Kangaroo Island **Agriculture Trials** 2024 Results

AGKI
AGRICULTURE
KANGAROO ISLAND

Government of South Australia
Department of Primary Industries and Regions

Proudly supporting Kangaroo Island's agricultural industries to prosper and grow

The Department of Primary Industries and Regions (PIRSA) team on Kangaroo Island continues to work with primary producers and the wider community to help strengthen our primary sector through advice, support and financial assistance.

Landholders can access:

- technical advice, educational courses and workshops
- enhanced biosecurity programs through weed management, animal health, and resources protecting the island from pests and diseases
- soil and water testing and interpretation of results.

General Enquiries: 8553 4949

PIRSA Offices:
Shop 7, 56 Dauncey St, Kingscote

https://www.pir.sa.gov.au

Animal Health:
Kate Buck 0419 091 156

Fisheries:
Aaron Ledgard 8553 4949

Soil and Land Management:
Lyn Dohle 0419 846 204

Ag Tech Extension Officer:
Ashley Balsom 0448 259 530

Biosecurity SA & Weed Control:
Bianca Jones 0427 981 410

Sheep Blow Fly Eradication:
Helen Brodie 0411 216 968

Feral Pig Eradication
David Jirman 0428 371 436

Government of South Australia
Department of Primary Industries and Regions

Foreword

It is a dry and late start to the winter season as we put together this years AgTrials booklet for 2024. Adapting to challenges is what KI farmers do best and AgKI's role in that is to keep providing access and up to date information on new technologies and research.

Locally produced agricultural trials are pivotal in providing access to relevant, local data to help inform strategic and day to day decision making for our farmers. This year's booklet includes trials that have been run by PIRSA's AgTech project along with other PIRSA funded projects and the KI Landscape Board. AgKI's ongoing partnership with these agencies enables us to access funding to deliver ongoing ag trial projects and findings that are tailored for our soils and climate. Contact details are provided at the end of each article so that further information about the application and findings of each project can be sourced if required.

As with previous years, the AgTrial's booklet is coordinated by local PIRSA staff, led by Lyn Dohle whose contribution to a thriving, sustainable agriculture sector on Kangaroo Island is well known and very much appreciated.

We look forward to continuing to work with our partners for all future projects – we have new, exiting projects in the pipeline for 2025!

Jamie Heinrich

Chair, Agriculture Kangaroo Island

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Note on the use of QR codes

We are increasingly using QR codes in this publication to direct you to further information online, as lengthy addresses are unwieldy to follow from a print publication. Hover your phone camera over the QR code without taking a photo, and your phone should ask whether you wish to go to the website. If you'd prefer to read on your computer, enough information is given alongside each code for you to find the page via a search engine such as Google.

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An Update from AgKI

AGRICULTURE
KANGAROO ISLAND

Agriculture Kangaroo Island Inc is the peak body for agriculture and primary production on Kangaroo Island. With over 150 members, we represent members across the breadth of the island, including grain, wool and livestock producers, along with other farming and production activities.

In 2023/24, AgKI:

- held the 2023 AgKI Biennial Conference (over 120 in attendance)
- held workshops & information sessions throughout the year
- represented the farming community on the Feral Cat, Feral Pig and Sheep Blowfly Eradication Committees, KI Landscape Board's Water Management Committee, KI Bushfire Management Committee and Lime Sand task force
- initiated discussions with Native Vegetation Council about strategic roadside fuel reduction breaks and the associated process for approval
- gave ongoing financial support to the feral cat eradication project
- lobbied KI Council to continue rate capping for Primary Production land, seeking re-introduction of differential rates from 2025/26
- provided sponsorship for two KICE students to attend SA Sheep Expo
- represented agricultural issues to State Government, including the ongoing need for biosecurity checks at the ferry terminal and a washdown facility
- represented agriculture sector at Sea Transport Round Table meetings, Fleurieu Freight Corridor Strategy and Penneshaw Harbour Master Planning meetings.

We have continued to deliver on island projects and research, as a result of grant funding, for the following projects:

- Feral Cat eradication
- Oestrogenic Clover
- Roadside weed spraying
- Soil probe weather station network expansion
- Filling the Feed Gaps
- MLA Producer Demo Site
- FRRR Future Drought Fun (weather station dashboard)
- SA Drought Hub – Improving Water Security for Ki Farmers
- AgTech Demonstration Groups – Livestock & Wool and Viticulture
- KI Landscape Board partnership programs.

Over the last 18 months, AgKI have delivered just over $650,000 worth of projects on Kangaroo Island with our PIRSA and KI Landscape Board partners. Projects have included feral cat management programs, roadside weed spraying, soil probe and weather station network, managing high oestrogenic clover trials, feed testing and analysis along with two for one feed tests.

We continue to work with key partners to ensure that our members are well represented, recognising that agriculture/primary production is the largest industry sector on Kangaroo Island.

We have delivered a variety of workshops and information sessions over the last 12 months, including the 2023 AgKI Biennial Conference which was a great success. We have more workshops lined up for the remainder of 2024 supported by the KI Ag Events Calendar where you can find all that is happening in agriculture on our website.

AGKI update

Our Board Members have continued to work hard representing the interests of our members. The current board members are:

Jamie Henirch (Chairperson)

Tim Buck (Deputy Chairperson)

Steph Wurst

Peter Cooper

Grant Flanagan

Jenny Stanton

Simon Veitch

Nathan Howard

Cr Sam Mumford (Council representative)

Lyn Dohle (PIRSA representative)

Jo Sullivan (NRKI representative)

We acknowledge our partners, whose valued assistance allows us to support and advocate for our members:

Platinum Partners

Natural Resources Kangaroo Island (NRKI)

Primary Industries & Regions South Australia (PIRSA)

Gold Partners

ANZ Bank

Nutrien Ag Solutions

Silver Partners

Elders

LawrieCo

Bronze Partners

Rabobank

Partner

Ella Matta

Precision Ag

To Contact AgKI:

Phone: 0428 716 330

Email: admin@agki.com.au

Website: www.agki.com.au

Join now

If you would like to become a member of AgKI and gain the many member benefits, please fill in the slip on this page and post it along with your payment. For more information or if you would like a membership brochure emailed to you with the BSB details, email to: admin@agki.com.au.

AgKI MEMBERSHIP FORM

Name: .....

Trading Name: .....

Postal Address: .....

.....

Phone number: .....

Email: .....

Enterprises (Please circle those you are involved in)

Wool | Prime lamb | Beef cattle | Cropping

Marron/aquaculture | Viticulture | Beekeeping

Other (please specify): .....

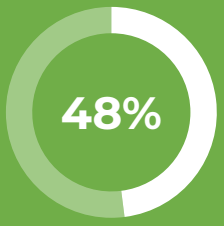
Payment: $99 GST incl.

Cheques or money orders should be made payable to 'Agriculture Kangaroo Island'

Please post this form and your payment to:

Agriculture Kangaroo Island
PO Box 794
KINGSCOTE, SA 5223

PRIMARY PRODUCTION SNAPSHOT



48% OF KI'S GRP

Primary Production generates $99.9 million per year, out of Kangaroo Island's total Gross Regional Product of $209 million.

LARGEST SINGLE EMPLOYER

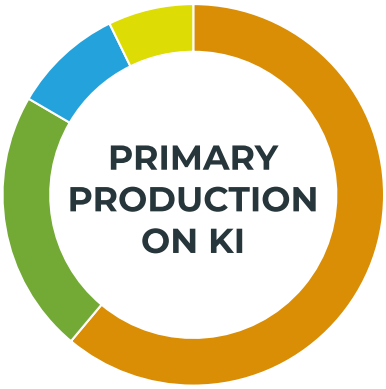
23% of all workers on KI are involved in primary production.

LIVESTOCK & CROPPING

is the single largest industry sector on KI.

BUSINESSES PER INDUSTRY

43.5% of all businesses on KI are involved in primary production.

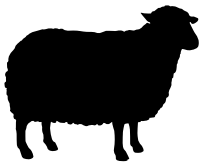


Livestock & Wool %61

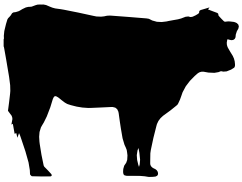
Eggs 9%

Cropping & Hay 22%

Potatoes, Wine, Fruit & Veg 7%



680,000 SHEEP



15,000 CATTLE

14,729ha CROPS

LANDCARE

Farmers set aside over 17% of their land for conservation, an area equivalent to 85% of Flinders Chase.

In 2021 AgKI won the South Australian Landcare Farming Award.

All figures cited here are based on the 2021 Census, with bushfire impacted properties still not fully stocked.

A Checklist for Before and After Fire

Background

Over the page is a checklist with ideas to assist farmers in preparing for and recovering from fire.

Its focus is not fire safety or prevention, but how to prepare and recover from fire as an agricultural business.

It is by no means a complete guide, and is intended as additional to the guides distributed by CFS, Red Cross, Government and others. The “Firey Women’s Workshops” hosted by the CFS are another excellent resource.

The checklist was prepared after the 2019/20 bushfires by Lyn Dohle, with input from several fire-affected farmers, KI FABS, and Tom Silcock from Agriculture Victoria. If you have any suggestions of information to add or change, please contact Lyn at PIRSA.

On this page are some QR codes which will take you to useful online resources which will supplement the checklist.

To use these codes, switch your phone to camera mode and hover over the code, without taking a photo. Your phone should ask if you want to go to the website.

Agriculture Victoria: Bushfires.

This site gives more detail on some of the points mentioned in our fire checklist, such as emergency stock containment areas and questions to ask when considering insurance. Note that a lot of information is Vic-specific, but the checklists are excellent.

CFA (Victoria): How to prepare your property.

This page contains more detail, including a video, on ways to prepare your home ahead of and during the fire season. It also has links to other suggestions and resources.

CFS 5 minute bushfire plan.

The CFS has made planning easier by creating this simple, clear checklist which enables you to download a printed plan.

MY BUSHFIRE PLAN

CFS Firey Women workshops.

As well as giving an overview of the course content, this page lists upcoming workshops. Keep an eye out here for KI events!

FIREY Women WORKSHOP

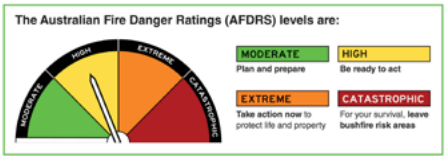
Alert SA App

The Alert SA App is back in an improved form, giving direct access to a real-time CFS incident map.

Alert SA

Australian Fire Danger Rating System

In 2022 some changes were made to the Australian Fire Danger Rating System to make it action-focused and consistent across the country.



Preparing for Fire

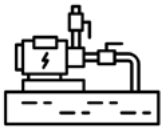
Plan

- ❑ Have a family Bushfire Survival Plan that has been developed by everyone in your household.
- ❑ Include individual plans to stay or go.
- ❑ The CFS 5-minute bushfire plan is an excellent resource for helping with this process.

Vegetation

- ❑ Clear up around house and sheds and ensure buildings have sufficient width & height vegetation clearance for fire fighting vehicles to safely access.
- ❑ Follow native veg clearance guidelines.
- ❑ Creek crossings need to be clear of vegetation and able to support 25Ton truck capacity.

Water Supply

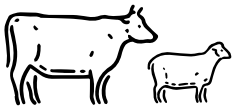


- ❑ Ensure you have sufficient water storage at house & sheds and adequate pumps so you can quickly fill your fire fighting unit. You may not be able to access your dams.
- ❑ Don't rely on electric pressure pumps as you may lose power. Have a generator back up.
- ❑ If you have a pump, ensure it is plumbed into the tank.
- ❑ Attach written durable written instructions to the pump, including fuel type and starting instructions. If possible, keep fuel near the pump, or instructions on where fuel is kept.
- ❑ Have fittings from the outlet that are compatible with CFS fittings or adaptors.
- ❑ Ensure tank manhole is easily accessible and free of vegetation to allow a hose to be dropped in to access water reserves.

Maps

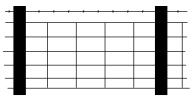
- ❑ Have aerial farm maps to hand to farm fire units, CFS etc. Identify water supplies, gates, property boundaries, easy escape routes, safe harbour locations and where it is safe to cross creeks. Include paddock names (especially for people helping to move stock).
- ❑ Have reflective signs with an arrow to indicate water points.

Livestock



- ❑ Have a plan for where to move stock for all directions of an approaching fire front. Consider options to move off farm.
- ❑ Ensure you have suitable yarding for stock and in an area that is defendable e.g. not surrounded by trees and scrub. Create a buffer zone (plough or burnt break).
- ❑ Try to avoid having all supplementary feed (hay & grain) stored in the one location.
- ❑ Consider splitting up large yards to enable more stock to be held, or consider the use of portable yards.
- ❑ Prepare a list for stock compatibility (i.e. which mobs can be boxed up) and include a map of yards so others can muster and record where stock have been placed.
- ❑ Once stock are mustered leave all paddock gates open for easier access.
- ❑ have a plan for pets and sheepdogs.

Infrastructure/Fences



- ❑ Woolsheds usually burn after the fire front has passed. Stop embers from blowing in under the woolshed by tech screwing or using droppers to hold sheets of iron around the base of the shed.
- ❑ Be prepared to have a generator to supply all electrical needs for several weeks.
- ❑ Spray along fence lines in early spring (aim for bare earth). Check your fences at the same time. If not against scrub, this will protect your fences and many will be salvageable with droppers, ensuring stock proof paddocks to return stock to.

Insurance

- ❑ Understand your policy. What is covered? Have a realistic replacement value.
- ❑ Reassess valuations each year. Sit down with your agent and go through each item in the policy.
- ❑ Ensure your policy provides funds for clean up and business continuance.
- ❑ Take photos of valuable furniture, jewellery and other expensive items you have in your home.

What to take

- ❑ Expect to lose phone and internet reception - UHF radios are useful. Have extra UHF available and the same channel that you all talk over.
- ❑ Be able to charge phone and laptop in the car, and have extra reading glasses on hand if necessary.
- ❑ Have a list of contact numbers, including neighbours and CFS.
- ❑ Ensure protective clothing, mask, goggles and boots are available.
- ❑ Take plenty of drinking water and snacks.

Post Fire Recovery Checklist

The emotional toll of a disaster can't be under-estimated.

A checklist of steps to take towards recovery can help you to focus and move forward.

Immediate Response: Days 1-7

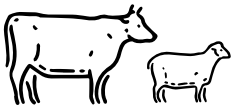
- ❑ Check fire – make sure fire/spot fires are blacked out – monitor regularly.
- ❑ Identify and isolate on-farm hazards such as unstable structures, chemicals or asbestos.
- ❑ Injured livestock – contact PIRSA, your vet & neighbours to assess, treat & euthanise livestock (do not do this by yourself if possible). Ideally put sheep in portable yards to do this. Ask for help. PIRSA can provide a burnt sheep assessment guide.
- ❑ Sort stock into the following categories:
  - immediate destruction
  - salvage by slaughter
  - retain for treatment
  - return to paddocks
- ❑ Assess paddocks – pick & secure good paddocks first to put livestock in, then look at boundary fences.
- ❑ Ensure livestock have access to sufficient feed & water.
- ❑ Prioritise, plan, delegate: What needs to be done now? What can be done later?
- ❑ Start doing a few small, safe jobs from the plan.
- ❑ Protect your drinking water by diverting downpipes until the first rains have provided an initial flush (off roof and pipes).
- ❑ Document everything (a pain, but may be critical).
- ❑ Take plenty of photos and notes for insurance and future reference. Use your camera to document everything, even by taking photos of people, business cards, situations, etc. You will be grateful later.
- ❑ Contact your insurance agent (They are going to be one of your best friends).
- ❑ Be humble enough to accept help that is offered and ask for help when needed (e.g. family, friends, contractors, agencies, army.)
- ❑ Take up offers of accommodation if required.
- ❑ Set up a "telephone tree" for contact with friends and family outside the fire scar. Delegate somebody to be your key contact for letting everyone else know how you're going and what's needed.
- ❑ Stay connected with your community. Where possible, attend community meetings and events and visit relief hubs. This will help you to access the supports you'll need at this time.
- ❑ Remember, you are not alone. It's overwhelming but just take one step at a time.

Long Term Recovery

What to focus on in the days, weeks and months after the fire.

If you're unsure where to go or how to start, contact PIRSA (8553 4949) who can help direct you to appropriate supports.

Livestock

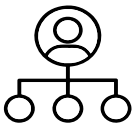


- ❑ Seek advice from PIRSA or vets regarding injured animals.
- ❑ Monitor closely as they can deteriorate weeks after.
- ❑ Assess good paddocks and start with these to secure stock.
- ❑ Consider agistment.
- ❑ Providing adequate food, water and shelter to remaining animals is a priority.
- ❑ Look at all normal livestock management and what areas will need to be adapted, and start looking for solutions.

Biosecurity

- ❑ Reduce weed spread from introduced fodder by feeding stock in one location, such as a containment area.
- ❑ Closely monitor areas disturbed by firefighting or recovery activities.
- ❑ Monitor purchased and agisted stock for worms, lice, footrot etc.
- ❑ Watch out for animals straying because of damaged fencing.
- ❑ Practice good disease hygiene management and ensure good biosecurity practices when buying stock.

Plan, Prioritise, Delegate, Allocate.



- ❑ You don't need to do this process alone - it's important to ask for help if you feel you need it.
- ❑ Write down all tasks to be done now.
- ❑ Prioritise these tasks.
- ❑ Detail what actions are required and who can take responsibility for each action.
- ❑ You need to change your role to facilitate, plan, plan, plan again, rather than just doing!

Mental Health & Wellbeing

- ❑ Ensure the safety and wellbeing of yourself, family and friends.
- ❑ Keep the home front as normal as possible – regular meals, adequate sleep, good communication & responsiveness to children's needs.
- ❑ It's a no brainer to seek professional help to support the entire family as they work through the trauma. Timely support for wellbeing can prevent mental illness.
- ❑ Watch out for each other.
- ❑ Share the challenges and issues facing you. Remain solution focused.
- ❑ Maintain connections with your community via sports clubs, church, social gatherings or community meetings.
- ❑ Prioritise getting enough rest and sleep, and avoid excess alcohol.
- ❑ Everyone will be affected differently and have different priorities. DON'T COMPARE.

Identify and Isolate on-farm hazards

- ❑ Fallen powerlines.
- ❑ Asbestos contaminated sites.
- ❑ Chemical storage areas.
- ❑ Sheep dips and spray areas.
- ❑ Lead and other heavy metal contaminated sites (batteries, treated pine etc.).
- ❑ Falling trees.
- ❑ Report contaminated sites to the local recovery centre.
- ❑ Only start salvaging any contents if safe to do so. Be aware of unstable structures and asbestos.

Insurance & Documentation

- ❑ Replace important documents that have been lost (driver's license, passport, marriage certificate).
- ❑ Keep taking photos and recording everything for future reference.
- ❑ Ring your insurance agent and keep them up to date. Be respectfully assertive; make sure you know what you are entitled to on your insurance policy and be persistent.
- ❑ Be aware that insurance claims can take up to 12 months or more to finalise.
- ❑ Talk to your accountant about tax implications of insurance claim payments.

Finance & Support

- ❑ Budgeting is really important to keep on track (taking into account insurance claims).
- ❑ Accept any relevant donations (fodder, fencing equipment, machinery etc.).
- ❑ Seek government, local council and charity support. Keep a folder with all grant and support information or delegate somebody to manage the process.
- ❑ Seek & accept advice on all matters.
- ❑ Record names and phone numbers of people and organisations who are offering support, as you might need them later.

If you've lost your house or sheds

- ❑ Consider good temporary accommodation close & convenient to property.
- ❑ Organise removal of burnt sheds, housing & contents – cleaning up cost can add up so allow for this in your budgeting.
- ❑ Organise house & shed replacement.
- ❑ Expect rebuild to take longer & cost more than you think. Be mindful of budget (it can easily blow out).
- ❑ You may be able to use the opportunity to make improvements to your farm, for example by relocating buildings, adding raceways, upgrading machinery and even discussing succession.
- ❑ If you are going to build in a new location, be mindful that there may be costs associated with connecting utilities to the new site.

Pastures, feed & soil

- ❑ Do a feed budget and test grain and hay to ensure you meet stock nutritional requirements.
- ❑ If possible, de-stock burnt and partly burnt paddocks.
- ❑ Seek potential for agistment.
- ❑ Consider building a stock containment area or sacrifice paddock to limit grazing to a defined area. This will protect your pastures, soil and vegetation. A paddock with heavier soil is best and with some shelter if possible.
- ❑ Perennial pastures and sub-clover are generally unaffected by fire. However, fire can have a major impact on annual pastures.
- ❑ Consider protecting loose, sandy soils from wind erosion with cover crop of oats. Deep ripping or ridging can also help to retain topsoil.
- ❑ Upgrade track drainage to minimize erosion.

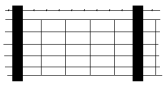
Native vegetation

- ❑ Consider the service of an arborist to identify trees that may fall on buildings and to identify the ones that will survive.
- ❑ Use loaders, dozers and/or an excavator to get this done (note dozers make a bigger mess and are nowhere near as efficient as an excavator). This is usually not covered under insurance.
- ❑ A significant proportion of native vegetation will survive a bushfire; give it time to recover. Fence it off to allow for regeneration.
- ❑ Watch for burning tree roots three to six months after the fire.

Protecting dam water

- ❑ Check all water infrastructure for damage.
- ❑ Trap ash, debris, organic matter and sediment with sediment traps or temporarily cutting gutters.
- ❑ Consolidate water supplies with pumps and pipes.
- ❑ Be aware that dams may require de-silting.
- ❑ Remove stock if water becomes putrid, looks or smells rotten or has signs of blue green algae (paint-like scum on surface).
- ❑ If in doubt, contact PIRSA for assistance with testing.

Fencing



- ❑ Your boundary fence is your priority.
- ❑ Mark boundary fence alignment prior to clean-up.
- ❑ Seek assistance with clearing & grading boundary fence lines. BlazeAid and other help may be available, such as the military and volunteers.
- ❑ Avoid replacing internal fencing immediately; fire offers an opportunity to re-think your farm layout, such as new fence alignment and gate locations.
- ❑ Consider getting an aerial photo of your farm to review your farm layout. Seek advice on whole farm layout.
- ❑ Consider replacing fencing along land class boundaries.
- ❑ Explore alternative fencing options such as vermin proof and fire resistant.
- ❑ Patch up old fences wherever possible, for example using droppers.
- ❑ Consider using portable sheep yards.
- ❑ Be organized in ordering fencing material so it is on hand & ready for fencing crew. Order as soon as possible as there may be delays due to high demand.

When you need someone to talk to

Emergency (Fire, Police, or Ambulance) 000

On-Island Support— *to connect with face-to-face*

KI Medical Clinic	8553 2037
Mental Health Team	0457 506 006
CAMHS (Child Adolescent Mental Health Service)	1300 222647
Summit Health	8406 7715
Uniting Communities (Family Mental Health Support Service)	8202 5200
Relationships Australia (Gaming and Gambling)	1800 934 196
Sonder (Drug and Alcohol)	8209 0710
Mission Australia (Youth & Family Alcohol & Other Drug Support)	8187 0707
Island Psychological Strategies (private provider)	0492 917 938
Sound Essence (private provider)	0434 914 463
Cheryl Vigouroux Counselling (private provider)	0432 392 934
Dr Gregory Bull Psychologist (private Provider)	0418 306 132

24/7 Off-Island Support—*telephone/internet*

Lifeline	13 11 14
Lifeline Text www.lifeline.org.au	0477 13 11 14
Suicide Call Back Service www.suicidecallbackservice.org.au	1300 659 467
Mental Health Crisis Service	13 14 65
Regional Access - (counselling for the pressures of everyday life) www.saregionalaccess.org.au	1300 032 186
Mensline www.mensline.org.au	1300 789 978
Beyondblue www.beyondblue.org.au	1300 224 636
Kids Helpline (5-25yrs) www.kidshelpline.com.au	1800 551 800
Standby Support After Suicide www.standbysupport.com.au	1300 727 247
Open Arms (Veterans & Families Counselling) www.openarms.gov.au	1800 011 046

Kangaroo Island AgTech Demonstration Program

The Kangaroo Island AgTech program demonstrates the potential for technology to improve productivity and profitability within the Island's agricultural sector. To date, the program has attracted interest from 21 technology companies.

Since the program began, 17 technology companies have partnered with 11 producers to trial various AgTech products on the island over a 12-month period at no cost. Additional technologies are being considered for future demonstrations.

These demonstration sites promote knowledge sharing and support investment decisions on farm. The following table provides an overview of the technologies currently showcased. Industry-specific tours to these sites will be held in 2024/25.

Technology Demonstration on KI Farms

Technology	Industry Demo Site	Description
eBottli	**Viticulture**	The Islander Estate is utilising this traceability, data collecting and task tracking app for all their viticultural needs. eBottli has a suite of new tracking and blockchain technologies, geolocating services and unique identifier labels assuring the authenticity of products and allowing producers to follow their product from harvest right through to consumption.
Farmbot Monitoring Solutions	**Sheep**	Two water level sensors and a rain gauge are being trialled, with associated software providing an accurate snapshot into water levels remotely. Sheep producer Tim Chirgwin – "The Farmbot water monitor has been very useful". A notification of increased water usage alerted him to sheep in the wrong paddock and a low water level notification led him to discover rams had broken a tap, resulting in quick identification and repair of the issue with minimal water loss and all stock maintaining water access.
Sentek	**Viticulture / Potatoes**	A soil probe technology that collects moisture, salinity, and temperature data at multiple depths, for precision irrigation management. Bay Of Shoals - "Great product, has decreased our water usage significantly and given us the ability to understand what the vines' water requirements are at different depths throughout the soil profile."
Shearwell X6 Stock Recorder and eID Weigh Crate	**Sheep**	A handheld scanner for RFID tags in cattle and sheep, providing the ability to track, assess and record information against the animal's individual RFID number. It is battery powered with a touch screen for data entry. It can connect to compatible readers and weigh scales via Bluetooth for drafting. The weigh crate is designed to safely confine livestock and weigh them efficiently. The crate paired with the X6 scanner will identify the animal and accurately record its weight automatically.

LB AgTech	**Apiary**	An in-hive sensor installed between the centre frames of the hive. The BeeSTAR device collects hive information to be analysed and informs the beekeeper of inspection needs and abnormalities. Powered by AI the sensor learns and adapts along with you as you confirm inspection types (missing queen bee, disease etc.). Therefore, the accuracy of targeted hive inspections increases over time and saves time and labour for the farmer as they get hive insights from their device.
AgTech By Design	**Viticulture**	AgTech by Design's Weed Selector is a green-on-brown vision system for spraying weeds in vineyards and orchards. It is a modular system based on stackable 3-metre boom arms that can be retrofitted to existing sprayers. Weeds are selectively targeted using AI, an alternative to blanket spraying. Weed Selector logs GPS data of every weed sprayed to generate maps of trouble areas and inform future spray decisions.
Farm Tech Solutions	**Sheep**	With a simple plug and play install, the Farmtech mobile app provides high quality, high definition cameras with night vision and two-way audio communication. Motion detection area and sensitivity levels can be customised and the record function can be set to motion-activated only or constant. Remotely monitoring critical assets like water points reduces risks associated with leaks and blockages and saves valuable time and money manually checking.

Above: AgTech By Design's Weed Selector spraying system. Photo credit AgTech By Design.

Program outcomes

Following the completion of the program, participating producers will be asked to share their experiences on the technology they have trialled. The provision of this feedback will allow the technology companies to assess the beneficial impacts, as well as opportunities to improve their product and service. Case studies and return on investment reports will also be created to provide greater understanding of the benefits of technology on farm. An island virtual tour is also soon to be realised, with the immersive experience hosted on the PIRSA website.

Above: LB AgTech's in-hive sensor installed between the centre frames of the hive. Photo credit LB Agtech.

Research

The program is delivering two applied AgTech research projects, utilising advanced science and emerging technologies to resolve Kangaroo Island high priority primary industry challenges.

Precision livestock management

Electronic identification (eID) tags are being implemented in sheep flocks to demonstrate how data collection on farm can help with production decisions including how to maximise value from available eID compatible technology. Various eID data will be collected, compared, and shown as a clear in-the-field model of how to use this technology.

Kangaroo Island scale and carbon stock level quantification

The program is using FarmLab and FLINTpro technologies to generate carbon stock levels for all primary production paddocks, areas of forrestry and the island as a whole. This will provide a basis for mandatory climate reporting that will be coming online 2024/25.

Funding/Sponsors

The KI AgTech Demonstration Program is being implemented by the Department of Primary Industries and Regions with funding by the Commonwealth Government Regional Recovery Partnerships Program.

Further Information

Ashley Balsom – AgTech Extension Officer Kangaroo Island

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E ashley.balsom@sa.gov.au

PIRSA: Visit an AgTech demonstration farm or site

The Kangaroo Island Landscape Board Is here to support KI farmers and Is committed to working with the Island's farmers to Increase the sustainability, resilience and adaptability of our primary production Industries.

Key roles within the sustainable landscapes program include:

Sustainable Agriculture Facilitator: Works to connect farmers with information you need to increase sustainable agriculture practices and reduce carbon emissions. Your input and feedback can help shape this role.

Soil Extension Officer: Supports farmers and farming groups to improve soil and landscape health through the provision of technical advice and information services that promote best practice in soil and land management.

Carbon Outreach Officer: Supports island farmers and land managers to make decisions to reduce emissions, store carbon and improve on-farm productivity and resilience. Workshops will be delivered to increase KI land managers understanding of the opportunities for emissions reduction and carbon sequestration.

Water Officer: Supporting the sustainable management of the island's water resources, through the provision of advice on Water Affecting Activity permits, erosion control, construction of crossings, water security plans and the management of the Board's water resources monitoring program.

Animal and Plant Control Officers: Supporting the management of pest plants and animals on Kangaroo Island through active management and prevention activities and the provision of identification and control advice.

DID YOU KNOW?

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SOUTH AUSTRALIA
KANGAROO ISLAND

ALL NEW DAM CONSTRUCTIONS AND THE ENLARGEMENT OF EXISTING DAMS REQUIRE APPROVAL.

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Carbon Farming Outreach Program

Background

The eight regional Landscape Boards across South Australia have received funding from the Carbon Farming Outreach Program to deliver 120 workshops and provide extension support to maximise land manager uptake of carbon farming and low-emissions technologies and practices.

The Carbon Farming Outreach Program seeks to

- build the capacity of trusted advisers to deliver independent advice
- facilitate access to clear, consistent and culturally appropriate information on carbon farming and low-emissions technologies and practices
- increase knowledge of greenhouse gas emission management among farmers and land managers
- support farmers and land managers to make decisions to reduce emissions.

What will be done

Over the next two years, the Kangaroo Island Landscape Board will deliver 16 workshops of around ten properties per workshop, to provide local farmers and land managers with an understanding of the opportunities to sequester carbon and reduce emissions within their primary production operations and land management practices.

These workshops will be tailored to participants' needs. They will support the island's farmers and land managers in making decisions that reduce emissions, store carbon, and improve on-farm productivity.

We will help farmers understand their carbon emissions footprint and identify the right carbon farming activities for them.

These can depend on several factors, including type of production, climate conditions and location. Carbon farming activities can include:

Examples of Carbon Farming Activities	
Carbon storage (sequestration):	**Emissions reduction:**
• Soil, pasture and grazing management to increase soil carbon • Agroforestry • Revegetation • Protecting and improving native vegetation	• Livestock and grazing management • Fertiliser selection and use • Improved production efficiency • Livestock feed additives

Take home messages:

- While focusing on opportunities to achieve on-farm carbon neutrality, workshops will also explore carbon markets and the generation of Australian Carbon Credit Units (ACCUs or carbon credits).
- A carbon-neutral farm reaps productivity, environmental co-benefits, and potentially increased profit as markets, banks and insurance companies increasingly seek to achieve their carbon emissions commitments.
- Expressions of interest are now open for upcoming workshops. Interested farmers can get in touch with the Board's Carbon Outreach Officer using the contact details below.

Funding/Sponsors

This project is funded by the Commonwealth of Australia through the Department of Climate Change, Energy, the Environment and Water under the Carbon Farming Outreach Program.

Further Information

Alex Comino, Carbon Outreach Officer, Kangaroo Island Landscape Board

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Update: Sheep Blow Fly Eradication on KI

Background:

The Australian Sheep blowfly (*Lucilia cuprina*) is one of several species commonly known as "blowflies". It is a sheep-specialist and considered responsible for initiating 90% of flystrike on sheep, whilst other "blowflies" concentrate their breeding efforts in carrion.

South Australia Research and Development Institute (SARDI) researchers are developing the Sterile Insect Technique (SIT) for Sheep Blow Fly on Kangaroo Island. This technique aims to rapidly reduce sheep blowfly populations to the point of eradication by releasing large numbers of sterile flies that mate with wild fertile flies to result in no offspring.

Construction of the sheep blowfly rearing facility at the corner of North Coast and Ten Tree Lagoon Roads is very close to completion and production of flies is planned for spring 2024 releases. Over 4 million sterilised blowfly pupae are planned to be released between September and November to supress the populations of wild flies. The weekly aerial releases will cover a 10km^2 section of Dudley.

What's being done

Spring Emergence

In order to determine when the flies first appear in spring, we examined the post-winter emergence of 10,000 flies at farming properties across the island in 2023. Although we knew the emergence was associated with an increase in soil temperature, we wanted to determine a more exact trend. Ten properties fitted with Agbyte weather stations were used in this experiment, located in Birchmore, Dudley, Duncan, Karatta, MacGillivray, Menzies, Newland, Seddon, and Stokes Bay. Blowfly maggots were deposited in May, June, and July into bottomless insect tents that allowed the maggots to burrow into the soil. A camera was mounted in front of each tent to monitor activity. Our cameras also caught a few other visitors to the sites! (Figure 2).

Adult flies were collected from jars fixed to the top of the tent. Of the 10,000 maggots put into the tents, only a third survived to adulthood. Of the surviving portion, around 50% of the maggots from May emerged as adult flies before winter began, while the other 50% emerged after winter. Only a few June maggots emerged as adults during winter, with the rest appearing in spring. All of the surviving July maggots waited until spring to emerge as adults.

The peak emergence of adult flies was seen in October and November when the soil temperature was consistently above 15°C. By the end of December, no further flies were found emerging.

From this experiment we know the conditions that pause the development of maggots in the soil, the estimated mortality of those maggots, and the weather conditions that initiate the emergence of adult flies at the start of spring. We can now plan the most effective time to begin releasing sterilised pupae: the few weeks preceding that period of key soil temperature in spring.

Spread of Blowfly Populations

Although we intend to release sterile flies across the whole island, we were unsure if the wild flies are living in areas without sheep. Because this blowfly species is highly adapted to living off sheep, remote areas where the maggots must compete for carrion food sources with other larger blowfly species would be less suitable.

In order to answer this question, we installed 81 fly traps across 27 sites in summer 2023-2024. The traps were installed on 9 sheep farms, 4 broadacre crop properties, in Ravine des Casoars, Seal Bay, D'Estrees, Lesueur and Simpson, Kingscote, American River, and Penneshaw. The traps were left to collect flies for three periods of three weeks between the end of November 2023 to the end of January 2024.

In total, we trapped and identified over 100,000 blowflies, almost 2000 of which were wild Sheep Blowfly (see the locations of the traps and the flies caught there in the map in Figure 1). Many of those were caught on the sheep farms. However, we were surprised to find a few in remote areas kilometres away from sheep. Five were caught in D'Estrees Bay, and six were caught in Ravine des Casoars. We know that despite doing as much as we can to make the best fly traps, we can only possibly capture an extremely small fraction of the true population. The five and six flies that were caught in those traps are likely from populations of several thousands. We also know from previous experiments that these blowflies generally only travel up to 2.5km, so it's very unlikely these guys were just passing through!

From this trapping research, we know the Sheep blowflies are likely present all over the island, although present in varying densities. Because of this, we will have to release sterile flies in even the most remote areas, adjusting the release number slightly for those patches with fewer flies.

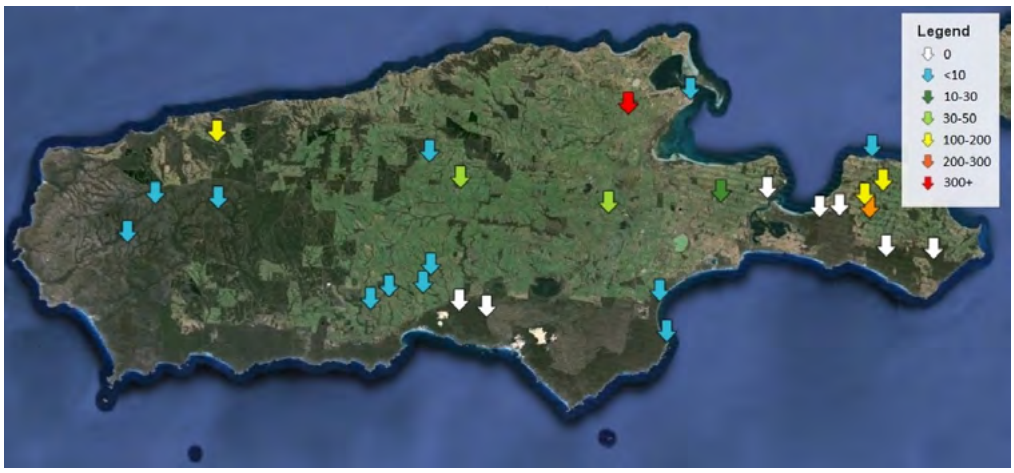

Figure 1: Locations of summer 2023-2024 fly traps colour-coded to show the number of wild Sheep Blowfly captured at each site.

Figure 2: Some curious visitors caught examining the tents used to observe the spring emergence of blowflies.

Take home messages

- Construction of the blowfly rearing facility is almost complete with first aerial releases of sterile blowflies planned for part of Dudley Peninsula in spring 2024.
- The 10,000 maggots released into cages during autumn/winter 2023 indicated that only a third of the species complete development to adult flies and the peak emergence of flies is associated with soil temperatures consistently above 15°C.
- Australian Sheep Blowfly are present in a variety of habitats including remote conservation areas more than 8 kilometres away from sheep.

Funding/Sponsors

The construction of the facility was an initiative of the Local Economic Recovery Program, jointly funded by the South Australian and Australian Governments under the National Disaster Recovery Funding Arrangements. The SIT implementation is funded through industry partners: Meat and Livestock Australia, Australian Wool Innovation, Animal Health Australia, SA Sheep Industry Fund and the University of Adelaide.

Acknowledgments

We would like to thank all the dozens of landowners who allowed us to access their properties and those farm managers, farm workers, and conservation carers who guided us find the best trapping positions.

Further Information

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eID for sheep and farmed goat traceability

Information for South Australian producers

Individual electronic identification (eID) tags are replacing the mob-based visual tag system for the identification and traceability of sheep and farmed goats. South Australia will transition in two stages:

Stage 1: Sheep and farmed goats born on or after 1 January 2025 will need to be identified with a National Livestock Identification System (NLIS) accredited eID tag before leaving their property of birth.

Stage 2: From 1 January 2027, all other sheep and farmed goats leaving a property will need to be identified with an NLIS accredited eID tag.

Requirements for producers

For many producers, the only change will be switching from visual tags to eID tags. Things to remember:

- Sheep and farmed goats born on or after 1 January 2025 will need to be identified with an eID tag before leaving their property of birth.
- eID tags must be NLIS-accredited (scan the QR code overleaf for the list of accredited devices).
- Sheep and goats born before 1 January 2025 DO NOT need an eID tag if sold or processed before 1 January 2027 - an NLIS visual tag will satisfy NLIS requirements for these animals.
- Stock being kept past 1 January 2027 can be voluntarily eID tagged before 1 January 2025.
- Sheep and farmed goats should only be identified with one eID tag. Once applied, the tag must remain with the animal for life. eID tags cannot be reused.
- Many eID tags can be applied with the same applicator used for visual tags.
- eID tags range in price, depending on the type and manufacturer. Talk to your reseller about discounts available on eligible tags.
- The year of birth colour system is used by most producers for management purposes and remains voluntary in South Australia.
- It is the receiver's responsibility to scan and transfer eID tags. If you move animals directly to a saleyard or processor, as a producer you DO NOT have to scan and transfer eID tags.
- You MUST scan individual eID tags if you:
    - have multiple property identification codes (PICs) and move stock between them
    - buy stock privately (with or without an agent)
    - agist stock on your property.
- If transferring animals to another business owner's PIC, it is the receiver's responsibility to scan.

Email: eIDsheepandgoat@sa.gov.au
pir.sa.gov.au/eID

Government of South Australia
Department of Primary Industries and Regions

What support is available for producers?

The Government of South Australia is providing funding to support implementation of the first stage of eID for sheep and farmed goats.

eID tag discount (1 January 2024 – 30 June 2025)

Discounted eID tags are available to producers with an active PIC registered with PIRSA.

An agreement is in place with tag manufacturers to provide a $0.95 discount per NLIS-accredited eID tag.

The discount applies to NLIS accredited eID tags aligned to the year-of-birth colour system:

- black eID tags for 2024 (discount available from 1 January 2024 to 31 December 2024)
- white eID tags for 2025 (discount available from 1 January 2025 to 30 June 2025).

The discount will be applied at the time of purchase, whether you are purchasing directly from a tag manufacturer or through a reseller. You should not need to complete an application form or any additional paperwork. (Scan the QR code below for more information).

eID device rebate (2023)

A rebate is available for sheep and goat producers with an active PIC who have purchased 2023 year of birth (sky blue) NLIS-accredited eID tags between 1 January and 31 December 2023. You can apply for a 50% rebate up to a cap of $0.95 (GST exclusive) per eligible tag.

Applications close 30 April 2024. (Scan the QR code below for more information).

Producer rebate for essential infrastructure

Essential infrastructure rebate assistance for producers is being finalised and will be announced in 2024.

What is eID?

The eID system allows for individual identification of animals for traceability via the NLIS database.

eID devices, also known as tags, use a radio frequency identifier (RFID) microchip to store a unique serial number. The device does not store any other information and can be read by a handheld wand or panel reader. This unique number can be used in management software, spreadsheets or databases to record production data for each animal.

Accredited eID devices are registered to the NLIS database and linked to your PIC at the time of purchase. Breeder eID tags are used to identify animals born on your property. Post breeder eID tags are used to identify animals missing a tag and no longer on their property of birth.

How can I find out more?

Learn more about SA's transition to eID and join the mailing list.

Learn more about the eID tag discount and eID Device Rebate (2023).

See the list of NLIS accredited eID devices for sheep and goats.

Fact sheet

Electronic identification (eID) tag tips

Transitioning from visual tags to eID for sheep and goats

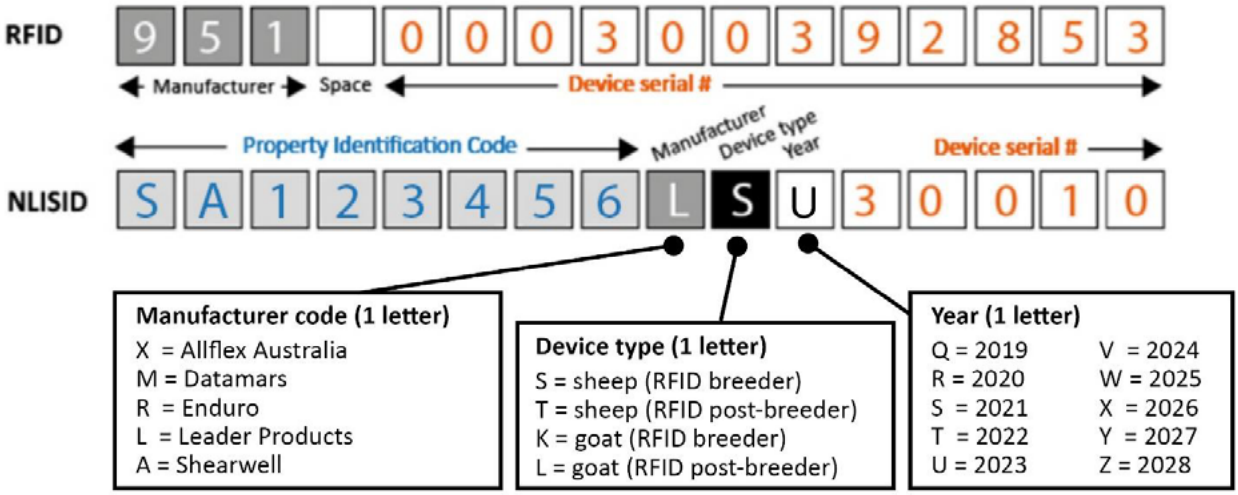
South Australia is replacing its mob-based visual tag traceability system with eID. All sheep and farmed goats born on or after 1 January 2025 will need to be identified with a National Livestock Identification System (NLIS) accredited eID device before leaving their property of birth.

Tag tip 1: NLIS accredited eID tags have two unique numbers

1. **Radio frequency identification (RFID) number** – a non-visible 16-digit electronic microchip number that can be scanned with a handheld wand or panel reader.

2. **NLIS number** – a visual number printed on the outside of the tag representing the property identification code (PIC) of the property it was issued to, a reference to the tag manufacturer, the device type (breeder or post breeder) and species, the year of manufacture, and a device serial number.

Example: Sky blue 'breeder' eID tag for sheep manufactured by Leader Products and printed for this PIC in 2023

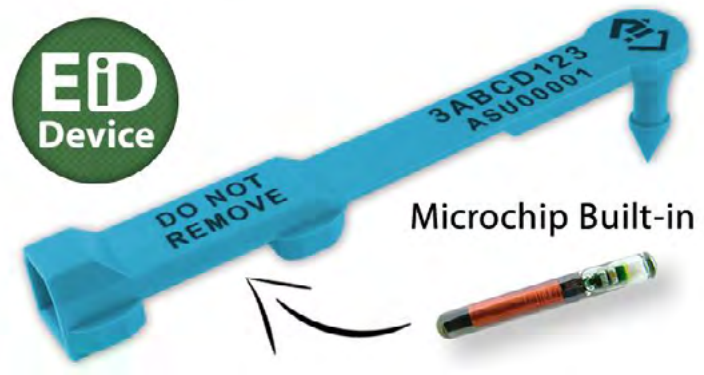


Tag tip 2: There are two types of eID tags

- Breeder tags are used to permanently identify animals before they leave their property of birth.
- Post breeder tags are used to permanently identify animals introduced onto a property that have not been eID tagged or have lost their original tag.
- Animals should only be tagged with one eID tag.
- Once an animal has been tagged, it must remain with the animal for life.
- eID tags can be purchased the same way as visual tags, through a rural reseller or directly from some tag manufacturers – scan the QR code to see the list of NLIS accredited tags.

Email: eIDsheepandgoat@sa.gov.au
pir.sa.gov.au/eID

Government of South Australia
Department of Primary Industries and Regions



Tag tip 3: eID tags come in different colours

- NLIS accredited breeder eID tags use a year of birth (YOB) colour system.
- The YOB colour system is voluntary in South Australia and the default colour is yellow.
- Post breeder eID tags are pink.
- If you buy in sheep or goats, you will need a supply of pink post breeder eID tags to use as replacements for missing tags.

Year	Tag Colour	Year	Tag Colour
2016	Black	2024	Black
2017	White	2025	White
2018	Orange	2026	Orange
2019	Light green	2027	Light green
2020	Purple	2028	Purple
2021	Yellow	2029	Yellow
2022	Red	2030	Red
2023	Sky blue	2031	Sky blue

Any year	Post-breeder tags must be pink

Tag tip 4: eID tags are species specific

- eID tags can only be used on the type of livestock they are purchased for - the species is recorded against each identification number on the NLIS database.

Tag tip 5: eID numbers are linked on the NLIS database

- RFID and NLIS numbers are linked together on the NLIS database. Either number can be used to record a movement.
- eID tag numbers are automatically registered to your PIC on the NLIS database by the manufacturer when they are purchased.
- You do not need to scan or transfer animals when you apply the tags as they are already registered to your PIC.
- To help keep track of your eID tags you need an NLIS account at www.nlis.com.au

Scan the QR code or visit www.pir.sa.gov.au/eID for more information about South Australia's transition to eID for sheep and farmed goats.

Updated: December 2023

Coming Together to Protect KI's Apiary Industry

An update on what's been happening in the Bee space on Kangaroo Island recently:

In early May, a half-day workshop was held in Penneshaw to gain feedback on what might appeal to KI beekeepers and what would be of value for us as a group. It was facilitated by ISC Consulting Group and a report on the feedback is to be provided to PIRSA to seek and develop relevant training specifically for KI beekeepers. More to come on this.

On the 14th and 15th of May, Bee Prepared Training came to the island to run a 2-day Bee Biosecurity Course focussing on managing pests and disease within a honeybee colony and applying biosecurity measures. There were several participants from the hobby and commercial beekeepers sector, and also government employees. If you'd like more news on KI's beekeeping industry, including notification of upcoming events/ training and biosecurity/disease prevention initiatives, please contact Shawn Hinves (see details below) to sign up to the mailing list.

Resources:

Several American Foul Brood (AFB) Vita (Rapid) Test Kits have been purchased on behalf of all KI Beekeepers to improve biosecurity measures and disease monitoring. These test kits provide a quick response for AFB concerns. If you would like one of the kits, please contact Brenton Davis (see below). Please note if you have a positive test result, it needs to be reported to PIRSA and further testing is required.

Further to the AFB Vita Kits, the PIRSA office in Kingscote has glass slides used for formal AFB laboratory testing, as well as many 125ml containers for honey sample tests. They also have 1L and 2L screw-top tubs for honey testing. PIRSA also offers free printed copies of Bee Prepared Training's field diagnosis guide for honeybee colony pests and disease.

Funding/Sponsors

National Disaster Recovery Funding Arrangements, including the Local Economic Recovery Program funded the training program and test kits.

Further Information

KI Beekeepers Association – Shawn Hinves (Acting President)
KI Living Honey
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South Australian Apiarists Association (SAAA) – Brenton Davis (President)
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Bianca Jones, Biosecurity Team Leader – Kangaroo Island (PIRSA Kingscote)
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- Matt Foster - Livestock Sales - 0400 342 016
- Sabrina Andrews - Livestock Sales - 0428 920 834
- Amanda Ratcliff - Animal Health Specialist - 0437 903 824
- Angus Slack - Agronomist - 0413 532 789
- Daren Amos - Wool Manager- 0428 605 586
- Simon Day - Account Manager - Insurance -0417 301 724

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GOING FURTHER®

Filling the Feed Gaps

Background

Knowing the nutritional value of supplementary feeds (hay, silage or grains) can save you money and time. Before you simply just feed out the hay or silage or run out a trail of grain, you must test the feed quality of your fodder, so you know exactly how much, and what, you are feeding.

For example, a barley with metabolisable energy (ME) content of 13.5 MJ ME/kg dm compared to a barley with a ME of 13 could save you $3,000 in feed costs for a 4000 ewe flock if you are paying the same $/tonne price. The savings may even be greater as the ME of barley can be as low as 12.2 and as high as 13.7 MJ ME/kg dm.

It is also important to know the ME content of your supplements so that you can maintain stock at the right condition score for joining and during pregnancy. You will feed much less kg/day of a high ME fodder compared to fodder with even a slightly lower ME and if you feed the same, you are either putting excess condition on your ewes or letting them slip, depending on the ME content of the supplement.

Wastage is also much less with high ME hay or silage compared to low ME hay or silage. Wastage of poor quality hay may be up to 30-50% compared to 10-15% for high quality hay.

A feed test for protein content is also important for weaner survival over summer.

A feed test to calculate the moisture content is essential to accurately calculate how much to feed for wet feeds such as silage.

Feed testing can help you to calculate an accurate feed budget, is cheap compared to the cost of making or buying fodder and is quick and easy to do. A feed test will provide a much clearer picture of the actual value of your feed and how many kg to feed out.

What was done?

AgKI, in conjunction with Mackillop Farm Management Group and the Future Drought Program, secured funding to run a 'Filling the Feed Gaps' project.

The project was run over two years (2022 and 2023) and included a series of workshops on how to manage a supplementary feed program to maximise stock performance and minimise costs, how to manage pasture and sown pasture mixes to make the best hay/silage and the best time to cut hay or silage.

In addition, a subsidy on the cost of feed tests for hay and silage was offered.

Results

A report of the 2022 results was published in the 2023 AgKI Trials booklet.

There was a big improvement in hay feed test results in 2023 compared to 2022, undoubtedly assisted by the very dry spring in 2023 compared to the exceptionally wet spring in 2022. Only three silage samples were submitted for testing in 2023 so a meaningful comparison between years cannot be made for silage, nor were there enough silage samples submitted in 2023 to report a range of results.

Neutral Detergent Fibre levels from hay averaged a very credible 53% in 2023 compared to 61% in 2022 indicating time of cutting in 2023 was close to ideal, which is a very good result.

This resulted in hay with an average digestibility of 65% in 2023 and a ME of 9.5 MJ/kg dm which is a high-quality result compared to an average digestibility of 58% and a ME of 8.3 MJ/kg dm in 2022.

In 2023 the hay sample with the highest ME of 11.7 also contained the most water (24%) whilst the next highest ME hay sample (ME 10.8) contained 17% moisture. Both samples were also low NDF (43% and 38% respectively).

ME 11.7 is an exceptionally good result. Early cutting and minimal wilting time will result in high quality hay, provided you can manage excess moisture levels by

- tedding
- using hay preservatives or inoculants
- baling into round bales to allow them to lose moisture, rather than high density square bales
- not stacking bales into a shed – letting them dry outside
- monitoring internal bale temperatures and feeding out as soon as possible after baling.

	2022 Hay: 62 samples Silage: 12 samples	2023 Hay: 22 samples Silage: 3 samples	Ideal for dry/ early to mid pregnant ewes	Ideal for merino weaner lambs
Hay:				
ME average	8.3	9.5	min. 8.7	min. 10.0
(range)	5.8–11.7	7.1–11.7		
Digestibility average	58%	65%	min. 60%	min. 68%
(range)	43%–78%	52%–78%		
Neutral detergent fibre (NDF) average	61%	53%	max. 60%	max. 55%
Crude protein average	10%	11%	min. 8-10%	min 12-14%
(range)	4%–19%	4%–19%		
Moisture % average	14%	14%		
	7%–31%	7%-24%		
Silage:				
ME average	10.0	10.3	min. 8.7	min. 10.0
(range)	8.7–10.6	n/a		
Digestibility average	65%	68%	min. 60%	min. 68%
(range)	56%–708%	n/a		
Neutral detergent fibre (NDF) average	52%	52%	max. 60%	max. 55%
Crude protein average	14%	16%	min. 8-10%	min 12-14%
(range)	8%–20%	n/a		
Moisture % average	59%	59%		
(range)	35%–77%	n/a		

Table 1: Ideal levels, compared to field test results for hay and sileage, 2022 & 2023. All tested by Feed Test Werribee.

Whilst there was generally high quality hay made in 2023, a few samples were also very poor. For example, a hay containing a ME of 7.1 and a NDF of 70% was clearly cut far too late and/or contained a high % of mature annual grasses such as silver, brome or barley grass.

If presented with paddocks containing a high % of annual grasses such as silver, brome or barley grass, hay can be an expensive option if the ME is only 7.1 and NDF 70%. In addition, feeding this hay can result in the spread of grass seeds around the farm (if fed in the paddock). In these situations, consider hay freezing or spray topping with either glyphosate or paraquat.

Silage feed test results in 2022 were much higher than for hay, due to earlier cutting and a shorter wilt, but wrapped silage is expensive per MJ ME, so good quality hay is the cheapest option in many cases. There were only 3 silage samples submitted in 2023, but they were all high quality with slightly higher ME than in 2022.

Take Home Messages

- Feed testing is essential to know what you are actually feeding out to your stock, as well as facilitating continuous improvement in your fodder conservation program.
- Good quality hay can be made in both poor and good hay seasons on Kangaroo Island, as can poor quality hay.
- Good quality hay will always be cheaper than good quality silage per tonne dry matter (and c/MJ ME), but it may be easier to produce good quality silage in some years on Kangaroo Island.
- Early cutting and quick wilting are keys to high quality forage, along with clean paddocks with minimal capeweed and silver/brome or barley grasses.

Funding & Sponsorship

Agriculture KI and Mackillop Farm Management Group with funding from Future Drought Fund.

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Improving Hay Quality on Kangaroo Island

Background

The hay making season in 2022 was disastrous. The wet spring resulted in hay being on the ground for up to 6 weeks between cutting and baling, leading to very low quality hay with the metabolisable energy (ME) from 62 pasture hay samples from Kangaroo Island averaging only 8.3 MJ/kg dm (range 6.0 to 11.7).

As a result, AgKI resolved to set up some on farm demonstrations in 2023 to see if conserved feed quality could be improved.

What was done?

Three different on farm demonstrations were set up.

1. Pasture/crop feed quality pre-cutting vs feed quality of subsequent hay or silage.
2. Inoculant applied to silage at baling vs no inoculant.
3. Feed test results from Feed Test Lab, Werribee vs feed test results from Forage Labs, Bendigo.

Tim Prance, T Prance Rural Consulting and Daniel Pledge, Nutrien Ag Solutions, Kingscote collected pasture and crop samples pre-cutting, whilst hay/silage contractor Brad May took time from his busy contracting schedule to apply silage inoculant to a small number (about 30 bales) of wrapped silage to enable inoculated vs not inoculated silage to be compared from the same paddock, cut and baled at the same time. He then marked the inoculated bales for subsequent feed test sampling.

Results

1. Feed quality pre-cutting cv hay or silage.

All were tested using Forage Labs, Bendigo.

Hay results from the 2023 hay season were very good with only a 7% drop in Metabolisable energy (ME) and digestibility from just before/at cutting to baling.

This indicates time of cutting was ideal. The Neutral Detergent Fibre (NDF) was acceptably low at 50-51% in Macgillivray 1 and 3, whilst the slightly higher NDF in the Macgillivray 2 sample may have been due to the presence of Wimmera ryegrass in the Tetila paddock, which would have been in head at time of cutting.

However crude protein dropped 22% and Neutral Detergent Fibre (NDF) increased by 17% between just before cutting and baling, which indicates some leaf loss during the raking/baling operation.

This could be due to

- raking too late in the day i.e. too dry
- raking too aggressively
- baling too late in the day i.e. too dry
- baler incorrectly set up.

In 2023, reducing time between cutting and baling to 10-14 days greatly improved hay quality, obviously greatly helped by the very dry spring.

One hay sample from Macgillivray (see figure 1) was cut at canopy closure, yielded about 4t/ha dm hay in October 2023 which tested 10.9 ME, 53% NDF and 13% CP (Feed Test Lab). This shows good quality hay can be made, and good quality hay will aways be much cheaper per tonne dry matter than good quality silage.

Silage paddocks

The Metabolisable energy (ME) and digestibility only dropped 1% from pre-cutting to baling, with NDF only increasing slightly and protein dropping slightly.

This supports the advantage of silage in improving fodder quality due to lower leaf loss and less time on the ground between cutting and baling, with the silage ME results very similar to the original pasture or crop and the Neutral Detergent Fibre (NDF) % lower than for hay.

The ME of Cassini 1 (oats) increased between cutting and baling, which could be a sampling error and/or an increase in ME because of the silage fermentation VFA (volatile fatty acids).

In both hay and silage paddocks, the protein levels were good overall (except for Birchmore 2 oat sample), indicating nitrogen fertilisation was adequate.

Adding vetch to oats

I question the advantages of this practise. The Cassini 1 oaten silage contained 30% vetch pre-cutting with none present in the silage, whilst Birchmore 2 oaten silage sown as an oat/silage mix contained only 5% vetch pre-cutting, with no vetch in the silage.

I suggest the most reliable way of improving protein content of hay or silage is to ensure adequate nitrogen nutrition of the crop. Furthermore, reducing oat seeding rates to accommodate the vetch reduces overall hay/silage yields and increases oat stem size therefore reducing forage quality.

Water

Water % in all silage samples dropped significantly from 82-90% down to 37–58% in only 1-2 days which is a credit to those involved, particularly Birchmore 1 paddock, which was predominantly sub clover and capeweed, where the water % quickly dropped from 90% to 50% due to tedding 2x.

This resulted in very good quality silage from a pasture mix which has caused major problems with silage in the past.

The importance of tedding immediately after cutting can't be overemphasised as a tool to ensure minimal time between cutting and baling for either hay or silage.

Reducing time between cutting and baling to 10-14 days greatly improves hay quality and reducing wilting time to between 1-2 days is essential for silage.

Obviously the very dry spring helped in 2023, without the need to ted hay, but tedding will help in more usual wet spring conditions. Tedding is essential for quick (and thorough) wilting of clover and/or capeweed dominant silage.

Silage fermentation

Fermentation was very good in all samples, with the pH dropping to between 4.5 and 5.4 compared to 6.5 to 7 at cutting.

Lactic acid content was also good in most samples (ideal 3% or higher). There was only a trace of butyric acid (sign of poor fermentation) in one sample. Lactic acid was the predominant fermentation (nearly 100%) in all samples, and there was very little protein breakdown to ammonia (0.7% to 1.5% which is very low).

This indicates quick wilting with baling 1-2 days after cutting and good sealing (wrapping).

2. Inoculant vs no inoculant for silage.

All were tested using Forage Labs, Bendigo

There are only three pairs of data. However, there were no significant differences between nil and + inoculant. The inoculant used was Pioneer 1174 containing lactic acid bacteria.

This backs up previous experiences, where there may not be any responses to inoculant with wrapped silage especially if heavily wilted and made under ideal conditions.

Good silage techniques such as the following minimise the need for silage inoculants:

- early cutting
- quick wilting
- prompt wrapping (with 5-7 layers of plastic)
- a high sugar crop such as ryegrass or cereal.

Silage inoculants are a valuable insurance if you must bale very wet silage and/or have a low sugar pasture such as capeweed and clover or lucerne. However, note Birchmore 1 silage sample, which was mostly capeweed and sub clover, was heavily wilted using a tedder and successfully made into silage with no inoculant.

Silage inoculants are more important for pit/bunker silage where there is much less wilting and therefore moisture content is higher. Some animal feed trials have shown animal performance to increase with inoculated chopped pit/bunker silage even through the MEs are similar.

Hay preservatives and inoculants

As with silage inoculants, these are applied with an applicator attached near the baler pick up. There are either preservatives (e.g. Hay Guard®) or inoculants (e.g. Hay King®) available for hay which will enable hay to be safely baled at up to 20-25% moisture.

They weren't tested as none of the contractors that I was aware of had an applicator attached to their hay baler.

3. Feed quality testing: Feed Test Werribee vs Forage Labs Bendigo.

There are two systems used in Australia, both of which measure livestock feed quality using NIR (Near Infra Red spectroscopy). The two systems are quite different, so do not attempt to compare results using the different laboratories.

The results from different testing labs will vary, but no lab is better than the other! Each lab regularly (several times/year) ground truths their NIR equation against wet chemistry, so there is good confidence in the validity of the results.

Stay with the same lab when testing your hay or silage.

There will also be a +/- 5% to 10% variance in test readings using the laboratory NIR regression equation, so even if you supplied an identical sample to the same lab at different times there could be a +/- 5% to 10% variance.

Figure 1: Tetila Rye Grass in Macgillivray produced excellent hay.

Feed Test Werribee (Australian Wool Testing Authority) uses an NIR feed quality equation developed in Victoria (at Hamilton DPI and AWTA Werribee) which predicts digestibility, from which they calculate metabolisable energy (ME). This is the Australian and New Zealand system, which is based on digestibility and ME. Another NIR equation is used to predict Neutral Detergent Fibre (NDF).

Forage Labs Bendigo uses a NIR equation developed by Cumberland Valley Analytical Services, Waynesboro, Pennsylvania, USA which predicts NDF (Neutral Detergent Fibre), from which they calculate digestibility and ME. This is the American system which is based on fibre. There are other labs in Australia using the American system - for example, Feed Central (Dairy One) and Dairyland.

Four paired fodder samples (two hay and two silage) were tested.

The Feed Test Werribee Lab ME was on average 1 MJ/kg DM higher than the Forage Labs ME.

This is consistent with anecdotal feedback received from nutritional consultants. This does not mean one lab is incorrect and one is not. What is means is you should not mix labs – select one and stick with them – especially if comparing results from one year to another or comparing different paddocks/different pastures or crops, or comparing hay with silage.

Crude protein, % NDF and DM% results were similar for both labs.

Forage Labs provides more than 30 different test results compared to about 10 for the Feed Test Werribee Lab.

The Feed Test Lab results follow the Feeding Standards for Australian Livestock: Ruminants and are reasonably easy to follow, whereas the Forage Lab results are more difficult to interpret, being based on American feeding standards, although they do provide an explanation sheet covering most of the results.

Forage Labs provides a particularly good NIR silage analysis which includes pH, total VFA (volatile fatty acids), ammonia as % of crude protein and VFA components (lactic acid, acetic acid, and butyric acid).

Feed Test Lab only provides silage pH and ammonia as % of crude protein, which are also expensive.

Take home messages

- Feed testing is essential to know what you are feeding out to your stock. It doesn't matter which lab is used, as long as you stick with the same lab.
- Use a tedder for quick wilting for both hay and silage unless you are confident of curing your hay in less than 14 days.
- Good silage making techniques minimise the need for silage inoculants for heavily wilted silage, but innoculants are a valuable insurance if the crop/ pasture and/or conditions are less than ideal.
- Consider using hay preservatives/inoculants if you can't get your hay dry quickly enough to bale.
- Good quality hay will always be cheaper than good quality silage per tonne dry matter, but it may be easier to produce good quality silage on Kangaroo Island in some years.
- In the 2023 paddock demonstrations, both hay and silage tested similar to the pasture at time of cutting, which is a creditable effort.

Funding & Sponsorship

Agriculture KI and Mackillop Farm Management Group with funding from Future Drought Fund.

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Pre-Breeding of Subterranean Clover for Novel Herbicide Tolerance

Background

The project aims to develop a new technology that will improve the resilience and recovery of livestock producer businesses on Kangaroo Island following the devastating impact of bushfires.

The dominance of high oestrogen subterranean clovers on Kangaroo Island and difficult to control weeds is now having a long-term effect on the profitability of sheep farming business. Some old cultivars of subterranean clover are highly oestrogenic and cause infertility in sheep. Continued exposure to high oestrogenic subterranean clover causes permanent infertility and problems with birthing. The cause of the infertility is formononetin and daidzein which is broken down to equol in the sheep gut and passes into the blood stream.

No cultivar has been released since 1982 with unsafe oestrogen levels. However, recent survey work on Kangaroo Island has shown high oestrogenic subterranean clover cultivars are persistent and can form a large proportion of the subterranean clover component of pastures.

Farmers on the Island are also concerned about low lambing rates. The old oestrogenic cultivars with high levels of hardseed are very persistent and have proven difficult to run down to very low numbers prior to sowing new safe cultivars.

A potential new way of controlling background high oestrogenic cultivars is to develop cultivars with tolerance to a new herbicide group that will kill old subterranean clover cultivars. A further benefit of the new herbicide tolerance is that it will provide a way of dealing with problem weeds that current herbicides registered for subterranean clover do not control. The objective of this project is to use mutation breeding to develop subterranean clover seed lines with novel herbicide tolerance. This pre-breeding step is the first step in a relatively long process in developing new cultivar/s.

Work to date

In the Kangaroo Island Agricultural Trials 2023 Results (pp. 32-33) we reported finding subterranean clover plants with apparent novel herbicide tolerance at 139 locations in the trial paddock.

Apparent herbicide tolerant plants were dug up, and potted up in Adelaide. Plants with the best growth were moved into a controlled environment room set to speed breeding conditions which can achieve four generations per year. Seeds were harvested by early September and progeny grown with and without herbicide.

We selected individual herbicide tolerant plants lines that had high drymatter production in both the herbicide treatment and untreated (figure 1).

By using speed breeding conditions we harvested seed by the end of the project (31/12/2023). Without using speed breeding conditions we would only have only been able to collect seed from plants recovered from Kangaroo Island and would not have been able to shortlist lines on herbicide tolerance of their progeny.

What does it mean

This project identified multiple lines with novel herbicide tolerance that have the potential to control old oestrogenic sub clover cultivars and problem weeds. The project completed the pre-breeding step of developing, selecting and progeny testing plants with novel herbicide tolerance.

The ability to control high oestrogenic subterranean clover with novel herbicide tolerance is seen as a way of increasing lambing percentages and hence overall livestock productivity. Novel herbicide tolerance will allow for the control of current problem weeds, which will lead to further productivity increases.

Development of new cultivars with this novel trait is expected to be highly valued by farmers and hence industry and seed companies. SARDI will lead further research including breeding and field evaluation of the trait.

Figure 1: Tolerant line with high growth without herbicide applied (LHS) and with herbicide applied (RHS).

Take Home Messages

- We have found multiple plants with novel herbicide tolerance which have the potential to be developed into cultivar/s to provide a new way of controlling background highly oestrogenic cultivars and dealing with problem weeds.
- Cultivar development is a long process, and you need to continue to use best current practices to minimise the risk from highly oestrogenic cultivars and problem weeds.

Funding & Sponsorship

This project is managed by Agriculture Kangaroo Island Incorporated, and funding was part of the Kangaroo Island Bushfire Recovery Innovations Projects managed by Livestock SA.

We acknowledge Keith Bolto for providing land, sowing the paddock, and managing the trial.

Thanks to David Peck and Alan Humphries from SARDI for this article.

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Soil Health Report 2023/2024

Background

With the increasing cost of fertilizers it's never been more important to test your soils. Soil testing allows you to more accurately determine the what type and how much fertiliser you should be applying or if you need to lime. PIRSA provides a soil testing service for all producers. We provide the soil testing kit and can even assist with the soil sampling. All results come with a detailed interpretation of the test results. Call into the PIRSA office in Kingscote to find out more. In 2023/24, 31 KI farmers submitted 127 soil samples for testing.

Results

Soil pH

Soil pH is important for optimum production of crops and pastures. If the soil pH falls below pH $5.5_{(CaCl2)}$ then nutrients such as phosphorus, magnesium, calcium and molybdenum become less available. Microbial activity starts to decline (including Rhizobia) and toxic amounts of aluminium can be released into the soil solution (refer to Table 1 for minimum pH targets).

LAND USE	pH $_{(CaCl2)}$
Extensive grazing	5.0 – 5.5
Broad-acre cropping/grazing	5.5
Most horticultural crops	5.5 – 6.5

*Table 1: Target for **minimum** soil pH.*

Almost all the soil samples taken during the 2023/24 seasons were below critical pH levels. Figure 1 shows that the average pH in all Hundreds was below 5.5 $pH_{(CaCl2)}$ except for MacGillivray. Four of the nine Hundreds had an average pH of 5.2 or below. At these levels, pH will be limiting farm productivity and profitability and therefore liming should be a high priority.

Salinity

Saline soils are defined as soils that contain a high enough level of soluble salts in the root zone that it can adversely affect plant growth. Ideally, soils should have a salinity level of less than 2 dS/m (for salt sensitive plant species). Of the soil samples taken, all were below 2 dS/m.

Organic Carbon

The organic carbon test is a useful indicator of organic matter status, therefore of overall soil fertility, microbial activity, and the structural stability of the soil. The ideal target level of organic carbon varies with soil type. In sandy soils greater than 1% is desired, through to greater than 2% in clay soils. Of the soils tested, all were well above critical values.

Soil Nutrients

Maintaining an adequate nutrient status in the soil is paramount to determining the productivity of the soil. Phosphorus, potassium and sulphur are essential nutrients for plant growth and yield (see Table 2 for target levels).

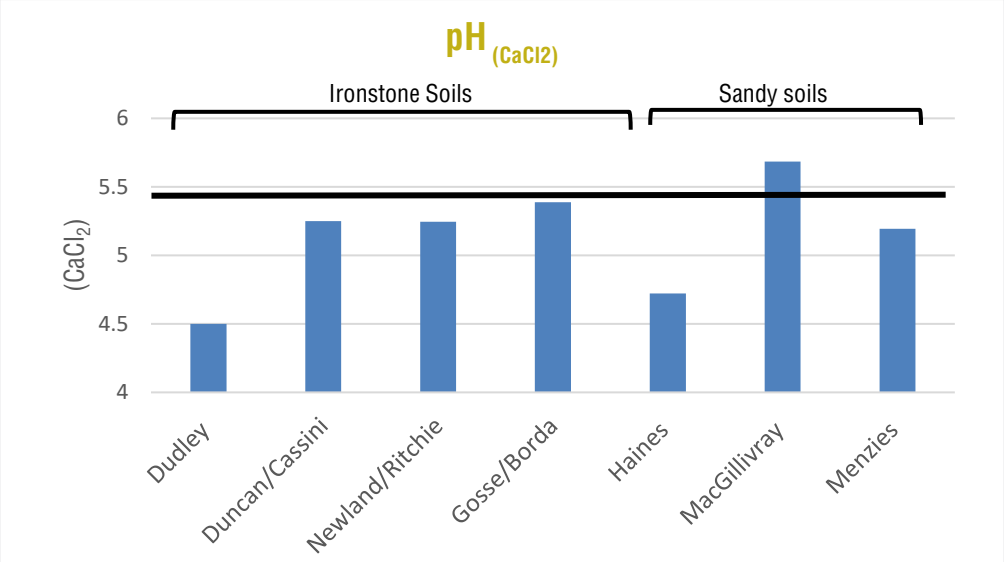

Figure 1: Average soil pH $_{(CaCl2)}$ results for each Hundred during the 2023/24 seasons. The black line shows critical value.

Phosphorous

During 2023, almost all samples collected from the Hundreds with predominantly sandy soils had phosphorus levels greater than 20 mg/kg. Of the Hundreds with predominantly ironstone soils, the majority of samples had phosphorus levels lower than the recommended level of 35-45 mg/kg (Figure 2).

Potassium

SOIL NUTRIENTS	TARGET LEVELS	
	IRONSTONE SOILS	SANDY SOILS
Potassium (Colwell)	>120 mg/kg	>120 mg/kg
Sulphur	6-8 mg/kg	>10 mg/kg

Table 2: Target levels for potassium and sulphur

All hundreds had average potassium levels above the critical values of 120 mg/kg (Figure 3).

Sulphur

Of the Hundreds with predominantly ironstone soils, three Hundreds (Duncan, Cassini and Dudley) had average levels below the recommended rate of 6-8 mg/kg (Figure 4). The majority of sandy soil samples, except the Hundred of Haines, had samples above the critical value of 10 mg/kg.

These results reinforce the value of soil testing to ensure the right rate and right product is applied i.e. if sulphur levels are low, farmers need to consider selecting a fertiliser that contains sulphur as well as phosphorus.

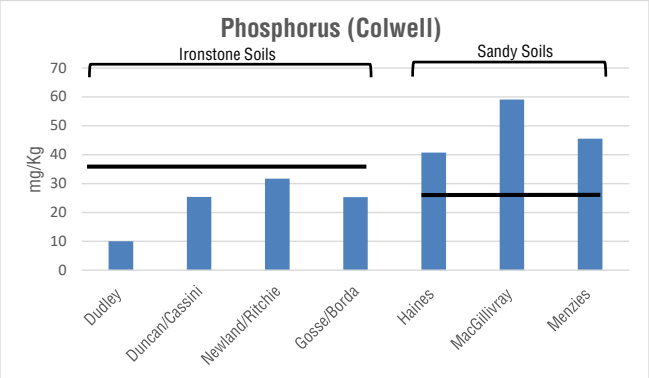

Figure 2: Average soil phosphorus levels for each Hundred during the 2023/24 season.

The black line shows critical value.

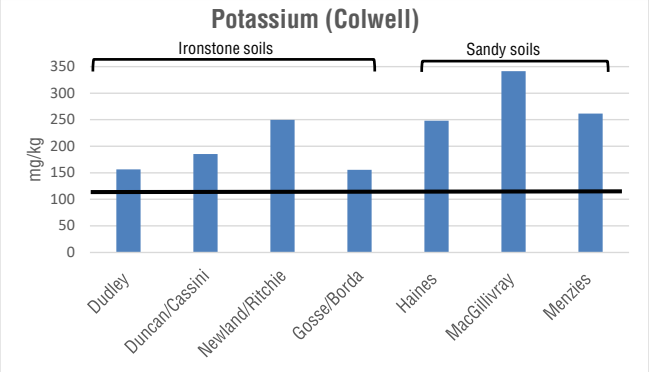

Figure 3: Average soil potassium levels for each Hundred during the 2023/24 season.

The black line shows critical value.

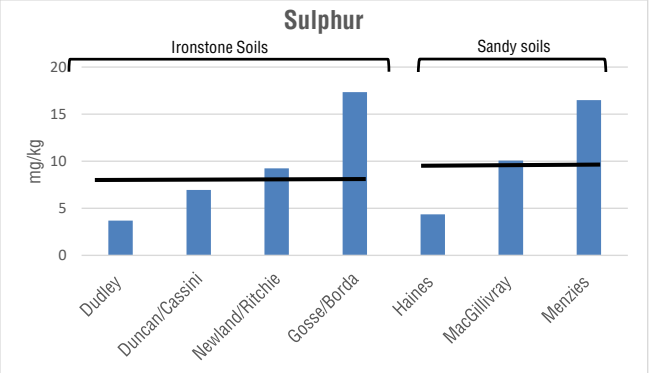

Figure 4: Average soil sulphur levels for each Hundred during the 2023/24 season.

The black line shows critical value.

Summary

The 2023/24 soil tests carried out by Kangaroo Island farmers indicate that overall, soils are on target or above for organic carbon.

The average soil phosphorus levels were low in the predominantly ironstone soil Hundreds. Potassium and sulphur were also low in some hundreds. Across the Island, soil $pH_{(CaCl2)}$ levels were below critical values. Low pH will reduce the availability of essential nutrients such as phosphorus to the plant and will result in limiting overall farm productivity.

The most cost effective and practical way to address low pH is through the application of lime. Low nutrient levels can be addressed through the application of fertilisers. Always seek advice from your local agronomist or consultant to ensure you are applying the right fertiliser or lime at the correct rate.

Soil types vary within each Hundred, so care must be taken in the broader interpretation. In addition, the data only reflects the number of samples taken in each Hundred, which may represent only a few properties. The data and resultant graphs can only be interpreted to the point of identifying trends over time.

Take home messages

- Soil testing is essential for monitoring soil fertility levels.
- PIRSA provides a soil testing service for all farmers – from provision of kits, to taking the soil samples, to interpretation of results.
- Of all the soil samples taken the majority were below critical levels for pH. Lime to maintain PH_{CaCl} above 5.5.
- Phosphorus, potassium and sulphur levels were low on some properties.

Hundred (number of samples)	Organic Carbon %	Conductivity dS/M	$pH_{(CaCl2)}$	Phosphorous mg/kg	Potassium mg/kg	Sulphur mg/kg
Haines	2.94 (2.31-3.63)	0.04 (0.02-0.13)	4.72 (4.3-5.1)	40.75 (35-46)	248 (198-305)	4.38 (3.6-4.4)
MacGillivray	3.32 (1.74-5.31)	0.22 (0.09-0.48	5.68 (4.7-7.40)	59.1 (16-102)	341.6 (49-908)	10.08 (4.10-22.4)
Menzies	2.17 (1.56-3.14)	0.29 (0.08-1.49)	5.19 (4.6-6.8)	45.6 (16-81)	261.7 (102-541)	16.49 (4.2-63.4)

Table 3: Summary of results for sandy soils. Note mg/kg is the same as ppm.

Hundred (number of samples)	Organic Carbon %	Conductivity dS/M	$pH_{(CaCl2)}$	Phosphorous mg/kg	Potassium mg/kg	Sulphur mg/kg
Cassini/Duncan	2.82 (2.44- 3.19)	0.12 (0.07-0.22)	5.25 (4.9-5.5)	25.4 (16-53)	185 (158-224)	6.96 (4.6-11.50)
Dudley	3.32 (2.73-3.90)	0.14 (0.10-0.17)	4.5 (4.4-4.6)	10 (8-12)	156.5 (131- 182)	3.7 (3.2-4.20)
Newland/Ritchie	3.08 (2.71-3.47)	0.16 (0.09-0.21)	5.24 (4.9-5.6)	31.7 (9-63)	249.6 (11-353)	9.26 (6.5-16.5)
Sedddon	2.99 (1.05-4.53)	0.19 (0.04-0.68)	5.39 (4.7-7.2)	25.3 (8-46)	155.6 (73-375)	17.34 (5-101)

Table 3: Summary of results for ironstone soils.

Funding/Sponsors

PIRSA.

Note: The information used was sourced from individual Kangaroo Island farmer soil tests and analysed using CSBP Analytical Laboratory.

Further Information

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Lime Trials

Background

Soil acidity is the most significant land degradation issue on Kangaroo Island, impacting over 75% of farmland with production losses of more than $7 million per annum. Most farmers are aware that liming is the best method to treat acid soils, and many have a liming program in place. However, broadcasting the lime with no follow up incorporation confines the lime to the topsoil, resulting in highly acidic subsurface soil layers. This hostile 'acid throttle' can prevent plant roots from accessing moisture and nutrients from the sub soil.

What was done

A trial was set up in 2019 to monitor the long term effectiveness of high rates of lime and incorporation to manage subsurface acidity. Local lime sand was used in the trial. There are two parts to the trial:

- Rate response trial – comparison of three rates of surface-applied lime sand with a control (no lime)
- Novel treatment (rate, incorporation) trial – comparison of two rates of lime sand, comparing surface-applications of the different rates, plus seeing what the effects of incorporation of a high rate of lime are, using offset discs (10-15 cm) to manage sub soil acidity.

In 2024, the rate response trial was monitored to gauge lime movement down the profile. The treatments in the rate response trial are:

- control: no lime was applied
- treatment 1: low rate of 0.5t/ha to target a rise in pH_{CaCl2} from 4.8 to 5.0 (0.6t/ha lime sand)
- treatment 2: moderate rate of 1.8t/ha to target a rise in pH_{CaCl2} from 4.8 to 5.5 (2.4t/ha lime sand)
- treatment 3: high rate of 3.2t/ha to target a rise in pH_{CaCl2} from 4.8 to 6.0 (4.1t/ha lime sand)

The starting topsoil (0-10 cm) pH_{CaCl2} was 4.8.

Soil pH changes were measured in the rate response trial in increments of 0-10, 10-20 and 20-30 cm down the profile and compared to the control (no lime applied).

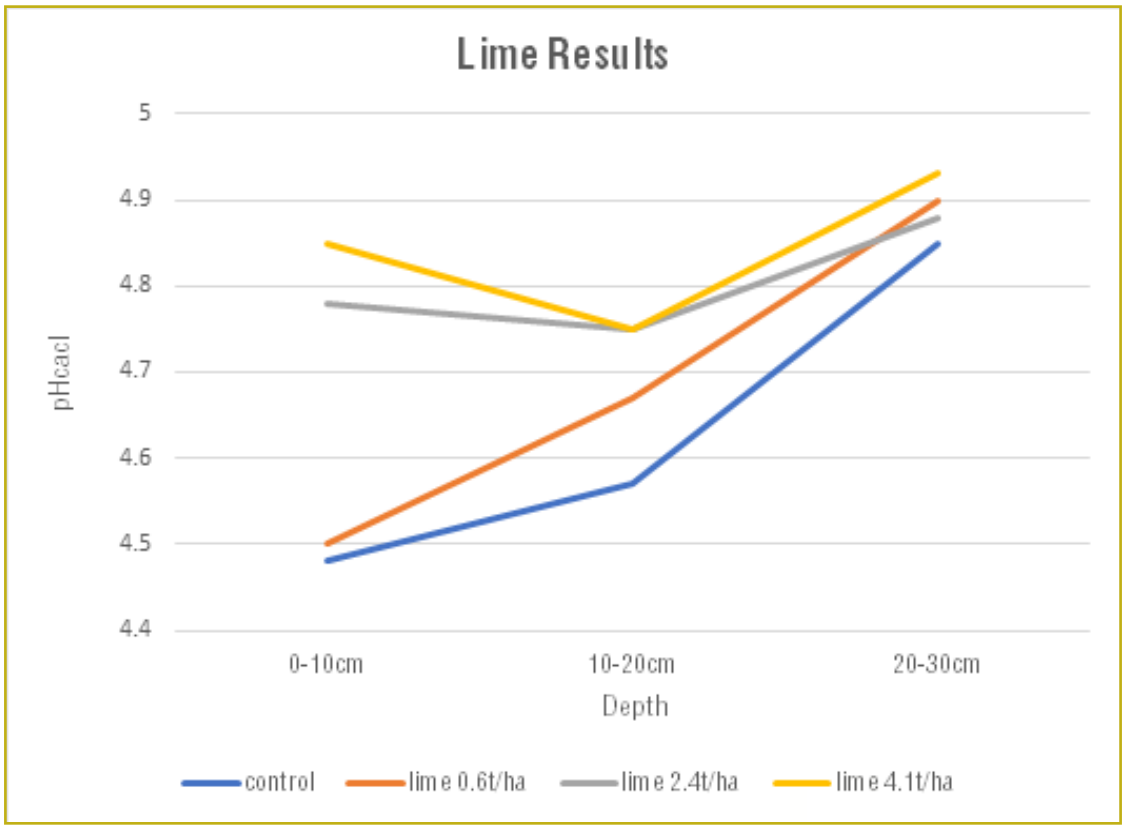
Results

The applied lime was not incorporated, but over 5 years the lime has moved into the 10-20 cm band. As expected, the higher rates of lime have had the greatest impact at both the surface and down to the 10-20 cm layer. But at depth (20-30 cm) there is only a slight improvement in pH compared to the control.

All pHs at all depths, regardless of the treatments, were below pH 5. This is significant as once surface pH_{cacl} falls below 5, acidity can move into the sub soil. Once pH falls below pH_{cacl} 4.8, aluminium toxicity can occur. High aluminium levels burn the plant roots inhibiting the uptake of nutrients and water. This is of particular importance to KI, as we have significant issues with subsurface soil acidity.

These results indicate that to change soil pH at depth ideally requires some form of incorporation and/or higher application rates. However, care must be taken with surface application of high rates as the sudden pH change can have negative impacts on nutrient availability.

The golden rule is, if higher rates are required, it is best to incorporate the lime or apply it in two applications over time.



Graph 1: Rate response trial – 2023 pH changes at depth.

Take home messages

- Subsurface soil acidification impacts on crop and pasture growth.
- Rates above 2.4t/ha have moved the lime into the 10-20 cm layer.
- If lime rates above 4.5t/ha are required, consider incorporating the lime or do a split application.

Funding/Sponsors

- PIRSA in conjunction with GRDC
- Simon and Marissa Veitch

Further Information

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The Impact of Phosphorus on Pasture Growth

Background

Applying phosphorus (P) to clover based pastures has been consistently shown to increase pasture production and increase stocking capacity. Phosphorus is frequently cited as the primary limiting nutrient in our grazing systems and Kangaroo Island soils are naturally low in P.

Many of our native grasses have adapted mechanisms to manage low P levels such as low growth rates, soil organism associations and a focus on internal nutrient cycling. This results in efficient but less productive systems.

Building our soil's fertility base requires the addition of nutrients to ensure the soil has sufficient reserves to promote growth. This becomes especially important in farming. Every time we 'harvest' we are removing nutrients, be it in hay, grain, wool or meat, and those nutrients need to be replaced or improvements made to the soil to improve nutrient availability if we wish to maintain productivity.

What was done

A demonstration site was set up on a property that not been fertilised for 15 years. In April 2023, 240kg/ha of DAP/Single Super 50:50 blend was applied across the farm (this equates to 34.7kg P/ha and 15kg S/ha). A small area was tarped and thus recived no fertiliser. The fertilised vs non fertilsed area was monitored for pasture growth rates (using pasture cages), species variation and soil nutrient levels.

Results

The soil tests taken 12 months after the initial fertiliser application show a 45% increase in soil phosphorus levels and 33% increase in sulphur levels (refer to Table 1).

Soil P levels can increase once application rates are above maintenance, with maintenace equaiting to 1kgP/DSE/Ha. Currently the landholder is running 12 DSE/ha = 12 kgP/ha required just to maintain soil P levels. The farmer applied 34.7kgP/ha, leaving 22.7kgP/h to build soil P reserves (i.e. 34.7-12 = 22.7kgP)

The soil phosphorus buffering index (PBI) at this site was 70. PBI determines the optimal amount of P the soil needs for pasture growth. The critical P level for a soil with a PBI of 70 is 31 ppm, i.e. once the soil gets to 31ppm of Phosphorus, pasture growth is not being limited by lack of P. (Now keep that number 31 in mind as we will refer to it later!)

Now onto a little bit of number crunching... Research has helped develop a formula to calculate how much P is required to increase soil P once maintanence requirements have been met: (Critical value – current soil P level) x 2.5 (if PBI in range of 35-70).

We know from the maintenance equation above (i.e. 1kg P/DSE) that the site needs 12kg P/ha to maintain levels. However the site received a mix of Single & DAP equating to 34.7kgP. As we calculated above, applied P minus the maintence requirement of 1kgP/DSE ie 34.7 – 12 = 22.7, meaning we have 22.7kgP/ha to build soil reserves, aiming to get to 31 as then pasture growth won't be limited by lack of P.

When the soil PBI is 70, research has show we need 2.5 kgs of P to increase soil P levels by one unit. We know from our figures above that 31 is the magic number, when pasture growth is not limited by P.

So the formula becomes: To get the soil P level to 31 will require 31 – 12 (i.e. the critical soil P level – the initial soil P reading) x 2.5 = 47.5kgP/ha.

We know from our calculations above that of 34.7kgP/ha applied, 12 was used for maintanence, leaving 22.7 to build soil levels, and we need 2.5kgP to increase our soil P reading by one.

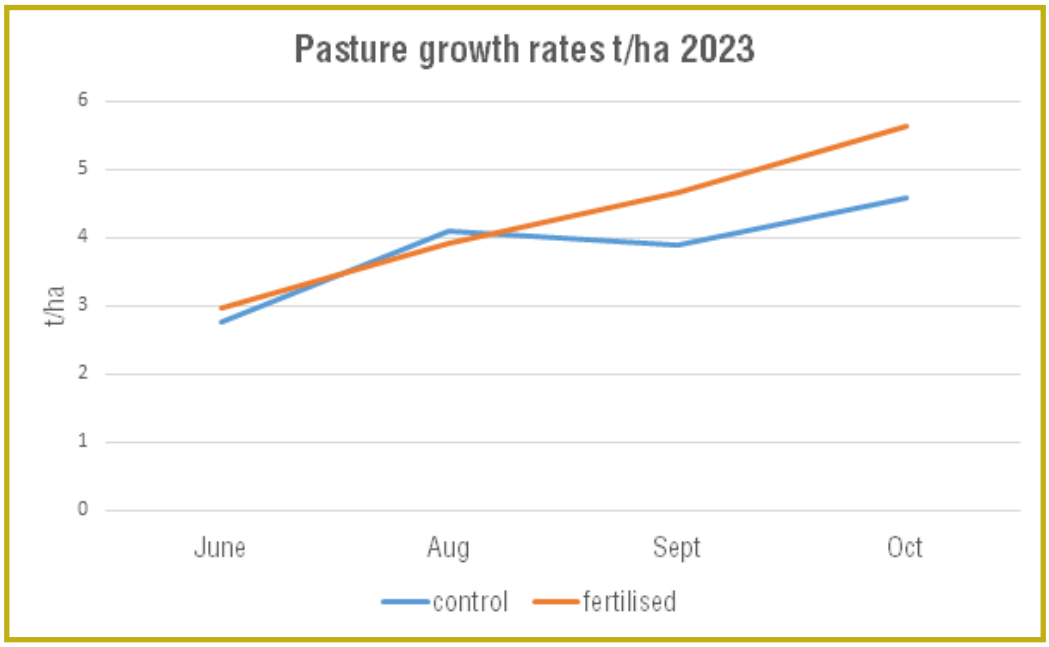
22.7/2.5 = 9.08 i.e. in theory, starting from a soil P level of 12, we should get an 9.08 unit increase which equates to 12+9.08 =21.08.

The soil test from the fertilised area was 22! Close enough with inherent soil variability to 21.08 (it's nice when science and reality concur!)

This exercise shows the importance of maintaining soil P levels as capital applications are expensive and the lost pasture productivity is a double whammy.

	Control (no fertiliser)	Fertiliser applied 34.7P and 15kgS/ha super
Phosphorous (P) ppm PBI - 70	12	22
Haines/MacGillivray	4	6

Table 1: Soul nutrients, Jan 2024.



Graph 1: Pasture growth rates t/ha

Pasture growth was measured monthly during the growing season (refer to Graph 1 – pasture growth rates). The fertilised site produced 12% more feed per ha over the growing season.

In addition to total feed grown, the site was monitored for species survival – percent grass, clover or broadleaf weeds. The fertilised site, at every measurement had a greater percent of clover. Clover is key to pasture growth as it makes the nitrogen that drives overall pasture productivity.

The pasture cuts (quantity and productivity) would lead to a 10-15% increase in carrying capacity.

Take home messages:

- If you want to grow good pastures, which in turn drive productivity, then you need to 'feed' the soil to maintain its productivity.
- This demo site reinforces the importance of ensuring soil P levels are at least at maintenance levels as capital applications are expensive and the loss in pasture growth is a double whammy.
- The extra pasture grown in both quality and quantity would lead to a 10-15% increase in carrying capacity every year compared to the control.

Further Information

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Vineyard Drought Resilience

Background

The Bay of Shoals winery is a 50-hectare business owned by John Willoughby, a retired eye surgeon and avid sailor. The property includes a 15-hectare vineyard, an olive grove and tourist accommodation. Peter Foster, the vineyard manager with six years of experience in the business, grew up on the Island and brings a wealth of knowledge from previous vineyard work and his roles in the mining sector.

Frank, originally from the Netherlands, is a viticulturist who joined the property a year and a half ago. He brings his expertise in environmental science and vineyard management from a previous role in Tasmania.

The property based near Kingscote receives an average annual rainfall of 480mm and has different soil types, including conducive soils, which require high levels of irrigation, as water has been critical to producing higher yields.

For years, the vineyard faced several challenges, including low yields, salinity issues, and pest control. Powdery mildew and bird damage were recurring problems impacting vine health and production.

Soil compaction and nutrient deficiencies were also hindrances to optimal growth and productivity. These factors were severely impacting the property's overall sustainability efforts.

What was done

Together with the KI Landscape Board, the landholders researched eco-friendly vineyard practices, consulted with agronomists, visited sustainable vineyards in the state, and explored alternative pest control and soil health solutions.

They focused on reducing chemical usage, implementing grazing management to reduce under-vine vegetation growth, and enhancing soil structure through deep ripping and composting.

The idea was to adopt a holistic approach, incorporating cover crops, native vegetation, and integrated pest management strategies.

Property management planning has increased drought resilience at Bay of Shoals vineyard, with reduced water use and a 39% increase in yield.

Results

Implementing sustainable practices resulted in reduced irrigation frequency, optimised water use, and investment in nutrient management.

These changes made over time led to significant improvements, including higher yields, reduced water consumption (from 7,000 KL to 4,000 KL across the property this year), and healthier vines.

It is incredible to see a 30-tonne increase in production (39%), decreased disease incidence, and enhanced soil fertility, resulting in a more sustainable and profitable operation.

The shift in weed control from chemicals to alternative solutions at a higher frequency, and the use of grazing management as a support have been significant.

Learning through water probes where the water sits, when to start, and how long to water was helped avoid water logging and incredibly increased our soil and vine health.

Before implementing sustainable practices, the vineyard lost all the Riesling to powdery mildew, which had been around for years. After implementing sustainable practices, there was no powdery mildew.

Take home messages

- The landholder's aspiration is to promote sustainable vineyards. Not only does this help with sales – customers want to see it these days – but it's also a good business practice that creates more sustainable property.
- Shifting towards sustainable practices has improved overall vine health and our bottom line.
- Sustainability is good business.
- A detailed analysis of management changes implemented and the results will be published in around 12 months time.

Funding/Sponsors

The Kangaroo Island Landscape Board supports this project through funding from the Australian Government's Future Drought Fund and National Landcare Program.

Further Information

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KI Biosecurity Checks Program

Protecting KI Agricultural Industries through raising awareness

Background

The Kangaroo Island Biosecurity Checks Program has conducted random biosecurity checks of travellers to the Island since 2015. Ferry Services to KI are recognised as a major pathway for biosecurity incursions and one of the major aims of the project is to minimise this risk for our agricultural industries.

The program was due to finish at the end of June 2024, however the Department of Primary Industries and Regions (PIRSA) has recognised the importance of protecting the Island from Biosecurity threats and has committed to funding the project for a further 2 years, to the end of June 2026.

Project Aims

The significantly increased presence of biosecurity officers at Cape Jervis, particularly over the higher visitation periods of the summer months, has resulted in increased engagement with travellers, freight companies and the KI community. Key aims for the biosecurity officers are:

- stopping restricted items such as honey, beekeeping equipment, unwashed potatoes, and potatoes for planting
- identifying travellers who have been to Bali/Indonesia in the last 2 weeks, who are checked to confirm footwear and clothing is clean. They are instructed not to have contact with livestock for a minimum of two weeks
- regularly seizing fruit fly risk products from interstate travellers, particularly over the summer months
- checking of compliance with livestock documentation requirements including National Vendor Declarations and Sheep Health Declarations. Pigs and Goats coming to the island are also inspected for their Landscape Board Permits before they are brought to the island
- inspecting consignments of plants to ensure declared weeds were not present and remind gardeners of risks of weeds and plant disease being transported in soil
- inspecting machinery including construction, earth-moving, agricultural and vegetation clearing machines to stress the importance of arriving clean on KI
- ensuring recreational boats arriving are free of marine pests and aware of the sanctuary zones
- carrying out biosecurity checks of cruise vessel passengers visiting Kangaroo Island.

More recently, travellers were also checked for diving equipment and other related equipment from the South-East of South Australia due to the latest Abalone Viral Ganglioneuritis (AGV) outbreak.

Signage at Cape Jervis.

What Was Done

Since early July 2023, staff have been using an app to record data collected at Cape Jervis. Using this data, we can determine which services require regular presence of Biosecurity Officers due to increased passenger and vehicle travellers.

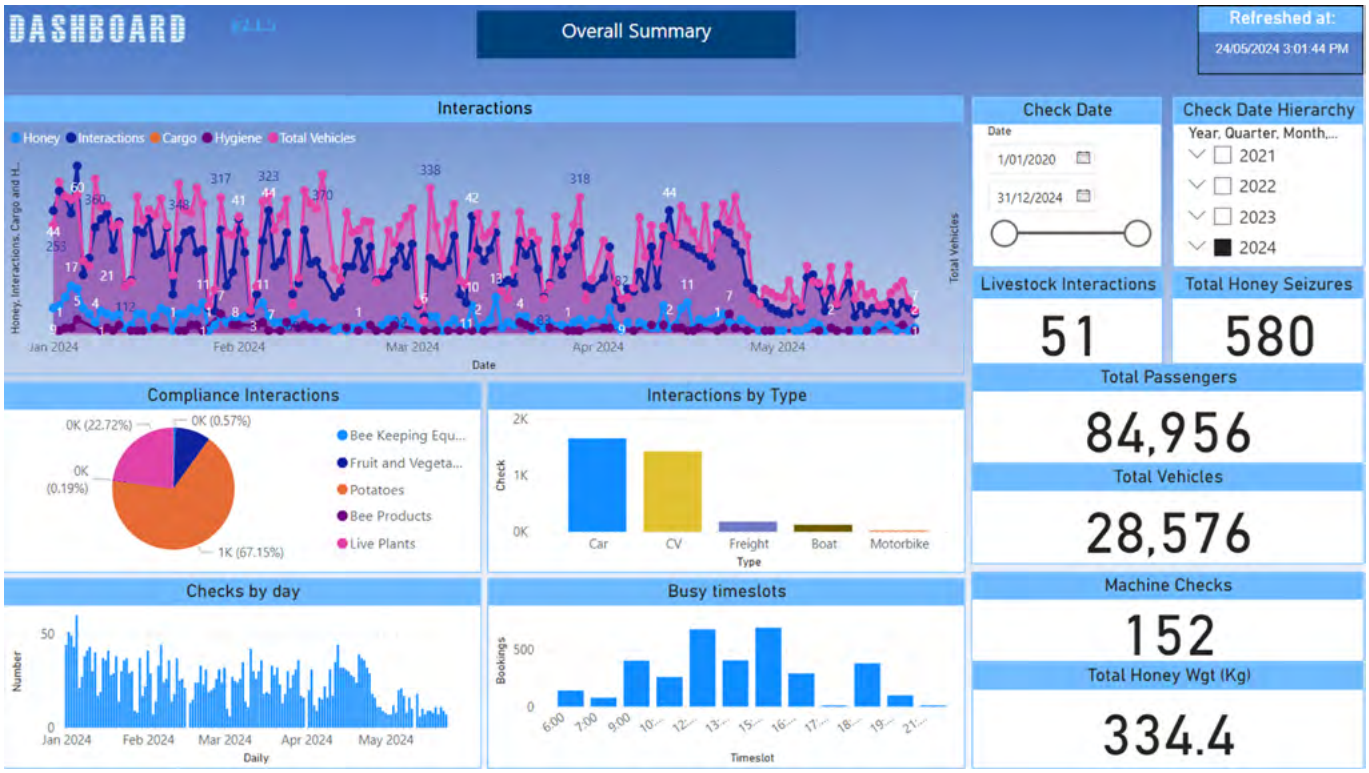
Quick Statistics:

From July 2023 to mid-May 2024 Biosecurity Officers:

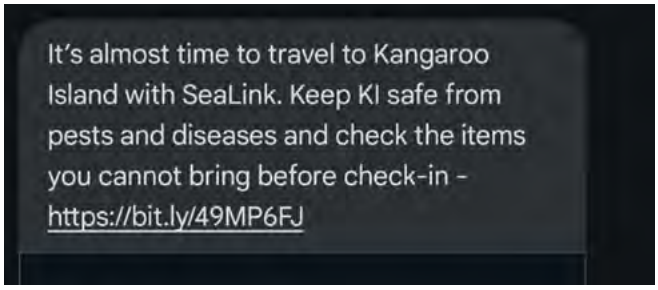
- seized 995 lots of honey to the weight of 475.9kgs at Cape Jervis. 150 of these came from people who have been to KI before;
- inspected or seized 20 other bee related or bee equipment items, including wax;
- seized 58 lots of unwashed/seed potatoes at Cape Jervis;
- seized 262 lots of fruit fly risk products from interstate travellers;
- inspected 119 livestock transporters for documentation, equating to over 55,000 animals;
- inspected 790 plants to ensure they were in potting mix and not disease carrying soil;
- inspected 313 machines for cleanliness;
- interacted with a total of 145,559 passengers and 49,418 vehicles at Cape Jervis.

The level of biosecurity awareness by the community and travellers has resulted in an increased level of reporting. This includes reports of sightings of live rabbits, foxes, goats, and pigs on Kangaroo Island. These are always investigated and usually resolved by an initial conversation and assessment using a tool to determine the reliability of the report.

Following an initial rabbit report, there has only been one significant compliance activity during the life of the project with a live pet rabbit on Kangaroo Island reported by a member of the public. This resulted in the owners undergoing a record of interview and compliance actions initiated. The owners of the rabbit were prosecuted and fined.



This year, a pre-departure text message was implemented in partnership with Sealink and the Landscape Board. This text message goes to all travellers before their ferry trip to remind them of what they cannot bring to Kangaroo Island. The message reads, "It's almost time to travel to with SeaLink. Keep KI safe from pests and diseases and check the items you cannot bring before check-in". The hyperlink takes you to the website at the end of this report where you can read the list of declared items for Kangaroo Island.



With the program continuing for a further 2 years, we are planning on implementing more biosecurity strategies both on Island and at Cape Jervis. If you have any concerns, please contact us with your thoughts and ideas.

Take Home Messages

- If you see anything coming to or on Kangaroo Island that you think shouldn't be here, call the Biosecurity Team Leader or the PIRSA office in Kingscote.
- The Kangaroo Island Biosecurity Checks Program is continuing for a further 2 years.
- If you have any concerns about biosecurity risks, thoughts or ideas for the project please get in contact with us to discuss.

Funding/Sponsors

The Kangaroo Island Biosecurity Rebuild Project is jointly funded by the South Australian and Australian Governments.

Further Information

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www.pir.sa.gov.au/biosecurity/keeping_kangaroo_island_safe_from_pests_and_disease

Biosecurity: Weeds After Fire

Background

The Weeds After Fire project aims to assist landholders effected by the 2019/2020 bushfires by assisting with weed incursions and fire responsive weeds, as well as building producers' weed control capacity.

The disturbance created by the bushfires produced ideal conditions for new weed incursions and the spread of established weeds.

As it is the last year of the project, efforts centred on landholder resilience, preparedness for future fire risks, and weeds that affect livestock & wildlife.

Project aims

- Weed surveillance and mapping, and the establishment of control programs over fire effected properties on KI.
- Monitoring landholder properties that received donated fodder, checking for weed incursions resulting from accidental seed transfer from the mainland.
- Providing landholders with free site inspections to identify weeds and provide control advice.
- Contracting weed controllers to perform large-scale weed control activities.

Cape Tulip

- Development of a weed identification guide for KI with relevant declared weeds and weeds of concern, suitable for all types of landholders and able to be contributed to in the future.
- Move to landholder preparedness for future fire risks and resilience in weeds affecting livestock and weeds of national significance (WoNS).

What Was Done

The Cape Tulip Campaign continued for a third season from July 2023 to June 2024. This year, 29 landholders were assisted with over 760 Cape Tulip control hours completed, including 510 contractor control hours.

Various projects and control work were undertaken to move away from the fire recovery space and into future fire risk prevention and landholder resilience. PIRSA Officers completed over 350 hours of control work on various species including Cape Leeuwin Wattle, Bulbil Watsonia, Blackberry, African Daisy and Tree Lucerne.

A large-scale African Boxthorn control program was implemented with 6 landholders over a significant landholding to begin works on Weeds of National Significance control, with aims to continue in the future. Landholders were provided with 67 hours of contractor control work to manually remove plants.

In an aim to mitigate the further spread of African Daisy, 37 hectares of burnt plantations were removed to reduce the area capable of harbouring and enabling weed growth. Due to the location and accessibility of the plantations, machine operators were engaged for 111 hours of control work. This work was completed after advice from other landholders concerned about the impact and presence African Daisy is starting to have.

Toxic weeds were also targeted this year with increased education and control packs developed and a toxic weeds targeted control program underway. 151 hours of contractor control were provided to landholders targeting Arum Lily, Salvation Jane, Yellow Burrweed, Variegated Thistle, Heliotrope & Lesser Loosestrife.

In collaboration with the Kangaroo Island Landscape Board, a 'Weeds of Kangaroo Island' Ute guide was developed to help landholders identify weeds they may come across on their properties. In an aim to increase resilience and community awareness, the guides were designed to provide relevant information on declared weeds found on KI and other relevant weeds, including identification, impacts, legal requirements and control advice. The guides have been designed so that they can be added to if new weeds emerge on Kangaroo Island or if new information becomes available. Landholders can get a copy from the PIRSA Office or the Kangaroo Island Landscape Board Office in Kingscote from July, or at the Parndana Show.

African Daisy. Photo: Trees for Life.

Take Home Messages

- If you see any unusual plants or one that you don't recognise, contact the PIRSA office in Kingscote.
- If you have Weeds of National Significance on your property, contact us to see how we can assist you.
- 'Weeds of Kangaroo Island' Ute Guide available for landholders for free! *Coming Soon*

Funding/Sponsors

The Kangaroo Island Biosecurity Rebuild Project is jointly funded by the South Australian and Australian Governments.

Further Information

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Further resources for controlling declared weeds can be found on the PIRSA Website.

African boxthorn

Case Study: Weed Wiper Wild Radish Trial

Background

A significant wild radish infestation within a winter variety canola crop was discovered by the owner. The landholder's attempts to control the radish within the crop using Overwatch and On-Duty were unsuccessful, suggesting the radish had become Group B resistant. The aim of the work was to salvage as much of the crop as possible, with the producer aiming for a minimum of 60% crop success.

What was done

The PIRSA Weed Wiper was selected as it enabled the application of herbicide to the wild radish, leaving the canola untouched (this is due to the clear gap between the crop and the taller, more mature weed). The chemical used was Glyphosate at a rate of 2L per hectare per pass, as recommended by the agronomist. A speed of 8km, set height of 10-15cm above the crop and a double pass was recommended. Some adjustments to the Weed Wiper's hoses were made to evenly distribute the flow of chemical to all segments of the device.

Results

After the initial control using the weed wiper, only 70% of the wild radish was killed due to immature wild radish coming up underneath the canola. However, this control enabled the canola to outcompete the remaining radish. Approximately 30% of the young canola plants were lost due to drips from the weed wiper and emerged as strips rather than big blankets of wiped-out canola. Further modifications are required of the weed wiper to prevent this in future.

At harvest, some wild radish remained however it wasn't as strong or prevalent as it was prior to using the weed wiper. Very few plants went to seed and the seed fell prior to harvest. The canola yielded 2 tonnes per hectare, which was considered a respectable outcome given the season and the substantial weed burden. Upon testing, no presence of wild radish was found within the canola seed sample, an excellent result.

Lessons learnt

If the landholder was found in this position again, he would explore this control option as he believed it was worth the effort and time it took to weed wipe the wild radish. He highlighted that if he were to do it again, he would pull the trigger earlier as the canola started to get to a similar height as the wild radish towards the end of control. The task took time and the canola had grown before he got to the end of the area of control. The control was completed in early August.

We would also like to highlight that this was completed on a winter variety of canola. It is very slow growing over winter, resulting in the height difference between the wild radish and the canola which made it possible to use the weed wiper for control. It is likely a spring variety of canola wouldn't have this needed height clearance as it does grow significantly faster than winter varieties.

Take Home Messages

- If you have a weed infestation, seek advice, all hope is not lost!
- The weed wiper is available to use for control of various weeds – not just Cape Tulip. Contact the PIRSA office in Kingscote to hire the weed wiper.
- This control was completed on a winter variety of canola. Success on a spring variety is unknown.

Wild radish was more mature than the winter canola crop.

Funding/Sponsors

The Kangaroo Island Biosecurity Rebuild Project is jointly funded by the South Australian and Australian Governments.

Further Information

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Further resources for controlling Wild Radish, and other weeds, can be found by scanning this QR code.

Recovering KI's Iconic Narrow-Leaved Mallee Woodland

Background

KI Narrow-leaved Mallee (*Eucalyptus cneorifolia*) Woodland is endemic to the eastern half of Kangaroo Island. The woodland occurs mostly as small isolated patches, as farm shelterbelts and along roadsides. The woodland provides habitat for some of KI's most highly threatened plants.

For many eastern Kangaroo Island landowners, KI Narrow-leaved Mallee is the only remaining native vegetation on the property. This makes the woodland very important for providing shelter for stock and windbreaks for crops, and also helps to alleviate salinity through water uptake.

Old stands of KI Narrow-leaved Mallee often form a closed canopy which deprives understorey plants of nutrients, water and sunlight. Over time, the understorey dies out resulting in an overstorey monoculture of Eucalyptus cneorifolia. This is a natural process known as senescence. Extreme senescence can lead to the eventual collapse of the woodland, with narrow stands such as shelterbelts especially at risk, as old trees are particularly vulnerable to being blown over by strong winds.

Senescence is principally corrected by fire, however altered fire regimes across much of eastern Kangaroo Island have resulted in a disproportionate amount of long-unburnt senescent stands of KI Narrow-leaved Mallee. By introducing fire back into the landscape in the form of controlled (ecological) burns, landholders can greatly improve the condition of their KI Narrow-leaved Mallee woodland and its effectiveness at providing shelter and wind protection for stock and crops.

What was done

Since 2020, the KI Landscape Board has been working with KI landholders to protect and improve KI Narrow-leaved Mallee woodland. One landholder that the Board has assisted is Tom (Trout) Willson, owner of the New Country KI property on the Dudley Peninsula. Tom has a long history of actively managing on-farm KI Narrow-leaved Mallee through fencing and pollarding (coppicing). Pollarding is an alternative form of disturbance to fire, mainly used to regenerate shelterbelts.

In 2022, the KI Landscape Board produced a property-scale Vegetation Management Plan for the New Country property which enabled Tom to conduct controlled burns and undertake further pollarding to improve the condition of his KI Narrow-leaved Mallee.

Ecological burning and pollarding are considered a form of native vegetation clearance under the Native Vegetation Act 1991, therefore they must be conducted in accordance with the Native Vegetation Regulations 2017. An approved Vegetation Management Plan provides landholders with the permission to undertake these activities.

Since November 2022, Tom has conducted four controlled burns covering approx. 12 hectares of KI Narrow-leaved Mallee woodland. Burns were conducted during autumn and spring, when conditions are suitable for fire, but when there is a low risk of fire escaping from the intended burn area.

Figure 1: KI Narrow-leaved Mallee woodland prior to burning, showing the absence of understorey. (Oct 2021)

Results

As the burns were conducted relatively recently, only preliminary assessment of the outcomes has been conducted. However initial assessment of post-fire regeneration is extremely encouraging, with extensive basal re-shooting of the Eucalyptus cneorifolia occurring, and large numbers of seedlings having germinated from the soil seedbank. Several species that have germinated were completely absent from the property prior the burns, but must have been present sometime in the past.

Prior to the burns these vegetation patches consisted of mainly just Eucalyptus cneorifolia with the very occasional tall shrub or understorey herb, but now they contain a wide range of species spanning a range of stratums including groundcovers, midstorey shrubs and overstorey trees. Once matured, these patches of KI Narrow-leaved Mallee woodland will be much healthier and will provide much more effective shelter and wind protection for livestock.

A detailed post-burn vegetation assessment is planned for spring 2024.

Figure 2 (top): The same woodland post-burning (Dec 2023). This patch was burned in April 2023.

Figure 3 (bottom): KI Narrow-leaved Mallee reshooting 8 months after fire, and post-fire seedling germination.

Figure 4: Post-fire regeneration and reshooting of KI Narrow-leaved Mallee (Jan 2024). Photo T Willson.

Take home messages

- Controlled use of fire is an appropriate tool for regenerating senescent vegetation, improving general vegetation structure and increasing plant species diversity.
- This method can be done safely by landholders with the appropriate resources and approvals.
- This method can be used for other vegetation types, not just KI Narrow-leaved Mallee.
- The KI Landscape Board can assist landowners with the necessary approvals to conduct controlled burns on their land.

Funding/Sponsors

- **Landowner Tom Willson**
- **KI Landscape Board through the Australian Government National Landcare Program.**

Further Information

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Update: KI Feral Pig Eradication

Background

The 2019-20 summer fires devastated Kangaroo Island. A silver lining to emerge from this devastation was a once in a lifetime opportunity to eradicate feral pigs from the island while their numbers were low, and the vegetation was recovering.

It is estimated that feral pigs were costing Kangaroo Island $1 million annually. Feral pigs were severely impacting Kangaroo Island producers through the destruction of pastures and farm infrastructure, and preying on lambs. Feral pigs were also a biosecurity risk as they spread livestock and human diseases.

What's being done

The project team used the latest technology in control tools to achieve eradication, including:

- Remotely triggered traps
- HOGGONE® sodium nitrite-based poison baits
- Thermal ground shooting
- Thermally Assisted Aerial Culling (TAAC)
- Artificial Intelligent (AI) 4G camera network

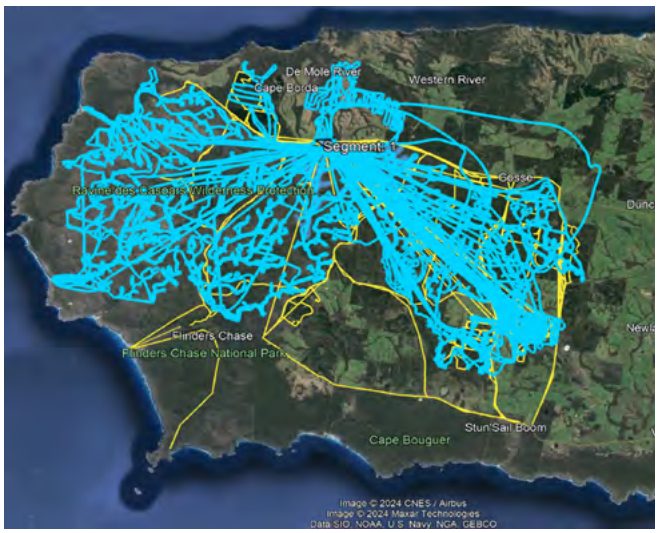
The eradication project began in September 2020 and has achieved the following:

- 878 feral pigs culled to date
- currently there are no **known** feral pigs on Kangaroo Island
- implementation of the largest Artificial Intelligent mobile camera network in Australia with over 300 cameras
- first in Australia to implement a thermally assisted aerial cull
- six thermally assisted aerial culling operations completed across Western Kangaroo Island
- the thermally assisted aerial culling operations have flown a total area of over 700,000 hectares, the equivalent of 1.6 times the entire area of Kangaroo Island.

At the end of 2022-23 financial year, soon after announcing the confirmed eradication, signs were detected that three sows remained. These sows proved elusive but in March 2024 all three were culled in a thermal assisted aerial culling operation which used detection dogs to assist in locating the pigs. No other feral pigs or signs of feral pigs were detected during the 2023-24 financial year.

The last five pigs to be culled (two in June 2023 and three in March 2024) were all sows about two to three years old, and were found to be all barren, with no evidence that any of them had reproduced. With all known feral pigs destroyed, the eradication will transition from large-scale control activities to a proof-of-freedom stage from 1 July 2024. Proof-of-freedom is the final stage of the eradication, where intensive monitoring is undertaken to ensure the eradication has been successful. To ensure proof-of-freedom, multiple different tools will be used, including:

- ground monitoring
  - on ground staff looking for signs of feral pigs – concentrating on waterways during summer
- 4G artificial intelligence camera network
  - a network of 300 cameras across the eradication area will continue to be monitored for feral pigs
- standard camera network
  - a network of about 200 cameras in areas where 4G is unavailable
- detection dogs
  - working at intervals throughout the year to detect feral pigs through scent
- eDNA water sampling
  - 25 sites will be sampled each month to check for the presence of feral pig DNA
- community education and reporting
  - engaging with the community and visitors at key events
  - the eradication project has a strong relationship with the Kangaroo Island community, ensuring any sightings are reported.



Left: Area covered by the helicopter and detector dogs during the March 2024 Aerial Cull.

Above: One of the sows destroyed in the 2024 Aerial Cull.

Below: Detector dogs and handler.

Funding/Sponsors

The Kangaroo Island Feral Pig Eradication is being delivered by PIRSA in partnership with the KI Landscape Board and KI National Parks and Wildlife Service. It is jointly funded by the South Australian and Australian Governments under the National Disaster Recovery Funding Arrangements including Local Economic Recovery Funding until 30 June 2023.

The State Government and Commonwealth Government has committed further funds to continue monitoring and implement the Proof of Freedom program.

Further Information

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Visit the PIRSA website to find out more:

Stokes Bay Community Blitz Feral Cats

Background

Last year, the Kangaroo Island Landscape Board (KILB), with support from Agriculture Kangaroo Island (AgKI), ran an Australian-first, landholder led feral cat trapping blitz using Celium trap monitoring technology.

Cage traps are widely used to remove feral cats, but this tool is often ineffective at controlling feral cat numbers as it is labour intensive and time-consuming. Landholders often do not have the time to undertake intensive trapping for sustained periods. For feral cat control to have positive benefits, it needs to significantly reduce feral cat numbers over large areas. To achieve this the Stokes Bay program used novel trap monitoring technology, which allowed landholders to remotely see if traps had been triggered, saving time and money. This first of its kind program highlights the critical role farmers have to play in managing the impacts of feral cats and how efficiencies through technology can deliver lasting benefits for biodiversity and primary production.

Stokes Bay was chosen for this trial as it is an eager, close-knit community that had noticed an increase in feral cat sightings post-fire and was keen to build its capacity to address the issue.

The project was initiated when AgKI successfully received funding through the Livestock SA Kangaroo Island Bushfire Recovery Innovation Grants Program.

What was done

1. Real-time monitoring through spatial technology

To make cage trapping easier and more efficient we purchased "Celium" trap monitoring technology from Encounter Solutions Ltd. The KILB had been scaling up the use of this technology since 2022 to remove large numbers of feral cats following the 2019/20 KI bushfires and more recently to eradicate feral cats from the Dudley Peninsula. The feral cat trap monitoring network on KI is the largest anywhere in Australia. Realising the potential of this technology to increase landholder participation in feral cat management, this AGKI supported program seemed like the perfect opportunity to roll it out, arming farmers with the tools to address the feral cat issue.

The use of Celium improves the efficiency of landscape scale trapping programs by remotely transmitting the trap status to the user in real-time, as either triggered by an animal or still open, which minimises the need to visit the trap to manually check it.

This means landholders only have to attend to triggered traps, which in turn increases reponse time, which improves welfare outcomes for trapped animals, better manages health and safety risks, and reduces the overall cost and time associated with trapping programs.

2. Support for landholders

Over an eight-week period from 28 April to 30 June 2023, 19 private landholders participated in the "Farmer Blitz" trapping program.

Many primary producers had previously undertaken feral cat trapping on their properties individually, but not collectively within a program.

KILB met with participating landholders to talk about the program, set up traps, and get them familiar with both the Celium trap alert technology, as well as the Trap.OZ app. They were also supported in the placement of cage traps on their property to ensure maximum trap success. As part of the program, KILB also set up a roadside array of traps in the Stokes Bay area. This meant that staff were available on ground every day to assist landholders as required.

Trapping commenced in late April, with a small group of landholders, to allow us to roll out the technology in a co-ordinated way. An expansion of the program followed in late May, with many additional landholders coming on board and the roadside trapping network extended to cover 20,000 ha across the Stokes Bay and Duncan area.

3. Development of trap.oz application and collection of data

The next challenge was to figure out how landholders could visualise their traps and record data.

Trap NZ from Groundtruth New Zealand is a free app that is widely utilised by predator control projects across New Zealand, which allows both land managers and community to manage their pest control projects by seeing traps, bait stations and monitoring stations.

KILB worked with developers of the app to create a demonstration version for the purpose of testing it with an Australian audience. Trap.OZ in demo form was used for the duration of the Stokes Bay project.

It allowed landholders to see their trap status (open/closed), get emailed alerts when a trap had triggered, but also, importantly, to record catch data so that we could measure the success of the program.

Cage traps (left) fitted with Celium sensors ready for deployment and a Celium hub (right) which communicates with trap sensors and reports status.

trap.nz

trap.oz

KILB worked with developers of New Zealand app Trap.NZ to create a demonstration version for Australia, Trap.OZ.

Results

- Over eight weeks and 13,209 trap nights (number of traps x number of nights deployed), 19 landholders helped to remove 259 feral cats from an area of more than 20,000 ha.
- The proof-of-concept project demonstrated how new technologies can increase landholder participation and improve the efficiency and impact of control and eradication programs.
- The success and learnings from the Stokes Bay program were used to shape the 2024 Landholder-Led Feral Cat Trapping Blitz on the Dudley Peninsula to support the Dudley Peninsula Feral Cat Eradication Program.

Take home messages

- Feral cats, as an apex predator, have been able to breed up large populations, which negatively impact both primary production and biodiversity on Kangaroo Island.
- New technology means primary producers can assist in cage trapping for feral cats without having to commit a large amount of time and resources
- This has resulted in greater participation from primary producers and land managers across the region, who want to play a part in not only reducing the impact of feral cat populations on the cost of production, but also on native wildlife and the environment.

AgKI board member Steph Wurst and husband Tom with one of the Celium fitted feral cat traps (sensor node at top right of trap) on their property at Stokes Bay (Photo: Andrew Cox, Invasive Species Council).

Funding/Sponsors

Kangaroo Island Landscape Board

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Further Information

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Vale Faye Stephenson

We remember Faye, who contributed to many Ag Trials books with her expertise, sharp eye for detail, tireless work and sense of humour.

If you see any typos, it's because Faye wasn't here to check things over!

She is, and will continue to be, sorely missed.

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