Clearing the air

Invisible in the fog, the methane cattle burp and breathe out is a potent contributor to total greenhouse gas emissions from agriculture. Industry and Investment NSW scientists are excited by new evidence that methane can, in part, be genetically controlled.

Story p7
Our need to eat applies pressure to environment

Environmental Agriculture

Environmental Agriculture with Rebecca Limes-Kelly

E VERYONE needs to eat. This fact alone, says a new UN review of the United Nations, makes agriculture and food consumption important drivers of environmental pressures, including climate change and habitat loss.

The UN report, Assessing the environmental impacts of consumption and production, reviews the effects of different activities on the use of natural resources and the generation of pollution.

It asks three questions:
- Which production processes contribute most to environmental pressures and impacts?
- Which products and consumption categories have the greatest impact across their life cycle?
- Which materials have the greatest impact across their life cycle?

In the past 50 years humans have changed ecosystems more rapidly than in any comparable time period of consumption and production, impacts from agriculture are expected to increase substantially due to population growth, anticipated to be nine billion by 2050.

"It is difficult to look for alternatives: people have to eat," says the report.

"A substantial reduction of impacts would only be possible with a substantial worldwide diet change, away from animal products."

It will be challenging to provide basic necessities such as adequate nutrition and water for a growing population while maintaining and improving ecosystem services.

To read the report, go to www.unep.org/resourcepanel/docu-
ments/pdf/PriorityProductsAndMaterials_Report_Full.pdf

Talking wasps:

Parasitoid wasps of fruit fly occur throughout much of the Queensland fruit fly’s range in Australia, albeit generally in numbers that are insufficient to provide control below economic thresholds. However, research shows promise for rearing and releasing large numbers of parasitoids for the control of fruit fly, and experts will talk about it at the Mudgee Small Farms Field Days this month.

Dr Olivia Reynolds and Dr Katina Lindhout will be at the Industry and Investment NSW field days site, to offer advice on how to encourage the presence of parasitoid wasps.

Dr Lindhout will also discuss post harvest disinfestation options.

More on the Mudgee field days, p13.
Pregnancy scans optimise survival

THE challenge for sheep producers in the best seasonal conditions shaping up in south eastern Australia for years is to ensure flock potential at joining turns into successful lambing.

Pregnancy scanning contractors have reported some flocks with over half the ewes carrying twins.

“The wonderful pasture and fodder crop growth this year is quite the reverse of what we have had to manage through and for many producers, abundance of feed will present its own challenges,” says Chris Shands, livestock officer at Glen Innes agricultural research station.

“Producers who have scanned their ewes for pregnancy status have a much better chance of optimising lamb survival, armed with information.”

“The main risks to lamb survival are starvation and mis-mothering, which often occurs in twins when birth weights are low – this is mainly caused by poor nutrition in late pregnancy.”

Shands says the abundant feed supply this year should help reduce losses from this problem.

To try to avoid single bearing ewes experiencing lambing difficulties, it is imperative to restrict the intake of ewes grazed on high quality pastures or fodder crops in the last month before lambing.

Livestock officer, Chris Shands

The lifetime wool study identified the optimum birth weight range of the NSW single born lamb between 3.5 and 5.5 kilograms.

Lambs with birth weights at six kilograms or heavier have a greater chance of getting stuck during the lambing process.

To try to avoid single bearing ewes experiencing lambing difficulties, it is imperative to restrict the intake of ewes that are grazed on high quality pastures or fodder crops in the last month before lambing,” Mr Shands said.

“Producers will need to significantly increase the stocking rate of single bearing ewe groups to restrict intake.”

“Pasture targets for these single bearing ewes should be no more than 800 kilograms of green pasture or fodder per head.”

“Single ewes may need to follow cattle or twin bearing ewe groups that have already grazed these pastures well down.”

Under current pasture conditions this grazing management regime will be difficult to achieve, but it’s a better option than losing both the ewe and the lamb through dystocia.

Single bearing ewes should be put into the lambing paddock when the first lamb appears and from this time the feed quantity and quality available to singles should be increased.”

Shands says nutrition of twin bearing ewes is a priority but this season it is likely current pasture conditions will be adequate to ensure optimum lamb birth weight and to prepare the ewe for lambing.

In pasture terms, twin bearing ewes need a minimum of 1200 kg of green dry matter per hectare (three to four centimetres pasture height) in the last four weeks before lambing.

If this pasture target cannot be achieved, then a balanced supplement of energy and protein needs to be fed.

Twin bearing ewes are highly susceptible to pregnancy toxemia in the last three weeks prior to lambing, so a balanced and concentrated diet is imperative.

“Any management activities like drenching and vaccinating should take place at least four weeks prior to the start of lambing to avoid pregnancy toxemia,” Mr Shands said.

“Keep twin bearing ewes out of the yards will also help to reduce foot abscess problems.”

Contact Chris Shands, Glen Innes, (02) 6730 1926, chris.shands@industry.nsw.gov.au

AN APPEAL is out to graziers to provide sheep and cattle brains for testing to demonstrate Australia’s ongoing freedom from brain diseases.

Australia is recognised as free of transmissible spongiform encephalopathies (TSE), including scrapie in sheep and mad cow disease in cattle (BSE or bovine spongiform encephalopathy). The NSW target is to examine 149 sheep and 87 cattle brains each year.

The sample numbers have been statistically calculated to ensure that if TSE was present in Australian sheep and cattle, it would be identified.

TSE surveillance program co-ordinator for Industry and Investment NSW, Dr Dermot McNerney, said generous incentives are available for graziers and veterinarians to submit samples from suitable sick or dead animals.

“A grazer can receive some compensation for an older animal that would otherwise be of no value,” he said.

“Graziers receive $300 for each cattle brain and $50 for each sheep brain.”

“The veterinarian is paid separately for collecting the brain, documenting the case and sending it to the laboratory.”

Dr McNerney said it was important to test brains each year to maintain this freedom status.

“These diseases overseas have caused extensive damage to European and US domestic and export markets and resulted in the massive slaughter of stock,” he said.

“If the diseases ever came into Australia it would have a devastating effect on our sheep flocks and cattle herds and we would lose major trading markets.”

“BSE, a risk to public health as the infectious agent in cattle, is implicated as the cause of a human TSE known as new variant Creutzfeldt-Jakob disease.”

Eligibility criteria for sheep and cattle:

● Cattle must be between 30 months and less than nine years old.
● Sheep must be more than 18 months of age.
● Animals that are sick and look like they are suffering from nervous signs or showed similar symptoms before dying are eligible.
● Nervous signs are common in conditions such as pregnancy toxemia, metabolic disorders, plant poisonings and pulpy kidney.
● Animals which are recumbent or down due to leg weakness are eligible.
● Vets are familiar with the details of the program and requirements.

If this fits, Dr McNerney said, graziers with any terminally sick animals be bled by the owner, and if not, how long they have been under ownership of the submitter.

You can also upload a scanned image of the movement document if you have the facilities to do so.

“This beauty of NLIS Sheep and Goats is that it is simple,” Mr White said.

“It is a mob-based, visual and paper-based system, and the introduction of mob-based movements to the database will complete the information along the supply chain.

“To the farm system, all sections of the supply chain, grazing, processing, transport, together, as the alternatives to this system, or implications if we do not have it, are far more complicated, and costly.”

Contact your local livestock officer, LHPA Office, or NLIS.

— MEGAN ROGERS

Brains sought for surveillance

NEW rules for the movement of mobs of sheep and goats come into force today, July 1.

The rules will affect sheep and goat producers and help to protect export markets and businesses from the effects of an emergency animal disease or food safety issue.

“One animal constitutes a mob,” said Ashley White, industry leader for sheepmeat development with Industry and Investment NSW (1 and 1).

“All movements of sheep and goats to a property with an Animal Property Identification Code (PIC) will need to be recorded on the NLIS database, as a mob-based movement.”

This requires logging onto the NLIS online database, www.nlis.com.au, to activate an NLIS database account, and then to record movements each time a producer takes delivery of stock, from another mob or property, including agistment.

If receiving stock from a saleyard or public auction, then the stock and station agent, or saleyard operator, will be responsible for performing the database transfer.

Producers won’t need to record a mob-based movement if they sell directly through a saleyard, send them direct to an abattoir, feedlot or export depot.

These operators are already required to record mob-based movements on the NLIS database.

With NLIS Sheep and Goats, producers do not need to log, move or enter into stock movements.

“It is usually the responsibility of the receiver of the stock, or person responsible for the stock to record the movement on the database,” Mr White said.

The required information is:

● Date of Movement.
● Species.
● Number of head in the mob-based movement.
● From PIC (the PIC where the animals have come from).
● To PIC (the PIC where the animals are moved to).
● Movement Document Serial Number (from National Livestock Identification Declaration or Travelling Stock Statement).

Other information may be included, such as whether the animals were bred by the owner, and if not, how long they have been under ownership of the submitter.

You can also upload a scanned image of the movement document if you have the facilities to do so.

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Contact your local livestock officer, LHPA Office, or NLIS.

— SARAH CHESTER
Brightest staff shine on the national stage

Women laugh at what they want

The program has seen the release of new varieties of wheat, including quick maturing varieties for the northern, central and southern regions and longer season varieties which are ideal for earlier sowing in the southern regions.

The department’s scientists and agronomists have proven experience, having conducted 129 cereal and pulse trials throughout the NSW grains belt and spearheaded initiatives to improve the scientific knowledge on viral diseases of livestock.

The catalyst for a whole day of initiatives was the keynote speaker, author, broadcaster and comedian, Wendy Harmer.

She was supported by family meeting facilitator, Lyn Sykes, a past coordinator of the Rural Women’s Network, Sonia Muir, and motivational speaker for Women’s Wellbeing, Genevieve Marchiori.

I can’t remember when I last had such a good laugh, especially listening to Wendy Harmer and Lyn Sykes’ ‘pithy hours’, or being moved to close tears by a speaker as I was when listening to Genevieve Marchiori’s personal story.

“Listening to others as they left the Town Hall, I know my sentiments were shared by many.”

Another said: “What a fantastic event! Honest, jovial and refreshing.

This was a day well spent, and I think truly another event of this type would be very well attended.

“I think you got the combination of talent just right – each woman gave something different of themselves, and for that I think the audience was very grateful.”

The group is assessing the response and planning what they can do next to live up to such expectations.

– HOWARD SPENCER

Women laugh at what they want

The Grains Research and Development Corporation has awarded the department the National Variety Testing (NVT) tender for the 2010-2014 cropping seasons for cereals, oilseeds and pulses.

“NSW growers will continue to see to conduct national testing of a range of crops in the State for the next five years.

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“NSW growers will continue to see to conduct national testing of a range of crops in the State for the next five years.

The department’s scientists and agronomists have proven experience, having conducted 129 cereal and pulse trials throughout the NSW grains belt each year for the past five years as the service provider for the NVT.

For the next five years, the NVT will have an expanded role with canola being added to cereals and pulses and some trials may also be carried out in Victoria.

In addition to varietal testing, other research will also be carried out including screening for rusts, acid soil, crown rot, root lesion nematode, yellow leaf spot and cereal cyst nematode resistance and tolerances which adds extra value to the NVT sites, Mr Whan said.

“For the first time growers will also be able to see wheat trials that are comparing variety performance with and without the application of foliar fungicides to control diseases.”

“I and I NSW district agronomists also play a key role in National Variety Testing by conducting field days and trial site visits during the growing season.

“This is another example of NSW scientists continuing to lead the way in important areas of agricultural science and research.”

The four addressed such topics as getting and staying motivated, managing difficult situations, building and maintaining a support network, and overcoming life’s challenges.

Testimonials began flooding in to Jenny Croft on the Monday after the event and have not stopped.

“I had so many phone calls and emails thanking me, saying they really needed to laugh until their sides hurt, especially from the farming women,” she said.

“They said they had lots of home messages delivered with lots of humour.”

In one testimonial one woman wrote:

“Personally, I thoroughly enjoyed each of the speakers and had a really great day.

Grains testing contract worth $7m

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Which wheat stands heat?

A NEW project will seek to identify sources of genetic variation for heat tolerance in durum and bread wheats.

Controlling growth chamber and greenhouse techniques will identify sources of different heat tolerance mechanisms. Validation experiments will be conducted to confirm that tolerant lines are able to maintain grain yield and grain quality under heat stress in the field.

“Durum and bread wheat accessions likely to contain tolerance will be sourced from Australia and internationally for the screening work,” said Dr Livinus Emebiri, cereal geneticist with the Primary Industries division of Industry and Investment NSW (I and I) at Wagga Wagga.

“Stabilising wheat production and quality under heat stress is a major challenge and will be fundamental to food security,” he said. The Grains Research and Development Corporation is funding the project.

Dr Emebiri said many established wheat-growing regions experience growth arrested well above the moderate temperature generally acknowledged to be optimal for growing wheat and related cereals.

INDUSTRY and Investment NSW (I and I) staff specialists have contributed four chapters to the recently released International Sheep and Wool Handbook. I and I primary industries deputy director-general, George Davey, said inclusion of chapters in the book by current and former I and I staff and I and I sponsors, Integrated Packaging, New Holland and Pioneer.

“The department invests heavily in sheep industries development and international recognition of the expertise of its specialists in this way shows that the investment is paying off.”

The International Sheep and Wool Handbook provides a comprehensive account of current and likely future developments in wool and sheepmeat industries in all the major regions of the world.

“Five current I and I staff and one former staff member contributed chapters as authors or co-authors,” Mr Davey said. “Director of Tranjoin Agriculture Research Centre and forest and rangeland ecosystems research leader, Dr Ron Hacker, wrote a chapter on extensive grazing systems.

“Cows based research scientist, Dr David Hopkins, contributed a chapter on processing of sheep and sheepmeats.

“Sheepmeat specialists, Brent McLeod and Ashley White, collaborated with the department’s former sheepmeat specialist, Bill O’Halloran, on a chapter on the marketing of sheep and sheepmeat.

“Livestock officer at Tancoon, Geoff Duddy, co-authored a chapter on intensive production systems.” The International Sheep and Wool Handbook is published by Nottingham University Press, a publisher of high quality scientific and technical publications, focusing primarily on the fields of animal and food science.

The publication covers all aspects of the industry, discussing the major world sheep and wool industries, biological principles, management, production systems, preparation, processing and marketing.

Early silage may beat lucerne before spring influx

FARMERS concerned about plague locusts in the coming spring could consider an early cut of silage to beat locusts must be made early.

Once lucers are in the crop they will affect yield and feed quality and, although a salvage harvest may be possible, it is much less likely to be successful.

Crops such as canola and some legume crops have also made good silage.

The decision to make slange from any crop this year is aimed at spreading risk and ensuring lucers don’t cause a complete crop failure.

Further information on winter cereal silage can be obtained from Industry and Investment NSW district agronomists, Top fodder courses, the Successful Silage manual or information on the department’s website www.dpi.nsw.gov.au.
Learn to invest and increase confidence – life can change

**Beyond the kitchen table**

Sonia Mier
Rural Women’s Network

I BELONG to a small women’s investment club called WINO (Women’s Investment Network of Orange) which has been running for more than 10 years.

We are a diverse group with a range of ages and interests who meet monthly in each other’s homes or in a local pub to talk about shares. We each contribute $25 a month into a kitty and have gradually built a small portfolio that has even managed to survive the global financial crisis.

Now, we aren’t about to retire next week and go live on a yacht in the Caribbean, but we have learned a lot about how the stock market works and used our knowledge to make personal investment decisions outside the group.

An Australian Financial Literacy Foundation survey in 2008 found that women are generally highly confident in their ability to budget, save, deal with credit and manage debt. However, fewer women (63 per cent) than men (75pc) are confident in their ability to invest.

Only 54pc had ever seen a financial adviser, although many had spoken to an accountant or tax agent (66pc), or a bank adviser (60pc).

Learning to invest and put money aside for the future is something that can start at any age – but the earlier the better.

Compared with our grandmothers, women in Australia are generally better educated, better paid and have many more career opportunities.

We need to remember, however, that life circumstances can change at any time.

We can become mothers, carers, get married (or unmarried), lose a partner, carers, get married (or remarried), have many more career opportunities.

We need to remember, however, that life circumstances can change at any time.

I &I NSW bookshop 1800 028 374

Catch & release measuring mats – the approximate weight of a fish can be estimated from its length measurement. They also include illustrations of the most popular freshwater species which has been designed to help anglers accurately record their catch. The mats include full colour illustrations of the most popular saltwater and freshwater species of fish and conversion tables so the approximate weight of a fish can be estimated from its length measurement. They also include tips on the best methods to use to ensure the fish is given a maximum chance of survival after release. Large graduations on the ruler can help in the many Catfish, Photograph and Release fishing competitions that have emerged in recent years. The mats are manufactured from a UV stable material, weighing your fish with a ruler!

**Choose rice fields with low water use**

RICE farmers need to carefully choose the fields that use the least water next season, when the total area sown is expected to increase.

Farmers need to avoid any higher water use friable soils more suited to winter cropping and other summer crops, according to Industry and Investment NSW rice farming systems industry leader, John Lacy.

“Of the main objectives of the rice industry is to improve profitability per megalitre of water so any strategies to minimise water use are vital,” Mr Lacy said.

Ideal rice suitability electromagnetic (EM) maps and sodicity tests, if available, are a guide to selection.

Rice farmers need to carefully choose the fields that use the least water next season, when the total area sown is expected to increase.

“Generally higher EM values indicate lower percolation losses and lower water use. The maps also indicate lower value EM areas of more permeable soils which should be avoided.

“Farmers should consult their irrigation company rice environmental officer about their field EM maps and field selection. Ideally, fields chosen should have uniform topsoil without heavy cut and fill areas.

Uneven fields with heavy cut and fill areas and soil fertility will result in uneven crop maturity, delays in drainable extra water use.

Fields to be laser level should be toposliced to reduce rice growth variation from cuts and fills.

**Update rice skills with course**

THE PROFarm Rice for Profit course offers the opportunity to update and refresh for the significant increase in rice plantings expected in the coming season.

This three-day course will be presented at Murrumbidgee Rural Studies Centre at Yanco from August 2 to 4.

Speakers from the Industry and Investment NSW (1 and 1) rice team will present information from the latest research and extension, and grower experiences.

The focus is on improving rice yields, profits and sustainability in the context of the rice farming system, said I &I 1 1 and 1 agronomist, John Smith.

Emphasis is on improving rice water use efficiency and profit per megalitre, with a practical approach to improving management for seasonal and economic decisions, rice field preparation, in crop management and timing of operations.

Other presentations include rice plant growth, nitrogen and fertiliser management and weed management.

The course has been highly rated by past course farmer and agronomist participants and is currently under evaluation for Farmready funds.

**Contact your district agronomist to discuss these strategies**

**Plant Bantler with PM Bowen**

Edward appointed

SOME grazing wheat crops sown early after the excellent rain are afflicted with wheat streak mosaic virus (WSMV). In previous seasons (particularly 2006) WSMV caused severe damage to wheat crops, mostly winter grazing wheats.

Symptoms are stunting and distortion of leaves that commonly show yellow streak patterns on the leaf. The streaks are bordered by a microscopic mite, the wheat curl mite, which survives on many grass species and will be active while temperatures range between 10 and 27 degrees Celsius.

The mites spread mainly by wind but are only viable within about one kilometre of the original source.

TO ORDER YOUR MAT:

$11.00 inc. GST of $3.00

For a pack of 5 contact I &I NSW bookshop on 1800 028 374 or go to our website www.dpi.nsw.gov.au/bookshop


**Wheat streak mosaic virus alert**

The virus can also be carried in the seed.

Many other cereal crops, such as triticale and barley, are also hosts for this virus but show no effects on crop growth or yields.

An important part of the cycle of the virus is survival over summer on summer active grasses or volunteer cereals.

This green bridge provides continuous host material across the seasons and the grain pasture and volunteer crop growth over the past summer has provided ideal conditions.

The problem will most likely express itself when plants are under stress.

The stress can commonly be from lack of moisture or recovery from grazing.

From previous experience, some crops are worse than others, but if symptoms are showing at this time of year, then the chances of recovery for further grazing and grain recovery are low.

Management strategies should be to maximise use of the crop growth for grazing now and then spray out the affected area to avoid build up of a source of viral material later in the season.

This could affect other crops and carry over into next season in seed or innoculum carried by the mites.

Some areas may be replanted now to later maturity varieties of triticale or barley. If you suspect you have a crop affected by WSMV, call your local agronomist, who can organise for samples to be sent to the lab for confirmation.

Industry and Investment NSW can also provide more information on WSMV at www.dpi.nsw.gov.au or through your local office.

**Read this column online at www.dpi.nsw.gov.au/agtoday**
Breed for less methane

EXCITEMENT is bubbling over Aussie cattle burps. New evidence proves agricultural production of the potent greenhouse gas, methane, can in part be genetically controlled, say scientists in the Primary Industries division of Industry and Investment NSW (I and I). After determining this in a first generation of bulls, they are now at the stage of breeding a second generation of low and high methane emitting progeny, for measurement next year. To bring it down to everybody's street level, the researchers make an interesting comparison between the greenhouse gas emissions of a six-cylinder family car and their highest methane emitters.

"Getting excited over cattle burps might seem strange to some people, but not to us," said Dr Robert Herd (pictured right), principal research scientist at the Armidale Beef Industry Centre of Excellence. Methane in burps and in the air that cattle breathe out is a major contributor to total greenhouse emissions from agriculture.

Two years ago, the department's scientists had evidence that different bulls produced different volumes of methane. So began their breeding program to produce low methane emitters. Sons and daughters of those bulls, now "teenagers", have just been measured for their methane production.

"We are breeding a new generation of low and high methane emitting cattle," Dr Hegarty said.

"If we get the expected outcome, that of producing some truly unique low methane-emitting offspring, it will be a world-first demonstration of breeding cattle that produce less greenhouse gas without sacrificing growth performance."

The calves will be born early next year and will be measured for methane late in 2011. Dr Hegarty says the project is doing much more than demonstrating the potential of conventional animal breeding to reduce methane emissions.

"In our lab, and in labs of collaborators in other States, we are investigating why some cattle are able to digest grass efficiently but seemingly produce much less methane than other cattle," he said.

"Is it the microbe bugs in their stomachs? Is it the way their stomachs function? Knowing may enable us to recommend feed supplements or pasture plants that change how other cattle are able to digest grass efficiently but seemingly produce much less methane than other cattle," he said.

Methane produced in bellies represents loss of feed energy, apart from being a greenhouse gas. "Reducing methane production means improved efficiency of feed use, and better for the environment," Dr Herd said.

In recognition, the project is funded by Meat and Livestock Australia and the Australian Government’s Climate Change Research Program.

Choose one of three field trips

THE Australian Society of Animal Production's 28th biennial conference will be held this month at the University of New England, Armidale.

"Producers and research and development providers from around Australia will come together, to discuss the application of science to the livestock industries of Australia," said one of the conference organisers, Robert Herd.

Dr Hegarty said Wednesday, July 14, would be a standout day.

The program will start with an animal welfare forum and the afternoon session will include a special showcase of science from the Sheep, Beef and Poultry Co-operative Research Centres (CRCs) which will include several tours.

Dr Hegarty, principal research scientist with Industry and Investment NSW at the Armidale Beef Industry Centre (below), said participants could choose one of three trips.

"They can tour Kirby Farm for Sheep CRC Information Nucleus flock demonstrations, join the Beef CRC for a trip to Tullimba beef research feedlot, or visit Kootingal to inspect a commercial turkey farm with the Poultry CRC," he said.

The tours will include lunch, presentations and demonstrations.

The conference starts with registration on July 11 and concludes on July 15 and Armidale district producers are being offered a special discounted registration fee.

More information is available at www.asap.asn.au, or from Robert Herd, (02) 6770 1808, or robert.herd@industry.nsw.gov.au

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**Contact Dr Robert Herd, (02) 6770 1808, robert.herd@industry.nsw.gov.au, or Dr Roger Hegarty, (02) 6770 1808, roger.hegarty@industry.nsw.gov.au**
**Profitability queried**

**Introducing the new PI-Test for BVDV on hair or skin samples**

Virology Laboratory EMAI

Your 'one-stop-shop' for Pestivirus (BVDV) testing - backed by a team of veterinary virologists offering a full range of BVDV tests at competitive rates

**Homework before bull market**

A FERTILE and efficient breeding herd is essential to maximise profitability and bulls are a major part of the breeding program.

Bulls need to be fertile, fit and, ideally, contributors of genetics which improves herd productivity.

“For many graziers, buying a new bull is one of the most significant annual purchases, so it is wise to do the right things options before actually committing,” said Alastair Rayner, beef livestock officer at Tamworth.

“The most successful purchasing decisions are often initiated up to 12 months prior.  
“It is important to evaluate the current generation of calves.”

How quickly have they grown? What maturity pattern do they display? Do they meet market requirements?

It is often worth evaluating information from even further back.  
How much difficulty was there at calving? How was the temperament of the calves? This information can be really valuable when planning what bull to buy this year.

As well as objective data, at weaning, or when selecting heifers, it is important to evaluate physical traits.  
How does the structure and maturity pattern suit the program you are operating? Does the current generation display enough muscle?  
From these observations, it is possible to settle on the type of bull which is best suited to take a breeding program forward.  
“Early decisions provide greater time to search for the right bull,” Mr Rayner said.  
“The bull selling season sees thousands of bulls from all breeds offered for sale.  
“Most bulls are accompanied by information regarding pedigree, estimated breeding values for genetic merit, photographs and, in some cases, videos.”  
“At the best of times, wading through this information to find the right bull can be daunting.”

However, producers who decide early what they want can take more time to visit breeders and view the bulls before a sale.

“This can also boost confidence that purchase of a particular bull will mean a contribution to profitability.”

**Muscle cow performance**

Jason Siddell, beef officer with the department at Glen Innes, with some of the muscling herd, now moved to Grafton, where ongoing research will quantify the effects from selection for muscling on cow reproductive performance.

The earlier this is done, the more the steers carrying the high muscling steers’ yield three per cent more and the steers carrying the high muscling steers’ yield six per cent more than the low muscling steers.

“Preliminary analysis of the 2008 drop steers fed for 100 days at Tallumba Feedlot, Kingspton and recently slaughtered at Casino, found the myostatin carrier steers were significantly more feed efficient than the low muscling steers, with the high muscling steers in between the two,” Mr Siddell said.

A total of 110 low muscling, 110 high muscling and 60 myostatin carrier cows were transferred to Grafton and the project is being funded by Meat and Livestock Australia as part of the Beef CRC material efficiency study.

**Contact Jason Siddell, Glen Innes, (02) 6730 1941, jason.siddell@industry.nsw.gov.au**
Beef-n-omics changes pay off

ROBERT Gowing runs 150 Angus cows at Castlereagh, west of Muswellbrook, in the Hunter Valley, where recent changes have increased his profitability.

Historically, Mr Gowing produced mostly Angus weaners for sale at the Scone saleyards. Gross margin analysis of his business as part of a Beef-n-omics course run by his local livestock officer led him to the changes. In 2009, Mr Gowing experimented with six hectares of oats to carry 21 steers through the winter.

The establishment cost of the winter feed was $300 a hectare, including cultivation, summer fallow chemicals, starter fertiliser, seed and in-crop herbicides.

The steers were grazed for 40 days and put on an average of 50 kilograms. This ensured all animals met minimum weight specifications for Caroona feedlot, but also avoided selling during the bottom of the annual price cycle.

The prices for feeder steers had improved by 20 cents a kilogram at the time of sale in mid-July. After the steers were sold to the feedlot, 28 weaner heifers were grazed on the oats until early October.

The total return from the oats, comprising kilograms of beef produced and an increased value per kilogram, was just over $900/ha, with a benefit cost of 3:1. This year Mr Gowing has expanded this part of his operation, grazing 42 steers on eight hectares of oats.

The winter forage crops also have an added benefit – they have been used to clean up creek flats that were seriously infected with galenia, a weed of growing importance in the Hunter region.

The pre-emergent and in-crop herbicides have provided excellent galenia control and Mr Gowing anticipates establishing improved perennials, for example, winter active lucerne and fescue, next year. He has recently purchased both Limosun and Chorolais bulls to use over a portion of his Angus cows.

Gross margin analysis with the Beef-n-omics programs suggests the returns from the extra weight gain of the Euro-infused calves will more than compensate for any price discount on the steer portion of the purebred Angus calves.

Contact Todd Andrews, Scone, (02) 6544 4904, todd.andrews@industry.nsw.gov.au.
FURTHER widespread rain across most of the state meant autumn ended as the wettest since 2000 for both NSW and the Murray-Darling Basin. However, there was a distinct contrast between the mostly wetter than average season to the west of the Great Divide and the drier than average conditions over many areas to its east, and particularly the

South Coast during April and early May, where the dry spell only broke at the very end of autumn.

In the last week of May, a low pressure system followed by an intense east coast low brought very heavy rain across much of the parched south east. Now, the chances of follow-up rain are looking more promising with each passing week. The equatorial Pacific Ocean is continuing to cool and the majority of international models predict this cooling will continue in coming months.

Several are suggesting Pacific sea surface temperatures will actually pass La Niña thresholds by late winter or early spring. Already we’ve seen deeper ocean temperatures in the equatorial Pacific three to four degrees Celsius cooler than normal and the Southern Oscillation Index (SOI) has been recording consistently positive values since April. These are all encouraging signs for the continued development of a La Niña during 2010.

La Niñas are often, but not always, associated with above average rainfall across NSW, west of the Divide. However, there was a distinct contrast between the mostly wetter than average season to the west of the Great Divide and the drier than average conditions over many areas to its east, and particularly the

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A NUMBER of gauging stations in central NSW are measuring salinity volumes, turbidity and discharge in streams in the Wellington area.

"We are working out how salt is mobilised in the landscape," said Tony Bernardi, research hydrologist with the Primary Industries and Investment NSW (1 and 1). 

"If we can understand the interactions between geologies and rainfall variation in these various landscapes, we can draw conclusions about climate and climate change and the requirements for future land management."

Some gauging stations have been newly established and some have been re-established and upgraded, where pre-existing infrastructure provided a logical place to research areas that contribute substantial salt volumes into waterways.

Part of $130,000 provided by the Bureau of Meteorology was to reactivate some piezometers – five in the Spicers Creek area, 40 kilometres north of Wellington – at depths between three and 90 metres.

1 and 1, and the NSW Department of Environment, Climate Change and Water (DECCW), are collaborating on the project.

During dry times, when there is little flow from Burrerrodong Dam, the flat lying high risk salinity catchments of Spicers Creek, Sandy Creek and Mitchells Creek contribute 25 per cent of total salt loads into the Macquarie system.

Spicers Creek contributes a majority of that salt, so it's a critical stream to monitor," said Allan Nicholson, principal salinity officer with DECCW.

Salt has a major effect on water quality, which then affects stream biota, agriculture, ecosystems generally, and human consumption. At Arthurville, southwest of Wellington on the Little River in another Macquarie sub-catchment, they have re-instrumented one gauging station.

"We have also re-established three piezometers here – we want to know how much salt is mobilised and where, in that landscape, and when it’s mobilised," Mr Bernardi said.

"The Little River starts salty, freshens up as it runs though grain country, but then it gets salty again near Arthurville."

The Little River catchment has a number of instrumentation sites and these sites add to an existing network.

"If we get a wet winter, we would expect to see some good numbers," Mr Bernardi said.

The result is an increase in their groundwater capacity to manage natural stream flows and less damage to the landscape.

"It is the only experiment which has detailed long-term measurements of salt and water transfers both before and after the fencing and planting treatments," he said.

Farmers can arrange to inspect the trial site and see how the salinity management treatments are working on the ground at Gumble.

Contact David Mitchell, (02) 6391 3852.

— BERNADETTE YORK
Grant for water tech upgrade

R ELOCATING hand shift sprinklers up to 20 times a week during summer is a job Eddie Galea will be happy to kiss off, both for its time consumption and relative inefficiency.

The sprinklers on his Werombi vegetable farm in the lower Hawkesbury-Nepean catchment apply water with low uniformity, requiring significant over-irrigation to ensure the crop is adequately covered.

Mr Galea will use a WaterSmart Farms grant to install a fixed sprinkler and drip irrigation system on five hectares of his crops to drastically reduce his labour input, water waste and farm energy costs, and boost production.

Hand shift sprinklers operate all day through summer just to keep the crops wet. This gave Mr Galea no option but to irrigate under windy, adverse conditions.

The new system has the capacity to irrigate only when weather conditions are ideal, resulting in much more productive water use.

Surface drip lines will be installed to apply water only where required: at the base of the vegetable seedlings.

The laterals, furrows and unproductive areas are not irrigated.

Accurate water placement also makes fertiliser application through the irrigation system (fertigation) a viable, efficient option.

Electricity savings are an additional benefit often associated with irrigation system upgrades.

The new electric pumps are controlled by variable speed drives, which vary the motor speed of the electric pump so it is always operating at the most efficient speed for the job required at the time.

The new pump can efficiently supply low pressure drip lines for one shift and then higher pressure overhead sprinklers in the next, if necessary, always operating efficiently.

The new system will help improve production, letting me establish seedlings and irrigate the crop with overhead irrigation when necessary, but use drip irrigation for the majority of a crop’s life,” Mr Galea said.

“With the assistance of the grant, I will be able to purchase a better quality high efficiency drip irrigation system that will last more than 15 years.

“Without the scheme, it would be difficult to outlay the capital for two irrigation systems for one vegetable crop.”

Scott Machar, Smart Farms officer with Industry and Investment NSW, says almost 200 irrigators in the lower Hawkesbury-Nepean catchment have submitted expressions of interest in receiving WaterSmart Farms grants.

“We are working with them to establish as many on-ground projects as possible,” Mr Machar said.

“The work at Mr Galea’s farm is typical of irrigation technology upgrades being rolled out with the aim of establishing long-term, highly productive, water efficient farms in the Sydney basin.”

WaterSmart Farms is part of the Hawkesbury-Nepean River Recovery Program, funded by the Australian Government through its Water for the Future program with supplementary funding from NSW Government through its Climate Change Fund.

Contact the Smart Farms Information Line, (02) 4588 2118 or visit www.dpi.nsw.gov.au/agriculture/resources/smartfarms

Greenhouse recycling demos

GREENHOUSE water and nutrient recycling and treatment systems will be commissioned on a number of demonstration farms being set up in the Hawkesbury-Nepean region.

The demonstration farms are part of the new WaterSmart Farms project.

The main issue with using recycled water in a hydroponic greenhouse is the high risk of crop failure from disease outbreaks caused by pathogens.

Industry and Investment NSW is currently testing ultrafiltration water treatment systems as a cost-effective way of removing pathogens from recycled water.

If proven effective, such units will be installed, along with water recycling infrastructure, on six demonstration farms located in key greenhouse production localities in the project area.

The systems will enable additional water savings through the construction of rainwater harvesting infrastructure.

They will also offer the option of an additional ultra-violet treatment unit if necessary.

A major function of the demonstration farms will be to provide real time data on the potential economic benefit gained from treating water and reusing it.

Information gained on nutrient management and reduced water costs will be used to underpin workshops and training packages.

Average vegetable growing hydroponic greenhouses in the region generally use between 7000 and 12,000 kilolitres a year, depending on the size of the enterprise.

The water price recently rose to $1.87/kL, and further rises are anticipated.

Increasing costs make water harvesting, recycling and treatment increasingly desirable options for the hydroponic greenhouse industry.

It is estimated a basic recycling system would save most growers around 30 per cent of their water use, and possibly up to 100 per cent if an alternative water supply source, such as a dam, is available.

There are many methods available for treatment to remove pathogens, however, effectiveness and cost vary.

Advances in technology and rising water costs have only recently made treatment systems feasible for the average greenhouse operation to consider.

The recycling and treatment systems on trial could potentially save from 1000kL to 10,000kL of water annually for each enterprise, as well as significant volumes of fertiliser.

If successful it is anticipated that these treatment systems will offer water saving measures that could be applied throughout hydroponic greenhouse enterprises in the Hawkesbury-Nepean region.

The Smart Farms project is part of the Hawkesbury-Nepean River Recovery Program.

Funding for the program has been provided by the Australian Government through its Water for the Future program, with supplementary funding for the WaterSmart Farms project provided by the NSW Government through its Climate Change Fund.

Contact the Smart Farms Information Line, (02) 4588 2118 or visit www.dpi.nsw.gov.au/agriculture/resources/smartfarms
INFORMATION on farming, forests and fish will be abundant and easy to get at the Industry and Investment NSW (I and I) display at this month’s Mudgee Small Farm Field Days.

The event over two days is scheduled for July 16-17. Livestock officers will hold a series of informative and practical sessions on beef cattle and sheep, including beef breeding for profit, how do cattle grow, improving lamb survival and building and selling sheep.

Information on stock handling, the National Livestock Identification System, feeding and nutrition, and marketing will also be available, readily available for visitors to peruse on the two days.

Visitors after information on horticulture can find out about everything from organics to fruit fly management. The Prune Road Show will also be there, along with information on cider apple production. Options for commercial and private fruit and vegetable growers to control fruit fly will be outlined.

For advanced growers and cropping, visit the agronomy plots to see live displays of many varieties. Agronomists at the local weed office will be available to answer questions.

I and I confidentiality will conduct free worm tests, providing faecal egg counts of worms for sheep, goats, cattle, alpacas and horses.

To take advantage of this service, drop dung samples to the I and I display at this month’s Mudgee Small Farm Field Days.

IN RESPONSE to great public interest in starting up free range poultry production, the Poultry Co-operative Research College in conjunction with, and with funding support from the Poultry Co-operative Research Centre at the University of New England. It costs $36.

Contact 1800 025 520 or www.tocal.com

Consider sweet sipping cider

APPLE cider, a popular alcoholic beverage enjoyed around the world, can provide the perfect industry for small landholders.

Made from fermented apple juice, apple cider can be made from any apple. Taste preferences and tradition mean, however, it is usually made from apples with different characteristics to eating or cooking apples. The main difference with cider apples is that they contain tannins which change the way the final product tastes and feels in the mouth.

Australia has a number of varieties of specialty cider apples, grown in the same manner as eating varieties. The difference with cider apples is that a consumer never sees the apple, meaning the degree of management applied to these varieties needs only to be at a relatively basic level.

Once fruit is harvested, growers have the choice to sell it to cider producers, outsource part of the product form the orchard to a cider producer, or to make it in their orchard.

For more information on the Australian cider industry and cider apple production, visit the Industry and Investment NSW display at the Mudgee Small Farm Field Days.

Technical officer from Orange Agricultural Institute, David Pickering, is pictured pressing cider apples.

There will be practical sessions on beef cattle breeding for profit as part of the Industry and Investment NSW display at Mudgee.
Goulburn’s tussock task

NINETY Goulburn district landholders got the latest information on managing serrated tussock at a free workshop in June.

The workshop was offered after recent reports of herbicide resistance showing up in serrated tussock in the area.

“We had confirmed one case of flupropanate resistance and wanted to help land managers limit opportunities for further resistance to develop,” said Industry and Investment Victoria’s principal research scientist, Dr David McLaren, provided the latest information about flupropanate resistance.

Flupropanate and glyphosate are the two main chemicals registered for the control of serrated tussock. Alternating between them and, most importantly, having an effective integrated weed management strategy, helps prevent resistance.

Weed chipping, competitive pastures, grazing management and cultivation where possible can all help control the weed and reduce reliance on chemical controls.

“It’s important to take heed of these recommendations as serrated tussock is an invasive weed which is both economically and environmentally costly to the whole community,” Mr McWhirter said.

“We have only two chemical groups, Group 1 (flupropanate and 2,2-DPA) and Group M (glyphosate), to manage serrated tussock and we need to maintain their effectiveness.”

A case of herbicide resistance in serrated tussock was confirmed in Victoria in 2002, with the first NSW case confirmed near Armidale in 2007.

Contact Lori McWhirter, Goulburn, (02) 4828 6625, lori.mcwhirter@industry.nsw.gov.au

Plant biodiversity in woodlands project

Biodiversity identified in farm pastures was a refreshing revelation for 43 landholders as they learned to identify paddock plants in the Murrumbidgee and Upper-Murray Catchments last month.

A project officer with the Primary Industries division of Industry and Investment NSW, Tony Cox, said field days held at Tooma, Gundagai, Adelong and Humula were part of the Communities in Landscapes project, targeting high-value environmental assets on private land to boost biodiversity and production.

“Prior to the field days farmers estimated 12 plant species would be found; at the end of the day we had identified 37,” Mr Cox said.

“The level of biodiversity in pasture paddocks and adjoining grassy woodlands bodes well for the future of the project, which aims to protect more than 55,000 hectares of endangered box gum grassy woodlands.”

Soil core samples taken from the paddocks and woodland areas are now being analysed ahead of soil carbon workshops.

Mr Cox said Communities in Landscapes is drawing on the diversity of information and research data available from the department to drive the project.

“LANDSCAN, Prograze and native pasture courses will be tailored to suit the goals of the project and the participating landholders,” he said.

The aim is to give landholders the biodiversity benefits of these box gums and grassy woodlands, to protect the grasslands for future generations.

Communities in Landscapes has been funded through the Australian Government’s Caring for our Country program with participation from Landcare NSW Inc, Industry and Investment NSW, Grassy Box Woodland Conservation Network, Sydney University, NSW Department of Environment Climate Change and Water, CSIRO, Greening Australia’s Florabank, Stipa Native Grasses Association and Birds Australia.

Contact Tony Cox, Orange, (02) 6391 3885, tony.cox@industry.nsw.gov.au

‘Elusive balance’ in south west

A FORUM attended by about 40 people at Henty discussed how best to balance agricultural production and sustainable management on the high-value land of the mixed farming zone of the South West Slopes.

Mainly farmers, government organisations, banks and agronomists took part.

Local farmer, Steven Scott, said there had been a lot of capital work on farms through Landcare, but now farmers were at a stage where they needed to integrate biodiversity with a sustainable farming practice.

His stretching revelation for 40 people at Henty said how best to balance agricultural production and sustainable management on the high-value land of the mixed farming zone of the South West Slopes.

The aim is to give landholders the biodiversity benefits of these box gums and grassy woodlands, to protect the grasslands for future generations.

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– BERNADETT YORK
Dr Chan says soil carbon can fortify

SOIL organic carbon (SOC) will play a crucial role in the future of mixed farming systems, according to Industry and Investment NSW principal research scientist, Yin Chan.

"Farming systems which can maintain or increase SOC levels will hold the key to adapting to an environment predicted by climate change research," Dr Chan said.

"And pasture management will play an important role in this challenge, with the potential to raise SOC levels.

"Significant increases in SOC, 0.5 tonnes of carbon per hectare annually, have been observed under improved pasture where a leguminous pasture was fertilised with phosphorus.

"Graziers can combine improved, fertilised pasture with grazing management and pasture cropping and other management practices to increase SOC levels.

"Replacement of shallow-rooted annual pastures with deep-rooted perennials pasture may change soil carbon cycling and distribution in the soil profile."

Dr Chan said in the past SOC expected could have been declared under declining – now conservative farming practices including no-till technology; can increase or, at the least, maintain SOC.

"Combining cropping and pasture phases in a mixed farming system offers additional potential for further SOC increases, which would allow graziers to improve the performance of mixed farms.

"There are many examples of increased grain yields resulting from an increase in SOC levels.

"In a long-term trial at Wagga Wagga, which has been running for 25 years, we have prepared extreme management treatments – traditional tillage, stubble burnt under continuous wheat and a no-till system with stubble retained under a wheat-lupin rotation.

"SOC was measured at 1.5 per cent in the most exploitative system, continuous wheat with average wheat yields of 1.5 tonnes per hectare.

"The no-till system delivered 2.5 per cent in the top zero to five centimetres of soil, with average wheat yields of 2.9/ha.

"This difference in crop yield has important implications regarding future food security."

"Of equal importance, more stable soil structure, higher moisture infiltration rates and more abundant earthworm presence and biological activity – all attributes of healthier soil – were found in soil with higher levels of SOC.

SOC plays a role in improving water use efficiency via its effect on soil structure and the associated soil physical properties. Increased water holding capacity, higher infiltration rate and higher nitrogen availability arise from increased SOC made farming systems more resilient to climate change.

"Soil found under the well managed rotational systems should also be more resistant to erosion hazards."

Dr Chan will present his research on soil organic carbon as the keynote paper at this year’s Grassland Society of NSW annual conference in Dubbo, on July 28 and 29.

Visit www.grasslandsww.com.au

Contact Don Yi Chan, Richmond, Fax: (02) 6880 2108.

BERNADETTE YORK

Stop the spread north

WITH any new weed incursion there is always a lag phase between appearance in the new environment and co-ordinated action to limit spread.

"Causes for the lag generally occur because landholders, councils included, don’t recognise the weed and/or are complacent, with an ‘I’ll get to it tomorrow’ attitude about sparsely present weeds," said Craig Muir, fireweed project officer with the Primary Industries division of Industry and Investment NSW (1 and 1).

"Fireweed is no different."

"Fireweed looks like many other weeds in its appearance. It is not completely eradicate it, only reduce its vigour."

"Fireweed is now commonly found on properties and along roadsides and public land in the Upper Hunter, and has been seen as far west as Merriwa.

"Isolated plants have also been identified in the Capertee and Bylong valleys. It was discovered on a development estate in the Mudgee town area in 2009, possibly introduced by vehicles or with building or landscaping materials brought in from western Sydney.

"This infestation was quickly removed by council nursery weed staff however, it provides a timely reminder to all property owners to be vigilant about getting unfamiliar plants identified."

"New weed incursions are often imported in contaminated fodder brought to the region, highlighting the necessity for landholders of large and small holdings to be vigilant when purchasing fodder."

"Don’t buy feed from known fireweed areas or known fireweed proper ties," Mr Muir warned.

"Always insist on inspecting the fodder before purchasing and always feed in designated ‘quarantine’ areas that can be easily monitored for newly arrived weeds."

"Fireweed looks like many other ‘yellow-flowered’ weeds such as St John’s Wort (Hypericum perforatum), Cineraria (Cineraria maritima) or Silver groundsel (Cineraria maritima).

"Fireweed has long narrow, slightly serrated leaves while Cineraria has deeply lobed, almost fern like, leaves.

"The flowers look similar."

"The one thing working in favour to help limit extensive spread is fireweed’s susceptibility to frost."

"Past research has shown it is reasonably frost sensitive, however, frosts will not completely eradicate it, only reduce its vigour.

"Landholders are urged to incorporate a range of control strategies to limit fireweed spread."

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Planting for success...

Development of the long-stem planting method in Australia has seen an increase in the survival rates of seedlings planted in many different environments. The advantages of this method, such as no post-planting watering, increased growth rates and higher survival rates, have made a positive contribution to many rehabilitation projects and seen individuals and groups obtain successful outcomes in areas that were considered a challenge.

What is long-term planting?

The long-stem planting method is an innovative way of planting that can result in higher survival and growth rates with minimal post-planting care. Seedlings are grown in pots for 10-18 months, so that they develop long woody stems. These seedlings are then planted with about three-quarters of their length below the soil surface which results in much of the woody stem being covered with soil. Once planted, the seedling develops roots from the buried stem and leaf nodes. This promotes the development of a robust root network which gives the seedling a greater chance of survival.

The long-stem planting method has challenged two long-held horticultural principles:

1. Large plants should not be grown in small containers as they will become root bound, thereby hindering the future growth of the plant.
2. Stems of seedlings should not be planted below the surface of the soil as this subjects them to fungal attack and disease.

Field trials using the long-stem method with a variety of native species have demonstrated that seedlings can not only be grown successfully when these two traditional principles are not followed, but can have survival and growth rates that exceed those planted using traditional planting methods.

How the long-stem method was developed

The long-stem planting method was pioneered by Bill Hicks in the Hunter Valley. The spread of willows had become an environmental problem and difficult to pull up a deeply-planted root ball; and

- the long-stem method creates an older, stronger seeding for planting.

Riparian environment

The main benefits of using the long-stem method within the riparian context is that the roots of seedlings are planted more deeply into the river bank therefore the seeding is not washed away during a flood event. In original trials in the Hunter Valley, Bill Hicks found that three of the four species planted exhibited greater growth rates using the long stem method. Bill showed that native plants could be reintroduced into riparian environments using the long-stem planting method where previous planting trials had not been effective.

Rainforest environment

Research conducted in the rainforest at Holgate, NSW, has indicated that some species show significantly greater growth rates when planted as long-stem seedlings. The long-stem seedlings often do not reach 1 metre high when grown in the pots. However, this does not affect their ability to be planted deeply using this method. Field trails using a larger number of rainforest species are currently being undertaken to further study long-stem planting within rainforest environments.

Coastal environment

Long stem plants in sand dunes benefit from having reliable soil moisture, limited root competition, and stable soil temperatures. The likelihood of the root ball being exposed in dunes as a result of sand movement is reduced when the long stem planting method is used. At Patonga Beach (Central Coast, NSW) the long-stem planting method has been used in trials of Coastal Wattie, Acacia longifolia var. sophorae, to restore the beach dune area. Results of these trials concluded higher survival and growth rates with plants using the long-stem planting method (Bakewell et al. 2009).

The advantages of using the long stem planting method in this environment include the elimination of the need to build structures around the seedlings to protect them and elimination of the need for post-planting irrigation. This can significantly reduce the costs associated with regeneration work and the amount of follow up maintenance required at the site.

Saline environment

There has been great success in the use of long-stem planting within saline environments. Bill Hicks planted 2,500 long-stem salt-tolerant seedlings in the Upper Hunter. The trees survived a record drought, above-average temperatures and frosts as well as high salinity levels.

The main benefit of this method in a saline environment is that the root system is planted below the salt encrusted top layer of the soil. Soil salinity is damaging because it reduces the ability of plants to take up moisture and nutrients. As in other areas, deep planting also protects the root ball from surface frosts and drying out.

Long-stem planting has been shown to be successful in a wide range of environments and conditions and the method provides an opportunity to improve the survival rate of native plants in the restoration of degraded ecosystems.

The Long-stem Planting Guide provides a step by step guide to this innovative method of planting which has applications for community groups and organisations involved in bush regeneration works, land management and natural resource management.

For further information on this planting method download The Long-stem Planting Guide from The Australian Plants Society website at www.australianplants.org or obtain a hard copy of The Long-stem Planting Guide by emailing the NSW Environmental Trust at info@environmentaltrust.nsw.gov.au or by phone on (02) 8837 6093.