UNFS UPDATE

Upper North Farming Systems Newsletter May 2016

Community Cropping Paddock For UNFS

UNFS has been incredibly lucky to be offered a paddock by Northern Ag to crop to generate funding for the group to continue its great work into the future. The 18ha paddock at Booleroo Centre will be sown with Canola this year and the profit from the cropping of this paddock will be invested into future projects and activities of the group throughout the Upper North. Thank you to Northern Ag for this very generous sponsorship of the group.

This year Pringles Ag + Crouch Rural will be sowing the paddock for the group and utilising the opportunity to hold a demo day of their seeding equipment. This will occur on Thursday, full details in the flyer on page 2.

If you are willing to help out with a post-em spray, spreading fert or at harvest time, please contact Todd Orrock to offer your assistance.

New Website for UNFS Under Development

UNFS will soon have a greater presence on the Web. At the last Strategic Board Meeting the group decided to begin works on a Website for Upper North. Mary met with the Website Designer yesterday to start the process and we are hopeful to officially launch the website at our Members Expo in August.

The site will act as a go to site for information on up coming events and current trial sites. It will also be a library resource with all of our publications available for download, including past results books and fact sheets. It will also provide a place to recognise our valued sponsors and funding organisations and make it easy for you to find our contact details at any time.

Also In This Issue

UNFS Yield Prophet in 2016

The UNFS will again be running the Yield Prophet program on 10 sites across the Upper North in 2016. We are very pleased to announce new sponsors for the program this year- our major sponsor for Yield Prophet in 2016 will be **Graincorp** with additional sponsorship being provided by **E.P.I.C. Grain Brokers**. It is great to have these new sponsors on board.

Initial soil sampling for the program has been completed and, once soil test results are available, we will set up each of the sites and provide regular updates on crop prospects through the season. Sites are well spread across the region, from Mambray Creek and Wandearah in the west to Jamestown and Willowie in the east. Already, we are observing interesting differences in soil moisture levels at the different sites. Any comments or queries, please contact Barry Mudge on 0417 826 790.

GrainCorp

Lehmann & Whillas Pty Ltd
Grain Brokers
E.P.I.C
Ph: 0886272304 Email: grain@epicbrokers.biz
Local People servicing local growers

JOHN DEERE 1870 ConservaPak & 1910 Aircart demo

Greenstar products on show including iTEC Pro, Autotac & Section Control

Thursday 12th May, Collins St, Booleroo Centre
10am onwards

Please book a time with your local salesman for a drive!
To keep the wheels turning on your farm, we will offer a staff member to drive your seeder whilst you drive our machine!
(this arrangement needs to be booked ahead of time)

pringles AG+ crouchrural

Dean Lawler: 0417857868
Brock Scott: 0488300029
Jess Koch: 0419982125

Proposed changes to the Wheat Variety Master List

The Wheat Variety Master List is produced annually by Wheat Quality Australia (WQA) and contains new varieties recently classified as well as varieties that have been classified in the past.

WQA is currently undertaking a review of the 'old varieties' on the list – those being varieties classified more than 10 years ago - with the view of removing them.

To assist WQA is encouraging all growers to review the old varieties proposed to be removed from the Wheat Variety Master List and advise if there are any that should be retained.

Responses are invited either to Wheat Quality Australia admin@wheatquality.com.au or to GrainGrowers enquiry@graingrowers.com.au

Ladies on the Land formed as a hub of Upper North Farming Systems Group in 2015 to bring the women of the region together to support their involvement in the region's farming enterprises. Ladies on the Land aims to create a learning and networking environment that is open, friendly, supporting and flexible.

Ladies on the Land invites all women of the Upper North to be part of a series of workshops aimed at connecting and upskilling women of the region. The 2016-2017 workshops will cover various topics relating to farming in the Upper North including: Agronomy, Precision Agriculture, Sustainable Farming Practices, Product Marketing and Business Management. Women are encouraged to attend as many or as few workshops as they like.

The first two Agronomic workshops will be delivered by **Lameroo Agronomist, Lou Flohr**.

Workshop 1
Cereal Types & Growth Stages
9am-2pm, Tuesday 21st June

- Cereal identification
- Zadok Growth Stage
- Identification in practice
- Afternoon out in the field studying cereal crops to apply theory from the morning.

Workshop 2
Crop Rotations
9am-2pm, Tuesday 16th August

- Rotations – role of legumes and canola
- Identification of issues in a paddock
- Afternoon out in the field, looking at any issues that may have arisen (disease, frost, pests), legume nodules, deep rotting, pest and weed ID.

Location: Morning sessions held in **Booleroo Centre at the Community Centre**, afternoon sessions held on local farms.
Children Welcome
Cost: Free
Catering: Please bring a plate to share for morning tea—Lunch supplied

For further details and RSVP – Jess Koch 0419 982 125 or Ruth Sommerville 0401 042 223

SAGIT
Australian Government
National Landcare Programme

Sow East-West to Minimise Weeds

Excerpt from Australian Herbicide Resistance Initiative (AHRI) 3/6/2014

- http://ahri.uwa.edu.au/sow-west-young-man

There is a new kid on the block in the competition between crops and weeds, and the best thing about it is that it is FREE! East-west sowing is a simple technique for southern Australian grain growers to help the crop shade the weeds.

Dr Catherine Borger measuring light availability to the inter-row space in wheat with a Sunfleck Ceptometer (photo courtesy of Glen Riethmuller, DAFWA).

Dr Catherine Borger from the Department of Agriculture and Food WA recently investigated light interception by wheat and barley crops in east-west or north-south crop row orientations. She found that east-west sowing halved the ryegrass seed set with no effect on grain yield by reducing the amount of sunlight available to the weeds.

As herbicide resistance increases in Australia we must use more non-herbicide weed control tools to guarantee the future of intensive cropping.

It is not for every paddock or every grower, but is a great option for suitable paddocks and growers with good sunglasses. Check it out in your own fields this year.

How does it work?

Every grain grower has seen how well weeds grow when they have a blocked seeding tube creating extra-wide row spacing. Instinctively, we all know how important crop competition is for good weed management. We now have good research data to back up this instinct.

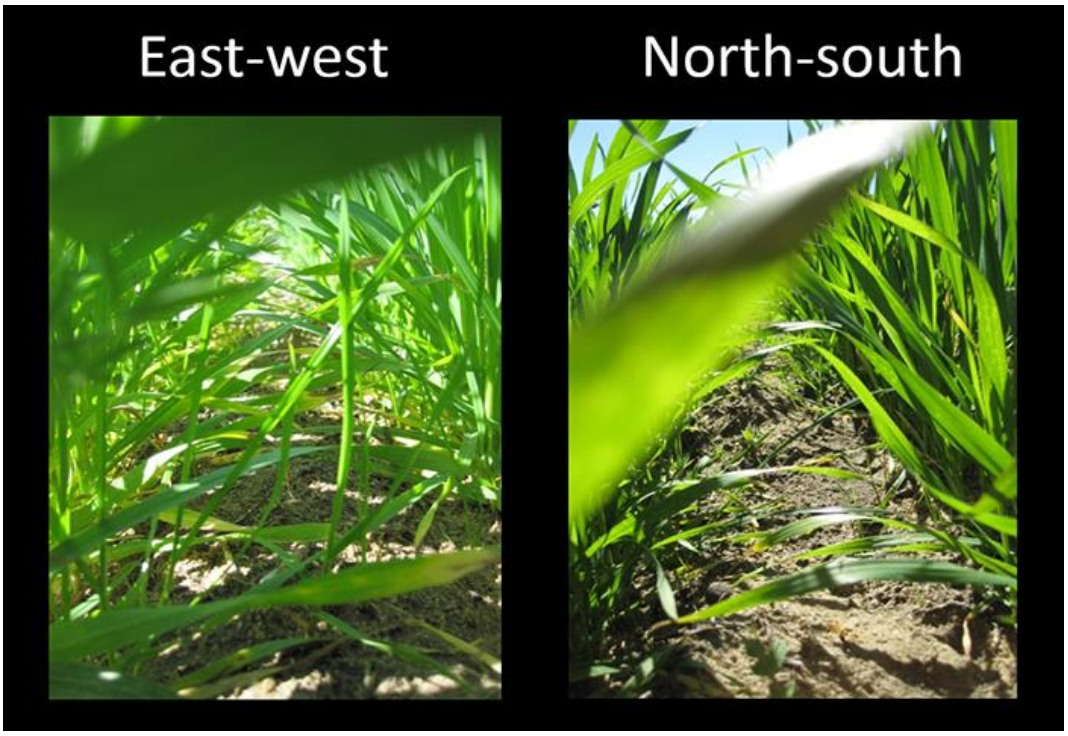


Figure 1. *Sowing east-west (left) in winter in Australia allows the crop to shade the weeds more than north-south facing crops (right) due to the winter sun being lower in the sky.*

The origins of E-W sowing

Crop row orientation is certainly not a new technique! It has been researched in a range of crops (from wheat to grapevines) in the USA from the 1950s. Professor Stephen Powles, AHRI Director, was first exposed to the concept during his days as a crop science postgraduate student at Michigan State University, where one of his professors was conducting E-W versus N-S soybean planting.

Continuing Story...

For many years this technique was not relevant in Australian broad-acre cropping because our growers sowed their fields round and round and not up and back.

Fast forward to 2002 in Western Australia where DAFWA researchers Shahab Pathan, Abul Hashem and Catherine Borger began investigating the concept in wheat and barley at Avondale and Merredin. This ultimately all led to further research being conducted by Catherine between 2010 and 2012 as an AHRI / DAFWA collaborative project. With up and back sowing now common in Western Australia, the culmination of all of this research is now very relevant.

Dr Catherine Borger is a research officer with the Department of Agriculture and Food, Western Australia (DAFWA) based in Merredin. She conducted research on several aspects of crop competition between 2010 and 2012. She found, as others have in the past, that high cereal seeding rates increased crop competition with weeds, reducing ryegrass seed production, and that barley competes more with weeds than wheat. However, her research into crop row orientation was of particular interest as it represents free weed control.

Ryegrass seed production

Ryegrass seed production was halved by sowing east-west compared to north-south. Catherine found an average ryegrass seed production of 2968 seeds/m2 in east-west crops, compared to 5705 seeds/m2 in north-south crops. The only exception was Katanning in 2010 where the ryegrass emerged two weeks after the crop, ensuring that the crop was highly competitive (regardless of crop orientation or seeding rate).

Table 1. *Ryegrass seed production (seeds /m2) for east-west versus north-south sown crops from six trials in south west Western Australia.*

Ryegrass seed production: orientation			
Year	Location	East-west	North-south
2010	Merredin	503	911
2010	Wongan Hills	12	159
2010	Katanning	529	465
2011	Merredin	27	125
2011	Wongan Hills	2, 610	6, 155
2011	Katanning	14, 112	26, 272
Average 51% reduction in ryegrass seed set by sowing east-west			

These field trials were conducted at DAFWA Research Stations located in Merredin, Wongan Hills and Katanning, in 2010 and 2011. In 2010, three trials investigated crop row orientation and seeding rate (Wyalkatchem wheat at 60 or 120 kg/ha). In 2011, trials investigated orientation, crop type (Wyalkatchem wheat or Buloke barley) and seeding rate (50 or 100 kg/ha). Of particular importance is that ryegrass seed production was reduced despite dry years (Merredin 2010).

Continuing Story...

Light availability

Sowing east-west in winter in southern Australia reduced the light available to annual ryegrass in the inter-row compared to north-south crops at all measured growth stages of ryegrass.

Wheat seeding rate

This research found, as many others have in the past, that high cereal seeding rates suppress weeds. Increasing the seeding rate from 50kg/ha to 100kg/ha halved the ryegrass seed set. The same result as east-west sowing. The main difference being that this increase in seeding rate increases cost by approximately $20/ha whereas east-west sowing does not increase the cost at all. Crop seeding rate didn't influence the amount of light available to the annual ryegrass canopy in the inter-row space.

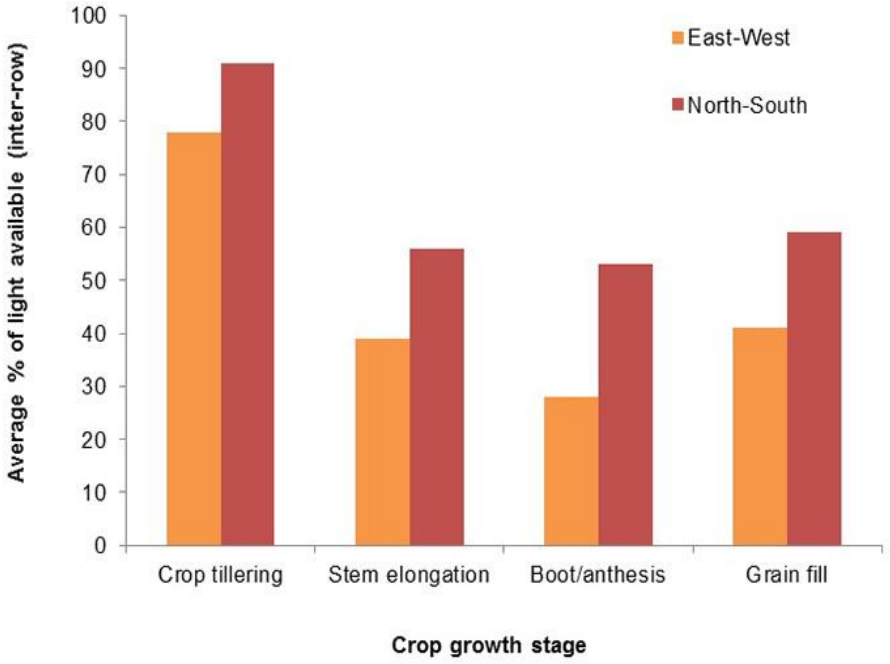


Figure 2. Average percentage of light (as photosynthetically active radiation) available to the annual ryegrass canopy in the inter-row space for east-west (orange) and north-south (red) crop row orientations measured at noon (during 2010 and 2011). Expressed as a percent of total light available to the crop canopy.

Additive effect?

So begs the question, should we aim to sow east-west at high cereal seeding rate to maximise competition? There was an additive effect of seeding rate and orientation at some sites but not others. Why? Catherine explains it like this: "Perhaps there is a limit to how much the crop can compete with weeds and adding more and more competition may not continue to suppress the weeds further". This will be an area of future research to help growers decide what is the most cost effective way to achieve adequate crop competition.

Yield

Wheat yield was largely unaffected by crop row orientation because ryegrass numbers were generally too low to impact crop yield.

Ryegrass seed production: seeding rate			
Year	Location	Low seeding rate 50kg/ha	High seeding rate 100kg/ha
2010	Merredin	1,033	381
2010	Wongan Hills	130	21
2010	Katanning	549	446
2011	Merredin	119	30
2011	Wongan Hills	5,029	3,736
2011	Katanning	24,087	15,826
50% reduction in ryegrass seed set by using high seed rate			

Table 2. Ryegrass seed production (seeds /m2) for wheat sown at 50 or 100 kg/ha from six trials in south west Western Australia.

Continuing Story...

Soil Moisture

Soil moisture was also influenced by crop row orientation. East-west sowing reduces the amount of sunlight hitting the soil surface which in turn reduces evaporation.

Wheat vs. Barley

Crop type (wheat or barley) was measured in 2011 and influenced light availability at Merredin and Katanning for both east-west and north-south crop orientations, but not at Wongan Hills. There was reduced light available to the annual ryegrass canopy in barley compared to wheat. This was consistent throughout the year, from tillering to grain fill (Table 1).

Seed production was lower in barley crops than wheat crops at both Merredin and Katanning (in 2011). However, the cultivars used (Wyalkatchem wheat and Buloke barley) are both uncompetitive against weeds.

Year	Location	East-west	North-south	P value
2010	Merredin	674	760	0.295
2010	Wongan Hills	1, 547	1, 613	0.827
2010	Katanning	2, 528	2, 414	0.811
2011	Merredin	2, 957	2, 589	0.019
2011	Wongan Hills	2, 656	2, 628	0.912
2011	Katanning	1, 945	2, 139	0.140
2012	Merredin	311	381	0.358
2012	Wongan Hills	3, 837	3, 591	0.006
2012	Katanning	2, 800	2, 743	0.796

Table 3 (above)**.** Wheat grain yield (kg/ha) for East-west v North-south sowing across nine trials

Year	Location	East-west	North-south	P value
2010	Merredin	2.2	2.0	0.486
2010	Wongan Hills	5.8	5.5	0.449
2010	Katanning	5.6	4.7	0.648
2011	Merredin	9.5	8.6	0.006
2011	Wongan Hills	5.7	5.6	0.803
2011	Katanning	9.3	8.7	0.248
2012	Merredin	6.4	4.4	0.002
2012	Wongan Hills	3.8	3.0	<.001
2012	Katanning	5.3	5.1	0.042

Table 4 (above). Soil moisture (%) of East-west v North-south sowing at nine trials.

Additional research

Research by Gardner, Mortell and Morphette from the NSW DPI, Tamworth found similar results. They found that East-west sowing of barley reduced weed biomass by 39% compared to North-south. In this research Canola was sown as a surrogate weed. They also found that crop yield was reduced by 6 to 7% when sowing east-west compared to North-south in the absence of weeds. The reduction in weed biomass could be further improved by using a more vigorous variety. Skipper barley significantly reduced weed biomass by a further 30% and 42% for the N-S and E-W row orientations, respectively, compared to Hindmarsh barley.

Continuing Story...

Tweak crop competition to fit your situation

Most of us now realise that to achieve true weed control success we need to add non-herbicide tools into the mix. It doesn't matter which weed, which crop, or which country we are talking about, the benefits of good cultural practices apply everywhere.

Sowing east-west may not be practical for all paddocks, for example, if you don't use autosteer technology (difficult to drive directly into the sunrise/sunset at seeding/spraying/harvest), or if your field shape doesn't suit east-west orientation, but it is a great form of free weed control in suitable paddocks.

It's too late for most crops for this year, but you can observe the effect in your own fields by inspecting them in the middle of the day.

Help give your crop the upper hand and let it be a united front against weeds!

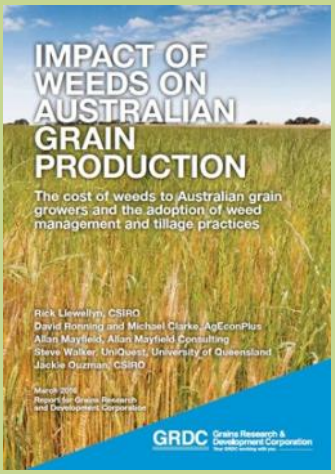
	% of light available to annual ryegrass			
	Merredin		Katanning	
	Barley	Wheat	Barley	Wheat
Tillering	53	61	92	96
Stem elongation	4	11	53	61
Boot/anthesis	6	22	34	47
Grain fill	20	37	33	39

Table 5. Percentage of light available to the annual ryegrass canopy in barley and wheat crops at both Merredin and Katanning.

GRDC Grains Research & Development Corporation
Your GRDC working with you

Impact of Weeds Report Available

The GRDC has commissioned a comprehensive industry study into the cost of weeds, including yield loss and the costs of weed management practices. With input from grain growers, agronomists, consultants, agri-business data experts and weed researchers, the report, Impact of weeds on Australian grain production: The cost of weeds to Australian grain growers and the adoption of weed management and tillage practices, is the most comprehensive review to date and will help guide future decisions on cropping systems research, development and extension.



The *Impact of Weeds* report is now available electronically on the GRDC website, www.grdc.com.au/ImpactOfWeeds

Farmers: Have your say on the future of weed warfare

Local farmers are being encouraged to have their input into a strategy to better understand future weed control needs in low-rainfall zones.

The survey is part of a three-year GRDC-funded project that is investigating alternatives to chemical herbicides, including cover cropping, row spacing and direction, the use of chaff carts, and narrow windrow burning.

The five-minute online survey asks a range of questions about current and future weed control measures, seeding systems and crop types.

Central West Farming Systems Project Officer Diana Fear says that survey is a chance for farmers to ensure that research and development is undertaken in line with grower needs.

“Survey data will provide us with a baseline understanding of current weed management strategies, which we’ll compare with information from a future survey. It also provides a valuable information to influence future research decisions in herbicide management”.

The survey can be accessed and completed at **https://www.surveymonkey.com/r/SLVB7MV.** Data gathered as part of the survey process is stored confidentially, with results to be compiled and analysed as a group.

Overdependence on AgroChemicals is managed by Central West Farming Systems, with trials carried out by Birchip Cropping Group, EPARF, Upper North Farming Systems and Mallee Sustainable Farming.

Monthly Commodity Highlights:

Grains & Oilseeds: Pressure on global Wheat prices remains, with global cash prices staying at subdued levels. This is despite a recent bounce in CBOT Wheat prices, which have followed soybeans and corn higher in recent weeks.

Beef: A combination of a slower US market and poor autumn rains has taken some of the heat out of the cattle market. Without good autumn rains, a further softening in prices could be expected as we head into winter.

Sheepmeat: Lamb prices have started to trend upwards, in line with the recent seasonal pattern.

Wool: The Australian Eastern Market Indicator, although pushed to a high of AUc 1,270/kg clean during the month, has re-

VIEW REPORT ▶

Rabobank

Improving pre-emergent herbicide efficacy in high stubble situations

Catherine Borger, Researcher, Department of Agriculture and Food, Western Australia

Maintaining high stubble has many benefits but there is a downside when it comes to applying pre-emergent herbicides, which must be applied to the soil surface to be effective.

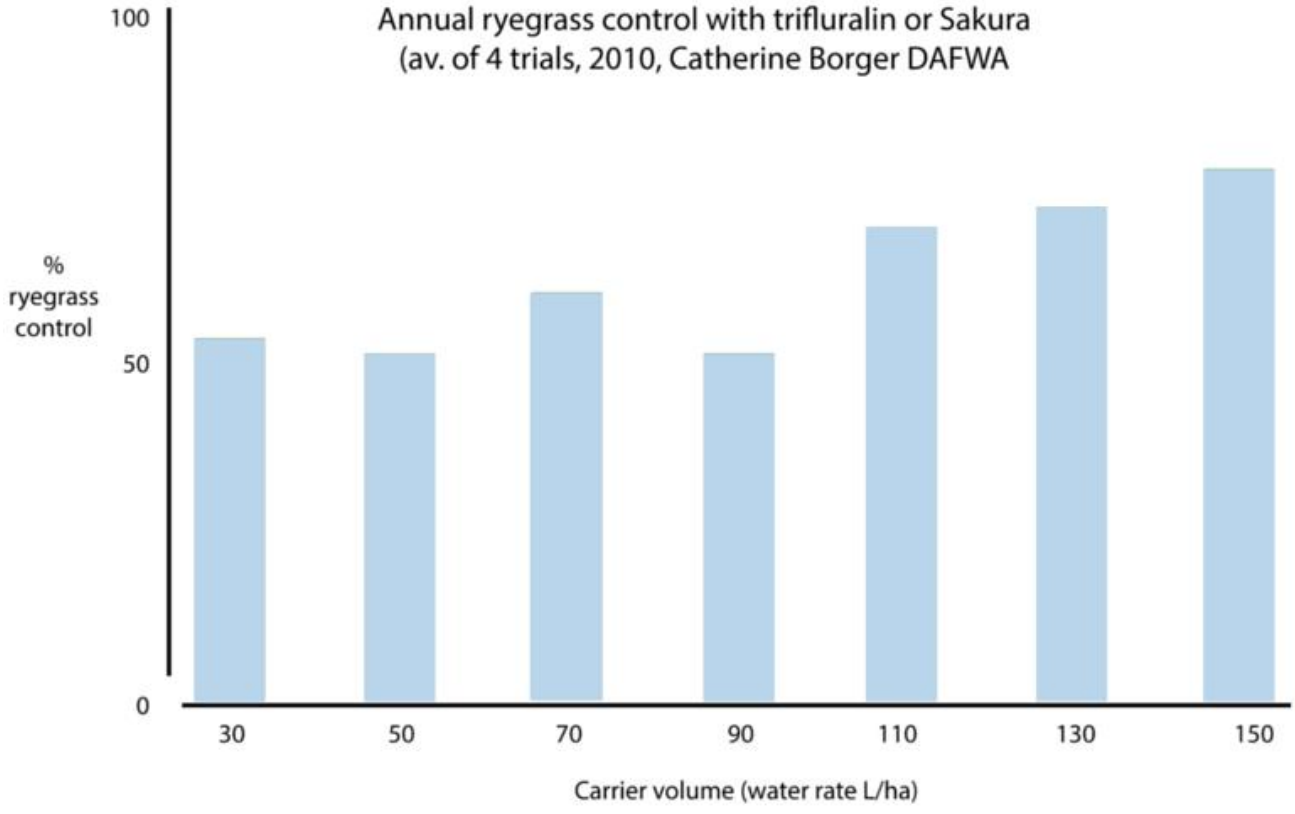
An application of 2.5 L/ha of trifluralin or the full label rate of Sakura® would usually be expected to achieve 70–90% ryegrass control in crop, however Department of Agriculture and Food (DAFWA) researcher, Dr Catherine Borger, has shown that the carrier volume has a large effect on the level of control achieved.

High water rates FOR PRE-EM in heavy stubble

Across four trial sites Dr Borger's research demonstrated that ryegrass control with trifluralin or Sakura® increased from 53% control when the carrier volume was 30 L/ha to 78% control when the carrier volume was increased to 150 L water/ha in high crop residue ground cover situations.

"The good news is that the effect was consistent, regardless of droplet size—from medium to extremely coarse," says Dr Borger. "Surprisingly, Sakura® responded similarly to trifluralin even though these two herbicides have quite different properties."

"Our four trial sites had stubble covering 50–90 per cent of the ground surface, a factor known to



influence pre-emergent herbicide efficacy," she says. "At all sites the average ryegrass control achieved increased as the carrier volume increased."

Expert boom spray set-up may be able to improve efficacy of pre-emergent herbicides at lower water rates but since this is hard to achieve, simply adding more water or slowing application speeds could increase ryegrass control levels with pre-emergent herbicides applied to paddocks with high levels of stubble cover.

Is increasing the water volume the best way to improve ryegrass control with pre-em herbicides?

Short answer: Yes, in high stubble situations high water volumes are the best option.

Longer answer: To increase ryegrass control when spraying trifluralin in high crop residue situations the only options are to increase the herbicide rate, or increase the carrier volume (water rate). Since the top label rate of trifluralin is 2.9 L/ha pre-sowing of wheat, there is little scope to increase the herbicide rate.

Why did such different products show the same response to water volume?

Short answer: All pre-emergent herbicides work best when the product is applied to the soil.

Longer answer: Trifluralin and Sakura® herbicides have different solubility and adsorption properties. Trifluralin has low solubility and is highly adsorbed to organic matter and Sakura® is the opposite, with higher solubility and low adsorption to organic matter. In these trials ryegrass control was similar for both herbiides and increasing the water rate also gave a similar response with both products.

If droplet size didn't make any difference to weed control rates, does that mean it isn't important?

Short answer: No, droplet size is important for several reasons and label instructions must be followed.

Longer answer: Set the droplet size to suit factors other than stubble load e.g. drift risk, delta T (bigger droplets for higher Delta T), mixing partner (e.g. medium droplets for paraquat). To evaluate spray jobs, place some water sensitive paper on the ground (in and between old stubble rows) and some vertically on standing stubble. For best results keep ground speeds below 25 km/hr when applying pre -emergent herbicides.

The cost to livestock of not worming dogs monthly

By Patrick Kluver, Livestock Biosecurity Network

A recent survey by Meat & Livestock Australia (MLA) and Charles Sturt University has shown that sheep producers on average do not worm their farm dogs with anywhere near the required regularity to break the lifecycle of tapeworms *(Taenia ovis)* and prevent costly sheep measles.

Dr Patrick Kluver from LBN said good on-farm biosecurity ensures all dogs entering a property with hunters, contractors, shearers, and so on, have been wormed with praziquantel in the last month, or don't access pasture – i.e. they are kept tethered. The survey showed that on average we worm farm dogs around twice per year. The hard reality is that we need to be treating all dogs on the property with a tape wormer once a month, as the parasite lifecycle is 35 days.

The old recommendation for controlling hydatids of worming every six weeks is probably also too long for effective sheep measles control. There are three dog tapeworms which have a life cycle that includes sheep: hydatids, sheep measles and bladder worm.

Economically, the most important is sheep measles which affects the majority of properties in all sheep regions in Australia. It is estimated to cost the sheep industry millions of dollars every year. The losses to the industry occur in a number of ways at processing – most lesions occur in the sheep's heart and diaphragm and are condemned. If lesions are found in the carcass they are trimmed and if there are more than five lesions, then the whole carcass is condemned. No matter where the lesions are found, all affected carcasses are diverted to a less valuable frozen product.

Dr Kluver said in dogs the sheep measles tapeworm itself is quite large and can measure up to two metres long. "The tapeworm start to produce eggs with 32-35 days and these eggs can contaminate a large area thought to be several kilometres. If you do have a sheep measles problem than you may want to talk to your neighbours about tapeworm control as well," he said. It's important to take a long-term view to controlling sheep measles – the tapeworm eggs can survive for up to 300 days on pasture and once a sheep is infected, the cysts are there for life.

The life cycle needs to be controlled by taking three steps:

1. Treating all dogs every month with a wormer containing praziquantel, every three months substitute a praziquantal only treatment for an all-wormer containing praziquantel to control other intestinal worms as well as tapeworms
2. Remove sheep meat and offal from the diet of dogs by feeding commercial dog food, tinned or kibble and preventing scavenging
3. All dogs coming onto the farm should have been wormed in the last 30 days, if they haven't been wormed in this time, worm them when they arrive on the farm. Wild dog and fox control is recommended practice where they occur and may have some impact on sheep measles.

By doing this you will control not just sheep measles, but hydatids and bladder worm as well.

Dr Patrick Kluver is the regional officer for Victoria for the Livestock Biosecurity Network. For biosecurity advice he can be contacted on 0499 077 213 or email. pkluver@lbn.org.au.

LBN Livestock Biosecurity Network

Fox Bait Distribution Days:

Co-ordinate autumn fox control with your neighbours to save money on fox baits!

One of the world's most successful predators, Foxes cost the sheep industry more than $17 million a year in lost production.

Adopting an effective fox control program is essential to farmers wanting increased lamb marking percentages. Coordinated Fox control across neighbouring properties brings the best results.

Between Summer and Autumn young foxes disperse to find new territories.

Through the Northern and Yorke NRM Board, NRM officers provide 1080 fox baits for landholders to purchase. If 3 or more neighbours bait at the same time of year, they may purchase fox bait pails at the special subsidised rate - please see Luke as a group.

Photo: Daryl Panther.Victorian Wildlife Management & Pest control

Dates and Locations as follows:

Tuesday 17th May **Wilmington:** Town Institute 9:30-10:30am

Quorn: Rural Traders 11.45-12.45pm

Hawker: CWA Hall 2.30-3.30pm

Wednesday 18th May **Booleroo:** Northern Ag: 9:30-10:30am

Melrose, DCMR Council: 11.30-12.30pm

Pt Germein, Jetty: 2.30-3.30pm

Thursday 19th May **Peterborough**, John Fergusan Dr: 10-11am

Please bring your section numbers with you to complete the paperwork.

CONTACT

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Natural Resources Northern and Yorke

Department of Environment, Water and Natural Resources

Phone (08) 8666 2014

0448 314 491

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www.environment.sa.gov.au

www.naturalresources.sa.gov.au/

1080 is a naturally occurring substance that is highly toxic to foxes and dogs. There is no antidote available so extreme care must be taken and directions for use followed carefully.

To arrange an alternative collection time or for help to plan your fox control program and for details about cost of baits, distribution centres and other information, contact staff at the Orroroo Natural Resource Management office on (08) 8658 1086.

Source: AWI April Market Intelligence Report

Highlight of International Wool Textile Organisation congress

The conference was attended by more than 400 delegates from all sectors of the global wool industry.

One of the most interesting presentations came from Dr Clint Laurent, Managing Director of Global Demographics, a company that specializes in changes to populations and markets over time.

Dr Laurent has an optimistic view of the opportunities for wool given the changing demographics in wool's key international markets. He told the audience how "wool is a fibre choice made by consumers in the premium apparel market, in other words those people who are able to routinely pay a premium price for their clothes."

In his presentation, Dr Laurent focused on the likely changes to the population of those most likely to be able to routinely invest in wool apparel products – the "premium market".

The "premium market" for clothing, defined as persons who traditionally spend about US $2000 per annum on clothes and have a household income of more than US$125,000 per annum and US$100,000 in China.

According to recent research, this segment makes up 9% of the global population and it is concentrated largely (85%) in three geographical areas: North America, Western Europe and affluent Asia (eg. Japan, South Korea, Hong Kong, Singapore). China is currently only a very small proportion of this market, contributing just 1% to the global population of the "premium market".

Given current global trends, the change in this picture over the next decade is not significant, except for one country and no surprises as to where that is: China.

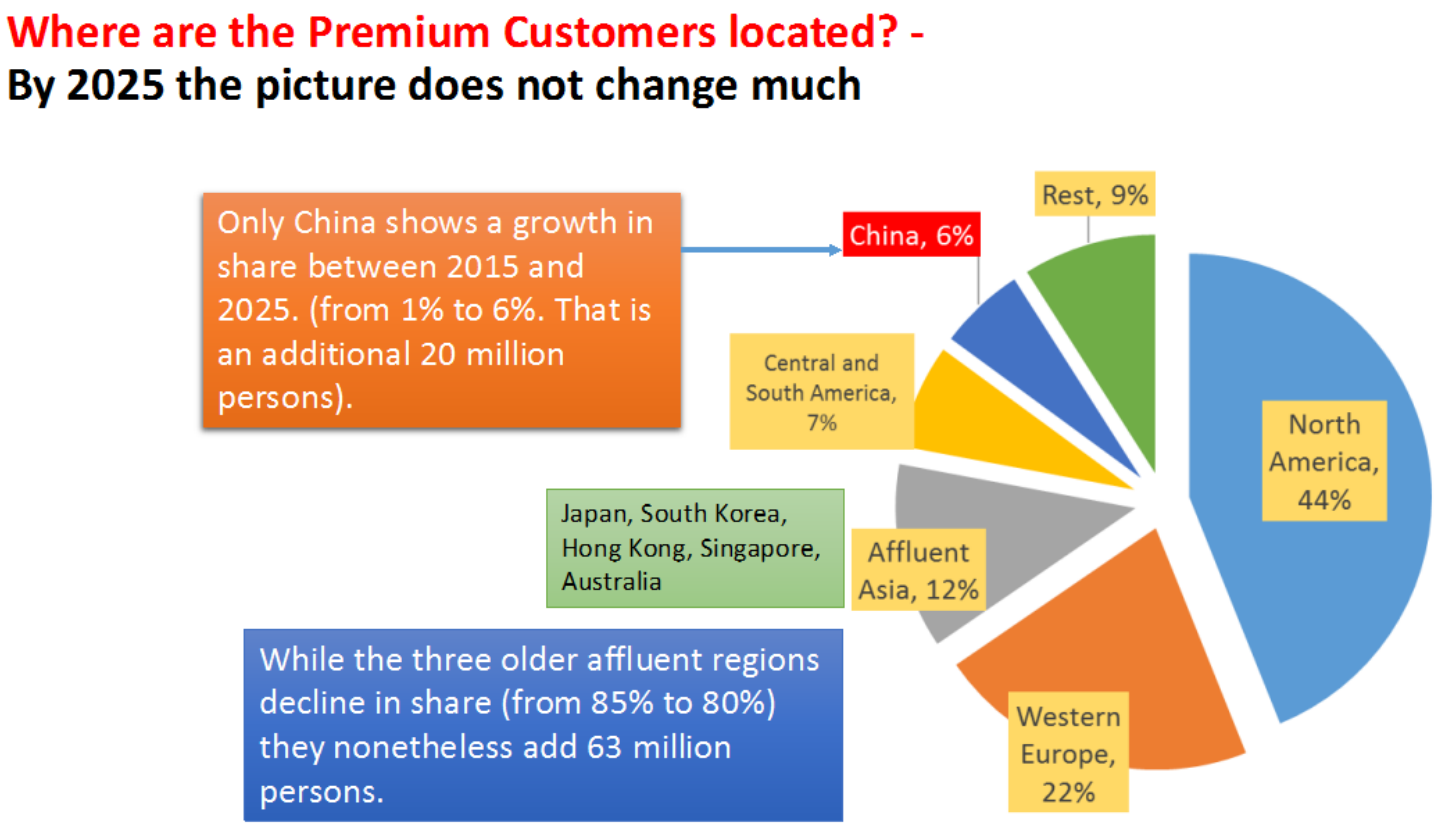
Even given moderate growth for China over the next decade, the number of consumers defined as the "premium market" lifts from 1%to 6% of the global share, adding a staggering 20 million extra consumers with a household income of more than US$100,000. That is almost one new Chinese consumer with this level of income for every current member of the Australian population.

Despite their decreasing share of the "premium market", North America, Western Europe and affluent Asia still increase their number of consumers in the "premium market", by 63 million consumers, as shown in the figure below.

The message for wool here is quite clear, marketing must be focused in areas where the potential for wool sales at retail is greatest. To sell a significant amount of wool requires, generally, three drivers: large population, cold climate and affluence and until recently China has had the first two but now and

increasingly China is becoming affluent as it moves from a manufacturing to a consuming economy.

AWI marketing must also target these areas and hence the very significant marketing campaigns in China such as Woolmark Gold, the heavy focus on the Campaign for Wool and International Woolmark Prize across Western



Europe, Northern America and affluent Asia.

In many ways AWI is fortunate as the consumers we wish to target are concentrated in a small number of countries and in China itself. The wealthy consumers in China are largely concentrated along the east coast. In fact Dr Laurent told the IWTO how just 23 of China's 655 cities hold 64% of China's population of people with an annual income of more than US$100,000.

This concentration allows a more targeted marketing spend and hopefully in-turn, a better return on woolgrowers' marketing investment via the wool levy. A more detailed examination of this subject will be seen in the June edition of AWI's Beyond the Bale magazine.

Rising carbon dioxide is greening the Earth but it's not all good news

Source: The Conversation - 26/04/2016.; http://theconversation.com/rising-carbon-dioxide-is-greening-the-earth-but-its-not-all-good-news-58282, Pep Canadell—CSIRO Scientist, and Executive Director of the Global Carbon Project, CSIRO, Yingping Wang—Chief research scientist, CSIRO

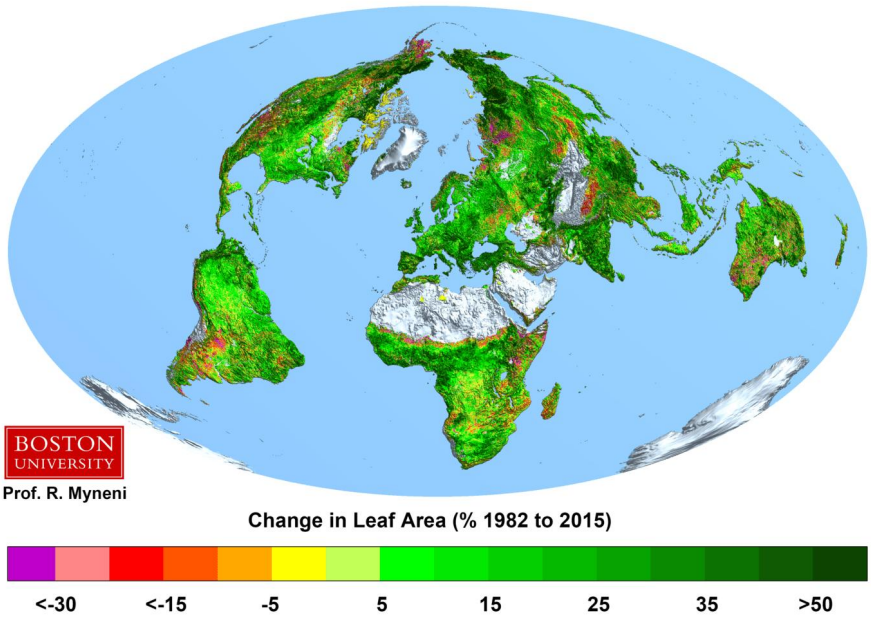
Dried lake beds, failed crops, flattened trees: when we think of global warming we often think of the impacts of droughts and extreme weather. While there is truth in this image, a rather different picture is emerging.

In a paper published in Nature Climate Change, we show that the Earth has been getting greener over the past 30 years. As much as half of all vegetated land is greener today, and remarkably, only 4% of land has become browner. Our research shows this change has been driven by human activities, particularly the rising concentration of carbon dioxide (CO_2) in the atmosphere. This is perhaps the strongest evidence yet of how people have become a major force in the Earth's functioning. We are indeed in a new age, the Anthropocene.

How do you measure green?

Plants play a vital role in maintaining Earth as a habitable place, not least through absorbing CO_2. We wanted to know how people are affecting this ability. To do this, we needed to know how much plants are growing. We couldn't possibly measure all the plants on Earth so we used satellites observations to measure light reflected and absorbed from the Earth's surface. This is a good indicator of leaf area, and therefore how plants are growing.

We found consistent trends in greening across Australia, central Africa, the Amazon Basin, southeast United States, and Europe. We found browning trends in northwest North America and central South America. We then used models to figure out what was driving the trends in different regions.



A CO_2 richer world

Plants need CO_2 to grow through photosynthesis. We found that the biggest factor in driving the global greening trend is the fertilisation effect of rising atmospheric CO_2 due to human activity (atmospheric concentration grew by 46 parts per million during the period studied). This effect is well known and has been used in agricultural production for decades to achieve larger and faster yields in greenhouses. In the tropics, the CO_2 fertilisation effect led to faster growth in leaf area than in most other vegetation types, and made this effect the overwhelming driver of greening there.

A warmer world

Climate change is also playing a part in driving the overall greening trend, although not as much as CO_2 fertilisation. But at a regional scale, climate change, and particularly increasing temperature, is a dominant factor in northern high latitudes and the Tibetan Plateau, driving increased photosynthesis and lengthening the growing season.

Greening of the Sahel and South Africa is primarily driven by increased rainfall, while Australia shows consistent greening across the north of the continent, with some areas of browning in interior arid regions and the Southeast. The central part of South America also shows consistent browning.

A nitrogen-richer world

We know that heavy use of chemical nitrogen fertilisers leads to pollution of waterways and excess

nitrogen which leads to declining plant growth. In fact, our analysis attributes small browning trends in North America and Europe to a long-term cumulative excess nitrogen in soils.

But, by and large, nitrogen is a driver of greening. For most plants, particularly in the temperate and boreal regions of the Northern Hemisphere, there is not enough nitrogen in soils. Overall, increasing nitrogen in soils has a positive effect on greening, similar to that of climate change.

A more intensively managed world
The final set of drivers of the global greening trend relates to changes in land cover and land management. Land management includes forestry, grazing, and the way cropland is becoming more intensively managed with multiple crops per year, increasing use of fertilisers and irrigation.

All of this affects the intensity and time the land surface is green. Perhaps surprisingly, felled forests don't show as getting browner, because they are typically replaced by pastures and crops, although this change has profound effects on ecosystems.

The greening trends in southeast China and the southeastern United States are clearly dominated by land cover and management changes, both regions having intensive cropping areas and also reforestation.

Although this management effect has the smallest impact on the greening trend presented in this study, the models we used are not suitable enough to assess the influence of human management globally. The fact that people are making parts of the world greener and browner, and the world greener overall, constitutes some of the most compelling evidence of human domination of planet Earth. And it could be good news: a greening world is associated with more positive outcomes for society than a browning one. For instance, a greener world is consistent with, although it does not fully explain, the fact that land plants have been removing more CO_2 from the atmosphere, therefore slowing down the pace of global warming.

But don't get your hopes up. We don't know how far into the future the greening trend will continue as the CO_2 concentration ultimately peaks while delayed global warming continues for decades after. Regardless, it is clear that the benefits of a greening Earth fall well short compared to the estimated negative impacts of extreme weather events (such as droughts, heat waves, and floods), sea level rise, and ocean acidification.

Humans have shown their capacity to (inadvertently) affect the word's entire biosphere, it is now time to (advertently) use this knowledge to mitigate climate change and ameliorate its impacts.

Applications for the 2017 round of Nuffield Scholarships are now open.

Nuffield Australia awards scholarships to farmers annually. The process for being awarded a 2017 Scholarship includes an application and interview process in 2016.

Applications are required by 30 June 2016, interviews are held in July and August 2016, scholarships are awarded in September 2016 and the Scholarship travel commences in 2017.

The following scholarships are supported by the GRDC:

- A grain grower in New South Wales or Queensland (GRDC Northern Region)
- A grain grower in Victoria, South Australia or Tasmania (GRDC Southern Region),
- A grain grower in Western Australia (GRDC Western Region),

To download the application form or the 2017 Nuffield Scholarship brochure click here:
http://nuffield.com.au/2017-round-of-scholarships-now-open/

For further information on the 2017 Nuffield scholarships click here:
http://nuffield.com.au/available-nuffield-farming-scholarships/

New Sheep and Goat Health Statements available

Updated versions of the Sheep Health Statement and Goat Health Statement are available on www.farmbiosecurity.com.au.

A new convenient feature for sheep producers includes a writable PDF version of the Sheep Health Statement so producers can complete the form on their computer before printing it or emailing it to agents or buyers of their sheep. There is still a printable PDF version for those who may not have reliable internet access.

LBN Both documents are also available in the Farm Biosecurity Toolkit.

Landcare Australia Special Projects Grants 2016

Landcare Australia is offering grants to farming and Landcare groups to undertake projects that protect environmental assets, address priority issues and improve the health of the environment.

Groups are invited to apply for a grant of up to **$15,000 (ex. GST)** to support projects that focus one of the following areas:

- Biodiversity and threatened species; and
- Sustainable Agriculture

Landcare Australia

For more information, login (or sign up) to the **Landcare Australia Communities Portal**.
Applications open on Monday, 18 April and close on **Friday, 20 May** (5.00pm EST).

Upcoming Events Calendar

May		
	UNFS Annual Results Book Launched	
June		
22	**UNFS Operations Committee Meeting**	
July		
19	Hart Winter Walk, **Sandy Kimber**	**0427 423 154**
22	GRDC Farm Business Update—Adelaide, Kathryn Toomey	03 5441 6176
27	EPARF Member Day, Minnipa Agricultural Centre, **Dot Brace**	**8680 6202**
August		
2	**GRDC Grains Research Update—Ardrossan, Matt McCarthy**	**03 5441 6176**
4	**UNFS Members Expo**	
9 – 11	EP Field Days, Cleve, **Renee Kelly**	**8628 2219**
10 – 12	Lambex Conference, Albury, **Donna Sykes**	**0412 778 849**
September		
7	MAC Field Day, Minnipa Agricultural Centre, **Naomi Scholz**	**0428 540 670**
13	**UNFS Eastern Spring Crop Walk**	
20	Hart Field Day, **Sandy Kimber**	**0427 423 154**
October		
18	Hart Spring Twilight Walk, **Sandy Kimber**	**0427 423 154**

Four Rivers Project - Volunteers Wanted

Do you want to get out in the great outdoors? Are you looking to get your hands dirty?

In the coming months there will be opportunities to be a part of a major project in the Northern and Yorke region.

Melrose area
30 May to 3 June
• Revegetation - planting along creeklines

Wakefield area (Mintaro to Balaklava)
May- Aug - 1 week per month
• Revegetation - planting along creeklines

Limited shared cabin accommodation (and camping) will be available. Breakfast and lunch will be provided.

Register your interest with Jennifer Munro via email **jennifer.munro@sa.gov.au** or on 0429 362 008.

For more information about the Four Rivers Project visit the **Northern and Yorke Website**.

Upper North Farming Systems

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