Safer helmets for jockeys

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The Rural Industries R&D Corporation’s Corporate Plan 2012-2017 has been approved by Minister Ludwig and is now publicly available from our website www.rirdc.gov.au

This Plan sets a new direction for the Corporation; a direction that aims to enhance the prosperity of our current and future industries and the wider rural sector. The Plan also sets the framework for how we will conduct our RD&E over the next five years.

Part of this involves a revitalisation of how we go about our business, including a greater and more strategic focus on cross-sectoral RD&E collaboration and a more outcome focused approach to how we manage the Corporation’s investments.

In developing this Corporate Plan, the Rural Industries R&D Corporation has identified nine priority areas. These are:

• Productivity growth to support industry profit and sustainability
• Building evidence about emerging issues impacting on the rural sector
• Ensuring new industry potential is explored in a rigorous way and the knowledge gained is shared
• Applying a life cycle approach to supporting rural industries
• Collaborating to respond to cross sector RD&E needs
• Supporting new industries
• Maintaining and building rural research capacity
• Investing in rural sector people
• Enhancing the adoption of RD&E

Enhancing the productivity of our rural industries remains our core business. We will however be devoting more resources to cross-sectoral issues that impact on farmers and the regions in which they operate.

We are looking forward to announcing the 2012 Australian Rural Woman of the Year on October 9, to be chosen from seven state finalists. The Award’s previous finalists and runners up have come from all walks of life and backgrounds, and represented an enormous array of primary industries and rural community groups. This year’s finalists and runners up are similarly diverse.

Our feature story in this issue profiles research that has led to a new standard for jockey helmets. This R&D has developed a benchmark for a safety helmet that will offer the maximum protection to riders. This is great example of RIRDC collaborating with industry to achieve real, practical outcomes.

I hope you enjoy this Spring 2012 issue of Rural Diversity.

Craig Burns
On 23 July 2012 the Minister for Agriculture, Fisheries and Forestry, Senator the Hon. Joe Ludwig, released the Government’s rural R&D policy statement which will see greater collaboration on research, efforts to increase investment, and a drive to improve the adoption of innovation across the sector.

The policy statement included the Government’s final response to the Productivity Commission’s inquiry report on Rural RDCs and the National Strategic Rural R&D Investment Plan.

Minister Ludwig said the improvements will:
- Increase transparency and accountability in the RDC model
- Improve coordination and priority setting across the whole rural R&D system
- Increase the pursuit of productivity growth and
- Increase operational efficiencies and value for money on investment.

Minister Ludwig said key changes include:
- Measuring performance across the broader rural R&D system
- Greater collaboration of RDCs on cross-sectoral research such as soils and climate change
- Enabling RDCs to undertake marketing if requested by industry and funded by a dedicated levy
- Matching government funding for private voluntary contributions where research findings are public and
- Moves to attract more private domestic and international investment.

“Research and development underpins future productivity and innovation within our rural industries. It drives growth, maintains our competitiveness internationally, and means rural Australia can make the most of opportunities and respond to challenges,” Minister Ludwig said.

“Australian producers are some of the most innovative and productive in the world, and ongoing government and industry commitment to R&D will help keep us on the front foot.”
About the RIRDC Rural Women’s Award

The RIRDC Rural Women’s Award is Australia’s pre-eminent Award for rural women. Since 2000, the Award has recognised women’s vital contribution to Australia’s primary industries and rural communities.

The Award identifies emerging leaders and change agents in primary industries and supports their development as leaders and their ongoing contribution to their chosen industry and community by providing financial assistance, mentoring and support via RIRDC’s nation-wide network of business and community leaders.

Women’s representation and involvement in primary industries is increasing with many occupying high level positions across a variety of sectors – the goal of the Award is to further harness and develop women’s capacity to shape and influence the future of rural Australia.

About the 2012 RIRDC Rural Women’s Award

The national winner of the 2012 RIRDC Rural Women’s Award will be announced in front of more than 200 industry leaders, politicians and special guests on Tuesday 9 October in the Great Hall, Parliament House.

A Sydney based agribusiness lawyer, a consultant to the live cattle industry, a viticulturalist and a citrus producer are among the 2012 state finalists for the RIRDC Rural Women’s Award.

The national winner and runner-up will be selected from these seven state finalists.

Catherine Marriott
Kununurra, WA

Catherine is a consultant to the live cattle export industry.

After watching the live cattle export trade crisis unfold, Catherine saw a real need for producers to be out telling their story. While much of the public conversation was based around the economic implications to the industry, Catherine strongly believed that as an industry, cattle producers instead needed to be talking about their values – the industry was talking, but it wasn’t being heard.

Following her passion to empower rural women and help create a positive image for agriculture, in April this year Catherine used her RIRDC bursary to organise and host a three-day Influential Women’s Forum in Broome for 47 women from all over Australia. The women developed new skills in communication and social media to ensure that they can effectively influence and become advocates for the northern beef industry. Women left the forum with a renewed sense of confidence and pride in the industry and are now a driving force behind the future of the cattle industry and rural and regional communities across Australia.

In September, Catherine travelled to Indonesia with 10 other women in the industry to learn more about the live export process by retracing the journey. Starting on a cattle station in northern Australia, the women travelled to the ports then on to the Indonesian abattoir before visiting a wet market and having dinner with an Indonesian family in their home to better understand the Indonesian culture and consumption of Australian beef.

Catherine says the RIRDC Award has enabled her to achieve her dream – not only through the bursary for her vision but through the support she has received from all corners of Australia and within the industry.
Danica Leys
Sydney, NSW

Danica is a Sydney based Senior Industrial Relations Advisor with NSW Farmers’ Association and co-founder of social media platform AgChatOz.

The social media community borne from the creation of AgChatOz is bridging the city-country divide by connecting rural Australia and providing a meeting place for weekly conversations about the issues relevant to rural and regional Australia.

Danica is using her RIRDC bursary to take AgChatOz to the next level, formalising the platform as a legal entity, increasing participation and awareness of this important platform and supporting people in rural Australia to develop their social media skills.

Danica believes AgChatOz will be a powerful tool for rural Australia to advocate on behalf of the agriculture industry and the RIRDC bursary will assist Danica to develop AgChatOz to its full potential.

Fiona Ewing
Straughn, Tasmania

Fiona is a Community Engagement Officer with salmon grower Tassal and has over 20 years experience in the Tasmanian seafood industry.

Fiona's interest in the social science area, particularly around creating sustainable communities in a changing environment inspired her RIRDC bursary project.

Aquaculture is a growth industry in Tasmania and with the planned expansion of the salmon industry on the west coast, Fiona's project is creating a pathway for engagement with the local community of Straughn to ensure a vibrant, sustainable local community.

Fiona travelled to Scotland in May to visit a salmon farming company that has established a community trust, which provides financial support for community projects that deliver lasting change. Since returning, Fiona has established a steering committee made up of women working in aquaculture and is busily tapping into the existing knowledge bank within their industry with the aim of gaining support from other companies and launching a similar model on the west coast of Tasmania within 12 months.

Fiona believes that women are the social fabric of rural communities - they recognise the importance of healthy communities and are at the forefront of creating sustainable rural communities. Fiona says the RIRDC Award has provided her with the opportunity to develop her leadership skills and progress an initiative that will directly impact and benefit her two passions - her local community and the aquaculture industry.

Mary Retallack
Adelaide Hills, SA

Mary is a third generation viticulturalist and Managing Director of Retallack Viticulture, which offers a wide range of consulting services throughout Australia.

Mary's Award and RIRDC bursary project is the culmination of a long held passion - to encourage more women into the wine industry and provide them with the support and empowerment to help them meet their full potential.

Mary is excited to see a new generation of people entering the industry who are hungry for the challenge. To feed this and develop strong links along the whole value chain, Mary is in the process of developing a ‘Women in Wine’ website as a central meeting place and information hub for women in the wine industry to collaborate, share ideas, mentor and support each other.

Mary is also keen to conduct a number of networking activities both online and face to face in South Australia with the view to rolling these out nationwide for the industry as a whole in the coming years.

The Rural Women’s Award has opened doors to a variety of new opportunities for Mary - she is regularly called on as a guest speaker at industry forums and events and is currently helping establish a women in agriculture network in South Australia. Mary says the Award has not only helped to raise her profile but also shine a light on the contribution women are making in the wine industry.
Barbara Koennecke
Gove, NT

Barbara Koennecke is a pioneer of the aquaculture industry and Principal of Arafura Aquatic Fish Pty Ltd, one of the first professional aquarium businesses in the Northern Territory.

Barbara and her partner Brian have been instrumental in developing the aquaculture industry in the Territory including the development and implementation on new management practices, licensing requirements and new environmental management and quality assurance guidelines.

As a pioneer in the aquaculture industry, Barbara has contributed to the development of the industry through the NT Seafood Council, Primary Industry Training Advisory Council, Women without Boundaries Network and Women’s Industry Network NT (WINSC)

Arafura Aquatic Fish has for the past five years been working in collaboration with the Darwin Aquaculture Centre on the reproduction and husbandry of the giant clam.

Arafura is the first enterprise within Australia to successfully spawn and re-seed on farm and then transfer to grow out in the wild commercial quantities of baby giant clams.

Barbara will use the Award Bursary to travel to the Solomon Islands and Vanuatu to learn from their research into restocking of giant clams and their experiences with engaging coastal communities in the aquaculture industry. She also plans to attend the International 2012 Australasia Aquaculture Conference.

Annette Smith
Emerald, Queensland

Annette is Chair of Central Highlands Regional Resources Use Planning Cooperative Ltd, the local Natural Resource Management Group and a Senior Property Valuer with Taylor Byrne.

Annette plans to use her $10,000 Award bursary to develop a series of workshops to increase understanding and build regional community capacity to negotiate better outcomes for agricultural landholders and mining companies from the current resources boom.

Annette was the youngest and only female ever appointed to a senior valuers role within the Department of Natural Resources and was Vice-Chair of the Emerald Pastoral College Board, prior to the amalgamation of Queensland’s four agricultural colleges.

Annette’s Award ambition is to take best management practice modules for pest management, biosecurity and salinity, currently delivered to rural industries and rewrite these workshops for delivery to representatives of resource companies. The aim is to better inform and build capacity to negotiate better outcomes for all parties and the broader community.

Tania Chapman
Mildura, Victoria

Tania is a citrus grower from Mildura, Victoria.

A mother of four children, having operated her own book keeping business for many years, Tania’s entry into the citrus industry came eight years ago when she purchased her 350 acre farm.

Since this time, Tania has become an advocate for the industry and is now Chair of Citrus Australia – the industry’s peak national body.

Tania’s Award ambition is to unify the Australian citrus industry by tapping into the skills, energy and leadership potential of its rural women and young people. The citrus industry is one of the most important horticulture industries in Australia but Tania believes that strong leadership and collaboration is needed to ensure its future sustainability.

With her RIRDC bursary, Tania is establishing a Rural Women’s Leadership forum to bring rural women together and harness their skills as leaders within their industry and community.

Tania is also establishing a specific program for the citrus industry to develop and nurture the next generation of leaders in the industry.
From the farmer’s mouth: taking climate research to the paddock and back

The Climate Champion program – a farmer-led program to get climate risk management research and tools to other farmers and then feed back to researchers—continues to go from strength to strength.

The program and its participants have developed strong strategic links with national and local organisations, and farming and research individuals. There has been strong local and national media coverage of the Climate Champion participants and the program which has increased its reach.

Next on the agenda is a national workshop to be held in Horsham and Birchip in October, where participants will hear from local researchers and will work on future directions and goals for the program. This follows a successful National Press Club event in March.

With the assistance and commitment of supporting corporations, the participating farmers can get critical information out to others about how to manage Australia’s increasingly challenging climate.

A champion for the olive industry

Paul Miller is one of thirty-six Australian farmers who have been recruited by the national Climate Champion program to help improve communication between scientists and farmers about managing climate risk.

Paul, who grows olives and grapes, says that the south-east of South Australia is a key area for the Australian olive industry, for a number of reasons.

“The quality of the oil that comes out of here, by and large, is excellent and the soils in this region are particularly well-drained,” Paul said.

“The extreme weather we’ve been having since 2000—late frosts and hot weather in spring—makes me wonder about how more uncertain agriculture is becoming generally, and how we, nationally, are going to deal with that.

“Clearly, there needs to be significant research and development in this area to back up the innovation we’re going to have to do.”

Paul is also the President of the Australian Olive Association.
A year ago ten members of the Australian Rural Leadership Program set out to investigate the challenges of a carbon price on regional, rural and remote Australia. The group included farmers, foresters, public servants as well as a fire fighter, accountant, banker, nurse and journalist.

The course had been asked by the foundation to embark on an intensive project requiring leadership as a core part of the learning and leadership development process. The then anticipated Federal Government Clean Energy Future Legislation was seen as an emerging issue that required leadership from government agencies, peak rural bodies and industry groups. Our group concentrated on understanding the implications for farmers through thirteen case studies of intensive livestock and mixed farming enterprises across the country.

Key findings

We found social impacts were most prominent for rural, regional and remote Australia. This included financial impacts on surrounding communities as farmers attempt to reduce their costs on machinery, labour and other inputs. We were told that the initial roll-out of the Clean Energy Future policy has increased feelings of uncertainty in some sectors. Farmers told us that the investment potential around carbon initiatives remains unclear.

We observed that the intensive pork and beef industries are already moving to expand their market share. It is also clear that this topic has created particular challenges for policy makers.

• Farming Communities are expected to be impacted socially

Farmers told us that social impacts are not recognised or supported beyond individual tax cuts and household subsidies. The policy focus seems to be urban rather than regional, rural and remote Australia. Social impacts seem to be missing from the four focus areas of the carbon policy.

Farmers say markets have historically been a harsh mechanism for social adjustment.

• Carbon policy roll-out is causing uncertainty

Farmers told us that the actual price of carbon remains unknown.

Opposing political perspectives and the potential for a change in government add to further market uncertainty. Confusion over the nature of the Carbon Farming initiative is holding back landholder support. Farmers told us that there has been ineffective stakeholder engagement and current global economic factors are not supporting investment.

• There are winners and losers at an industry level

We observed that structure, culture and mindset within an industry is influencing responses. It appears that the intensive pork and beef industries have been quicker to move and see opportunities.

Physical aspects such as the geographic location of a particular industry may be influencing responses.

What leadership is required to progress this issue?

Capacity building in industry

• Industry bodies can help build the capacity of their members to effectively respond.

Farmers owning the market

• Farmers can aggregate to a more regional level to re-frame the issue, own the market and reduce middlemen.

More research to guide farmers

• Opportunities exist for research institutions to further identify opportunities around a carbon market and the Carbon Farming Initiative.

Political certainty around clean energy future policy

• Bi-partisan agreement to support a carbon economy

*Our project group acknowledges the limitations of the project, specifically around the restricted scope of data collected.*
Twenty six of agriculture’s brightest young stars came together in Canberra in July to build their skills and to meet the nation’s agricultural leaders.

The students are all part of the Horizon Scholarship, an initiative set up and coordinated by the Rural Industries R&D Corporation with the goal of attracting more school leavers to undertake university degrees in agriculture-related disciplines.

Involving Horizon Scholars from the past three years, a highlight of the Scholarship workshop was a discussion forum with four of the agriculture’s most inspirational leaders - Ben Fargher, General Manager Operations at PrimeAg and ex-NFF Chief Executive; Danica Leys, current NSW Rural Woman of the Year; Naomi Godden, social worker and social researcher; and Hollie Bailieu, Chair of the NSW Young Farmer Council.

The workshop also included sessions on presentation and leadership skills, job application development and media interview skills. The latest developments in the effective use of social media were also covered.

Sponsors of the Horizon Scholarship are Woolworths, Quality Sileage Systems, the Australian Department of Agriculture, Fisheries and Forestry, the Australian Egg Corporation, Australian Pork Limited, Australian Wool Innovation, the Cotton Research and Development Corporation, the Grains Research and Development Corporation, the Grape and Wine Research and Development Corporation, Horticulture Australia Limited, Meat & Livestock Australia, RIRDC, the RIRDC Chicken Meat Program and the RIRDC Rice Program.

The Horizon Scholarship offers a bursary of $5,000 per annum for the duration of a Scholar’s university degree and provides the students with work placements, mentors and a range of personal development opportunities. More information about the Horizon Scholarship and Scholars can be found at www.rirdc.gov.au/horizon.

Horizon Scholarship at Ag Youth Think Tank

The Rural Industries R&D Corporation’s Horizon Scholarship was represented at a recent Ag Youth Think Tank which saw young people from rural and regional Australia share their stories, thoughts and visions for the future.

Horizon Scholar, Ashley Hobbins took part in the forum with 29 other young rural Australians.

Held in Canberra, the aim of Ag Youth Think Tank was to raise awareness and celebrate the range of career opportunities available to young people in agriculture and develop strategies to attract and retain more young people working in the industry.

Participants were drawn from youth-targeted programs that have been funded by the Department of Agriculture, Fisheries and Forestry, including previous entrants in the Australian Broadcasting Corporation’s (ABC) Heywire rural and regional youth initiative and RIRDC’s Horizon Scholarship.

Aged from 18 - 35 years, the diversity of the attendee’s backgrounds and experiences meant the views and opinions shared were both real and practical.

The Ag Youth Think Tank concluded with participants presenting their strategies to Government Ministers, key stakeholders and senior public servants.

Ashley was involved in a group that was tasked with discussing and guiding the implementation of a vision that would see more people entering and staying in the agriculture industry with skills and qualifications. Their vision would also see an increase in enrolments and completion of agricultural courses through traineeships, onsite training and tertiary education.
RIRDC fighting the good fight against Myrtle Rust

By Rob Atkinson*

Agricultural producers and the public alike were understandably concerned when it was discovered that an exotic and potentially devastating plant pest had become established in Australia in April 2010. Myrtle Rust, a fungus native to South America, had entered Australia and had the potential to affect a variety of plants from the Myrtaceae family, which include many Australian native species, such as Eucalyptus. Also at threat were plants central to Australia’s developing essential oil and native food industries, such as tea tree and lemon myrtle.

A Myrtle Rust National Management Group was quickly established and following expert examination determined that it was not technically feasible to eradicate Myrtle Rust from Australia. Focus then shifted immediately to measures of reducing the effect Myrtle Rust could have on Australia’s environment and valuable plant-based industries.

An immediate requirement was to begin research into plant resistance and methods of fungal control. RIRDC’s established links with relevant industries and top-class researchers, combined with its responsive structure meant it was able to move quickly in this area.

RIRDC is currently managing multiple research projects spanning New South Wales and Queensland. Importantly, these are taking a multi-pronged approach to combating Myrtle Rust - addressing the use of new and established compounds to reduce fungal growth, identifying naturally resistant plants, and even methods of inducing resistance to the fungus.

Of vital initial importance was proving the safety of established anti-fungal compounds on plants from Australian industries. A current two year trial will provide the residue data that allows these compounds to be safely used by producers, and that ensures that end-use products can be safely consumed, and importantly for the growers, be freely traded. This research is being complemented by a second project investigating the effectiveness of a wide variety of natural fungicides, such as those derived from essential oils and elemental compounds.

Reducing the need for these antifungals by developing plant resistance is another major angle in the fight. RIRDC is funding research that is scanning hundreds of plant phenotypes sourced from the widest possible genetic background (including as far afield as the Whitsunday Islands) to pinpoint those with naturally occurring resistance. Already this is paying dividends, with the identification of lemon myrtle families that show extremely low infection rates compared to the moderate to highly susceptible plants currently being cultivated.

These selections will now be included in a recently commenced and highly technical project being run through the Australian National University which is taking resistance research to a new level, aiming to identify genetic markers of resistance and develop cheap and rapid identification tests that can be used by industry. This model of research will be developed concurrently for some of Australia’s larger industry groups such as the forestry and nursery sector and also for some of the rare/endangered species at risk from myrtle rust. The Australian National University will also be pursuing promising preliminary experiments showing that it is possible to induce Myrtle Rust resistance by subjecting plants to specific treatments (acibenzolar-S-methyl - ‘Bion’).

This research fits squarely under RIRDC’s objective of increasing knowledge that fosters sustainable, productive and profitable rural industries. By continuing to be the hub between government, industry and researchers, RIRDC is committed to fighting the good fight against this foreign intruder, and in turn protecting Australia’s environment and plant-based industries.

For more information contact Alison Saunders, Senior Research Manager: alison.saunders@rirdc.gov.au

*Rob is a part of the Graduate Development Program with the Department of Agriculture, Fisheries and Forestry and spent three months at RIRDC as one of his workplace rotations.

MYRTLE RUST

a fungus native to South America entered Australia in April 2010 and has the potential to affect a variety of plants from the Myrtaceae family, which include many Australian native species, such as Eucalyptus.
Research vital to help tackle Hendra virus

The fight against Hendra virus has been boosted by six new research projects supported by $2 million in funding to look into how the virus is spread, how infection might be prevented and ways to improve detection.

The projects will be centrally coordinated by the Rural Industries Research and Development Corporation (RIRDC) and carried out by a number of Australian universities and the CSIRO. The research is expected to be finalised within three years.

The funding is part of an overall $9 million package provided jointly by the Australian Government and the New South Wales and Queensland Governments under the National Hendra Virus Research Program announced in July 2011.

Minister for Agriculture, Senator the Hon. Joe Ludwig, said the projects will increase Australia’s capability to minimise the risk of Hendra virus by providing a better understanding of its behaviour and impacts.

“Increased knowledge about the virus and an improved ability to detect it will be of real benefit to protecting the health of horses, those in contact with horses and our broader animal industries,” he said.

### Summary of funded research projects

#### Development of improved diagnostics and therapeutics for Hendra virus infections - CSIRO

This project aims to develop sensitive and specific tests for rapid diagnosis of Hendra virus in infected horses, other animals and humans. Sensitive pen-side tests for Hendra virus detection in acutely infected horses will be developed.

#### Longitudinal cohort study of horse owners – University of Western Sydney

Horse owners from across all industry sectors will be surveyed over a two-year period. The project will provide both a research platform and a resource to track horse owner risk awareness, mitigation practices, and the effectiveness and reach of government agency-directed communication and guidance in the context of an evolving and uncertain threat.

#### Models that predict risk for Hendra virus transmission from flying foxes to horses – James Cook University

Using conceptual and mathematical models this project aims to predict periods of high risk of a Hendra virus outbreak in horses. It aims to identify the variables that can increase the size and impact of an outbreak and determine how risk can be minimised through manipulating important risk factors.

#### Models to predict Hendra virus prevalence in flying fox populations – Griffith University

Modelling approaches will be used to develop a suite of predictions on the patterns of high prevalence and intensity of Hendra virus infection in flying fox colonies in Queensland and New South Wales. These predictions will focus on identifying high levels of Hendra virus infection in flying foxes and thus the distribution of risk of transmission to horses.

#### Implementing a national flying fox monitoring program - CSIRO

This research project will determine the trends in both the abundance and distribution of flying foxes to allow for better prediction and management of their associated disease risk and for their conservation management.

#### Early detection of Hendra virus infection by microRNA profiling - CSIRO

This project will develop reliable tests for differentiating infected from vaccinated animals by using a platform of Hendra virus antigens other than the G glycoprotein. It will also address the lack of specific human post-exposure treatments.

For more information contact Dave Alden, Senior Research Manager: dave.alden@rirdc.gov.au
SAFER WORK FOR JOCKEYS
With the Spring Carnival upon us, the excitement and glamour of horse racing is in the air. But this belies the fact that the sport can be very dangerous for the jockeys that ride in races all over Australia every day.

Working as a jockey is a high risk occupation. A study conducted by the Menzies Research Institute and published in the Medical Journal of Australia in 2009 examined Stewards reports over a four-year period. They found that there were 861 injuries and 3360 jockey falls from 748,367 rides. Head injuries featured heavily ranging from concussion to severe and permanent trauma.

The Australian Racing Board (ARB), which make the rules of racing, is committed to doing whatever is possible to make Australian racing safer than ever before utilising the best researchers and science available. To this end they have released a new standard, ARB HS 2012, for the helmets used by jockeys and track riders.

Peter McGauran, Chief Executive of the ARB said that they supported R&D to develop the world’s best safety helmet that will offer the maximum protection to the riders and is of the highest standard.

“The aim of ARB HS 2012 is to significantly reduce high impact injuries. A prototype of the helmet designed by Albion Sports, makers of cricket helmets, is being tested. We are confident that it will meet the standard within a short period of time with other manufacturers then given nine months to also meet ARB HS 2012 before their helmets are banned under the rules of racing,” Mr McGauran said.

“Over a four-year period there were 861 injuries; 3360 jockey falls from 748,367 rides.”

“The new helmets will provide greater protection if a jockey has a fall. A combination of new materials and a new design will make the helmet the best science can produce at this point in time.”

The helmet potentially could be used by the equestrian industry as well as pleasure and recreational riders.

The new standard is the end result of a three year RIRDC funded project led by Racing NSW in collaboration with the University of NSW on health and safety in Australian racing. A number of jockey helmets were evaluated for their performance against the European High Performance Equestrian Standard which is universally regarded as the international benchmark. Dr Andrew McIntosh, a renowned expert in the field of bio-mechanics and helmet research, was instrumental in guiding the project team to achieve very promising test results throughout the course of the study, ably supported by his team at UNSW.

In the latter stages of the project the team worked closely with Albion Sports which designed a prototype helmet to aid in the development of ARB HS 2012.

Mr McGauran said that the new helmet standard is one of two current projects between the ARB and RIRDC aimed at improving the health and safety of Australian riders.

“The ARB has instigated a new RIRDC study which has just started to evaluate safety vests worn by riders first introduced fifteen years ago. An initial survey of jockeys found that the currently approved vests can be restrictive, uncomfortable and poorly ventilated.”

“This study led by Dr Caroline Foote involves Dr Caron Jander, National Medical Officer for the ARB, Ray Murrihy, Racing NSW Chairman of Stewards, the Australian Jockeys Association and Racing NSW. The project will identify whether there are other safety vests that are better suited to Australian conditions than those currently used by jockeys and track riders.

“This is an incredibly important project as to our knowledge there has been no comparable study into the use of vests anywhere in the world. We need to know how to improve their effectiveness as a safety measure whilst understanding the needs of the jockeys who wear them.

“The ARB has enjoyed a long and productive partnership with RIRDC and we look forward to future collaborations in the interests of rider safety and horse welfare.”

For more information contact Dave Alden, Senior Research Manager: dave.alden@rirdc.gov.au
Stevia – potential for a sweet new industry

Imagine a natural sweetener that is more than 250* times sweeter than sugar, but won’t affect your waistline. It might sound too good to be true, but the herb stevia fits this bill.

Stevia is native to Paraguay and belongs to the Chrysanthemum family. The leaves, which have been used as a sweetener for centuries contain high intensity sweeteners called steviol glycosides.

Stevia is not grown commercially in Australia and there is no processing industry, but following a successful application in 2008 to the Food Standards Australia New Zealand approving its use as a sweetener in food, interest has grown in the product. Currently dried steviol glycosides are imported from overseas, mainly from China.

A recently completed collaborative project between RIRDC, Sanitarium and Central Queensland University looked at the potential for a stevia industry in Australia.

The research was led by Professor David Midmore, Director of the Centre for Plant and Water Science at Central Queensland University in Rockhampton.

“Stevia is a natural product and has no calories so it is appealing to those who want to avoid laboratory-synthesised sweeteners and to the organic industry, which has been searching for a natural sweetener to put into its processed products,” Professor Midmore said.

“Stevia is also an ideal source of sweetener for people with diabetes, and as a partial solution to obesity when caused by an excessive consumption of calories through sugar.”

In terms of the potential value a stevia industry could have, Professor Midmore estimates that if the artificial sweeteners consumed here were to be replaced by stevia grown in Australia, and the use of stevia sweetener reached 30% of sugar consumption, it would represent an industry with a gross value of somewhere between A$40-80 million.

The project involved investigating the chemical composition of three varieties imported from Shandong China. They found high levels of steviol glycosides in dried, ground leaves. They also developed a rapid and reliable system to measure the amount of steviol glycosides in different varieties.

In addition to the chemical testing, they studied and documented the growing requirements of stevia such as the effect of flowering time on yield, the nutritional and water requirements, and weed control options.

The study found that currently available varieties of stevia from Shandong in China would be suited to coastal subtropical Queensland, northern NSW and other warm zones of NSW, Victoria and WA.

The publication “Further Development of the Stevia Natural Sweetener Industry” is available from the RIRDC website.

For more information contact John de Majnik, Senior Research Manager: john.demajnik@rirdc.gov.au

*According to Food Standards Australia New Zealand, steviol glycosides are 250 to 300 times sweeter than sugar

Identifying Australia’s new rural industries

RIRDC now has a new program, New Plant and Animal Feasibility which will be developed and implemented during 2012-13. This program will support projects which assess the feasibility of new animal or plant products that have the potential to contribute to Australia’s agricultural productivity in a sustainable way. These products are ones which have not been produced on a commercial basis in Australia in recent times. The feasibility projects should include:

• A scan of consumer demand for the product, including relevant food and fibre trends in Australia and overseas
• Investigative research which assesses the likelihood of the product being grown or raised in identified regions of Australia, including consideration of any environmental, biosecurity or cultural issues
• The potential scale and location of markets (domestic and overseas)
• Collaboration with any available expertise, and if possible commitment from potential investors
• An identification of possible impediments to successful production and profitability
• A plan towards commercialisation (this may have a long term outlook), including the next steps for research.

The findings of every feasibility study will be shared on-line, creating an accessible resource about the new industry ideas and innovations which are emerging for the Australian rural sector.

The next round of funding applications will open in August 2013.

Please contact Julie Bird on 02 6271 4140 or Julie.bird@rirdc.gov.au for further information.
Juvenile Tripneustes gratilla cultured at the National Marine Science Centre, Southern Cross University. Source: H. Sheppard Brennand.

A lot to spike about sea urchins

They’re spiky, and they have a taste that’s seen them feature on the menus of many of the world’s leading restaurants, but they could also be the next big thing in Australia’s aquaculture industry.

The gonads, or roe, of the sea urchin are considered a delicacy in several countries, and a new research study funded by the Rural Industries R&D Corporation has revealed that Australia is in a prime location for the development of an aquaculture industry that could grow and export the unique looking creatures to the world.

The research project conducted by the National Marine Science Centre at Southern Cross University found that farming a particular species of sea urchin, Tripneustes gratilla (T. gratilla), could be a viable new industry, especially in Australia’s tropical north.

The research project’s lead researcher, Symon Dworjanyn, said they found that T. gratilla had fast growth and high survival rates, as well as robust gonad production.

“The aim of this project was to provide baseline data about the growing conditions required to successfully farm the T. gratilla species of sea urchin. We looked at the effects of culture density, seawater exchange rates, water temperature, nitrogenous wastes, and dissolved gases on growth, survival and gonad production of juvenile and adult sea urchins,” Mr Dworjanyn said.

“Some of the key findings were that the optimal water temperature for fastest growth was between 26-28 degrees Celsius, and that reduced water pH limited gonad production.

“Another of the key findings was that T. gratilla could grow in high densities, meaning a lot could grow in a small space under controlled conditions, and with low seawater exchange rates, therefore the seawater did not need constant refreshing in order for the sea urchins to maintain health and grow.”

There is currently no commercial sea urchin aquaculture industry in Australia. Sea urchins are currently produced in small quantities for restocking in Japan, and as a food in the Philippines.

The research highlighted that Australia is well placed to establish a sea urchin aquaculture industry given its clean green image, large coastal areas available for aquaculture, the availability of innovative aquaculture technology, and established commercial ties with the Japanese seafood market, which is currently the biggest user of sea urchin gonads. The research report can be downloaded for free from www.rirdc.gov.au.

For more information contact Julie Bird, Senior Research Manager Julie.bird@rirdc.gov.au

Sam brings a wealth of experience

Sam Nelson joined RIRDC as Senior Research Manager, Policy and Strategy in April this year after spending two years at the National Farmers’ Federation as Manager of Rural Affairs. Sam answered a couple of questions for Rural Diversity.

What are you passionate about in the agricultural sector?

I enjoy working with science and the agricultural and fishing industries, and I am passionate about Australia making the informed decisions which ensures that future generations are able to have the same access to food and fibre that we enjoy. The decisions that we make today on issues such as how land is used, investment in infrastructure and on biosecurity and the environment will have long term implications for Australia’s productivity. Australia needs informed debate and discussion on these issues, along with some lateral thinking if we are to successfully meet the challenges we face. I am pleased to be working in a position which can help to make a positive contribution to these debates.

If you could have dinner with anyone who would it be and why?

I have been inspired by a number of people that I have met through my work and outside of work. I continue to be inspired by leading farmers and their capacity to ‘multi-task’, their ability to recognise and adopt innovations, manage complex businesses in volatile markets; to contribute to their local communities whilst still keeping an eye on the weather. But, to be truthful I think I would invite a group of friends around to play squatter than have dinner with a celebrity!
A Board’s eye view

Learning about special ways of trellising tropical fruit trees to reduce cyclone damage, or standing alongside a wild rice habitat with enormous genetic diversity are not activities you normally associate with Boards.

But at least once a year, the RIRDC Board leave the boardroom and into the field, visiting a different region in Australia to see first hand the research that is being done.

In July, the RIRDC Board visited Far North Queensland. Board member Michael Guerin shares his insights.

Of note is a new project underway looking at ways to improve the capacity of a range of diverse industries to withstand cyclones. Some of the techniques being trialled in the plant area include trellising to support fruit trees, the use of defoliants to reduce wind shear, pruning and windbreaks.

We visited the Stewart brothers in Biboohra where custard apples are being trellised using a modified Tatura trellis system to minimise the impact of cyclones. It is a system designed to withstand cyclones of the strength of cyclones Larry and Yasi.

In the area of animal production, in industries such as dairy, beef and aquaculture, the researchers are looking at fence design, electronic identification and the tracking of animals after a cyclone, pollution, power disruption and animal welfare issues. This work has broader implications as the techniques have the potential to be exported overseas to countries that are affected by cyclones.

Dovetailing with this is a project delivering an overview of the lessons learned from previous cyclones and pulling together all the information that we have from the point of view of farmers and all levels of government.

We also visited the Mareeba wetland which is a natural wild rice habitat. Australia has many intact populations of several species of wild rice throughout northern Australia. We met with Professor Robert Henry of the University of Queensland who is leading an initial project for collecting and analysing the genetics of some Australian wild rice populations which are still intact. These populations contain genes which could provide qualities such as disease resistance, improved drought resistance, and better yields to existing commercial rice varieties.

“The field trips are great because they give us the opportunity to see RIRDC research first hand and meet the passionate people who are doing the research.

Last year we visited Tasmania where we visited a range of industries such as a large grower of pyrethrum and a beekeeper who is the largest commercial pollinator in Tasmania.

This time we visited Far North Queensland and what struck me the most was the great work being done on cyclones and wild rice,” Michael Guerin said.
The future of Australia’s tea tree industry relies on improving long-term productivity while increasing sustainability and resilience to climate change. Using residues & legumes to develop a low-emission tea tree industry

By Rob Atkinson*

Australia’s $17 million tea tree industry will take an important step into the future thanks to RIRDC’s success in obtaining an ‘Action on the Ground’ grant, funded by the Department of Agriculture, Fisheries and Forestry (DAFF) as part of the Australian Government’s Carbon Farming Futures program. These DAFF grants enable on-farm trials and demonstration of practices that reduce greenhouse gas emissions, increase carbon sequestered in soil and improve farm productivity, thus building the foundations of a clean, sustainable and more profitable industry.

The trial to be undertaken will involve strong collaboration between Southern Cross University, the Australian Tea Tree Industry Association and New South Wales Department of Primary Industries. Also vital will be the input of industry, which aside from contributing their own funds, have a strong reputation for innovation and adoption of new practices.

The trial will span three years and focus on two innovative practices.

The first is reducing nutrient export in leaf waste. Currently 21,000 tonnes of leaf waste is exported from farms as garden mulch following oil extraction. Because of this nutrient loss the industry relies heavily on imported fertilisers, which aside from being costly cause high nitrous oxide emissions. Furthermore, there is little opportunity to build soil carbon. After obtaining baseline data on nitrous oxide emissions and soil carbon storage under current practices, the trial will investigate the on-farm re-use of leaf waste following cutting-edge treatment by pyrolysis – decomposing the waste at high temperature in the absence of oxygen to create a ‘biochar’ which can return nutrients and carbon to the soil.

The second investigation will be trialling inter-row legume cropping. Legumes are known to effectively fix nitrogen in soil, and thus act as a natural fertiliser while further decreasing nitrous oxide emissions. Eight different legumes will be compared to determine if this property can be effectively exploited.

Results that are highly relevant and practical are pivotal, and this will remain the key focus given the project is being driven by industry. Four trial farms have been selected to encompass the major soil types and environments used for Australian tea tree production. These are ‘Main Camp’ with the property of John Frazier in Rappville, properties of Robert Dyson and Glenn Donnelly in Casino, and John Seccombe’s property in Coraki. It is envisaged these properties will continue as broad acre demonstration sites following the trial. Major outcomes expected include the production of a booklet ‘Managing soil carbon and nitrous oxide emissions in tea tree production’ and the development of a decision support tool that will allow growers to quantify financial benefits through either sequestering soil carbon or reducing emissions of nitrous oxide.

The future of Australia’s tea tree industry relies on improving long-term productivity while increasing sustainability and resilience to climate change. This project, with its basis in recent and successful research, will work to safeguard the industry and allow growers to take advantage of a rapidly changing landscape, such as the economic opportunities of the recently instigated Carbon Farming Initiative.

For more information contact Alison Saunders, Senior Research Manager: alison.saunders@rirdc.gov.au

*Rob is a part of the Graduate Development Program with the Department of Agriculture, Fisheries and Forestry and spent three months at RIRDC as one of his workplace rotations.
Preparing for Varroa mite

By Bethany Reid*

The worst fears of Australia’s honeybee industry have been confirmed, with new research showing that Australian honeybees are highly susceptible to a pest that hasn’t yet reached our shores but will potentially devastate them when it does.

The exotic Varroa mite is one of the greatest threats to Australian honeybees. Although only the size of a sesame seed, the effects of these mites on honeybee populations are severe. These mites attack themselves to bees, causing colonies to become weak and highly susceptible to disease as the mites are a significant vector of otherwise benign viruses.

Varroa is present in all bee keeping countries worldwide with the single exception of Australia. This includes our near neighbours New Zealand and Papua New Guinea.

Although Australia’s honeybee industry has so far been fortunate to escape the Varroa mite, most experts agree that the pest will eventually reach Australian shores.

With the threat of a Varroa mite incursion a very real one to Australia, the Honeybee Program at the Rural Industries R&D Corporation has focussed efforts on preparing the industry for the mite’s inevitable arrival.

As part of this preparation RIRDC funded a recently completed project investigating whether or not there is any resistance in Australian commercial honeybees to Varroa. This is important as it gives an indication of how the bees would cope with a Varroa incursion as well as help direct ways the industry could continue to better prepare for the pest.

Professor Ben Oldroyd, from the University of Sydney led the research project, in collaboration with Dr Tom Rinderer from the United States Department of Agriculture’s Agricultural Research Service. The research involved collecting seven lines of queen bees from around Australia. The bees were then packaged and flown to experimental apiaries in Kansas, USA.

Upon arrival in Kansas, the Australian honeybees were exposed to Varroa to see how they would respond. The responses were compared to US Italian honeybees that are known to be susceptible to the mite and two other types of honeybees known for their resistance to Varroa.

The results confirmed fears of Australia’s honeybee industry.

All Australian lines were found to be highly susceptible to Varroa. After only four months of exposure to the mite 44 percent of all the Australian honeybee lines had died. This compared to only a 4 percent mortality rate for the most resistant Russian honeybee, which isn’t found in Australia.

“Because Australian honeybees have never been exposed to Varroa the chances of them being susceptible are much greater,” Professor Oldroyd said.

“If there is a positive to take out of this research it is that it showed there are breeds of bees that do have a considerable resistance to Varroa, however these bees aren’t currently found in Australia.

“If the Australian honeybee industry and honeybee dependent crops are to have any chance of minimising the impact of Varroa then it is critical that Varroa-resistant honeybees are bred for the Australian environment, and urgently.”

Since early September 2012, Australian borders have been reopened to allow the importation of queen bees from approved countries. This means beekeepers are now able to import Varroa-resistant stocks to begin the crucial task of breeding resistance into Australian bees.

The New Zealand Institute for Plant & Food Research Limited has successfully produced colonies of bees carrying a trait that gives the bees an ability to clean their hives of Varroa naturally, offering the potential to reduce chemical use in the colonies and to slow the build-up of chemical resistance. The eight-year breeding project is now complete and the bee colonies are being distributed to the New Zealand beekeeping industry.

The biosecurity risks of allowing queen bee imports has been assessed by the Department of Agriculture, Fisheries and Forestry and specific quarantine procedures have been put in place to minimise these risks.

Of specific concern is the potential establishment of Africanised bees into Australia. Africanised bees have many undesirable characteristics such as more frequent swarming, reduced honey production and extreme defensiveness.

To help prevent the establishment of Africanised bees in Australia, RIRDC is now investing in research being carried out by the University of Sydney to develop a testing procedure for identifying Africanised alleles in imported bees and semen.

Once developed, this testing procedure will be another step towards protecting the Australian honeybee and pollination industries from hazards which have devastated bee colonies in many other parts of the world.

*Bethany is a part of the Graduate Development Program with the Department of Agriculture, Fisheries and Forestry and is currently spending three months at RIRDC as one of her workplace rotations.
Phosphorus - an essential element in limited supply

Phosphorus - it’s an essential ingredient in fertilisers for the growth of agricultural crops and pastures. Australian soils are low in phosphorus and we import about 80,000 tonnes of phosphorus each year, mainly as imported fertilisers and phosphate rock.

Investigations by the Institute for Sustainable Futures at the University of Technology, Sydney predict that without action and at current rates the production of the best supplies of phosphorus will have peaked in as soon as 25-40 years.

Dr Dana Cordell and Professor Stuart White from the Institute for Sustainable Futures at the University of Technology have been awarded the 2012 NSW Office of Environment and Heritage Eureka Prize for Environmental Research for their research tracking the flow of phosphorus through the Australian food system. The study was part funded by RIRDC.

As part of their work, the scientists from the Institute for Sustainable Futures and their global colleagues created an international network, the Global Phosphorus Research Initiative (GPRI). The GPRI is involved in public policy debate to raise awareness and prompt action to sustainable manage this non-renewable resource.

The research has sparked an international effort to raise awareness and foster sustainable management of phosphorus, an essential component of the global fertiliser industry. Scenarios have been developed to use the remaining phosphorus in a more sustainable way, to ensure long term soil fertility, food security and environmental security.

The RIRDC-funded analysis will enable the identification of key intervention points within agriculture and other sectors to increase the resilience, efficiency and ‘closed-looped’ nature of Australia’s food system with respect to phosphorus.

Without action, world phosphorus supplies are expected to only last another 20 years.

The $10,000 NSW Office of Environment and Heritage Eureka Prize for Environmental Research is awarded for research in any field of the biological, physical, mathematical or biomedical sciences leading to the resolution of an environmental problem, including a challenge posed by climate change, or the improvement of our natural environment.

For more information contact Anwen Lovett, Executive Manager, anwen.lovett@rirdc.gov.au
Who and what is RIRDC?
The Rural Industries Research and Development Corporation (RIRDC) is an Australian Government statutory authority. Our aim is to maximise knowledge outcomes for industry and government from R&D investment in:
• New Rural Industries
• Established Rural Industries
• National Rural Issues

Our vision is for enhanced prosperity for Australian rural industries and their communities.

We focus our R&D investments at the applied end of the innovation pipeline to ensure we maximise outcomes for the benefit of rural industries and communities.

Through our wide network and extensive advisory committee structure, RIRDC is able to identify the strategic knowledge needs of stakeholders and select and manage the best R&D investments to meet those needs.

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Download from our website www.rirdc.gov.au

Native Australian Bees as Potential Pollinators of Lucerne, 12/048
The seed lucerne industry in Australia produces around $AUD 38 million worth of seeds annually. It is generally recognised that improved pollination would increase yield. This report summarises a proof-of-concept study to investigate the efficacy of some common Australian native bee species to pollinate lucerne.

Review of National ‘Blueprints’ for Agriculture, 12/070
To assist the National Farmers’ Federation (NFF) and the Australian Government in developing national blueprints, the Centre for International Economics (CIE) reviewed national blueprints developed for other countries’ agricultural sectors.

Climate Change for Horse Owners: Fact sheet, 12/077
This project sought to engage horse owners to examine the potential impact of climate change. As the horse keeping population of Australia moves towards capital cities and major regional townships, horse keeping practices have shifted from broad acre or rangeland grazing to smaller properties.

Producing high quality Lucerne hay: Project summary, 12/102
This is a summary of the information contained in the RIRDC publication Producing Quality Lucerne Hay, publication no. 08/101.

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