



The SAGIT Snapshot

SA grain growers
funding research
solutions

2023

The South Australian Grain Industry Trust ...

SA grain growers funding research solutions

YOUR support keeps SAGIT going

The South Australian Grain Industry Trust Fund (SAGIT) was established in 1991 to administer the voluntary research levy contributed by SA grain growers. SAGIT is funded by a 30 cents per tonne contribution on all grain delivered by SA grain growers. Without your support, there would be no SAGIT.

SAGIT is directed by, and accountable to, growers

SAGIT has a board of four grower trustees and a trustee appointed by the South Australian Minister for Agriculture. An open call is held annually and the trustees take into consideration issues affecting SA grain production and innovative ideas to progress the industry. Trustees receive specialist agronomic and scientific advice to ensure their funding decisions are informed and credible.

An annual report on how levy funds are spent is available to growers and provided to Grain Producers SA and the South Australian Minister for Agriculture.

SAGIT is unique - No other state has a research fund supported by growers for state-based, grains industry research. We are the envy of other states!

Key project dates

August 2023	Trustee visits to projects.
31 August 2023	Final reports and financial statements (Form A) due.
September 2023	Trustee visits to projects continue. Final reports reviewed.
November 2023	Call for applications for next round of funding.
1 January 2024	Current project invoices to be submitted 14 days prior to the payment date.
2 February 2024	Project applications due.
1 March 2024	Progress reports (continuing projects) due.

Trustees



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SAGIT extends its thanks to former trustee Bryan Smith, who was involved in the project funding allocation for 2023-24. We wish Bryan all the best as he retires from SAGIT following eight years as a trustee.

SAGIT Management



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March 2024

Applications assessed by SAGIT. Applicants notified of results of applications by the end of March.

1 July 2024

First payment*. Applicants must submit invoice 14 days prior to payment date.

November 2024

Call for applications for next round of funding.

1 January 2025

Second payment. Applicants must submit invoice 14 days prior to payment date.

**Contract and payment can be earlier than 1 July.
Please contact SAGIT management if this is required.*

Investment Index

✓ = new investments starting in 2023 totalling \$2.9 million

Code	Organisation	Supervisor	Project title	New	Pg
AAC0723	AgriLink Agricultural Consultants	Mick Faulkner	Evaluation of agronomic practices for SHO safflower production	✓	8
ACR3923	Agricultural Consulting and Research Pty Ltd	Stefan Schmitt	Are crop yields limited by iron deficiency on calcareous soils of the Yorke Peninsula?	✓	8
AEQ4022	Aust Export Grains Innovation Centre	Siem Siah	Developing a new high value noodle market for South Australian growers		8
AEP3423	AIR EP	Naomi Scholz	Eyre Peninsula internship in applied grains research 2024	✓	9
AEP1022	AIR EP	Naomi Scholz	Managing crown rot on upper Eyre Peninsula – a joint learning experience		9
AEP1422	AIR EP	Naomi Scholz	Eyre Peninsula internship in applied grains research 2023		9
AEX4523	Ag Excellence Alliance	Michael Wurst	Publication of the 2024 Farm Gross Margin Guide for SA	✓	10
AGC4322	AgCommunicators	Belinda Cay	Lead agriculture teacher for South Australia – growing curriculum and learning		10
AGX3623	AgXtra	Richard Porter	Powdery mildew control in wheat - extension project	✓	10
AGX4223	AgXtra	Richard Porter	Genetic and fungicidal control of septoria tritici blotch and stripe rust in wheat	✓	11
AGX3822	AgXtra	Richard Porter	AgXtra high school and university crop competition		11
AIA1122	Ag Institute Australia	Craig Davis	Student Compendium – supporting the next generation, 2023-25		11
ASO3523	Agronomy Solutions	Sean Mason	Soil salinity thresholds for chickpeas, faba beans and lentils	✓	14
ASO4922	Agronomy Solutions	Sean Mason	Sulphur dynamics and budgets in two contrasting soil profiles		14
CAS4822	Central Ag Solutions	Sam Holmes	On row sowing benefits on Yorke Peninsula – what are the drivers?		14
CSI3522	CSIRO	Gupta Vadakattu	Improved resilience of soil function through crop management		15

Code	Organisation	Supervisor	Project title	New	Pg
GGG121	Global Grain Genetics	Michael Materne	Lentil varieties for low rainfall and sandy soil environments		15
HAR0423	Hart Field Site Group	Rebekah Allen	Regional internship in applied grains research	✓	15
HAR0523	Hart Field Site Group	Rebekah Allen	Improving efficacy of glufosinate for annual ryegrass control in canola	✓	16
H121	Hart Field-Site Group	Rebekah Allen	Variety selection and weed management options for genetically modified canola		16
MF2123	MacKillop Farm Management Group	Meg Bell	MacKillop Farm Management Group Annual Trial Results Book 2023-2025	✓	16
MF4522	MacKillop Farm Management Group	Meg Bell	Reducing wheat yield loss from Barley Yellow Dwarf Virus in the HRZ		17
MHR1523	Mid North High Rainfall Zone	Mick Faulkner	Frost Research and Learning Centre	✓	17
MSF0823	Mallee Sustainable Farming	Jay Cummins	Enhancing farmer knowledge of soil function to improve management outcomes	✓	17
S/UA121	SARDI/University of Adelaide	Amanda Cook	Improving management of Group A resistant barley grass in current farming systems		20
S/UA421	SARDI/University of Adelaide	Blake Gontar	Measuring and managing yield loss caused by Phoma root in lentil and faba bean		20
S/UA721	SARDI/University of Adelaide	Rhiannon Schilling	Extension support for SA Drought Hub internship program		20
SAR1023	SARDI	Melissa McCallum	SA Crop Variety Sowing Guide publication	✓	21
SAR2223	SARDI	Stuart Nagel	Profitable Vetch - agronomy, breeding and market development	✓	21
SAR1222	SARDI	Melissa McCallum	Ground truthing wheat and barley flowering time in the Mid North and Mallee using the Mesonet		21
S121	SARDI	Amanda Cook	Eyre Peninsula Farming Systems Summary 2021-2023		22
TCO2423	Trengove Consulting	Sam Trengove	Using grain protein maps to optimise nitrogen fertiliser to paddock scale nitrogen variability	✓	22
TC221	Trengove Consulting Trust	Sam Trengove	Improved management of variable phosphorus requirement and strategies for highly responsive soils		22
UAD1123	University of Adelaide / SARDI	Janine Croser	Processing solutions for a novel high-protein food ingredient from vetch	✓	23

Code	Organisation	Supervisor	Project title	New	Pg
UAD1223	University of Adelaide / SARDI	Lachlan Lake	Pairing pulses for improved yield, protein, agronomy, and profit	✓	23
UAD1323	University of Adelaide	Glenn McDonald	Optimising crop establishment under dry and marginal soil moisture	✓	23
UAD1423	University of Adelaide / SARDI	Maria Saarela	Colour preservation in faba beans to enhance quality & value	✓	26
UAD1623	University of Adelaide / SARDI	Penny Roberts	Preparing for a pulse protein market - pulse options for expansion areas	✓	26
UAD1723	University of Adelaide / SARDI	Simon Michelmore	Minimising market access risks in herbicide tolerant pulses	✓	26
UAD1823	University of Adelaide	Ken Chalmers	Higher barley yield through improved microbial interactions	✓	27
UAD2023	University of Adelaide	Phil Brewer	Developing new breeding material to stabilise barley yields	✓	27
UAD3023	University of Adelaide / SARDI	Tara Garrard	Improving industry response to white grain disorder and fusarium head blight outbreaks while protecting export markets.	✓	27
UAD3123	University of Adelaide / SARDI	Yusuf Genc	Manipulating spike architecture to improve wheat yield	✓	28
UAD3223	University of Adelaide	Matthew Tucker	Screening for genetic components of head-retention in barley	✓	28
UAD4423	University of Adelaide	Matthew Denton	Delivery of beneficial organisms through seed coating to improve grain yield	✓	28
UAD1722	University of Adelaide	David Peck	Harvest and use of medic pods on-farm		29
UAD1922	University of Adelaide / SARDI	Penny Roberts	Agronomy strategies for frost management in pulse crops		29
UAD2222	University of Adelaide / SARDI	Brendan Kupke	Realising cereal yield potential using crop physiology and drone technology		29
UAD2522	University of Adelaide	Kym Perry	Revegetation for enhanced biocontrol of pest conical snails		30
UA420	University of Adelaide	Scott Boden	Enhancing grain production and quality traits for bread wheat		30
UNF2822	Upper North Farming Systems	Jade Rose	Canola profitability as a break crop in the Upper North		30
USA3323	University of SA	Casey Doolette	Pesticide effects on soil microbial functions in contrasting SA soils	✓	31
USA121	University of South Australia	Enzo Lombi	Developing a DGT methodology to assess bioavailability of herbicide residues		31

SAGIT INVESTMENTS

Research Projects

✓ indicates new project starting in 2023-24



AAC0723: Evaluation of agronomic practices for SHO safflower production



Agrilink Agricultural Consultants



\$159,488



1/7/2023 – 30/6/2025



Super high oleic oil content safflower is a new crop to SA. This project will investigate variety, sowing time, water use efficiency, herbicide tolerance, nutrient responsiveness, phenology, residual soil water and canopy manipulation to determine where the crop can be profitably grown.



Mick Faulkner, 0428 857 378, mick.faulkner@bigpond.com

ACR3923: Are crop yields limited by iron deficiency on calcareous soils of the Yorke Peninsula?



Agricultural Consulting and Research



\$46,010



1/7/2023 – 30/6/2024



Advancements in iron fertiliser formulations have delivered significant yield gains on calcareous soil types in the South East of South Australia and this provides an opportunity to investigate the degree of iron deficiency in other regions where these soil types are prevalent such as the Mid North and Yorke Peninsula.



Stefan Schmitt, 0418 524 754, stefan@agconsultingandresearch.com.au

AEG4022: Developing a new high value noodle market for South Australian growers



Australian Export Grains Innovation Centre



\$399,700



1/7/2022 – 30/6/2025

This project aims to establish a new high-value noodle wheat market for South Australia, increasing demand in Taiwan, South Korea and Hong Kong, estimated at \$95 million annually for SA wheat. It will position a segment of the Australian Hard (AH) class as a premium noodle grade in Asia, creating additional value for selected hard wheat varieties grown in SA at AH protein levels. This project is a co-investment, with the Grains Research and Development Corporation providing 50% of the total funding (above).



Siem Siah, 02 8025 3200, siem.siah@aegic.org.au

AEP3423: Eyre Peninsula internship in applied grains research 2024



AIR EP



\$66,790



1/7/2023 – 30/6/2024



To improve the capacity of grains research, development and extension on the Eyre Peninsula and to further develop applied research skills of recent graduates so they will make an improved contribution to the grains RD&E industry in SA, through the appointment of interns within local research organisations. This project is a co-investment, with the SA Drought Hub providing an additional \$66,790 funding.

Naomi Scholz, 0428 540 670, eo@airep.com.au

AEP1022: Managing crown rot on upper EP – a joint learning experience



AIR EP



\$150,724



1/7/2022 – 30/6/2024

This project aims to reduce yield losses due to crown rot, increasing the amount and consistency of grain for export; increase the adoption of existing and novel options for managing crown rot; and improve the ability of farmers and advisers (and researchers) to understand trials and demonstrations and how to interpret the results for application and implementation in local farming systems.

Naomi Scholz, 0428 540 670, eo@airep.com.au

AEP1422: Eyre Peninsula internship in applied grains research 2023-24



AIR EP



\$140,000



1/7/2022 – 30/6/2024

To improve the capacity of grains research, development and extension on the Eyre Peninsula and to further develop applied research skills of recent graduates so they will be able to make an improved contribution to the grains RD&E industry in SA, through the appointment of a recent graduate as an intern in applied grains research on EP.

Naomi Scholz, 0428 540 670, eo@airep.com.au

AEX4523: Publication of the 2024 Farm Gross Margin Guide for SA



Ag Excellence
Alliance



\$32,750



1/7/2023 – 30/6/2024



This project aims to produce an updated Farm Gross Margin Guide in both hard copy and electronic form to improve the business acumen of crop and livestock producers in SA. The guide will increase crop and livestock producers' capacity to assess the relative profitability and risk of enterprises as part of their farm business planning process in 2024, leading to improved farm planning, decision making and providing more profitable and sustainable businesses in the long term.



Michael Wurst, 0418 803 685, michaelwurst1@gmail.com

AGC4322: Lead agriculture teacher for South Australia – growing curriculum and learning



AgCommunicators



\$143,080



1/7/2022 – 30/6/2024

The lead agriculture teacher is a pilot program which will see a leading agriculture teacher engaged to mentor, support and train agricultural teachers across SA and to engage students in meaningful food and fibre production content. The role will assist teachers seeking access to new curriculum content and individualised support to revitalise their teaching programs across all secondary year levels.



Belinda Cay, 0423 295 576, belinda.cay@agcommunicators.com.au

AGX3623: Powdery mildew control in wheat – extension project



AgXtra



\$38,000



1/7/2023 – 30/6/2024

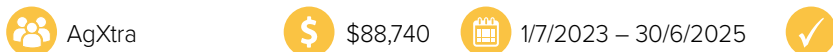


This project aims to demonstrate to growers and agronomists in the Mid and Upper North regions the effectiveness of existing and emerging wheat powdery mildew control options across four varieties with diverse susceptibility ratings. The agronomic efficacy and economic effectiveness of control options will be demonstrated in each wheat variety.



Richard Porter, 0413 027 670, rporter@agxtra.com.au

AGX4223: Genetic and fungicidal control of Septoria tritici blotch and stripe rust in wheat



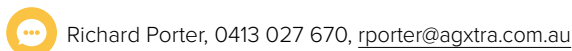
This project will seek to evaluate the effectiveness of various fungicide treatments for control of Septoria tritici blotch and stripe rust in a range of wheat varieties with differing levels of resistance at different rainfall zones. It will also determine the genetic influence of yield loss from disease and find a suitable application package of fungicide to reduce the cost of production.



AGX3822: AgXtra high school and university crop competition



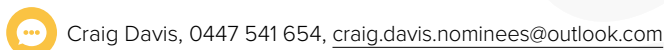
A wheat production competition for high school students and university agricultural students which promotes agriculture as a career choice to high school students and engages tertiary students with agribusiness and consultants for career option awareness. Promotes hands-on learning to participating students and addresses the urban/rural disconnect by moving students out of the classroom and into the field to experience, and participate in, field crop agronomy.



AIA1122: Student Compendium – supporting the next generation, 2023-25



The Student Compendium is an annual collation of graduate programs, internships, training, competitions, conferences, associations, awards and scholarships for high school and vocational training students and tertiary agricultural, animal and veterinary and agribusiness undergraduates. It assists the next generation of South Australian students to find opportunities to connect them with industry and broaden career horizons and empower students in agriculture.



X-ray technology points the way to reducing head loss in barley

For some South Australian growers, the risk of head loss in barley outweighs the potential returns of including it in a rotation.

Now, a three-year trial supported by SAGIT has investigated the problem and discovered several avenues with the potential to protect yields.

Plant scientist Associate Professor Matt Tucker from the University of Adelaide led a team of agronomists, geneticists and technicians who studied the nature of head loss caused by the barley stem breaking at the peduncle – typically within the first 3 centimetres immediately below the head.

The researchers studied the major barley varieties available to growers, planting Compass, Spartacus and Planet at sites in the South East, Murraylands, Mallee, Mid North and Yorke Peninsula.

“We wanted to look at the sensitivity of the different cultivars and assess the genetics to see if we could pinpoint traits that might indicate susceptibility or resilience to this type of head loss,” Associate Professor Tucker said.

“We also tested the efficiency of applying different plant growth regulators, then delayed harvest and scored the head loss for each cultivar.”

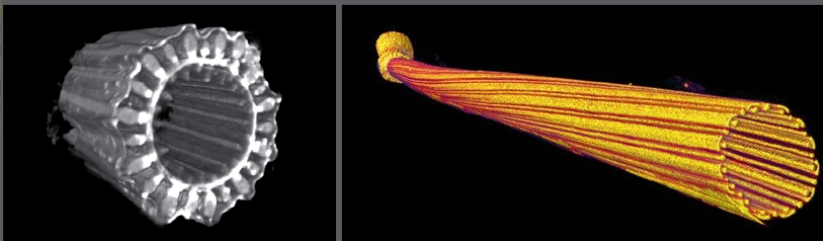
Real insights came when the team took sample peduncles back to Adelaide Microscopy at the University of Adelaide’s North Terrace Campus, and The Plant Accelerator® at the Waite Campus, and investigated them using X-ray Computed Tomography (CT) scanning.

“We looked at peduncles from cultivars that we knew were losing their heads and peduncles from the same cultivar that had been treated with growth regulator,” Associate Professor Tucker said.

“We found the plants that had been treated with growth regulator accumulated dense material inside the peduncle, which seemed to add strength and help retain the head. We hadn’t seen that before.

“Now we know what to look for in the peduncle, we’ve got a target that we can look for in different barley breeding lines to see if we can potentially select for that trait and develop a more robust genetic solution.”

X-ray micro CT scanning enabled researchers to view the barley peduncle structure at 3.5 micron (left) and 10 micron (right) resolution



In the meantime, the project has identified a number of practices growers can adopt now to minimise their head loss risk.

The most important is timely harvest, with the study showing each day of delay manifestly increased the rate of head loss. At all the trial sites, the best yields consistently came from harvesting on time.

However, applying a growth regulator at Growth Stage 37 will encourage some varieties to accumulate the dense tissue in the peduncle that Associate Professor Tucker and his team observed.

The application timing was found to be critical, and variety had a significant influence on the benefit.

“The growth regulator we used was Moddus Evo® (Trinexapac-Ethyl), which is registered for use to protect barley against head loss,” he said.

“It seemed to have the most benefit with Compass, while Spartacus is pretty resilient against head loss so there wasn’t much benefit, and Planet was similar with some variation depending on the growing environment.”

Associate Professor Tucker is now talking to barley breeders, most of whom list head loss in the top three problems they’re working to solve.

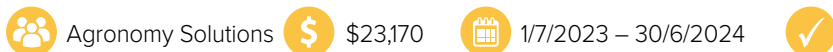
“Based on what we’ve learned, we want to bring strengthened stems to the breeding populations, test them in the environment and hopefully deliver improvements to growers in the not-too-distant future,” he said.

The results of this project are being furthered through:

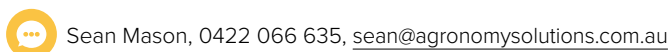
- A new SAGIT investment to collect extra field data and assess new barley lines
- Pilot funding from the Australian Plant Phenomics Facility for X-ray CT scanning of peduncles (Project #0628)
- A two-year ARDC OzBarley project aimed at consolidating phenotypic data from a panel of Australian breeder-relevant cultivars.

UA619 Revealing the basis for head-loss in barley and UA721 Revealing the basis for head loss in barley

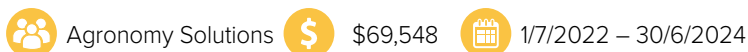
ASO3523: Soil salinity thresholds for chickpeas, faba beans and lentils



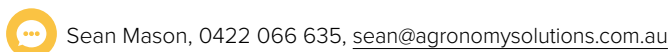
Pulse crop sensitivities to fertiliser inputs and soil salinity are greater than cereals but limited information currently exists for advisers and growers to the potential yield penalties associated with a particular soil salinity measure. This project aims, through a controlled glasshouse trial, to determine soil salinity thresholds for emergence and vigour of current pulse crops across a small range of soils by manipulating baseline soil salinity levels; and to compare pulse salinity thresholds with other popular crop types for sensitivity and checks of current critical levels outlined from previous studies through interpretation guidelines for salinity.



ASO4922: Sulphur dynamics and budgets in two contrasting soil profiles



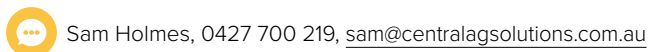
This demonstration project aims to provide valuable information on immediate and longer-term sulphur management options applicable to a wide range of growing regions. The project aims are to be achieved by comparing different forms of sulphur fertilisers for mobility and availability within soil profiles with detailed profile sampling; and assessing the impact of two different crop types in sulphur accessibility due to varying rooting depths.



CAS4822: On-row sowing benefits on Yorke Peninsula – what are the drivers?



This project aims to understand improved early crop vigour from on or near row sowing. Two trials will demonstrate yield benefits from on or near row sowing of previous crop stubble lines under different phosphorus management programs. On-farm paddock trials (8) will demonstrate variation in soil type within paddocks across Yorke Peninsula; a general survey was undertaken of soil conditions in 2022 on-row sowing vs interrow sowing across YP (50 paddocks x 2 production zones).



CSI3522: Improved resilience of soil function through crop management



CSIRO



\$189,270



1/7/2022 – 30/6/2024

This project will identify management practices that promote resilience of biological functional capacities relevant to nutrient supply, carbon sequestration and overall soil health. It proposes to determine the impact of cover crop systems on soil biological functional resilience and its relationship with crop performance. Additionally, the impact of soil and crop management practices such as stubble management, tillage, fertilisers and rotations on soil functional resilience will be quantified in ongoing field experiments in SA.

Gupta Vadakattu, 08 8303 8579, gupta.vadakattu@csiro.au

GGG121: Lentil varieties for low rainfall and sandy soil environments



Global Grain Genetics Pty Ltd



\$158,094



1/7/2021 – 30/6/2024

Lentil germplasm developed in SAGIT project GGG118 is to be evaluated at multiple low rainfall sites and a contrasting higher rainfall site to understand traits that confer adaptation to sandy soils, and to identify lines for variety release. Lentil germplasm is screened to identify lines with specific adaptation to Mallee duplex soils and deep sandy soils. Outcomes will identify traits for lentil adaptation to sandy soils and agronomy required to increase yield and yield stability.

Larn McMurray, 0466 113 848, lmcmurray@globalgraingenetics.com
Michael Materne, 0413 977 940, mmaterne@globalgraingenetics.com

HAR0423: Regional internship in applied grains research



Hart Field-Site Group



\$80,280



1/7/2023 – 30/6/2025



The project aims to give graduates with a specific interest in applied RD&E an introduction and hands-on training in the fundamentals of applied RD&E, relevant to the grains industry. Attracting and encouraging agricultural graduates into applied grains research across South Australia, assisting with the succession planning of key staff in research organisations, particularly farming systems groups, is essential. This project is a co-investment, with the SA Drought Hub providing an additional \$26,760 funding.

Rebekah Allen, 0428 782 470, rebekah@hartfieldsite.org.au

HAR0523: Improving efficacy of glufosinate for annual ryegrass control in canola



Hart Field-Site
Group



\$69,717



1/7/2023 – 30/6/2024



The aim of this project is to better understand environmental conditions influencing the efficacy of glufosinate for annual ryegrass control and provide spraying strategies for successful and increased weed control.



Rebekah Allen, 0428 782 470, rebekah@hartfieldsite.org.au

H121: Variety selection and weed management options for genetically modified canola



Hart Field-Site
Group



\$61,708



1/7/2021 – 30/6/2024

Genetically modified canola varieties are to be demonstrated at the Hart Field Site for the Mid North region and herbicide regimes for best annual ryegrass control are to be determined.



Rebekah Allen, 0428 782 470, rebekah@hartfieldsite.org.au

MFM2123: MacKillop Farm Management Group Annual Trial Results Book 2023-2025



MacKillop Farm
Management Group



\$30,000



1/7/2023 – 30/6/2026



To fund compilation of MacKillop Farm Management Group Annual Trials Results book for trials undertaken in 2023, 2024 and 2025. The book will be available in March the following year. MFMG's Annual Trial Results Book brings together trial, demonstration and other project results from the Limestone Coast together in one publication, for the benefit of members and the agricultural community.



Meg Bell, 0433 499 630, ceo@mackillopgroup.com.au

MFM4522: Reducing wheat yield loss from Barley Yellow Dwarf Virus in the HRZ



MacKillop Farm
Management Group



\$90,000



1/7/2022 – 30/6/2024

Barley Yellow Dwarf Virus (BYDV) consistently and significantly impacts wheat crops in the high rainfall zone (HRZ) of South Australia. This impact appears in the form of erect heads with poor grain fill, approximately 3-4 weeks before harvest in crops that have previously appeared generally healthy, and results in yield loss. This project aims to evaluate agronomic tactics and insecticide regimes to reduce the impact of BYDV on wheat yields in the SA HRZ.



Meg Bell, 0433 499 630, ceo@mackillopgroup.com.au

MHR1523: Frost Research and Learning Centre



Mid North High
Rainfall Zone



\$162,000



1/7/2023 – 30/6/2024



The project objective is to extend the research and extension conducted in the SAGIT/GRDC co-funded Frost Learning project (MHR121) for another year. This will help validate results, particularly from 2021, and give opportunities to reinforce the significance of frost management and introduce new concepts. This project is a co-investment, with the Grains Research and Development Corporation providing 50% of the total funding (above).



Mick Faulkner, 0428 857 378, mick.faulkner@bigpond.com

MSF0823: Enhancing farmer knowledge of soil function to improve management outcomes



Mallee Sustainable
Farming



\$84,000



1/7/2023 – 30/6/2025



The focus for this project will be to produce a highly engaging and easy-to-read publication resource titled *101 questions about SA cropping soils you were never game to ask*. This will help farmers identify and understand subsoil constraints, soil-water dynamics and in turn make informed decisions to help them manage emerging soil related issues unique to SA cropping environments.



Jay Cummins, 0418 818 663, jay@msfp.org.au

Containerised grain guide offers growers advice on their export options

While bulk handling is the default export option for many grain shipments, containers offer a flexible, controllable alternative for cereals, pulses and fodder.

In 2020-2021, Australian growers exported almost 4.2 million tonnes of grain by container.

Now a year-long study of grain containerisation logistics, undertaken by the Australian Export Grains Innovation Centre (AEGIC) with SAGIT and GRDC support, has resulted in a range of resources to help growers navigate container shipping for their grain.

Containerisation suits specialised grains or lines where co-mingling through bulk handling is undesirable. Containers can also be shipped direct to ports without bulk grain handling facilities or direct to a buyer's facility. Containers have proven ideal for moving small parcels of grain within Australia.

AEGIC Chief Economist Professor Ross Kingwell, who led the study, said the modular nature of containers makes them ideal for exporting small cargoes with high margins.

“With food grade containers, a grain shipment can be effectively sealed from the farm gate to the customer's door, so they are great for protecting the inherent value of speciality shipments and container logistics infrastructure is almost universal.”

However, the project identified circumstances that constrain the viability of container shipping, as well as noting ways to improve container usage.

“We found containers are much more viable for general grain exports when the farm is located closer to a container packing facility than the nearest bulk terminal,” Professor Kingwell said.





“Growers also need to ensure they can access enough food grade containers when they need them.”

The study identified improvements to Australian container wharf infrastructure and operations that would support greater grain containerisation.

These range from increasing the transparency – and therefore competitiveness – of pricing and efficiency for container handling facilities. Greater investment in road-rail logistics for container movement could also benefit producers by lowering transport costs and emissions.

One business profiled through the study is AG Schilling and Co on the Yorke Peninsula. CEO Mark Schilling would like to see the South Australian government and the container terminal investing to improve efficiency.

“We can do a lot more to make (containerised exports) accessible to growers,” he said.

He believes there needs to be more investment in agriculture and its supply chains, including local container production, ship ownership, and more facilities to stimulate competition.

“Farmers can look at their infrastructure too... I’ve invested over a million dollars and, I’ve got to say over the past ten years, that’s paid for itself twice over.

“We can do a lot of our grain handling on-farm now.”

Grain growers who would like to learn more about containerisation can access the project’s ‘how to’ manual for South Australian grain growers, along with a factsheet and three video case studies, via the SAGIT website ‘Research’ page.

AEG121 Economic analysis of Australia’s main containerised grain supply chains



S/UA121: Improving management of Group A resistant barley grass in current farming systems



SARDI / University of Adelaide



\$224,861



1/6/2021 – 30/6/2024

Control of resistant barley grass is to be investigated on upper Eyre Peninsula through 1) impact of new herbicides and management options in cereals and break crops, 2) understanding the seed dormancy and germination patterns of barley grass in that region, and 3) identifying soil constraints that impact on herbicide efficacy by monitoring five farmer paddocks per season.



Amanda Cook, 0427 270 154, amanda.cook@sa.gov.au

S/UA421: Measuring and managing yield loss caused by Phoma root in lentil and faba bean



SARDI / University of Adelaide



\$347,511



1/7/2021 – 30/6/2024

The effect of Phoma root rot on yield in lentil and faba bean is to be measured in a series of field trials which are inoculated with varying rates of the pathogen. Trials are subjected to various levels of soil water via supplementary irrigation to investigate the role of soil water in the root rot disease. A range of chemical options are tested for disease control.



Blake Gontar, 0430 597 811, blake.gontar@sa.gov.au

S/UA721: Extension support for SA Drought Hub internship program



SARDI / University of Adelaide



\$30,000



1/7/2021 – 30/6/2024

This project links to the Federal Government Future Drought Fund which has a South Australian Hub, to demonstrate and increase grower adoption of innovative drought resilience tools, technologies and practices. The SA Drought Hub extension intern will run a series of workshops to extend the outcomes of previous SAGIT investments aligned to the Hub.



Rhiannon Schilling, 0407 815 199, rhiannon.schilling@sa.gov.au

SAR1023: SA Crop Variety Sowing Guide publication



SARDI



\$131,448



1/7/2023 – 30/6/2026



The aim of this project is to continue producing the annual SA Sowing Guide for growers and advisers. The SA Sowing Guide communicates the most up-to-date information on new and current varieties across a range of crop types. It combines the most recent yield results from the National Variety Trials with the most relevant varieties for SA as well as agronomic and pathology information. The Guide is compiled by SARDI staff, with printing and distribution costs funded by GRDC.

Melissa McCallum, 0448 188 841, melissa.mccallum@sa.gov.au

SAR2223: Profitable vetch – agronomy, breeding and market development



SARDI



\$342,053



1/7/2023 – 30/6/2025



This project will develop a multi-faceted role for a research officer looking into vetch production, agronomy and breeding. The project will: 1) consolidate current and previous agronomic research conducted in vetch; 2) produce updated agronomy recommendations; 3) leverage outcomes from oaten hay research to improve vetch hay production, and 4) integrate new breeding technology into the National Vetch Breeding Program. This project is a co-investment, with the Grains Research and Development Corporation providing 50% of the total funding (above).

Stuart Nagel, 0407 720 729, stuart.nagel@sa.gov.au

SAR1222: Ground truthing wheat and barley flowering time in the Mid North and Mallee using the Mesonet



SARDI



\$62,860



1/7/2022 – 31/12/2023

The project aim is to characterise the environmental differences across the Mid North and South Australian Mallee regions and the subsequent effect on planting time and variety selections for cereals. This aim will be achieved by utilising the Mesonet weather network to ground truth wheat and barley flowering time.

Melissa McCallum, 0448 188 841, melissa.mccallum@sa.gov.au

S121: Eyre Peninsula Farming Systems Summary 2021-2023



SARDI



\$30,000



1/7/2021 – 30/6/2024

The Eyre Peninsula Farming Systems Summary is an annual publication consisting of research results undertaken on the EP and other areas of relevance, and their implications to upper EP farming systems.



Amanda Cook, 0427 270 154, amanda.cook@sa.gov.au

TCO2423: Using grain protein maps to optimise nitrogen fertiliser to paddock scale nitrogen variability



Trengove Consulting



\$123,201



1/7/2023 – 30/6/2025



Grain protein map data and other spatial data layers will be investigated for application in targeting nitrogen (N) inputs more precisely to optimise N use, grain yield and protein and profitability. A combination of spatial data and targeted small plot N response trials will improve understanding of how to utilise available spatial data layers for variable rate application of N. This project is a co-investment, with the SA Drought Hub providing a further \$10,000 funding.



Sam Trengove, 0428 262 057, samtrenny34@hotmail.com

TC221: Improved management of variable phosphorus requirement and strategies for highly responsive soils



Trengove Consulting



\$207,822



1/4/2021 – 30/6/2024

Phosphorus (P) response prediction based on spatial data in variable soils is to be validated in a series of field trials encompassing different soil types. Best practice for long term management of high P response sites is to be determined.



Sam Trengove, 0428 262 057, samtrenny34@hotmail.com

UAD1123: Processing solutions for a novel high-protein food ingredient from vetch



University of
Adelaide / SARDI



\$107,434



1/7/2023 – 30/6/2024



Researchers have recently found a way to detoxify vetch via a steeping method. This project will be undertaken by SARDI researchers and aims to develop a low-cost, robust method for physical removal of the β -cyanoalanine toxin from common vetch, and capacity in quantitative analysis of toxin levels, towards including vetch as an alternative feedstock for plant protein production in SA. Investment in manufacturing for pulse protein fractionation in South Australia is expected to increase local demand for this under-utilised grain legume.



Janine Croser, 0448 990 281, janine.croser@adelaide.edu.au

UAD1223: Pairing pulses for improved yield, protein, agronomy and profit



University of
Adelaide / SARDI



\$123,263



1/7/2023 – 30/6/2026



This project will be undertaken by SARDI researchers and will investigate if the pairing of faba bean and semi-leafless field pea will benefit both crops by increased seed and protein yield; reduced lodging, disease and harvestability issues; and improved yield and reduced N fertiliser cost of the following wheat crop. This system could increase faba bean representation in more marginal areas and increase yield in drier seasons as field pea is better adapted to drier conditions.



Lachlan Lake, 0418 813 495, lachlan.lake@sa.gov.au

UAD1323: Optimising crop establishment under dry and marginal soil moisture



University of
Adelaide



\$247,195



1/7/2023 – 30/6/2025



The aim of this project is to improve the effectiveness of dry sowing focusing on wheat and canola. It will conduct experiments at three sites with different rainfalls and soils to examine the effect of sowing practices on establishment at a range of sowing times. The project will explore the ability of remote sensing to measure seedbed moisture content to aid decision making. Controlled environment studies on emergence in different soils and moisture contents will support the field studies. This project is a co-investment, with the SA Drought Hub providing a further \$51,327 funding.



Glenn McDonald, 0447 725 285, glenn.mcdonald@adelaide.edu.au

Camera observation setup and installation and crosshair pitfalls at Finniss, 2020.



Camera study reveals crop damage isn't always by the prime suspect

As a rule, farmers are all too familiar with the invertebrate pests in their paddocks, and the damage they can cause to crop seedlings.

However, in 2021, SAGIT supported a joint project between SARDI and the University of Adelaide to investigate exactly what was eating emergent crops in six paddocks at Finniss, on the Yorke Peninsula and in the Lower Mid North.

The project planted 'target trays' of barley, wheat or oat, canola, chickpea, faba bean, lentil and vetch to assess pest preference, then placed them in paddocks with pitfall traps and infrared observation cameras for night viewing. Trays were replaced fortnightly to simulate early or later planted crops.

Project supervisor Dr Maarten van Helden said video recordings of each two-week period took the team up to three days to analyse, as they identified and counted each species.

"We observed a total of 16,645 individual invertebrates in the images we analysed," he said.

"The different test sites had vastly different invertebrate communities, with up to 25 different species groups identified in the pitfall traps and 12 to 18 species groups distinguishable in the camera footage."

This difference in counts between the pitfall and camera traps hints at the most surprising aspect of the research.

"We observed high numbers of slaters (*Australiodillo bifrons*) in several paddocks and pitfall traps, and these are often blamed for seedling damage," Dr van Helden said.

"However, the cameras showed the ratio of slaters present to slaters actually observed feeding on crops was very low.

Video image showing an earwig (top), Portuguese millipede (middle) and weevil (bottom) at Finniss, 2021.



“It was the same with Portuguese millipede (*Ommatoiulus moreletii*), which could be present in very high numbers but was seldom observed eating seedlings.”

In contrast, the pitfall traps caught relatively low numbers of earwigs but the cameras identified them as the main invertebrate culprit attacking seedlings in several paddocks. Red legged earth mites were observed in high numbers and high feeding ratios at Halbury.

Another surprise was weevils, which are rarely reported for damaging seedlings, but they were detected in higher numbers, than expected and were frequently seen attacking crops.

“We were also able to observe a range of beneficial invertebrates, such as carabid beetles which often go unnoticed,” Dr van Helden said.

“Other beneficials included spiders and ants, with the site at Reeves Plains in particular having high numbers of ants and very few invertebrate pests damaging the seedlings.”

Overall, the project showed that pests observed in high numbers may not actually be causing the most damage to emerging crops, and closer observation, particularly at night, is needed to identify the true pest so it can be managed more effectively.

The observation methods developed for this project promise to make pest observations easier and more accurate for grain growers. The target seedling trays and pitfall traps are both low tech equipment, while the infrared cameras are relatively common and affordable.

The camera setup concept from this project is now being used in a GRDC project to quantify the diversity and abundance of pest and beneficial invertebrates associated with harvest weed seed controlled systems in southern Australia. (UOA2112-001RTX).

S/UA1420 Caught red-handed: Revealing invertebrate species and conditions causing seedling damage in field settings

UAD1423: Colour preservation in faba beans to enhance quality and value



University of
Adelaide / SARDI



\$67,515



1/7/2023 – 30/6/2025



Seed colour is an important quality trait required to meet the highest value export markets for faba bean, with consumers demanding a pale tan colour. Faba beans darken on storage, and storage temperature and moisture both affect this process. This project will be undertaken by SARDI researchers and has three aims: to determine what chemical mechanism is behind the darkening process; to find a low-cost post-harvest treatment able to slow down the darkening; and to look for varietal differences in storage darkening.



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UAD1623: Preparing for a pulse protein market - pulse options for expansion areas



University of
Adelaide / SARDI



\$172,173



1/7/2023 – 30/6/2025



This project will be undertaken by SARDI researchers and aims to provide information to growers when considering a pulse protein market in key pulse expansion areas. This will be achieved by evaluating current genetic variation for protein content and seed quality, evaluating the crop choices for different environments, and by conducting an economic analysis.



Penny Roberts, 0436 678 982, penny.roberts@sa.gov.au

UAD1723: Minimising market access risks in herbicide tolerant pulses



University of
Adelaide / SARDI



\$126,166



1/7/2023 – 30/6/2024



This project will be undertaken by SARDI researchers and aims to exploit natural genetic variation in herbicide metabolism ability to reduce the market access risks associated with chemical residues in herbicide tolerant pulse grain. This project will identify variation in the ability of lentil and faba bean genotypes to metabolise metribuzin and investigate whether herbicide residues are retained or reduced in plant-based protein extraction processes.



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UAD1823: Higher barley yield through improved microbial interactions



University of
Adelaide



\$65,887



1/7/2023 – 30/6/2024



The aims of this project are to determine whether Australian barley varieties differ in their effects on the diversity of potentially beneficial soil microbes in the field, and to investigate the genetic control of any observed differences. This will result in growers being able to choose varieties that will benefit soil biological health and provide new molecular tools for breeders to use in selection to develop new varieties with improved soil biological health.



Ken Chalmers, 0439 994 727, ken.chalmers@adelaide.edu.au

UAD2023: Developing new breeding material to stabilise barley yields



University of
Adelaide



\$115,362



1/7/2023 – 30/6/2025



South Australian crops can be severely impacted by poor and variable growing conditions, which includes low-fertility soils. Crop plants possess strong instincts to reduce grain number due to variable growing conditions or reduced fertiliser. This is a major contributor to the yield gap in SA. This project seeks to help close this yield gap through the import and testing of new genetic material that makes barley less responsive to environmental conditions.



Phil Brewer, 0404 250 110, philip.brewer@adelaide.edu.au

UAD3023: Improving industry response to white grain disorder and fusarium head blight outbreaks while protecting export markets



University of
Adelaide / SARDI



\$223,554



1/7/2023 – 30/6/2025



This project will be undertaken by SARDI researchers and aims to improve industry preparedness for dealing with white grain disorder and fusarium head blight to reduce rejection and down-grading of grain at silos while protecting SA's export markets. Grain samples, trial data, spore trapping data and weather data will be utilised. This project is a co-investment, with the Grains Research and Development Corporation providing 50% of the total funding (above).



Tara Garrard, 0459 899 321, tara.garrard@sa.gov.au

UAD3123: Manipulating spike architecture to improve wheat yield



University of
Adelaide / SARDI



\$136,595



1/7/2023 – 30/6/2024



This project will be undertaken by SARDI researchers who will use a novel bread wheat mapping population and high-throughput phenotyping method (X-ray computed tomography) to measure spike traits that contribute to yield, and identify genetic markers associated with improved yield for breeding programs. This project includes controlled environment studies and field trials.



Yusuf Genc, 0468 343 899, yusuf.genc@adelaide.edu.au

UAD3223: Screening for genetic components of head-retention in barley



University of
Adelaide



\$149,174



1/7/2023 – 30/6/2025



Barley head loss is an ongoing issue that leads to reduced yield based on environmental factors and cultivar sensitivity. Although management options exist, improved genetic solutions are needed to limit the seasonal and site variability. In this project, researchers will extend current knowledge of head loss management and peduncle structure to consider new cultivars and candidate genes that might influence head retention.



Matthew Tucker, 8313 9241, matthew.tucker@adelaide.edu.au

UAD4423: Delivery of beneficial organisms through seed coating to improve grain yield



University of
Adelaide



\$197,149



1/7/2023 – 30/6/2025



This is a pilot project focused on seed quality improvement and enhanced grain production in wheat, barley, chickpea and canola as major diverse crops in SA. This will be achieved by generating new formulas for seed coating that enhance the delivery of Trichoderma, mycorrhizal fungi and other beneficial microbes, nutrients and other effective additives.



Matthew Denton, 0417 026 227, matthew.denton@adelaide.edu.au

UAD1722: Harvest and use of medic pods on-farm



University of
Adelaide



\$180,000



1/7/2022 – 30/6/2024

This project will research novel ways of harvesting and sowing medic pods which have the potential to reduce medic establishment costs by 60 per cent. A cheaper method of harvesting and sowing medic pods is expected to result in increased medic dry matter production and increased benefit to subsequent grain crops.



David Peck, 0407 528 104, david.peck@adelaide.edu.au

UAD1922: Agronomy strategies for frost management in pulse crops



University of
Adelaide / SARDI



\$123,036



1/7/2022 – 30/6/2025

This project will be undertaken by SARDI researchers. Novel management strategies that either provide crop protection or avoidance during the critical reproductive stages, such as including mixed species cropping (intercropping) and delayed sowing, will be investigated to successfully grow pulse crops in frost prone environments. This project is a co-investment, with the Grains Research and Development Corporation providing 50% of the total funding (above).



Penny Roberts, 0436 678 982, penny.roberts@sa.gov.au

UAD2222: Realising cereal yield potential using crop physiology and drone technology



University of
Adelaide / SARDI



\$69,921



1/7/2022 – 30/6/2024

This project will be undertaken by SARDI researchers with the optimal flowering period for wheat and barley for the Murray Plains to be refined and validated from previous investment S/UA1021 through field trials and crop modelling. Drone imagery will be used to estimate both plant establishment and biomass of these field trials to help dissect key grain yield drivers independent of flowering time. Drone methods will be further developed from UA217 and UA318 in collaboration with the Unmanned Research Aircraft Facility (URAF).



Brendan Kupke, 0429 411 032, brendan.kupke@sa.gov.au

UAD2522: Revegetation for enhanced biocontrol of pest conical snails



University of
Adelaide



\$239,917



1/7/2022 – 30/6/2025

This study investigates the impact of native revegetation on suppressing conical snail populations on the Yorke Peninsula. The establishment of revegetation strips adjacent to grain cropping paddocks and near silos can enhance the survival of a beneficial parasitoid fly by providing essential floral food resources and refugia, boosting parasitism rates and suppression of pest conical snails. The project team is led by SARDI researchers. This project is a co-investment, with the Grains Research and Development Corporation providing 50% of the total funding (above).



Kym Perry, 08 8429 0738 / 0421 788 357, kym.perry@adelaide.edu.au

UA420: Enhancing grain production and quality traits for bread wheat



University of
Adelaide



\$174,021



1/7/2020 – 31/12/2023

Speed breeding to back cross F3-4 of wheat lines from AGT, Intergrain and LongReach Plant Breeders with lines that have potential to increase grain yields. These lines will be assessed for nitrogen use efficiency in glasshouse and field trials at Roseworthy, Mallala and Bordertown.



Scott Boden, 0413 801 112, scott.boden@adelaide.edu.au

UNF2822: Canola profitability as a break crop in the Upper North



Upper North
Farming Systems



\$101,180



1/7/2022 – 30/6/2025

This project aims to explore if new canola technology allows it to be a more reliable and viable break crop option in the Upper North agricultural zone. The project will assess the profitability of different canola agronomy packages in local validation trials (GM vs open pollinated TT) against wheat over a three-year period.



Ruth Sommerville, 0401 042 223, unfs@outlook.com

USA3323: Pesticide effects on soil microbial functions in contrasting SA soils



University of
South Australia



\$245,855



1/7/2023 – 30/6/2025



The aim of this project is to understand how soil properties influence the effects of pesticides on soil health. The project team will assess six targeted pesticides in 10 contrasting South Australian broadacre cropping soils. This knowledge will deliver farmers essential information for identifying the best pesticide-soil combinations to maintain healthy soil microbial communities. This project is a co-investment, with the Grains Research and Development Corporation providing 50% of the total funding (above).



Casey Doolette, 8302 6233, casey.doolette@unisa.edu.au

USA121: Developing a DGT methodology to assess bioavailability of herbicide residues



University of
South Australia



\$213,806



1/9/2021 – 31/8/2024

A robust testing system for imidazolinone residues is to be developed using Diffusive Gradient in Thin-Films (DGT) technology. This tool will provide information on bioavailability of herbicide residues independent of soil type characteristics. The DGT tool will be validated in spiked soils, in a range of soil types and two water regimes. The DGT tool for glyphosate residue is also to be assessed.



Enzo Lombi, 8302 6267, enzo.lombi@unisa.edu.au








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