KEY POINTS

* Bellaroi has been the industry standard durum wheat variety grown in the region, out performing most other varieties in terms of lodging tolerance, yield and quality in southern NSW.

* There is a need for an alternate durum variety to Bellaroi in SNSW, which is now outdated, as in many NVT trials it has not performed as well as some of the newer released varieties.

* Bellaroi remains the standout durum variety, in terms of lodging resistance, yield and quality, at the irrigated Hillston trial. Once again its grain protein was around 1% higher than Caparoi.

* DBA-Aurora shows promise as a Bellaroi replacement. In this trial it yielded equivalent even with in-season lodging (prior to Bellaroi lodging). Although it has a lower grain protein achievement when compared to varieties such as Bellaroi; if a demonstrated significant yield improvement can be shown in replicated trials, further nitrogen work can be conducted to ensure grain protein targets are met.

BACKGROUND

Durum wheat contributes to a large proportion of Ag Grow Agronomy clients irrigated wheat production, and potential for expansion into the MIA is significant.

Variatel choice is limited by end users preferences, yield potential, lodging, acid soil tolerance and grain quality. The industry standard variety Bellaroi (in SNSW) is now outdated, but there are limited alternatives that offer any advantages in yield and quality in Southern NSW. This has been confirmed by previous durum trials in the region by both NSW DPI and Ag Grow.

TRIAL DETAILS

An irrigated trial was established at Graeme Horneman’s, Hillston on 15th May and a dryland trial was established at Michael Pfitzner’s, in the Rankins Springs area on 19th May, in conjunction with Jason Able, from the University of Adelaide.

The aim of the trials were to compare various durum wheat varieties from the University of Adelaide durum breeding team with existing varieties commonly grown in SNSW at one irrigated site and one dry land site. Four industry standard bread wheat varieties were also chosen for each site for comparison.

Both trials consisted of 8 durum varieties and 4 bread wheat varieties (as checks). They were replicated 3 times and had plot sizes of 12m by 1.75m.

A list of the varieties used in the trials is shown in table 1.

Hillston Site:

The trial at Hillston was sown at 120 kg/ha and had 150 kg/MAP applied at sowing, and 100kg Nitrogen predrilled prior to a planned cotton crop that was never planted. It was topdressed in August with 300 kg Urea. Two spring irrigations were applied in August and September as were 2 timely fungicides in August and October (by plane).
Rankins Springs Site:
The Rankins Springs trial was sown at 30 kg/ha with 60 kg/ha MAP. It was topdressed with 60 kg Urea in July.
It also received 2 fungicide applications the first in July and the second in September.

RESULTS AND DISCUSSION
Statistical analysis was carried out on the Rankins Springs and Hillston trials, with no significant differences found.

Below is a discussion of the observations of each of the trials.

Grain yield and protein
The yield and grain protein results for the Hillston and Rankins Springs trials are shown in figure 1 to figure 4.

Hillston:
Yields ranged from 7.9 to 10.1 t/ha, as shown in figure 1, and protein ranged from 11.5 to 14.7%, as shown in figure 2.
The variability in yield between replications was high and likely due to lodging, therefore unfortunately no yield differences were measured at 95% confidence.

Bellaroi had the highest grain protein in this trial, with 14.7%, whilst DBA-Aurora had the lowest grain protein of the durums with 12.7%. The other durum varieties WID 802, Yawa, Caparoi, Hyperno, Tjilkuri and Saintly had proteins of 13.7%, 13.5%, 13.4%, 13.3%, 13.2% and 12.8% respectively.

Spitfire had the highest protein of the bread wheats with 13.4%. This was followed by Lancer 12.5%, Chara 12.4% and Merinda 11.5%, the lowest protein for this trial.

Rankins Springs:
Yields ranged from 2.9 to 3.8 t/ha, as shown in figure 3, and protein ranged from 10.1 to 11.9%, as shown in figure 4.

Again the yield variability between replications was too large to highlight any differences in yield at 95% confidence. This was likely due to the severe drought conditions at the end of the season causing the trial to finish grainfill prematurely.

The durum variety Yawa had the lowest protein at 10.1%, while Bellaroi had the highest with 11.7%
Figure 1: Average durum trial grain yield - Hillston (no significant differences).

Figure 2: Average durum trial grain protein - Hillston

Figure 3: Average durum trial grain yield - Rankins Springs (no significant differences).
Figure 4: Average durum trial grain protein - Rankins Springs

![Rankins Springs Grain Protein](image)

Figure 5: Average durum trial lodging at harvest - Hillston

![Hillston Lodging Scores](image)

Figure 6: Durum varieties lodging at Hillston

![Durum varieties lodging at Hillston](image)
Figure 7: Height at flowering at Hillston and Rankins Springs.

Figure 8: Photo at harvest at Hillston highlighting lodged plots. Durum trial is in bottom left corner.
Lodging scores

Lodging scores were taken in October and again at harvest. Lodging was scored on a scale of 0 to 9, with 0 indicating no lodging and 9 flat on the ground.

There was no lodging recorded at the dryland Rankins Springs site. Under a high input irrigated situation, as was the case at Hillston, most of the varieties showed some degree of lodging, as shown in figure 5.

Lodging at Hillston was variable. The durum varieties Yawa and Hyperno had the highest degrees of lodging in this trial. This was followed by Bellaroi and Saintly on 8.3; DBA-Aurora, WID802 and Tjilkuri on 8 and Caparoi, which had the least amount of lodging out of the durums with a score of 7. Whilst the data is not shown, Bellaroi lodged much later in the season when compared to DBA-Aurora and Yawa. With DBA-Aurora lodging much earlier, this could have significantly impacted on the overall yield potential of this variety.

Out of the bread wheats Spitfire had the highest degree of lodging with a score of 8.3. Lancer showed the greatest standability in the trial with a score of 2.3.

It is important to note that given the lodging in the trial the yields were not that different, however varieties that lodged more and earlier may have lost yield as a result.

SUMMARY

Under a high yielding irrigated environment in SNSW the standard durum variety Bellaroi still holds its own, in terms of yield and quality. Although in NVT trials across the state it has not performed as well when compared to the newly released varieties (e.g. DBA-Aurora), under local conditions at Hillston it remains one of the highest yielding varieties with the highest grain protein, and one of the better varieties for lodging resistance.

The newly released variety DBA-Aurora has shown some promise as a replacement for Bellaroi yielding well locally, although further work investigating its grain protein achievement will need to be conducted as it did not meet the 13% DR1 specification in either the Hillston or Rankins Springs trials.

Lancer proved to be the pick of the bread wheats in the irrigated trial, not only yielding well but also showing great standability compared to most of the other varieties. In the dry land trial both Spitfire and Suntop proved to be the pick of the varieties.

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Further contacts

Barry Haskins  Ag Grow Agronomist  barry@aggrowagronomy.com.au
Mat Ryan  Ag Grow Agronomist  mat@aggrowagronomy.com.au
Rachael Whitworth  Ag Grow Research Manager  rachael@aggrowagronomy.com.au
Dr Jason Able  Durum Breeder, University of Adelaide  jason.able@adelaide.edu.au