NORTHERN
OCTOBER 2016

GRDC GROWNOTES™

GRDC
GRAINS RESEARCH & DEVELOPMENT CORPORATION

DURUM

SECTION 3

PLANTING

SEED TREATMENTS | TIME OF SOWING | TARGETED PLANT POPULATION | CALCULATING SEED REQUIREMENTS | SOWING DEPTH | SOWING EQUIPMENT

SECTION 3

Planting

For more information, see the *GRDC GrowNotes WHEAT (Northern region),* Section 3: Planting.

3.1 Seed treatments

Research is under way to establish whether it is of economic benefit to use seed treatments (such as imidacloprid) to prevent aphids in durum. The cost of around AU$33/ha was considered worthwhile during times of high grain prices. Northern Grower Alliance (NGA) research over two seasons found yield increases averaged ~11% in barley and durum, and 5% in wheat. One of the challenges of electing to use a prophylactic treatment such as a seed dressing is that aphids are a sporadic pest and will not reach damaging levels every year. [1]

For more information, download: http://www.grdc.com.au/uploads/documents/GRDC_FS_CerealAphids1.pdf

For details of registered seed treatments, visit: www.apvma.gov.au

More information

R Graham, N Graham, S Simpfendorfer (2015), Yield impact of crown rot and sowing time on winter cereal crop and variety selection Tulloona 2015

J Hunt, B Trevaskis, A Fletcher, A Peake, A Zwart, N Fettell (2015), Novel wheat genotypes for early sowing across Australian wheat production environments.

3.2 Time of sowing

The optimum sowing date will depend on the maturity ranking of the variety, latitude of the sowing site, and topographic aspect (e.g. north/south facing slope, elevation). Durum wheats will perform well if sown later, but grain yields will depend on seasonal conditions, especially during the flowering and grain-filling stages.

The sowing time of a variety is a critical factor in crop risk management. Growers should aim for a balanced minimisation of the combined risks of frost damage around flowering/grain-filling, moisture stress at this time, and rain or storm damage just prior to harvest.

Crops sown earlier than optimal will be exposed to an elevated frost risk, whereas those sown later than the optimal period could encounter high moisture stress and harvest spoilage. None of these risks can be eliminated, but minimisation is possible.

The normal sowing window for durum in the northern regions is from mid/late May to mid-June. EGA Bellaroi and Caparoi are suitable for sowing in mid/late May. Jandaroi is early maturing and it should be sown late May onwards and it is also suitable for sowing late after a cotton crop. The suggested sowing time for DBA Lillaroi in the northern region is late May to end of June. It is also suitable for late sowing (e.g. after a cotton crop).

The sowing of several varieties of different maturity ranking over several weeks should spread the risks associated with flowering, grain-filling and harvest. Given differing rates of growth development, each variety should not be exposed to the same degree of risk at any specific critical stage (e.g. at flowering). [2]

More information

Winter Cereal Planting Guides: http://www.dpi.nsw.gov.au/agriculture/broadacre/guides/winter-crop-variety-sowing-guide

NVT Queensland Wheat Variety Guide 2015.

https://grdc.com.au/Research-and-Development/National-Variety-Trials/Crop-Variety-Guides

[1] GRDC (2010) Cereal aphids—aphid control in cereals can pay. GRDC Fact Sheet Northern Region July 2010, http://www.grdc.com.au/uploads/documents/GRDC_FS_CerealAphids1.pdf

[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

GRDC GRAINS RESEARCH & DEVELOPMENT CORPORATION

More information

https://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2016/02/Yield-impact-of-crown-rot-and-sowing-time-on-winter-cereal-crop-and-variety-selection-Tulloona-2015

https://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2016/02/Durum-agronomy-a-northern-perspective

https://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2015/03/High-crown-rot-risk-barley-vs-wheat

https://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2015/02/Variety-specific-agronomy-2014-agronomy-trials-in-the-northern-grain-region-of-NSW

http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0011/272945/winter-crop-variety-sowing-guide-2016.pdf

3.3 Targeted plant population

Commonly used seeding rates are 45–50 kg/ha (northern NSW) and the standard planting times are May–June. Planting should be adjusted to suit the local seasonal conditions to avoid frost damage to the heads and stems at head emergence and during flowering. [3]

Durum wheat remains the most susceptible of the winter cereal crops to crown rot infection and yield loss. Management strategies such as rotation, fallow/stubble management, inter-row sowing and planting time have been investigated, with demonstrated benefits. However, little work has focused on the effect of varying plant population and the carryover effect on soil water available for the critical crop development stages of flowering and grain-fill, which dictates the extent of yield loss to crown rot.

In 2009, five replicated trials were conducted across northern NSW, using the four main durum varieties in the region, to assess whether the impact of crown rot could be minimised by varying plant populations and using different varieties.

Varying plant populations at sowing did not reduce the impact of crown rot in the four durum varieties examined. In fact, at lower plant populations there appeared to be a higher risk of lodging associated with crown rot infection, which usually results in lower yields. High loads of crown rot reduced plant establishment, as well as reducing tiller and head production. However, there were significant varietal differences in yield and tiller production (Figure 1).

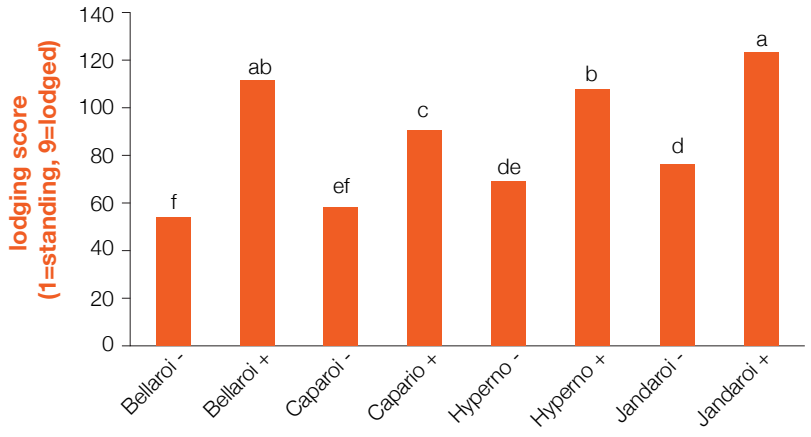

Figure 1: Yield loss due to crown rot in northern NSW.

The greatest impact on durum yield remains the crown rot inoculum level, with the disease having a greater impact on yield in the more western environments, which tend to have hotter/drier conditions during grain-fill. Analysis of the soil water and plant pathology data should provide additional insight into the impact of crown rot on soil water use. However, under high crown rot pressure, yield losses in durum cannot be managed by manipulating the plant population at sowing. Given the extreme susceptibility of durum wheat to crown rot, it remains critical to target durum production only in paddocks known to have low levels of inoculum. [4]

For more information, download the GRDC Update paper '*Impact of plant population on crown rot in durum wheat*': http://www.grdc.com.au/Research-and-Development/GRDC-Update-Papers/2010/09/IMPACT-OF-PLANT-POPULATION-ON-CROWN-ROT-IN-DURUM-WHEAT.

[3] J Kneipp, (2008) Durum wheat production, NSW Department of Primary Industries, http://www.nvtonline.com.au/wp-content/uploads/2013/03/Crop-Guide-NSW-Durum-Wheat-Production.pdf

[4] GRDC (2010) Impact of plant population on crown rot in durum wheat. GRDC Update Papers 24 Sept. 2010, http://www.grdc.com.au/Research-and-Development/GRDC-Update-Papers/2010/09/IMPACT-OF-PLANT-POPULATION-ON-CROWN-ROT-IN-DURUM-WHEAT.

3.4 Calculating seed requirements

A sowing rate of 45 kg/ha is given as a general guide. However, growers may consider a variation, higher or lower, to benefit their situation. A reduced germination percentage or a late sowing will make it necessary to increase this rate. [5]

3.5 Sowing depth

In a well-prepared seedbed, the sowing depth should be about 3–6 cm and not exceed 8 cm. As the current durum cultivars are semi-dwarf cultivars, the length of the coleoptile is reduced and so it cannot penetrate greater soil depths. Sowing rate can be considered a risk-management tool. Dense stands of plants tend to produce few tillers per plant (i.e. the primary and a few secondary), whereas stands at a reduced density have plants that produce a larger number of tillers per plant. Such reduced-density stands have greater flexibility in response to changing growing conditions. For example, if moisture is limiting, fewer tillers are initiated; however, if seasonal conditions improve, additional tillers may develop. [6]

3.6 Sowing equipment

Use conventional sowing equipment, the larger grain size may need appropriate adjustments. A sowing rate of 45 kg/ha is given as a general guide. However, growers may consider a variation, higher or lower, to benefit their situation. A reduced germination percentage or a late sowing will make it necessary to increase this rate. [7]

[5] 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

[6] 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

[7] 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