Did we forget to mention...

During the past 12 months the FFI CRC has achieved some significant outcomes across its program portfolio. Many of these have been featured in the past five editions of *Focus on Perennials* — but by no means have they all received the limelight they deserve.

Following are just a few of the wallflowers from the past year that deserve a special mention as the year draws to a close. Some of the following projects have received coverage in *Focus on Perennials* and *Future Farm*, many have not. It just goes to show how much is going on behind the scenes with FFI CRC researchers and our collaborators across the country.

Even more new *Lotus* varieties hit the hot spot

The development of new perennial pasture varieties is a key focus for many CRC's researchers. Their quest is to breed or find new and better-adapted variety options for southern Australia to improve producers' ability to adapt to a rapidly changing climate in a sustainable way.

While John Ayres' work on the development and commercialisation of two new Birdsfoot trefoil (*Lotus corniculatus*) varieties has featured twice in *Focus on Perennials* recently (see Issue 2 and Issue 5) there have been some other quiet achievers waiting in the wings.

FFI CRC Researcher Dr Graeme Sandral, NSW Department of Primary Industries (NSW DPI) said his work with Dr Daniel Real, Department of Agriculture and Food WA (DAFWA) had lead to new Birdsfoot trefoil cultivars, which have extended the species' range well beyond the boundaries set by current varieties.

"These new varieties come with the expectation of being highly productive and hardy when grown in acidic and low-fertility soils in areas receiving an annual average rainfall of 500-1000 mm, particularly where winter waterlogging is an issue," Dr Sandral said.

"Sale of these cultivars to farmers could transform areas of land previously thought as being too difficult for a productive perennials legume."

More information

Dr Graeme Sandral, NSW DPI
T: 0409 22 6235
E: gsandral@cyllene.uwa.edu.au

Woody perennials establish their way

The benefits of woody perennials such as saltbush are well know. During the past year researchers in the *Future Livestock Production* Program have made inroads into successful establishment techniques and technology to facilitate their use.

"New technology for the establishment of specific woody perennials has been developed to increase efficiency and lower costs," project leader Dr Phil Nichols said.

"These technical advances make it likely that Oldman saltbush will be reliably established from seed with conventional agricultural equipment using a combination of seed harvest, physical and chemical treatments."

Specific treatments have been identified to enhance establishment of a number of recalcitrant species.

More information

Dr Phil Nichols, DAFWA
T: (08) 9368 3547
E: pnichols@agric.wa.gov.au

New species: new opportunities

FFI CRC researchers look not only at adapting existing species, but identifying new and novel species that could prove useful.

An example is the *Understorey* project, a new salt- and waterlogging-tolerant pasture legume (*Melilotus siculus*) has been identified as having substantial stress tolerance advantages over current commercial options.

Understorey is now developing a new salt-tolerant *Melilotus siculus* cultivar as part of the CRC's *PastureSearch* initiative. The challenge is now to find better performing root bacteria suited to saline environments.

Project leader Andrew Craig, South Australia Research and Development Institute (SARDI) said nodulation failure has occurred repeatedly in regenerating plots across several trial sites and seasons in South Australia and Western Australia.

"Recent measurements have shown about 70 per cent of plants are failing to nodulate in the year after establishment," Andrew said.

Eliminating or significantly reducing nodulation failure is the first research priority for this project.

"Considerable effort is being directed towards identifying a rhizobial inoculant that will persist in highly saline pastures," Andrew said.

In addition, studies of various agronomic practices that may increase rhizobial survival and reduce the impact of salt are being assessed. After these constraints are overcome, research from this project will result in the release of a new salt-tolerant pasture legume cultivar and an accompanying salt-tolerant rhizobial inoculant. This will represent a significant advancement for Australian agriculture which will allow greater utilisation of this marginal land.

More information

Andrew Craig, SARDI
T: (08) 8762 9193
E: craig.andrew@saugov.sa.gov.au

Research expands pasture species' range

It's not all about new varieties and species though — researchers in the *Future Livestock Production* program have been investigating the options with existing varieties.

"Our team has discovered the unrealised potential of sub-tropical perennial grasses in northern New South Wales. Grasses that can greatly extend the perenniality of pastures in regions receiving a high proportion of summer rain," program leader Dr Joe Jacobs said.

The research optimised the agronomy of pasture establishment in the region and produced benchmark performance standards for production, quality, water use and water-use efficiency. All the information was combined to demonstrate the economic implications of the new techniques.

The potential of chicory as a short-term, high-quality forage break crop in the cereal belt and medium-rainfall permanent pasture zone of southern Australia has been further explored, extending its use well beyond its traditional use in the high-rainfall zone.

"We have investigated the role of winter-active Mediterranean ecotypes of cocksfoots, fescues and phalaris in the medium-rainfall wheatbelt and the need to select for increased levels of summer dormancy," Dr Jacobs said.

Researchers have also been busy identifying the value of *Lotononis bainesii* as the perennial subtropical legume most capable of persisting in medium- to low-rainfall cool temperate/mediterranean regions that receive some summer rainfall.

Lucerne remains a key focus for researchers in the livestock production team and the hardy perennial continues to prove its superior drought tolerance and persistence across a diversity of sites, justifying further efforts to extend the limits of adaptation of this valuable species with a focus on increasing tolerance to grazing, waterlogging and acid soils.

"We also have recognised the excellent persistence of the Australian native grass *Austrodanthonia caespitosa*, which is enabling the subsequent development and release of the first cultivar of this species," Dr Jacobs said. "*Austrodanthonia caespitosa* also has a low-to negligible environmental weed risk, compared to cocksfoot and phalaris."

For low-rainfall areas legume germplasm has been consolidated with Lancelot trefoil (*Bituminaria bituminosa* var. *albomarginata*) showing the greatest potential.

More information

Dr Joe Jacobs, DPI Victoria
T: 0427 947 692
E: joe.jacobs@dpi.vic.gov.au

Wireless sensing still on the radar

Developmental research continues to develop wireless sensing technologies for vegetation studies.

This offers benefits of improved experimental design via flexible equipment deployment, improved monitoring access in logistically challenging environments (such as tall tree canopies) and increased density of observations for better validation of models and hypotheses.

More information

Steve Burgess
T: (08) 6488 2073
E: ssb@cyllene.uwa.edu.au

Postgraduate training

FFI CRC has seen the successful recruitment of 18 new postgraduate students for this first year of the CRC.

More information

Daryll Richardson
M: 0409 312 574
E: drichardson@agaveeducation.com.au

Perennials make a bold statement

After more than seven years of research and almost one year in preparation the FFI CRC's *Prospects for profitable perennials in mixed farming systems* publication will soon be distributed to farmers, extension officers and other industry stakeholders.

Put together by UWA researcher Dr Sarita Bennett, the publication comes as changing conditions threaten the sustainability of farming operations across southern Australia.

"An increasingly variable climate and recent drought years have led to the realisation that current farming practices in the low- to medium-rainfall farming areas of Australia need to be altered in order for farmers to remain viable," Dr Bennett said.

"Perennial plants with deep roots can access water in the soil profile, and as a result provide out-of-season feed, are regarded as one way mixed farmers can maintain their profitability."

The *Prospects for profitable perennials in mixed farming systems* publication is based on six years of research by the former CRC for Plant-based Management of Dryland Salinity and provides perennial plant options for farming regions across southern Australia.

"It takes a region-by-region approach based on temperature, rainfall and soil type," Dr Bennett said.

"During the past lucerne has been the most popular perennial but I have also looked at other perennial legumes, grasses and herbs such as chicory."

Dr Bennett said the publication was a handy reference to perennial plants for both farmers and extension officers.

"They can look at the information that is relevant to their area, decide what perennial plants are most suitable for their needs and also find out more about different farming systems which include perennial plants."

Farmer case studies support the scientific data and demonstrate, in a practical way, how perennial plants are being successfully and profitability incorporated into Australian mixed farming operations.

The publication also includes a cost-benefit analysis comparing perennial plants with annual forage and out-of-season feed and a weed risk analysis.

The *Prospects for profitable perennials in mixed farming systems* publication is set to be released early during 2009.

More information

Dr Sarita Bennett, UWA
T: (08) 6488 4841
E: sarita@cyllene.uwa.edu.au