

Tarin Rock BioBlitz

Intensive soil testing  
to depth following  
liming

Get to know your  
*Gastrolobium*



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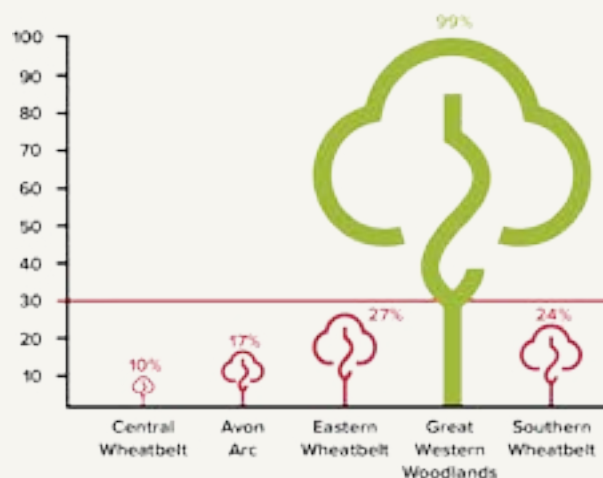
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# Dashboard watch

## Remnant Bushland



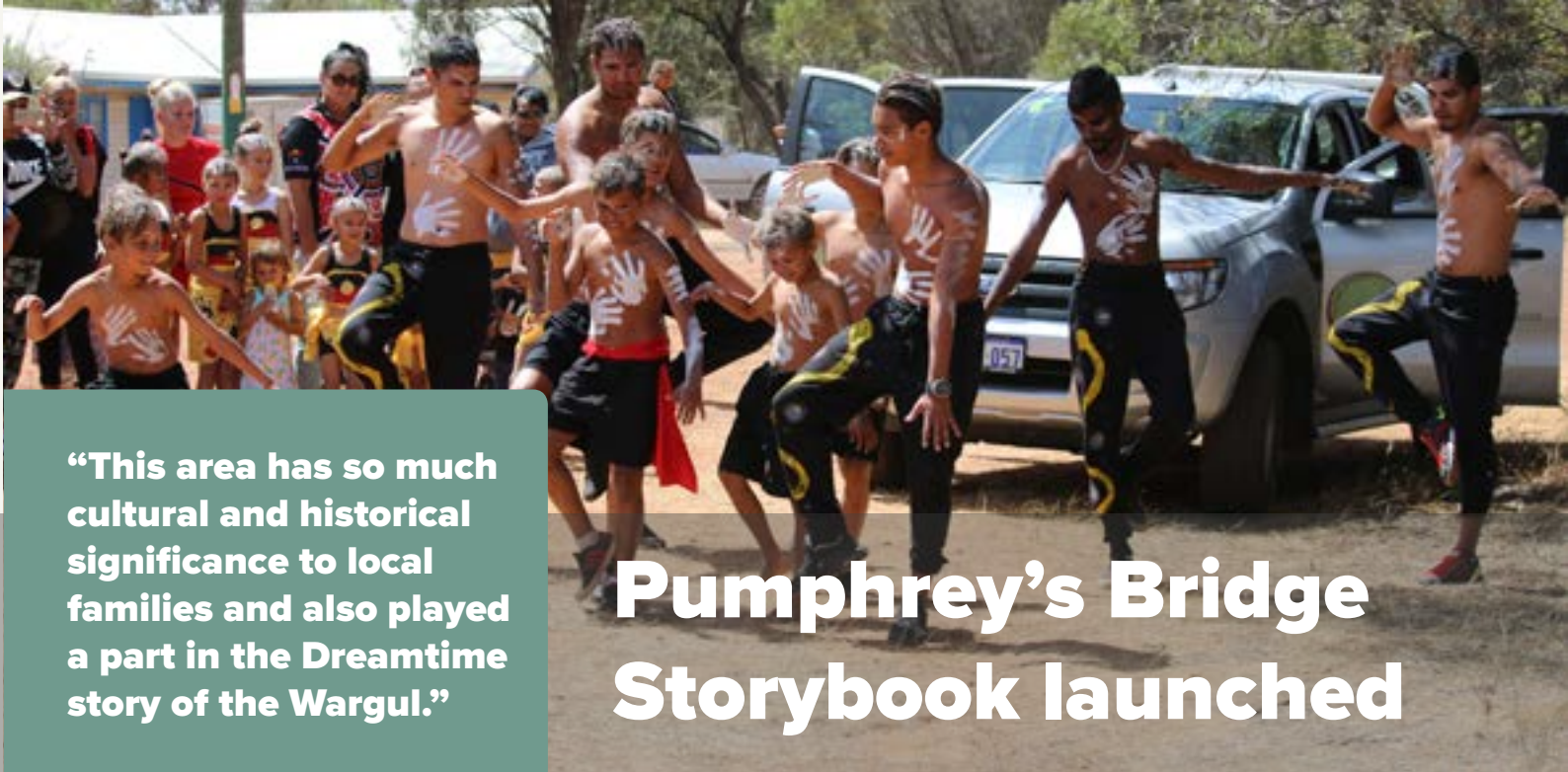
Land clearing, primarily for agriculture, has arguably had the greatest impact on species viability in the Wheatbelt region. More than 70% of the native vegetation in the Wheatbelt NRM region has been cleared since European settlement, with an average of over 2700 hectares approved for clearing per year since 2010.

**Data Source:** Department of Environmental Regulation

The extent and composition of our native vegetation can also be variously effected by fire, secondary salinity and climate change. As we collate data we will be increasingly able to comment on whether the area of perennial vegetation cover is increasing or decreasing across the region.

The data underlying the Remnant Bushland Threshold of Potential Concern was derived from the 2007 Department of Agriculture and Food, WA Native Vegetation Extent spatial dataset. With the exception of the Great Western Woodlands which are virtually uncleared, every sub-region of the Wheatbelt NRM region falls well below the threshold of 30% land cover. This threshold has been identified in the literature on biodiversity conservation featured on the NRM Dashboard <http://www.nrmstrategy.com.au/climate-change-portal>. Our challenge is to manage the region to improve species viability by increasing perennial landcover to exceed this threshold. About 13% of our remaining native vegetation is protected in crown reserves and under freehold covenants and non-binding agreements while revegetation efforts on freehold land continues. In these ways we can protect, enhance, enlarge and connect our remaining bushland.

**View the NRM Dashboard online:**  
[www.wheatbeltstrategy.com.au](http://www.wheatbeltstrategy.com.au)



**“This area has so much cultural and historical significance to local families and also played a part in the Dreamtime story of the Wargul.”**

## Pumphrey’s Bridge Storybook launched

**More than 150 people gathered at Pumphrey’s Bridge to celebrate the launch of a book and plaque recognising the significance of the site to the local community.**

Wheatbelt NRM worked with local Noongar families in preserving and re-telling their stories through the publication ‘Koompkinning: The Pumphrey’s Bridge Storybook’.

The book is a collation of local stories and photographs, containing information on locally significant sites, flora and fauna, family groups, and the mysterious falling phenominum stones.

The site along the Hotham River, just west of Pingelly, was home to Aboriginal families because of its rich diversity in wildlife and flora.

A specially commissioned memorial plaque for the site was also unveiled recognising the Noongar families who lived and worked in Pumphrey’s Bridge and who still have ties with the area.

Wheatbelt NRM’s Michelle Winmar helped to organise the event, which included an unveiling of a plaque, cultural dancing fused with hip hop, live music, an evening meal and plenty of story-telling.

The celebrations included a ‘Welcome to Country’ by local Noongar Elders Mervyn Abraham and Gary Bennell.

“The celebration was such a success we were hoping it would become an annual event,” Michelle Winmar said.

“This area has so much cultural and historical significance to local families and also played a part in the Dreamtime story of the Wargul.”

“The highlight was the unveiling of the plaque by Nick Abraham, which showed the families who camped along the river, fishing for djilgies and hunting for rabbit and kangaroo.”

“These families worked closely with the nearby farmers to clear the land,

building fences using the local Mangart trees.”

The Koompkinning book followed the recent publication of stories from Boogin Rock, near Brookton.

Both books have been funded through the Australian Government’s National Landcare Programme.

The Koompkinning storybook can be downloaded at: <http://bit.ly/2gX3GTW>

Or call the office on 9670 3100 to have a copy posted to you, while stocks last.





# Capturing the Wheatbelt

## Overall Winner

‘Seeding at sunset’

Julie Anderton, Wongan Hills

**Brilliant wildflowers, vibrant farm machinery, wise old gumtrees, stunning fields of canola, and faces from the Wheatbelt’s unique social tapestry featured in this year’s Youth Environment Photography Competition.**

Budding photographers aged 35 years and under living in the Wheatbelt were invited to showcase the beauty of the region in four categories – Paddock Trees, Flora and Fauna, Faces of the Wheatbelt, and a Sense of Place.

This year’s competition attracted an over 200 entries from 45 entrants, ranging in age from four years to 35 years. The quality of entries also vastly increased, making the judges’ job very rewarding.

“The competition is targeted at young people and it gives them an opportunity to show off what’s just outside their back door,” said Wheatbelt NRM’s Chris David.

“Each year the competition grows and grows, with young people capturing some great images to share.”

“This year we also recognised the next generation of Wheatbelt photographers with four highly commended entries awarded to people aged between 11 and 16 years.”

The five winners of the competition were announced at the Dowerin Field Days with the Honourable Mia Davies MLA presenting the prizes and certificates.

Twenty-two year old Julie

Anderton from Wongan Hills won best overall picture with her photo of a tractor seeding at sunset.

A single salmon gum standing in a crop of barley shot by 35-year-old Kristo Orma from Hyden won the Paddock Trees category.

An aerial shot of Lake Baandee entered by 29-year-old Jonathon Dyer from Kellerberrin won the Sense of Place section.

A photo of three Tawny Frogmouth birds resting in the shade won 23-year-old Sally Read from York first place in the Flora and Fauna section.

An image of working kelpie dog Meg won 16-year-old Kaylea Richards from Merredin the Faces of the

Wheatbelt section.

To view the entries you can log onto [www.wheatbeltrnm.org.au/photocomp-2016](http://www.wheatbeltrnm.org.au/photocomp-2016)

The competition was supported by Wheatbelt NRM with funding from the Australian Government's National Landcare Programme.

### Following her passion for photography

Julie Anderton moved to Wongan Hills in the Wheatbelt twelve years ago from South Africa. She describes the small country town she calls home as beautiful, comforting and safe.

It is the place she discovered her passion for photography which tends to focus on candid, unscripted shots of people in natural Wheatbelt settings.

But the twenty-two year old's winning landscape image of a tractor seeding a paddock at sunset was a huge step out of her comfort zone.

"I enjoyed the challenge that came with submitting an image into a category that is definitely not where my strongest skills are."

"Mum has tried to get me to go out and do photographs of seeding and harvesting for years now and I always resisted because I was never great at landscape photography."

"Finally this year, my dad lined up a date and time with one of his customers and once I got out there I just couldn't stop shooting. There is absolutely nothing that beats the sunsets that you witness in the Wheatbelt,

not even photos do them justice. They are some kind of magic!"

Julie hopes that one day her children will be able to experience living in the Wheatbelt just as she has, to appreciate its magic. And that it is still as beautiful and healthy in the future.

"It's only when we start thinking about the future, the consequences of treating the environment badly – what we'll be leaving our kids in and that sort of thing – that we start taking an interest in the state of our environment."

"I have found that the way to get people to care about anything is to show that you care about it first, and then lead by example. Gather with those who think like you or understand your philosophy and build a network. If each person in an ever growing network is able to inspire the people living and working around them, eventually more and more people will start to share your passion."

And her advice for budding photographers looking to take part in next year's competition?

"Do it! Do it even though you doubt that your work is good enough, do it to add to the story that comes together when all the photos are displayed at the end, and do it to play a role in supporting and caring for the Wheatbelt environment."

### Faces of the Wheatbelt Winner

'Meg'  
Kaylea Richards,  
Merredin



### Paddock Tree Category Winner

'Sound of silence'  
Kristo Orma, Hyden



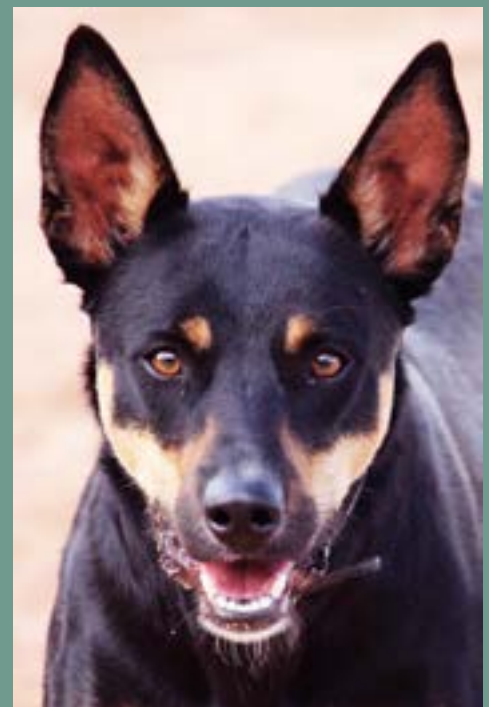
### Fauna Category Winner

'Tawny Frogmouth family'  
Sally Read, York



### Sense of Place Category Winner

'Lake Baandee a great place to be'  
Jonathon Dyer, Kellerberrin



# BioBlitzing the Wheatbelt



■ Jan's Banded Snake (*Simoselaps bertholdi*)

## What is a BioBlitz?

A BioBlitz is a 24 hour citizen science event that aims to discover and record as many different living things as possible within a set location over a limited time period.

They are also a fun and informative way of engaging the local community and landholders while raising their awareness of the links between agricultural systems and the natural environment.

## A typical BioBlitz:

- draws participants to the region and showcases the local environment
- raises awareness of local groups and environmental issues
- increases local community interest in the environment, science and agriculture
- increases the skills and knowledge of participants for future projects
- encourages networking and collaboration between science and agriculture
- fosters a strong network of individuals and groups for future projects.

The 2016 Tarin Rock BioBlitz was the eleventh BioBlitz held in the Wheatbelt and was jointly organised by Wheatbelt NRM and Dumbleyung Landcare Zone, with key support from local Department of Parks and Wildlife staff.

The collaborative biological survey was held in early October 2016 near Lake Grace in the southern part of the Avon River Basin. Site surveys were conducted on Tarin Rock Nature Reserve, North Tarin Rock Nature Reserve, and Reserve Number 38379, in an area totalling 4000 hectares of remnant vegetation.

Professional and amateur biologists, ecologists and naturalists worked together as 'citizen scientists',

conducting fieldwork with local community members and participants to discover more about this area's high conservation value bushland and biodiversity.

Over 60 people attended the event despite heavy winds and rain being forecast. Thankfully the inclement weather was short lived and attendees were able to enjoy relatively dry but cool conditions for most of the weekend.

## Highlights

The BioBlitz's most exciting discovery was large collections of chewed quandong nuts (*Santalum acuminatum*) at specific feeding sites under dense bushes, indicating the presence of the conservation dependent Western Mouse

(*Pseudomys occidentalis*). It was fabulous to see evidence of the species still surviving here as it hadn't been seen on this reserve since 1992.

Other highlights included a Wedge-tailed Eagle (*Aquila audax*) nesting with its chick, camera trap footage of a threatened Red-tailed Phascogale (*Phascogale calura*), visually striking Jan's Branded Snakes (*Simoselaps bertholdi*), and the intriguing discovery of two rarely seen Turtle Frogs (*Myobatrachus gouldii*) that were found dead and were being consumed by ants.

### Other results

The botany groups had a field day at the BioBlitz, identifying 200 species of plants, fungi and lichen. This is a fantastic effort in just 24 hours and reflects the region's extremely high biodiversity where over 900 species of plants have been identified by previous surveys.

Considering the damp and windy conditions, the herpetology (reptile) survey and foraging teams were very productive, identifying nine species of reptile and two frog species. The ornithology (bird) groups also did well identifying 35 species, while the entomologists (insect spotters) excelled with over 100 insect species found.

Evidence of nine mammals was recorded during the survey via motion sensing cameras and scats. The cameras were placed on the reserves prior to the survey and revealed the exciting presence of threatened Red-tailed Phascogales. Sadly, it also showed numerous feral foxes and cats in the same

area, as well as rabbits and house mice.

### Report

The information and data gathered during this BioBlitz will provide an invaluable snapshot of the region's environment which will help with future monitoring and management work in the remnant bushland.

Results from the Tarin Rock BioBlitz are being collated into a report which could also help local groups access funding for preserving native wildlife and flora in the area.

The Tarin Rock BioBlitz was funded by the Australian Government's National Landcare Programme and made possible through the hard work of many wonderful volunteers. Huge thanks to everyone who helped out and also to those who attended!

### Further reading

View results from the 2015 BioBlitz in Toodyay:

<http://www.wheatbeltnrm.org.au/knowledge/bioblitz-report>

View further information on running a BioBlitz:

[http://www.ala.org.au/wp-content/uploads/2011/10/BIOBLITZ\\_Guidelines\\_WEB-final-201507.pdf](http://www.ala.org.au/wp-content/uploads/2011/10/BIOBLITZ_Guidelines_WEB-final-201507.pdf)

### To find out about plans for the 2017 BioBlitz, please contact:

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## Some things we found!

### Mammals

Brush-tail Possum  
(*Trichosurus vulpecula*)  
Echidna  
(*Trachyglossus aculeatus*)  
Red-tailed Phascogale  
(*Phascogale calura*)  
Grey Kangaroo  
(*Macropus fuliginosus*)  
Western Mouse  
(*Pseudomys occidentalis*)

### Reptiles

Granite Worm Lizard  
(*Aprasia pulchella*)  
Marbled-faced Delma  
(*Delma australis*)  
Frazers Delma (*Delma fraseri*)  
Jan's Banded Snake  
(*Simoselaps bertholdi*)  
Southern Blindsnake  
(*Anilius australis*)

### Birds

Wedge-tailed Eagle  
(*Aquila audax*)  
Southern Scrub-robin  
(*Drymodes brunneopygia*)  
Western Yellow Robin  
(*Eopsaltria australis griseogularis*)  
Owlet Night-jar  
(*Aegotheles cristatus*)

### Insects

Large Bush Cricket (*Pachysaga*)  
Weevil (*Catasarcus*)  
Jewel Beetle (*Buprestidae*)  
Stag Beetle (*Passalidae*)

### Plants

Echidna Wattle (*Acacia depressa*)  
Drummond's Conostylis  
(*Conostylis drummondii*)  
Mallet Poison  
(*Gastrolobium densifolium*)  
Blue Boronia (*Boronia tenius*)



# Spotlight on the Western Mouse

*Pseudomys occidentalis*

**Family:** Muridae

**Conservation status:** Priority 4: Rare, Near Threatened and other species in need of monitoring

## Western Mouse facts

**Size:** (head and body length) 90 – 110 mm

**Size:** (tail) 120 – 140 mm

**Weight:** 33 – 53 g

**Habitat:** Semi-arid and arid WA, in sandy clay and loam with dense shrubs including quandong and sedges. Reduced population restricted to isolated Wheatbelt reserves and sites on the South Coast.

**Diet:** Seeds, plant stems, fruits, flowers and some invertebrates.

**Reproduction:** Breeding begins in winter, young are born from mid-late spring and weaned in early summer. Young can breed in their first year.

## Identification

The Western Mouse has been described as a 'roman-nosed' rodent which is an accurate description of this species' rounded snout. Its fur is dark grey and yellowish-buff, overlaid with black guard hairs. The underside is pale, greyish-white and the paws are white. The tail is long and distinctively marked; it is pale grey with a dark brown line down either side of the upper surface. The soles of the hindfeet are only slightly granulated and the pads under the toes are small near the tips of the toes and larger further back.

## Habitat and distribution

The Western Mouse was historically found in a band across south-western Western Australia to the southern Nullarbor plain and the south coast near Ravensthorpe. The species is now restricted to the Ravensthorpe Range, Fitzgerald River National Park and several small reserves in the Avon region.

It occurs in long unburnt vegetation on sandy loam or sandy clay loam, often with patches of gravel. The vegetation can





© Lochman Transparencies

include a variety of species but usually includes patches of very dense shrubs and often quandong and sedges.

The first specimen of this species was collected in Tambellup in 1930. The Western Australian Museum also collected this species during surveys in scattered Wheatbelt reserves in the 1970s.

The Western Mouse is a social animal and spends its days in a group, down a burrow 20 to 40 centimetres deep. The burrow has a single vertical entrance which connects to a large semi-circular loop two to three metres in diameter. A nesting chamber is situated opposite the entrance.

### Diet

Seeds, plant stems, fruits, flowers and some invertebrates, including beetles and moths form the diet of the Western Mouse. It is an agile animal and climbs low shrubs when foraging for fibrous plant material, such as flowers of *Hibbertia* and *Acacia* and seeds of *Banksia* and *Hakea*. It chews holes in quandong nuts to eat the protein-rich and oil-rich kernels. Feeding areas appear to be used

over a long period of time as shown by piles of chewed and decomposing nuts which cover the ground in areas near mature quandong trees.

### Reproduction

Pregnant females are found in early to mid-spring. The young are born from mid to late spring and weaned in early summer. The young are fully grown by May or June. Juveniles can breed by July or August, when less than a year old. Population sizes can fluctuate from year to year depending on conditions.

### Threats

The Western Mouse has particular habitat requirements so clearing of these habitats has been detrimental to this species. Changes in fire regimes may also have been a factor, as large wildfires remove the dense shrub layer over a wide area so the animals lose their feeding areas and cover from predators.

Western mice are usually found in long-unburnt vegetation (30 to 50 years since fire). Remnant populations in small reserves are vulnerable to predation

by introduced cats and foxes, particularly if the reserve is burnt. Degradation of vegetation by rabbits and other grazing animals is also a concern.

### Management actions

Management priorities include the control of feral predators, grazing animals and weeds in conservation reserves. The prevention of wildfire is also important, particularly in dense long-unburnt vegetation and stands of quandong trees. Replanting of quandong is also carried out in some areas.

**SOURCE:** *Mammals of the Avon Region*, M. Bamford, R. Inglis, K. Watson, Wheatbelt NRM, WWF, Department of Environment and Conservation, 2009

<http://bit.ly/2gBn7C4>

[https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/animal\\_profiles/western-mouse\\_2012.pdf](https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/animal_profiles/western-mouse_2012.pdf)

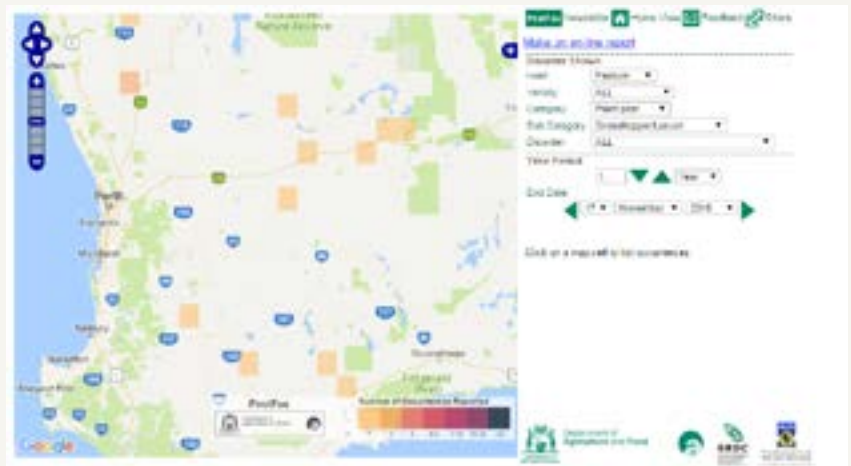
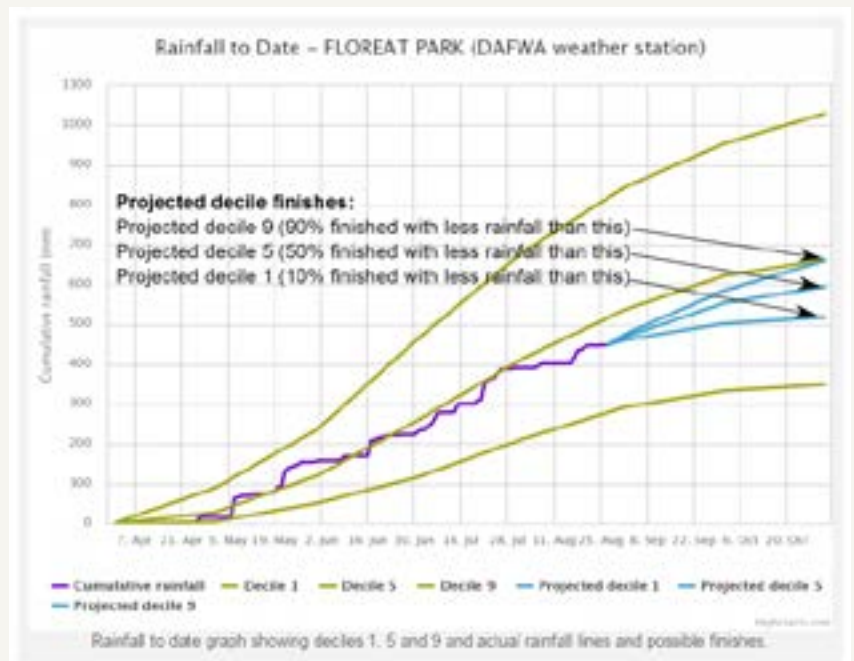


# ‘The times are a changing’ - Making sense of the agriculture tools/apps available

In the words of our newest Literary Nobel Prize winner, Bob Dylan ‘the times are a changing’.

Long gone are the days of having to rely solely on your own knowledge, experiences and gut feel when it came to farming decisions. Although these should never be ignored, there are now a huge number of agricultural web tools and apps available to assist growers in farm management decision making. These tools range from integrated whole farm management systems to simpler weed and disease identification apps.

Listed here are a number of agricultural tools and apps (not all of them by any stretch of the imagination), grouped by type to help with comparison. While sitting on a header over harvest it may be a good time to explore the capabilities of some of these tools/apps to determine how they might fit in with your current operations and add value to your farming business.



## Potential Yield and /or Nitrogen Decisions

NAME	SUPPLIER & LINK	FEATURES	COST
<b>Yield Prophet</b>	Birchip Cropping Group (BCG) <a href="http://bit.ly/2giIWlt">http://bit.ly/2giIWlt</a>	<ul style="list-style-type: none"> <li>Paddock specific potential yield using APSIM.</li> <li>Matches nitrogen applications with predicted crop demands.</li> <li>Inputs required – requires paddock specific soil test data and crop details, optional growing season rainfall and paddock management data entry. Uses BOM climate data.</li> </ul>	Full rate \$230/paddock/year
<b>iPaddock Yield App</b>	iPaddock <a href="http://bit.ly/2gjPHqC">http://bit.ly/2gjPHqC</a>	<ul style="list-style-type: none"> <li>Uses historical farm rainfall and whole farm average annual wheat yields to determine potential yields.</li> <li>No in-paddock testing required.</li> <li>Inputs required – farm rainfall records, previous wheat yields and uses BOM climate data for current readings.</li> </ul>	On- off fee \$169.99
<b>Wheat Yield Constraints Calc</b>	DAFWA <a href="http://bit.ly/2frhKQN">http://bit.ly/2frhKQN</a>	<ul style="list-style-type: none"> <li>Based on a modified French and Shultz equation, estimating water limited yield potential and stored water at time of sowing.</li> <li>Inputs required – soil type, selection of nearest DAFWA weather station.</li> </ul>	Free
<b>N Broadacre</b>	Planfarm <a href="http://apple.co/2gDkEXt">http://apple.co/2gDkEXt</a>	<ul style="list-style-type: none"> <li>Nitrogen calculator – calculates N available to crop and N required to meet yield/protein targets.</li> <li>Includes a simple yield calculator but can be teamed up with other tools such as Yield Prophet.</li> <li>Accounts for variations in fertiliser and grain prices.</li> <li>Inputs required – basic soil test data, crop type, fertiliser type and applications, rotational history.</li> </ul>	\$24.99

## Pests, Disease & Weeds

NAME	SUPPLIER & LINK	FEATURES	COST
<b>MyPest Guide -Reporter App -Crops App -Diseases App</b>	DAFWA <a href="https://www.agric.wa.gov.au/biosecurity/mypestguide-suite">https://www.agric.wa.gov.au/biosecurity/mypestguide-suite</a>	<ul style="list-style-type: none"> <li>Reporter – photos can be uploaded and locations of pests found recorded with direct communication with DAFWA possible.</li> <li>Crops and disease – identification tool, search by crop type, damage, size, area of plant affected, etc.</li> <li>Inputs required – photos and pest location – Reporter</li> </ul>	Free
<b>Prosaro Scale</b>	Bayer CropScience <a href="http://www.theprosaro-scale.com.au/prosaro/aboutscale/">http://www.theprosaro-scale.com.au/prosaro/aboutscale/</a>	<ul style="list-style-type: none"> <li>Predicts onset of seasonal arospore emanating from canola residue based on the DAFWA Blackleg Sporacle Model.</li> <li>Option for <i>sclerotinia</i> prediction.</li> <li>Inputs required – postcode and rotation (for <i>sclerotinia</i>).</li> </ul>	Free
<b>Pestfax -Newsletter -Reporter App -Map</b>	DAFWA, GRDC <a href="https://www.agric.wa.gov.au/crop-diseases/about-pestfax-newsletter">https://www.agric.wa.gov.au/crop-diseases/about-pestfax-newsletter</a>	<ul style="list-style-type: none"> <li>Newsletter – weekly pest updates as reported by farmers, agronomists and industry.</li> <li>Pestfax Reporter – allows for simple reporting of pests and diseases.</li> <li>Pestfax Map – shows occurrences of pests and diseases reported.</li> <li>Inputs required – initial contact details, date, crop type, variety, pest/disease type, severity and location.</li> </ul>	Free
<b>My Weed-Watcher App</b>	DAFWA <a href="https://www.agric.wa.gov.au/weeds/weed-watcher-homepage">https://www.agric.wa.gov.au/weeds/weed-watcher-homepage</a>	<ul style="list-style-type: none"> <li>Identification Guide – ID of weeds.</li> <li>Inputs required – flower colour, leaf shape and plant type.</li> <li>Survey/reporting – maps current weed distributions, allows for entry of weed survey data.</li> <li>Inputs Required – images, location, weed density, weed counts, and control activities.</li> </ul>	Free

## Climate

NAME	SUPPLIER & LINK	FEATURES	COST
<b>Australian CliMate</b>	<a href="http://bit.ly/2fabvWd">http://bit.ly/2fabvWd</a>	<ul style="list-style-type: none"> <li>Allows for interrogation of climate records (last 60 years).</li> <li>Shows probability of extreme events.</li> <li>Shows how the season is tracking compared to average.</li> <li>Estimates how wet soil is after a fallow period</li> <li>Inputs required – region and soil type (for soil water).</li> </ul>	Free
<b>DAFWA Weather Stations App or web based tool</b>	DAFWA <a href="https://www.agric.wa.gov.au/weather-stations">https://www.agric.wa.gov.au/weather-stations</a>	<ul style="list-style-type: none"> <li>Provides weather data for all DAFWA weather stations.</li> <li>Charts available compare year by year or year by average.</li> <li>Inputs required – DAFWA weather station selection.</li> </ul>	Free
<b>DAFWA Rainfall to Date</b>	DAFWA <a href="https://www.agric.wa.gov.au/climate-weather/rainfall-date-tool">https://www.agric.wa.gov.au/climate-weather/rainfall-date-tool</a>	<ul style="list-style-type: none"> <li>Shows growing season rainfall to date against rainfall deciles (data from 1975-2014).</li> <li>Shows historical finishes to a season (as projected deciles) from the current date onwards.</li> <li>Inputs required – DAFWA weather station selection and dates (growing season).</li> </ul>	Free
<b>Meteye</b>	Bureau of Meteorology <a href="http://www.bom.gov.au/australia/meteye/">http://www.bom.gov.au/australia/meteye/</a>	<ul style="list-style-type: none"> <li>BOM online mapping tool that allows you to visualise weather data for Australia.</li> <li>Maps latest weather as well as official forecasts that are not just automatically generated but also adjusted by BOM meteorologists for better forecasts.</li> <li>Inputs required – town, postcode or GPS coordinate.</li> </ul>	Free
<b>Extreme Weather Events Tool</b>	DAFWA <a href="http://bit.ly/2flicatW">http://bit.ly/2flicatW</a>	<ul style="list-style-type: none"> <li>Maps extreme temperatures using the extensive DAFWA weather station network.</li> <li>Threshold temperatures can be manually set and the length of time at these temperatures available for specific days or a range of days.</li> <li>Inputs required – date, period of time, temperature.</li> </ul>	Free

## Farm Management/All Rounders

NAME	SUPPLIER & LINK	FEATURES	COST
<b>Agworld</b>	Agworld <a href="http://www.agworld.com.au/farmers/features">http://www.agworld.com.au/farmers/features</a>	<ul style="list-style-type: none"> <li>Allows for management of farm activities using interactive maps where paddocks can be tapped. on to create and view activities, records and notes.</li> <li>Farm planning that covers financials with a detailed breakdown of inputs.</li> <li>In the field data collection that syncs automatically when next online.</li> <li>Product information – labels and MSDS's.</li> </ul>	Free – basic \$879/yr/user – standard \$1099/yr/user - Premium
<b>Back Paddock Manager</b>	Back Paddock Company <a href="http://www.backpaddock.com.au/products/back-paddock-manager/">http://www.backpaddock.com.au/products/back-paddock-manager/</a>	<ul style="list-style-type: none"> <li>Ability to quickly prepare whole farm cropping and pasture plans.</li> <li>Summarise inputs into 'shopping lists'.</li> <li>Determine gross margin by crop and paddock over a range of prices and yields.</li> <li>Detailed reports and budgets including seasonal cash flow projections.</li> <li>Operations plans for managers and workers.</li> <li>Easy to revise plans.</li> </ul>	\$395 – Year Licence - Standard \$795 – Year Licence - Premium



# Karla Hooper: Creating a sustainable Wheatbelt

**Karla Hooper is a Health and Environmental Scientist who had an epiphany while working on an oil-drilling platform off the coast of Australia.**

“I had a professional career in the Oil and Gas industry, had my own house and on the surface life was pretty sweet. But I couldn’t stop thinking ‘is this it?’”

It prompted her to return to her sustainability roots and follow her passion for community development.

After several years travelling Australia, Karla returned to Western Australia and currently lives in Toodyay.

“The Wheatbelt is full of opportunity. It is rich in natural resources, it is so diverse, and the ancestral history is just incredible.”

Karla worked with the Toodyay Shire as Environmental Officer to develop the town’s sustainability plan. She was also instrumental in creating the Toodyay Farmers’ Market, and since leaving the shire has started a similar market in Northam.

Both the markets allow consumers to interact directly with growers and farmers – reinforcing a sense of place and valuing local produce and community.

“Projects like these incorporate farmers, the wider community and tourists which helps people to reconnect to food, the environment and each other.”

In 2016, Karla received the Wheatbelt NRM Youth Board Scholarship, which encourages people under the age of 40 to join the board of directors.

As part of the \$10,000 scholarship she received training and mentorship to help improve her leadership skills.

“It has been a really exceptional experience to be part of the Board. I’m extremely impressed with the Board and each individual who is on there. The Board and staff should all be extremely proud of what they are out there representing.”

Karla’s next big project is

creating self-sustaining communities.

“I love the idea of growing all my own food but I’m not particularly good at it, whereas there are other people out there who really are. I want to bring together a whole range of people where they can focus on what their passion or gift is.”

“We’re in the food hub and there is room for expansion. And to do that in a connective, sustainable way – that really is the future for the Wheatbelt.”

Karla’s other plans include trekking in the Wheatbelt with her gypsy wagon, two clydesdale horses and camel.

“I want to go out in the Wheatbelt for one to two weeks and walk peacefully and quietly on the land – to reconnect – using the horses and camels to transport the gear. I want to gift that kind of experience to people – something like that is hugely empowering.”

Keep an eye out for Karla Hooper – she is certainly one to watch.



# Get to know your *Gastrolobium*

**WARNING** - *Gastrolobiums* are poisonous to humans and pets. They are suitable only in areas of vegetation that are effectively fenced from stock and where children and domestic animals do not have unsupervised access to the site.

■ *Gastrolobium parviflorum*

Most farmers in south-west Western Australia know about the group of plants commonly called poison bushes. Whether that be through personal experience of stock losses or stories from others (including older family members). These poison bushes are scientifically known as *Gastrolobium* species and contain a toxic chemical known as 1080 (monofluoroacetic acid or sodium fluoroacetate).

There are 109 species of *Gastrolobium* found throughout Australia, 45 of which are native to the Avon Wheatbelt. Since the 1830s, many of the European settlers had difficulty raising stock in Western Australia on land populated by these species. James Drummond, the Western Australian Government Botanist of the time, identified the plants

causing the problems as *Gastrolobiums*, but did not know why. In 1964, the toxic component of *Gastrolobium* plants was finally identified as 1080, a tasteless, odourless and colourless toxin.

## Historic use and discovery of 1080

According to historic records it appears that 1080 was first identified in plants decades after it was first synthesised in 1896. Little information is available on how scientists came to create 1080 originally.

Some of the early uses of 1080 include as a moth-repelling agent in the 1920s and as a rodenticide in the 1940s.

The first discovery of 1080 in plants occurred in 1944, in several plant species from Africa.

In the 1950s, the synthesised chemical was introduced in

Australia as a rabbit control agent.

In 1963, 1080 was identified in an Acacia species from Queensland, followed by its discovery in *Gastrolobium* species in 1964.

## Are *Gastrolobium* plants keeping native animal species alive?

The discovery of the toxic component of *Gastrolobium* plants opened new doors to animal conservation in Western Australia. Western Australian native animals have evolved at the same time as the *Gastrolobium* plants. This means that they have much higher levels of resistance to 1080 than other animals. This has allowed the creation of bait that contains enough 1080 to kill an introduced species, while most native species would need to eat a very high number of these baits to die.

In 1981, Kitchener theorised that the Red-tailed Phascogale probably survives in nature reserves in the Western Australian Wheatbelt and Dryandra State Forest because poison plants in these reserves buffer vegetation from the effects of domestic stock and feral animals.” This idea was further explored by Short et al (2005). They hypothesised that the presence of either dense cover and/or plants of the genus *Gastrolobium* in moderately moist bushland areas may have protected native species from cat predation. To investigate this theory they compared mammal collections from the early 1900s to the abundance and distribution of *Gastrolobium* species and found a correlation between them. The density and distribution of *Gastrolobium* species supported their hypothesis. Further

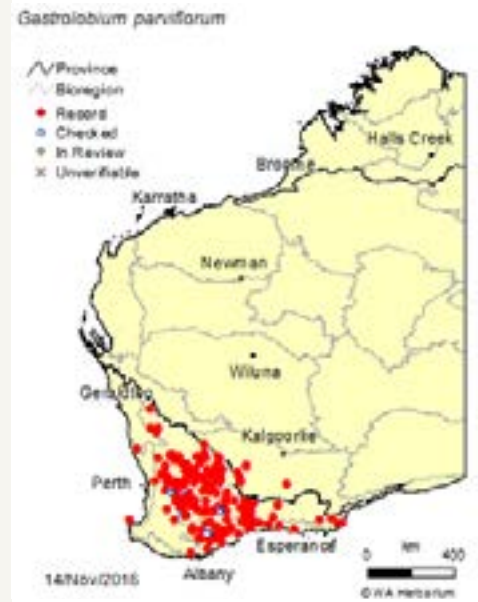
**“In short, reserves that have conserved native mammals have abundant *Gastrolobium* species, while those reserves that have not tend to have few *Gastrolobium* plants.”**

examination of survey data from the Western Australian Wheatbelt in the 1970s also showed that while the size of vegetation reserves was the most important determining factor for areas of high species diversity, the presence of *Gastrolobium* plants can increase the number of species present at a site by as much as 25%.

Survival of native mammal populations away from coastal margins of south-west WA is strongly linked to sites with abundant poison peas of species

with relatively high 1080 toxicity. The presence of *Gastrolobium* in understorey vegetation (often as thickets) has been identified as contributing to the survival of several species of mammals in south-west Western Australia.

In short, reserves that have conserved native mammals have



### ***Gastrolobium parviflorum*—Box Poison, Marlock Poison**

*Gastrolobium parviflorum* is an evergreen shrub spreading from 1.5m wide to 2m high. It has orange red flowers from late winter to mid-spring. It is one of the most toxic *Gastrolobium* species, with 15-2500mg of 1080 found in each kilogram of dried plant material. It is widespread across the Wheatbelt region and is likely to have considerably enhanced the resistance of local native species to 1080 poison.

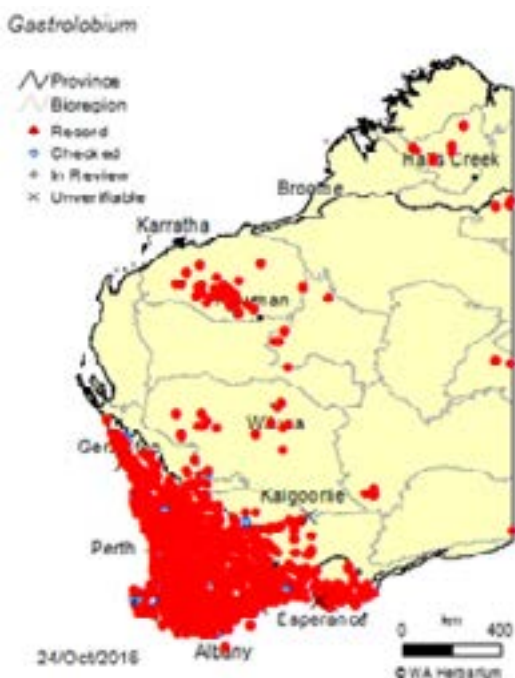


Figure 1 *Gastrolobium* distribution in WA. Image used with the permission of the Western Australian Herbarium, Department of Parks and Wildlife (<https://florabase.dpaw.wa.gov.au/help/copyright>). Accessed on 1 November 2016.



abundant *Gastrolobium* species, while those reserves that have not tend to have few *Gastrolobium* plants.

It is likely that this effect has occurred not only because cats and foxes that eat native species are lethally poisoned by 1080, but also because some have sub-lethal doses of 1080, get sick and then learn to avoid eating the species that made them sick. When this happens they will also teach their young to avoid preying on certain species.

**The following suggestions are suitable only in areas of remnant vegetation that are effectively fenced from stock and where children and domestic animals do not have unsupervised access to the site.**

Some recommendations made by Short et al to help protect native species in remnant vegetation in the south-west of WA include:

**Using understorey plantings of *Gastrolobium* species around key fauna habitat.**

**Using more *Gastrolobium* species for habitat reconstruction.**

**Providing *Gastrolobium* seed as feed supplements to free-ranging native species, so the native animals are toxic if eaten by introduced species.**

Although *Gastrolobium* plants are not known to spread like weeds it is also important to be aware of where any poison bushes are on your property or

COMMON NAME	GASTROLOBIUM SPECIES	FLUOROACETATE CONCENTRATIONS (MG/KG)
Bullock Poison	<i>Gastrolobium trilobum</i>	Not detected
Mallet Poison	<i>G. densifolium</i>	Not detected
Crinkle-leaf Poison	<i>G. villosum</i>	10-50
Hook-point Poison	<i>G. hamulosum</i>	100
Gilbernine Poison	<i>G. rotundifolium</i>	150
Thick-leaf Poison	<i>G. crassifolium</i>	150
Spike Poison	<i>G. glaucum</i>	200
Berry Poison	<i>G. parvifolium</i>	300
Prickly-leaf Poison	<i>G. spinosum</i>	0-400
Roe's Poison	<i>G. spectabile</i>	400
Sandplain Poison	<i>G. microcarpum</i>	0-600
Rock Poison	<i>G. callistachys</i>	100-1000
Champion Bay Poison	<i>G. oxylobioides</i>	0-1050
Granite Poison	<i>G. graniticum</i>	1240
Cluster Poison	<i>G. bennettsianum</i>	1300
Wodjil Poison	<i>G. floribundum</i>	1350
York Road Poison	<i>G. calycinum</i>	400-1400
Box Poison	<i>G. parviflorum</i>	2500
Heart-leaf Poison	<i>G. bilobum</i>	730-2650

Table 1: Adapted from Twigg and Socha (1996). Levels of 1080 in Wheatbelt *Gastrolobium* species.



in neighbouring bushland, and regularly monitor for any *Gastrolobium* plants that may sprout in your paddock.

### How toxic are *Gastrolobium* plants?

The answer varies, dependant on several factors, including the *Gastrolobium* species and time of year. Most *Gastrolobium* species contain traces of 1080 year round in their mature wood and leaves. However, new shoots, flowers, seedlings and seeds are the major reservoirs of the toxin, and are generally only present at certain times of the year.

Many species of *Gastrolobium* contain very low concentrations of 1080, with some species relying more on spines and thick leaves to put off herbivores rather than the chemical defence of 1080. A direct correlation has been identified between the presence of physical deterrents and the concentration of 1080 – the more spiny the plant is, the lower the concentration of 1080.

### References

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<https://florabase.dpaw.wa.gov.au/browse/profile/3909> (scientific information on *Gastrolobium microcarpum*)

<http://www.plantthis.com.au/plant-information.asp?gardener=24934&tabview=features&plantSpot=0> (information on the use of *Gastrolobium microcarpum* as a garden plant)

<http://publications.rzsns.wa.gov.au/doi/pdf/10.7882/AZ.2011.034> (Historical accounts of toxicity to introduced carnivores consuming bronzewing pigeons (*Phaps chalcoptera* and *P. elegans*) and other vertebrate fauna in south-west Western Australia)



### *Gastrolobium microcarpum* – Sandplain Poison

*Gastrolobium microcarpum* grows as a shrub to 2.5m high and has stunning gold and red flowers from August to October. It is found in Dryandra Reserve, and is believed to be the reason numbats still survive in this reserve, along with other *Gastrolobium* species. Numbats are found in a few other locations in the south-west of WA and nowhere else in Australia – despite once being found all the way through to inland NSW. It is thanks to this *Gastrolobium* and a few other closely related species that wild Numbats have not become extinct

■ (Right) *Gastrolobium parviflorum*





# Digging deeper: Why it's important to test subsoil to 30cm

**Land managers:** Rob Sawyer, Gary Sawyer and families

**Property size:** 22,000 hectare cropping programme

**Location:** Dalwallinu Shire

**Annual Rainfall:** 293mm

**Enterprise:** Cropping

**Soil types/vegetation:** Varied

## The move to subsoil testing

Like many growers in the Wheatbelt, the Sawyers had done regular topsoil testing (0-10cm) across their property over the last 30 years, but they had never sampled deeper.

When you consider the roots of most crops have the ability to reach depths in the soil of a metre or more, topsoil is a relatively minor contributor to the volume of soil that can be potentially accessed by plant roots. Understanding constraints at depth is necessary before amelioration options can be investigated.

With this in mind, in 2014 Rob Sawyer, Gary Sawyer and families (with encouragement from their consultant Ty Henning) commenced a Wheatbelt NRM funded project to explore subsoil pH on paddocks that had previously been limed.

At the time, it was suspected that subsoil acidity might be limiting productivity in some areas of the farm and that surface applications of lime may not be 'hitting the spot'. Soil samples were collected and analysed from depths 10-20cm and 20-30cm and subsoil pH as low as 3.9 were identified.

These initial results sparked the Sawyers and their management team into action. They realised that for larger scale acidity management practices to be implemented, to improve farm productivity and profitability, a more comprehensive understanding of the farms subsoils would be required.

The knowledge of their soil health was identified and the Sawyers started the process in identifying the actual pH levels within the soil at 0-10cm, 10-20cm and 20-30cm.

Since 2014, the Sawyers have started a comprehensive subsoil testing program and now have tested most of their 22,000 ha property, with the aim of this large personal investment paying off by assisting them to make more informed management decisions that improve farm productivity, profitability and overall soil health.

## Liming decisions on the back of subsoil test results

For the last 20 years, the Sawyers have spread lime on an almost annual basis at rates of around one tonne to the hectare. Rob Sawyer explained that they have an annual liming budget, however, where possible aim to increase the annual area covered (depending on the previous season).

Since participating in the Wheatbelt NRM funded project and having a better understanding of subsoil pH, the Sawyers have spread approximately 15,000 tonnes of lime and have increased spreading rates to 1.5t/ha on average.

Liming to date has focused on the higher production paddocks, whereas some of the more marginal country and land further from the coast that attracts increased cartage costs, has not been limed due to budget constraints.

Rob Sawyer strongly believes that increasing the soil pH will improve soil health and therefore increase the productivity of the entire property. He believes his current liming program is perhaps below district average and has plans to increase the amount of lime spread, especially in the more marginal country, as budget allows.

### Experimenting with lime incorporation

The Sawyers first dabbled with deep ripping in the 1990s, with mixed results. Now, with the knowledge they have gained from the extensive soil testing, the Sawyers are again giving deep ripping a go, albeit with some changes. To counteract some of the negative effects of the deep

ripping done in the 1990s, that may have brought acid subsoil to the surface, they are spreading lime before ripping and have installed inclusion plates to the ripper tynes.

The hope is that the lime will move down with the topsoil into the slot created by the inclusion plates increasing the rate of subsoil neutralisation, improvements in productivity and a quicker return on investment.

### Other crop management advances

In addition to their focus on increasing the pH of their subsoils, the Sawyers have set up some other systems on farm to more efficiently manage their crops.

#### Yield Prophet®

Seven 'Yield Prophet®' sites with automatic weather stations have been set up across their property.

A core sample is taken at these locations at seeding time to a meter depth to test and account for the moisture, nitrogen and nutrients that are currently available. This data is then used to predict a potential yield average and then the data from the harvest is compared. If there are discrepancies further research is conducted.

Yield Prophet® is a web-based tool that can incorporate soil test results (including soil core samples, soil moisture analysis and nitrate content immediately prior to seeding), paddock specific rainfall, seasonal fertiliser applications and BOM historical and current climate data, to generate reports that help with crop

input decisions based on potential yield predictions. The Sawyers predominately use the Yield Prophet® sites for the collection of weather data, however, they are interested in exploring further functionality of this tool going forwards.

#### Variable Rate Technology (VRT)

In 2016, the Sawyers commenced using VRT for their fertiliser applications.

Rob Sawyer commented that like with all changes in crop management, VRT came with its share of 'teething issues'. Upskilling a large group of staff was one challenge. Another was base fertiliser rates which could have been higher given the wet year and subsequent good early crop growth.

Subsoil acidity is a major constraint of crop production in the Wheatbelt. The first management step is to understand the extent of the issue at a farm level and subsoil testing is the key.

Since extensive subsoil testing across their property, the Sawyers have been able to implement specific management practices (liming, deep ripping and topsoil slotting) to address their acidity issues. Rob Sawyer admits that although it would be nice to have a 'quick fix' solution, soil acidity will be an on-going issue on farm and annual liming is part of the program for the foreseeable future. He also believes that addressing soil acidity issues will reduce weed burdens, assist crops to better survive dry finishes, improve nutrient use efficiency and ultimately improve soil health.

**“There is no right and wrong in different farming management practices, it’s just what works for your business.”**



# Mudjar Western Australian Christmas Tree | *Nuytsia floribunda*

Mudjar is a tree or shrub that can grow to 10 m high and has rough grey-brown bark. It grows on white, grey or yellow sand, sandy loams, brown sandy gravel over clay, granite, laterite, limestone. It prefers landscapes of sandplains, slopes and the base of rock outcrops.

Mudjar is particularly beautiful around Christmas time, when it has stunning displays of strikingly bright yellow to orange flowers.

Mudjar is a hemiparasitic plant, which means its roots attach themselves to the roots of other plants to obtain nutrients from the host plant.

Mudjar was traditionally regarded by Noongars

as a place where a recently deceased person's spirit resided, 'resting on the branches' en route to the island of the dead 'beyond the western sea'. As such it is recommended to never bring this tree inside your home.

### Cultivation

Despite its spectacular flowers and ornamental desirability for garden use, it will hunt down the roots of most plants within a 50 m radius and unless they can quickly develop alternative roots, they will die within a few years. Mudjar is also difficult to permanently remove, as they will rapidly regrow their trunk if knocked over, providing the root

system is not too badly damaged. While they will not make a good addition to the home garden, they are a visual pleasure in the bush over the Christmas period.

### NOONGAR USES

- The Noongar people made use of the species during the season of **Kambarang**, from **October to early December**.
- The flowers of the Mudjar were soaked in water to make a sweet drink.
- The gum that exudes from the wound after obtaining bark to make shields was collected later. It is sweet and eaten raw.
- The suckers on the roots were also eaten.