesses can facilitate a seed sharing transaction between two farming businesses but cannot enter into one. The restricting clause identifies that the purchasing party agrees to be liable for the EPRs that are due following the harvest of the subsequent crop.

# **CEREAL DISEASES**

Cereal diseases pose a constant, significant threat to the Australian grains industry. In the past, entire crops have been wiped out in Queensland and across Australia. Growers and the wider industry have been beneficiaries of the combined efforts of breeders and work conducted by the Plant Breeding Institute, University of Sydney, situated in Cobbitty, New South Wales, over the past 100 years.

In any given year there are numerous pathotypes (sometimes referred to as races or strains) of the different diseases that attack our crop varieties. Surveys of the rust populations have been carried out each year since 1921 by the Plant Breeding Institute. This information is crucial in assessing current makeup and levels of the rusts and thereby pre-empting the potential threats to the industry.

The Plant Breeding Institute rates the rust responses of thousands of potential new cereal varieties each year, undertakes innovative genetic investigations to find new sources of rust resistance and crossing for breeding companies, as well as training students in plant breeding and pathology.

The best protection for varieties is to have genetic resistance to the diseases present in the production environment. Protection is afforded by resistance in the plant host to the invading pathogen. The rating to the three rusts that appear in Table 1 are based on the most prevalent pathotype identified by the surveys conducted by the Plant Breeding Institute in the years prior to publishing the guide.



#### INTRODUCTION

Over time, a variety's rating to a particular rust disease may change. This is due to random changes that occur within the makeup of the pathogen, which enable it to overcome the genetic resistance of a variety. This is not due to any changes in the variety itself.

In this guide the variety ratings for a specific disease relate to the most prevalent rust strain occurring in Queensland at the time of printing. For example, the ratings for stripe rust refer to 2021 east coast resistance, which in the case of stripe rust is specifically for the dominant stripe rust strain 198 E16 A+ J+ T+ 17+. This strain was first detected in Australia in 2018 and originated from either Europe or South America.

Detecting the origin of such exotic incursions is another example of the critical work undertaken by the Plant Breeding Institute. The response of some of these varieties may differ should another pathotype of stripe rust build up and become common. More specific information is available in reports that can be downloaded on the Plant Breeding Institute Rust Laboratory website (https://www.sydney.edu.au/science/our-research/ research-areas/life-and-environmental-sciences/ cereal-rust-research.html; Cereal Rust Report Volume 17 Issue 3).

Growers should monitor all crops for rust. Any suspicious lesions should be collected, the sample kept dry and wrapped in paper, not plastic.

#### Post rust samples to:

University of Sydney Australian Rust Survey Reply Paid 88076 Narellan NSW 2567

# Reply-paid sample envelopes can be obtained by contacting:

Jo-Ann Geist ACRCP Research Hub Coordinator The University of Sydney Faculty of Science, School of Life and Environmental Sciences Plant Breeding Institute 107 Cobbitty Road Cobbitty NSW 2570

Phone: +61 2 9351 8864 Email: jo-ann.geist@sydney.edu.au

## For pulse disease sample testing contact:

Lisa Kelly, Queensland Department of Agriculture and Fisheries, for sample dispatch details.

Phone: +61 477 747 040 Email: <u>lisa.kelly@daf.qld.gov.au</u>

## For cereal disease sample testing contact:

Lisle Snyman, Queensland Department of Agriculture and Fisheries, for sample dispatch details.

Phone: +61 428 324 932 Email: <u>lisle.snyman@daf.qld.gov.au</u>

The disease ratings in this report are current at the time of publication. Regularly visit <u>https://nvt.grdc.</u> <u>com.au/nvt-disease-ratings</u> to find the latest NVT disease ratings.

# TIMING IS ESSENTIAL FOR SUCCESS

Growers face many decisions before sowing. Getting each decision correct is important and will ultimately affect final grain yield and farm profitability. Put simply, know your paddock, know your varieties and get your timing right. Concentrate on the aspects of your farming operation that you can control and try not to worry about the rest.

Relevant information on individual wheat, barley and chickpea varieties is summarised in this guide. The information is a collation of data from the NVT program conducted across the region. The guide benchmarks the yield performance of regionally important varieties together with individual disease and agronomic ratings.

Timing of each element associated with grain production is critical and can be the difference between success and failure.

Crucial elements include:

- Selecting a crop and then a variety that will fit in with your paddock rotation plan.
- 2) Knowing as much as possible about each individual paddock. This includes the overall nutritional status, different disease inoculum loads and weeds, both current and those possibly in the seedbank. However, it does require a steely resolve to stick to a farm rotation plan in the face of varying commodity prices.
- 3) Do not second-guess any aspect. If in doubt, get the relevant tests done. Variety selection is part of the overall plan and decisions need to be made not just for the current season but long term. Soil tests should be taken well before sowing to estimate nutrient levels. They are extremely beneficial when used in conjunction with existing records of grain production and grain protein to determine a nutritional program for the crop.



Growers need to ensure their preferred variety for sowing is good quality, taking into account purity, germination and vigour. This is particularly relevant for growers looking to use retained seed. Aim for an even establishment across the paddock, more than simply trying to achieve a given sowing rate. Aim for an even established plant density of between 100 to 200 plants/m<sup>2</sup> for wheat and barley and 20 to 30 plants/m<sup>2</sup> for chickpeas, rather than just relying on a set planting rate based on kilograms per hectare. Ensure there is good seed-to-soil contact by sowing into moisture and firming with the use of press wheels.

Another important consideration for growers is to ensure the variety selected has the correct maturity to correspond with planting time to minimise the risk of crop damage from both frost and heat.

Be mindful of a variety's coleoptile length. Varieties' coleoptile length is shorter in central Queensland due to the higher temperatures usually experienced around sowing. Chickpeas can tolerate a greater sowing depth if chasing moisture.

# AN INDUSTRY GUIDE FOR WHEAT VARIETY MATURITY DESCRIPTION

The wheat breeding members of Australian Crop Breeders (ACB) have worked together to develop a consistent approach to describing wheat variety maturity. It is their intent to use this system on company fact sheets and they encourage the rest of the industry to adopt this system in their publications to provide growers with consistency and transparency. It is hoped to develop a similar approach for the other crops that are represented by Australian Crop Breeders.

The purpose of this wheat variety maturity description (Appendix 1, page 8) is to provide growers, agronomists, extension officers, plant breeders and others with a consistent approach to wheat variety maturity (relative heading date) description. As a core component of adaptability and variety management, it is important that the industry has access to a clear and sufficiently detailed method of describing relative maturity in Australia's field crops.

For further information or to discuss Appendix 1, contact ACB at <u>enquiries@australiancropbreeders.</u> <u>com.au</u> or Haydn Kuchel (0428 817 402), who is the chair of the NVT subcommittee of ACB.

# DISEASE RATING COLOUR RANGE

R	RMR	MR	MRMS	MS	MSS	S	SVS	VS
---	-----	----	------	----	-----	---	-----	----

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.

# COLOUR GRADIENT LEGEND: MEAN VARIETY YIELD PERFORMANCE

#### LOW

Long-term mean yield illustrated by colour gradient from lowest (red) to highest (green), comparable on an annual basis.



HIGH

BARLEY

**CHICKPEA** 

NOTES

# **APPENDIX 1. WHEAT VARIETY MATURITY DESCRIPTION**

Northern region		
Maturity* description	Quick wheat boundary	Slow wheat boundary
Very quick spring	N/A	-
Very quick – quick spring	-	-
Quick spring	-	LongReach Mustang $^{\rm (b)}$
Quick – mid spring	LongReach Mustang $^{\circ}$	Suntop <sup>®</sup>
Mid spring	Suntop	LongReach Reliant $^{(\!\!\!\!\!\!\!\!\!\!\!\!\!)}$
Mid – slow spring	LongReach Reliant®	EGA Gregory®
Slow spring	EGA Gregory <sup>®</sup>	Sunzell
Slow – Very slow spring	Sunzell	Sunmax <sup>®</sup>
Very slow spring	Sunmax <sup>®</sup>	N/A

\*Maturity is defined as the time taken from seedling emergence until 50 per cent of tillers have heads that are 50 per cent visible (GS55) above the flag leaf auricle. Source: Australian Crop Breeders Ltd



# WHEAT

# **KEY POINTS**

# Newly released varieties available for sowing

- LongReach Raider<sup>(b)</sup>, a slow spring-maturing APH bread wheat variety from LongReach Plant Breeders
- DBA Mataroi<sup>(b)</sup>, a quick-maturing durum wheat variety bred by the NSW DPI node of Durum Breeding Australia at the Tamworth Agricultural Institute

# Varieties planned for removal in August 2022

- Batavia
- LRPB Hornet
- Marombi<sup>⊕</sup>
- Sunvex<sup>(b)</sup>

Refer to www.wheatquality.com.au

# **DISEASE CHARACTERISTICS**

#### Yellow spot

Seedling disease alone rarely results in significant grain yield losses. For grain yield losses to occur a wet spring is needed for the disease to develop on adult plants and affect the top three leaves, which drive yield. Previous advice on spraying is still valid. Delay decisions on fungicide spraying for yellow spot control until plants are close to heading and most of the yield-determining leaves have emerged. Variety yellow spot ratings are shown in Table 1.

## False black chaff

This physiological disorder can readily occur in susceptible varieties. It causes brown/black, slight to extensive striations on the glume and, in extreme cases, along the tillers. It is associated with the stem rust resistance gene Sr2, which is common in Australian cultivars.

#### Crown rot

Crown rot survives for several seasons on decaying stubble from host cereal crops and from grass weeds in non-host crops. Infection of the stem bases of the young crop is high with a wet autumn/winter, but above-ground symptoms are normally only seen when the plant undergoes water stress at the end of the season. Variety crown rot ratings are shown in Table 1.

#### Stripe rust

Historically, the spread of stripe rust occurs in spring. With night-time temperatures increasing above 20°C the epidemic usually slows down from late October to early November in Queensland. A new pathotype, 198 E16 A+ J+ T+ 17+, poses an increased disease threat to several wheat varieties and growers should monitor their paddocks for any infestation. Send rust samples to University of Sydney, Australian Rust Survey, Reply Paid 88076, Narellan NSW 2567. Variety stripe rust ratings are shown in Table 1.

Reply-paid sample envelopes can be obtained by contacting:

Jo-Ann Geist ACRCP Research Hub Coordinator The University of Sydney Faculty of Science, School of Life and Environmental Sciences Plant Breeding Institute 107 Cobbitty Road Cobbitty NSW 2570

Phone: +61 2 9351 8864 Email: jo-ann.geist@sydney.edu.au

#### Leaf rust and stem rust

From seedling stage onwards, regular scouting of crops should be undertaken to determine if rust spores have infected plant leaves and are developing in crops. If the cultivar has less than an MR level of resistance, fungicide application should be considered. Variety ratings for leaf and stem rust are shown in Table 1.



NOTES

# Root lesion nematodes (RLN)

These nematodes are widespread in the northern grains region and can significantly reduce wheat yields. RLN is also hosted by many non-cereal crops so the absence of a winter cereal crop in recent seasons does not mean there are low levels of nematodes in the soil. A soil test should be considered before planting if you do not know the species or levels in your paddocks. If wheat is to be sown into nematode-infested soil, the tolerant varieties (listed as T, TMT or MT in Table 1) should be considered for best yield. Choose a variety that has a higher resistance rating to maximise yield and leave fewer nematodes in the soil to attack the next crop. The reaction of a wheat variety may differ to the two species of RLN, Pratylenchus thornei and Pratylenchus neglectus. This should be checked for individual varieties in Table 1.

#### Bunt

To avoid bunt, wheat seed should be treated with a fungicidal dressing if it has been saved from a crop grown from untreated seed.

#### **Black point**

Black point is a brown-black discolouration at the germ end of wheat and barley caryopsis. In wheat, the discolouration occurs in the outer pericarp and inner seed coat tissue. Black point is a physiological response to a certain set of environmental conditions such as heavy morning dews, rainfall and high humidity. Variety black point ratings are shown in Table 1.

#### **Russian wheat aphid**

Russian wheat aphid (RWA) was initially found in South Australia and Victoria in 2016 and has subsequently been found in NSW and Tasmania. Grain growers and agronomists across Queensland are urged to regularly monitor cereal paddocks for signs of Russian wheat aphid. GRDC continues to promote the FITE (find, identify, threshold approach and enact) strategy, which has been developed to provide growers and advisers with a simple guide to Russian wheat aphid management. It involves:

- **Find** look for aphids especially where leaf rolling is observed. The characteristic plant symptoms of infection include leaf streaking or leaf rolling on cereal crops and grasses.
- **Identify** positively identify RWA by consulting with an industry specialist.
- **Threshold approach** before deciding on your plan of attack consider thresholds for control, the presence of natural aphid enemies in the crop, crop growth stage and potential yield losses.

• **Enact** – take appropriate action. Manage your next steps including encouraging beneficial insects and protecting honeybees before implementing control options.

More information: <u>https://grdc.com.au/resources-and-publications/resources/russian-wheat-aphid</u>

#### Wheat Quality Australia

Classification identifies varieties with the provsen capability to deliver the requirements of each class, creating a solid foundation for consistent processing and end-product performance. This foundation, along with Wheat Standards (which are designed to ensure defects and contamination are absent), gives customers an assurance that Australian wheat is of the highest quality. The objective of the system is to classify wheat varieties to meet distinct quality attributes for processors and end users.

Wheat quality refers to the performance of grain in meeting the requirements for its use in flour milling, breads, noodles, cereals, pasta or animal feed. Quality is determined by the genetic attributes of the variety grown and the environmental conditions during crop growth. The wheat classification process involves assessing the inherent quality characteristics of a new variety, focusing on processing and end-use performance.

The Wheat Quality Australia Wheat Variety Classification Panel assesses new wheat varieties to determine their processing and end-product suitability (for qualities such as milling extraction, dough balance, baking performance and noodle colour and texture) to meet key market requirements.

In August, Wheat Quality Australia introduced a new milling wheat class, Australian White Wheat (AWW), suitable for the instant noodle and general-purpose flour markets.

AWW maintains the core quality characteristics of Australian hard wheat — white, hard and sound with superior milling extraction and flour colour. AWW is set to deliver greater choice and value for breeders, growers and the trade.

The Wheat Quality Australia Panel meets regularly to consider applications for classification. To find out more about the classification process go to www.wheatquality.com.au.

The Wheat Quality Australia (WQA) 2020/21 Wheat Variety Master List is available from the WQA website at <u>www.wheatquality.com.au</u>. It is also published in the Grain Trade Australia Wheat Standards at <u>www.graintrade.org.au</u>.



# WHEAT VARIETY DISEASE RATINGS

Table 1 contains varietal ratings for the predominant diseases of wheat in Queensland. Varieties of most relevance to Queensland growers are listed in alphabetical order and disease ratings are colour-coded to match resistance and susceptibility ratings.

Table 1: Bread a	nd durun	ז wheats	– disease	e and agrond	omy ratin	igs.					
						Root lesio	n nematode				
	Black	Common	Crown		P. neg	lectus	P. th	ornei		Stripe rust	
Variety	point	root rot	rot	Leaf rust**	resistance <sup>+</sup>	tolerance*	resistance <sup>+</sup>	tolerance*	Stem rust <sup>+</sup>	coast)**	Yellow spot
					BREAD WHI	EATS	•	,	,		
Borlaug 100⊕	MSS	MS	MSS	MR	S	T	MS	TMT	MR	SVS	MR
Coolah®	S	S	MSS	RMR/MS (P)	S	MT	MS	MT	MR	RMR	MSS
DS Faraday <sup>(b</sup>	MSS	S	MSS	R/MS (P)	S	MTMI	MSS	MT	RMR	MR	MSS
LG Gold <sup>(b)</sup>	S	MS	MSS (P)	MRMS/SVS (P)	S	MT	S	MII	MSS	SVS	S
LRPB Flanker®	MS	MSS	MSS	RMR/MSS (P)	S	MT	MSS	MT	RMR	RMR	MS
LRPB Gauntlet <sup>®</sup>	_	-	MSS	MRMS	S	MTMI	MRMS	MT	RMR	RMR/MS (P)	MS
LRPB Hellfire <sup>(b)</sup>	MSS	MSS	MSS	MSS	MSS	TMT	MSS	MI	MR	MR	MSS
LRPB Lancer®	MRMS	S	MSS	RMR/MRMS (P)	S	MTMI	MS	TMT	R	RMR	MRMS
LRPB Mustang®	MS	MS	MSS	MSS	S	MI	MSS	MTMI	MRMS	RMR	MSS
LRPB Raider®	MSS (P)	-	MS (P)	MRMS (P)	-	-	-	MT (P)	R (P)	RMR/MS (P)	-
LRPB Reliant®	MS	MSS	MS	RMR	SVS	MTMI	MSS	TMT	R	MR	S
LRPB Spitfire®	MSS	MSS	MS	S	MSS	MI	MS	MTMI	MR	MR	MSS
LRPB Stealth®	RMR (P)	MSS	S (P)	RMR/S (P)	MS	MI	S	MTMI	R	RMR	MS
Mitch®	-	MS	MS	MSS	S	MT	S	MT	MRMS	MR	MSS
RockStar <sup>(b)</sup>	MSS	MSS	S	S	MRMS	MII	MS	MI	MR	MRMS/S (P)	MRMS
SEA Condamine	MRMS	MSS	MSS	RMR/MRMS (P)	S	MT	MS	MT	MRMS	MRMS/MS (P)	MSS
Sunblade CL Plus®	MR (P)	S	S (P)	MRMS/MSS (P)	MSS	MTMI	MRMS	MT	MS	MR	MSS
Suncentral <sup>®</sup>	RMR (P)	MS	MSS (P)	RMR/MRMS (P)	MS (P)	MI	MS	MT (P)	MRMS	MRMS/S (P)	MS
Sunchaser®	MRMS	MSS	MSS	R	MSS	MTMI	MSS	MT	MR	RMR	MS
Sunflex <sup>(b)</sup>	MSS	S	MSS (P)	RMR/S (P)	S	MTMI	MSS	MI	MR	RMR	MS
Sunlamb <sup>(b)</sup>	MS	MS	S	MS	MSS	I	MSS	MI	RMR	MR	MRMS
Sunmaster <sup>(b)</sup>	RMR (P)	MS	S (P)	RMR/MS (P)	MS	MTMI	MS	MT	MS	MR	MSS
Sunmax®	MRMS	MSS	MSS	MS	S	MTMI	MS	MI	MRMS	RMR	MS
Sunprime	MSS	MSS	S	MR/S (P)	S	MTMI	S	MTMI	MRMS	RMR	MSS
Suntime®	MS	S	MSS	MS	S	MTMI	MRMS	MT	MS	MR	S
Suntop <sup>(b)</sup>	MSS	MS	MSS	MR	S	MT	MRMS	TMT	MRMS	MRMS	MSS
Vixen <sup>®</sup>	MSS	MS	S	SVS	MRMS	MT	MS	I	MRMS	MRMS/SVS (P)	MRMS
				ĺ	OURUM WH	EATS					
DBA Aurora®	MS	MSS	VS	R	MRMS	I	RMR	MT	RMR	MR	MRMS
DBA Bindaroi®	MRMS	MSS	SVS	MR	MRMS	MI	MR	MTMI	MRMS	MS	MRMS
DBA Lillaroi®	MS	MSS	SVS	RMR	MRMS	MI	RMR	MT	RMR	MS	MRMS
DBA Mataroi®	MRMS	MS	SVS	MR	MS	MT	RMR	MII	MR	MR	MRMS
DBA Vittaroi <sup>(b</sup>	MSS	MSS	SVS	RMR	MS	I	MR	MI	MR	MS	MRMS
Westcourt <sup>®</sup>	MSS	MRMS	VS	RMR	MS	MI	MR	MT	RMR	MR	MRMS

#### Legend

R (Resistant) RMR (Resistant – Moderately Resistant) MR (Moderately Resistant) MRMS (Moderately Resistant – Moderately Susceptible) MS (Moderately Susceptible) S(Susceptible) S(Susceptible) S(Susceptible) VS (Very Susceptible) T (Tolerant) TMT (Tolerant – Moderately Tolerant) MT (Moderately Tolerant) MTMI (Moderately Tolerant – Moderately Intolerant) MI (Moderately Intolerant) MII (Moderately Intolerant) I (Intolerant – Very Intolerant) VI (Very Intolerant) (Very Susceptible) VP) Preliminary results. Provisional information. Disease and agronomic scores based on one year of data. RLN data relating to these varieties is based on fewer than four years of testing.

\* RLN tolerance – The root lesion nematode (*P. thornei* and *P. neglectus*) tolerance ratings that appear in this guide are based on field data collected in the northern grains region rather than national consensus ratings.

\*\* Ratings separated by "/" denotes different responses to different pathotypes.

<sup>+</sup> RLN resistance – The Root lesion nematode (*P. thornei* and *P. neglectus*) resistance ratings that appear in this sowing guide are national consensus ratings based on glasshouse and field data collected from all Australian grain regions.

# DISEASE RATING COLOUR RANGE

RRMRMRMSMSSSSVSVS
-------------------



<sup>-</sup> Rating not available.

2 2	Table 2: Bread a	nd durum wheats – vari	ietal detai	ls.							
2022				Varietal info	mation						
2 QUE			End Doint	Grower to grower			EPR rate \$/toppo				MOA mavimum
EENSLA	Variety	Pedigree	Royalties (EPR)	sales permitted	Licensee	Released by	a/tunite (GST exclusive)	Year of release	Comments (as supplied by breeding companies)	Maturity grouping	ween meaning quality classification⁺
ND						BREAD V	VHEATS				
WINTER CROP S	Borlaug 100 <sup>4</sup> )		>	Yes	Rebel	Rebel	\$4.55	2018	A mid-season variety released for its high long-term average yield in the northern NSW and Queensland regions, where livestock markets erode APH premiums. Proven to outyield in dry conditions and exceed in irrigation. Very strong straw strength, low screening and <i>P. thornei</i> tolerant. While stripe rust presents in wetter years it is easily controlled with low-cost fungicide applications.	Quick – mid spring	Not classified
	Coolah <sup>(h)</sup>	EGA Gregory <sup>th</sup> /VQ2791//EGA Gregory <sup>th</sup>	>	Yes	AGT	AGT	\$3.50	2016	Coolan <sup>60</sup> is regarded as a yield benchmark in the slow spring maturity group. As a replacement for EGA Gregory <sup>40</sup> it is slightly shorter in stature and has better lodging resistance. Combined with good foliar disease resistance, Coolah <sup>40</sup> is a clear choice for late April/early May planting opportunities throughout Queensland and NSW.	Slow spring	АРН
E	DS Faraday <sup>(h)</sup>	EGA Gregory <sup>40</sup> / UQ01484//3*EGA Gregory <sup>4b</sup>	>	No	Seednet	Dow Seeds	\$4.25	2017	A good early season APH wheat with enhanced pre-harvest sprouting tolerances and a solid rust package.	Slow spring	APH
	LG Gold <sup>th</sup>	Farak/Surco//05SW19	>	°Z	Elders	Elders	\$3.00	2020	LG Gold <sup>®</sup> is a high-yielding AH classification wheat variety best suited to the inner Darling Downs in Queensland as well as northern and central NSW. It is well suited to late planting and has demonstrated superior yield maturity to l Suntop <sup>®</sup> . LRPB Spitfire <sup>®</sup> and EGA Gregory <sup>®</sup> with an added maturity advantage. It has an excellent disease package and shows consistently high protein and test weight along with very low screenings.	Quick – mid spring	AH
	LRPB Flanker <sup>db</sup>	EGA Gregory <sup>th</sup> //EGA Gregory <sup>th</sup> / Lang <sup>th</sup>	>	Yes	Pacific Seeds	LRPB	\$4.25	2015	APH variety well suited to Queensland with sound diseases resistance.	Mid – slow spring	APH
	LRPB Gauntlet <sup>(h)</sup>	Kukri/Sunvale	>	No	Seednet	LRPB	\$3.00	2012	Early to main season APH variety similar in maturity to Sunvale. Has good yellow spot and RLN ( <i>P. thornet</i> ) resistance and a solid grain receivals package.	Mid – slow spring	APH
	LRPB Hellfire <sup>d)</sup>	EGA Gregory <sup>4)</sup> /2*LPB05-2148	>	Yes	Pacific Seeds	LRPB	\$4.25	2019	Mid – quick maturing high-yielding main season APH variety with protein accumulation similar to LRPB Spitfire <sup>40</sup> . Good early vigour and RLN tolerance. Demonstrated yield performance under crown rot pressure.	Quick – mid spring	APH
	LRPB Lancer <sup>(b)</sup>	VII84/Chara//Chara/3/Lang $^{\rm O}$	>	Yes	Pacific Seeds	LRPB	\$4.25	2013	Slower-maturing APH spring wheat with a compact canopy, solid grain quality and rust packages.	Mid – slow spring	APH
	LRPB Mustang $^{(\!b)}$	EGA Gregory <sup>dy</sup> /LPB1117	>	Yes	Pacific Seeds	LRPB	\$4.25	2017	Quick-maturing APH variety with compact canopy and reliable grain package. Good foliar and soil disease package with highly competitive yield.	Quick spring	APH
<u>ال</u>	LRPB Raider <sup>0</sup>	LRPB Lancer <sup>dy</sup> /LPB10-2506	>	oz	Pacific Seeds	LRPB	\$4.25	2021	A short, higher-tillering LRPB Reliant <sup>cb</sup> plant type that showed relatively high and stable yield performance across early and main season NVTs in 2020. Slow spring maturity best suited to mid-April to early May sowing times across a range of growing environments. Robust disease profile based on LRPB Lancer <sup>cb</sup> genetics with APH classification.	Slow spring	АРН
GRD	LRPB Reliant $^{\oplus}$	LRPB Crusader <sup>(b)</sup> EGA Gregory <sup>(b</sup>	>	Yes	Pacific Seeds	LRPB	\$4.25	2016	A high-yielding APH variety with excellent early vigour and robust grain package, well suited to main season planting windows throughout the Queensland cropping zone.	Mid – slow spring	APH
) C <sup>°</sup>	LRPB Spitfire <sup>(h)</sup>	Drysdale/Kukri	>	Yes	Pacific Seeds	LRPB	\$3.50	2 010	APH variety well suited to Queensland conditions. Provides a good grain package and solid disease resistance.	Quick – mid spring	APH

Table 2: Bread an	ıd durum wheats – vari	etal detai	ls (contin	ued).						
			Varietal infor	mation						
		End point	Grower to grower			EPR rate \$/tonne	10			WQA maximum
Variety	Pedigree	(EPR)	sales permitted	Licensee	keleased by	exclusive)	release	comments (as supplied by breeding companies)	grouping	quainty classification*
					BREAD V	VHEATS				
LRPB Stealth $^{\phi}$	Lancer $^{\phi}$ /Sunguard $^{\phi}$	>	No	Pacific Seeds	LRPB	\$4.25	2020	A slow spring maturing APH variety demonstrating excellent crown rot resistance and the ability to maintain yield in tight finishes. Well suited to all Queensland production environments.	Slow spring	APH
$Mitch^{\Phi}$	QT10422/Giles	>	Yes	AGT	AGT	\$3.25	2014	A mid – slow spring wheat with distinct adaptation to central and south-west Oueensland regions. Crown rot tolerance belies its resistance rating and performs well in tough environments.	Mid – slow spring	АН
RockStar <sup>db</sup>	Mace^/IGW3119	>	Yes	InterGrain	InterGrain	\$3.50	2020	RockStar <sup>to</sup> is a high-yielding, mid – slow-flowering variety with a slightly quicker time to flowering than LRPB Lancer <sup>to</sup> . It has excellent yield stability across its sowing window and very good lodging tolerance. RockStar <sup>to</sup> has good grain size, good test weight and has a moderate plant height, reducing stubble loads in high-yielding environments.	Mid – slow spring	APH
SEA Condamine	UQ01800	>	No	Seed Exchage Australia	na	\$3.00	2018	A tall, main season maturity, high-yielding variety in central Queensland. It has a short grain-filling period, large kernel size, low screenings and stiff straw.	Quick – mid spring	FEED
Sunblade CL Plus $^{\rm th}$	RAC1664/2*Suntop <sup>(h)</sup>	>	NO	AGT	AGT	\$4.35	2020	The first Clearfield <sup>®</sup> Intervix <sup>®</sup> tolerant variety granted an APH classification. Sunblade CL Plus <sup>4b</sup> is a mid spring variety that demonstrates exceptional yield performance and is suitable for the entire northern region. A replacement for Elmore CL Plus <sup>4b</sup> .	Mid spring	APH
Suncentral <sup>(b)</sup>	RAC1629/2*Suntop <sup><math>(b)</math></sup>	>	Yes	AGT	AGT	\$3.60	2020	Exceptional yield performance from an APH-classified variety. Suncentral's <sup>(b)</sup> quick – mid spring maturity makes it uniquely suited to central and south-west Queensland. Suncentral <sup>(b)</sup> shares a lot of characteristics with Suntop <sup>(b)</sup> but is a quicker maturing variety and has a better physical grain package.	Quick – mid spring	APH
Sunchaser <sup>d)</sup>	SUN626B/B1289F	>	Yes	AGT	AGT	\$3.50	2019	An alternative for the popular variety Suntop <sup>6</sup> . Sunchaser <sup>6</sup> has a similar fit in terms of maturity and yield performance with improved characteristics of note. Good grain size and low screenings, moderately long coleoptile, improved crown rot resistance and similar tolerance.	Quick – mid spring	APH
Sunflex <sup>0</sup>	QT13334/SUN574A	>	Yes	AGT	AGT	\$3.60	2020	As a slow spring variety, Sunflex <sup>4b</sup> is at the very slow end and is a high-yielding option for early sowing situations throughout Queensland and NSW. Sunflex <sup>4b</sup> has a shorter plant type, consistently large seed size and low screenings, as well as a moderately long coleoptile.	Slow spring	APH
Sunlamb <sup>4b</sup>	2*Baconora/Sunlin	>	Yes	AGT	AGT	\$2.75	2015	Suitable for early April sowing, it differs from other dual-purpose wheats in that it is a spring wheat and does not have a strong vermalisation requirement. When planted early it has a long grazing period due to its unique combination of photoperiod sensitivity and cold responsiveness.	Very slow spring	ASW
Sunmaster <sup>d)</sup>	RAC1629/2*Suntop <sup>0</sup>	>	Yes	AGT	AGT	\$3.60	2020	A mid spring variety with greatly improved yield performance compared with its major parent Suntop <sup>0</sup> . Sunmaster <sup>0</sup> has a similar adaptation pattern but in a shorter plant type. A genuine replacement for Suntop <sup>0</sup> .	Mid spring	АРН
Sunmax <sup>(b)</sup>	CRW142.16/2*Sunzell	>	Yes	AGT	AGT	\$3.50	2015	As a very slow spring variety. Summax <sup><math>\theta</math></sup> has shown its ability to maintain its maturity in all early sowing situations. Suited for mid-April sowing in southern Queensland and northern NSW.	Very slow spring	APH
Sunprime <sup>(b)</sup>	SUN445//EGA Gregory $^{\rm O}$	>	Yes	AGT	AGT	\$3.50	2018	A quicker maturing APH variety with higher, stable grain yield and good <i>P. thornei</i> tolerance.	Quick spring	АРН
Suntime <sup>db</sup>	SUN457A/SUN405B	>	Yes	AGT	AGT	\$3.50	2015	An APH disease-resistant variety for sowing early in the season.	Slow spring	APH

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INTRO

BARLEY

CHICKPEA

NOTES

lable Z: Bread al	nd durum wheats – vari	etal detai	ls (contin	ued).						
			Varietal info	rmation						
			Grower			EPR rate				
Variety	Pediaree	rid point royalties (EPR)	to grower sales permitted	Licensee	Released by	a/tonne (GST exclusive)	Year of release	Comments (as supplied by breeding companies)	Maturity grouping	wwa maximum quality classification*
					BREAD	WHEATS				
Suntop <sup>(b)</sup>	Sunco/2*Pastor//SUN436E	>	Yes	AGT	AGT	\$3.25	2012	A consistently high-yielding APH variety, possessing a solid disease resistance package including an elevated level of tolerance to crown rot infection.	Mid spring	APH
Vixen <sup>to</sup>	Mace <sup>4/</sup> /GW3119	>	Yes	InterGrain	InterGrain	\$3.50	2018	A mid – quick variety, similar in maturity to LRPB Spitfire <sup>(h)</sup> . Suited to sowing from mid-May onwards. High yield potential, with very good lodging resistance and strong physical grain characteristics. It has good grain size and produces low screenings. Vixen <sup>(h)</sup> has a short to moderate plant height, providing reduced stubble loads in high-yielding environments.	Quick – mid spring	АН
					DURUM	WHEATS				
DBA Aurora <sup>(b)</sup>	Tamaroi*2/Kalka//RH920318/ Kalka///Kalka*2/Tamaroi	>	No	SADGA	NA	\$3.00	2014	A high-yielding variety, particularly in the south-east Queensland zone, which possesses good semolina and colour stability attributes.	Quick – mid spring	ADR
DBA Bindaroi <sup>(b</sup>	Caparoi <sup>4)</sup> /261102	>	To be advised	Seednet	Iddwsn	\$3.50	2017	Higher-yielding with lower screenings and good protein achievement. Better grain quality than Caparot <sup>60</sup> , with higher semolina yellow colour compared with Lillarot <sup>60</sup> . Best performance compared with all released durum varieties in DBA yield loss trials.	Quick spring	ADR
DBA Lillaroi <sup>to</sup>	960273/980596	>	To be advised	Seednet	NSWDPI	\$3.30	2015	This variety is preferred by millers, highest semolina yield, high yellow pigment, highest 1000 grain weight, lowest screenings compared with other released varieties. Medium early variety, around two to three days later than Jandaroi <sup>40</sup> . Excellent yield performance in Queensland NVT and is suited to dry seasons, including double cropping, with excellent protein achievement.	Quick spring	ADR
DBA Mataroi <sup>d)</sup>	234194/Yawa	>	To be advised	Seednet	NSWDPI	\$3.50	2021	DBA Mataroji <sup>(b)</sup> is a high-yielding, quick-maturing durum wheat, adapted to the dryland durum-producing areas of NSW (including western NSW) and Queensland. DBA Mataroj <sup>(b)</sup> has erect plant growth and medium stature and straw strength similar to Caparoj <sup>(b)</sup> . It has demonstrated grain, semolina and pasta-making quality comparable with Caparoj <sup>(b)</sup> as well as low screenings. DBA Mataroj <sup>(b)</sup> has a useful disease package, including rated MR for the new 2021 east coast stripe rust race and is rated MRMS for black point.	Quick spring	ADR
DBA Vittaroi <sup>d)</sup>	200856/980990	>	To be advised	Seednet	NSWDPI	\$3.30	2017	Recommended for irrigated cropping. Short stature and high tolerance to lodging. High yield combined with excellent grain protein achievement and grain and semolina quality under irrigated conditions relative to EGA Bellaro <sup>10</sup> . Higher semolina yellow colour compared with Lillaro <sup>10</sup> . Achieves lower screenings.	Quick – mid spring	ADR
Westcourt <sup>db</sup>	WID22209/WID22301	>	Yes	AGT	AGT	\$3.50	2019	Westcourt <sup><math>\phi</math></sup> is a durum variety specifically bred to perform in the northern durum growing region. Displaying exceptional yield and offering a dominant package of disease resistance, moderately long coleoptile and grain quality, including very low screenings and milling qualities similar to DBA Lillaroi <sup><math>\phi</math></sup> .	Quick – mid spring	ADR

467 – Australian Grain Technologies, EGA – Enterprise Grains Australia, LRPB – LongReach Plant Breeders, NSWDPI – New South Wales Department of Primary Industries, SADGA – South Australian Durum Growers Association, University of Adelaide, UQ – University of Queensland.

<sup>6</sup>Varieties displaying this symbol are protected under the *Plant Breeder's Rights Act 1994.* Unauthorised sale of seed of these varieties is an infringement under this Act.

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• Wheat Quality Australia maximum classifications describe suitability for export markets and do not always reflect the varietal preference of domestic millers. (Note: APH Australian Prime Hard, AH Australian Hard).

# WHEAT VARIETY YIELD PERFORMANCE

Tables 3A to 3H contain wheat grain yield results for selected varieties within each NVT region in Queensland for the past five seasons. Data is presented (as a percentage) for each variety relative to the mean trial yield for the location within each year. Varieties are listed in descending order of average yield over the period.

#### Table 3A: NVT Central Queensland – wheat early season 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	3.85	2.40	2.41	3.05	3.04
Variety	No. trials	1	5	3	5	5
Coolah <sup>(b)</sup>	19	106	121	114	125	130
LRPB Flanker®	19	108	116	119	122	129
LRPB Raider®	5					125
Sunflex <sup>(b)</sup>	13			117	119	130
Mitch <sup>®</sup>	13			113	119	125
LRPB Stealth®	10				123	122
LRPB Lancer®	19	103	109	119	111	111
DS Faraday®	18		104	96	113	111
LRPB Gauntlet <sup>(b)</sup>	14	105	99	108	105	
Suntime®	14	99	105	96	104	
Sunmax®	18		96	72	88	89

#### Table 3B: NVT Central Queensland – wheat main season 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	3.69	2.62	2.34	3.28	3.16
Variety	No. trials	5	4	2	5	5
SEA Condamine	21	116	120	112	113	107
Sunblade CL Plus®	10				108	105
Borlaug 100 <sup>(b)</sup>	4		112			
Sunmaster <sup>(b</sup>	10				107	106
Suncentral <sup>(b)</sup>	10				104	101
LRPB Hellfire <sup>®</sup>	12			107	104	101
LRPB Reliant®	21	108	103	104	101	97
Suntop	21	101	103	99	100	101
Sunprime®	16		99	113	100	97
Sunchaser	12			105	99	100
LG Gold <sup>⊕</sup>	10				99	98
LRPB Mustang <sup>(b)</sup>	21	105	93	112	94	88
LRPB Spitfire®	21	92	94	94	96	99

#### Legend: Annual variety yield performance

Lowest





#### Table 3C: NVT South-East Queensland – wheat early season 2016–20.

#### Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	5.44	2.06	2.00	3.17	3.81
Variety	No. trials	2	2	1	2	1
LRPB Raider®	1					114
Mitch <sup>®</sup>	8	109	113	117	109	110
Sunmax®	8	113	118	124	102	98
Coolah®	8	107	110	106	111	112
Sunflex <sup>®</sup>	4			114	102	109
LRPB Flanker®	8	105	102	98	104	109
LRPB Stealth®	3				112	110
Suntime®	7	100	107	104	108	
DS Faraday®	6		101	87	108	105
LRPB Lancer®	8	94	96	96	103	104
LRPB Gauntlet <sup>(b)</sup>	7	88	90	82	104	
Sunlamb®	4	104	91			

## Table 3D: NVT South-East Queensland – wheat main season 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	5.60	1.99	2.58	1.81	3.90
Variety	No. trials	2	1	1	2	2
Sunmaster <sup>(b</sup>	4				114	105
Sunblade CL Plus®	4				113	103
SEA Condamine	8	111	117	98	105	109
Borlaug 100 <sup>(b)</sup>	6		115	95	104	116
Suncentral <sup>(b)</sup>	4				109	109
LRPB Hellfire <sup>®</sup>	5			101	108	103
Suntop	8	102	115	101	103	103
Sunchaser	5			102	104	106
LRPB Reliant®	8	101	99	99	102	105
Sunprime®	6		101	98	104	110
LRPB Mustang $^{\oplus}$	8	93	97	96	110	107
LG Gold <sup>₼</sup>	4				94	107
LRPB Spitfire <sup>®</sup>	8	95	100	96	94	99

#### Table 3E: NVT South-East Queensland – wheat (durum) 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020	
	Mean yield t/ha	4.93		3.11	0.76	3.88	
Variety	No. trials	1		1	1	1	
DBA Aurora®	4	110		109	102	93	
Westcourt <sup>®</sup>	3			107	103	101	
DBA Mataroi <sup>(b)</sup>	4	101	No trial	101	107	103	
DBA Bindaroi <sup>(b</sup>	4	99	ino triai	101	100	101	
DBA Vittaroi <sup>®</sup>	4	96		94	103	104	
DBA Lillaroi <sup>(b</sup>	4	93		96	96	104	



#### Table 3F: NVT South-West Queensland – wheat early season 2016–20.

#### Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	4.69	1.88	2.96	1.24	3.19
Variety	No. trials	5	8	3	3	5
LRPB Raider						116
Coolah®	24	107	126	102	111	110
Sunflex <sup>®</sup>	11			100	111	108
Mitch®	24	110	122	104	116	103
LRPB Flanker®	24	105	118	97	106	111
LRPB Stealth®	8				107	109
DS Faraday®	19		113	99	89	115
Sunmax <sup>®</sup>	24	108	100	107	90	102
Suntime®	19	101	108	104	104	
LRPB Lancer®	24	99	107	100	114	96
LRPB Gauntlet <sup>(b)</sup>	19	92	100	99	103	
Sunlamb <sup>(b)</sup>	13	99	48			

#### Table 3G: NVT South-West Queensland – wheat main season 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	4.43	1.93	2.01	1.18	2.84
Variety	No. trials	8	8	3	3	6
Sunblade CL Plus®	9				111	109
Sunmaster <sup>(b</sup>	9				114	108
SEA Condamine	28	111	110	115	111	110
Suncentral <sup>(b)</sup>	9				112	108
LRPB Hellfire <sup>®</sup>	12			103	107	104
Borlaug 100 <sup>(b)</sup>	20		112	116	113	112
LRPB Reliant®	28	104	110	117	100	107
Suntop <sup>®</sup>	28	106	105	103	104	102
Sunchaser	12			101	106	103
LRPB Mustang <sup>(b)</sup>	28	98	108	99	108	104
Sunprime®	20		105	102	109	105
LRPB Spitfire®	28	92	90	90	96	94
LG Gold <sup>⊕</sup>	9				102	99

#### Legend: Annual variety yield performance

Lowest

Highest



NOTES

## Table 3H: NVT South-West Queensland – wheat (durum) 2016–20.

#### Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	4.67	2.67	1.71		
Variety	No. trials	1	1	1		
DBA Aurora <sup>(b</sup>	3	109	97	107		Trial failed
DBA Mataroi <sup>(b)</sup>	3	99	105	101		
Westcourt <sup>®</sup>	1			103	Trial fails al	
DBA Bindaroi <sup>(b)</sup>	3	99	100	100	Irial tailed	
DBA Vittaroi®	3	95	105	97		
DBA Lillaroi <sup>(b)</sup>	3	94	99	95		

#### Legend: Annual variety yield performance

Lowest

Highest



# BARLEY

# **KEY POINTS**

#### Newly released variety available for sowing

• Yeti<sup>(b)</sup>, a medium maturity variety from Australian Grain Technologies

#### Newly accredited varieties, March 2021

The varieties listed below have been accredited by Barley Australia as malting barleys following established evaluation and testing procedures in association with the Malting and Brewing Industry Barley Technical Committee (MBIBTC) and Pilot Brewing Australia (PBA).

- RGT Planet  $^{\rm (b)}$  has been granted malt accreditation by MBIBTC
- LG Alestar<sup>b</sup>, Compass<sup>b</sup>, La Trobe<sup>b</sup>, Leabrook<sup>b</sup>, Maximus<sup>b</sup> CL, RGT Planet<sup>b</sup>, Spartacus CL<sup>b</sup>, Westminster<sup>b</sup>

#### Varieties under evaluation, February 2021

- Beast<sup>(b)</sup>, undergoing stage 1 malt evaluation in 2021
- Laperouse<sup>(D)</sup>, undergoing stage 2 malt evaluation in 2021
- Commodus  $^{\oplus}$  CL, undergoing stage 1 malt evaluation in 2021

# MARKETING BARLEY

Large, plump, bright-coloured grain with high hectolitre weight is preferred for both the malt and livestock industries. Price dockages will be incurred if grain does not meet specifications. Barley trading standards can be accessed at www.graintrade.org.au.

# WILL YOU BE DELIVERING BARLEY THIS HARVEST?

If you did not deliver barley last harvest, you may not be aware that Grain Trade Australia (GTA) has changed the name of feed barley grades from Feed 1 Barley to Barley 1. GTA took this action to recognise the fact that feed barley is often also used for human consumption in some export markets. There are no changes in the specifications of the grade; it is simply a name change and has not had any impact on segregation or price.

# **MALTING BARLEY**

In Queensland, domestic brewing demand is rated as medium for Commander<sup>Φ</sup>, Compass<sup>Φ</sup> and Westminster<sup>Φ</sup>, while export brewing demand is rated as medium for Commander<sup>Φ</sup> and Westminster<sup>Φ</sup> and low for Compass<sup>Φ</sup>. Malt is made from premium-quality barley and provides the characteristic flavours, aromas and colours that beer drinkers are familiar with and also contributes to the whole brewing process (along with water, hops and yeast).

# DISEASE CHARACTERISTICS

# Leaf diseases

#### **Powdery mildew**

Although powdery mildew is often present in susceptible barley varieties, the disease seldom causes grain yield losses above 10 to 15 per cent. Variety ratings for powdery mildew are shown in Table 4.

#### Leaf rust and stem rust

Leaf rust and stem rust can cause significant loss of grain yield – in excess of 50 per cent – especially in wetter environments and later sowings. Epidemics of stem rust have been rare in recent years, but leaf rust has been a persistent problem. Crops of varieties rated MS or above should be regularly monitored from mid-elongation for the presence of leaf rust. If present, it is likely to appear on older leaves as small brown pustules or small green dots in senescing leaf tissue. Varieties rated S to VS should be sprayed once the disease



#### BARLEY

is detected. In favourable seasons, fungicide application may be warranted in varieties with levels of resistance less than MR. Variety ratings for leaf rust appear in Table 4.

#### Stripe rust

Barley stripe rust ratings have not been included in the disease table as this disease is not present in Australia. However, some barley varieties can be infected by barley grass stripe rust and even wheat stripe rust. Introduction of true barley stripe rust poses a serious threat to the industry. Growers should monitor crops and any suspicious lesions should be collected and sent to the Australian Cereal Rust Survey, PBI, Private Bag 4011, Narellan NSW 2567.

## Net blotch

There are two forms of net blotch: the spot form and the net form. As the common names suggest, spot form is seen as dark brown to black round to oval spots while net form is more likely to occur as brown elongate lesions or stripes. Both forms survive on infested barley stubble, while net form can also be seed-borne. Growers need to be aware if grain is infected as this can introduce the disease to clean areas. Seed treatments are available. Leaves can be infected by both forms of the pathogen at the same time. Variety ratings for net blotch appear in Table 4.

# Head and root diseases

#### **Head blight**

Head blight can be caused by several Fusarium species or Eutiarosporella. Spores are stubbleborne and infection usually occurs following wet conditions at and shortly after head emergence.

#### Loose smut

Barley varieties with Hindmarsh<sup>(b)</sup> in their pedigree are more susceptible to loose smut. Control is achieved by applying a registered seed dressing at sowing.

## **Covered smut**

Covered smut is seed and soil-borne. End-users do not usually accept contaminated grain except at a heavy discount. Control is by using a recommended seed dressing.

## **Black point**

Black point is a brown-black discolouration at the germ end of wheat and barley caryopsis. In barley, black point appears mainly in the lemma and palea tissue (glume) and in severe cases discolouration can also occur in the testa. Black point is a physiological response to a certain set of environmental conditions such as heavy morning dews, rainfall and high humidity. Variety ratings for black point appear in Table 4.

### Crown rot

Crown rot survives for several seasons on decaying stubble from host cereal crops and from grass weeds in non-host crops. Infection of the stem bases of the young crop is high with a wet autumn/ winter, but above-ground symptoms are normally only seen when the plant undergoes water stress at the end of the season. Barley crops do not usually display the typical 'white heads' that are seen in infected wheat crops. Variety ratings for crown rot appear in Table 4.

## Root lesion nematodes (RLN)

These nematodes are widespread in the northern grains region and can significantly reduce grain yields. RLN is also hosted by many non-cereal crops so the absence of a winter cereal crop in recent seasons does not mean there are low levels of nematodes in the soil. Barley is considered more tolerant than most wheats, yet significant yield losses can occur in some varieties. A soil test should be considered before planting if you do not know the species or levels on your farm.

If barley is to be sown into nematode-infested soil, the tolerant varieties listed as T, TMT or MT in Table 4) should be considered for best yield. Choose a variety that has a higher resistance rating to maximise yield and leave fewer nematodes in the soil to attack the next crop to be planted. The response of a barley variety may differ between the two species of RLN, *Pratylenchus thornei* and *Pratylenchus neglectus* (Table 4).

#### Insects

Malting barley can only be treated with specific grain protectants for control of insects. Check with all potential end-users to ensure a particular insecticide is acceptable.



# **BARLEY VARIETY DISEASE RATINGS**

Table 4 contains varietal ratings for the predominant diseases of barley in Queensland. Varieties of most relevance to Queensland growers are listed in alphabetical order and disease ratings are colour-coded to match resistance and susceptibility ratings.

Table 4: Barley disease and agronomy ratings.												
									Root lesion	nematode		
					Net blo	tch		P. neg	lectus	P. thornei		Snot
Variety	Black point	Common root rot	Crown rot	Leaf rust	Net form**	Spot form**	Powdery mildew	resistance <sup>+</sup>	tolerance*	resistance <sup>+</sup>	tolerance*	blotch (barley)
LG Alestar®	MRMS	MSS	S	MS	MR-MSS (P)	MSS	MR	MR	MII	MR	MTMI	SVS
Beast <sup>(b)</sup>	MSS	S	S (P)	S	MRMS-SVS (P)	MSS	MSS	MRMS	MTMI	MR	Т	S
Bottler®	MRMS	MS	S	MRMS	MS	S	R	MS	TMT	RMR	MI	S
Commander®	MSS	MSS	S	S	MS-S (P)	MSS	MS	MRMS	MT	MRMS	MT	S
Commodus <sup>(b)</sup> CL	MSS	S	-	SVS (P)	MRMS (P)	MRMS (P)	MS (P)	MSS	MT	S	MT	MS (P)
Compass®	MSS	MS	S	VS	MS	MS	MS	MRMS	Т	MR	TMT	S
Fathom®	MSS	MSS	S	MRMS	MSS	RMR	MS	MRMS	TMT	MR	MT	SVS
La Trobe®	MSS	S	SVS	MSS	MS	S	MSS	MRMS	TMT	MRMS	MT	SVS
Laperouse <sup>(b)</sup>	MSS	MSS	S	SVS	MRMS	MR	MS	MR	MI	MR	MI	S
Leabrook <sup>(b)</sup>	MSS	MS	S	SVS	MS	MS	MSS	MR	MT	RMR	TMT	S
Maximus <sup>®</sup> CL	MSS	S	S	SVS	MRMS	MRMS	MS	MRMS	MT	MR	MI	SVS
RGT Planet®	MRMS	MSS	S	MRMS	MRMS-SVS (P)	S	RMR	MRMS	TMT	MR	MI	SVS
Rosalind <sup>®</sup>	MSS	S	MSS	MR	MRMS	MS	MSS	MRMS	TMT	MR	TMT	SVS
Spartacus CL <sup>®</sup>	MSS	MSS	S	MSS	MS-SVS (P)	S	MS	MRMS	MTMI	MRMS	MI	SVS
Yeti <sup>(b)</sup>	MSS	MS	S (P)	SVS	MS	MR	MS	MRMS	TMT	MR	MT	S

#### Legend

R (Resistant) RMR (Resistant – Moderately Resistant) MR (Moderately Resistant) MRMS (Moderately Resistant – Moderately Susceptible) MS (Moderately Susceptible) MSS (Moderately Susceptible) S (Susceptible) VS (Very Susceptible) T (Tolerant) TMT (Tolerant – Moderately Tolerant) MT (Moderately Tolerant) MTMI (Moderately Tolerant – Moderately Intolerant) MTMI (Moderately Intolerant) I (Intolerant – Very Intolerant) VI (Very Intolerant) (Very Intolerant) MTMI (Moderately Intolerant) I (Intolerant – Very Intolerant) VI (Very Intolerant) (Very Intolerant) (P) Preliminary results. Provisional information. Disease and agronomic scores based on one year of data. RLN data relating to these varieties is based on fewer than four years of testing.

- Rating not available.

\* RLN tolerance – The root lesion nematode (*P. thornei* and *P. neglectus*) tolerance ratings that appear in this guide are based on field data collected in the northern grains region rather than national consensus ratings.

\*\* Ratings separated by "-" denotes responses to different phenotypes.

<sup>+</sup> RLN resistance – The Root lesion nematode (*P. thornei* and *P. neglectus*) resistance ratings that appear in this sowing guide are national consensus ratings based on glasshouse and field data collected from all Australian grain regions.

# **DISEASE RATING COLOUR RANGE**



Table 5: Barley varietal details.												
			Varietal info	rmation^								
Variety	End point royalties (EPR)	Grower to grower sales permitted	Variety owner*	Year of release	Royalty manager, EPR collector	EPR rate \$/tonne (GST exclusive)	Comments (as supplied by breeding companies)					
Beast <sup>⊕</sup>	√	Yes	AGT	2020	AGT	\$4.00	A very high-yielding feed barley line with particular adaptation to low to moderate rainfall environments. Beast <sup>(b)</sup> demonstrates excellent grain size (low screenings) and high retention rates. A Compass <sup>(b)</sup> plant type with similar adaptation and biomass production.					
Commander®	~	No	University of Adelaide	2008	Seednet	\$3.80	Malt variety suited to domestic and export markets <sup>^</sup> . Can lodge if sown too early and in high-yielding situations. Rated susceptible to net form net blotch.					
Commodus <sup>®</sup> CL	~	No	InterGrain	2021	InterGrain	\$4.25	High-yielding, quick-maturity, imidazoline-tolerant variety suited to lighter soils and medium-low rainfall environments. Agronomically similar to Compass <sup>(b)</sup> . Similar lodging tolerance and head loss risk to Compass <sup>(b)</sup> , which may require in-season agronomic management. Excellent grain size with high retention levels and low screening. Moderate hectolitre weight. Under evaluation by Barley Australia for malt accreditation.					
Compass <sup>®</sup>	$\checkmark$	No	University of Adelaide	2015	Seednet	\$3.80	Malt-accredited variety suited to domestic and export markets. Earlier flowering compared with Commander <sup>(b)</sup> , high yielding with large grain size, low screenings and high retention. Can lodge if sown too early and in high-yielding situations. Rated VS to leaf rust.					
Fathom®	$\checkmark$	No	University of Adelaide	2014	Seednet	\$2.00	Feed grade variety with large grain size and long coleoptile length. Good resistance to spot form net blotch. Rated susceptible to net form net blotch.					
Laperouse®	~	To be advised	Secobra	2020	Seednet	\$3.80	Laperouse <sup>(h)</sup> is a mid-season variety and has undergone preliminary trial work that indicates its phenology could be better suited to early sowing times than other spring varieties. It has good yield and grain size with lower screenings, a good disease resistance package, particularly improvements in net blotches, and very good straw strength. Malt barley evaluation was undertaken in year 1, further parcels of grain were pilot malted to satisfy the requirements for Stage One. Stage two commercial evaluation trials commenced in 2021. Due to availability of grain parcels, it is expected that Stage Two evaluation will be carried into 2022.					
La Trobe®	~	Yes	InterGrain	2013	Syngenta	\$4.00	Malt-accredited variety suited to the export trade. A semi-dwarf variety, avoid deep sowing due to shorter coleoptile length. Susceptible to spot form of net blotch and powdery mildew.					
Leabrook <sup>®</sup>	~	No	University of Adelaide	2019	Seednet	\$3.80	Leabrook <sup>®</sup> is a mid-early maturing, medium-tall variety with malting accreditation. A very high-yielding variety with similar large grain size and lower screenings compared with Compass <sup>®</sup> . Good resistance and tolerance to root lesion nematode.					
LG Alestar <sup>(b</sup>	$\checkmark$	No	Limagrain	2014	Elders	\$3.00	Insufficient grain quantity available to complete malting assessment hence it has been carried over next year.					
Maximus <sup>®</sup> CL	~	No	InterGrain	2020	Seednet	\$4.25	A mid-quick maturity, imidazoline-tolerant, high-yielding barley. Maximus <sup><math>\Phi</math></sup> CL is similar to Spartacus CL <sup><math>\Phi</math></sup> with an erect plant type, strong lodging tolerance and low-medium head loss risk. Maximus <sup><math>\Phi</math></sup> CL has a short coleoptile and it is recommended that sowing depth be adjusted accordingly. The variety also has a good physical grain package, slightly improved over Spartacus CL <sup><math>\Phi</math></sup> .					
RGT Planet <sup>®</sup>	~	No	RAGT	2017	Seed Force Semences	\$4.00	Malt-accredited variety. Yielded well in the NVT series. Susceptible to spot and net form of net blotch.					
Rosalind <sup>₯</sup>	$\checkmark$	No	InterGrain	2015	Syngenta	\$3.50	Feed grade variety. Avoid deep sowing due to shorter coleoptile length. Rated VS to powdery mildew.					
Shepherd <sup>®</sup>	$\checkmark$	No	QDAF	2008	Seednet	\$2.30	Feed grade. A tall variety with long coleoptile. Susceptible to powdery mildew and SVS to both forms of net blotch.					
Spartacus CL <sup>®</sup>	~	No	InterGrain	2016	Syngenta	\$4.25	Malt-accredited variety. Semi-dwarf and Clearfield® tolerant. Avoid deep sowing due to shorter coleoptile length. Susceptible to spot form of net blotch and powdery mildew.					
Yeti <sup>®</sup>	~	Yes	AGT	2021	AGT	\$4.00	After two seasons in the NVT system, Yeti <sup>®</sup> has established itself as the highest-yielding barley variety in the northern region. While it has a Compass <sup>®</sup> plant type and similar growth habit and early vigour, Yeti <sup>®</sup> is shorter in stature and demonstrates better standability. Yeti <sup>®</sup> also has large grain size and high retentions					

 $\bullet$  QDAF – Queensland Department of Agriculture and Fisheries, AGT – Australian Grain Technologies.

^ www.barleyaustralia.com.au

(b) Varieties displaying this symbol are protected under the *Plant Breeder's Rights Act 1994*. Unauthorised sale of seed of these varieties is an infringement under this Act.

# BARLEY VARIETY YIELD PERFORMANCE

Tables 6A to 6C contain barley grain yield results for selected varieties within each NVT region in Queensland for the past five seasons. Data is presented (as a percentage) for each variety relative to the mean trial yield for the location within each year. Varieties are listed in descending order of average yield over the period.

#### Table 6A: NVT Central Queensland – barley 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha		1.49	2.41	3.47	3.49
Variety	No. trials		2	2	2	2
Leabrook <sup>®</sup>	8		123	114	123	107
Yeti <sup>®</sup>	4				125	110
Compass®	8		119	112	117	101
Beast <sup>(b)</sup>	4				117	100
Commodus <sup>(b)</sup> CL	2					100
RGT Planet <sup>(b)</sup>	8		108	109	116	103
Commander	8	<b>N</b>	117	106	108	106
Laperouse®	6	No trial		98	106	107
Rosalind	8		91	99	104	101
LG Alestar <sup>(b)</sup>	4		103	100		
Fathom	8		90	98	99	97
La Trobe®	8		96	101	98	91
Maximus <sup>®</sup> CL	4				92	105
Spartacus CL <sup>(b)</sup>	8		74	90	85	90

#### Legend: Annual variety yield performance

Lowest

Highest

WHEAT



#### Table 6B: NVT South-East Queensland – barley 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	6.66	2.57	2.44	1.92	4.28
Variety	No. trials	1	1	1	2	2
Yeti <sup>®</sup>	4				122	115
Leabrook®	7	102	110	111	115	107
Rosalind®	7	107	106	94	107	108
Laperouse <sup>(b)</sup>	5			103	111	110
RGT Planet®	7	117	119	94	90	103
Compass®	7	98	105	104	121	105
Maximus <sup>®</sup> CL	4				119	114
Beast <sup>(b)</sup>	4				121	103
Bottler <sup>(b)</sup>	5			100	96	101
Commodus <sup>(b)</sup> CL	2					100
La Trobe®	7	97	99	87	119	103
Fathom <sup>(b)</sup>	7	96	94	90	117	104
Spartacus CL <sup>(b)</sup>	7	99	93	80	112	104
Commander®	7	97	101	115	98	98
LG Alestar <sup>(b)</sup>	7	105	105	102	87	97

#### Table 6C: NVT South-West Queensland – barley 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	4.34	1.33	3.18	2.32	3.48
Variety	No. trials	2	2	1	1	2
Yeti <sup>®</sup>	3				119	115
RGT Planet®	8	122	110	102	106	105
Beast <sup>(b)</sup>	3				119	116
Leabrook®	8	101	115	113	110	110
Compass®	8	98	119	110	114	111
Rosalind <sup>⊕</sup>	8	110	109	103	109	102
La Trobe®	8	102	118	101	116	105
Fathom <sup>(b)</sup>	8	98	113	99	114	108
Bottler <sup>(b)</sup>	4			103	101	100
Commodus <sup>®</sup> CL	2					108
Laperouse <sup>(b)</sup>	4			105	106	105
Spartacus CL <sup>(b)</sup>	8	104	109	94	112	99
LG Alestar®	8	105	92	99	92	93
Commander®	8	92	95	106	93	100
Maximus <sup>®</sup> CL	3				104	98

# CHICKPEA

# **KEY POINTS**

#### Variety selection

Choose varieties that best suit your environment

#### Seed source

Only sow seed from a reputable source

#### **Paddock history**

• Aim for a break of at least three years between chickpea crops

# INTRODUCTION

There are two groups of chickpeas, desi and kabuli, mainly distinguished by seed size, shape and colour.

The two types have different production requirements, markets and end-uses. Most Australian chickpea (desi type) production is in northern Australia and nearly all the grain is exported. The main markets for desi chickpea are India and Pakistan, and Indian communities in other parts of the world such as Britain and western Canada. Buyers in India and Pakistan prefer larger, light-coloured desi chickpea grain.

Temperature, day length and drought are the three major factors affecting flowering in chickpea. Temperature is generally more important than day length. Flowering and pod set require an average daily temperature of 15°C; cool wet conditions at flowering can adversely affect pod and seedset. Flowering is invariably delayed under low temperatures, but more branching occurs.

# **INOCULATION**

All seed should be treated with Group N chickpea inoculant just before sowing. Inoculation should occur for every chickpea crop, every year, regardless of cropping history or soil type, to ensure nodulation.

# DISEASE CHARACTERISTICS

# Leaf diseases

Fungal disease control is geared around protection rather than curing. The first fungicide spray must be applied as early as necessary to minimise the spread of the disease. Additional sprays are required if the weather conditions favour the disease. Timing of fungicide sprays is critical. As Ascochyta and Botrytis can spread rapidly, do not delay spraying. A spray in advance of a rainy period is most desirable.

#### Ascochyta blight

Chickpeas can be infected by Ascochyta blight at several growth stages. Ascochyta inoculum can be found as infected chickpea stubble, internally infected seed, externally infected seed (due to contamination by affected residue) and infected volunteer chickpea plants growing over summer. Variety disease ratings for Ascochyta, which are shown in Table 7, are based on northern Australia results. Avoid planting chickpeas in the same paddock for at least three years or next to last year's chickpea crop.

In seasons of high Ascochyta pressure, a reactive foliar fungicide program is required. Monitor the crop 10 to 14 days after each rain event and if Ascochyta is detected, consult your agronomist.

#### **Botrytis grey mould**

Botrytis grey mould (BGM) is an airborne foliar disease present when temperatures are rising, usually above 15°C and canopy closure is likely.

A registered fungicide seed dressing is highly recommended for early control of seedling root rots, seed-transmitted Ascochyta blight and Botrytis seedling disease. Monitor for BGM in spring as temperatures and humidity rise. Apply a fungicide containing either carbendazim or mancozeb once BGM has been identified within the crop. Variety BGM ratings are shown in Table 7.



# **Root diseases**

#### Phytophthora root rot

Phytophthora root rot (PRR) is a soil and waterborne disease that can establish in any paddock regardless of soil type. Monitor paddocks for affected areas and avoid these if possible, as well as areas that have had pasture legumes (medics and lucerne) and areas that may become waterlogged. A soil test should be carried out on all paddocks before sowing to ascertain the range and levels of disease present. Variety ratings for PRR are shown in Table 7.

#### **Root lesion nematodes (RLN)**

These nematodes are widespread in the northern grains region and can significantly reduce grain yields. RLN is also hosted by many non-cereal crops so the absence of a winter cereal crop in recent seasons does not mean that there are low levels of nematodes in the soil. A soil test should be considered before planting if you do not know the species or levels in your paddocks. Choose a variety that has a higher resistance rating to maximise yield and leave fewer nematodes in the soil to attack the next crop. The reaction of a chickpea variety may differ to the two species of RLN, *Pratylenchus thornei* and *Pratylenchus neglectus*. Refer to Table 7 for variety ratings.

## INTEGRATED DISEASE MANAGEMENT

#### **Summary of strategies**

- Variety selection is critical. Choose varieties that best address your paddock disease status, especially for Ascochyta.
- Paddock isolation from chickpea stubble is a high priority (greater than 500 metres).
- Paddock history. Aim for a break of at least three years between chickpea crops.
- Seed source. Use seed from a paddock where disease was not detected and check germination and vigour.
- Fungicide seed dressing is effective and should be used, especially in high disease risk situations.
- Sowing date. Do not sow too early, even with an Ascochyta-resistant variety.
- Sowing depth. If using an Ascochyta-susceptible variety, sow deeper than normal.
- Sowing rate. Aim for 35 to 50 plants per square metre, depending on the situation and crop type.

- Foliar fungicides. Ascochyta-resistant varieties still require foliar fungicide at podding. Success is dependent on monitoring, timeliness of spraying and correct fungicide choice. Early detection and correct disease identification are essential.
- Manage aphids and virus. Ground surface cover, healthy plants and crop canopy are important. Control aphids at their source (host) crop.
- Harvest management. Harvest early to minimise disease infection of seed. Crop desiccation enables even earlier harvest.

# DESICCATION

Desiccation can occur in chickpea crops when 80 to 85 per cent of pods have turned from green to yellow-brown and 90 per cent of seed has begun to lighten in colour (indicating physiological maturity).

For more information consult <u>www.pulseaus.com.au</u>



# CHICKPEA VARIETY DISEASE RATINGS

Table 7 contains varietal ratings for the predominant diseases of chickpea in Queensland. Varieties of most relevance to Queensland growers are listed in alphabetical order and disease ratings are colourcoded to match resistance and susceptibility ratings.

Table 7: Chickpea disease ratings.										
				Root lesion nematode						
	Ascochyta blight (Pathogen Group 2	Potrutic grou	Dhytenhthere	P. neg	lectus	P. thornei				
Variety	– North)*	mould**	root rot	resistance#	tolerance##	resistance#	tolerance##			
CBA Captain <sup>()</sup>	MS	S	MSS (P)	MR (P)	TMT (P)	MS (P)	MT			
Kyabra <sup>®</sup>	VS	S	S (P)	MRMS	MT (P)	MSS (P)	TMT			
PBA Boundary®	MS	S	VS (P)	RMR (P)	MII (P)	MRMS	TMT			
PBA Drummond <sup>(b)</sup>	S	S	SVS (P)	MR (P)	T (P)	MRMS (P)	MTMI			
PBA HatTrick <sup>(b</sup>	MS	S	MSS (P)	MRMS	MT (P)	MRMS	MT			
PBA Pistol <sup>(b)</sup>	VS	S	_	RMR (P)	-	MS	I			
PBA Seamer	MS	S	S (P)	MRMS	MII (P)	MRMS	MT			

#### Legend

R (Resistant) RMR (Resistant – Moderately Resistant) MR (Moderately Resistant) MRMS (Moderately Resistant – Moderately Susceptible) MS (Moderately Susceptible) MSS (Moderately Susceptible) - Susceptible) S (Susceptible) SVS (Susceptible) - Very Susceptible) VS (Very Susceptible) T (Tolerant) TMT (Tolerant) - Moderately Tolerant) MT (Moderately Tolerant) MTMI (Moderately Tolerant) Moderately Intolerant) MI (Moderately Intolerant) MII (Moderately Intolerant - Intolerant) I (Intolerant) IVI (Intolerant - Very Intolerant) VI (very Intolerant) (P) Preliminary results. Provisional information. Disease and agronomic scores based on one year of data. RLN data relating to these varieties is based on fewer than four years of testing.

- Rating not available

\* Ascochyta ratings are for northern Australia only.

## RLN tolerance – The root lesion nematode (P. thornei and P. neglectus) tolerance ratings that appear in this guide are based on field data collected in the northern grains region rather than national consensus ratings.

# RLN resistance – The Root lesion nematode (P. thornei and P. neglectus) resistance ratings that appear in this sowing guide are national consensus ratings based on glasshouse and field data collected from all Australian grain regions.

\*\* The risk of Botrytis grey mould (BGM) damage can be affected by the spray programs for Ascochyta blight (AB); fungicides used to control AB can also control BGM. Note that if BGM risk is high, then a fungicide with greater efficacy for BGM than for AB might also be needed. BGM screening is conducted in a controlled environment and rating is independent of plant architecture.

# DISEASE RATING COLOUR RANGE

R	RMR	MR	MRMS	MS	MSS	S	SVS	VS
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BARLEY

Table 8: Chickpea varietal details.								
	Varietal information							
Variety	End point royalties (EPR)	Grower to grower sales permitted	Variety owner*	Royalty manager, EPR collector	EPR rate \$/tonne (GST exclusive)	Year of release	Comments (as supplied by breeding companies)	
CBA Captain <sup>(b)</sup>	$\checkmark$	No	NSWDPI/GRDC	NSWDPI	\$4.50	2020	An erect, early to mid maturity, medium height variety with broad adaptation. Yellow brown seed coat and angular seed shape. Good pod height and low lodging.	
Kyabra <sup>()</sup>			QDAF/NSWDPI	Heritage Seeds	Nil	2005	Tall, erect, high-yielding variety with large seed size and susceptible to all three diseases (AB, PRR, BGM). Lodging resistant, bred for southern Queensland but performs well in central Queensland as well. Amethyst/Norwin/Barwon cross. Seed royalty applies. No EPR.	
PBA Boundary <sup>(b)</sup>	~	No	PBA	Seednet	\$4.00	2011	Moderately susceptible to Ascochyta blight but susceptible to Phytophthora root rot. Tall, erect with high yield. Lodging resistant and bred for southern Queensland. Jimbour cross.	
PBA Drummond <sup>(b)</sup>	$\checkmark$	No	PBA	Seednet	\$4.50	2018	Tall, erect, high-yielding variety evaluated and released in central Queensland with limited Ascochyta blight (AB) resistance. Lodging resistant. PBA HatTrick <sup>(D)</sup> /PBA Pistol <sup>(D)</sup> cross.	
PBA HatTrick <sup>()</sup>	$\checkmark$	No	PBA	Seednet	\$4.00	2009	Moderate susceptibility to Ascochyta blight and moderate resistance to Phytophthora root rot. High yields in and bred for southern Queensland. A cross involving Jimbour.	
PBA Pistol <sup>(1)</sup>	$\checkmark$	No	PBA	Seednet	\$4.00	2010	PBA Pistol <sup>(4)</sup> was released as a Moti <sup>(b)</sup> replacement. It is taller, more resistant to lodging and offers improved harvestability. High yielding with large seed size. PBA Pistol <sup>(4)</sup> must not be grown south of Theodore/Rolleston due to its susceptibility to Ascochyta blight. Evaluated and released in central Queensland and susceptible to all three diseases (AB, PRR, BGM). Lodging resistant. A Moti <sup>(4)</sup> cross.	
PBA Seamer <sup>(b</sup>	~	No	PBA	Seednet	\$4.00	2016	Most resistant variety to all three diseases (AB, PRR, BGM). Semi-erect plant type with high yield. Lodging resistant with improved seed quality. PBA HatTrick <sup>(D</sup> cross, bred for southern Queensland conditions.	

GRDC – Grains Research and Development Corporation
NSWDPI – New South Wales Department of Primary Industries
PBA – Pulse Breeding Australia
QDAF – Queensland Department of Agriculture and Fisheries

 $\langle \! D \rangle$  Varieties displaying this symbol are protected under the *Plant Breeder's Rights Act.* Unauthorised sale of seed of these varieties is an infringement under this Act.



# CHICKPEA VARIETY YIELD PERFORMANCE

Tables 9A to 9C contain chickpea grain yield results for selected varieties within each NVT region in Queensland for the past five seasons. Data is presented (as a percentage) for each variety relative to the mean trial yield for the location within each year. Varieties are listed in descending order of average yield over the period.

#### Table 9A: NVT Central Queensland – chickpea desi 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	2.85	2.17	1.96	1.96	2.38
Variety	No. trials	4	4	3	3	3
PBA Drummond <sup>®</sup>	17	107	109	117	105	103
CBA Captain®	15	103	104	108	103	102
PBA Seamer®	17	101	103	101	104	103
PBA Pistol <sup>(b)</sup>	17	98	100	94	103	104
PBA HatTrick®	17	98	97	96	97	98
Kyabra®	17	96	93	97	98	101

#### Table 9B: NVT South-East Queensland – chickpea desi 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	2.50	1.91	1.93	1.51	1.36
Variety	No. trials	3	3	1	3	1
PBA Drummond <sup>()</sup>	5			108	108	109
CBA Captain®	11	112	109	103	104	104
PBA Boundary®	11	99	105	104	100	103
PBA Seamer®	11	106	98	98	100	98
Kyabra <sup>®</sup>	11	93	103	99	106	106
PBA HatTrick <sup>®</sup>	11	92	97	99	99	100

#### Table 9C: NVT South-West Queensland – chickpea desi 2016–20.

Long-term predicted grain yield expressed as a percentage of mean yield.

	Year	2016	2017	2018	2019	2020
	Mean yield t/ha	3.00	1.27	1.59	0.72	1.18
Variety	No. trials	2	3	3	1	1
PBA Drummond <sup>(b)</sup>	5			112	103	120
CBA Captain®	10	109	110	105	105	109
Kyabra <sup>®</sup>	10	103	107	104	89	114
PBA Boundary®	10	102	102	104	87	104
PBA Seamer <sup>(b)</sup>	10	101	100	98	114	97
PBA HatTrick <sup>®</sup>	10	96	97	99	92	99

Legend: Annual variety yield performance

Lowest









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