

Western Division newsletter

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Daughterless carp

by Lauren Starr
Communications / Media Officer,
Pest Animal Control Cooperative Research Centre,
Canberra



Carp are one of Australia's worst introduced pests, but researchers at the Pest Animal Control Cooperative Research Centre (PAC CRC) are using biotechnology in an attempt to control the spread of carp in the Murray-Darling Basin.

The intention of the 'Daughterless Carp' project is to use 'gene silencing' technology to stop the production of aromatase – the protein that stimulates embryos to become female. Embryos in carp always start out as males, so the Daughterless Carp technology aims to modify a carp gene to produce exclusively male offspring, which will lower population levels over a few generations, when and if it is released into the wild.

While there exists a general concern in the community about Genetic Modification technology, in this case, no foreign genes from other species are introduced, as the

daughterless gene is modified from carp genes only. Therefore the gene is species specific, and means only carp will be affected – humans and pets are not at risk.

The common carp was first introduced to Australia in the 1860's, but only spread significantly when carp escaped a fish farm at Boolarra in Victoria during flooding in the late 1960's into the Murray Darling Basin. Other isolated populations of carp existed around Sydney before they infiltrated the Murray Darling Basin. In some areas of the Basin, carp now comprise up to 90 per cent of the fish biomass.

Carp are a pest because they compete with native fish species for food, and because of their feeding habit, which involves sifting through bottom sediment when feeding. This has the effect of reducing sunlight penetration, which then causes a loss of plant life and some native fish habitats. Carp possess many of the attributes that typify a successful invasive species – they are very hardy, and are able to survive a wide range of water temperatures from as low as 4 degrees up to 35 degrees Celsius. They can tolerate low dissolved oxygen levels, and can gulp air from the surface of the water when dissolved oxygen levels are depleted. Carp are also highly fertile – an adult female carp weighing six kilograms can produce 1.6 million eggs, which equates to about 13 per cent of its body weight. Carp are also relatively unaffected by high concentrations of pollutants and sediment in the water.

Continued on page 6



by Trudie Atkinson
Livestock Officer
(Sheep and Wool),
NSW Department of Primary
Industries, Broken Hill

Welcome to the November/
December edition of the
Western Division Newsletter.

A number of the articles in this edition discuss activities or ideas that may assist with maintaining or developing markets and with the development of new industries in the Western Division. Topics discussed include two new tourism initiatives – the Mungo Loop and the Paroo-Darling Visitors Centre, research into the health benefits of eating kangaroo meat, growing trees for diversification, producing more prime lambs and live sheep export.

Other articles highlight the continued focus on natural resource management and pest control (animal and plant) in the Western Division. These articles include information on trap yards, vegetation mapping, soil carbon, pest control programs used by NSW National Parks and Wildlife Service, controlling carp, woody weeds and prickly bushes.

Previous editors have encouraged contribution from producers. Rex Andrews has taken up the challenge and documented observations he has made on his property over a number of years. If there is something interesting happening on your property, we would like to read about it in the next newsletter.

I would recommend reading the articles on the daughterless carp and kangaroo meat projects. I approached the authors to write the articles, as I thought WDN readers would find both these projects interesting.

Thank you to everyone who has contributed to this edition. Our contributors have posed some interesting questions, these include; Could the kangaroos on your property fight cancer, heart disease and obesity?, How many more ewes could a property run if it never had any weaners to look after?, Live sheep export: can we better prepare our sheep?, How do we produce more prime lambs in Australia?. I will leave you to consider these questions, and hope you enjoy this edition of the Western Division Newsletter.

Oversight: the photograph of the bat (*Mormopterus* sp.) published in Issue 102 of the WDN on page 15 was taken by David Gee, DIPNR.



NSW DEPARTMENT OF
PRIMARY INDUSTRIES



Department of
Infrastructure, Planning and Natural Resources

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Live sheep export: can we better prepare our sheep?

by Greg Curran, Veterinary Officer, NSW Department of Primary Industries, Broken Hill
Melissa Gosson and Kimberley Booker, Veterinary Interns, University of Sydney
Ross Andrews, Pastoralists Association of West Darling

Bans placed on live export of pastoral sheep

Following the Cormo Express incident in 2003, live sheep exports were reviewed. Additional criteria were set for live export of sheep through southern Australian ports from 1 May to 31 October each year.

The following sheep were banned from live export between 1 May and 31 October by Australian Quarantine Inspection Service (AQIS):

- Sheep from all Australian pastoral zones.
- Sheep which are more than 800 km to registered live export premises.

Sheep from pastoral areas can be accepted at live export premises if they are sent to a property in the high rainfall and wheat sheep zone, and held there for a minimum of 30 days, if they can be identified to their property of origin.

Sheep from pastoral areas prepared in sheds at registered live export premises for 5 days are also eligible. Most Western Australian sheep are prepared in feedlots in sheds. Most NSW, South Australian and Victorian sheep are prepared in feedlots in paddocks. Western Australian sheds are designed to allow dung to fall through flooring, greatly reducing the amount of Salmonella-contaminated faecal material that sheep come in contact with. In paddock feedlots, sheep are constantly exposed to any bacteria excreted in dung.



Preventing mortalities during live sheep export

From comprehensive studies in Western Australia, two major causes of deaths were identified, and need to be managed:

- sheep not eating (inappetence)
- salmonellosis

Sheep not eating has been recognised for many years. Why don't some sheep eat in feedlots?:

- they simply don't recognise that the grain and pellets in troughs are 'food'. They may have never been fed grain or hay, or learnt to feed or water from troughs.
- some are upset by the stresses involved in mustering, yarding, handling, trucking and feedlotting, and can go off their feed (as do some people when stressed).
- sheep sick from an infection can go off their feed.

Continued overleaf

Salmonellosis is the disease caused by salmonella. Salmonella are a family of bacteria that live in the gut, and are spread in dung. Symptoms of Salmonellosis include scouring, weight loss, and inappetence. The scour spreads huge numbers of Salmonella bacteria. Animals become susceptible to Salmonellosis if they are not eating, not fed, or if stressed. Because Salmonella are passed in dung, and spread in contaminated feed or water, the disease is seen more where sheep are close together and crowded, as in feedlots.

What could be done to further reduce the small number of pastoral sheep dying during live sheep export?

- **teach sheep about handfeeding:**
 - if ewes with lambs at foot are handfed for short periods, the lambs know to eat grain or other feed from troughs all their lives
 - give sheep destined for live export grain or pellets from troughs or feeder drums for a short period weeks or months before departure
- **reduce the time sheep are off feed:**
 - time mustering, handling, and trucking so that sheep are not off feed for more than 24 hours, including time spent in trucks
 - if trucks are delayed, feed sheep in yards or in holding paddocks
 - you may be required to withdraw water to prevent soiling and wetting in trucks, but keep the feed up as needed
- **prevent sheep drinking or eating material contaminated with dung, to avoid Salmonella infection:**
 - keep feed off the ground
 - place feed and water in containers that won't easily collect dung
 - clean feed and water troughs regularly to remove dung

(Imagine how healthy you'd be if eating or drinking material contaminated with human faeces! Basic hygiene applies equally to sheep.)

- reduce stress on sheep to a minimum during mustering, handling and trucking.

Regaining this market

The bans have been applied in an attempt to prevent mortalities during live export.

The Pastoralists Association of the West Darling and some Rural Lands Protection Boards are working to regain access to this market. They have pointed out that, in Western Australia¹, mortalities were lower in sheep coming from their pastoral areas, and higher in sheep from their high rainfall areas.

These grazier organisations have proposed that, as all Australian sheep entering the live sheep export process will have eartags identifying property of origin, simply removing and recording eartags of dead sheep each day will allow flocks or areas with nil or lower mortality rates to be identified. Additionally, they have asked that the effectiveness of the ban on pastoral sheep be fully assessed.

The Department of Agriculture, Fisheries and Forestry has 6 working groups currently reviewing all aspects of the live export trade, with decisions due late in 2004. Pastoralists Association of West Darling currently has a submission before these working groups, detailing the effects this ban will have on pastoral zones, and outlining ways to address mortalities.

¹ Higgs, ARB et al. 'Mortality of sheep exported by sea: evidence of similarity by farm group and of regional differences' *Aust. Vet J.* 1999; 77: 729-733

Exciting new outback experience – Mungo Loop

by Renae Collier, Community Support Officer,
Murrumbidgee Catchment Management Authority, Hay

A new and exciting outback touring experience has now been launched. The Mungo Loop tour, set amongst the semi-arid environment of New South Wales Western Division, takes its traveller on a self-guided 380 kilometre round trip tour through a piece of Australia's most unique outback country.

The Mungo Loop Outback Touring Guide, an initiative of the Homebush Landcare Group, was officially launched on Thursday 30 September at the Homebush Recreation Ground. This exciting event attracted over 60 people to an informative and fun afternoon. In his opening address, Greg Ayson, chair person of the Homebush Landcare Group explained that the Mungo Loop tour brochure 'idea' was originally established in order to de-mystify the many misconceptions that visitors had concerning the tree-less landscape and to ultimately educate tourists travelling through Balranald to Mungo National Park. This idea then began to grow and evolve through the hard work and dedication of a local sub-committee comprising Kate Weaver, Marianne O'Halloran, Sue Williams and Lorraine Ayson. The sub-committee with the help of Hank Van Apeldoorn (Development Officer, Balranald Shire), built the initiative into a tourism venture which will ultimately benefit and encourage the tourism industry within the Balranald Shire and beyond.

Western Lands Commissioner, Geoff Wise, highlighted the afternoon by officially launching and opening the new tour brochure. Mr Wise congratulated the Homebush Landcare Group and emphasised his support of the Mungo Loop brochure. He also extended his



Front row: Sue Williams, Marianne O'Halloran, Kate Weaver, Steve O'Halloran
Back Row: Geoff Wise, Hank Van Apeldoorn, Greg Ayson, Lorraine Ayson and Ron Hoare

gratitude to the group for their tireless efforts in not only establishing a new and important link for tourists to Western NSW, but for their continual stewardship and management of the natural resources throughout the Western Division, particularly their successful rabbit control program. Mr Wise commented on the ever increasing tourism industry and believes that the Balranald/Euston area and the Western Division at large will benefit greatly due to the Mungo Loop Outback Touring Guide.

The touring guide brochures are now being dispersed around the countryside with 20,000 brochures fresh off the printers. The attractive colour brochure skillfully guides each tourist on an expansive and exciting adventure starting from Balranald and travelling through vast outback stations and saltbush plains, into the significant Willandra Lakes World Heritage Area and on to view the highest clay lunette in the world. Many secrets and historical facts are unveiled as the tourist traverses through to the Walls of China in Mungo National Park and back through mallee country on the return to Balranald/Euston. The Mungo Loop touring guide is a great tool for anyone interested in seeing and learning about the landscape and heritage of Western NSW and especially for those looking to experience real outback Australia.

The Homebush Landcare Group wish to extend their sincere thanks to WEST 2000 Plus, Euston Bowling and Recreation Club and Balranald Shire Council for their financial support and assistance throughout the establishment of this successful initiative.

For more information please contact the Balranald Visitors Information Centre or call 1800 444 043. Mungo Loop touring guide brochures will be available at tourist information centres, caravan parks and motels.

Local firm starts construction of Paroo-Darling visitor centre

by Jacki Roberts
Senior Public Affairs Officer,
Department of Environment
and Conservation

Broken Hill building contractors De Franceschi and Sons has commenced construction of a new visitor centre and office at White Cliffs, which will form the gateway to the magnificent new Paroo-Darling National Park.

National Parks and Wildlife Service Acting Broken Hill Area Manager Paul Seager said construction work had started and was progressing well.

‘The new visitor centre has quite an eye catching design and is the major new piece of infrastructure to be built in White Cliffs for some time.

‘We were delighted to be able to award the tender for the construction of the building to local firm De Franceschi and Sons.

‘The visitor centre has been designed on “clean and green” principles, and will feature grid-connected solar power generation, rainwater recycling and energy-efficient air conditioning.

‘The building design is drawn from the many corrugated iron buildings in the area, and features a full length south-facing skylight to maximise natural light.

‘The visitor centre will feature interpretive displays, landscaping using local native plant species, and car, caravan and bus parking.

‘It is anticipated that construction will be completed early in the new year.

‘The visitor centre is the latest in a series of developments in the 230,000 hectare Paroo-Darling National Park since it was gazetted 2 years ago.

‘A camp ground has been established on the banks of the Darling River at Wilga, a workshop has recently been completed in Wilcannia, and planning for the day use area, board walk, walking trail and lookout at Peery Lake is progressing well.

‘When fully established, Paroo-Darling National Park will be one of the most significant parks in western NSW,’ Mr Seager said.

‘Daughterless carp’
continued from page 1

Female carp mature at about two to four years of age and are capable of multiple spawning all year round if water temperatures remain above 16 degrees Celsius, as is the case in some rivers in Queensland. Further south in NSW and Victoria, spawning time is generally from October to February when water temperatures are warmer.

The Daughterless Carp project is at an early stage, after being commissioned in 2002 by the Murray-Darling Basin Commission (MDBC). The Commission is funding the Daughterless Carp research, which started in early 2003.

The Daughterless Carp program is part of the MDBC’s Native Fish Strategy, which aims to increase native fish stocks by addressing pest species such as carp, as well as other issues such as environmental flows and habitat restoration.

Results from the Daughterless research will not be evident for quite a few years yet. It will take five years to reach the stage of producing large numbers of small carp (fingerlings) carrying the Daughterless gene modification. It could potentially be eight years before the fingerlings are released, then another 30 years before a significant reduction in carp numbers is evident.

While the Daughterless Carp project is an exciting area of research and offers hope as a long-term control tool for carp, it is not intended as a ‘silver bullet’ solution to the problem. It will be important to develop and continue to implement short-term controls as well as taking an integrated approach involving targeted fishing and rehabilitating the environment. This is a priority for both the Murray Darling Basin Commission and the Pest Animal Control Cooperative Research Centre.

Could the kangaroos on your property fight cancer, heart disease and obesity?

by Clare Engelke, School of Animal Biology,
University of Western Australia Ph (08) 6488 2528

Kangaroo meat could be an excellent source of anticarcinogens. In addition to its low fat content, this anticarcinogenic property might mean Australia has the some of the healthiest meat in the world.

My PhD research, at the University of Western Australia and CSIRO Livestock Industries, shows that the fats in kangaroo meat include high levels of conjugated linoleic acids (CLA). These polyunsaturated fats have been linked, predominantly in animal studies, to health benefits for humans including anticarcinogenic activity and reductions in obesity and heart disease.

Until now, meat and milk from ruminant animals, such as sheep and cattle, have been considered to have the highest known levels of naturally occurring CLA. These high levels are the result of the activity of ruminal micro-organisms and the activity of an enzyme, D9-desaturase, in body tissues of ruminants. The micro-organisms in the rumen (stomach) convert dietary unsaturated fats to saturated fats during which various fats, including CLA, are formed. The CLA can flow out of the rumen and be absorbed in the small intestine or further saturated in the rumen. The fats that are saturated further also flow out of the rumen and are absorbed by the animal. The enzyme D9-desaturase, found in the tissues, can convert some of the further saturated fats into CLA. Non-ruminant species with simple stomachs (monogastric animals such as pigs, chickens and humans) do not have as much CLA as ruminants because they do not have a rumen and micro-organisms found in ruminants that can extensively saturate fatty acids. Instead, they have fats in their tissues that largely reflect what they eat.

Kangaroos are not true ruminants but they do have a similar digestive system. Like ruminants, kangaroos have a microbial population in their foreguts that ferment forage before it is digested further down the

gut. I thought it was possible that some of the micro-organisms in the kangaroo foregut population might be similar to micro-organisms in the rumen and saturate fatty acids to form CLA, so I measured the CLA in kangaroo tissues and compared them to CLA concentration in lambs from the same area of Western Australia. What I discovered was very exciting and not quite what I expected. I found that kangaroo tissues had up to five times more CLA than the lambs and more than any reported levels from sheep, cattle or any other species. When I compared three kangaroo species, the red, eastern grey and the western grey from various locations across Australia, I found that the species did not differ in their CLA concentrations but the diet they ate was important. Kangaroos from drier areas had less CLA than those from areas with more rainfall. This reflects the variation observed in sheep and cattle, where animals grazing on green pasture have higher levels of CLA than those being fed grain or dry diets. However, all of the kangaroos had higher levels of CLA than sheep and cattle regardless of diet.

Why are kangaroos so efficient at producing CLA? There are at least three strong possibilities. First, the micro-organisms in the kangaroo foregut are likely to be different from those in the ruminant foregut and may not saturate fats as extensively. Second, kangaroos may have more D9-desaturase (enzyme) activity in their tissues forming more CLA. Third, it could simply be that digesta passes more quickly through the kangaroo, allowing the micro-organisms in the foregut less time to saturate the fats from the diet.

Currently, we know that kangaroos have high levels of CLA in their tissues but only further research will tell us whether they can really help to fight cancer, heart disease and obesity. Meanwhile, we have found a large, new source of natural CLA and my immediate aim is to find out how and why it gets there.

Western Lands information

by Peter Walker, Manager,
Resource Access and
Compliance, DIPNR

Information Sheets

The Department has updated and reproduced several Fact Sheets about the Western Division and Lease Administration, as follows:

- The Western Division of NSW
- Western Lands Leases Tenure and Conditions
- Alteration of Purpose or Conditions of a Western Lands Lease
- Western Lands Leases over camps on the Lightning Ridge opal fields
- Subdivision of a Western Lands Lease
- Frequently asked questions about Native Title

The sheets are available from DIPNR offices in the Western Division and on the DIPNR website at www.dipnr.nsw.gov.au.

Additional Information Sheets are being progressively developed.

A set of Fact Sheets on aspects of water licensing has also been produced on the DIPNR website. One of these is entitled 'Farm Dams in the Western Division'.

It outlines the circumstances under which water licences are / are not required for farm dams. Different rules apply in the rest of the state.

Sub-Leasing

Leaseholders are reminded that although approval to sub-lease a Western Lands Lease is no longer required, there is an obligation to notify the Department of the arrangement (the person(s), the purpose of the sub-lease and the term), within 28 days of granting. The sub-lease must be for a purpose consistent with the lease purpose.

The Department will continue to hold the leaseholder responsible for compliance with lease conditions and payment of rent.

Prickle Bushes

Following on from the article about mesquite in the last Newsletter, a NSW Prickle Bush Working Group has been set up to coordinate efforts to control and prevent further entry of prickle bushes into NSW. For us, the main prickle bushes are mesquite, of which there are several established infestations, and parkinsonia, of which there are a couple of outbreaks, the major one along part of the Narran River.

I will be representing our Department on the Working Group, which is chaired by Department of Primary Industries and has Shire Council, Weeds Council and landholder members.

New advisory committees appointed

by Jacki Roberts
Senior Public Affairs Officer,
Department of Environment
and Conservation

The National Parks and Wildlife Service has appointed new advisory committees for each of its four regions in Western NSW – Northern Plains, Far West, Upper Darling and Western Rivers.

Advisory committees play a vital role in providing advice and input to NPWS on park management and planning, and providing a conduit through which the community can raise issues.

NPWS Western Director Terry Korn said the new advisory committees contained people from diverse backgrounds.

'In some cases the advisory committees have Aboriginal representation for the first time which is really pleasing.

'Many people have been reappointed for additional terms while there are also lots of new faces.

'I would like to thank everyone who nominated to be on an advisory committee and wish the committees a productive term.

'I look forward to their input', Mr Korn said.

Where can we find more prime lambs in Australia?

by Gerald Martin
MLA Weaner Lamb Project Co-ordinator
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ph (08) 8556 2900

Clearly the Australian prime lamb industry could do with some more product. Our marketers and markets have remained strong while we have doubled the price to them, a credit to all involved.

But we really can't sustain the heady prices of this winter and keep shelf space, so what do we as an industry do?

Well over a rack and a bottle of SA's best grape juice we have put in some planning time.

The traditional prime lamb areas could be tweaked their production – better genetics, pre-mating feeding and predator control – increase lamb numbers by 10%, that would be great.

The grain belt, well, will the 'diesel jockeys' climb down from their comfortable cabs? Do they have any fences, yards or troughs left?

The pastoral areas of Australia – why not? Most pastoral areas, SA in particular, have very healthy sheep, big framed merino ewes and a range of mating times, all a big help to lamb production. But what our pastoral regions don't have is ideal finishing country.

So why not just breed 'em!

Why not turn off 1st cross lambs as weaners and never attempt to finish them? Many of our beef breeders never finish their calves.

Well, the good news is many pastoralists are breeding 1st cross lambs and are pretty happy with their returns. The challenge for them to be an important participant long-term in the prime lamb business is



Craig Bell with his Bono Station ewes. Bono is just south of Menindee. Craig has sent a semi load of 10-week old lambs to Darryl Croser (Acacia Park, west of Penola) for finishing.

that they need to focus on what they do best – breeding – keeping it simple, high growth EBV rams, ewes pumped with a little protein just prior to mating and all lambs trucked off to finishers at weaning, then focus on the ewes again.

OK, so when is weaning? – well early – from 10 to 12 weeks old.

To be clear, we are defining weaning as 10 weeks from the end of a 6 week lambing. The interesting question we need an answer to is, how many more ewes could a property run if it never had any weaners to look after? Many pastoralists think it could be as high as 30% more ewes, could that be right?

There are a number of aspects to weaner production that need to be explored – use of teasers, lupin feeding ewes and weaner value. There are plenty of producers willing and able to be finishers, whether on grass, lucerne, irrigation, stubbles or grain fed, but they cannot find quality weaners, planned weaners.

Meat and Livestock Australia are keen to help groups of pastoralists become involved in prime lamb weaner production and we plan to set up trials in the Lower Flinders region of SA and on the Darling in NSW. The trials will be designed to test 'best bet' weaner production management and publish the outcomes. We have a few pastoralists who are already into the production of weaners and both they and their feeder clients seem well pleased.

If you are interested in either breeding or finishing please give me a yell.

Woody weed control: start planning early

by Angus Atkinson
WEST 2000 Plus
Ph 1800 068 072

Once the current drought breaks, landholders should be on the lookout for woody weed seedlings. Most woody weed seedlings need above average rainfall to germinate and survive their first summer but once established they become very difficult to control. Planning is an essential part of any effective woody weed strategy. Before starting a woody weed control program landholders should complete the following steps:

1: Map the location of the woody weeds and identify their average height, density and species present

It is important to identify the location of all the woody weeds on the property because this will significantly improve the planning process. For example, a good map in most cases will clearly demonstrate why it is more important to treat the relatively large open areas or small areas of seedlings compared to treating a small area of dense mature woody weeds. If landholders need assistance with mapping they should contact their local Department of Primary Industries or Catchment Management Authority office.

It is important to identify the woody weed's location so that in the future landholders can determine if they are continuing to spread. Knowing the species is also essential because different species respond differently to each type of treatment. For example, to control turpentine and prevent re-sprouting, the blade on a blade plough must be a set at a minimum of 35 cm below ground level whereas to control hop bush, the blade need only be set at 5–10 cm below the ground.

2: Determine how much money and time is available to spend on woody weed control

It is essential that landholders include woody weed control in their annual budgets. Otherwise this essential task will probably not be undertaken and the problem will become even harder and more expensive to control in the future.

Most landholders don't have much spare time, so it is important that time be made available or outside labour employed to assist. In areas affected by woody weeds, it is important that woody weed control becomes as routine as shearing and/or lamb marking.

3: List the priority areas

Landholders need to evaluate the cost and effectiveness of each potential treatment and determine the area they wish to treat with their limited time and financial resources. Treating open areas generally gives the best value for money. However, in areas where there are very few woody weeds it may be necessary to treat the dense areas as well as the open areas to prevent further seed production. In high value areas such as holding yards and laneways it may be necessary to treat dense areas. The following table indicates the typical costs involved in various woody weed control techniques on non-arable land.

4: Determine if any permit/consents are required to perform the on ground work

Native vegetation management legislation is continually changing and it is essential that landholders who wish to perform any woody weed control consult with all the relevant government agencies.

Landholders interested in performing woody weed control should contact their Department of Infrastructure, Planning and Natural Resources (DIPNR) office and speak with the appropriate officer.

Cost of various woody weed control techniques

| Technique | % killed (personal obs.) | \$/ha | \$/1000 ha |
|--|-----------------------------|--------|------------|
| Blade ploughing 35 cm to control turpentine | 99 | \$100 | \$100,000 |
| Blade ploughing 10 cm to control hop bush | 99 | \$60 | \$60,000 |
| One way chaining: Targeting turpentine (significant re-sprouting will occur) | 10 | \$30 | \$30,000 |
| One way chaining: Targeting hop bush (will cause a significant germination of seeds) | 80 | \$30 | \$30,000 |
| Chemicals (treating 10 X 3 metres plants/ha X 3 ml/m X 3c/ml = \$2.70/ha) | 95 | \$2.70 | \$2,700 |
| Chemicals (treating 100 X 3 metres plants/ha X 3 ml/m X 3c/ml = \$27/ha) | 95 | \$27 | \$27,000 |
| Chemicals (applied using an aeroplane) Illegal | Unknown | \$18 | \$18,000 |
| Goats (only applicable to edible woody weeds such as hop bush) | 80 | \$20 | \$20,000 |
| Burning (most effective on plants under 25 cm in height) | Variable | \$2.50 | \$2,500 |

All of the above techniques require follow-up and good grazing management if the project is to be successful in the longer term.

5: Set up monitoring points to evaluate the effectiveness of the on ground works

Monitoring should be an essential part of all woody weed control projects.

Monitoring does not have to involve a complicated system, photographs are a simple but effective way of recording changes in vegetation and the project's effectiveness. Without photographs it is difficult to remember what an area really looked like before and after treatment. Photographs also reinforce the importance

of doing the work. Landholders interested in setting up photo points should contact WEST 2000 Plus for more details.

Woody weeds are one of the greatest threats to many parts of the Western Division and will significantly affect landholders viability in those areas. Early planning and strategic management will minimise the risk of an area becoming more and more encroached upon. Landholders with areas of woody weed encroachment on non-arable land can either watch the problem grow or try to prevent the area becoming significantly less productive and the problem much harder to manage.

For more information about WEST 2000 Plus woody weed control projects contact WEST 2000 Plus on 1800 068 072.

Excellent results from a management burn

by Angus Atkinson, WEST 2000 Plus, Ph 1800 068 072

Mr. Tony Falkenhagen, 'Gundabooka', Bourke performed the burn in March 2001 with fantastic results. The following photos clearly show how effective the burn was. If Tony hadn't burnt these areas, all the dead bushes in the photos would now be flowering and about to set seed. While the burn didn't kill all of the woody weeds, it has made a significant difference. Tony can now clean up the re-growth and any new seedlings that appear with various control techniques including grubbing and/or herbicides such as Velpar.



Trialing trees as a form of diversification

For more information contact:
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The first session of the Master Tree Growers (MTG) Program held at Fowlers Gap has been a resounding success.

Rowan Reid from the School of Resource Management at Melbourne University has been working closely with Louise Turner from Greening Australia over the past few months to set up and tailor a MTG workshop to suit the needs of local Far West landholders. The Program is generally run as a partnership between the University, local agencies and landholders, with the assistance of forestry and farm forestry industries and regional extension officers, policy writers and researchers. Most of the funding to run this particular Program has been funded by WEST 2000 Plus.

The aims of the Master Tree Growers Program for the Far West are:

- To help landholders to recognise and critically evaluate commercial tree growing opportunities;
- To encourage all participants to play a more active role in farm forestry development by providing knowledge that instils confidence;
- To support regional farm forestry, agroforestry and Landcare programs by providing a program that can be tailored to regional requirements; and
- To encourage strong communication links between participants, extension officers, researchers and industry.

The program at Fowlers Gap was well attended mainly by landholders who are members of the Barrier Area Rangeland Group, as well as Greening Australia and Melinda Fletcher, the local CMA Community Support Officer from Broken Hill.

Day one looked at the type of things participants wanted to learn from the



Participants discuss the ecology of arid lands and its implications for agroforestry.

program and Rowan Reid facilitated a session on trees – their growth, reproduction and regeneration as well as tree establishment and management. After lunch Dr David Croft from Fowlers Gap Station facilitated a session on the landscape ecology of arid lands – vegetation responses to soils and rainfall and the function of vegetation in capturing water and nutrients. A mini field trip to the ‘Emu pen’, which hasn’t been grazed in 30 years, highlighted some of the things Dave spoke of and put some others in perspective. Mid afternoon brought a session by Jason Sheehan and Geoff Horn from DIPNR who looked at utilising satellite imagery for studying vegetation types and vegetation changes over time, as well as a general discussion on the importance of Property Vegetation Planning as a tool for future planning.

Day two dawned bright and warm and the early risers had to amuse themselves until an appropriate time for starting at the ‘office’. Neville Bonney who is a rangelands specialist and enthusiast from South Australia joined the group mid morning and over some delicious muffins, discussed how native vegetation has changed over time in the rangelands and some commercial options from existing vegetation including fuels, timber and

native foods. Throughout the rest of the morning the group looked at seed collection and propagation, growing to harvest, post planting maintenance, time and costs involved in such a project and most importantly – the potential returns.

During the afternoon Neville, Rowan and Louise looked at ways in which vegetation can support farming, reduce costs and improve lifestyle – planting for fodder, dust suppression and aesthetics.

Day three brought Barry Alston who is the Agribusiness Manager for the Department of State & Regional Development based in Dubbo. Barry discussed a timber industry for the arid zone and the pilot trial he has funding for over the next two years. Barry also discussed licensing arrangements and the types of 'arid' timbers the region is hoping to replace in international trade as well as processing and selling arid timbers domestically.

Thursday afternoon brought about some discussion as to what the participants wanted to achieve on their own properties (if anything) and how they would like to go about it. This session resulted in an outcome of five farm forestry trials in the

Far West that piggy back the trials Louise Turner is already undertaking in conjunction with the Far West Regional Development Board. Subsequently, a draft Landcare funding application was written to set these sites up for timber investigation.

The final day heralded a session by Peter Walker who is Manager for Resource Access & Compliance from DIPNR. Peter looked at the relevant land, water and vegetation legislation in relation to farm forestry in the rangelands. In particular Peter looked at a landholders basic rights to water and licencing dams or ground tanks and bores to irrigate a farm forestry plot; application fees for licencing; land tenure requirements; and clearing approvals. We also discussed the Plantations and Reafforestation Act of 1999.

All round, the MTG course was a great forum for new ideas and creating a sound farm forestry network in the Far West. A big thanks goes out to all the participants and guest speakers as well as our fantastic cook – Jacinta Cullen. The final session of the MTG Program will take place from 25–27 October 2004.

Northern floodplains vegetation mapping completed

by Kat Miller, Project Coordinator, DIPNR Walgett

Reliable and detailed vegetation information is now available for use on a regional scale following the completion of the Northern Floodplains Vegetation Mapping Project.

This 3.6 million hectare project commissioned by the Northern Floodplains Regional Planning Committee (NFRP), The Department of Infrastructure, Planning and Natural Resources (DIPNR) and the Federal Government is now complete.

The Northern Floodplains is located in far northern NSW. The mapped region

incorporates the floodplains of the Culgoa, Barwon, Bogan and Narran river systems. The region is bordered by the Mitchell Highway from Bourke to Barringun in the West, the Barwon - Darling River and the Brewarrina Shire in the South, Mungindi and the Barwon River in the East and the Queensland border in the North.

The vegetation mapping provides a comprehensive picture of the vegetation communities of the Northern Floodplains in Western New South Wales (approximately 4.4% of NSW).

Continued on page 18

Observations of a grazier, over many years

by Rex Andrews
'Toora', Wentworth

Our property 'Toora' is situated 50 km north of Wentworth, just west of the Silver City Highway. The property is a mixture of open plains and timbered areas, comprised of mainly open Belah / Rosewood country with areas of Black Bluebush, some open Mallee and Black Box flood plains.

Pasture changes observed in the last 50 years

After the 40's drought up until the 1960's there was an invasion of Saffron and Stemless thistles. These looked as if they were going to 'take over', however their numbers then subsided to a low incidence that still applies today. Wild Turnip was very prevalent 20 or more years ago, it is still present but it is not generally troublesome.

Wild Sage, which can invade large areas, appears to 'peak' and then largely subside. My observation is it leaves the affected country in better condition, but you often have to wait 15 or 20 years.

I consider Red Brome Grass and Silver Grass (Rat's Tail Fescue) to be two of our most insidious and damaging weeds.

Red Brome can cause eye, wool and skin damage as well as early tooth losses in sheep. In cattle, mouth and throat abscesses can occur.

Silver Grass contaminates wool.

Neither of these grasses produce worthwhile forage and crowd out useful species, often over large areas.

Blue Crowfoot used to be one of our 'stand by' annual species. However in the 1980's I noticed the seedlings being eaten by a large yellow and khaki striped caterpillar, since then it has generally been a minor component of the pasture.

Wards Weed

'Plants of Western N.S.W.' states that this plant is 'not known to be utilised' by livestock.

I was really terrified (until very recently) by the rapid spread of this species on our property. It still worries me, but somewhat differently due to my following observations:

I have found stock eat it quite avidly and do well on it, at least up until the advanced flowering stage. In 2003/04 the paddock which has the greatest density of Wards weed was by far our most productive paddock. From July 2003 to July 2004 it produced 220 SDH (Sheep Days per Hectare) of forage, this is a below average year. Approximately a third of this rate was from January to May 2004 (with breaks), this was a dry period, after good rain in December. I believe during this time the sheep were nibbling the Wards weed plant and licking the seed off the ground. On 'Toora', our average stocking rate is 120-130 SDH, thus 220 SDH is an incredible result.

I set up two exclosures in July 2003 and took record photos at intervals; these clearly illustrate how well it is utilised. Incidentally I moved the exclosures, a little over a week ago (20/9/04) and there is a clear difference between inside and out already.

The down side to Wards weed is that it is such a 'take over' species. To get the best value out of it, it must be grazed heavily from germination (while it is young and attractive to stock), this allows other germinating species to better compete.

I know of one case of heavy stock losses on Wards weed, when a post mortem was carried out, the stomachs of the dead sheep were full of seed from the mature plants.

It is too early to ascertain how this species will affect the country over the longer term, only time will tell.

Other Observations

There is a huge difference in the palatability between the same species on different soil types, the clearest example on 'Toora' is Black Bluebush. On calcareous and clay soils it is readily and profitably utilised in dry periods, whereas on sandy loam soils it grows prolifically but is largely ignored. This, I believe, is because of the differing soil minerals /

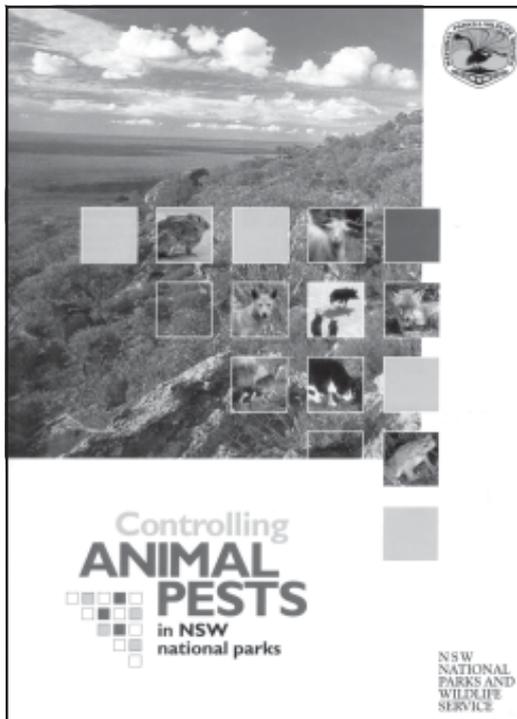
chemicals in varying soil types and areas, I don't believe this fact is sufficiently recognised (I also believe this factor is why some plants are neglected / eaten in different areas).

We currently have a set stock / rotational grazing trial in progress as part of the Western TGP Project. Due to drought conditions since starting (a bit under 2 years ago), the main difference noted to date is that in rotationally grazed paddocks the 'sub shrubs' are surviving, in the set-stocked paddock they are nearly all dead.

I hope my ramblings motivate other graziers to put their thoughts down on paper, I believe it is essential to 'swap notes'.

Pests brochure

by Jenny Stokes, Senior Public Affairs Officer,
Department of Environment and Conservation



The NSW National Parks and Wildlife Service (NPWS) has released a booklet highlighting the importance of its pest animal control programs in the fight to protect some of the state's most endangered species.

The release coincides with Threatened Species Day, which marks the death of the last Tasmanian Tiger in captivity in Hobart on September 7, 1936.

Head of the NPWS, Tony Fleming said pest animals and weeds were one of the biggest threats to biodiversity and threatened species in Australia.

The booklet highlights fox control programs and other case studies highlighting the control of feral pigs, wild dogs, feral goats, rabbits, feral cats, feral deer, horses and cane toads.

'Given the size of the pest problem, priorities for pest control must be targeted to those areas where the impacts of pests are greatest,' Mr Fleming said.

'While the primary objective of the NPWS pest animal control is to protect threatened species, many programs also aim to minimise the damage of pest animals on park neighbours,' he said

'In New South Wales, threat abatement plans are the key to prioritizing pest control programs for conserving biodiversity.

'Our first such plan, the Fox Threat Abatement Plan, was developed four years ago and identifies 75 priority sites for fox control and provides recovery actions for 34 threatened species (11 mammals, 15 birds and 8 reptiles).

'It is based on carrying out joint fox control programs with all agencies and landholders across all land tenures at these sites and aims is to protect species such as the rufous bettong, brush-tailed rock wallaby, yellow-footed rock wallaby, black-striped wallaby, southern brown bandicoot, broad-toothed rat, Albert's lyrebird, plains-wanderer, malleefowl, Bellinger River turtle and shore nesting birds such as the little tern and pied oystercatcher.'

Mr Fleming said the booklet may provide a useful guide to other landholders on the range of strategies employed by NPWS to combat the feral animal problem.

The community can get a copy of the pest control booklet from NPWS offices and visitors centres or visit the website for more information on specific pest species at www.nationalparks.com.au.

Traps yards a sound investment

by Angus Atkinson
WEST 2000 Plus
Ph 1800 068 072

The number of Western Division landholders using self-mustering facilities (traps yards) as part of their routine property management is steadily increasing.

Only a few years ago there were very few permanent multi-species trap yards. Most of the traps were of lightweight construction and required constant maintenance and were only really used to capture feral goats.

With assistance from WEST 2000 Plus many Western Division landholders have now installed trap yards to capture both domestic and non-domestic stock.

Geoff and Kerrie Davies of Marra Station, Wilcannia, report that their WEST 2000 Plus Natural Resource Management project using a series of self mustering facilities (trap yards) on their properties has worked extremely well. The Davies managed to capture over 300 goats in one week!

Geoff and Kerrie have been using their multi-species trap gates that can handle cattle as well as sheep and goats and believe that the multi-species trap gates were a very sound investment, significantly improving their stock management and allowing them to better manage their pasture.

Instead of chasing the goats with bikes, planes and dogs and hoping to capture as many as possible, the Davies now set the traps and let the goats come to them. This is an enormous saving of time and resources and has significantly increased their property's productivity.

An essential part of any good trap yard is its design and construction. Poorly designed and/or constructed trap yards will require constant maintenance and will only last a few years.

Trap yards are increasingly being built using mesh instead of hingejoint/ringlock due to their ability to better handle the pressure placed upon them. Mesh costs more but will last longer and require less maintenance. A well made trap yard in a good location can pay for itself within twelve months.

Most traps yards have the 'in' and 'out' gate located in the one corner. A very successful alternative is to place the 'in' gate in one corner and the 'out' gate in another. The reason for locating them in another corner is basic, the animals learn that the only way to get out is through a particular corner of the yard so when you close the 'out' gate they congregate around it waiting to get out. As soon as you open it, they will run straight through but instead of finding the 'wide blue yonder', they find themselves on the back of a truck.

Another part of a good trap design is the inclusion of jump downs. They enable big billies to enter the traps without hitting their horns on the trap gates and therefore improving the traps effectiveness.

The Queensland Department of Primary Industries produced a booklet entitled 'Cost-effective multipurpose self-mustering enclosures for stock'. It contains detailed information regarding the use of self mustering enclosures and various design plans for spear gates. Copies are available from WEST 2000 Plus

Landholders considering building self-mustering facilities should contact either their local Department of Primary Industries office or Angus Atkinson at WEST 2000 Plus on 1800 068 072.

Western Division Young Farmers Forum

The second Western Division Young Farmers Forum, 'Expanding the Western Horizon', brought together over 100 delegates from across agriculture and agricultural related industries and departments and from right around the Western Division. The Western Division Young Farmers Forum was funded by WEST 2000 Plus and organised by a steering team of young farmers and department people dedicated to delivering an opportunity rare to young farmers in the Western Division. Two days committed to sharing stories, ideas and inspirations, to establishing and reinvigorating networks, to setting and revisiting goals and to the learning and skills development necessary to realise them.

The Western Division Young Farmers Forum gave delegates access to a range of presenters. Some topics replicated those critical issues covered in the 2002 Forum such as Succession Planning, Communications and Alternative Industries. Other topics addressed those identified as important in the feedback from the 2002 Forum such as Livestock Management and Financial Planning and Risk Management. Motivational stories from Chris Nunn (former head coach of the Australian Para-Olympic Athletics Team) and Lorroi Kirkby (Runner-up NSW Rural Woman of the Year, 2004) lifted delegate spirits after what has been a difficult few years for some, and Jeff McMullen (ex 60 Minutes) shed light onto the increasingly complex global environment we operate within.

The final half of the second day of the Forum was once again dedicated to six 'Breakout Groups' where delegates were able to discuss at length the issues that affect them and their possible solution/s. Breakout group topics were around Natural Resource Management, National Parks and



Young Farmers Forum Committee L-R: Craig Bell, Mandy Tripcony, Pauline Kuhner, Jess Choen, Terry Smith (Chair), Ben Mannix, Rachael Williams

Wildlife Services, Succession Planning, Young Farmer Assistance (in first property purchase), Labour, Education and OHS, and Young People Having a Voice.

One issue identified within the NRM breakout group was a concern that there was not enough education available to farmers around NRM and that this was being compounded by the loss of Landcare networks. For delegates solutions included hearing from successful farmers, and sharing their own successes. Delegates were keen to have a positive impact in NRM and be proactive in protecting the environment and this was part of the drive leading to the development of the Rotating Farm Tour (where delegates travel between other delegate's properties sharing information and ideas). Delegates were also interested to engage more actively with the CMA's and learn more about their operation and processes. With this in mind delegates suggested a CMA 'Roadshow' to travel the Western Division and fully inform interested parties of their operation.

The Western Division Young Farmers Forum prides itself on being strongly solutions focussed, and this combined with the passion of delegates for the Western Division results in a lasting impression of all who attend. 'During my travels last week through the Riverina, I ran into people who had either attended the forum... or had heard about it, and the comments were always the same – no-one could believe how positive and upbeat the young people were who are making a go of it in the Western Division.' Alicia Wilson, NSW School to Industry Project Officer Rural Skills Australia.

For further information or a copy of the report when it is completed please contact Rachael Williams on 0416 201 643 or email rawilliams@csu.edu.au

The six-year project used landholder input, fieldwork, aerial photography, satellite imagery and data analysis to establish the location and status of vegetation types. This included the updating of inaccurate information and improving community and agency access to maps using geographic information systems.

The accurate location of vegetation will provide invaluable data to assist local communities in the planning for the future use and preservation of native vegetation.

There was a high level of community and landholder participation, through the Northern Floodplains Regional Planning Committee, the Walgett and Brewarrina Regional Vegetation Committees and various landholders provided on-ground verification of vegetation to DIPNR staff.

The Northern Floodplains Planning Committee comprised landholder, conservation, Aboriginal, Catchment Management Board, local government and state agency representatives. Committee community members include: Rory Treweeke, Neil Warden, Bill Murray, Wayne O'Mally, Ted Fields, Evelyn Crawford, Ron Mason, Neville Schrader, Phil Spark, Judy Boyden and Ron Rees.

The mapping provides historical evidence of what vegetation existed prior to clearing or cropping and the cumulative impact of clearing on different vegetation types.

The information will help planning authorities such as the Western Catchment Management Authority, the Natural Resources Commission and the local community make decisions about vegetation in their areas, how this can be used and developed, and what areas need to be reserved and protected.

The maps will also assist in the development of long term clearing thresholds for particular vegetation types to ensure long-term viability.

The data gathered by the NFRP project has been integrated with other mapping products to give a complete picture of the vegetation of the Northern Floodplains area.

Using the power of geographic information systems coupled with local knowledge and community consultation, the project has produced a series of three interpretation manuals that describe and record the unique characteristics of the region's vegetation.

The three reports entitled 'Vegetation Communities of the Northern Floodplains - Books 1, 2 & 3' describe the vegetation communities of the Western Division Walgett Shire, Brewarrina Shire and the North Eastern Section of the Bourke Shire.

The three publications describe in detail the structure and floristics, condition, status, distribution, cultural heritage plant value, habitat value, predicted and known threatened species, plants with restricted distribution, soils and land capability values and threats to each mapped vegetation community.

Also available is a series of 1:100,000 vegetation maps that will assist the local community in native vegetation planning and management.

Chair of the Western Catchment Management Authority, Mr Rory Treweeke said the project was a strategic approach to the on ground impacts of natural resource allocation and natural resource management problems.

'The accurate assessment and identification of land capability, vegetation communities and biodiversity values on the Northern Floodplains will have immeasurable benefits both to the local community and the Catchment Management Authority.'

Limited supply of the maps and reports are available in hardcopy and are more readily available on CD-Rom. The maps and reports were primarily produced to assist planning committees in the management of vegetation, however the information is also available to the public from the Walgett DIPNR Office, Ph (02) 6828 1272.

Restoration of soil carbon should be a top global priority

by Doug Campbell, formerly Senior Natural Resource Officer (Resource Access), DIPNR Far West Region

Global perspective

The headline statement is from a recent viewpoint paper in the internationally pre-eminent journal *Science*. Since mechanised agriculture started soil carbon losses as carbon dioxide (CO₂) to the atmosphere has been 78 billion tonnes. CO₂ is a greenhouse gas causing human induced global warming. Mankind's CO₂ increase also increases plant growth through CO₂ absorption but this will reduce pasture protein and hence livestock productivity as well as fruit and grain quality.

Science further says that the restoration of soil carbon in degraded agricultural soils will directly influence global food security and climate change within current human lifetimes. Soils could sequester or store 5–15% of fossil fuel CO₂ emissions each year for the medium term giving decades of extra time to address the global warming threat to mankind.

Local perspective

The hot semi-arid climate of marginal farming in the Western Division causes low total plant production and hence low plant litter turnover and so inherently low soil carbon. Western Division soils developed for cropping have organic carbon levels typically between 10% and 30% of the accepted norm for agricultural soils.

What can we do in the Western Division? Pastoralists can stock at rates within the land's carrying capacity. The 'take some; leave some' grazing rule will give plant litter to the soil. Other benefits include more perennial pasture plants, more per head production and bigger more stable pastoral returns even if from fewer livestock.

Western Division farmers have fewer options than their higher rainfall farmers to maintain or boost soil carbon. They can use conservation farming methods suited to individual soil, crop and climate combinations. Periodic long pasture phases of lucerne on red soils or perennial grasses on the northern floodplains should also maintain surface and subsoil fertility. They can also manage crop stubbles into soil organic matter to maintain or at least reduce fertility losses including soil carbon. This in the long run is preferable to burning stubbles, although admittedly burning stubbles for a summer crop or the next winter crop is very tempting. If there is enough stubble to tempt a burn there is probably enough to make a positive soil fertility contribution.

Western Lands cultivation consents and lease conditions

Because all Western Division soils are inherently low fertility for cropping, cultivation consent and/or lease conditions either prohibit stubble burns or require the Western Lands Commissioner's consent. The premise is to retain stubbles for erosion prevention and fertility retention. Breaking plant disease cycles was sometimes an excuse for burns but plant pathologists now rarely accept that view. Woody weed regrowth in the pioneering stages of red country development might justify a burn. DIPNR officers will be most unlikely to authorise stubble burns and will take regulatory actions where burns are reported or found. Media reminders will be given in seasons and crop districts enjoying favourable springs.

Climate change

Another perspective – CSIRO recently predicted average rainfall declines of up to 40% in southern Australia. What will that mean for the various Western Division districts? We don't yet know but we need to incorporate the information into policy development and natural resource administration.

However, wise soil carbon and fertility management will be a positive local contribution to a global problem and a local step towards living with a worsening global problem.

For more information contact Richard Hicks, DIPNR Far West Region, Dubbo (02) 6883 3000.

Western Division Newsletter

NSW Department of Primary Industries

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