October 2016

SECTION 2

Pre-planting

For more information, see the *GRDC GrowNotes WHEAT (Northern region),* Section 2: Preplanting.

2.1 Varietal performance and yield ratings

More information

NSW DPI. Winter crop variety sowing guide 2016.

T Napier, L Gaynor, D Slinger, N Graham, C Podmore (2015), Drivers of high-yielding irrigated wheat production.

Z Hochman, D Gobbett, H Horan, JN Garcia (2015),Visualizing yield gaps in Australia's wheat cropping zone.

M Robertson, G Rebetzke, J Kirkegaard, R Llewellyn, Tim Wark (2015), Are future yield gains in wheat of 1.5% per year achievable?

Figure 1: Durum in the paddock.

Caparoi(ϕ) ADR quality. A mid season maturity durum, with a maturity between EGA_Bellaroi and Jandaroi. It is a semi-dwarf durum variety with good yield potential in all regions. The grain quality is better than Wollaroi, and similar to Jandaroi and EGA_Bellaroi. Caparoi has improved dough strength compared with EGA_Bellaroi, but is inferior to Jandaroi for this trait. Caparoi is superior to Jandaroi for semolina yellowness. Moderately susceptible to root lesion nematode (Pratylenchus thornei) and very susceptible to crown rot. Adequate resistance to common root rot. Good shedding resistance. (Marketed by Seednet).

DBA_Aurora(ϕ) ADR quality. A mid season maturity durum variety with high yield potential, released for the southern grains region. High yield potential, with yield levels similar to Hyperno in most NSW regions, so nitrogen management is important to obtain acceptable grain protein levels for delivery into durum quality grades, especially DR1. Higher levels of screenings can occur in some circumstances when compared with varieties such as Jandaroi and Caparoi. Avoid sowing DBA_Aurora later than the suggested sowing window for your region as grain quality and yield potential can be affected. It can lodge under irrigation or high yielding conditions. It is rated resistant–moderately resistant to root lesion nematodes (P. thornei) and susceptible–very susceptible to crown rot. Bred by the Southern Program of Durum Breeding Australia (University of Adelaide). (Marketed by SA Durum Growers Association).

DBA_Lillaroi(ϕ) ADR quality. An early–medium maturity variety, three days later flowering than Jandaroi, with a higher grain yield. Excellent durum quality with the large grain size of the commercial varieties, low screenings, high test milling yield, and the highest semolina colour compared with current varieties. Adapted to the rain-fed durum production regions of NSW and is also suited to sowing later in the season. DBA_Lillaroi is not recommended for high-input irrigated systems without the appropriate agronomic management. Rated moderately resistant to root lesion nematode (*P.thornei*) and susceptible–very susceptible to crown rot. Bred by the Northern Program of Durum Breeding Australia (NSW Department of Primary Industries). (Marketed by Seednet).

EGA_Bellaroi(ϕ) ADR quality. A mid season maturity durum variety. The grain yield is typically better than Yallaroi or Wollaroi, but inferior to the newer-released varieties, Caparoi, DBA_Lillaroi and Jandaroi. The grain protein is consistently higher than other current commercial varieties. EGA_Bellaroi makes good quality pasta, but has poor dough strength. Moderately resistant to common root rot and very susceptible to crown rot. It can lodge under high yielding conditions, but is still the best variety for reduced crop lodging in irrigated durum production systems in southern NSW. (Marketed by Seednet/Heritage Seeds.)

Hyperno(ϕ) ADR quality for northern NSW. A mid season maturity durum with excellent yield potential. Maturity is earlier than EGA_Bellaroi. It is resistant to stem rust and resistant–moderately resistant to leaf rust; susceptible–very susceptible to crown rot. It has a good level of sprouting and black point tolerance. It can produce higher screenings than other durum varieties in some circumstances. It can lodge under irrigation or high yielding conditions. (Marketed by AGT).

Jandaroi(ϕ) ADR quality for northern NSW. A quick maturity variety adapted to most durum producing regions and is suited to sowing later in the season. It has been shown to have improved weather tolerance at harvest compared with other varieties. Grain quality is superior to Caparoi, EGA_Bellaroi and Wollaroi, with much stronger dough properties but lower yellow pigment. An erect, semi-dwarf plant type. It is very prone to lodging under high yield conditions in southern NSW. It is moderately susceptible–susceptible to root lesion nematode, moderately resistant to black point and very susceptible to crown rot. (Marketed by Seednet.)

More information

Graincorp (2015), Durum standards 2015-2016

See Table 1 for resistance ratings of some durum cultivars. Information about varieties is also available at National Variety Trials on http://www.nvtonline.com.au/nvt-results-reports/

Table 1: Levels of resistance to diseases and other conditions (Source: www.acasnvt.com.au)

Variety	Rust Resistance			RLN (*P. thornei*) Resistance/ Tolerance	RLN (*P. neglectus*) Resistance/ Tolerance	Yellow Leaf Spot	Septoria tritici	Crown Rot	Common Root Rot	Black-point
	Stem rust	Leaf rust	Stripe rust							
DBA Lillaroi	MR	MR	R-MR	MR/MI-I	MR-MS/-	MR-MS	MR-MS	S-VS	MR-MS	MR
Jandaroi	R-MR	MR	MR	MR-MS / MI	MS / MI	MS	R-MR	VS	MR	R-MR
Caparoi	MR	MR-MS	MR	MR / T-MT	MS-S / MI	MR-MS	MR	VS	MS	MR
EGA Bellaroi	MR	MR-MS	MR	MR / MT	MS / MI-I	MR-MS	MR-MS	VS	MR	R-MR

2.1.1 Quality traits

Grain quality is very important for obtaining premium prices with durum wheat. Downgrading may occur if grain contains mottling, black point or weather damage (Table 2).

Table 2: Major durum wheat quality classes[1]

	Protein	Vitreous kernels	Falling number	Screenings	Stained grains[A]
ADR1	13.0%	>80%	>300	<5%	<3%
ADR2	11.5–12.9%	>70%	>300	<5%	<5%
ADR3	10.0–11.4%		>250	<10%	<20%
Feed	< 10.0%				

[A]Includes black point.

2.1.2 Maturity

There is currently a relatively small range in maturity length in durum varieties compared with bread wheat varieties. Durums are generally similar in maturity to the faster growing bread wheat varieties. This is an important consideration when managing frost risk and can limit opportunities to exploit early-planting opportunities.

Extended flowering could reduce the risk of pollination failure caused by frost or extended moist weather. The time difference in reaching full maturity between the early-flowering and late-flowering tillers is normally fairly small; therefore, the early heads are not likely to be ripe for many days ahead of the later heads. Harvesting should not be delayed significantly.

Durum wheats will perform well if sown later, but grain yields will depend on seasonal conditions, especially during the flowering and grain-filling stages. [2] However, best yields are achieved with planting in the mid-May to mid-June window and crops sown in early parts of the sowing window establish well, escape terminal drought to some extent and yield the best.

2.2 Planting-seed quality

2.2.1 Seed size

Durum seed is, on average, 20% larger than bread wheat seed. The planting rate should be adjusted based on 1000 grain weight data to sow 100 seeds/m^2. However, a higher planting rate may be beneficial in some situations (e.g. seed with a low germination, irrigated crops or early/late sowings). Conventional sowing equipment can be used but the larger seed size may necessitate adjustments.

2.2.2 Seed germination and vigour

Use germination tested viable seed that is true to type (varietal purity)—free of diseased seed and weed seeds, cracked and small grain, and barley and bread wheat grain. Ensure that the initial seed of a purchased variety is of high quality, preferably from certified seed stocks, with a germination percentage >80%. Before harvesting seed stocks for the following season, remove all off-types and contaminant crop and weed plants. [3]

[1] DAFF (2012) Durum wheat in Queensland. Queensland Department of Agriculture, Fisheries and Forestry, http://www.daff.qld.gov.au/plants/field-crops-and-pastures/broadacre-field-crops/wheat/durum-wheat

[2] R Hare (2006) Agronomy of the durum wheats Kamilaroi, Yallaroi, Wollaroi and EGA Bellaroi. Primefacts 140, NSW Department of Primary Industries, http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0007/63646/Agronomy-of-the-durum-wheats---Primefact-140-final.pdf

[3] R Hare, (2006) Agronomy of the durum wheats Kamilaroi, Yallaroi, Wollaroi and EGA Bellaroi. Primefacts 140, NSW Department of Primary Industries, http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0007/63646/Agronomy-of-the-durum-wheats---Primefact-140-final.pdf

Seed grain kept for sowing in subsequent seasons must be stored in clean silos capable of aeration, sealing for insect control and keeping grain dry and as cool as possible. Such storage conditions will assist the maintenance of high-viability seed for the following season.

Treat seed with an appropriately registered product just prior to sowing to control smut and bunt. Some chemical constituents can reduce viability and seedling vigour if they remain in contact with the seed for any length of time.

Seed treatment will offer protection to the establishing seedlings from damping-off diseases and insect attack such as armyworms, cutworms, false wireworms and wireworms. Ground preparation is the same as for bread wheat. Adequate cultivation and/or spraying should eliminate all volunteer plants of bread wheat, barley and other crop/weed species. [4]

[4] R Hare, (2006) Agronomy of the durum wheats Kamilaroi, Yallaroi, Wollaroi and EGA Bellaroi. Primefacts 140, NSW Department of Primary Industries, http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0007/63646/Agronomy-of-the-durum-wheats---Primefact-140-final.pdf