



Office Use Only

Project Code	
Project Type	

FINAL REPORT 2018

Applicants must read the *SAGIT Project Funding Guidelines 2017* prior to completing this form. These guidelines can be downloaded from www.sagit.com.au

Final reports must be emailed to admin@sagit.com.au as a Microsoft Word document in the format shown **within 2 months** after the completion of the Project Term.

PROJECT CODE	UA415
---------------------	-------

PROJECT TITLE	(10 words maximum)
Growing durum demand in SA: gross margin sensitivity analysis trials	

PROJECT DURATION

These dates **must** be the same as those stated in the Funding Agreement

Project Start date	1 st July 2015				
Project End date	30 th June 2018				
SAGIT Funding Request	2015/16		2016/17		2017/18

PROJECT SUPERVISOR CONTACT DETAILS

The project supervisor is the person responsible for the overall project

Title:	First Name:	Surname:		
A/Prof	Jason	Able		
Organisation:				
The University of Adelaide				
Mailing address:				
Telephone:	Facsimile:	Mobile:	Email:	

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

ADMINISTRATION CONTACT DETAILS

The Administration Contact is the person responsible for all administrative matters relating to the project

Title:	First Name:	Surname:	
Ms	Chelsea	DuBois	
Organisation:			
The University of Adelaide			
Mailing address:			
Telephone:	Facsimile:	Mobile:	Email:

PROJECT REPORT

Provide clear description of the following:

Executive Summary (200 words maximum)

A few paragraphs covering what was discovered, written in a manner that is easily understood and relevant to SA growers. A number of key dot points should be included which can be used in SAGIT communication programs

When compared with bread wheat (*Triticum aestivum*), durum or pasta wheat (*T. durum*) has several significant industry advantages including its hardness, protein content, yellow colour and reputation for quality from national and international millers and producers.

Typically there is a premium for growing durum most seasons, when compared to bread wheat. This can be low/negligible (<\$20 tonne) or high (>\$80 tonne), and will be dependent (to a large extent) on global volatility of durum being grown in the northern hemisphere.

When price differences are low/negligible, growers need to know whether durum is a viable, profitable alternative for their farming system. Through conducting a series of trials across areas that were not considered durum 'heartland' [Lower EP (Yeelana); Upper Mid-North (e.g. Wandearah); the Western Murray Plains (e.g. Sanderston); and the 'Upper South East' (e.g. Coonalpyn)], we undertook a gross margin sensitivity analysis of how the latest durum varieties stacked up against lead bread wheat varieties (i.e. at what point for yield, price and inputs would durum be a profitable proposition). We also included the lower mid-north (Roseworthy) as a 'check'.

Key points from the three year project were:

- Price difference between bread wheat and durum is a main driver for return;
- Good quality for durum will generally result in a healthy gross margin being achieved;
- Under good growing conditions there is not a significant difference in yield between the best durum (e.g. DBA-Aurora) and bread wheat varieties (e.g. Mace);
- With a later start to the season, durum does suffer a yield penalty;
- All trial sites evaluated showed a three year average that had durum returning a higher gross margin than bread wheat.

Project Objectives

A concise statement of the aims of the project in outcome terms should be provided.

This project set out to:

1. Evaluate leading durum varieties and a selected advanced breeding line (from Durum Breeding Australia's (DBA) Southern Node Breeding Program) against leading bread wheat varieties in the same trials;
2. Establish a series of coordinated trials in areas that are not yet known for widely growing durum and/or have grown durum historically but are no longer pursuing this crop. Areas included the Lower EP (Yeelana); Upper Mid-North (e.g. Wandearah); the lower mid-north (Roseworthy); the Western Murray Plains (e.g. Sanderston); and the 'Upper South East' (e.g. Coonalpyn);
3. Promote durum as an alternative high value crop through field day events highlighting the trials, results and updating growers (and consultants/advisors) with further information about the durum industry in South Australia.

Overall Performance

A concise statement indicating the extent to which the Project objectives were achieved, a list of personnel who participated in the Research Project including co-operators, and any difficulties encountered and the reasons for these difficulties.

All project objectives were achieved. It can also be stated that through the research results generated and communicated from this SAGIT-funded project, there has been a direct increase in durum uptake across the State (see application/communication of results later).

Personnel at University of Adelaide: A/Professor Jason Able, Alistair Pearce, Stuart Hentschke.

Personnel at SADGA: Alwyn Dyer, John Green, Deb Baum, SADGA Committee.

Trial Co-operators (all years):

Coonalpyn – Fred Schilling *or* Calum Dow

Roseworthy – John Mathieson (Farm Manager)

Sanderston – Tim Starkey

Wandearah – Phillip Johns

Yeelana – Jordan Wilksch

Difficulties: Nil, although more rain in 2017 would have been good!

Key Performance Indicators (KPI)

Please indicate whether KPI's were achieved. The KPI's **must** be the same as those stated in the Application for Funding and a brief explanation provided as to how they were achieved or why they were not achieved.

KPI	Achieved (Y/N)	If not achieved, please state reason.
Plan, conduct, harvest and analyse at least four trials each year in the district areas listed in the research proposal (minimum one trial per area)	Y	N/A
Publish trial results for relevant Farming Systems Groups, and the SADGA website	Y	N/A
Annual progress reports submitted to SAGIT	Y	N/A
Final report submitted to SAGIT	Y	N/A

Technical Information (Not to exceed **three** pages)

Provide sufficient data and short clear statements of outcomes.

A short summary for each trial site is listed below for across the three years (2015-17). Excel files for the three years have been provided previously for each annual report and are not included here. Such files have also been uploaded to the SADGA website and when downloaded, are adjustable so that growers have the flexibility of altering it based on their individual circumstances and pricing that they receive.

COONALPYN

- In 2015 (year 1), in hindsight, we sowed a little too early for the district. This was amended for years 2 and 3 of the project, sowing either on the day or within a day of the grower sowing the surrounding crop (mid-May).
- In 2015, and as a consequence of the difficult season (and the fact that we sowed a little too early), the site suffered severe moisture stress in spring. In 2016 (exceptional season) and 2017 (average season), no obvious signs of stress were evident.
- Trojan (ASW), Emu Rock (H1) and DBA-Aurora (DR1/DR2) were the varieties with the highest gross margins across years 1 and 2. With yields well above expectations in year 3, quality downgrades to the durum varieties occurred and consequently, the bread wheats at this site in the final year returned a higher gross margin than the durum varieties.

ROSEWORTHY

- Across the three years, this trial site was sown at a similar time to other bread wheat crops in the area (mid-May).
- The site was mixed with stress events across the years. Frost was experienced in year 1, probably too much rain in year 2 (some parts of the trial site were

water logged), and a lack of rain late in the growing season (year 3) significantly reduced the durum's ability to fill to potential and therefore reduced yields.

- Irrespective, Trojan (GP) and DBA-Aurora (DR1) had the highest gross margins in 2015 with similar results obtained in 2016 (although WID802 slightly outperformed DBA-Aurora). All varieties had quality issues.
- Across all yield / price combinations (for the first two years – 2015, 2016) the durum had a higher return when compared to the bread wheat.

SANDERSTON

- In the first year of the project, this site was visited by SAGIT staff and was one of the best sites throughout that season. Across the years, this site was sown into minimal soil moisture (early-May).
- Higher than expected yields were obtained across all varieties.
- The finish was a bit softer than some areas and this showed in the quality.
- Trojan (APW) and WID802 (DR1) were the higher returning varieties, with no quality issues for either.
- In year 1, despite bread wheat averaging over 5 t ha⁻¹ compared to the durum under 4 t ha⁻¹, the higher market price for durum meant that it still returned a higher GM across all yield / price combinations (apart from the low yield / low price).
- In year 2, the yield difference obtained meant that the durum varieties' gain in gross margin was not as large as some sites, but the low value of bread wheat saw the durum have a comfortable advantage over the bread wheat varieties in several of the yield / price combinations (excluding low yield/low price and high yield/low price).
- In year 3, the increased vigour of the bread wheat varieties and their ability to recover from the dry start, enabled these varieties to significantly out-yield the durum varieties. With such a significant yield gap, the durum varieties' gross margins were lower in all yield and price combinations.

WANDEREAH

- In general, across the three years, the site was sown at the same time as the bread wheat crop around it.
- This was a challenging site (area in general) and this was reflected in the test weight and protein results in year 1, where quality issues were recorded across all varieties.
- In 2016, a very good end to the season saw yield and quality for both bread and durum wheat varieties to be high, with all achieving their top grade. Furthermore, both bread and durum wheat varieties had very similar yields. Consequently, the gross margin difference recorded in the second year at this site is a direct reflection of the much higher durum price.
- To highlight the yield potential of such a challenging site in what was a good season, bread wheat varieties ranged from 3.8 t ha⁻¹ (Emu Rock) to 4.9 t ha⁻¹ (Cobra), while the durum variety yields ranged from 4.1 t ha⁻¹ (Tamaroi) to 4.7 t ha⁻¹ (DBA-Aurora).

YEELANNA

- In 2015, this site was sown early by local standards, and had a good season with an average finish; while in 2016 the site was sown around the same time as the surrounding crop and enjoyed good moisture throughout the season.

- Quality was good across all varieties, although the protein was down due to the higher yield in year 1. In year 2, and largely due to the heavy rain events that occurred around harvest time, quality was affected significantly at this site.
- Even with lower quality, the durum had a higher GM return across all price / yield combinations in year 1 and in year 2 the gross margins were closer only due to the spread of the premium between bread and durum wheat. Irrespective, in most yield / price combinations the durum showed a significantly higher figure.
- In reality, and specific to the 2016 season, if durum was grown in a season like that again (and in this district) it would be harvested before bread wheat due to its higher value and would not have been affected by late rains in December.

See key points and Table in conclusions reached section below that highlights the overall findings.

Conclusions Reached &/or Discoveries Made (Not to exceed one page)

Please provide concise statement of any conclusions reached &/or discoveries made.

Key points from the three year project:

- Price difference between bread wheat and durum is a main driver for return.
- Good quality for durum will generally result in a healthy gross margin being achieved.
- Under good growing conditions there is not a significant difference in yield between the best durum and bread wheat varieties.
- With a later start to the season, durum does suffer a yield penalty.
- All trial sites evaluated showed a three year average that had durum returning a higher gross margin than bread wheat (see Table below).

Table 1: Bread and durum wheat gross margin analysis summary spanning 2015-2017. Gross margin values are expressed in AUD per tonne, where GM refers to gross margin.

BREAD / DURUM GROSS MARGIN ANALYSIS							AVERAGE 2015 - 2017	
		Low Yield Low Price	Low Yield High Price	High Yield Low Price	High Yield High Price	Average GM	Actual Best GM	
Coonalpyn	Bread	458	524	616	700	561	652	
	Durum	733	850	958	1112	939	1052	
Roseworthy	Bread	549	645	745	867	687	762	
	Durum	811	982	1004	1185	1054	1138	
Sanderston	Bread	758	858	875	987	886	962	
	Durum	866	936	1030	1111	1017	1080	
Wandereah	Bread	362	424	466	542	464	542	
	Durum	518	669	611	772	629	748	
Yeelanna	Bread	505	705	672	920	736	818	
	Durum	508	849	678	1069	770	939	
Across All Sites	Bread	527	631	675	803	667	747	
	Durum	687	857	857	1050	882	992	

Intellectual Property

N/A in this project.

Application / Communication of Results

- The trial results for all three years have been distributed to SADGA and are uploaded on their website.
- Grower forums have also been attended and these results were presented at those events for each year of the project.
- In the last two seasons of the project we have seen interest from growers in and around Port Broughton (Schmidt family), Coonalpyn, Monarto (Harvey family), and the Mallee (below) – who are now evaluating durum in their own farming systems.
- Earlier this year, the breeding program made available 150 kg each of several durum varieties (provided free of charge) to an agronomist (Shaun Krahnert, Elders) for evaluation in a client's farming system in the Mallee region for 2018. This was sown on the 4th May, and as of mid-June was at the 2 leaf stage. Based on rainfall to date this season, it will be challenging in 2018 to get a result that can be relied upon with confidence.
- Opportunities such as the example given above has only come about due to this project and the broadcasting of the annual results we have achieved.

POSSIBLE FUTURE WORK

Provide possible future directions for the research arising from the project including potential for further work and partnerships.

This concludes the gross margin trial project (UA415). Thank-you to SAGIT and the board for selecting this project to be funded. It has resulted in clearly identifying that durum is a good alternative (in most seasons) to bread wheat. With the new varieties that we have released (e.g. DBA-Aurora), there is renewed confidence in the durum industry and results from this project have shown that such varieties are competitive against the best bread wheat varieties. Nonetheless, there is still work to be done and through the combined efforts of the breeding program and all industry stakeholders (such as SAGIT, the GRDC, San Remo and SADGA), we will continue to move forward in delivering better varieties for growers in the coming years. It is likely that a peer reviewed publication will be drawn up and submitted to an Agricultural economics based journal in early-2019. Current commitments prevent A/Professor Able from tackling this immediately.

AUTHORISATION
Name: A/Professor Jason A. Able
Position: Head, Department of Agricultural Science
Signature: _____
Date: 03/07/2018

Submit report via email to admin@sagit.com.au as a Microsoft Word document in the format shown ***within 2 months*** after the completion of the Project Term.