

# From the Ground Up™

ISSUE 81 | Autumn 2015

ADDING VALUE TO THE BUSINESS OF ARABLE FARMING™

**FAR®**

## In this issue:

- FAR Conference 2015 - be there!
- Cereal silage research
- Winter dairy grazing

# Contents

## This Issue

- 3** How can we make things even better?
- 4** 20 years of practical research for arable farmers
- 6** A word from the Chairman
- 7** Three new SFF projects for FAR
- 8** See you at the Conference!
- 10** What's up with cereals?
- 11** Seed trial update
- 12** Maximising the value of irrigation: Soil management to enhance water-use efficiency
- 14** Dedicated potato session at FAR conference
- 14** Cereal silage research
- 15** Autumn sown whole crop cereal silage 2014-15
- 16** Sustainable winter dairy grazing
- 18** Integrated management of slugs
- 18** Biosecurity and imported grain
- 19** Sclerotinia stem rot of kale



7



12

**SEE YOU AT THE CONFERENCE!**



**FUTURE VISIONS FOR  
THE ARABLE INDUSTRY**

**22-23 JULY 2015, ASHBURTON**



8

# How can we make things even better?

The first quarter of 2015 has been busy with a range of FAR, and other, meetings and events. Annual programmes have been drafted for groups like Women in Arable and Arable Ys, and regular events like our FAR Results Round-Ups have come and gone, attracting a couple of hundred growers, researchers and industry personnel. We have also run a series of Dairy Grazing Workshops which have asked some hard questions around the real costs of winter grazing and, in a first for FAR, we were involved in Get Ahead Days, aimed at promoting careers in agriculture to high school students.

Much thought and planning goes into the each and every event we run or collaborate on. Questions are asked around what value the event will deliver to our levy payers and whether it will meet our goal of adding value to the arable industry. We also ask ourselves what sort of event will work best...an indoor meeting, a field walk or multi-stop farm tour. We then agonise over the location, seeking a venue or property that will fit the estimated number of attendees, illustrate the issues in question, and be sufficiently central to attract growers. Then we advertise via postcard, e-mail and text and hope that people turn up.

We are constantly reviewing the way we deliver information to our growers and are more than willing to discuss this with you at any time. Things we are interested in are how far will you travel for an event? Would you watch a short video if we posted items on-line? Do you prefer receiving information and invitations in the mailbox at the end of your drive, via e-mail or text (or all three)? Do you use apps... can you think of an app that doesn't exist yet that would make your farm day easier?

If you have any comments or ideas on events, extension and communication, please let me know via email [heslopa@far.org.nz](mailto:heslopa@far.org.nz) or 03 345 5783.

Anna Heslop

- 20 Life as a FAR Industry Graduate
- 20 FAR Postgraduate Scholar announced
- 21 Supporting agricultural careers
- 23 Nuffield Scholarships
- 24 FAR Australia update
- 26 Controlling yellow bristle grass
- 27 Maize Hybrid Performance Trials update
- 27 A survey of garden pea seed in Canterbury
- 28 Arable kids
- 30 New forage research position
- 30 Arable Research Group tours WARS





# 20 years of practical research for arable farmers

**It is 20 years since FAR was set up to "undertake practical research for arable farmers".**

A number of farmers realised that if the cropping industry did not invest in research and extension then input from government in the future was unlikely. This visionary group of farmers set out to set up FAR under the Commodity Levies Act and their first achievement was the first referendum that gave the mandate to proceed and form FAR.

Since then, the levy funded organisation has developed to actively undertake research and extension on a broad range of grain and seed crops in New Zealand and Australia, and, in more recent years, developed a broader systems approach to research.

It is difficult to single out any particular project or piece of research as the most important, as the organisation's research focus is broad and has developed over time.

Initially our research focused within the farm gate on things like crop inputs and cultivar selection. From there grew one of our key achievements, our involvement in the Cultivar Performance Trials which provide growers with completely independent advice to help them select the appropriate wheat and barley cultivars to meet their production and agronomic needs. The CPT booklet produced each autumn and spring is very widely used within the industry to aid in selecting varieties and most seed breeding / selection companies are actively involved in the programme to maximise the value of this information to growers and the broader industry. It has been pleasing in the last 12 months to see the development of a similar programme for the maize industry and we hope this will evolve to be a very useful programme for maize growers.

Another key focus has been the development of long-term research sites and we are very lucky to have maintained access to our Chertsey and Waikato Arable Research Sites for 12 and 8 years respectively. Location-wise they provide a focal point for our work, and importantly, they allow us to carry out long term research, comparing results over a number of seasons and years.



Research is only part of what FAR does and research is of absolutely no use if it isn't partnered with a strong extension programme. Our extension work is a combination of meetings, field events and publications using a wide range of forums from small groups of growers to electronic just in time email information. All of these have developed over time as research projects have increased in number and scope, and as results accumulated. For example, Strategy Booklets which outline tested options for disease management and nutrient use on grain and seed crops are based on several seasons' research results, and FAR Focus books compile the results of several projects over several seasons to provide comprehensive information on topics like converting pasture to crop, irrigation management and nutrient management.

A key development for FAR in recent years has been an increased focus on research into whole farm systems and managing the environmental impacts of cropping farms. This focus recognises that cropping farmers grow a range of crops for an increasing range of end uses. Thus research on cereal silage has led to involvement in research on forage crops and in future FAR will have a greater involvement in research and extension in forage brassicas and fodder beet. This in turn has led to increased collaboration with other primary sectors, particularly the dairy industry, and with other research providers, notably the Crown Research Institutes and Universities. It has also led to an increase in external funding, with FAR levy funds being used to leverage contributions from central government agencies Ministry for Primary Industries (MPI) and Ministry for Business, Innovation and Employment (MBIE)

An example of this collaborative approach is the 20t by 2020 project. 20t by 2020 involves FAR, Plant & Food Research, Canterbury University and NIAB TAG in the UK, and aims to up wheat yields, increase productivity and improve farm profitability. Each partner organisation is contributing funding and or expertise, and in the case of NIAB TAG, replicating trials in the Northern Hemisphere to add knowledge to the programme.

A further recent focus has been the identification and development of new, higher value products and systems for the cropping industry. The Avanex® grasses, released by PGG Wrightson last year are an example of FAR having involvement in a new product from concept to commercial production. FAR are also working to develop other new products for crop farmers, often in conjunction with other companies.

Over the last 20 years there has been an increased demand from farmers for information to support their businesses. Initially this resulted in the development of Women in Arable and Arable Y's. More recently FAR have invested in ProductionWise® as well as a number of presentations on topics such as succession planning, diversification and Farm Environment Plans.

FAR has successfully increased research investment from approximately \$1 million of levy funds, to \$5.5 million of levy and grant funds. The development in Australia has led to the development of a range of trans-Tasman collaborative research and extension programmes and the establishment of FAR Australia in 2012.

Nick Pyke, CEO



# A word from the Chairman

One of the challenging things about farming is that no two seasons are the same, and the last two seasons have certainly illustrated this. The wet autumn which hindered the planting of many crops quickly turned dry, and many eastern areas suffered moisture deficits to crops as the season progressed. Many of these areas remain in moisture deficit for this time of year and significant recharge will be required over the winter months to replenish aquifers and increase river flows.

These changing weather patterns mean we must be able and willing to adapt our agronomic programme to the increases or decreases in crop risks within growing seasons. These adjustments can give us the ability to reduce some inputs into the crop and help with a more robust programme in relation to chemical resistance.

The dry has obviously had the greatest effect on dryland crops with yields down on average. The harvest results from irrigated crops that were able to keep up with crop moisture demands were above average, once again demonstrating the benefits of well designed irrigation systems and managing the water allocations we have available to us.

The recent AIMI survey found that despite the dry conditions, average yields were very similar to last season, but with little carryover from last season there will be less unsold cereal on the market. This deficit is being filled by large amounts of imported grain, especially maize into the North Island, which has created storage issues for this year's crop. This situation is disappointing, given that New Zealand grown product is available and helps our domestic economy. We do live in a global market and import parity is a part of that, but it is always difficult to compete with subsidised product.

Many regions are in the process of developing, or have released, new environmental legislation that will affect where and how we farm. Many of FAR's past research projects have delivered financial and environmental benefits, especially around nutrient inputs. Current projects will give us the ability to accurately understand our system losses and from this ascertain the environmental gains that our industry has already achieved through FAR's research. We need regulators to understand that the arable industry has already achieved significant reductions in nutrient losses and that this should be taken into account when setting limits.

It has been 20 years since the inception of FAR, so this is a good time to both look back over the progress that the industry has achieved in that time and also look forward trying to imagine what our farm systems will look like in 20 years time. During this time we have seen significant development in nutrient, fungicide, herbicide and PGR management along with the interaction between them. The development of the CPT system for cereal cultivar comparison and recently a similar system for maize, has given growers robust and independent information on which to make choices. Looking at the whole farming system has allowed us to understand how individual crops fit into rotations and the returns over a period longer than the single crop.

We can only imagine what our farms will look like in 2035, the technologies we will be using as everyday management have not even been thought of yet. Hopefully New Zealand's arable industry will be recognised as a global centre for high technology and high value seeds supplied worldwide. This will only be achieved with strong research and development and even stronger relationships across all aspects of our industry.

The 20th birthday of FAR will be celebrated at our conference *Future Visions for the Arable Industry* in Ashburton on the 22nd and 23rd of July. This is a great opportunity to see the latest research outcomes, hear from international speakers, attend field trips and help us celebrate our anniversary. We look forward to seeing you at the conference where FAR can help you to add value to your farming business.

David Birkett, Chairman





# Three new SFF projects for FAR

FAR has been successful in gaining MPI Sustainable Farming Fund support for three new projects in the 2015 funding round.

FAR CEO Nick Pyke says each of the projects, which will focus on precision agriculture, groundwater and potatoes, will benefit different parts of the cropping sector, but ultimately, all will add value to the industry.

Mr Pyke says the projects involve other industry funders and research organisations, a clear reflection of FAR's strategy to gain the best for its levy payers through targeted collaborations.

The three projects which have been funded are:

## Transforming variability to profitability

The aim of this project is to increase the uptake of precision agriculture technology through the development of easy-to-use systems for transmitting and interpreting data. The project will include a stocktake of precision agriculture (PA) technologies available in New Zealand and the use of PA tools to carry out a geospatial analysis of soil characteristics and measure yield and quality of barley, maize and potatoes from those soils. This will enable the identification of the soil and crop characteristics associated with profitability. For growers, the major outcome will be a simple system to allow the development of site-specific crop management plans for geospatial soil and crop sensing results. This will encourage the adoption of precision agriculture and increase the efficiency of inputs such as water, agrichemicals and nutrients. Collaborators for this project include Landcare Research and Potatoes NZ.

## Understanding the quality of our groundwater resource

This project, developed in conjunction with the Ashburton Water Users Group, will collate existing data from ground-water monitoring and modelling, identify where there are gaps in this knowledge and develop a well monitoring programme to address these gaps. This data will provide farmers in the Ashburton Zone with a better understanding of high risk zones and nitrate variability by season, region, depth and time. This in turn will help them to work with regulators to develop management strategies. It is hoped that this project will result in a template which could be used by other regions in New Zealand to collect more data on water quality.

## Increasing potato yield through understanding the impact of crop rotation and soil compaction

This project aims to increase potato yields and improve soil quality in potato crop rotations. It will provide information to growers about how they can use different crops to a) reduce the impact of the soil-borne diseases *Rhizoctonia solani* and *Spongospora subterranean* b) reduce soil compaction and c) improve soil structure. Overall, it is hoped the results will contribute to a 12% (7.2 tonne/ha) increase in marketable potato yields. This project will utilise Potatoes NZ research funding, which is managed by FAR.

Funding for the projects kicks in in June, and work will begin on the projects after that time.

# See you at the Conference!

This year's conference is going to be great! We have a full programme and a great range of New Zealand and international speakers, along with farm visits and an entertaining dinner.

Each of the four sessions: Cereals, Farm Systems, Seeds and Potatoes will feature a speaker who was involved with FAR at its inception, and who will briefly outline achievements to date. The rest of the session will focus on current issues and research, looking at new ideas and technologies that will provide solutions for the arable industry moving forward.

We are pleased to confirm an additional international speaker. Mr Thor Kofoed, Chairman of the Danish Seed Council, joins Mike Carver, the former Director of NIAB TAG, who did a lot of work with FAR in our first 10 years; David Firman, a potato yield expert from NIAB CUF, and leading Australian herbicide resistance researcher Chris Preston.

We are also very pleased to welcome AGMARDT as our Platinum sponsor. AGMARDT provides travel assistance for international keynote speakers and experts to come to New Zealand to transfer knowledge and international expertise. We are delighted with the degree of support from industry, whose sponsorship is covering the costs of our four international guest speakers. Without the support of our sponsors, we would have to think carefully about the number of international speakers, and registration costs would probably double!

On that note, registrations opened in mid-April and are trickling in, remember that early bird rates close at the end of this month. One or two day registrations are available, and the programme has been formulated to encourage potato growers to attend on day two, then stay over for the Potatoes NZ Conference, also in Ashburton, the following day.

## Registration costs and dates:

Early bird registration: Closes end of Sunday 31 May.  
Full price registration: Closes end of Sunday 5 July.

### Registration costs:

Early bird two day	\$140.00
Early bird one day only	\$90.00
Full price two day	\$190.00
Full price one day only	\$110.00
Full time student (no early bird or one day option)	\$80.00
Dinner (Wednesday 22 July)	\$60.00
Extra dinner guest	\$60.00

## Thank you to our sponsors for their support



### GOLD sponsors:



### SILVER sponsors:



All registrations must be made on-line via the FAR website [www.far.org.nz](http://www.far.org.nz)

Potato growers who are staying on for the Potatoes NZ Conference must register for that event separately on the Potatoes NZ website [www.potatoesnz.co.nz](http://www.potatoesnz.co.nz)





# FUTURE VISIONS FOR THE ARABLE INDUSTRY CONFERENCE 2015

22–23 JULY 2015, ASHBURTON

## WEDNESDAY 22 JULY

### SESSION 1: CEREALS 9.00AM–12.30PM

*Kindly sponsored by BASF*

#### **20 Years of arable research**

*Mike Carver, Carver  
Associates Ltd, UK*

#### **FAR in 2015**

*Nick Pyke, Nick Poole &  
David Birkett, FAR*

#### **Wheat agronomy**

*Nick Poole, FAR*

#### **Barley agronomy**

*Rob Craigie, FAR*

#### **New technologies for cereals**

*Nick Pyke, FAR*

#### **Cereal silage**

*Elin Arnaudin, FAR*

#### **Gluten – What's the story?**

*Nigel Larsen, Plant & Food  
Research*

#### **Future options for control of grass grub**

*Richard Chynoweth, FAR*

### **FIELD TRIP 1.00–5.00PM**

*Kindly sponsored by Syngenta*

### **DRINKS AND CONFERENCE DINNER 5.30PM ONWARDS**

*Kindly sponsored by  
PGG Wrightson Grain*

## THURSDAY 23 JULY

### SESSION 2: FARM SYSTEMS 8.30AM–12.30PM

*Kindly sponsored by Ballance Agri-Nutrients*

#### **From crops to cropping systems**

*Rab McDowell*

#### **Farm environment plans**

*Diana Mathers, FAR*

#### **Forages for reduced nitrate leaching**

*Ina Pinxterhuis, DairyNZ*

#### **GIA – What is it and what will be the involvement of the arable industry?**

*Nick Pyke, FAR*

### **SESSIONS 3A & 3B: 1.30PM–4.30PM CONCURRENT**

#### **3A: SEEDS**

*Kindly sponsored by  
Federated Farmers Grain and Seed*

#### **Seed production since 1995 – What have we learned?**

*Phil Rolston, AgResearch*

#### **Growing seed crops under nutrient limits – The Danish experience**

*Thor Gunnar Kofoed, Danish Agriculture  
and Food Council, Seed Section*

#### **Maximising yield in grass seed crops**

*Richard Chynoweth, FAR*

#### **Pollination**

*David Pattemore, Plant & Food  
Research*

#### **Clover breeding**

*Warren Williams, AgResearch /  
Massey University and Brent Barrett,  
AgResearch*

#### **New endophyte technologies**

*Linda Johnson, AgResearch*

### **CLOSING SESSION 4.30PM**

#### **What my farm might look like in 2035**

*Hew Dalrymple*

#### **Maize systems**

*Allister Holmes, FAR*

#### **Herbicide resistance**

*Chris Preston, University of Adelaide*

#### **Opportunities in forage brassicas and beet**

*Ivan Lawrie, FAR*

#### **Precision agriculture on our farms**

*Peter Mitchell and Andrew West*

#### **3B: POTATOES**

*Kindly sponsored by  
Plant & Food Research*

#### **What's holding back potato yields – An international perspective**

*David Firman, NIAB CUF*

#### **Role of irrigation in increasing yield in New Zealand potato crops**

*Jen Linton, FAR and Alex Michel,  
Plant & Food Research*

#### **Crop rotation trial**

*Peter Wright, Plant & Food Research*

#### **Impact of cultural control on soil borne diseases in New Zealand**

*Richard Falloon, Plant & Food Research*

#### **Future options for TPP management**

*Jessica Dohmen-Vereijssen,  
Plant & Food Research*

#### **2014 Nuffield Scholarship findings**

*Paul Olsen, Grower and Nuffield Scholar*

# What's up with cereals?

At the recent post-harvest Results Round-up meetings we provided a run-down of the season's CPT2 autumn cereal cultivar evaluations and 20t by 2020 wheat project three years on. The key points from that talk are summarised here.

Wheat yields this season compared with the four year average:

- Irrigated feed and biscuit: 13.4 t/ha compared with a four year average of 12.6 t/ha
- Dryland feed and biscuit: 8.9 t/ha compared with a four year average of 10.1 t/ha
- Milling: 11.3 t/ha compared with a four year average of 10.6 t/ha

The highest yielding feed wheat cultivars in Canterbury based on four year adjusted means:

- Irrigated trials: Torch, Wakanui, and Starfire
- Dryland trials: Wakanui, Conqueror, Torch, Gator, and Starfire

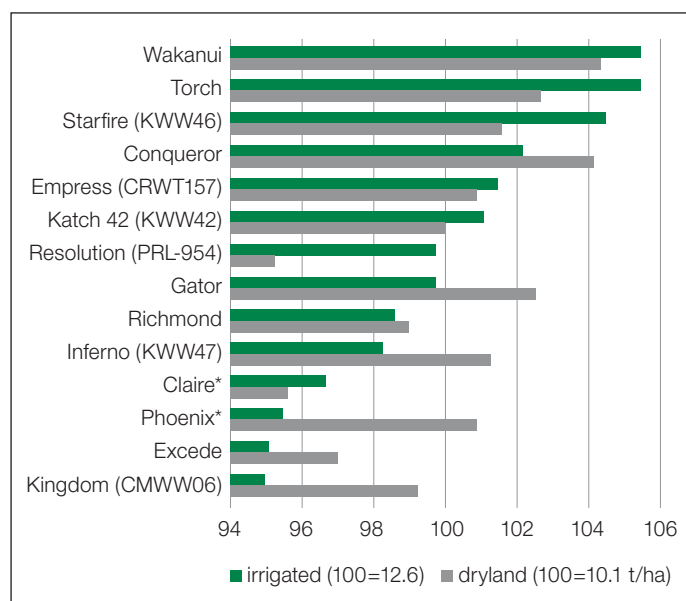
The highest yielding milling wheat cultivars in Canterbury based on four year adjusted means:

- Premium grade: Duchess\*, Reliance
- Medium grade: Discovery
- Gristing: Hanson\*

The highest yielding autumn sown barley cultivars in Canterbury based on four year adjusted means:

- Sanette, SYN411-291, SYN411-287\* and SYN411-285\*

\*1st year CPT2



**Figure 1.** Autumn sown feed and biscuit wheat four year adjusted mean yields (relative to a site mean yield of 100) for four irrigated and three dryland Canterbury sites.

\*Biscuit and feed wheat standards which appear in both feed and milling wheat trials to allow cross comparisons.

## Time of sowing trials

In time of sowing trials at Leeston (part of the 20t by 2020 project) over the last three seasons late March-drilled wheat cv Wakanui has given higher yields than February and April drilled wheat. In the first two seasons there were three sowing dates, February, March and April while in the 2014-15 season there were early and late March sowing dates as well as February and April ones. Grain yields ranged from 9.7 t/ha to 15.9 t/ha. For the late March sowing date, target plant populations of at least 150 plants/m<sup>2</sup> were optimal for highest grain yield. The mean yield for late March sown crops at a target plant population of 200 plants/m<sup>2</sup> was 0.82 t/ha higher than crops sown three to four weeks later in April. The site was a deep silt loam soil with a high water table which was not irrigated in the first two seasons but received 30 mm in

the 2014-15 season. February drilled wheat was very difficult to manage in the 2013-14 season with the high biomass prone to disease and lodging.

Much of the increased dry matter potential with late February/early March sowing appears to be lost as the crop "chokes", and senesces for a period in the winter and early spring. This collapse and early spring senescence reduces light interception in the early spring through reductions in the area of the green crop canopy. This can be recorded as differences in NDVI (Normalised Difference Vegetative Index) scores taken through the course of the season with different sowing dates.

Rob Craigie, Research Manager - Cereals

# Seed trial update

## Record yields for irrigated ryegrass seed crops

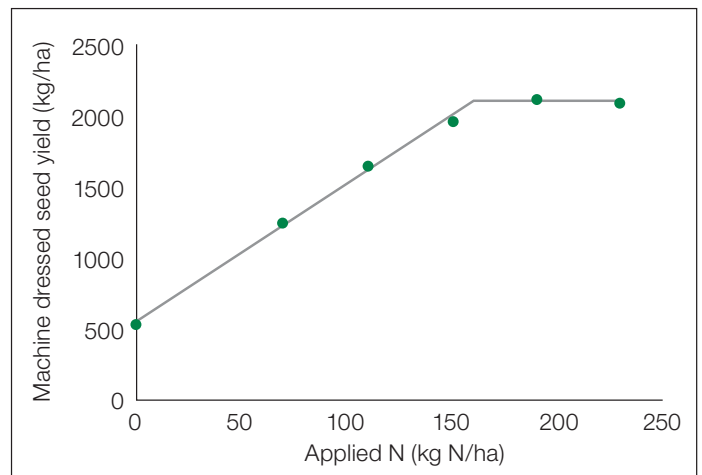
The season of 2014/15 started out under difficult circumstances with the wet autumn conditions hampering not only harvest but also planting. Considering this, the harvest results on many grass seed crops under irrigation have been outstanding, but conversely, yields from some dryland crops, particularly late flowering types, have been very poor.

For the first time, machine dressed seed yields of 4000 kg/ha have been achieved in perennial ryegrass seed plots, not once, but twice. One in a later season tetraploid forage cultivar (+20 days compared with Grasslands Nui) and the other in a diploid turf type. Both crops were under irrigation in the mid Canterbury district. Achieving 4000 kg/ha has been a goal for the past three seasons and it is great to have achieved this in both a plant growth regulator (PGR) trial and a fungicide trial.

In the PGR trial, shortening stems to approximately 60 cm produced the highest seed yields and was achieved using a combination of three plant growth regulators. In the fungicide trial, treatments which controlled stem rust all produced high seed yields. While this work was experimental, the control of stem rust in turf ryegrass produced a large economic return which would pay for the chemical input in a real on-farm situation. This was not the case for the PGR trial where the cost of the chemical input was so large that economically, growers are better off sticking with their current practice.

In nitrogen (N) work on perennial ryegrass we continue to see 170 kg applied N as the optimum spring nitrogen application rate. This season many crops were very low on residual nitrogen due to the rainfall which occurred prior to winter. This was demonstrated where plots which received no N produced just over 500 kg/ha which was approximately 1000 kg/ha below the long term untreated average. However at the optimum N application rate, seed yield was similar to the

long term average. For further information on nitrogen see FAR Cropping Strategy Issue 5, Spring 2013: *Nitrogen in perennial ryegrass seed crops*.



**Figure 1.** Seed yield response of perennial ryegrass cultivar 'Rohan' to applied nitrogen when grown near Methven in the 2014/15 growing season.

## White clover pests and PGRs

In white clover work we have seen limited clover root weevil damage in mid Canterbury, but ongoing work is investigating various treatments targeting both weevil larvae and adults. Controlling the larvae, which live under the soil surface, is difficult if attempted after planting, but SuSCon Green® applied at sowing has provided good control.

In PGR trials on white clover we have again demonstrated that Trinexapac ethyl (e.g. Moddus®) is good at reducing seed yields of white clover while, for reasons unknown, paclobutrazol (e.g. Payback™) continues to offer an exciting 20% yield lift.

Richard Chynoweth, Research Manager - Herbage



# Maximising the value of irrigation: Soil management to enhance water-use efficiency



The ability of the soil to absorb and retain water is a key factor to ensure precious irrigation water is used efficiently and effectively by crops. Hence good management of our often fragile soils is critically important to maintain and enhance soil water storage and maintain soil quality for growing irrigated crops.

Researchers in the MBIE-funded research programme, Maximising the Value of Irrigation, are investigating how soil management practices can improve the absorption and storage of water on cropping and horticultural farms. The programme is expected to deliver some practical methods to increase production from each mm of irrigation applied.

In our first year of work we have conducted a survey of arable soils to assess their susceptibility to develop water repellent soil conditions, and a PhD student has been appointed to research the potential of soil amendments to enhance soil water storage efficiency.

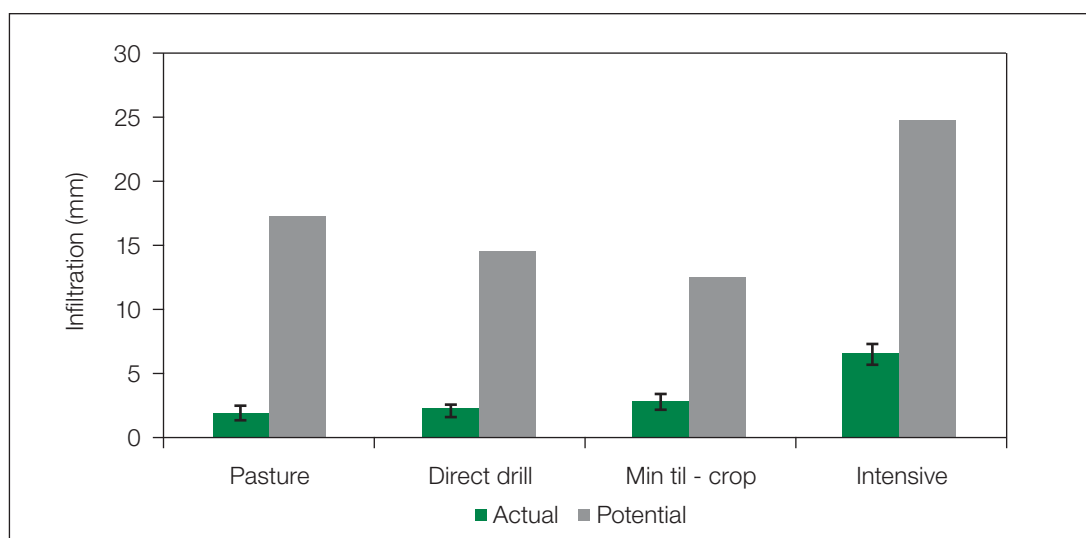
A bizarre but common property of many soils is that they can exhibit degrees of water repellency. This means that they will not readily wet on contact with water, resulting in uneven infiltration of water into the soil surface. Once water infiltrates into the soil it

typically moves through larger pores, often called macro-pores. Ideally under irrigation we want rapid and even absorption of the water from the macropores into the large volume of smaller soil water storage pores.

Sub-critical water repellency is used to describe the condition where although the soil appears to absorb water readily, some of the soil is repellent and prevents the recharge of storage pores. More water remains in the macropores resulting in some of the infiltrating water bypassing soil water storage pores.

There was little known about the occurrence of sub-critical repellency in our arable soils. Last autumn we surveyed a range of soil types with different tillage histories in Canterbury, as well as at FAR's Waikato Arable Research site (WARS). The results show that New Zealand arable soils can develop sub-critical water repellency.

Figure 1 illustrates the effect of this sub critical repellency on soil water storage efficiency. Under air-dried soil conditions actual water infiltration into storage pores is much lower than the potential infiltration, which is the infiltration rate of the storage pores if there was no repellency.



**Figure 1.** Comparison of actual and potential (non-water repellent) infiltration (cumulative) over a 5 min period of water into the storage pores of air dried soil from the FAR Hamilton long-term tillage trial.

Based on the findings of the survey we have started a series of experiments to establish the critical water contents at which sub-critical water repellency could become an issue. The degree and onset of repellency is likely to be affected by the initial moisture conditions of the soil. Starting with a soil at field capacity (the point at which drainage ceases) we will allow the soil to progressively dry. We will then measure repellency at a range of soil water deficits that can be easily compared to those occurring at typical irrigation return intervals.

Over the next year we will be investigating how soil water properties change over a growing season. There are a number of factors that can influence the soil water attributes that affects the ability to absorb and retain water. For example, cultivation can change the soil porosity significantly. Following cultivation, at regular time intervals we will be measuring soil water storage and infiltration attributes as the growing season progresses to see how significantly these attributes change, and whether this needs to be accounted for in management and modelling tools. We will also be starting to expand our research into measuring the effects of residue management on soil water use efficiency.

Lincoln University PhD student, Dirk Wallace has started researching how soil amendments might be used to increase retention of irrigation water in cropped, shallow stony soils. Dirk, in his first trial is comparing the effects of four organic and three synthetic amendments on total soil water storage and plant available water. When he has completed this study he will use the three most promising amendments to investigate whether their use can save on how often soil needs to be irrigated without penalising production.

Sam Carrick, Landcare Research and Steve Thomas, Plant & Food Research





# Dedicated potato session at FAR Conference

Since FAR took over management of the Potatoes NZ research and development fund last year, we have worked hard to engage with as many growers and industry personnel as possible in order to gauge their research needs. We have delivered several well-attended field days and developed research plans for the coming year, including one funded through the Sustainable Farming Fund.

Building on all of this will be the Potatoes session at our conference in Ashburton in July. This conference, Future Visions for the Arable Industry, will be the first time FAR has run a stand-alone session for potato growers, and we are very pleased with the calibre of speakers who will present and the range of topics they will cover. These include papers on rotations, irrigation and disease management.

Key note speaker for the session will be Dr David Firman, head of the Potato Agronomy Group at the Cambridge University Farm (part of the UK's National Institute of Agricultural Botany). Dr Firman has 30 years of potato research and extension experience under his belt, and in that time has worked on crop nutrition, foliar and tuber diseases, seed physiology and crop modelling. These projects have led to many practical applications adopted by potato growers in the UK and elsewhere, including variety

specific nitrogen rates, control of tuber blemishing diseases, limiting virus spread and seed rates accounting for seed age that maximise marketable yield.

Through the Cambridge University Potato Growers Research Association, David maintains close linkages with growers and the wider potato industry to enable effective communication and practical adoption of research findings. He oversees the development of yield and irrigation modelling systems which are increasingly being adopted by collaborators to improve efficiency and productivity and provide data to guide strategic decisions.

The Potato session is being held on day two of the conference, and one day registrations are available. The programme has been developed this way to enable potato growers to attend on day two (Thursday 23 July) then stay over for the Potatoes NZ Conference, also in Ashburton, the following day. All registrations must be made on-line via the FAR website [www.far.org.nz](http://www.far.org.nz) Potato growers who are staying on for the PNZ Conference must register for that event separately on the PNZ website [www.potatoesnz.co.nz](http://www.potatoesnz.co.nz).



## Cereal silage research

FAR is investing considerable research effort into the area of cereal silage, in the knowledge that this, often overlooked, crop is an important part of the farm system for many arable and other farmers.

Projects such as those outlined on the following page are investigating the impact of sowing date and harvest window on yield for different cereal types. This work will continue in coming seasons, and there are also plans to invest in cereal silage quality research.

This work is funded through FAR's Cereal Silage Levy. Under the Commodity Levies Act, cereal silage levies of \$10/hectare sown, must be paid on all cereal silage, regardless of whether it is used on the property where it is grown or if it is sold.

Levy payment is generally the responsibility of the grower and should be made immediately after harvest (the Act notes that the latest date for payment is the 21st day of the month following harvest).

If you have any queries about the levy or research into cereal silage please contact FAR on 03 345 5783



# Autumn sown whole crop cereal silage 2014-15

Whole crop cereal silage is a high carbohydrate-low protein feed supplement to pasture for dairy cows. Much of the cereal silage grown is sown in the spring, but an autumn planting provides a higher yield potential, so trials in the 2013-14 and 2014-15 seasons have looked at how management inputs affect DM yield, feed quality, and harvest window of autumn sown cereal silage crops.

Results from the 2013-14 trial indicated that wheat was both high yielding and gave the most flexibility in the harvest window. The 2014-15 trial was therefore designed to look more closely at wheat and to determine how yield and quality components were affected by PGR inputs over wheat cultivars with different maturities and heights.

Five wheat cultivars (Wakanui, Raffles, Torch, 09-25\*, and 12-45\*) were tested alongside oats (Coronet), triticale (Prophet), and barley (Sanette). Plots were sown at Lincoln, Canterbury on 7 May 2014 and later harvested for DM yield and quality at three timings: flag-boot stage (green chop), 38% DM (direct chop), and at grain maturity. \*coded varieties.

At green chop harvest, oats and triticale yielded the highest (4.9 and 4.5 t/ha), while triticale and wheat were the highest yielding

at the 38% DM harvest (23.2 and 21.4 t/ha). No differences were seen in yield between wheat cultivars at either harvest.

From flag-booting to the cheesy dough stage (~38% DM), the estimated change in biomass averaged 310 kg DM/ha/day and 840 kg/ha per change in DM%. Wheat and triticale put on the most biomass per day and per increase in DM%. Cereal species was the most important factor contributing to the ratio of head to total biomass at direct chop harvest as well as the harvest index at grain maturity.

The PGR regime was only able to improve these characteristics in certain cultivars. Barley had the highest harvest index. It is important to keep in mind that in a direct chop harvest, the grain component is the most important contributor to feed quality characteristics such as digestibility and metabolisable energy (ME). While some crops may be higher yielding than others, it is the grain portion that drives quality, so a good balance of the two is needed when deciding what to sow.

Photo: Cereal silage plots of oats (Milton), wheat (12-45), and triticale (Prophet) nearing whole crop harvest in the 2014-15 trial at Lincoln.

Elin Arnaudin, Research Manager - Forage



## Key points

- Oats are more suited to a green chop harvest than a direct chop, while triticale and wheat performed well at both harvests. Barley had the lowest green chop yield.
- Crops gained an average of 310 kg DM/ha/day after flag-booting, so every day counts (but don't miss the harvest window).
- The first consideration for crop selection is the fit for the rotation.
- The second consideration is a tricky balance between yield and feed quality:
  - This season, barley yield was comparable to wheat and had a much higher proportion of grain.
  - PGR may be able to enhance feed quality in some cases.





# Sustainable winter dairy grazing

A recommended mitigation to reduce nutrient losses for the dairy industry is to move the dry cows off the dairy platform for winter grazing. Arable farmers have picked up on this opportunity and a forage crop for winter dairy grazing is becoming a common component on many arable farms. There's good winter income to be made by having the cows there, but is it sustainable?

The questions to be asked are:

- Is this a good business opportunity for me?
- Is it sustainable? and
- If I'm going to have the cows on my farm, what are the risks and what can be done about them?

Intensive winter dairy grazing presents environmental challenges which must be managed. These are related to soil damage through compaction and loss of aggregate stability, the loss of soil sediments through run-off and managing of the nutrient load from the cows to prevent nitrogen and phosphorus losses to fresh water.

In our survey of winter grazing practices around the country we identified four risk factors for soil damage and nutrient loss during and immediately after the grazing period. Some of these risk factors are manageable but all should be considered when planning for winter dairy grazing.

- The weather – wet soils are more vulnerable to compaction and pugging damage to the soil surface. Nitrogen is leached during drainage events.

- Soil type – clays and silts with smaller soil particles, soils with low organic matter and/or poor drainage and weak structures are vulnerable to compaction.
- Cow number and cow behaviour – the more cows the more damage to the soil and the bigger the nutrient load. Cold, wet cows, seeking shelter huddle together increasing the risk of compaction through their trampling.
- The human factor – Undertake the management of the cows on your land if possible or ensure the terms of the grazing contract enable some control over the herd management when the weather turns rough.

Bear in mind that if all these risks are present, then there effect is compounded.

## A comparison of the financial return from two dairy grazing systems.

As well as considering the environmental risks, farmers should consider the economic returns from grazing, especially when deciding on the intensity of the system they are going to run.

Tables 1 and 2 present the gross margin parameters and the gross margins for two different dairy grazing systems; a low intensity system with cows grazing on forage oats compared to a high intensity system on fodder beet. Note: These are generic gross margins which may differ from the gross margins relating to your winter grazing enterprise.

On the surface the business proposition of a high intensity system is a no-brainer with it delivering more than double the gross margin of the low intensity system. However there are things other than the bottom line for one year to be considered.

**Table 1.** Gross margin parameters

	Forage Oats	Fodder Beet
Grazed area (ha)	20	20
Irrigated area (ha)	20	20
Dryland area (ha)	0	0
Irrigation volume applied (mm)	0	270
Cow number grazed	225	800
Stocking rate (cows/ha)	11	40
Length of stay days	61	61
Feed requirement (TDM for the length of stay)	137.3	488.0
Crop yield/ha (TDM )	8	20
Crop Production (Total TDM)	160	400
Feed utilisation (%)	80%	70%
Crop available to the cows (TDM)	128	280
Additional feed to supply (TDM)	9.3	208.0
Length of time in the rotation (months)	5	12
Costs (crop production and additional feed )	\$630	\$5,035
Gross margin	\$1,917	\$4,042

Note: Crop yields (TDM) will vary between crops, farms and regions. Substitute your own crop yields to gain more accurate gross margins for your farm.

**Table 2.** Feed requirements for the two systems

	Cow Number	Feed Requirement kg DM/day	
		per head	Total
In-calf cows	225	10	2250.00
Total (T/day)			2.25
In-calf cows	800	10	8000.00
Total Feed Requirement (T/day)			8.00

Note: Fodder beet must be supplied with silage, baleage and straw to maintain cow health.

Fodder Beet allocation for the intensive system (488 TDM required)		
	% of diet	TDM
Fodder beet	55	268.40
Grass silage	35	171.00
Straw	10	49.00

The first consideration to make is the length of time taken up by growing the forage crop, the grazing and the return time for the following crop. In the low intensity forage oats system, the oats are planted in March compared to a spring planting date for the fodder beet crop. So there is time to include an additional crop, such as spring barley, in the rotation before the forage crop is planted. Include the value of this crop in the financial comparison of the two systems.

More importantly, when considering the long term economic sustainability of an intensive system we should think about the risks associated with the higher stocking rate, 40/ha compared to 11/ha.

The risk of compaction is strongly related to stock number. Compacted soils after winter grazing are slower to dry and require more work to prepare them for the next crop. Some farmers in our survey reported 6-7 passes following intensive grazing on kale (20 cows/ha) to prepare the paddock for the

next crop. Farmers also reported a suspicion of lower yields in the following crop, one reporting 3 T/ha less on the yield monitor for a barley crop grown after winter grazing compared to an adjacent barley crop on non-grazed land. These are system costs associated with the grazing component of the rotation which affect the gross margin of the next crop and the long term profitability of the farm.

Choose carefully between low and high intensity systems by considering the long term economic and environmental aspects of the system.

Don't push the system too hard - damaged soils are slow to heal.

This work is part of a MPI/FAR funded Sustainable Funding Project: *Good management practices for winter grazing on arable cropping land.*

Diana Mathers, Research Manager - Farm Systems





# Integrated management of slugs

The first field trial for this 2014 MPI SFF funded project has been established. It will investigate methods of managing slugs in ryegrass and brassica crops sown into maize residue with slug populations present. The slug management treatments will include a control with no treatment, three different slug bait treatments and treated seed. Levels of slug damage will be assessed in the establishing crops.

Funding for this work is provided by the Sustainable Farming Fund, FAR, Ravensdown Fertiliser Corporation, Lone Star Farms, PGG Wrightson Seeds and Landcorp Farming.

Photo: Brassica seed being drilled into maize crop residue.

## Biosecurity and imported grain

Considerable shipments of grain are currently being imported into New Zealand, partly because of the strength of the New Zealand dollar, and also because of high levels of grain stocks in other countries. Whenever agricultural products are imported in to New Zealand, there is some risk of importing a problem weed, pest or disease. The management of this risk is undertaken by the Ministry for Primary Industries (MPI), which undertakes risk evaluation and inspections according to rules outlined at: [www.mpi.govt.nz/importing/food/grains-seeds-and-nuts/](http://www.mpi.govt.nz/importing/food/grains-seeds-and-nuts/)

Recently FAR staff were shown a picture of imported maize containing some weed seed. It is highly likely that the weed seed was Noogoora Bur, a weed present, but not widely spread in New Zealand. This issue was raised with MPI staff who investigated the situation and declared they were, "confident

that this particular weed, which is already present in New Zealand, will pose no additional threat, as it is contained". MPI also stated that... "all viable grain coming into the country is under MPI control, via inspection or audit, from landing through to final processing and de-vitalization. No viable grain is transferred to any party who is not registered with us, and does not enter the end use market as viable grain. Imported viable grain is not fed out on farm, nor are any weeds associated with that grain. The entirety of the consignment, and any contaminants, are rendered into a devitalised state where they are not a threat".

We encourage any growers with concerns about biosecurity of imported agricultural products to contact their local MPI office. Full contact details are available at: [www.mpi.govt.nz/contact-us](http://www.mpi.govt.nz/contact-us)



# Sclerotinia stem rot of kale

As more kale is grown for dairy grazing, there is an increased risk of crops being affected by soil borne diseases. Last winter Plant & Food researchers Farhat Shah and Ian Scott were presented with samples of a diseased kale crop and their follow up research found the disease in question was *Sclerotinia sclerotiorum*.

The life cycle of *S. sclerotiorum* includes both a soil-borne and an air-borne phase and sclerotia of *S. sclerotiorum* can survive in the soil for 10 years or more. Common symptoms of sclerotinia are the appearance of water-soaked irregular spots on stems, leaves or petioles. These spots start off dark green or brown, growing paler and larger over time. Eventually they become covered in a dense white cottony layer of mycelium. In the case mentioned above, a field visit found that almost 90% of the kale crop was lodged and showing variable symptoms of brown and black lesions on leaves and stems. Most of the lodging occurred following girdling of stems from infection at ground level.

Management of sclerotinia stem rot occurs at several growth stages of crop development. The most common techniques include: making the crop microclimate less conducive for infection (canopy management), fungicides or biological products, eliminating sources of inoculum (crop rotation), and the use of resistant varieties. Successful disease control commonly requires the implementation of integrated control measurements which might also include weed control, soil organic amendments and the burning of infected plant residue.

A factsheet on the problem including a description of the conditions for infection, aspects of disease epidemiology and some tips for disease management is available on the FAR website and a PDF copy has been emailed to all FAR levy payers. If you wish to receive a hard copy in the mail, please contact us and we will get one to you.



Photo: Infected kale crop showing the formation of sclerotia from the fungal pathogen *Sclerotinia sclerotiorum* on stem.

# Life as a FAR Industry Graduate

During my first six months on the graduate programme I have been exposed to many aspects of the arable industry from agronomy to extension. The role is a unique opportunity to get a broad view of the arable sector and understand what goes on at FAR, internally as a business, and externally through communication and extension with farmers. The FAR team provides a professional environment to develop and gain knowledge and the skills I will need to work in the industry. Working at FAR also allows networking with industry experts to exploit their resources and knowledge also.

Over the last six months, I have enjoyed the mix of various learning environments with both office and field work. Through working in the field with the research staff I have picked up skills required to carry out a research experiment; understanding the how a research idea is developed into a trial, the importance and development of trial protocols and knowledge of how to establish a trial. Organising and planning Women in Arable for 2015 has allowed me to understand the knowledge and needs of others in the farming business. Attending special interest groups such as Arable Ys and Women in Arable has opened up opportunities to network with industry professional and build relationships.

My current focus is working with Rob Craigie (Research Manager - Cereals at FAR) and Plant & Food Research staff to undertake a pot trial experiment to determine if there is a growth stage in wheat beyond which the Barley Yellow Dwarf Virus (BYDV) infection does not decrease yield. The trial is

the result of growers indicating concerns about their current management practices. We will be testing to see if wheat is tolerant to BYDV after GS 31 and therefore whether or not wheat crops need protection from aphids beyond this growth stage. This trial exposes me to different agronomic inputs, cereal growth stages and insect management. The results should be exciting and relevant for farmers. It also allows me to use all the skills gained in understanding a trial from its protocol to results.

Due to the growing issue of bird damage in arable crops I am producing a Bird Pest Management FAR Focus publication. I am collating all of FAR's research into bird damage from past years into a publication to help growers make decisions around bird management.

Winter will be exciting as I will be joining FAR's Arable Ys study tour to the USA. The trip will provide a platform to learn and gain an understanding of US crops, management systems and practices. I hope to bring back new ideas that can be integrated into New Zealand systems.

Spring will round out my year at FAR and provide the opportunity to spend time with the research team in Australia and seek external placement in the industry for work experience. In the meantime, what I am learning and doing is helping with decision making about what role I wish take in the industry.

Hannah McCulloch

## FAR Postgraduate Scholar announced

FAR is pleased to announce the winner of their 2015 Postgraduate Scholarship is Timothy Brooker from Lincoln University.

Tim is in his fourth year of study towards a Bachelor of Science (Honours) Degree and is particularly interested in plant science and its application in farm systems. This interest is reflected in his Honours project which is investigating the integration of arable crops into dairy farm systems. The crops he is looking at are dual purpose wheat and canola, and he is studying their growth and production under different grazing regimes.

FAR CEO Nick Pyke says he was impressed with Tim's academic record and also his interest in, and understanding of, the role of crops beyond cropping farm systems.

As FAR Postgraduate Scholar, Tim is awarded \$7000 to assist with his final year of study.



# Supporting agricultural careers

This year, for the first time, FAR was involved with the development of a module for the Get Ahead Careers Experience days managed by Young Farmers. Get Ahead days provide an opportunity for high school students from around New Zealand to experience first-hand the extensive choice of jobs and career opportunities the primary industry has to offer.

Beginning on March 3 in Gore, the events were held successfully in Dunedin, Christchurch, Greymouth, Wellington, Palmerston North, Hawera, Rotorua and Cambridge, before finally finishing up in Auckland on April 23.

Students spent the day talking to industry professionals and completing tasks and challenges relating to 12 primary industry sectors. These included Grain and Seed, Dairy, Sheep and Beef, Technology, Science, Exporting/Marketing. Lunch time demonstrations like the flight and presentation of a working, commercial drone, gave students an amazing insight into what the future, and technology, may hold for them.

Working with the New Zealand Grain and Seed Trade Association, FAR developed a two part grain and seed module for the day. In it, the students' first task was to use a moisture metre to test wheat samples, while the second involved using the FAR Cultivar Evaluation book to select wheat and barley cultivars suitable for growing under specific conditions in different regions of New Zealand.

Get Ahead Project Leader, Adam Caldwell of Young Farmers, says feedback on this year's events has been overwhelmingly positive from students, teachers and industry volunteers.

"In total the 2015 Get Ahead days reached over 100 schools, and approximately 1000 students, who enjoyed an educational day aimed at attracting them towards a career or study in the industry and improved their general knowledge and understanding of the primary sectors. They were a resounding success."





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**Phone 03 345 5783 for further information.**

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# Nuffield Scholarships



Have you ever considered becoming a Nuffield Scholar? FAR supports the Nuffield Scholarship programme and recognises it as one of New Zealand's most valuable and prestigious awards. So what exactly does it involve?

A Nuffield Scholarship is an international focused programme which includes an international conference, a six week global tour covering four continents, and individual research and travel.

The scholarships provide opportunity to:

- Internationalise your understanding and experience and lift your thinking to another level
- Develop your own vision for New Zealand agriculture
- Develop global networks with other like-minded individuals
- Gain a deeper understanding in a chosen study topic and to lead debate in this area at the end of your study year
- Improve confidence and skills with travel and individual study
- Become part of the Nuffield network with other successful individuals

Former scholars agree that receiving a Nuffield Scholarship was a privilege which has changed the way they look at agriculture and their farming businesses. All have developed a huge network of friends and advisors from industries and countries all around the world who encourage them to think more widely and find solutions to business and industry problems.

## Craige Mackenzie

**Topic: Understanding the carbon footprint in farming systems (2008)**

I got to meet many researchers, leading farmers and politician's including republican and democrat senators on Capitol Hill where we had a chance to discuss the Farm Bill for two hours. The programme increased my knowledge but more importantly the way I thought about our businesses and led ultimately to the formation of a new precision ag company with our daughter.

## Paul McGill

**Topic: Catchment management strategies (2010)**

The six week Global Focus Tour provided the opportunity to see diverse farming systems in diverse global areas of the world and helped me to form a global network of contacts. The Nuffield experience gave me a greater appreciation of the importance of arable farmers to global food supply and greater confidence to get outside of my comfort zone and step up.

## Michael Tayler

**Topic: New technologies in arable farming (2012)**

I was always amazed how open and receptive the officials were, from trade negotiators in the WTO offices in Switzerland to agricultural administrators in Washington DC. They always made time for us. Nuffield allowed me to look at New Zealand farming generally, and my own farm business in particular, with fresh eyes.

## Steve Wilkins

**Topic: The synergies between arable and dairy (2013)**

I learnt that New Zealand agriculture is a very small part of global food production, but that we punch well above our weight and are very well respected internationally in what we do. The intellectual debate around my topic lifted my thinking to another level, across all aspects of agriculture and policy.

Applications for 2016 Nuffield scholarships will close on 31 August 2015  
We would love to see more arable sector applicants so check out [www.nuffield.org.nz](http://www.nuffield.org.nz)



# FAR Australia update

## Hyper-yielding cereals

FAR Australia has successfully tendered for the Grain Research Development Corporation (GRDC) funded Hyper-yielding Cereals project which will start in July this year. The project has the overall aim of making Tasmania more self-sufficient in feed grain cereals. Despite a more favourable climate for grain production than the mainland and much higher yield potential, the average yield of feed wheat in Tasmania is 4.4 t/ha and the state remains a net importer of cereal grains (150,000 tonnes imported compared to a domestic production of 60-80,000 tonnes).

The five year project collaborating with the High Rainfall Zone (HRZ) farming group Southern Farming Systems aims to engage with international breeders, researchers, growers and advisers to evaluate and better manage new feed wheat and barley cultivars for the Tasmanian environment. It is also hoped that links with those same breeders can result in new germplasm being secured for the 20t by 2020 project in New Zealand.

The aim of the project is to:

- Increase average red feed wheat yields in Tasmania from 4.4 t/ha to 7 t/ha by 2020
- Have 10% of commercial Tasmanian feed wheat crops yielding 14 t/ha by 2020

Through engaging and collaborating with the dairy industry and other end users to identify and endorse the value of metabolisable and digestible energy in feed grain cereals, the project will also create:

- An independent testing and reference system whereby high yielding cereals can be reliably described in terms of energy content and value to the end user
- A positive environment based on trading feed cultivars with quality attributes for better milk solid or poultry production in Tasmania.

FAR also hopes to develop international linkages for the project with both Europe and New Zealand in order to complement FAR's work in 20t by 2020.

## Research projects and reporting from the 2014 season

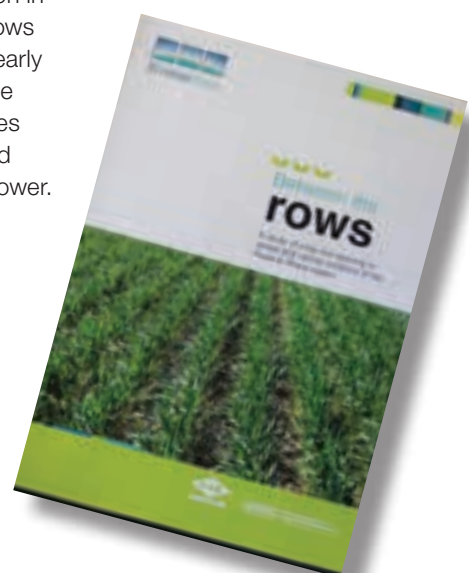
The focus of FAR's work for the first quarter of the year has been the compilation of results from the different projects worked on across Australia in 2014. These projects are many and varied, and have involved the organisation working with a wide range of collaborators (see table on right). The research funding for these projects comes from the wider Australian grains industry, GRDC and the Australian Government. These projects have resulted in FAR having an extensive network of research and farming group contacts across Australia. The same network is also creating new opportunities to collaborate across the Tasman in jointly funded projects, such as rust pathotyping, and providing access to some of the world's leading agricultural scientists, for example in the field of herbicide resistance.

The early part of the year also saw the completion of a publication produced in collaboration with the Riverine Plains Farming Group on row spacing. The 40 page booklet entitled *Between the rows – A study of crop row spacing in wheat and canola rotations of the Riverine Plains region* was released to growers and advisers in that region in March this year. Based on a GRDC funded project aimed at improving Water Use Efficiency, the publication is a compilation of five years of research results on the influence of row spacing. Some of the major findings from the project were:

- Increasing row spacing from 9-15 inch (approximately 23-38 cm) in first and second wheat reduced yield (9.5-11%) as result of lower dry matter production per unit area.
- Yield difference between 9 and 12 inch was negligible where wheat yielded below 3 t/ha.
- At yields of 4-5 t/ha in the Riverine Plains region there was an indication in trials that the yield penalty of wider 12 inch rows was not as great when crops were sown earlier in April.
- Nine inch row spacing overall produced better water use efficiency in wheat whilst with canola, results indicated little difference between 9 and 15 inch row spacing.

Though these environments are far removed from those in New Zealand there is some farm based research work being conducted this season in Southland on wide rows combined with very early sowing in order to see if there are advantages in disease control and improved standing power.

Nick Poole,  
Managing Director -  
FAR Australia



## Major FAR Australia Research Projects conducted in 2014.

Project	Collaborating Partners
Carbon Farming Initiative funded by the Australian Government – Management strategies for reducing nitrous oxide emissions in broad acre cropping.	Queensland University of Technology, SPAA, Riverine Plains & Hart Farming Group
New Fungicide Actives project in cereals and pulses – A GRDC funded project working with agrichemical manufacturers to introduce fungicides with new modes of action.	Centre for Crop Disease Management (CCDM) based at Curtin University, Perth
Integrated Fungicide Management – A project examining the interaction between cultivars carrying known Adult Plant Resistance (APR) genes and new generation fungicides.	Sydney University's Australian Cereal Rust Control Programme (ACRCP)
Northern Region Irrigated Grain Project – Research work dedicated to improving the agronomy of irrigated wheat in northern NSW and Queensland.	CSIRO* (*project leaders)
GRDC Stubble Initiative Project (Riverine Plains region NSW/Vic border) – Project looking at improving the performance of no-till cropping in this high yielding region.	Riverine Plains Farming Group.
GRDC Time Of Sowing Project – Improving the performance of early sown wheat using Near Isogenic Lines (NILs) to identify the perfect “ideotypes” for planting early.	CSIRO* (*project leaders) Birchip Cropping Group and Southern Farming Systems
National Variety Trial (NVT) Extension – A small project where FAR Australia are extending the regional results from the NVT trials in the High Rainfall Region and North East Region of Victoria.	Birchip Cropping Group (Mallee and Wimmera regions)
Evaluation of experimental foliar fungicides in barley and faba beans.	Agrichemical manufacturer
Evaluation of experimental foliar fungicides for Septoria and Tan spot control.	Agrichemical manufacturer



Nick Poole presenting at a GRDC update meeting in Ballarat.





# Controlling yellow bristle grass

**Yellow bristle grass (YBG) is an unwanted grass weed which is rapidly spreading south. While mainly concentrated in the Waikato and Bay of Plenty, in Taranaki it is rapidly spreading and has recently been observed as far south as Ashburton.**

Too often growers spray out paddocks right to the fence-line prior to sowing crops 0.5 to 1 m in from the fence-line. After sowing, the un-sown fence-line strip generally receives no other herbicides (a risk factor for the development of resistance) and tends to become choked with weeds which often invade further into the paddock and add significantly to the weed seed bank.

A FAR trial investigating the use of suppressive species for paddock margins was set up on a 6 ha continuous maize-annual ryegrass rotation paddock on a Waikato dairy farm belonging to Geoffrey and Rowena Peake. The object was to control fence-line weeds using non-invasive suppressive species combined with minimal herbicide use.

Geoff Peake says having followed FAR's efforts to keep YBG away from his maize crop for two and a half years, in his eyes the most successful edge planting of the field to prevent and suppress YBG has been the legumes.

"That is the lucerne, red clover and white clover all as pure swards. These have had minimal spray applications for maximum returns and can supply additional nitrogen to the outside maize rows. The least successful edge planting has been ryegrass or bare ground with multiple spray treatments. This was because of repeated germinations of YBG in these areas. Prairie grass has some positives and negatives. Positive because while initially the areas had severe YBG infestations, the spraying controlled this and then the prairie grass became very suppressive. Negative because it did not withstand winter stocking rates well."

Geoff says that even though he lost close to 0.1 ha of land to the suppressive species, it has been very satisfying to have a clean fence-line margin with strong tall maize plants growing

on the crop edge and that major weed transfer has been considerably reduced to other parts of the crop. However he adds that the amount of extra feed supplied to cows by the suppressive species has been minimal, as they had grown rank and woody by the time the maize had gone.

"If it were possible, a timely mowing might improve feed quality and utilisation. However, the main function was to smother weeds, not provide animal feed."

He concludes by noting that suppressive species will never eliminate YBG on their own, and that timely (and often repeat) herbicide applications will continue to be part of the control plan for this difficult weed.

## Trial method

As the paddock was already sprayed out to the fence-line, 1 m+ wide replicated strips of either red clover (Sensation), white clover (Kopu 11), Lucerne, perennial ryegrass (Nui)-white clover mix, and prairie grass were sown in the early autumn of 2013. The site's main weed species were black nightshade, water pepper, willow weed, fathen, seedling docks, Californian thistle, smooth witchgrass, summer grass and yellow bristle grass. To control these weeds, in late October the clovers and lucerne were sprayed with 400 mls/ha imazethapyr (Equate®) + 0.5% oil (Hasten™) and the ryegrass-clover mix with 3 l/ha MCPA + MCPB (Tropotox® Plus). In early December all species were sprayed with 750 mls/ha fenoxaprop-p-ethyl (Puma® S) to control yellow bristle grass. Further applications of these herbicides were made in the 2014/15 season.

In both seasons maize followed the annual ryegrass, and the pre-emergence herbicides acetachlor (Roustabout®) and saflufenacil (Sharpen®) were used. The narrow margins between the maize crop and the suppressive species received two applications of nicosulfuron (Neeko™ Oleo) in the 2013/14 season and two of topromezone (Arietta®) in the 2014/15 season.

Mike Parker, Research Manager - Agri-chemicals



# MPT trials update

The first ever Maize Hybrid Performance Trials (MPT) harvest is complete. Trial plots in Waikato and the Bay of Plenty were harvested for silage and grain, while silage only was taken in Canterbury.

Silage harvest went well with the aim of harvesting each of the hybrids at 35% Dry Matter, about the optimal DM content for ensiling. There was some variation in DM between replicates, largely because of the dry conditions affecting different parts of the trial block differently. All plants from a single row in each plot were harvested, and weighed, and all these plants were then mulched using a chipper adjusted to replicate the cut of a silage harvester at 10-15 mm. A sample of this material was then taken for DM testing, and a full Forage Feed Analysis was also undertaken.

A brief summary of this first year's results will be published when fully analysed, but already we have seen some difference in the feed quality of different maize hybrids, as well as in dry matter yields.

We have also measured any lodging in the hybrid plots, as well as any incidence of significant plant or cob disease.



Photo: Mulching maize silage samples for dry matter samples.

Grain harvest was completed in April for both the WARS and BOP sites. This involved harvesting all cobs from a single row in each plot, then shelling the grain from these cobs. We have purchased a Dickey-John GAC 2100 Agri grain moisture meter, an industry standard unit, for measuring the grain moisture and bulk density of the grain from the different plots.

The Maize Technical Committee of New Zealand Plant Breeders Association met in early May to review the first season of trials, and plan for the coming season.

## A survey of garden pea seed in Canterbury

In response to concerns over the challenges of growing garden peas for seed, FAR teamed up with Canterbury Seed to conduct a survey of 13 garden pea seed growers in the Mid Canterbury region. The object of the survey was to help identify the factors that influence yield, and to determine the status of the garden pea seed industry since the previous FAR survey in 2006.

Paddock history records were collected and soil and plant tissue samples were tested at the beginning of the 2014 season. Plant counts and root disease assessments

were made at pre flowering, and crop vigour and canopy development assessments were also carried out. Combine yield and shatter losses were assessed at harvest.

Rainfall for the growing season was 31-55% below the long term average, with dryland crops being particularly affected by water stress, which impacted on yield. The dry season also had an impact on disease development, with a weak relationship between disease and yield in a low disease pressure season. Other relationships that showed up in the survey included:

- Weak relationships between sowing date and plant population and yield.
- Relationship between crop ground cover and the amount of light the canopy intercepted and yield.

The average crop yield across all 13 growers was 2.8 t/ha which is in line with the industry average of 3 t/ha. The survey indicated that crop rotation, cultivation, soil borne diseases and canopy development should all be considered as areas for future research.

# Arable kids

## Activities for wintery days!

Don't let staying inside on winter days drive you to despair, there are loads of fun indoor activities to keep you entertained! If you find yourself with nothing to do, pick something from the list below and kick that boredom to the curb!

### Family movie night

On a cold winter evening, turn the family room into your own personal theater. Find a movie the whole family will enjoy, pop some popcorn, grab a blanket, settle in, and enjoy the show!

### Fort fun

The next rainy day that comes around, build your own super fort out of furniture, blankets, and cushions.

### Break out the board games

Whether you are snapping up real estate in Monopoly or sliding down a snake in snakes and ladders, playing board games is a great way to spend a leisurely day at home.

### Dance party

Release pent up energy with some energetic music and slick moves. Turn your room into a disco hall, put on your favourite tunes and dance the day away!

### Read a book

Whether it's a re-read of a favourite or a trip to the library or on-line store for a new book, reading is a great way to transport yourself to another world for a few hours!

### Hide and seek

There are so many fabulous hiding places around the house, why not test your stealth with this classic game.

### Charades

Charades is a great family game for a rainy day. To begin, split into two teams and move into separate rooms. Each team should write down words, names, places, books, movies, etc. on pieces of paper. These are then exchanged with the other team's. Teams take turns picking a piece of paper and silently acting out what's on the paper. Each time a player takes a turn, use a stopwatch to track the time. The team with the shortest overall time is the winner.

## Kids cooking

A warm breakfast on a cold morning is always good! Impress your family by learning how to make this healthy and yummy breakfast yourself!

### Porridge

- 160 g rolled oats
- 600 ml milk, soya milk or water
- Salt

Place the oats and the milk or water in a large pan over a medium heat.

Add a tiny pinch of salt and stir with a wooden spoon.

Bring to a steady simmer for 5 to 6 minutes, stirring as often as you can to give you a smooth creamy porridge – if you like your porridge runnier, simply add a splash more milk or water until you've got the consistency you like.

### Stewed fruit

- 500g seasonal fruit, such as rhubarb, apples or pears
- Caster sugar, to taste

When stewing fruit, it's best to decide for yourself how much sugar to add – if your fruit is really ripe and sweet, you'll need less. Just have a taste as you go along and add more if you think you need to. Be careful when tasting as it gets really hot!

Chop up all the fruit, discarding any stones.

Place the fruit in a pan. Add the sugar – start with approximately 2-3 heaped teaspoons. Add 2 tablespoons of water and cook on a medium heat with the lid on.

Once the fruit has softened, remove the lid and let the liquid reduce – you want to end up with a fairly thick consistency.

Remember stewed fruit doesn't just go with porridge! Add it to cereal, pancakes, ice-cream, yoghurt or eat it by itself.

## Congratulations to our competition winners!

Tomas Harrison from Ashburton and Emma Johnson from Leeston

Give this issue's competition a go to be in to win





# Arable kids competition

**Ages up to 7 years:** Colour in the rainy day picture and send it in to FAR to be in to win.



**Ages 8 to 12 years:** Transport yourself to the year 2035, what will farming be like in the future? Either write a story or draw a picture (or both!) to show how you think the farms of the future will be. Send it in for a chance to win.

Name: ..... Age: .....

Address: .....

Postcode: .....

Tel: ..... Fax: ..... Email: .....

**Return your entry by Friday 31 July 2015 to:**

Arable Kids Competition  
FAR  
PO Box 23133  
Templeton 8445

## GOOD LUCK!



# New forage research position

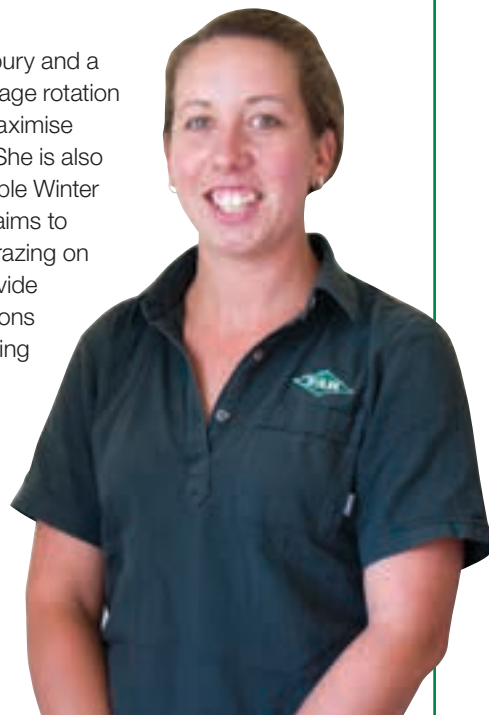
We are very pleased to announce the appointment of Elin Arnaudin to the new position of Research Manager – Forage Crops. She brings to the position her experience on working in Cereal Forage crops and a solid understanding of animal nutrition in the context of an arable rotation.

This is a critical new role as FAR moves to take on research in the areas of fodder beet and brassicas, not only from a crop husbandry perspective, but also from their impact on our whole farm systems. We look forward to the development of new projects and collaborations in this area.

Elin came to New Zealand from the United States in 2012 after completing a Masters of Crop and Soil Environmental Sciences at Virginia Tech. After working six months on a dairy farm in Te Pirita, Elin joined the FAR team as a Trials Officer. In her 2 ½ years with FAR, she has been involved in a range of projects which have centred around forage crops and their role in arable systems. Current trial work includes an autumn cereal silage trial in conjunction with Plant & Food Research, a double

cropping trial in Canterbury and a long-term alternative forage rotation trial in the Waikato to maximise dry matter production. She is also involved in the Sustainable Winter Grazing project, which aims to assess risks of winter grazing on arable farms and to provide good management options (see page 16 Dairy grazing article). Work from this project feeds into MBIE programme, Forages for Reduced Nitrate Leaching, where Elin represents FAR.

Contact Elin at [arnaudine@far.org.nz](mailto:arnaudine@far.org.nz) or phone 03 345 5783



## Arable Research Group tours WARS

Members of the Northern North Island ARG met in February to tour the WARS site and discuss current and future maize research needs. Environmental issues were high on the list of concerns, with weed and disease management also up for debate. The group, from left: John Hodge, Chris Pellow, Grant Dixon, Kevin Hickey, Allister Holmes, Rowland Tsimba, Greg Edmeades, Colin Jackson, Mike Parker, Alan Henderson, Ian Gavin and John Austin.



# Members of the FAR Board



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DR TONY GREGSON  
Appointed Member

To get all the latest arable information and updates visit  
**[www.far.org.nz](http://www.far.org.nz)**

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