

Rice Industry Field Day

Smarter farming for all seasons.

3rd March 2016



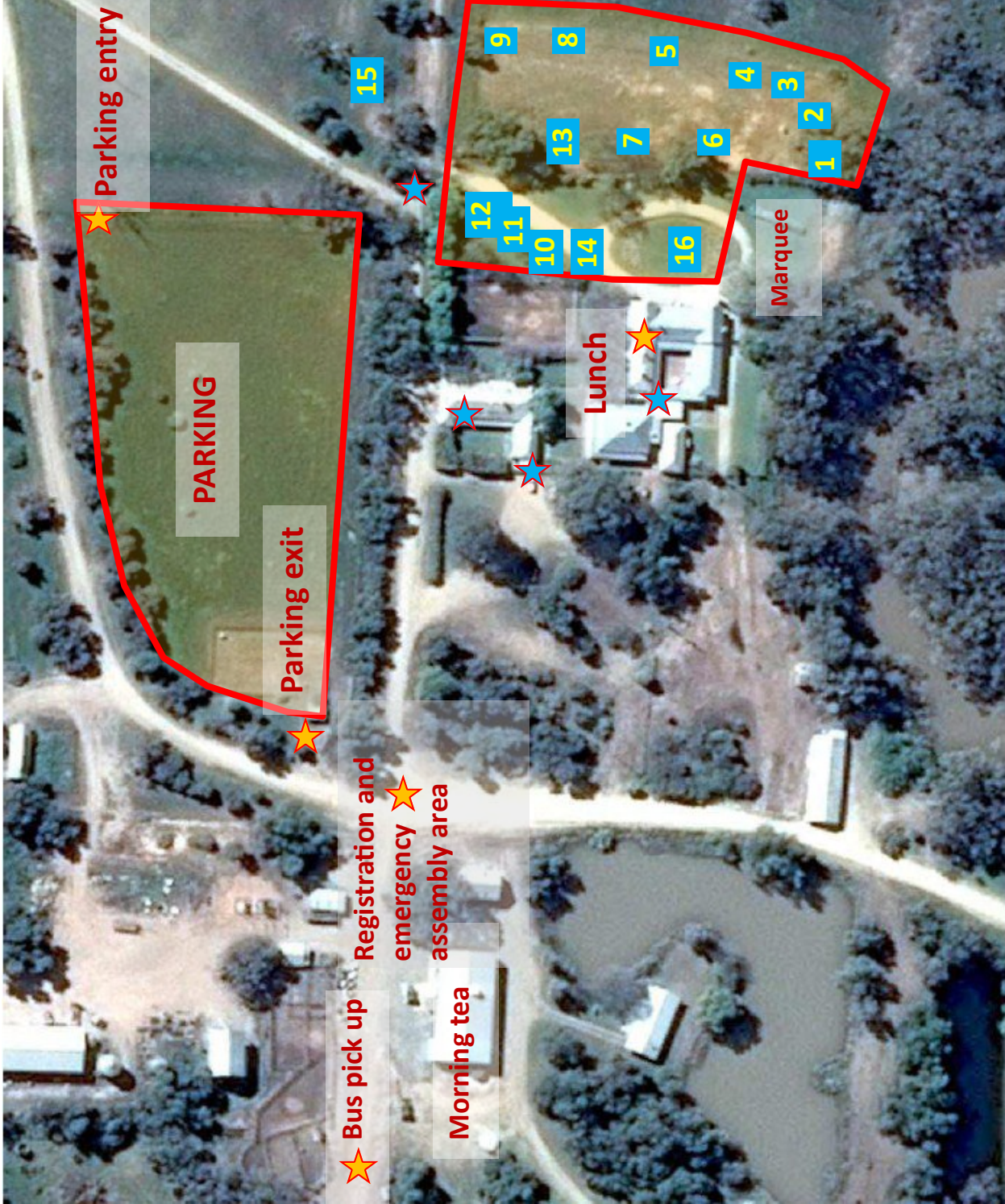
PROGRAM

2016 Rice Industry Field Day
Smarter farming for all seasons.

9.00am	Registration and Morning Tea			
9.30am	Introduction- Russell Ford, Manager of Rice Research Australia Pty Ltd			
9.35am	Welcome Ian Mason, Chair of Rice Research and Development Committee for Rural Industries Research and Development Corporation			
9.45am	Move to buses for travel to the field sites OR stay at the Homestead Marquee			
Field sites- The latest research				
Field Site 1	Field Site 2	Field Site 3	Field Site 4	Homestead marquee
<p>Peter Snell: Agronomic and sowing time recommendations and double-cropping options for new rice varieties.</p> <p>Tim Ford: Fodder as a rotational tool in the rice farming system</p>	<p>Malcolm Taylor: Winter crop herbicide residual impacts in the rice farming system</p> <p>Malcolm Taylor: What options are available in drill sown rice when pre-emergent herbicides are missed?</p>	<p>Harry Kooloos: Adopting delayed permanent water: a growers experience</p> <p>Nick Morona: Double cropping: a growers experience</p>	<p>John Hornbuckle: Using technology to improve decision making - the use of IRRISAT, drones & thermal imagery</p> <p>Sam North: Soils under an irrigated environment</p> <p>John Smith: Maximising on-farm irrigation profitability</p>	<p>Phil O'Callaghan, ORM Consulting: Risk Management- The rewards for managing risk</p> <p>Graham Christie, NSW Rural Financial Counselling Service: How can I benefit from the Rural Financial Counselling Service?</p> <p>Aimee Snowden, The Lego Farmer: Innovative thinking-The legacy of the Lego Farmer!</p>
Cooking demonstration by the Sunrice ambassador - Poh Ling Yeow				
12- 2.00pm	Lunch - Including machinery and static trade displays			
2.00pm	Welcome and drawing of the lucky door prizes			
2.05pm	Q and A session with a focus on new marketing initiatives			
2.40pm	Grower Update			
4.00pm	Wrap up- Did we learn anything today?			
4.10pm	Social BBQ and Refreshments			
	<p>Glen Andrezza, Chairman of Rice Research Australia Pty Ltd</p> <p>Poh Ling Yeow – SunRice ambassador</p> <p>Craig Young – SunRice Senior Marketing Manager</p> <p>Rob Gordon - SunRice CEO</p> <p>Laurie Arthur - Sunrice Chairman</p> <p>Glen Andrezza, Chairman of Rice Research Australia Pty Ltd</p> <p>Everyone welcome - Berriquin Branch, RGA</p>			

Trade displays

1. Rice variety sampling with NSW DPI
 2. CopRice and Riviana
 3. W&P Pumps
 4. Pine Rise Pumps
 5. Echuca CIH
 6. RiceGrowers Ass, Feed Central, IREC, Riverina LLS
 7. Koch Fertiliser
 8. Serafin Machinery
 9. MIL Cast
 10. SST
 11. Hi-Tech Ag
 12. Independent Precision Ag
 13. Hutcheon & Pearce, Finley
 14. H2OX
 15. Eagle I Machinery demo
 16. Research poster display
- ★ Toilets



200

LOCATION OF FIELD SITES

Buses will leave at 9:45 am, if you miss the bus follow the Field Day signs out to the sites. Parking is available at Site 1.



BUSINESS & INNOVATION FORUM PRESENTERS

PHIL O'CALLAGHAN, Managing Director and founder of ORM Pty Ltd

Contact: 03 5441 6176 **Email:** phil@orm.com.au



Phil is the Managing Director and founder of ORM, an agricultural consulting and agri-extension company based in Bendigo Victoria.

ORM comprises a team of 19 providing business management advice to growers, workshops/seminars and publications to the ag industry.

Since commencing ORM 24 years ago Phil has worked with hundreds of farming businesses, and contributed to the development of comparative analysis for broad-acre farming. Phil uses comparative analysis to support families to fine tune, grow and achieve their business and personal goals.

Phil also farms 3,000 hectare located across the Wimmera and Mallee, and employs 4 fulltime and up to three casuals during peak times. Phil finds the farm a good reality check for ORM's consulting roles and enjoys the opportunity to transfer business principals into practical farm management.

Phil continues his commitment to improving the profitability and sustainability of Australian farmers.

GRAHAM CHRISTIE, Rural Financial Counsellor, Coleambally

Email: GChristie@rfcsnsw-sr.com.au



Graham has a balanced understanding of agriculture at all levels – as a former lecturer on farm management at the University of Melbourne, Glenormiston Campus and with hands on experience running mixed, irrigation and livestock farms in western Victoria and the Riverina.

He relates well to farmers, he knows what it is like dealing with the day-to-day issues of managing changing water allocations and watching the political issues unfold.

Graham knows the importance of financial analysis, budgeting and planning, and he delivers these services to farming families to help them identify the best path for their future.

Graham's qualifications include: Diploma of Agricultural Science (Dookie), Graduate Diploma of Agribusiness (Caulfield, now Monash) and a Diploma of Community Services- Financial Counselling (Adelaide TAFE).

BUSINESS & INNOVATION FORUM PRESENTERS

AMIEE SNOWDEN, Farmer and founder of the Lego Farmer & Finalist in the 2016 NSW RIRDC Rural Women's Award



Aimee Snowden hails from an irrigation farm between Finley and Tocumwal, where her family specialise in lucerne hay production. Aimee has currently returned home to the farm, after working locally in accounting and irrigation. Aimee is currently studying a Bachelor of Agricultural Business Management through CSU Distance.

In September 2014 Aimee created the Lego Farmer, now Little Brick Pastoral, to celebrate Australian agriculture. The Lego Farmer has received a worldwide following, and has provided many opportunities for Aimee to share her passion for agriculture.

Aimee was an Australian Delegate to the Youth Ag-Summit in 2015, and has recently been named a 2016 RAS Rural Achiever for the Sydney Royal Easter Show, and is one of four finalists in the 2016 NSW RIRDC Rural Women's Award.

FIELD PRESENTERS –the latest research

PETER SNELL, Rice Breeder, NSW Department of Primary Industries

Contact: 0428 890 507 **Email:** peter.snell@dpi.nsw.gov.au



Dr Peter Snell has 17 years rice-breeding experience at Yanco since his appointment in 1998 and is responsible for the release of five commercial rice varieties. He has implemented a wide range of new techniques including increasing the number of quantitative measures recorded throughout small plot testing, and increased accuracy in determining breeding value through the use of restricted maximum likelihood statistical methods to account for field-based spatial variation and lab-based temporal variation. He has re-introduced backcrossing into the program for germplasm enhancement and stress tolerance.

Peter is the lead researcher evaluating aerobic rice varieties for temperate and tropical production in Australia and has a Bachelor of Agricultural Science (Hons 1) and a PhD in crop physiology. His current projects include Rice Cold Tolerance for Yield Stability and Water Use Efficiency, Rice Improvement, and Enhancing Rice Germplasm Development for Transforming Production Systems in Cambodia and Australia.

Peter's interests include rice breeding and genetics, genetic improvements in rice water productivity, and genetic improvements through selection to abiotic and biotic stresses.

FIELD PRESENTERS—the latest research

TIM FORD, Managing Director of Feed Central

Email: TimFord@feedcentral.com.au



Tim Ford is the founding Managing Director of Feed Central. Feed Central provides Feed Testing and on farm Visual Testing services across the country for more than 300,000 tonnes of hay and grain. Feed Central also has a trading / marketing arm in which we supply to domestic customers. Right here in the Riverina Feed Central supplies dairies, chaff mills and graziers, as well as the UWE Export Hay Facility at Griffith. Feed Central invites you to come and meet the team and ask any questions during this field day.

MALCOLM TAYLOR, Agropraisals Pty Ltd

Contact: 0427 722 892 **Email:** malcolmc.taylor@bigpond.com



Malcolm Taylor, Managing Director of Agropraisals Pty Ltd has conducted rice weed control research since 1981, managed over 1200 replicated field trials and contributed data towards the registration of all Australian rice herbicide products. Malcolm's research delivers innovations in rice weed control practices that assist to sustain economic production of rice in Australia.

FIELD PRESENTERS—the latest research

NICK MORONA, Rice Farmer, Deniliquin



Nick Morona farms with his brother Steve north of Deniliquin and at Boorooban. They have 3000ha of irrigation with dry land. They usually grow 1500ha of cereals and 400ha of rice, they run fat lambs and produce hay. He has planted 120 ha of rice this season.

Nick enjoys trying different cropping systems and rotations and trialing different irrigation layouts. Pioneering v-bays with drive over banks with Harry Kooloos.

He believes the new short season rices are going to change cropping systems/rotations so that we can be sustainable to compete on the temporary water market.

HARRY AND JENNY KOOLOOS, Rice Farmer, “Amarran”, Mayrunga



Harry has an engineering background and his three sons are all engineers. It is this background combined with Harry’s innovative and investigative mindset that sees Harry at the forefront of Drill sown rice and other management practices such as Stubble incorporation, V-bay irrigation systems, semi automation irrigation infrastructure, worked closely with Padman stops and hosting winter cereal National Variety Trials (NVT).

Harry and Jenny farmed 328 ha downsizing to 253ha over recent years. Harry has 43 ha of rice sown this year. Harry has been drill sowing for 15 years and practising Delayed Permanent Water (DPW) for the last 5 years with success, yielding 11.3 dry tonnes/ha of Opus in 2014/15 season and a whole grain yield of 71%.

The adoption of DPW came about due to cotton being grown locally and the associated issues with chemical drift applied from the air, however “I wouldn’t go back to aerial sown even if there was no cotton in the area”.

Harry has also been always thinking and nutting out better ways to do things -whether modifying a piece of machinery or a more efficient way to water. Harry has also hosted rice herbicide trials on his farm and many visiting groups of students, farmers and industry people.

FIELD PRESENTERS—the latest research

JOHN SMITH, Research Officer, Irrigation—NSW Department of Primary Industries

Contact: 0427 060 597 **Email:** john.smith@dpi.nsw.gov.au



John Smith commenced work with NSW DPI in 1994 as a Technical Officer for the Rice Breeding program and Rice Physiology projects based in Deniliquin and continued in that role until 2005 when he became the District Agronomist for Barham.

John continued as DA Barham until the start of 2013 where he moved and commenced a development role within the cotton industry based on the Darling Downs. In 2014 John started a PhD candidature with the University of Queensland through a Cotton Research and Development Corporation scholarship investigating the influence of irrigation system and fertiliser management practice on nitrogen use efficiency in irrigation cotton.

In 2015 he took up a research role within the Water and Irrigation team of NSW DPI based at Yanco Agricultural Institute, where his focus is on increasing water productivity within the broad-acre irrigated systems of southern NSW. His PhD will also contribute to this area work.

SAM NORTH, Research Hydrologist, NSW Department of Primary Industries

Contact: samuel.north@dpi.nsw.gov.au



Sam North is a Research Hydrologist with NSW Department of Primary Industries based at Deniliquin.

He joined the NSW Department of Agriculture in 1989 and in 2002 was appointed to the position of Research Hydrologist (Irrigated Farming Systems). Since then he has examined ways of improving the agronomic, hydraulic and operational performance of basin (contour) irrigation systems; determined benchmarks for profitable use of pivot / linear move irrigation; and developed management guidelines for irrigation with saline-sodic groundwater.

Between 2010 and 2014 he led research into the salinity tolerance of Australian rice cultivars as part of a larger ACIAR funded project looking to improve rice establishment and productivity in Australia and Cambodia.

He is currently leading a GRDC project (*Soils under an irrigated environment*) which aspires to increase grain production and profitability from surface irrigated soils in the GRDC Southern Region.

FIELD PRESENTERS—the latest research

JOHN HORNBUCKLE, Associate Professor, Deakin University

Contact: 0429862920 Email: j.hornbuckle@deakin.edu.au



John is an irrigation and drainage engineer focusing on improving water use productivity in irrigated agriculture systems.

John is currently developing and investigating irrigation design and water management tools and technologies for improving water use efficiency, maximizing production and minimizing the environmental footprint of irrigation across a range of scales. He is the project leader for the IrriSAT Satellite Irrigation Water Management tools which are being developed for irrigation water management and

benchmarking irrigation productivity. He currently leads Deakin University's Centre for Regional and Rural Futures (CeRRF) Irrigation Research group and has a range of national and international projects focused on irrigation research.



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Business Risk – How to manage it.

Phil O'Callaghan, ORM. Business Consulting and Agri-extension

An important criterion of risk is the relationship between losses in poor years versus profits in good years.

Over the last twenty years total \$ spend per business has increased up to three fold. As a result it is now the size of the loss in the poor years that is the main determinant of sustainable farm profit.

Enterprise selection, crop rotation and farming practice determine how much we spend hence are key to farm business risk. Management systems aimed at optimizing production with associated careful cost control have a better risk profile than for businesses targeting maximum. Maximum production in the good years is no longer top 20% profit performance. Best profit businesses have lower income volatility and often have lower income per hectare. Lower income is offset by lower costs, so that in low income years the financial loss is less.

Take home messages

- Managing risk through cost control has become the key to sustainable profits and equity growth.
- When selecting land use and enterprise mix, balance potential return with reliability of return.
- In a low income year the highest cost paddocks in the crop rotation will be the first to make a loss.
- Remove high cost paddocks by changing the land use.
- Paddocks requiring higher inputs of fertilizer or herbicides are high cost/high risk paddocks. Look for an alternative land use to reduce costs while also complimenting the rotation.
- Income volatility increases with crop intensity. Look for a rotation that has least exposure to climatic events but still generates sufficient income to achieve a cash-flow profit.
- Match costs to “5 year average” income, then budget 8 - 10% cash profit. Healthy businesses make cash-flow profits in at least 66% of years.
- If one cost area increases (such as interest costs) then offset by spending less in another area eg machinery capital.
- Financial buffers are a risk management tool. To ensure profits go to the things most needed, plan your profit allocation prior to making profits ie at budgeting time.
- A better understanding of the cost of production and financial risk management is essential for farming businesses to prosper into the future. Farmers and their advisers need to understand the drivers of profitability in the business, and how the business compares with others in the industry
- It is clear that for leading farmers the yield gap has closed and managing the cost of production and risk is now the key to long term profitability.

How can I benefit from using the RFC service?

Graham Christie, Rural Financial Counsellor, Coleambally

The Rural Financial Counselling Service provided in NSW is divided into 3 sections and managed by 3 separate and independent organisations. In the south of the state by Rural Financial Counselling Service NSW – Southern Region.

The organisation and service is funded by state and federal allocations and so provides a free and confidential service to all farmers and small rural business owners that seek our support.

It is important to note that the service provided is NOT an advisory service and in no way competes with professional farm or financial advisors.

The support provided by a Rural Financial Counsellor depends entirely on the needs of the individual client and the issues they are dealing with at the time.

Examples of the range of discussions and support include but are not limited to are as follows:

- Planning for your future in farming
- Accessing Government assistance – e.g. Farm Household Allowance
- Help in identifying your financial position
- Cash flows, budgeting and forecasting
- Developing bank relationships
- Reviewing your loans
- Help with refinancing your debt
- Farm debt mediation
- Family and farm decision making
- Access to other services – referrals to professional advisors

What are the benefits of involving a RFC in my business?

- Consideration and evaluation of alternative solutions to problems and opportunities.
- Access to a range of experiences from within the RFC group
- Support in dealing with financial institutions – preparation of reviews and applications eg - RAA – Farm Innovation Fund. See below
- Remember ***“you only get one chance to make a first impression”***
- Support in managing a farm debt mediation situation.
- An RFC is an independent person with no interest other than to benefit the interests of the clients

One program that RFC's can be involved in is in utilising the Farm Innovation Fund for farm development. The Farm Innovation Fund is a package to assist primary producers identify and address risks to their farming enterprise, improve permanent farm infrastructure and ensure long-term productivity and sustainable land use, aiding in meeting changes to seasonal conditions.

A feature of the application for this fund is the need to prepare a farm business plan incorporating an assessment of the risks confronting the business and detailing how the application of the loan funds will address the risks.

Currently, the fund will support loans up to \$250,000 for up to 20 years at an interest rate of 2.5%. The length of the loan is dependent on the type of project the funds will be used for.

For information about the Farm Innovation Fund see: <http://www.raa.nsw.gov.au/assistance/farm-innovation-fund>

Contacting the Rural Financial Counselling Service in the rice growing areas:

Cooma - Head Office: 0264525850

Coleambally: Graham Christie 0269544179

Deniliquin: Murray Freshwater 0358815766

Griffith & Leeton: Haidee Laycock 0269623812

Hay: Darren Macartney 0269934130

Hillston: Linda McLean 0416235759

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David Toohey	0427 515 179
Justin Whittakers	0429 802 664



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LANDMARK

Lego, Farming, some Social Media, and Opportunities...

Amiee Snowden, Farmer and founder of the Lego Farmer

Lego and farming may seem like an odd combination, but that is what makes the Lego Farmer unique.

Aimee Snowden has always felt the drive to share her agricultural story, and a mutual love of Lego and macro photography, saw the Lego Farmer born in September 2014. Since beginning the photographic blog, and sharing the images on social media, the Lego Farmer has been shared around the world.



The Lego Farmer is a Lego minifigure created to represent farmers in Australia and around the world, and he stands at just 4 ½ cm tall! His Lego pieces are carefully chosen - a wide-brimmed, Akubra-style, hat representing all Australian farmers who work under our hot sun. Green overalls, whilst a stereo-type, are a worldwide recognised symbol of agriculture. And a smiling face, which eclipses the generous and welcoming attitude of farmers.



On the 1 January 2016, the Lego Farmer became Little Brick Pastoral to continue to share and celebrate Australian agriculture throughout the world, and to also take advantage of impending opportunities.

Aimee has a website and blog, as well as using three forms of social media, to share photos of the Lego Farmer with the rest of the world. The use of social media has allowed many to participate in conversations about the Lego Farmer and what he is doing, as well as providing an easy platform to share the images to reach large audiences.



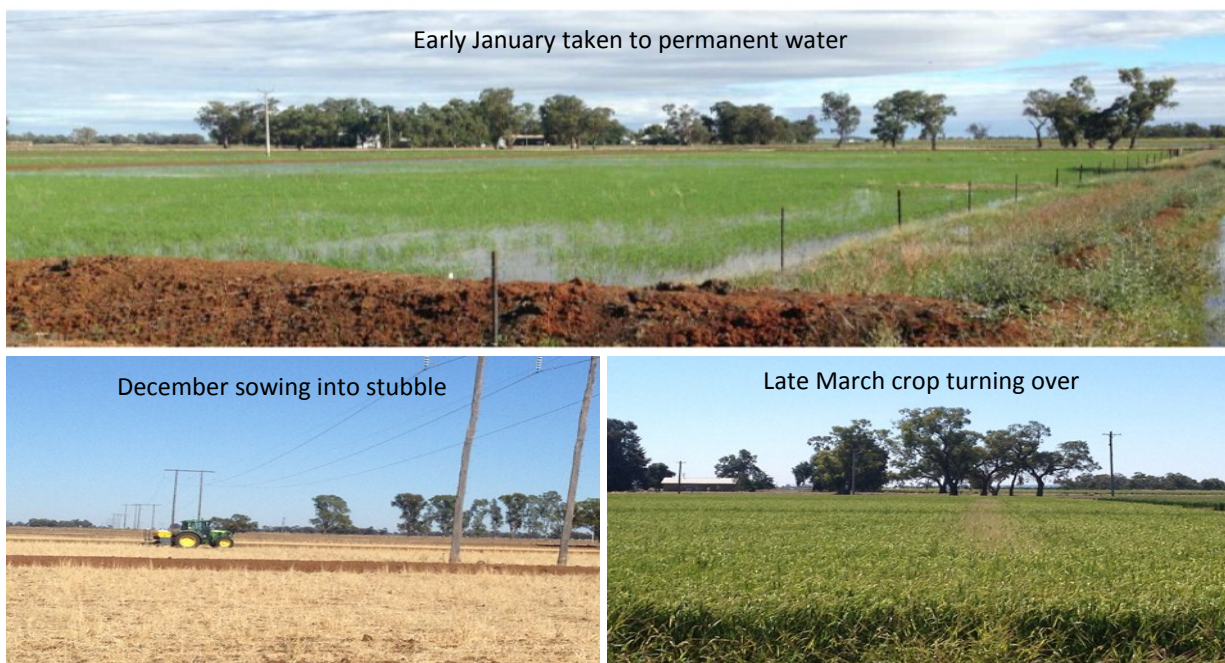
The sharing of the Lego Farmer images has provided Aimee with countless opportunities to share her agricultural journey, celebrate Australian agriculture, and introduce audiences to the diversity of farming in Australia. Aimee has been interviewed on national radio, had articles on international news websites, participated in a global youth agricultural summit, and attended Lego Exhibitions.



Variety Development: Flexibility for growers / options for outside the square

Peter Snell and Ben Ovenden, NSW Department of Primary Industries, Yanco

With higher levels of cold tolerance than their predecessors, future releases are set to carve out new rice rotation schedules to overcome on-farm labor shortages and water allocation uncertainties generally associated with current spring sowing options. These new varieties are also poised to capitalise on the full potential of existing premium markets, by allowing either comingling at delivery or through their suitability as an over-sowing options for Reiziq and Opus.



A third likely release, YRL127 a cold tolerant Doongara replacement will allow the industry to service the current global shortfalls in low GI rice. As our most lucrative export markets are also those countries in which Type II Diabetes is becoming more prevalent amongst their younger generation. It is of no surprise that rice is becoming a food ingredient for which healthier options are sought. Australian growers through SunRice are well placed to reap benefits through the pro-active “Wellthy” (well-being and healthier eating) product portfolio supplied thus far. Currently a low GI medium grain variety is lacking but likely to be forthcoming from the Partnership to ensure Australian growers stay ahead of trending food choices.



IMAGE—Top 9 Global Incidence of Diabetes per Capita


What is the fodder market looking for?

Tim Ford, Managing Director of Feed Central

If you want to know what the market is looking for you are best to ask who the market is. The fodder market is divided into two groups: Domestic and Export.

The Domestic Market group is made up of Dairies, Feedlots, Graziers, The Drought market and Niche market. Each of those sections that make up the Domestic Market Group have different needs and look for different products within the fodder industry. For example:

- **Dairies** look for legume Hay with high protein and energies.
- **Feedlots** look for cereal hay and straw, they not only look for attractive hay of high quality that smells and looks nice but they also need lower quality hays that will act as fillers for rations.
- **Graziers** look for in-between feed and for a pasture replacement. This can be anything from green and fresh hays to fillers.
- **The Drought market** look for clean and green quality hays
- **The Niche market** includes many different operational needs for example the performance horse industry which looks for great quality feed with high energies.

Summary of DOMESTIC Specifications
9.5 M.E.
FC A (minimum visual score of 600)
Shedded
8x4x3 bales over 600kg
Highest moisture 18%
 FEEDcentral Hay & Grain - Quality & Marketing Services

The Export Market group is a large section of the market which looks for high specifics (quality) in their product (see Summary of EXPORT Specifications chart) and a large quantity. The Export market looks for high quality square 8x4x3 Oaten hay bales.

Summary of EXPORT Specifications
FC A (minimum visual score of 600)
No visual rain damage
Shedded
8x4x3 bales over 600kg
ADF (Range: 33-42%)
NDF (Range: 55-65%)
WSC (Range: 16-24%)
Highest moisture 14%
No contamination
Fresh Smell
Green and a thin stem preferred



Quality is of the highest importance, those in the Fodder Market want to receive exactly what they are looking for with the quality to back it up. No one likes receiving something that does not meet their needs and expectations.

So that begs the question: What does a good quality product look like? Free of weeds, sticks, rocks, dirt and animal carcasses. Low moisture levels that enable safe storage, no spoilage (which includes no bad bacteria or mould) and with the right amount of proteins, fibres, minerals and energies, therefore a good quality safe product which can be used for the buyers operation .

To be able to achieve Quality hay here are few tips:

- Plant Thick
- Do not plant and / or cut close to tree lines or trees
- Plant into a clean stick free / root free country
- Remove dead animals prior to planting
- Roll paddocks promptly after planting
- Cut the crop at a height of at least 20cm from ground level
- Use a Re-conditioner or Macerator – dry down to 18% (domestic) 14% export
- Keep raking to bare essential
- Move the hay into covered and well drained areas immediately after baling — *continued on next page.*



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SIZE & SHAPE OF BALES

When comparing the size and shape of bales there are many factors to consider, please review the below content:

Square bales

- Diverse Market Choice (Great for both Domestic and Export)
- Easier to store (Stack well)
- More efficient
- Less bales & more weight
- Logistically better
- Overall more cost effective per tonne

Round Bales

- Less popular with the Market (Only a select few in the Domestic Market will buy)
- More expensive to freight
- Special equipment to handle
- Easier to handle for a hobby farm
- Store better in the paddock than square bales
- Don't stack as well as square bales

HAY VS SILAGE

Silage can increase the digestive process and increase the nutritional value. It is easier to bale as it can be cut and baled within 24hrs therefore resulting in less exposure. When freighting silage your costs increase largely as there is a lot of water – 50% (PLUS) moisture compared to the 14% or 18% moisture in hay. The silage bales don't stack as well as normal square bales. You've also got extra expenses of wrapping material, limited marketing avenues (dairy farmers are the biggest buyers) and the need of special equipment to handle the wrapped silage. There are no export options for silage.

Hay is such a diverse product that comes in so many different sizes and varieties. It has a broad application and multiple uses. It is easy to handle, stacks and stores well (long shelf life) and is an effective way of feeding in an intensive environment. In simple terms silage is great to use on your own farm, but hay is best if you are marketing – unless you have a specific pre-harvest order for silage.

No matter what market you deal in quality is essential. Feed Central has been providing quality services to the fodder industry for 14 years and continues to do so. Feed Central are specialists in the domestic market and procure exclusively for UWE hay, at Griffith, for the export market.

We are happy to talk to you either at the field day or phone 1300 669 429 or Scott Bloomfield 0477 046 628.

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We are happy to talk to you either at the field day or phone **1300 669 429** or Scott Bloomfield **0477 046 628**.

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Herbicide carryover from preceding winter crops

Malcolm Taylor, Agropraisals Pty. Ltd.

Rice sown immediately after a prior cereal or broadleaf winter crop may be susceptible to injury from carryover of herbicide residues. The current rice crop protection guide has warnings in relation to carryover of Group A, B and C herbicides. Herbicide carryover will be influenced by temperature, seasonal rainfall, soil pH, organic matter and soil texture, thus it is difficult to offer definitive answers to questions regarding the risk of damage to a following rice crop.

In June 2015 we applied twelve different winter crop herbicides at twice their common use rate in a replicated study at Old Coree. The site remained an undisturbed fallow for the season, with the application of glyphosate twice across all plots. Rice was direct drilled in all plots in November 2015 with permanent water applied in late December 2015. Results from a visual rating of rice seedling biomass reduction (percentage of the untreated control) and seedling counts (plants/m²) are presented in the table below.

Rice biomass reduction ratings and plant counts showed severe – moderate injury to rice (in descending order) from INTERVIX, SAKURA, GLEAN, ATRAZINE, BOXER GOLD, SIMAZINE and LOGRAN. No or negligible injury was discernible with AVADEx XTRA, TRIFLURX, ALLY, STOMP and DIURON. In the most severe cases (INTERVIX and SAKURA) the injury has remained profound and can be expected to reduce rice grain yields.

This work will be repeated in order to develop improved guidelines for avoiding herbicide carryover injury to rice established immediately after winter crops.

FIGURE 1: Carryover of winter field crop herbicides into a subsequent drill sown rice crop, Jerilderie, NSW, 2015-16 season

Treatment	Form	Form	Form		Rate	Rice % biomass reduction		Rice Plants/m ²	
Name	Conc	Unit	Type	Rate	Unit				
untreated control						0	e	40	a
BOXER GOLD	920	GA/L	EC	5.0	l/ha	16	bcd	36	a
SAKURA	850	GA/kg	WG	236	g/ha	64	a	15	b
AVADEx XTRA	500	GA/L	EC	3.2	l/ha	0	e	40	a
LOGRAN	750	GA/kg	WG	70	g/ha	10	cde	30	a
GLEAN	750	GA/kg	WG	40	g/ha	29	b	31	a
TRIFLURX	480	GA/L	EC	4.0	l/ha	0	e	34	a
STOMP	440	GA/L	EC	3.6	l/ha	3	de	34	a
DIURON	500	GA/L	SC	1.0	l/ha	0	e	38	a
SIMAZINE	900	GA/kg	WG	2.2	kg/ha	15	b-e	35	a
ATRAZINE	900	GA/kg	WG	2.2	kg/ha	18	bc	38	a
ALLY	600	GA/kg	WG	14	g/ha	5	cde	31	a
INTERVIX	48	GA/L	SL	1.5	l/ha	76	a	15	b
						13.0		12.3	LSD (P=.05)
Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)						9.1		8.6	Standard Deviation
All treatments applied 4 th June 2015, Rice damage assessed 6 Jan 16						50.29		26.84	CV

Using technology to improve decision making : use of remote sensing from satellites to drones for NDRE and thermal imaging

John Hornbuckle, Associate Professor, Deakin University

Key Messages:

- New Sentinel-2 satellite data is freely available giving 7 day revisit and 10m resolution in addition to Landsat 30m imagery. This will all be available in IrrisAT on line free irrisat-cloud.appspot.com
- Sentinel-2 data also includes a red edge (RE) band which is sensitive to crop/canopy nitrogen content
- NDRE (Normalised Difference Red Edge) is a crop nitrogen sensitive index that may be an indicator of canopy N. The project 'Using remote sensing to predict PI nitrogen uptake in Rice' .
- These NDRE sensors are now available on fully automated drone platforms costing less than \$6000 US (Drone + Sensor) http://www.micasense.com/Sequoia_Brochure_J.pdf
- Drone platforms are fully automated including image processing and data analysis

IMAGE 1: Sentinel-2 (10m pixel) NDVI map

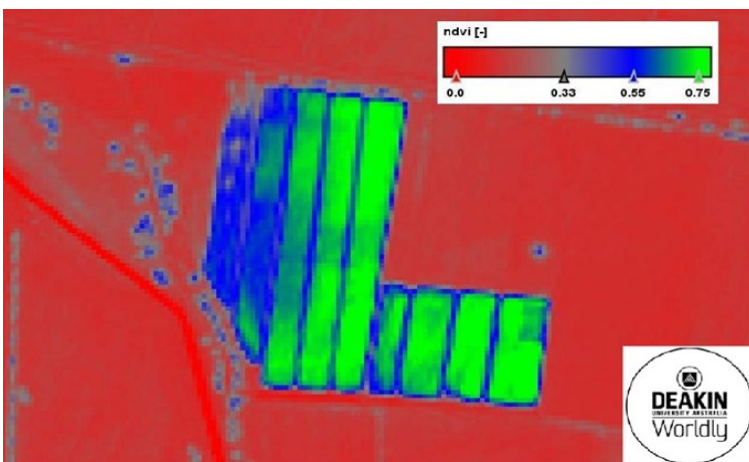
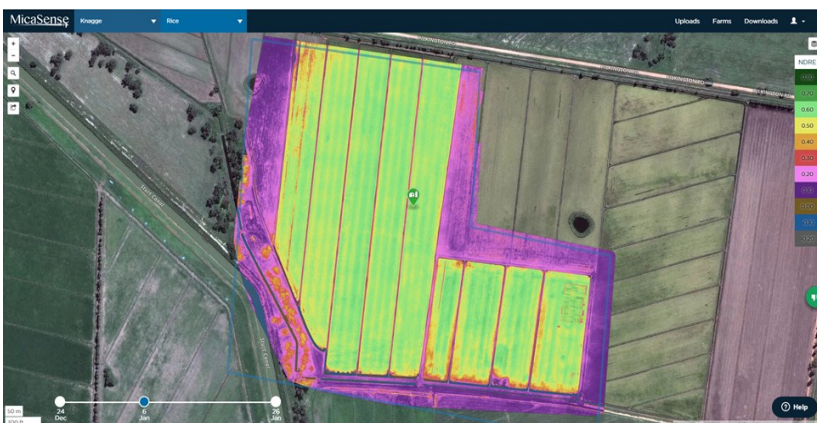


IMAGE 2: Hi-Resolution (7cm pixel) NDRE map



The project 'Using remote sensing to predict PI nitrogen uptake in Rice' - Brian Dunn, Tina Dunn & Iain Hume, NSW Department of Primary Industries - Remy Dehann, Charles Sturt University - Andrew Robson, University of New England is analysing the usefulness of NDRE and a range of remotely sensed data to derive PI N uptake maps. This will reduce the need to physically sample the crop and provide a greater understanding of the within crop spatial variability.

A farmer's perspective on adopting the practise of delayed permanent water (DPW) in drill sown rice?

Harry Kooloos, Rice Farmer, "Amarran", Mayrunga

With many years of experience under his belt, Harry Kooloos talks about the key components of success on his farm for managing a profitable DPW drill sown rice crop.

Paddock selection and preparation

- 4 ha bays are preferred as this size is complimentary to irrigation flow rates available on farm.
- Ground preparation begins in the Autumn by incorporating the stubble, preferably a wheat stubble
- Rice crops are sown as part of a 4 year rotation.
- Ground preparation must include wide boarding (grader boarding) to ensure a flat surface with no holes or areas where ponding will occur.
- On his soil type, Harry has found drill sowing can be adapted to many different irrigation layouts including V-Bays, bankless channel contour or border check as long as they can achieve somewhere near the following:
 - Water on and off within 12 hrs on the first flush
 - Water on and off within 8 hrs on subsequent irrigations which allows excellent internal drainage within the soil profile

Sowing

- Sowing commences 1 week prior to the recommended sowing window of aerial sown rice for that particular variety. Sowing needs to be early but needs the ground to be warm enough for rice and particularly barnyard germination.
- The sowing rate of rice is 200 kg/ha. He uses this higher rate because he believes less tillering occurs in DPW drill sown rice. He finds that the higher plant population compensates for the less tillers.
- The seed has a zinc dressing applied as it is augured from the truck to the grouper (note that soil tests show a deficiency in zinc).
- 130 kg/ha of DAP is sown with the seed.

- Leaving the surface flat after sowing is critical so a piece of railway iron is dragged behind the seeder to level the furrows left from the tynes and followed by a roller .

Weed and Pest control

- Sowing commences with a knockdown spray, usually Roundup and Striker a couple of days prior to sowing.
- The second spray in Harry's program occurs post the first flush and as the rice emerges (which allows the maximum number of barnyard grass (BYG) plants to germinate). The spray program Harry uses is a three way mix consisting of, 3L/ha of Stomp, 600ml/ha of Magister and 1.5L/ha of Gramoxone. ***"While the Magister and Gramoxone rates are on the upper limit of recommendations and cost an extra \$40/ha it is cost effective and very effective on BYG" Harry said "As usually no follow up BYG herbicides (Barnstorm or Aura) are needed, which costs around \$135/ha plus the plane".***
- Gramoxone is softer on the emerging rice compared to Glyphosate.
- The rice is flushed within 24 hrs of applying the three way herbicide mix to activate the Magister and build residual protection against weeds straight away.
- The third flush is applied 10-14 days later no matter if it needs it or not, as Harry believes "this 'reactivates' the chemical in a drying soil as well as making sure that the barnyard grass is not stressed, thus increasing efficacy".
- If you are unable to get on the paddock for the second three way mix spray (such was the case this year due to all the rain in late October early November) there are alternatives such as Barnstorm with Uptake.
- Armyworms appear to like drill sown crops and are sprayed by plane with Lorsban.

Nutrition

- 130 kg/ha of DAP is applied at sowing.
- 300-400 kg/ha of urea is applied pre-permanent water. This depends on the variety of rice and paddock. Crop appearance including density and colour are taken into consideration. ***"If it is denser, the higher rate of Urea I will apply"***
- 90% of the farm has been topsoiled when it was lasered. As a consequence all areas of the paddock are treated the same. Harry says that through this practice the weak (cut) areas have caught up to the fill areas over time because the nutrient use on the cut areas has been less than the units applied.
- Harry does not top-dress due to the application of urea pre-permanent water being so close to panicle initiation. *Continued on next page.*

Water management

- Harry has the first irrigation on and off within 12 hours.
- Subsequent flushes are less than 8 hours and use around 0.7 ML/ha. If the soil water deficit is larger (i.e. dried and stressed out more) it will take longer to flush, which causes stress to the rice and reduces its growth. ***“If it has water ponded on the bay for more than 8 hrs this causes further stress on the plant”*** Harry said.
- Subsequent irrigations after the third are done when the rice on the double sown areas start to stress. Harry assesses this in mid-afternoon-not first thing in the morning. ***“If you can see a change in the colour of the rice as you are irrigating it, you are too late.”***
- The crop is flushed until late tillering with permanent water applied between Christmas and New Year.
- Bays are filled individually or, in a bank less channel system, they are filled from the bottom up to limit the amount of nitrogen carried in the water to the next bay.
- High water is still required post PI and during microspore.
- 5cm of water is held on the paddocks from flowering until drainage.
- Draining commences when there is less than 2 milky grains/head –usually the last week of March or the start of April.

Harry says ***“DPW rice has deeper roots and hangs on longer than aerial sown crops which Harry attributes to his high appraisals”***. An example, 2015 results achieved a 71% whole grain yield (WGY) versus the industry average for Opus of 66.8%. ***“This has been a trend over the last few years including the disastrous year for appraisals a couple of years ago”***

Harvest

Harry finds the crop is easy to harvest as there is less lodging, less biomass and better ground conditions due to the excellent deep root system that DPW rice develops.

The stubble is easier to incorporate as the roots are not “balled” up in the topsoil and there is less biomass.

Advantages and disadvantages of delayed permanent water drill sown rice from Harry's perspective

Advantages

- No wind damage
- No ducks, ibis, water fowl
- No muddy water issues
- No bloodworm or leaf minor
- No snails and aquatic worms
- No green or brown slime
- No dirty Dora, starfruit, alisma or water plantain
- Less water depth issues at sowing
- Less herbicide drift
- Less herbicide applications and passes over the crop. One herbicide, one fertiliser (no aeroplane expense)
- Better N efficiency – apply urea to dry soil and incorporate with flush
- Improved cold weather protection at microspore due to a shorter plant with the developing panicle at ground level
- Easier harvest with firm ground conditions and less lodging
- If applicable, able to sow winter crop into rice ground as ground conditions are usually excellent
- Better WGY. Harry believes that DPW develops a more extensive root system, similar to wheat rather than a root 'ball' as per aerial sown crops. Harry thinks that the plant can use existing moisture longer from a greater depth after drainage which limits moisture stress and maximise WGY.
- Use less water

Disadvantages

- The extra cost of a higher seeding rate (200kg/ha)
- Extra cost of spraying for Armyworms every year since adopting DPW
- Slightly delayed harvest with potential weather issues (however over the last few years, it has been an advantage as there have been fewer trucks at the rice sheds allowing a quicker turnaround time).
- Barnyard grass
- No NIR Tissue Test

It is important to remember this is a case study of one farmer's experiences and what works on this farm may not work on all farms due to a range of factors including soil type, preparation practices (i.e. along with history of crop rotations and stubble incorporation) and different farming systems.

Maximising irrigation profitability

John Smith, Department of Primary Industries, Yanco

Aim of the project

To develop sustainable broadacre irrigation systems that increase the profitability and flexibility of farming systems in the southern Murray Darling Basin.

The project will:

- 1) Assess the ability of precision irrigation to apply defined irrigation depths on time and determine its potential to reduce deep drainage and waterlogging risk, and increase nutrient and water productivity; and
- 2) Develop irrigation design criteria to allow precision irrigation to occur on basin irrigation layouts.



The methodology provides three key areas of focus within the project:

Agronomy; the influence of irrigation layout and management on input efficiencies, particularly nitrogen and subsequent impact on water productivity and system profitability.

Hydrology; to gather information on the impact of factors such as slope, bay surface roughness and soil type on water infiltration, and then validate these factors to develop the irrigation layout design criteria.

Communication/adoption; utilisation of grower groups to ensure project activities are meeting grower needs, local demonstration of activities, collection of relevant data .

2015/16 Activities

- Benchmarking of commercial layout performance
- Establishment of key grower learning sites

Project partners

- Murray and Riverina LLS
- Rice Extension
- CottonInfo
- Deakin University

Southern Growers, Jerilderie – Intensive double cropping in a rice rotation:

Is continuous double cropping a possible alternative to increase productivity and profitability of the rice farming system? What are soil and nutrient constraints to winter crop production following rice?

The project is supported by the Cotton Research and Development Corporation, through funding from the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit programme and Rural Industries Research and Development Corporation.

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RICE EXTENSION

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Connecting growers

The Rice Extension Team make information and tools available to enable the rice business to be profitable, sustainable and resilient.

Resources are available on the web, emails, publications and through presentations at grower forums, field days, farm walks, meetings and group discussions.

Messages aim to be grower focussed on:

- more tonnes /ha, more tonnes/ML
- caring for the environment
- rice as part of the farming system



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Soils under an irrigated environment

Sam North , NSW Department of Primary Industries, Deniliquin

Project Outline

Goal

Determine best practice guidelines so that growers can:

1. maintain / improve soil structure under surface irrigation;
2. design / manage rice layouts for a greater range of crops;
3. manage irrigation and crop agronomy to optimise profitability;
4. select crops / layouts to minimise production risks from waterlogging.

Outcomes

By 30 June 2017, growers will have access to information that will improve their understanding of the interactions between crops, soils and irrigation design and management and their effects on productivity.

Outputs

- Situation Analysis' report for irrigated crop production in rice layouts
- Annual reports
- Extension materials detailing BMP for irrigation design, soil amelioration techniques, irrigation management and crop agronomy

Project Methodology

The project involves four tasks:

1. Identify where winter crop yields are below potential in rice layouts.
2. Determine soil and irrigation layout parameters associated with below potential yield.
3. Find solutions to overcome constraints and lift yields.
4. Extend project findings

Double cropping—a grower’s experience

Nick Morona, Rice farmer

With the need to make more return/ML or /ha, cropping systems or rotations need to be looked at. The new short season rice varieties will open up new opportunities.

Since 2012 we have been aerial sowing rice into sub-clover paddocks cut for hay and have seen good water saving benefits by growing a rice crop straight after harvesting cereals or baling hay.

The short season rice will give much more flexibility to this system. You now have the option of sowing rice after harvesting cereals and have a clearer indication of water allocation and you can harvest rice earlier, sow cereals and take advantage of sub soil moisture.

For example for 4 seasons we have been growing sub & rye in April, feeding ewes and lambs through the winter, cut hay in October, grown rice from November to April and then sown a cereal - all in 20 to 22 months.

April 2015	Sow 48 ha sub & rye	130 ML (2 waterings) @2.7ML/Ha
May - 15 th August 2015	400 ewes & lambs	No water
August - September 2015	Locked up for hay	40 ML (1 water mid-Sept)@ 0.8ML/Ha
April - August 2015	Cut hay October	180 mm rain
Nov - Apr/May 2015/16	Rice established	528 ML @11 ML/ha
May - December 2016	Wheat	(hopefully no watering required)

Benefits

Lower water use

increase in rice, lamb & cereal production

better returns/ML so we can compete against other industries on the temporary water market

late sowing varieties spreads workload and watering schedule preventing the need for 2nd water of cereals and rice fill up at the same time

spring watering of cereals wets profile, 1st flush of rice uses less water

wet years – more stock or cereals followed by rice

possible no mid-season draining required due to delayed permanent water

Issues that need refining

compaction from stock, hay making or harvesting affects disc seeder penetration and therefore germination

need good layout and recirculation system

need to get water on & off quickly on 2nd flush

final grade fields the previous summer



IMAGE 1: Rice drill sown into wheat stubble



IMAGE 2: Rice drill sown into canola stubble

2016 Rice Industry Field Day Posters

As a new initiative in 2016, researchers, PhD students and industry people have been invited to display a poster highlighting the research they are working on or recently completed. This initiative is to expose the work they are doing to growers and the industry. RIRDC funds a wide range of research as you will observe when viewing the posters at the homestead during lunch. A list of posters that are on display are listed below. Please feel free to view the posters and ask questions direct to the authors of the posters most of who will be present during lunch time.

- Herbicide resistance in rice weeds, John Broster, **Charles Sturt University**
- Deep banding of urea in irrigated wheat, **Leigh Vial, Moulamein Farmer and Laura Kaylock, BR & C Agronomists**
- A study of microwave-based weed management in the rice industry, **Graham Brodie, The University of Melbourne**
- Improving pest and disease biosecurity in the Australian rice industry, **Mark Stevens and Andrew Watson, NSW Department of Primary Industries**
- “Aerially Sown” Rice Establishment Technique Trials, **John Fowler, Murray Local Land Services**
- Next generation healthy rice, **Chris Blanchard, Charles Sturt University and students**
- Defining the link between rice grain protein profiles and rice grain quality, **Daniel Waters, Southern Cross University**
- Connecting Growers, **Gae Plunkett, Rice Extension**
- Cold tolerant traits and QTLs for improved efficiency of rice breeding program, **Jaquie Mitchell, The University of Queensland**
- Rice grain quality, **Rochelle Ward, NSW Department of Primary Industries**
- Development of rice bran protein hydrolysate-based bioactive products, **Jian Zhao, The University of NSW**
- Developing and testing tools for measuring and managing variability in rice, **John Hornbuckle, Deakin University**
- Developing superior aromatic rice germplasm for Australia, **Melissa Fitzgerald, The University of Queensland**
- Rice crop protection research and development, **Malcolm Taylor, Agropraisals**
- Reducing greenhouse gas emissions and building soil carbon in the rice industry and Fate of applied nitrogen in rice under full flood and delayed permanent water, **Terry Rose, Southern Cross University**
- Social factors influencing technology adoption in the rice industry, **Vaughan Higgins, Charles Sturt University**

NOTES

The 2016 Rice Industry Field Day is a joint initiative of:



RICE EXTENSION

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