



## Southern Plant Systems Report

The past season was once again a very difficult period for irrigators with very low allocations in the Murrumbidgee valley and a second year of nil allocation for the Murray valley. The Southern Cropping Unit was still able to carry out projects in both winter and summer crops to deliver on contracted milestones over the past 12 months. Both winter and summer crop trial results are again being published in the Southern NSW Research Results 2020 which will be available as a hard copy or as a pdf via the website:

<http://www.dpi.nsw.gov.au/content/agriculture/broadacre/guides/>.

The NSW DPI flagship publications Rice Variety Guide and Rice Crop Protection Guide are being updated and will be available as a hard copy and on-line this year. Research results from the NSW DPI Southern Irrigated Cropping team have been presented to growers at local farm walks through to National and International conferences, seminars and other forums.

The renovating of the irrigation infrastructure at Leeton Field Station has continued this year and the first cotton field day was held on the newly developed cotton block with growers, agronomists, researchers and cotton industry representatives impressed with the setup of the new research block and the trials that had been grown.

NSW DPI and QDAFF were successful in obtaining funding from CRDC for a research project on weed management. The project has nodes at Toowoomba, Narrabri and Wagga/Yanco. The project in the south is led by Eric Koetz and welcomed MD Asaduzzaman and Adam Shephard to the team from WWAI for technical support. There is a focus on weed management in farming systems and as such herbicide treatments and resistance testing will be undertaken during the cotton crop and fallow period.

### **NSW DPI Research:**

Summaries of Southern NSW DPI projects are summarised in attached table.

### **Staffing:**

We are currently in the process of seeking a new cotton pathologist. We expect this position to be filled in the coming weeks in time to be on the ground for the upcoming season

The rice breeding, and quality team will be advertising soon for two Technical Assistants. One in the breeding team and one in the quality team.

Anil Raghavendra the Plant Pathologist has recently transferred to EMAI at Camden.

### **Deb Slinger and David Troidahl**

Department of Primary Industries, Southern Cropping Systems



**Current Irrigated Cropping Projects**

<i>Projects</i>	<i>Notes</i>
<p><b>Rice Breeding / Stability</b> DPI Team: Bert Collard, Peter Snell, Greg Napier, Kim Philpot, Kylie Elliott, Fred Ciccio, Hannah Blackburn, Minna Russell, Nathan Doss, Esther Van Meeuwen, Tiffany Graham and Wah Paw,</p>	<ul style="list-style-type: none"> <li>• Australian Rice Breeding Partnership II Agrifutures 2015-2020. Extended till 2021</li> <li>• Implementing accelerated breeding methods</li> <li>• Integrates cereal chemistry and direct link to SunRice’s market intelligence focusing on medium grain</li> <li>• Other quality classes include long grain, short grain and healthy rice (e.g. low GI and coloured)</li> <li>• Incorporating cold tolerance screening</li> <li>• Marker Assisted Selection for early generation selection and pure seed validation</li> </ul>
<p><b>Rice – Chem / QEP</b>  DPI Team: Prakash Oli, Jo Pianca and Leanne Johnston</p>	<ul style="list-style-type: none"> <li>• Service breeding quality evaluation assessments to assist variety breeding choices</li> <li>• Looking to develop GI assessment and Antioxidant methods in new partnership program</li> <li>• Support farmers, SunRice and Breeders in delivering world class rice</li> <li>• Education on importance of quality in addition to yield</li> </ul>
<p><b>Soybean breeding and agronomy projects</b> DPI Team (Southern): Tony Napier, Kathryn Bechaz and John Dando</p>	<ul style="list-style-type: none"> <li>• Variety evaluation project for the national soybeans breeding program</li> <li>• Looking for better varieties suited to the MIA.</li> <li>• The focus in 2020/21 for the LFS experiments will be evaluating SU tolerant germplasm.</li> </ul>
<p><b>Cotton Integrated weed management</b> DPI Team: Eric Koetz, Asad Asaduzzaman and Adam Shephard</p>	<ul style="list-style-type: none"> <li>• This is a two and a half year CRDC project conducting research to improve the understanding of factors that influence the efficacy of pre-emergent and residual herbicides and investigate the extent of glyphosate and group A herbicide resistance in cotton farming systems.</li> <li>• Cotton Info Weed Technical Lead role</li> <li>• Across state agency collaboration with nodes in Toowoomba with QDAFF and ACRI with NSW DPI</li> <li>• Field experiments on Leeton Research Station and IREC, a range of residual treatments to reinforce HRMS</li> <li>• Weed surveys across the cotton growing regions of NSW and Queensland to complement existing datasets collected by other weed scientists. Escape weeds will be tested for tolerance to group A and glyphosate control options, + 24-D in sowthistle</li> <li>• Ecology and biology of dwarf Amaranth, tall Fleabane, sow thistle and Button Grass</li> <li>• Investigating the impact of residual herbicides in a double cropping scenario (ACRI).</li> <li>• Demonstrations of integrated weed management principles, including the control of large "escape" weeds and the impact on seed set, to aid in the uptake of the research outputs by industry.</li> </ul>
<p><b>Cover cropping</b> DPI Team: Hayden Petty and Gabby Napier [Project led by QDAF – Dave Lawrence]</p>	<ul style="list-style-type: none"> <li>• To evaluate if cover crops increase the net water accumulation (Plant available water) in (grain and) cotton systems with low ground cover in the northern GRDC growing region.</li> <li>• What is the net water cost to grow the cover crops?</li> <li>• What is the net water gain to the subsequent (grain/)cotton crops</li> <li>• What is the impact on the yield of the subsequent (grain/)cotton crops</li> <li>• Evaluate the relationship between stubble cover/loads and the accumulation of Plant available water in northern (grain and) cotton farming systems.</li> </ul>



<i>Projects</i>	<i>Notes</i>
<p><b>Supporting Southern Cotton Production - Cotton Research Officer</b> DPI Team: Hayden Petty, Gabby Napier</p>	<ul style="list-style-type: none"> <li>• CRDC Jul 19- June 22</li> <li>• Collaboration with CSIRO and CSD E&amp;D team</li> <li>• Management practices to optimise seedling emergence and improve crop agronomy in Sth cropping areas</li> </ul>
<p><b>Southern Crop Protection</b> DPI Team: Sandra McDougall, Tim Green and Alison Young</p>	<ul style="list-style-type: none"> <li>• CRDC Jan 19-Sept 2021</li> <li>• Early and late season Southern disease surveys, Cotton Info Pathology Lead</li> <li>• Evaluation of product efficacy (soil drench at planting) against seedling disease – monitored through to picking</li> <li>• Spray efficacy trial – fungicide use to control/prevent Alternaria Leaf Spot</li> <li>• Compensation trial to simulate mirid pressure in conjunction with Paul Grundy DAFF Qld</li> <li>• Light traps used to monitor mirid activity on a farm with no insecticide use and a farm following a conventional spray program</li> <li>• Whitefly survey across farms in the Lachlan and Murrumbidgee to help ground truth a new monitoring system developed by Richard Sequeira DAFF Qld to make sure the whitefly population in the Southern areas fits the model</li> </ul>
<p><b>MEF</b> DPI Team: Katherine Bechaz, Dionne Wornes, Peter Davidson and Alan Boulton</p>	<ul style="list-style-type: none"> <li>• Fee for service model with our research collaborators</li> <li>• Research collaborators (currently CSIRO and DPI)</li> <li>• Core measurements delivered to relevant research leaders each season</li> <li>• MEF maintained and managed each season</li> </ul>
<p><b>GAPP- Canola</b> (Yanco node) DPI Team: Tony Napier and Dan Johnston [project led by Rajneet Uppal]</p>	<ul style="list-style-type: none"> <li>• Canola heat tolerance project.</li> <li>• This project is assessing new canola germplasm for their tolerance to heat over the flowering period.</li> <li>• At LFS there is a large replicated experiment with 30 breeding lines</li> <li>• Sown at 5 sowing dates (Late April to early August).</li> </ul>
<p><b>GAPP – Profitable Pulses</b> (Yanco node) DPI Team: Tony Napier and Dan Johnston [project led by Mark Richards]</p>	<ul style="list-style-type: none"> <li>• Winter Pulses</li> <li>• The experiments at LFS will now be including an irrigation treatment for evaluation.</li> <li>• The three experiments at LFS will be assessing three winter pulses including Lentils, chickpeas and Faba beans</li> </ul>



## Water Projects

<i>Projects</i>	<i>Notes</i>
<p><b>Rice variety nitrogen and agronomic management</b> DPI Team: Brian Dunn, Tina Dunn, Craig Hodges and Chris Dawe</p>	<ul style="list-style-type: none"> <li>• Agrifutures July 2015- July 2021</li> <li>• Determine varietal nitrogen management requirements and phenology information for new and soon to be released varieties</li> <li>• Develop growing guides for new rice varieties as they are released</li> </ul>
<p><b>Improving mid season nitrogen management of rice</b> DPI Team: Brian Dunn, Tina Dunn, Craig Hodges and Chris Dawe</p>	<ul style="list-style-type: none"> <li>• Agrifutures July 2018- June 2021</li> <li>• Maintain the NIR Instrument and calibrations used for the NIR Tissue Test</li> <li>• Investigate the use of remote sensing to determine mid-season crop nitrogen requirements without the need for physical sampling of the crop.</li> </ul>
<p><b>Slow release nitrogen fertiliser in drill sown and delayed permanent water rice</b> DPI Team: Josh Hart, Brian Dunn, Tina Dunn, Chris Dawe, Craig Hodges</p>	<ul style="list-style-type: none"> <li>• Evaluating how slow release nitrogen fertilisers behave when applied at sowing in a drill sown rice crop system</li> <li>• Determine if there is a yield benefit to supplying nitrogen at sowing to drill sown and delayed permanent water rice crops</li> </ul>

## Horticulture Projects

<i>Projects</i>	<i>Notes</i>
<p><b>Advanced production systems for the temperate nut crop industries</b> DPI team: Jacquelyn Simpson and Jason Lewis</p>	<ul style="list-style-type: none"> <li>• Research for Profit, DAWR, managed by HIA Jul 2016- June 2021</li> <li>• Research more efficient water and nutrient supply regimes</li> <li>• Investigate the use of technologies during harvest</li> <li>• Evaluate the potential use of plant growth regulators to reduce tree vigour</li> </ul>
<p><b>Hazelnuts in Australia</b> DPI team: Jacquelyn Simpson and Jason Lewis</p>	<ul style="list-style-type: none"> <li>• Agri- Australis co-investment with AgriFutures June 2012- Apr 2017 (extended until 20122)</li> <li>• Assessment of commercial hazelnut planting production at three locations with varying climates</li> <li>• Quarantine plots of imported hazelnuts for establishment of new commercial production in Riverina</li> <li>• Investigate the effects of different pruning regimes on tree micro-climate and productivity</li> </ul>
<p><b>Vulnerability of horticultural crops to climate change</b> DPI team: Jianhua Mo, Kevin Dodds, Jessica Fearnley, Darren Fahy, Bruno Holzapfel, Steven Falivene, Jeremy Bright, Ruth Huwer, Melinda Simpson, Jaquelyn Simpson and Jason Lewis</p>	<ul style="list-style-type: none"> <li>• NSW Government</li> <li>• Assess the impact of future climate change to the production of key horticultural crops in NSW</li> </ul>



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