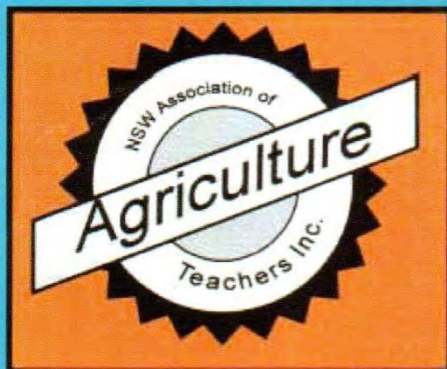
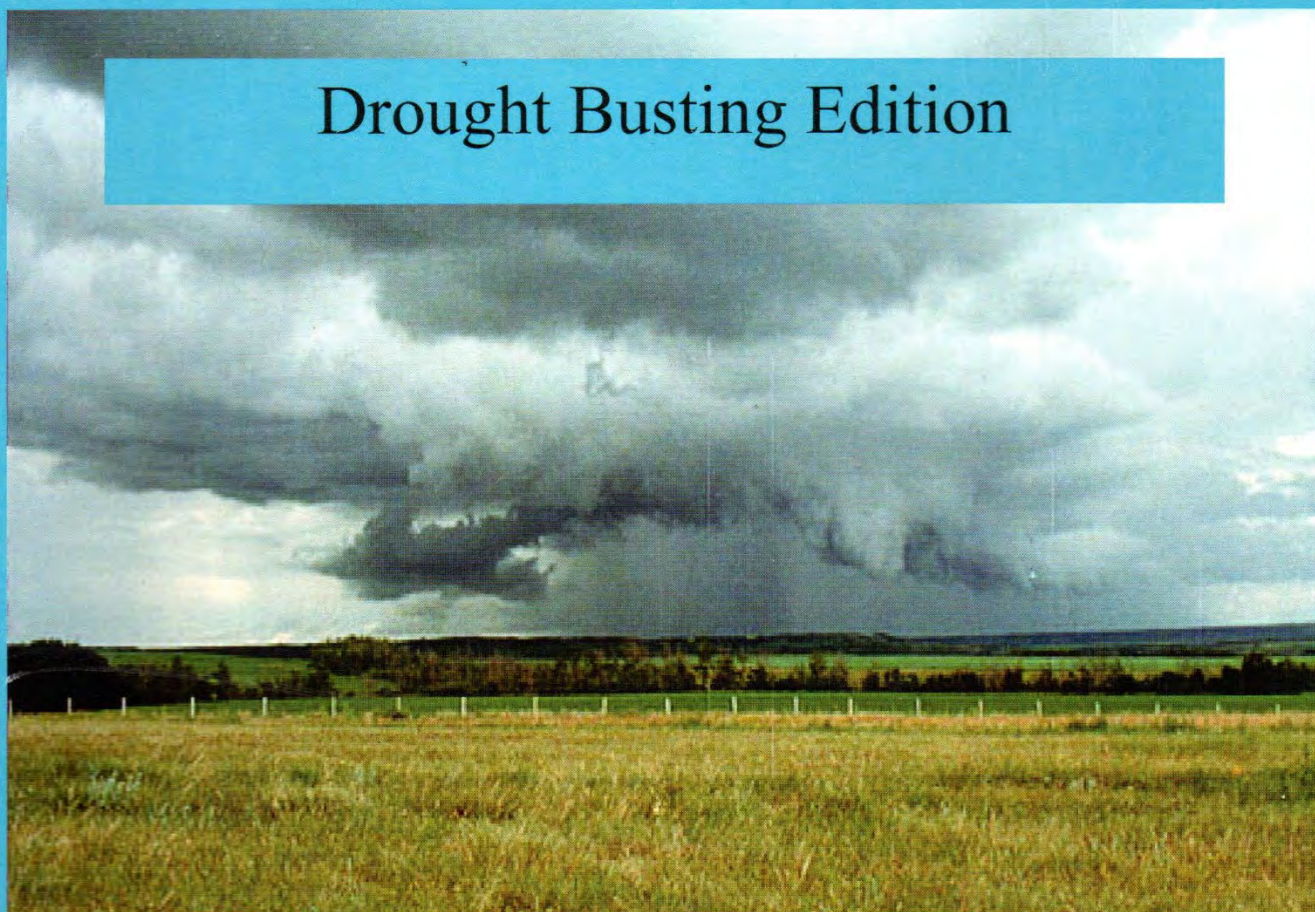




Bulletin of the NSW Association of Agriculture Teachers

BAAT. 2007

Drought Busting Edition



Presidents View Point.....



RE-APPOINTMENT:

^ Robert Cain resigned from his position as President of the Association as of March 2007. The Association's constitution states that the Presidency position can revert to a past president of the Association.

^ I was re-appointed to the position after discussions with the current executive.

^ I would like to thank Robert for initially accepting this position at the conference in 2006 but circumstances arose where he could not fulfil his duties.

^ The new executive are located throughout the western Riverina district & all have varying skills and ambitions which will only enrich the Association for the next term.

^ Due to the isolation of the executive we have been able to meet via the teleconference facilities which is a new experience for me but I have found this a great way to communicate & realise that students & their teachers communicate effectively by this method each day.

MAIL MERGES: (NSW AGRICULTURE TEACHERS ASSOCIATION NEWSLETTER)

^ The Association sends out each semester a 'mail merge information newsletter' to each school throughout NSW. Distribution of this newsletter includes government & non government schools as well as universities & TAFE campuses. The latest newsletter was distributed to well over 1000 localities in the first week of term 2.

^ This newsletter contained a list of the current executive & their respective roles & contact details. The newsletter also contained an update of the current financial membership of the Association.

^ It is important that you are receiving this newsletter & perhaps if you didn't then you need to do some investigating in your school. If you have done this and still did not receive your copy then please inform the executive.

ASSOCIATION MEMBERSHIP:

^ As mentioned in the email merge the financial situation of the Association depends on you contributing to the Association by way of membership; either on a yearly or biannual basis.

^ The membership fees remained at the current level from the 2006 Conference, which are \$60 per year or \$120 for two years.

^ If there are issues with the membership list please give Johana McCarthy at Hillston Central a call. Keep in mind that the publication of membership is from March 2007. There may be names that are not included in the email merge list.

^ It is important to maintain your membership to the Association for the following reasons:

- Networking can be maintained or established by identifying fellow colleagues in your immediate area.
- You can contribute to BAAT with your resources which is read & distributed to nearly 200 people across the state. Find out how other schools across the state deliver the Agriculture & Primary Industries curriculum.
- Keep current with new syllabus updates, programs and resources which are provided by your employer.
- Be aware of current training & development opportunities that are provided regularly by your employer or industry.
- Information on the next Agriculture conference be it state or national.
- Professional reading provided by various industry & research organisations throughout the country.
- Be involved in issues that affect yourself & other colleagues in delivery of your subject to students.
- Receive a BAAT twice a year: "Bulletin Association of Agriculture Teachers"

^ To maintain your membership please complete a membership form which can be downloaded from the website at: www.nswaat.org.au & send it with your funds to the treasurer Johana.

AGRICULTURE CLASS SIZES:

^ Earlier in March the NSW Teachers Federation pursued the issue that Science be considered as a practical subject and therefore limit class sizes to 20 students. Staffing formulas & all other resources should of course be adjusted accordingly. This concept would assist to attract Science teachers & would also enable adequate supervision for students to ensure their safety.

^ The approach to take to bring Agriculture classes in line with this proposal is to approach your local federation sub branch & move motions to the effect that:

'Agriculture is included with Science as a practical subject. Teaching Agriculture to class sizes of more than 20 students per class has safety implications particularly with students using various pieces of agricultural machinery such as plant, animal and agriculture equipment. Students are involved in handling plant and animals in practical classes where the ratio of equipment to students is generally unequitable.'

^ This process is both a time & lengthy one & will only have support if the message is sent to our employer from across the state many times over. If you have concerns in this area then voice your opinion at your local area branch.

^ This proposal investigates class sizes for Stage 5 Agriculture Technology.

^ Currently Agriculture classes in Stage 5 can have up to 30 students per class. As we all know, this can be unmanageable with the limited resources we have at our disposal.

^ Be informed that this resulted from discussions some thirty years ago whereby Industrial Arts class size was set at 20 with no assistant; Home Economics had classes reduced to 24 maintaining an assistant while Agriculture maintained an assistant but no movement occurred with class sizes.

STAGE 6: AGRICULTURE: UP FOR REVIEW

^ Discussions with the BOS recently have outlined a review process which is being held for Agriculture Stage 6 over the next few months.

^ This review process is the first for the syllabus since its inception in 1999. The BOS plans to conduct meetings at Bathurst, Lismore & Wagga Wagga. These meetings will be conducted by Howard Kennedy & Beverly Deahm from Board of Studies.

^ Information about the minor changes to the syllabus has been circulated to schools in the region close to these centres. Please be informed of the proposed minor changes and have an input to the discussions around this minor review process; which ultimately will affect you in the delivery of Agriculture to your students at the Stage 6 level.

^ This is a minimal review of the syllabus and will investigate the areas of exam specifications with paper 2 regarding the block question in the elective questions.

^ The second area in the review process will be to bring the Agriculture 'Learn to' & 'Learn about' into line with the format of the TAS syllabus.

^ Please attend these review meetings when they are scheduled in your area, not only to have an input into your Agriculture Syllabus but also to network with your fellow colleagues in your area.

AGRICULTURE AT THE NATIONAL AGENDA:

Promotion of Agriculture in Schools:

^ Is an initiative which has been on the agenda for almost two years, involving the national agriculture executive in conjunction with industry and government investigating strategies to improve the promotion and understanding of agriculture in schools and their communities.

^ This is an exciting approach towards increasing the bar of agriculture in our schools & communities by addressing resources in schools, professional development of teachers and funding of these and other initiatives.

^ You will find an article re: 'Agriculture Promotion in Schools' in this addition of BAAT which appeared in the Weekly Times in February of this year.

National Agriculture Teachers Conference in 2008:

^ You are invited to the National Agriculture Educators Conference:

When: Sunday 6th January to Thursday 10th January 2008

Where: Deakin University: Geelong Victoria

Theme: "Changing Climate of Agriculture"

Cost: \$550 per delegate

Further Information: www.naae.asn.au

Tony Butler
President
May 2007

►► **EDUCATION PLAN**

Private move for ag

By **DAVID MCKENZIE**

THE nation's top farm group wants to set up a new company as part of its push to boost rural education in schools.

The National Farmers' Federation will float the plan at a meeting of educators and industry groups in the next few weeks.

It sees a company as an efficient way to co-ordinate existing information and education initiatives.

It said a company would provide resources for schools, with rural industries providing

EXCLUSIVE

information and funding. It wants the backing — and some funding — from federal and state governments to encourage schools to use the resource when developing rural-influenced courses.

NFF chief executive Ben Fargher said there was no desire to duplicate existing projects.

"What is needed is better co-ordination and a better profile for agriculture within school curricula," he said.

"This is one aspect of our long-term strategy to improve the

community's understanding of the value of agriculture."

The approach is based on Britain's Farming and Countryside Education (FACE), a private website-based body that develops teaching materials to schools, organises farm visits and offers professional development for teachers.

Federal Agriculture Minister Peter McGauran, who supports the idea, will chair the educators' meeting.

He said he was keen to kick-start a nationally co-ordinated approach to promoting agriculture in schools.

"The Federal Government wants to ensure good-news stories and positive images are communicated broadly, particularly in primary and secondary schools," he said.

"It's especially important students recognise a career in agriculture as fulfilling and rewarding."

The meeting will be attended by the National Association of Agricultural Educators, farm groups, state Royal Agricultural Societies and CSIRO and other research bodies.

It first met last June.

Meanwhile, a federal parliamentary inquiry has called for action to address major rural skill shortages.

The House agriculture committee said a national strategy was needed, including fewer, better-funded institutions and a revitalised agricultural colleges.

It wanted more flexible approaches to training, including a skills "passport" to allow greater transferability of skills.

A new national extension service and more secure funding for rural research were also required, it said.

From the Editors

Thanks to all those who have again contributed to this magazine – we have again found this to be a new rewarding experience. Does anyone ever read the Editor's Notes? I'm writing this as a test to see if anyone actually reads them. If you do read this then contact Greg and I on the email below so that we know that all this two finger typing is worthwhile. Actually, we are looking forward to your contributions for our next edition. Nothing is too small or insignificant.

Thommo

Wanted ~~your~~ help
Contribute to BAAT

ilt1@bigpond.net.au

Greg Fulljames



Ian Thompson



THE TIMES THEY ARE A CHANGING



:

The NEW NSW Association of Agriculture

Teachers Inc. Committee are as follows:

EXECUTIVE 2006-2008

PRESIDENT:

Tony Butler

Tumut High School

PO Box 70

TUMUT NSW 2720

Ph: 02 69471077 (w)

Fax: 02 69472497 (w)

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David Crick

Barham High School

Gonn Street

BARHAM 2732 NSW

Ph: 03 5453 2322 Fax: 03 5453 3259

barham-h.School@det.nsw.edu.au

TREASURER:

Johana McCarthy

Hillston Central School

62-80 Moore Street HILLSTON NSW 2675

Ph: 02 6967 2277 Fax: 02 6967 2385

hillston-c.School@det.nsw.edu

PRESIDENT:

^ The teaching of Agriculture Science to students is a passion which we all should have, to ensure that we are doing the best for our students, the subject and for our communities. For this reason I decided to fill this position in the Association for the current term of the executive.

^ I enjoyed thoroughly the challenges of this position over the last two years and working professionally with a great bunch of people in the eastern Riverina region.

^ I look forward to now working with the new executive who reign from the western parts of the Riverina. All of them are great operators and they have already contributed to the Association by taking on their respective roles.

^ Our family property is just 10 km from Tumut. It has been hit hard by the drought like every where else across the state but now hoping for the return of a good season to turn things around.

^ I have taught at Broken Hill High and in my later years at Tumut High School. At Tumut, such courses as Forestry Industries, Primary Industries, Junior & Senior Agriculture; can only be delivered through the involvement of various rural & commercial industries, & the wider community.

^ For those of you who are just embarking on their Agriculture teaching profession: ensure that you are part of the local scene so that your students have the best opportunities and experiences by involving people from your local area.

^ As time goes on please don't forget to become involved in your Association; because we all need to ensure that we have a viable Association that maintains contact and support for Ag teachers throughout the state. Lets face it no one else will do it for us.

^ The next conference will be held in the western Riverina and I encourage all of you to support this very worthwhile Aggie get together by being an active participant. The Riverina region has much to offer and the conference will be enriched with activities for you to be professionally developed as well as take something back to your students.

^ If you have Agriculture issues that need addressing please contact any of the executive members & hopefully we can assist any way we can.



CONFERENCE ORGANISER:



Name: Robyn O'Leary
School: Finley High School
School: Population 520

- ^ FHS is a comprehensive rural high school.**
- ^ We experience fantastic support from our local community.**
- ^ Even though we have been suffering from the terrible effects of drought the local farmers have continued to supply us with fodder, steers and transport to shows.**
- ^ We have many students undertaking Primary Industries and Agriculture and cater for Lifeskills students also.**

SECRETARY:

Name: David Crick
School: Barham high school
Population: 250 students

^ Barham High is a fantastic school, great students and staff.

^ Barham is located on the Murray River and is a strong Rice, Dairy and red gum area.

^ The drought has been having a serious effect on the farmers but with the recent rain a more positive atmosphere is starting to develop.

^ I have been only teaching for 1 ½ years and I have found teaching to be a very rewarding occupation with many positives.

^ Before teaching I was running a small berry farm in the Mudgee area of NSW and I have found the change to have been a steep learning curve but I'm glad I've changed professions.



11 Daniel Drive,
Goonellabah,
LISMORE, N.S.W. 2480

3rd October, 2006

The Editor,
Bulletin of the
N.S.W. Association of Agriculture Teachers.

Letter to the Editor

Dear Editor,

As a long standing member of the N.S.W.A.A.T., I am writing to congratulate you and your Team, on the outstanding job you have done in the production of the recent issues of the Bulletin of the N.S.W. Association of Agriculture Teachers. It is a quality production that is easy to read with its large number of photos, very informative and interesting. Even though it is over two decades since I was associated with school Agriculture, I love to receive and read my copy of B.A.A.T. Your Bulletin has certainly come a long way since we re-formed N.S.W.A.A.T. in the mid – 1970's and produced about a two-page Bulletin printed with an Gestetner ink duplicator !

I also wish to congratulate and thank all teachers of Agriculture for the excellent job they do in schools for presenting Agriculture as a most worthwhile and valuable subject for secondary students and for the practical Agriculture set ups/ School Farms established and maintained by teachers of Agriculture. These would not be the successful show pieces they are, without the commitment and dedication of such teachers.

As a former Inspector of Schools (Agriculture) who visited schools with Agriculture throughout the whole State, I read with delightful pleasure in B.A.A.T., of the write up of such schools. My two grandsons, our only grandchildren, both study Agriculture and Primary Industries at Richmond High School. They thoroughly enjoy these subjects, which have significantly contributed to their secondary education and their outlook on life.

Finally, hearty congratulations to all, and keep up the excellent work you are doing, both as teachers and as a professional association.

Yours sincerely,

Norm Robinson
Former President and a Life Member of N.S.W.A.A.T.



N.S.W. Association of Agriculture Teachers Inc



www.nswaat.org.au

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www.nswaat.org.au

Rob Spears

Director of Examinations

Board of Studies Fax: 93678489

117 Clarence Street

Sydney NSW 2000

10th May 2007

Dear Rob,

Thank you for the student names with the highest academic achievements in the 2006 Higher School Certificate courses for Agriculture and VET Primary Industries.

The Association has organised appropriate awards for these students which will be forwarded to the students via their schools.

As you mentioned no student was identified as the top achievers award for the submitted Agriculture project in 2006 HSC, and this has been the situation for past two years.

Agriculture teachers feel strongly that an award be issued each year for the Agriculture project, if not to the 'top' student then to the 'best' student which may mean the project with the highest awarded mark. The quality of work submitted by these students would certainly be a band 6.

This award would continue to recognise the importance of the project in the Agriculture syllabus along with the many hours that students put into completing the outcomes for these projects, under the guidance of their Agriculture teacher.

For these reasons the Association would like to recognise the 'best' student in the 2006 HSC Agriculture project and future Higher School Certificate Examinations. If it is possible for the Board of Studies to identify the 'best' student in the 2006 HSC Agriculture project, the Association could formerly recognise the achievements of this student and school in the normal process.

Could the requested information be faxed to self at Tumut High School on 69472497 or sent to Tumut High School PO Box 70 Tumut 2720 NSW.

Thanks you for your attention to this matter.

Yours Sincerely,

Tony Butler

President

NSW Association of Agriculture Teachers

Year 10 & 11



CHARLES STURT
UNIVERSITY

Agriculture



Enrichment Day

Charles Sturt University



CONCEPT:

^ RIVERINA AGRICULTURE TEACHERS IN CONJUNCTION WITH THE E. H. GRAHAM CENTRE FOR AGRICULTURE INNOVATION AND CHARLES STURT UNIVERSITY WAGGA WAGGA, HAVE COMBINED TOGETHER TO PROVIDE AN ENRICHMENT DAY FOR THE YEAR 10 & 11 AGRICULTURE STUDENTS.

RIVERINA SCHOOLS:

^ 80 STUDENTS FROM 9 SCHOOLS ACROSS THE RIVERINA PARTICIPATED IN A 'HANDS ON' DAY.

- MURRAY HIGH-ALBURY
- SCOTS SCHOOL-ALBURY
- TUMBARUMBA HIGH
- TUMUT HIGH
- YANCO AGRICULTURAL HIGH
- LEETON
- KOORINGAL HIGH
- MT AUSTIN HIGH
- WAGGA WAGGA HIGH SCHOOL



AGRICULTURE ENRICHMENT ACTIVITIES:

^ STUDENTS WERE PLACED IN GROUPS, AND ROTATED THROUGH VARIOUS ACTIVITIES FOR THE DAY.

^ ACTIVITIES WERE BASED ON AGRICULTURE SCIENCE AREAS FROM:

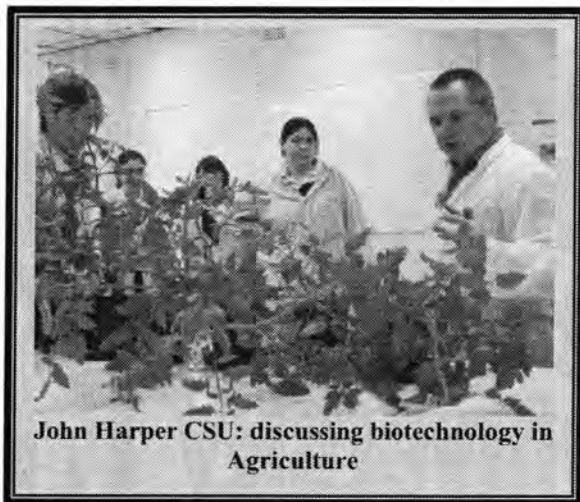
- CEREAL SCIENCE
- BIOTECHNOLOGY
- PLANT DISEASES
- WEED SCIENCE
- SILAGE PRODUCTION

^ STUDENTS WORKED THROUGH ACTIVITIES WITH PRESENTERS FROM NSW DPI & CSU. THESE ACTIVITIES WERE 30 MINUTES IN DURATION & MAINTAINED THE INTEREST AND PARTICIPATION AMONGST THE STUDENTS.

MANY THANKS:

^ A GREAT DAY LIKE THIS IS ONLY POSSIBLE BY THE EFFORTS OF THE FOLLOWING:

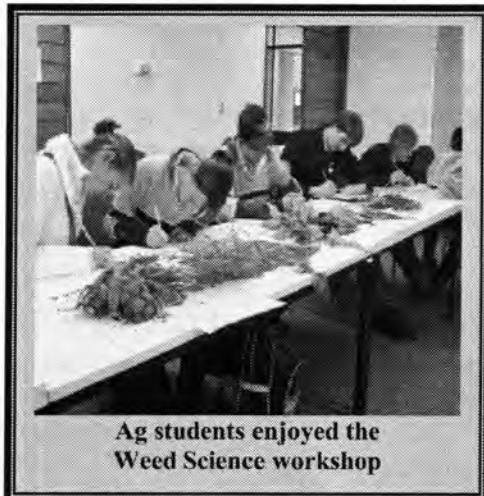
- KERRY WRATTEN: NSW DPI
- JOHN KENT: CSU (BIOTECHNOLOGY)
- HELEN BURNS: NSW DPI (SILAGE)
- GORDON MURRAY: NSW DPI (PLANT)
- HELEN ALLEN: NSW DPI (CEREAL)
- DEIDRE LEMERLE: E.H.GRAHAM (DIR.)
- ANNETTE BEER: NSW DPI (WEEDS)
- JOHN HARPER: CSU (HEAD AG/SC)
- ALLAN MCMILLAN: WAGGA HIGH SCHOOL
- AGRICULTURE TEACHERS & STUDENTS WHO PARTICIPATED



John Harper CSU: discussing biotechnology in Agriculture



Jill Kuchel 'New Aggie' assisting in the Weed Science workshop



Ag students enjoyed the Weed Science workshop



Students checking for fungal spores in Canola stubble.



Students visited the new facilities at Veterinary Laboratories



Protein analysis in wheat was a popular workshop



Silage investigation was an 'interesting' workshop



NSW DEPARTMENT OF
PRIMARY INDUSTRIES



Investigating nematodes in various soils

E H GRAHAM CENTRE for
AGRICULTURAL INNOVATION

CHICKENS

From: president@nswaat.org.au
[mailto:president@nswaat.org.au]
Sent: Mon 4/06/2007 4:35 PM
To: THOMPSON, Ian
Subject: Chicken Resource

Hi Ian

Just opened up a brochure
advertising a free video on the Australian Chicken
Meat industry. One is
for primary ie 27 minutes and the other is 30 minutes
for secondary.
Haven't seen them but have requested one to view.

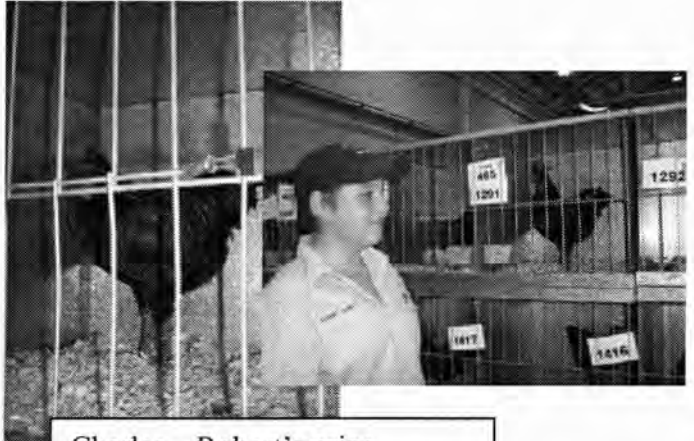
The Website is
www.chicken.org.au
<<http://www.chicken.org.au/>>

Resource is one page so perhaps include it in the BAAT

and an email is
acmf@chicken.org.au

A chicken resource which may be useful for inclusion in the
resource section of June BAAT

Thanks
Tony



Charles – Robert's prize
winning Rooster at the RAS



Robert and Ryan – The Week at the
show that they'll never forget

Robert and Ryan from Yanco Ag had their hard work pay off. After many hours of tending their poultry, feeding, watering, grooming – they finally had the chance of entering their birds in the Royal Show. They had a great time and it was certainly worth going. Thanks to all the stewards and organizers of the Poultry section at the RAS for helping these boys.

Profile on Ian Baird (Technology and Communications)

I am a teacher at Murrumburrah High School, which is in the southern slopes region of New South Wales. I have been teaching agriculture for the past 31 years however, this year, my teaching allocation has had a decidedly technological flavour with some science teaching thrown in for good measure.

I have been asked to continue in the technology area with the NSWAAAT for the next two years. The main task being the upkeep of the association's website.

We discovered during the last biennial conference, that the website provided a good means of quickly disseminating information to members, particularly, last minute changes to conference activities.

Since then, industry and educational programs relevant to teachers and students, have been promoted on the website. This requires regular updates to keep the information current. Contributions from association members are also valued and welcomed, so get in touch at one of the following email addresses:

<mailto:ian.baird@education.nsw.gov.au>

Or

<mailto:webmaster@nswaat.org.au>



NSWAAT:

Top Achievers in 2006 HSC

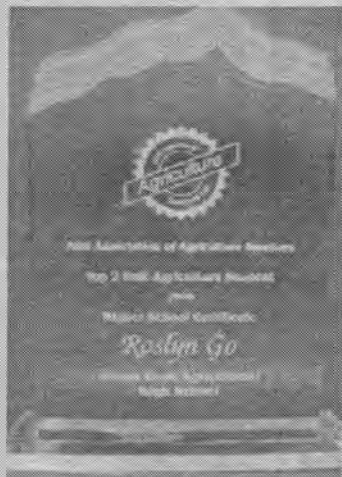
Congratulations to the top student achievers in the 2006 HSC for:

- *2 Unit Agriculture*
- *2 Unit Primary Industries*

Congratulations to these students & a special mention to the students' teachers & their schools.

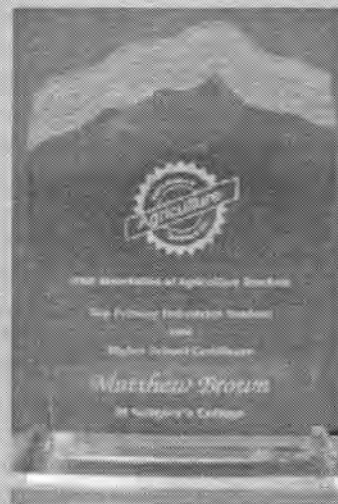
The NSWAAT presented each achiever with a trophy & certificate in recognition of their fine achievement.

Charles Mullarvey Awards



Top Student: **2 Unit**
Agriculture

Roslyn Go
James Ruse
Agricultural High School



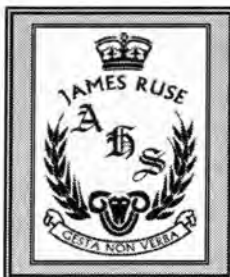
Top Student: **2 Unit**
Primary Industries

Matthew Brown
St Gregory's College



CHARLES MULLAVEY MEMORIAL PRIZE 2006

ROSLYN GO



Top Agriculture student 2006 HSC

^ Roslyn Go of James Ruse Agricultural High School was first in 2 Unit Agriculture at the 2006 HSC with a mark of 99 and thus receives the Charles Mullavey Memorial Prize.

^ This is the result of a combination of things. She has a very high academic ability. She is a dedicated student. She has support from her family and she has had the privilege of doing Agriculture at James Ruse with its experienced and committed staff.

^ Her teacher for the HSC was Gail Roberts and Roslyn's first in the state was the fourth in a row for Gail. This would be a record unequalled in any subject at the HSC.

^ Roslyn's parents migrated to Australia from the Philippines in 1988 and she was born in Sydney in 1989. Harrington Street Public School Cabramatta was the school she entered James Ruse from. Cabramatta is the most ethnically diverse suburb in Sydney with 40 languages being spoken.

^ At Ruse she has excelled, topping her year in Agriculture in years 8, 9 and 10. In year 10, doing the Preliminary HSC, she did not lose a mark in any assessment or examination. She was dux of year 10.

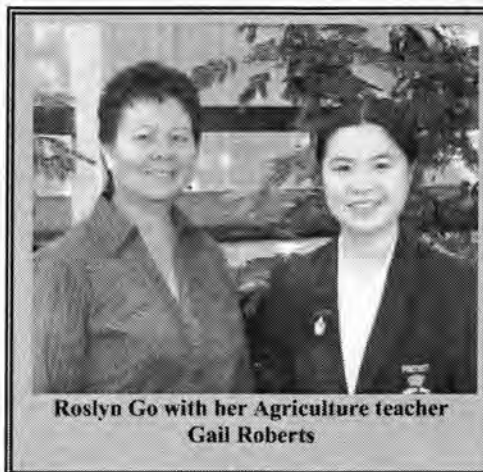
^ This year in year 12 she is studying 4 Unit Mathematics, 2 Unit English, 2 Unit Physics, 2 Unit Chemistry and 2 Unit French. Her plans for the future are not definite but may be in the field of Optometry or Teaching. It would be great to see people with this much ability doing teaching.

^ At school Roslyn is involved with leadership in ISCF and as a Prefect. Stamp collecting is her hobby.

Lisle Brown

Head Teacher Agriculture
James Ruse Agricultural High

*NSW Agriculture Teachers Assoc.
congratulates Roslyn on her achievement.*



Roslyn Go with her Agriculture teacher
Gail Roberts

HSC Agriculture at James Ruse

^ In 2006 we had 56 students sit for the Agriculture HSC. The average mark was 92 and all were band five or six. All 138 year 10 students do the Preliminary HSC in terms 1, 2 and 3. They do the first topic of the HSC in term 4. Term 4 is not easy for the teacher because classes contain students who have elected to complete the HSC in year 11 and those who are not continuing and whose minds are on other things like formal dresses. The non continuers have to be in class as they are still juniors and can't be given study periods as they would if they were in years 11 and 12.

^ In order to keep as many students as possible into year 11 they are allowed to do 14 units if they take Agriculture. This gives us enough students to have four classes in year 11. The down side is that half the classes in year 11 are taught out of school hours either before or after the normal school day. At the start of year 11 this year 75 had elected to continue Agriculture. By the end of term one this has fallen to 55 which means classes are smaller. Students have dropped out because they feel they can't handle 14 units or in some cases they can't make the early lessons because of transport difficulties. Some of our students travel a long way e.g. from Monteray which is on Botany Bay to Carlingford which is near Parramatta.

^ Most students do the electives. In 2006 only one did a project and this year three are attempting it. The electives we study are Plant Management and Animal Management. They are done in parallel with the core animal and plant topics. The electives are studied by guided research.



St Gregory's College

"What you sow, so shall you reap"

100 Badgally Road, Campbelltown 2560

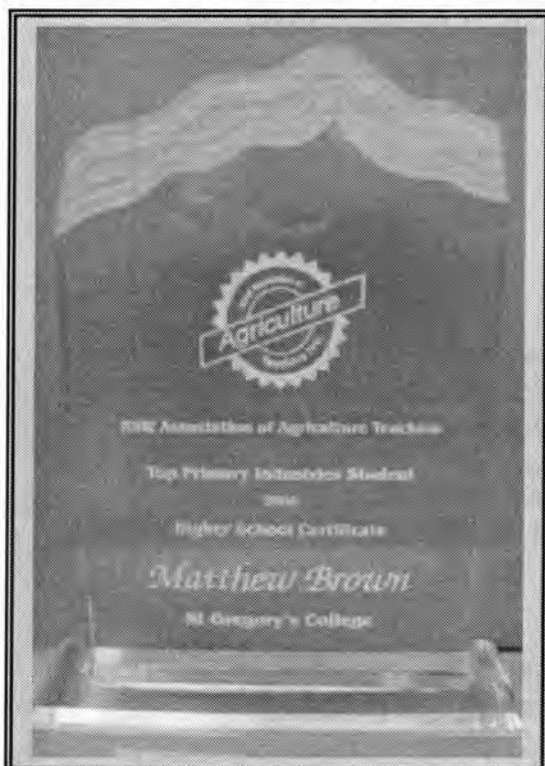
Tel: 02 4629 4222 Fax: 02 4620 0485

www.stgregs.nsw.edu.au

Top Primary Industries Student 2006 HSC



Matthew Brown



Matthew Brown receiving his
Primary Industries
prestigious award from the
NSW Education Minister
Mrs. Carmel Tebbutt

^ Matthew is a local Campbelltown boy who had no background or interest in Agriculture until attending St. Gregory's College as a day boy from 2001 to 2006. St Gregory's College was set up by the Marist Brothers in 1926 to educate young boys from the land and until 1990 was known as St. Gregory's Agricultural College. The college is situated on a 526 Ha property between Camden and Campbelltown and operates a Catholic boy's school for both Boarding and day students.

^ Matthew joined the Show cattle team in year 7 and developed a keen interest in exhibiting cattle at local shows. He has remained a member, and each year has represented the college at local shows and Canberra and Sydney Royal shows. In 2004 he also joined our show sheep program and exhibited at Canberra, Sydney, Dubbo and Bendigo. Matthew's achievements are as follows;

- 2005 – State finalist in Cattle paraders Sydney Royal
 - Placed 4th in Sheep handling, Sydney Royal
 - Champion junior judging ASBA, Bendigo
 - Corriedale Youth achiever award ASBA Bendigo
 - Placed 1st in Agriculture, Preliminary Course
 - Placed 1st in Primary Industries, St. Gregory's College
- 2006 – Associate judge Corriedale section, Dubbo Show
 - Steward, Corriedale section Sydney Royal
 - Team leader, Show cattle program, St. Gregory's
 - Placed 1st in Agriculture HSC course, St. Gregory's
 - Placed 1st in Primary Industries, St. Gregory's
 - 1st Place HSC, Primary Industries.

^ Matthew is currently attending University, and working part time at Novartis. He has started his own Corriedale stud from sheep donated by the Corriedale association as his winning prize for being the Corriedale youth achiever award. He has been a tremendous ambassador for the college and has worked hard for his achievements.

*NSW Agriculture Teachers Assoc.
congratulates Matthew on his fine efforts.*

Welcome to the Cotton Catchment Communities CRC eNews. You are receiving this because you have registered your email address at the Cotton Catchment Communities CRC's Technology Resource Centre. To stop receiving this, see instructions at the bottom of the newsletter.

The aim of this electronic newsletter is to inform you of important new information that is available on the **Cotton Catchment Communities CRC** website:

Significant additions and changes to the Cotton CRC web site and upcoming events are listed and hot linked to our site.

Web site :
<http://www.cotton.crc.org.au>

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www.cotton.crc.org.au/CCCCRCRSS.xml

Welcome to the Cotton CRC Enews Number 5 March 2007

Cotton CRC web tools that use SILO climate records

- [Update on SILO situation](#)

Information sheets and Agronomic Notes

- [Results from Bt resistance monitoring 2006/07 until end of February 2007](#)

Events:

- [Cotton Field to Fabric Training course July 2007](#)

Media releases:

- [Increased support on the Darling Downs](#)
- [Communicating Cotton](#)
- [Improving Nitrogen fertilisers in cotton under scrutiny](#)
- [Cotton focus on better soil management](#)
- [Student focus on cotton summer scholarships](#)

Cotton CRC Issues

Positions Vacant

- [PhD Scholarship or Research Masters Scholarship - Groundwater Modelling](#)
- [PhD Scholarship in the area of Hydrology, spatial integration and probabilistic modeling](#)

RSS Feeds (Really Simple Syndication or Rich Site Summary) New Service

A link has been added to the Cotton Catchment Communities CRC web site for use with personal aggregation tools.

www.cotton.crc.org.au/CCCCRCfeedpod.xml

Personal aggregation tools dynamically read, collect, and organise syndicated Web content, and seamlessly deliver it directly to your desktops. Using an aggregation tool, you have instant, convenient access to the up-to-the-minute news you need, without information overload.

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- A description of RSS feeds and how they can make it easier for up to keep up to date

RSS feed added for Whats New Page . Right mouseclick on this link and use copy shortcut to copy this RSS link to your RSS feed reader software.

www.cotton.crc.org.au/CCCCRCRSS.xml

Audio (New Service)

- Audio - An Introduction to Podcasts and RSS Feeds for the Cotton Catchment Communities CRC Web Site.
- Audio - Peter Gregg inaugural Lecture Armidale "The Australian Cotton Industry and its Pests: Past Present and Future".
- A description of Podcast feeds and how they can make it easier for you to keep up to date

Podcast feed added for audio. Right mouseclick on this link and use copy shortcut to copy this podcast link to your podcast receiver.

www.cotton.crc.org.au/CCCCRCfeedpod.xml

Newsletters

- Cotton Tales Regional Newsletters

MERINO BREEDING for profit

Ensuring consistent gains in productivity remains one of the most important issues determining the future viability and profitability of Australian Merino sheep and wool producers.

Different breeding methods impact on production, and ultimately, profitability. It has been shown that a change in breeding method and subsequent use for ten years can provide a Gross Margin increase of up to \$10/DSE for a Merino enterprise.

And this level of financial improvement can be continued, and even increased, by ram breeders and wool producers across all sheep types and traits.

The reality for wool producers is finding the best way to acquire and incorporate the best genetics.

Is it through breeding and using rams based on the use of sheep classers, skin based selection, the use of modern genetic tools, or a mix of two or all three?

These vital questions became the focus of a landmark 10-year study, funded by Australian Wool Innovation, the South Australian Research and Development Institute and supported by Meat and Livestock Australia, The University of Adelaide and the South Australian Stud Merino Breeders Association.

The study found that while all breeding methods made good genetic progress and a combination of strategies can be used in any flock, a strategy based on objective estimates of genetic performance achieved the highest dollar return.

AIM OF THE SDF PROJECT

In 1996, the Selection Demonstration Flock project was established to evaluate and demonstrate the strengths and weaknesses of the various selection strategies that are typically used in the Merino industry. The breeding methods applied to the flocks were named as Performance Index, Classer Assessed and Elite Wool.

The overarching breeding objective was to maintain or slightly increase fleece weight and body weight. It was also decided that wool quality should be improved, through:

- reducing fibre diameter
- reducing the variation in fibre diameter; and
- improving style

Exploring two new breeding directions embraced by industry, dual purpose Merinos and finer wool, a further two flocks were established in 2000 and 2001. The breeding objective of the Dual Purpose flock was to improve fleece and meat values using a

combination of performance index and visual appraisal, while the breeding objective for the Fine Wool flock was to improve profitability of fine wool sheep in a wheat/sheep environment by using a combination of all selection strategies.

While the project was conducted in South Australia, and based on 'South Australian Merinos', the project has national ramifications.

The outcomes – presented in this report – provide an insight into the breeding methods that are used to make substantial and predictable ongoing gains in the productivity of the various strains of the Australian Merino.

HOW DID THE SDF PROJECT WORK?

Four initial flocks of 200 breeding ewes were established as the basis of the project. These ewes were drawn from leading South Australian Merino studs and were randomly allocated to the four flocks.

For consistency, outside sires were able to be used for the first two matings only in the Performance Index, Classer Assessed and Elite Wool flocks. From then on, they were 'closed' and replacement sires were bred from 'within flock'. Randomly selected sires were used in the Control flock.

The Dual Purpose flock was established in 2000 from contributions of ewes from across Australia. Running with the initial flocks, the Dual Purpose flock used outside genetics across 5 years of mating.

The Fine Wool flock commenced in 2001 with 400 ewes drawn from several fine wool flocks. The flock was open to outside genetics for three matings, then reverted to 'within flock' mating for the last two matings and was grazed separately from the other flocks under similar conditions.

A group of woolgrowers, ram breeders, sheep classers and advisors was formed to manage each flock. Group members were advocates of each breeding method and all groups made selection decisions according to their breeding objective and collaborated to explore each selection method.

The results of using each breeding method were evaluated each year by recording and analysing a wide range of objective and subjective traits, including: fibre diameter and its variation, fleece weight, staple strength, live weight, skin and conformation traits.

To remove any potential bias, all flocks were run under equal husbandry and management conditions on the one property at Turretfield, SA, except the Fine Wool Flock which was run on two properties in a similar environment.

THE SELECTION DEMONSTRATION FLOCKS

Establishment Year	SDF Flock	Description
1996	Control	a flock to provide a reference point against which genetic change in the other flocks can be measured
1996	Performance Index	a flock with selection based on a performance index system, with some attention to visually assessed wool and conformation characteristics
1996	Classer Assessed	a flock with selection based on classer assessment of wool quality and quantity plus conformation with occasional and non-systematic use of objective measurement data
1996	Elite Wool	a flock with selection based on elite wool principles involving visual and tactile evaluation for wool quality and loose, pliable skin and some use of objective measurement and matching of sire and ewe characteristics
2000	Dual Purpose	a flock with selection based on improving both fibre quantity and quality and carcase traits, using a combination of performance index and visual appraisal to reflect industry demand for increased body weight and carcase traits
2001	Fine Wool Flock	a flock with selection based on a combination of objective measurement, visual assessment and elite wool principles to improve profitability of fine wool sheep in a grain growing zone

RESULTS

The progressive outcome of each selection system was analysed by assessing progeny every year. In 2005, after 10 years of selection and breeding in the initial selection flocks and 5 years of breeding and selection in the newer flocks, the project concluded and the overall results were analysed.

The first few years of the project saw rapid gains in many traits among the flocks – this was largely through the use of specially selected outside sires which enabled the breeding groups to quickly take their flocks towards their breeding objectives.

In the flocks where matings reverted to using 'within flock' rams, the rate of genetic gain slowed. However, all flocks made progress towards their breeding objectives, and importantly, a range of strengths and weaknesses of each method emerged.

The key project findings are:

Breeding and Selection	1. Breeding better sheep increases stud and commercial producers' profits 2. Different selection methods will lead to different levels of profit 3. Breeding goals that focus on long term profit bring profit, regardless of the selection strategy 4. Breeding goals need to take into account all important traits, including visual and measured traits
Monitoring and Measurement	1. It is important to monitor changes in all traits, including visual and measured traits, and all selection strategies benefit from monitoring 2. All selection methods can substantially improve visual wool quality and skin traits 3. Placing a strong emphasis on wool traits such as fleece weight and fibre diameter did not affect conformation
Genetics	1. The introduction of genetic material from 'outside' sires can result in significant, rapid and profitable changes 2. The superiority of sheep selected at a young age is maintained through their lifetime
Combining for Success	A combination of selection methods can be successfully used in breeding programs

Indicative responses to selection for the key breeding objective traits are:

Breeding Objective	Maintain or slightly increase CFW & body weight & significantly improve wool quality			Increase body weight & wool quality	Significantly improve wool quality
Trait response	Performance Index	Classer Assessed	Elite Wool	Dual Purpose ¹	Fine Wool ²
Clean Fleece Weight increase	++++	+++	++++	+++++	++
Fibre Diameter reduction	+++++	+++	++	+++++	+++
Staple Strength increase	+	+	+++	+	++++
Staple Length increase	+	+	+++	+	++++
Live Weight increase	+	++	++++	+++++	++++

+ indicates relative scale of achievement; eg +++++ is very significant, + is negligible

¹ The Dual Purpose flock saw a yearly introduction of outside genetics over a 5 year period.

² The Fine Wool flock had a higher number of ewes, ran for 5 years and was grazed separately under similar conditions.

Hence the results from these two flocks are more preliminary than those from the four original flocks.

FINANCIAL ANALYSIS*

Aim: The project's outcomes were analysed to compare the financial impacts in a commercial enterprise by using rams bred from the different selection systems.

Method: Financial analysis was only conducted for the four original flocks. Measurement of each flock's progress was based on the production data achieved after 10 years of selection, which was analysed in a typical self-replacing Merino flock enterprise to account for wool and carcase returns from adult sheep. Average fleece and carcase prices of the last 10 years and 5 years were used to develop Gross Margin values.

Gross margins of each flock per DSE after 10 years of selection based on 10 year and 5 year average prices

Flock	10 year \$GM/DSE	5 year \$GM/DSE
Control	18.60	15.70
Performance Index	24.20	25.60
Classer Assessed	21.40	20.40
Elite Wool	23.10	22.80

The 5 year average prices show a higher premium for fine wool and a higher carcase value than the 10 year average prices. Of these two effects, the higher premium for fine wool had the largest impact, particularly the premium below 19µ. The extra reduction in fibre diameter achieved by the Performance Index breeding method significantly increased the value of the wool from this group.

Conclusions: Each of the three selection systems provided a higher gross margin than the Control. This indicates that when using a breeding objective based on economically important traits all selection methods can increase profitability of commercial flocks. The Performance Index selection method returned the highest gross margins regardless of market conditions.

*Young, J.M., Report on a Gross Margins Analysis of the Selection Demonstration Flocks, January 2007

REVIEWING EACH SELECTION METHOD

PERFORMANCE INDEX FLOCK

Selecting sheep for maximum gains in wool quantity and quality, body weight and reproductive ability using a performance index system, with some visual assessment.

INFORMATION AND OUTCOMES

- An 8% MP selection index was used which placed equal emphasis on increasing fleece weight and decreasing micron
- The selection system gave ability to recognise and assess genetic trends (both positive and negative) and respond quickly
- Breeding values were used to guide selection
- The selection system requires a certain level of technical support and understanding
- The system can be used to improve any trait or number of traits.

Bill Richardson – Performance Index Participant

- “Seamour” Poll Merino Stud near Tumby Bay on the Lower Eyre Peninsula, SA
- 1000 ha, 12km from the coast
- Average Annual Rainfall: 435mm
- 500 stud ewes
- Production aims: grow more high quality wool and rear fast growing lambs from ewes with high reproductive rates and disease resistance

The “Seamour” Poll Merino Stud produces dual purpose rams that are below the district average for micron. The ewe flock average is just under 20 micron, and Bill Richardson still regards them as a South Australian ‘type’ as the flock’s live weight average is as heavy as the best 15% in Australia.

“We haven’t gone smaller as we’ve gone finer, and wool cut per head has increased.”

Bill was an original member of Merino LAMBPLAN and then Merino Genetic Services, and has been measuring stock and obtaining Estimated Breeding Values (EBVs) since the early 90s. He became involved in the SDF project at its inception.

“I thought the project would be very important, and would provide an opportunity to demonstrate the value of measurement and breeding values.

“And we showed that you can achieve better gains in going from measurement to estimated breeding values. Even so, the project has been useful in demonstrating the strengths and weaknesses of all the different types of classing and selection methods,” he said.

Breeding method is not the issue it once was according to Bill.

“The initial debate dissipated because of the selection methods that are now available to breeders and they can see the value in using combinations of methods: measurement, elite wool and traditional classing – they all have value.”

With the Performance Index method, the breeding objective was to improve wool quantity and quality, and increase body weight and



reproductive ability to provide a greater return per head. The selection parameters were about 80% measurement and 20% visual.

“We saw the reduction of fibre diameter as the key issue which was achieved quickly by using outside sires, and we were able to continue decreasing fibre diameter under the selection method.”

Bill says the short experience of using outside sires demonstrated the potential for making a major impact on rapid genetic gain and profitability and the strength of the Performance Index method was being able to increase economic returns and constantly monitor progress.

“For instance, in one year we lost some staple strength, but after identifying it through analysing measurement data, we were able to quickly correct it in the next year.

“However, the weakness of the breeding objective was that it didn’t move with the market in not selecting for body weight and carcass traits, which the industry had a new emphasis on. This highlighted how important it is to continually relate breeding objectives to market demand,” he said.

Bill says he intends to continue making a profitable living from his breeding enterprise and aims to do this by increasing production by 3% a year, saying he can’t “just go to the boss for a pay rise”. He has no motivation to change what he’s doing; rather, he has every motivation to continue with using measurement and estimated breeding values (MERINOSELECT) as a breeding method.



CLASSER ASSESSED FLOCK

Selecting sheep using largely visual and tactile assessment to reduce ewe flock micron to 22 microns, increase fleece weight, improve skin quality, wool softness and handle, maintain body size and maintain or improve structural soundness in sheep.

INFORMATION AND OUTCOMES

- Selection based on visual and tactile assessment by professional classers with occasional and non-systematic use of objective measurement data
- The method resulted in even progress and consistent conformation
- Fibre diameter was reduced, fleece weight slightly increased, staple strength was maintained, staple length increased, and body weight significantly increased
- Progress was slower than some other breeding methods
- Low cost operation is a significant feature of the Classer Assessed method



Fleeces went from 24-25 μ down to 21 μ average over the project's 10 years while all other necessary production traits were maintained.

Geoff believes the Classer Assessed method demonstrated that setting a breeding objective is the first step to achieving production goals.

"And the selection method also proved that a good classer can achieve good results at low cost.

"Though after watching what happened at Turretfield over 10 years, perhaps we could've improved our outcome if we had used more measurement data.

"In particular, progeny testing data would have been good to assess the progress towards the breeding objective."

He noted that it was difficult to achieve classing consistency from year to year as it depended on who was available on classing day to make the decisions.

"I think the traditional classer-based selection system as a method on its own might become more applicable to commercial flocks, while at stud level we'll move towards using a combination of selection systems," he said.

Geoff regards the use of outside sires as an excellent way of making a large initial impact.

"But one has to be careful not to introduce unwanted traits – and that's where being able to measure and monitor progress is very useful."

In his own enterprise, Mr Davidson is using some of the key SDF outcomes.

"I am working to a breeding objective and gathering more information on my flock, especially on fertility, body weight, micron, fleece weight, muscle and worm resistance – though I'm not using an index at this stage.

"I think it's vital to recognise that client demand is the key driver for breeders. The industry has become very commercially focused, and we need to keep this in mind when producing the seed-stock sought by our clients," he said.

Geoff Davidson – Classer Assessed Participant

- "Moorundie Park" Poll Merino Stud, 50 kms north of Clare, SA
- 2000 ha
- Average Annual Rainfall: 460mm
- 4,000 stud ewes
- Production aims: increase client profitability through improving fertility, worm resistance, growth rate and quality wool production

Geoff Davidson approached the SDF project believing sheep classers have a clear role in further improving the performance of the Australian Merino and saw the project as a unique opportunity.

"Visual appraisal is essential to maintain the conformation standards of the national flock.

"I wanted to improve my understanding of the use of objective measurement in sheep selection, and contribute to a valuable industry endeavour.

"While many commercial farmers focus on productivity and achieving their goals I believe stud breeders are obliged to be fully aware of selection system developments."

The aims of the Classer Assessed group were to decrease micron to 22 μ , maintain good body weight and improve conformation from the starting flock of 24-25 μ sheep.

"The dilemma facing South Australian Merino producers at the time [1996] was strong micron in an era of premiums for fineness. So our selection committee looked at ways of reducing micron without compromising other production traits.

"We had to be mindful of fleece rot and selection for white wools, and as the project unfolded, the committee decided to decrease micron further – which was achieved," he said.



ELITE WOOL FLOCK

Selecting sheep to increase profitability by using tactile evaluation of skin, objective measurements and matching sires to ewes.

INFORMATION AND OUTCOMES

- The Elite Wool breeding method decreased the variation of fibre diameter, and made small gains in decreasing fibre diameter
- Wrinkle and pigmentation decreased and sheep became 'easy care'
- The measured traits of fibre diameter and the variation of fibre diameter were reduced
- Fleece weight, staple length, live weight and conformation improved significantly
- There was limited availability of preferred outside sires

Murray Elliott and Richard Weatherly – Elite Wool Participant and Elite Wool Supporter

- "Connewarran", Mortlake, western Victoria
- 4000 ha
- Average Annual Rainfall: 550-600mm
- Commercial Merino flock of 4,000 ewes and 700 stud ewes
- Production aims: to increase wool production/ha and improve other production traits

Hamilton-based Sheep Breeding Services Proprietor, Murray Elliott, was a member of the Elite Wool flock group and he participated to represent the thinking behind 'Elite Wool'.

"We've been putting it into practice since the 1970s – with a surge in interest in the 1990s – and the SDF project offered an interesting challenge to industry: the ability to compare selection systems under identical conditions."

Murray says the Australian Merino in all its forms has come a long way, but remains short of what is possible.

"We wanted to show how the Elite system can deliver improved productivity through increasing fleece weight and wool quality – with broader crimping and finer micron wools.

"In the SDF project, we only really went a few steps towards developing what we call an Elite sheep – given constraints such as the limited ewe base and that outside sires could be used in the first two years only.

"Even so, we introduced more evenness in fibre quality and increased quantity, we tailored wool type to suit the local environment and we thought we showed what is possible for 'eliteness'."

The Elite selection group refined some areas throughout the project – it graduated towards breeding Poll Merinos, and increased emphasis on growth rate and body weight.

Richard Weatherly has been using the Elite Wool selection system on "Connewarran" under the guidance of Murray Elliott. Richard started



his breeding program in 1985 using visual assessment backed up by measurement of key traits.

"The single most important factor was having a clear goal, a vision of the ideal sheep for our environment – and pursuing that vision with determination.

"The original sheep here were a low production, high micron type; whereas we wanted robust grazing machines that just want to have lambs and grow lots of quality fibre.

"We needed to get rid of tight skins to grow free-flowing, long stapled, bright, white, deeply crimped wool on a big well-framed body.

"We selected rams visually for stature and style, feel and handle of the wool, skin type and follicle development," he said.

To avoid penalties for over-long staple, shearing now occurs every 8 months – three wool clips every 2 years. In 1985, the Connewarran commercial flock ewes were cutting an average of 6.5 kgs of 24µ wool at a rate of 27kg/ha. Now, they're cutting 4.4 kg of 19µ wool (every 8 months) at a rate of 85kg/ha.

Richard says this is a direct result of good animal husbandry, pasture utilisation and applying the Elite selection system to utilise the best genetics.

"We visually assess all rams, and then test them all twice per year for fibre diameter, yield, tensile strength, CV, spinning fineness and comfort factor. This information is provided to intending purchasers and is used in our selection process.

"The Selection Demonstration Flocks have been fascinating. I think it was a little unfortunate that a lot of people watching wanted to 'pick a winner' – people are very tribal that way.

"We're all looking for good sheep – how we get them is a matter of personal choice, but I've got to say that if sheep were bred following a formula, it would become Dullsville. The Elite wool system is not necessarily for everyone; a breeder has got to be interested in it and see it through," he said.



DUAL PURPOSE FLOCK

Selecting sheep to improve fleece and meat values using a combination of performance index and visual appraisal.

INFORMATION AND OUTCOMES

- Fleece and meat trait improvements can be made simultaneously
- Increases in body weight for age can be made at every growth stage
- Using EBVs and a selection index is vital for integrating selection methods
- To achieve a balanced animal, use measurement backed by visual selection, and measure both meat and wool traits
- To reach a breeding objective, the identification and use of suitable outside ewes and rams will increase progress
- Good information is vital in selecting outside rams

Tom Hawker – Dual Purpose Participant

- "Anama", located at Clare, SA
- 3000 ha
- Average Annual Rainfall: 420-450 mm
- Poll Merino and Merino stud of 1300 stud ewes and 1200 commercial ewes
- Production aims: maximise wool and meat value per hectare



Tom Hawker believes information provides power to a Merino breeder. He and his father Ryves have been collecting information and using objective measurement for more than 30 years, and in his own flocks, selection is weighted at 70% measurement and 30% visual.

Tom originally became involved with the Performance Index flock, and then with the Dual Purpose flock in 2000.

"Our goal was to maintain clean fleece weight while decreasing fibre diameter, and maintain staple strength and staple length. We also wanted to increase lamb growth rate and the number of lambs weaned, as well as improve carcase quality and resistance to internal parasites.

"The true potential of the Merino has not been reached despite 200 years of intense selection, and the SDF project addressed a key industry need: evaluating the different selection systems.

"With other woolgrowers, breeders, advisors and classers, the project allowed us all to 'look into the future' as to the effects of selecting for different traits under different selection methods," he said.

"We realised that having good information is vital to achieve the breeding objective, but we found that good objective information on outside sires was hard to obtain.

"A key part of our strategy was to use outside sires to provide upfront impact, but because we couldn't find the right ram with necessary information, we had to use some rams that were unproven and some wool quality concerns arose," he said.

Tom highlighted that the industry now has the benefit of MERINOSELECT to provide the right performance information to woolgrowers.

Tom says there were a number of positives in the Dual Purpose selection method. "It was predictable, it was not subjective and we could monitor progress – this gave us confidence in where we were taking the sheep.

"Also, it was simple and easy to follow – in fact it could be replicated by any breeder, in any stud or on any farm," he said.

However, Tom says that when using such a system breeders need to be prepared to collect information and there is some investment required in equipment such as scales.

"Extra cost is always a challenge in the Merino industry, but the gains that we made easily compensated for the outlay.

"Importantly, the method showed that improvements in both meat and fleece value can be achieved at the same time, which a lot of people said couldn't be done."

Tom says that measurement has put many producers on a new level on the growth curve by increasing profit per sheep and profit per hectare.

"But the secret about collecting information is what's done with it. It is important to translate measurements into EBVs; that way producers can compare animal performance within their flock, and across other flocks.

"Good objective information can also be used to improve meat and wool value by introducing proven genetics, and to monitor and assess breeding decisions," he said.



FINE WOOL FLOCK

Selecting sheep to improve profitability of fine wool sheep in a wheat/sheep environment by using a combination of visual and tactile assessment and objective measurement systems.

INFORMATION AND OUTCOMES

- Fibre diameter was reduced while fleece weight, yield and body weight were increased
- Emphasis on monitoring staple strength led to significant staple strength improvement and substantial reduction in variation of fibre diameter
- Conformation, constitution and skin quality traits were maintained to industry standards
- Three selection techniques (visual, 'elite' and measured performance recording) were used and combined successfully
- With careful genetic selection and matching rams to ewes, this method proved to be sustainable and potentially valuable
- Dust penetration of fleece became an issue (as anticipated). It was overcome through introducing rams with dust resistant fleece structure

Hugh Jarvis - Fine Wool Participant

- "Aramis", 45 kms north-west of Hamilton, VIC
- 1100 ha
- Average Annual Rainfall: 550-650mm
- Wool and grain producer
- Production aims: Produce 60kg of 18 micron wool /ha from easy-care highly-fertile sheep with high resistance to internal parasites and flystrike in a wheat/sheep zone

Hugh Jarvis was drawn to the project bearing a commitment to using objective techniques to select and breed productive sheep.

He is well known for breeding fine wool Merinos, having reduced the micron in his sheep from 24µ down to 18µ over a 15 year period.

"Breeding method is certainly important, but it is also important to keep things in perspective and use common sense in a selection system," he said.

"When the project began, I thought it was good to have proponents of each method with the same opportunity to prove how well their system could meet the breeding objectives."

To test the capacity of combining the best components of each selection system, the SDF Fine Wool Flock was established in 2001 and run through until 2005. The breeding objective was to reduce micron, while increasing tensile strength and fleece weight.

"In other words, breed finer wool sheep suitable for the wheat/sheep belt.

"Yet very few woolgrowers in this climatic zone have attempted this, due to preconceived ideas about yield and vegetable matter discounts, as well as concerns about the constitution or doing ability of fine wool sheep.



"While many have reduced their micron from a strong base, particularly during the periods of high fine wool premiums, most now want to improve meat production."

Hugh says the old bogey quickly occurred, with dust penetrating the fleece and hence reducing style and yield. But he says what was more interesting was the fact that it was quickly resolved by selecting rams with dust-repelling fleece structure. There was also a slight shift in methodology towards increasing staple strength through the project to avoid tenderness discounts.

"The project worked quite well in terms of what we had to work with and what we achieved in the time available.

"While the professional classers clearly contributed with their adeptness in identifying 'doer' sheep, it was more challenging to blend the elite and objective measurement approaches – some compromises had to be made to achieve our goals.

"Another interesting area was in our use of outside sires. While there was performance information on these outside sires it didn't translate to results within the flock in that environment and not as much progress was made as hoped.

"The rams were mostly sourced from high rainfall areas and were untried in the wheat/sheep belt. Not all the progeny had the necessary fleece structure to repel dust – this required correction later."

Hugh says as a result of working alongside the Elite group, he is now looking to improve staple strength by looking for wool with well-defined even crimp and finer follicle bundles, as well as by measuring staple strength.

"And working with the Professional Classers helped my capacity to target visual traits including feet, frame and mouths," he said.

Hugh says market signals and client demand are key drivers for changing breeding and selection programs.

"In my own breeding program, I've also had a focus on selecting sheep for low worm egg counts and this has resulted in a near halving of the amount of drench I'm using.

"And we've also altered our shearing time so that it now occurs before harvest, to fit with the increased cropping program and to reduce the amount of dust in the wool," he said.



A FINAL WORD FROM PARTICIPANTS:

BILL RICHARDSON: "The interaction with the other breeders and classers during the project was stimulating with a cross-fertilisation of ideas and methods; it made you think about what you can do and achieve on your farm."

GEOFF DAVIDSON: "While contact with other Merino breeders is invaluable, as is the exposure to genetic evaluation systems such as MERINOSELECT, my greatest learning was that without clear goals, you cannot know where you're going."

TOM HAWKER: "The experts say we need to make a 2-3% productivity improvement in sheep every year to be profitable, and you need measurement to be able to determine this."

HUGH JARVIS: "It is now possible to use modern tools for genetic selection and link these to visual and tactile assessment techniques to obtain a balanced package for sheep selection."

MURRAY ELLIOT: "For many woolgrowers, the 'ideal sheep' is a suitable and satisfactory aim - it is important to have an objective, but it need not be complicated."

The project's outcomes pose a number of questions for ram breeders and buyers:

- What is your breeding objective?
- What information is available on your rams and ewes?
- Which selection method do you make most use of, and how?
- How can you demonstrate genetic progress over the past 5 years?
- How do you prioritise those economically important traits you are selecting for?
- How do you compare your animals with those of other breeders?

WHERE TO NOW?

All breeders' selection strategies and breeding objectives can be assisted by accessing information through Sheep Genetics Australia and MERINOSELECT. See www.sheepgenetics.org.au

Additional Merino genetic information can also be found at Merino Superior Sires: <http://mss.csiro.au>

The following websites contain more detailed information about the SDF project outcomes:

www.woolinnovation.com.au - Australian Wool Innovation
www.sardi.sa.gov.au/sdf - SDF Project Website

Or contact the AWI hotline: 1800 070 099

ACKNOWLEDGEMENTS:

AWI and SARDI gratefully and sincerely acknowledge the time and commitment provided by all Merino producers, breeders and advisors involved in the SDF project, and the contributions made by the project partners: MLA, University of Adelaide and the South Australian Merino Breeders Association.

Excellent Resources

In the last week I have had the good fortune to in receiving some good resources that I think will be of use to agricultural and horticultural teachers across Australia.

It has become obvious that there are many good resources out there however the distribution of these is often limited to farmers who attend work shops or field days. Teachers both at the secondary level and Tafe are often forgotten. This is not a deliberate action. It just happens. As a result people who often do work shops have much of the resource under their desk.

Below is a short out line of resources I have received that are excellent. I will give a contact either by website or email as to where to get them.

Sheep Resources.

1. Code of Practice for the AWEX Quality System
Preparation of Australian Wool Clips The Wool Classer
This is a book Excellent! Approx cost \$10.00
2. Bale Descriptions
This is a poster. Excellent Free?
3. www.woolcheque.co.au
This site is easy to use to help determine the price of your wool. Could be good for simulation.

Refer to the email woolclasser@awex.com.au for the first 2 resources above

4. www.lifetimewool.com.au
This website is the result of many different organisations.
Resources include

(a) A book titled Ewe Management Handbook Optimising Merino ewe nutrition to increase farm profit. Excellent!

(b) A heavy duty card titled Condition Scoring of Sheep. Very practical and easy to use.

(c) Feed Budget Tables for drought/dry conditions in southern Australia. Excellent for students.
Easy to use

5. Lambing Planner Virtual Shepherd version 2 A-Sheep Group
Simple and easy to use. Excellent.

Contact Department of Agriculture and Food 444 Albany Hwy, Albany 6330. Ph 9892 8444
Email : albany@agric.wa.gov.au

6. Australian wool Innovation Product catalogue 2007
Website www.woolinnovation.com.au
Email info@woolinnovation.com.

7. Salt deck cards. Excellent for identification of salt tolerant plants. Can be used in the field easily.
Contact www.landwaterwool.gov.au
www.cresalinity.com.au
www.salinity.com.au

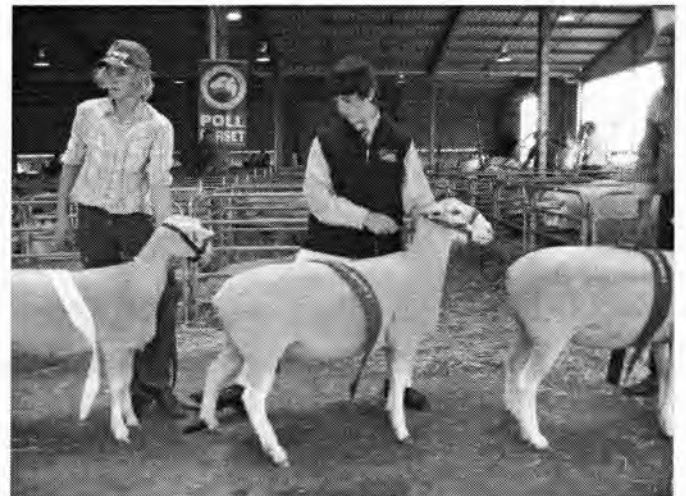
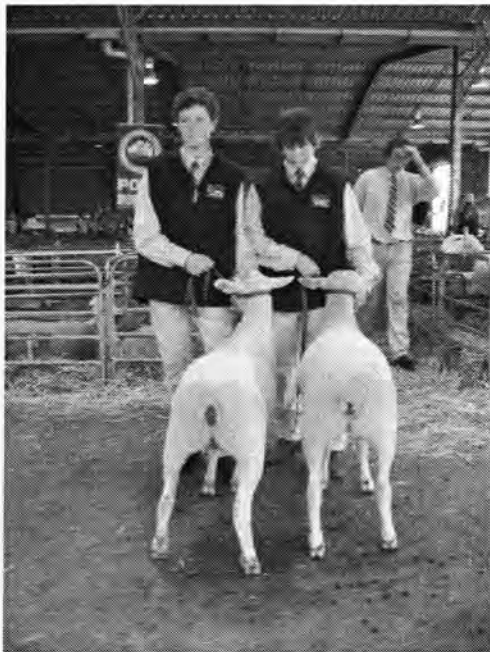
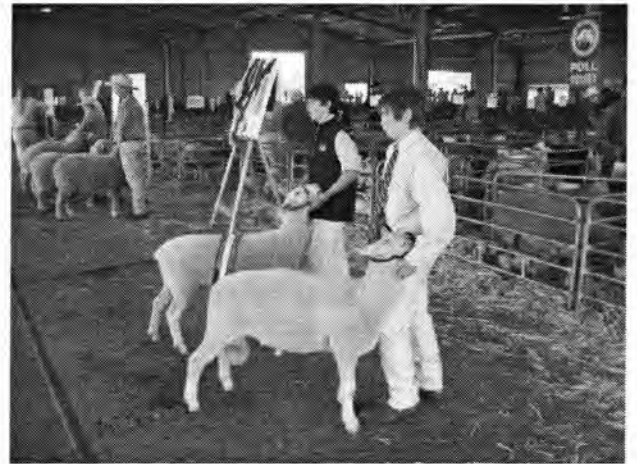
8. Red Legged Earth Mite

The website is www.timerite.com.au This weside allows farmers to know exactly when to spray for red legged earth mite. This resource was produced by the AWI and the CSIRO.

9. Stockplan.

This is a series of three computer programs which help the farmer in determining how to manage his stock. Do you sell them, keep them or sell half keep half etc. Work shops have been run around the state for farmers to understand how to use them. Contact 1800 070099

White Suffolk and students from Yanco Ag



Riverina Primary Industries Day

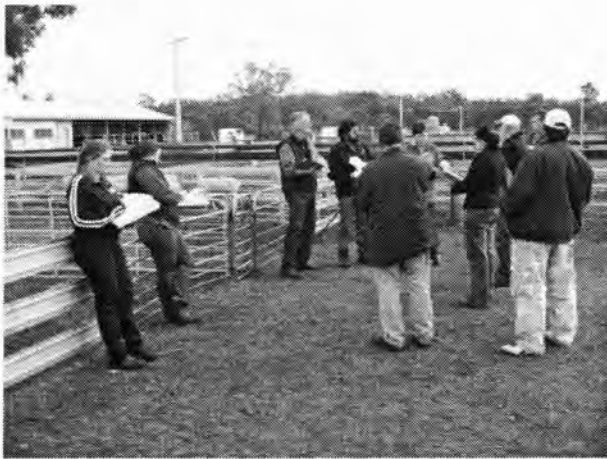
Ag teachers from across the Riverina converged on Yanco Agricultural High School for a networking meeting. Graham Levett facilitated the day.



Morning Tea at Yanco Ag High



ICT in PI – enough of the acronyms – computers are very useful in PI – even if it only to keep records for BOS.



Assessment of sheep handling skills.
Notice how green it is!!!!





VICTORIAN ASSOCIATION OF
AGRICULTURAL AND
HORTICULTURAL EDUCATORS



**The National Association of Agriculture Educators
FIFTEENTH BIENNIAL CONFERENCE
The Victorian Association of Agricultural and Horticultural
Educators proudly presents:
THE CHANGING CLIMATE OF AGRICULTURE**

**Deakin University, Geelong
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Melways ref: 578**

Monday 7th January – Thursday 10th January 2008

Option 1:

Workshops/excursions: all four days

Accommodation: from Sunday to Wednesday

Meals: breakfast, morning tea, lunch and dinner (except Tuesday dinner) Approx **\$550**

OR

Option 2:

Workshops/excursions: all four days

Meals: morning tea, lunch and dinner (except Tuesday dinner) Approx **\$300**

**To show an expression of interest and/or
more information about membership contact the
VAAHE secretary antjok@nhillcollege.vic.gov.au**

HSC MARKING

From: Hemmings, Stuart C [mailto:Stuart.C.Hemmings@det.nsw.edu.au]

Sent: Sun 26/11/2006 4:35 PM

To: Ian THOMPSON

Subject: BAAT picture ag marking Tamworth

Hi Ian,

Please find attached a photo of the group from the Ag Marking centre in Tamworth in 2006.

Names are as follows: (I just need belinda's surname from Lithgow?? Have some messages in for people to call me back but Perhaps you could ring the school if necessary?)



Back: L-R Chris Bowling (Sydney DEC), John Lee (ex Glen Innes HS), Steve Trickett (Billabong HS), Owen McLaughlin SOM (Canowindra HS), Tony Barnett (Walcha Central), Rick Wheaton (Oxley HS), Stuart Hemmings (DET New England Region), Rowan Chandler (Uralla CS), Doug White (Manilla Central)
Front L-R Peter Humphries (Deniliquin HS), Belinda (La Salle Academy Lithgow), Lisa O'Brien (Yanco HS), Brony Nielsen (Calrossy Girls), Prue Kesby (St Mary's Gunnedah), Graeme Harris (Farrer MAHS)

From: Ian THOMPSON [mailto:IAN.J.THOMPSON@education.nsw.gov.au]

Sent: Tuesday, 28 November 2006 6:10 PM

To: Hemmings, Stuart C

Subject: RE: BAAT picture ag marking Tamworth - reply

Hi Stuart,

That is Belinda Auld - a good friend of mine who used to teach at Wee Waa with me. The article will have to go in the next issue as I have had to send the last issue off already (by 27th November)

Thanks heaps

Thommo

Again from Stu:

Perhaps a little promo with it encouraging people to apply for the experience, given it is day marking and an opportunity for school to fund relief etc if people would like to have a go at marking Question 4 and 5 in section 2 of the paper. We are a pretty friendly bunch and usually all the out of towners share accommodation in an apartment style setting to reduce personal costs involved. Owen would be the one people could contact if they were interested.



Also have included a shot of Owen (supervisor of Marking) in consultation with one of the two senior markers, Steve Trickett)

Have plenty more if you feel the need for a collage page....just let me know.

I would also if possible, like to put together a 1-pager about ""Demystifying the student research project"".

Not sure of your deadline for this issue. Can try and do by Tuesday if possible?

Let me know one way or another.

Cheers

Stu

Hi Ian,

I thought you might be interested in the following story for the BAAT. After finding out about the farmbike safety competition from the AG conference that i went to last year I decided to get my english I teach AG and English) students to write scripts and enter it. One of my kids won the state section. If you need any more details just email me. I will also try and attach a photo and what appeared in our local paper. I will try and find out the peoples names in the photo, one was a cargill rep and the other from moree where the comp was run.

Belinda Henderson (Tumbarumba High school)

Also - At the end of last year our school ran interest electives. One of them was a Bike safety and maintence course that Wagga TAFE came and held on our school oval. If you want more details about this too just email me. I have included some photos

HIGH SCHOOL STUDENT STATE WINNER

Jennifer Mitchell, a Year 10 student at Tumbarumba High School, was recently announced as the State Winner of a competition conducted by the Australian Centre for Agricultural Health and Safety.



Students were required to develop an advertisement promoting farm motorbike safety. Ms. Belinda Henderson, a member of the English faculty, was able to dovetail the competition into the Year 10 English course enabling each student to enter the competition.



Jennifer's script, written for television, covered all safety aspects and was chosen as the State winner. Jennifer's prize consists of dirt bike clothing valued at \$250 dollars, the school also receives a prize of \$250.

Well done Jennifer.





**NSW Association of
Agriculture Teachers
2006-2008 Executive**

**Membership is
NOW due
\$60/year
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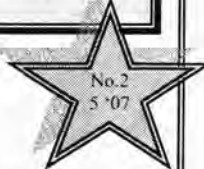
02 69511500 (w)

02 69557180 (f)

www.nswaat.org.au

Events for Ag & PI Teachers

Newsletter



From The Presidents desk..

^ *Robert Cain has resigned from his position as President of the Association as of March 2007. The Associations constitution states that the Presidency position can revert to a past president of the Association.*

^ *Tony Butler, has been re appointed to this position for the duration of the current executive.*

^ *The Association thanks Robert for initially accepting this position but circumstances arose where his duties could not be fulfilled.*

^ *Members of the executive are listed to the left with their respective contact numbers & email addresses.*

^ *Please send materials about your students etc. to the BAAT editor as the bulletin is as only as good as your input. We all need to contribute.*

^ *Check out the Associations web site:*

www.nswaat.org.au



Riverina

**Agriculture
teachers
Interest group**



**Allan McMillan
Wagga High School
Ph: 69253611 (W)**

al_mcmillan@bigpond.com

or

**Tony Butler
Tumut High School
Ph: 69471077 (W)**

vineyard@wirefree.net.au

YOU
can contribute to
this newsletter by
sending ..

**Contact Tony for
further info...**

Important Dates for term 2

These days have been organised
for you & your students so please
support them

RIVERINA DAYS:

- School Agriculture Enrichment Day @ CSU Wagga Wagga**
^ Wednesday 30th May ^ Details: page 2
^ Purpose: 'High flyers': Year 10/11 Agriculture students
- PI Networking Day @ Yanco Agricultural High School**
^ Friday 1st June ^ Look for details: 'InPrincipal'
^ Purpose: Networking, Assessment validation & get together
- Study Day/ PI & Ag @ Nth Wagga Wagga TAFE**
^ Friday: 15th June ^ Details: later
^ Purpose: Year 12 students
- Year 10 Agriculture Rural Expo: @ Nth Wagga Wagga TAFE**
^ Friday 22 June ^ Details: later
^ Purpose: Extend Agricultural skills of year 10 students



E H GRAHAM CENTRE for AGRICULTURAL INNOVATION

an ongoing partnership between the University of NSW, Charles Sturt University & NSW Department of Primary Industries

**CHARLES STURT
UNIVERSITY**

UNIVERSITY OF NEW SOUTH WALES

RIVERINA DAYS:

1. School Agriculture Enrichment Day @ CSU Wagga Wagga

^ Wednesday 30th May

^ Purpose: 'High flyers': Year 10/11 Agriculture students

^ Contact: Allan McMillan Wagga High: Fax: 02 69255150

If attending notify Allan
by: **FRIDAY 18th MAY**
with student numbers.

^ High School Ag Enrichment Day on Wednesday 30th May 2007, starting at 8.45am (introduction and briefing, first session at 9am) at Joyes Hall, CSU.

^ Allan McMillan and Tony Butler will be organising the high school students and we expect a similar arrangement to last year. That is:

^ The first session starts at 9am

^ Students will come through in groups of up to 20 (space is limited in the labs).

^ Graham Centre supplies all protective equipment - lab coats, safety glasses etc.

^ The sessions are 30 minutes long with 10 minutes in between for students to get to their next session. Someone from your group will have to take the students to the next session as they will not be familiar with the layout.

^ Teachers will come with students, so feedback about the day would be appreciated.

^ As this is a careers type day, the Graham Centre staff will end their session discussing the jobs that are available with the skills that the staff have shown the students and/or jobs available in the area of work

^ The students will be from years 10 and 11 and will probably come long distances from throughout the Riverina

^ The day will finish at 2.30pm; leaving from Joyes Hall.

^ Below is the current program. The final version with minor changes will be sent soon.

Regards

Kerry Wratten

for the E.H.Graham Centre
Wagga Wagga

Maximum: 100 -110 students

Cost: \$2/student (payable on day)

Times	Group A	Group B	Group C	Group D	Group E	REST PERIOD and session location
Muster & Introduction – Deirdre Lemerle, Graham Centre and John Harper, CSU 8.45-9.00am JOYES HALL						
9.00-9.30 10 min approx. between sessions	Animal Science	Plant Diseases	Weed Science	Soil Science	Cereal Science	Ag Biotechnology Lab 166, Sutherland Buildings CSU
9.40-10.10	Ag Biotechnology	Animal Science	Plant Diseases	Weed Science	Soil Science	Cereal Science Mill Rom, C Block DPI
10.20-10.50	Cereal Science	Ag Biotechnology	Animal Science	Plant Diseases	Weed Science	Soil Science D Block, BBQ Area
11.00-11.30	MORNING TEA	MORNING TEA	MORNING TEA	MORNING TEA	MORNING TEA	MORNING TEA Joyes Hall grassed area
11.30-12.00	Soil Science	Cereal Science	Ag Biotechnology	Animal Science	Plant Diseases	Weed Science Conference Room, D Block, DPI
12.10-12.40	Weed Science	Soil Science	Cereal Science	Ag Biotechnology	Animal Science	Plant Diseases Back of J Block, DPI
12.50-1.40	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH Joyes Hall grassed area
1.50-2.20	Plant Diseases	Weed Science	Soil Science	Cereal Science	Ag Biotechnology	Animal Science Veterinary Labs, opposite oval at CSU

Name: _____

Animal Welfare Guidelines.



The word welfare means to look after the needs of something.

Laws exist that tell the people who look after cattle what they must do to care for the animals properly.

The word cattle means cows, bulls, heifers, steers and calves.

The basic needs that cattle have are for:

- (a) Food
- (b) Water
- (c) Shelter
- (d) Enough space to stand up, lie down, stretch and groom and perform normal patterns of behaviour
- (e) Treatment to prevent or treat disease or injury.

1. Find the meanings for the words:-

(a) Cow

(b) Bull

(c) Heifer

(d) Steer

(e) Calf

2.



Look at the feedlot and carry out some measurements in regard to the welfare of our cattle, then fill out the table below.



Need	Amount required	Amount available at the feedlot
Food	a) Grain must be introduced slowly (1/2 kg increases per two days) so that the animals stomachs can get use to the grain and they don't get sick.	_____

	b) The animals should be fed twice a day.	_____

	c) To gain weight the cattle will need	_____
	• 13% protein and	_____
	• 10% energy in their diet.	_____
	•	_____
	d) They need 250 - 300 mm of trough space	_____

Water	a) They need 20 - 45 litres of water per day.	_____

	b) The water must be cool and clean	_____

Shelter	In summer when the temperatures are high there must be enough shade.	
Space	Animals in feedlots need 9m ² of space per animal.	
Socialisation	Do the animals get to mix with other cattle or are they all by themselves along way away from other cattle. (Can't see them or sniff them or play with them?)	
Health care	a) A vaccine stops cattle from getting certain diseases eg tetanus etc. Are the cattle vaccinated when they come to the feedlot? b) Drenches, like Cydectin, help to stop the animals being affected by parasites (worms and lice).	

It's Your Move First Aid Video.

Lesson 1 - Basic Lifesaving.



What do the acronyms below stand for?

E _____
A _____
R _____

C _____
P _____
R _____

Lesson 2 - DRABCD.

You are first on the scene:-

(a) What do you look for?

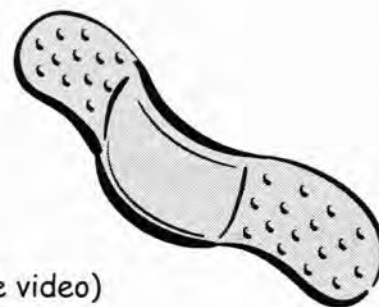
(b) What do you do?

(c) What does the acronym below stand for?

D _____
R _____
A _____
B _____
C _____

(the last one has just been added and does not appear on the video)

D _____



Lesson 3 - Bleeding & Shock.

Bleeding.

What are the 3 elements?



Shock.

(a) What is this condition?

(b) What causes it?

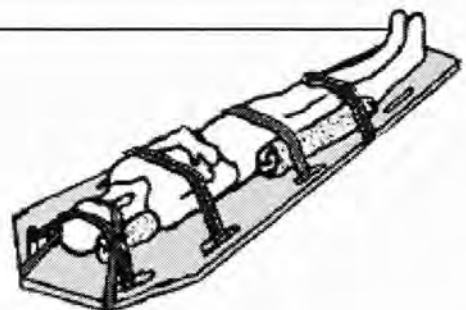
(c) What are the symptoms?

(d) What should you monitor?

Lesson 4 - Head & Spinal Injuries.

(a) Why don't you move a victim?

(b) Causes of spinal injury include:-



- (c) List 4 indicators of spinal injury.

Lesson 5 - Burns & Scalds.

Burns.

- (a) What are they caused by?

- (b) What do 3rd degree burns look like?

- (c) What do you check for?

- (d) What should you do?

Scalds.

- (a) What are they caused by?

- (b) What should you do?

Run cool water
over area of
burn



ADAM



Lesson 6 - Poisoning.

(a) How can we be poisoned?

(b) Signs of poisoning include:-

(c) What should you do if you suspect that someone has been poisoned?

(d) What is the number for the poisons information centre?

(e) What details do you need to give the centre if you call them?

Snake Bite.

What should you do if someone has been bitten by a snake?

Lesson 7 - Extreme Heat/Cold.



Heat Stroke

(a) What are the symptoms of heat stroke?

(b) How do you treat someone for heat stroke?

Hypothermia

(a) What are the symptoms of hypothermia?

(b) How do you treat someone for hypothermia?

Lesson 8 - To Help or Not To Help

When should you seek a persons consent to provide them with first aid?



Believe it or not all this is true! Worth reading - give you something to think about!!

In the 1400's a law was set forth that a man was not allowed to beat his wife with a stick no thicker than his thumb. Hence we have "the rule of thumb".

Many years ago in Scotland, a new game was invented. It was ruled "Gentlemen Only...Ladies Forbidden"...and thus the word GOLF entered into the English language.

The first couple to be shown in bed together on prime time TV were Fred and Wilma Flintstone

Every day more money is printed for Monopoly than the US Treasury.

Men can read smaller print than women can; women can hear better.

Coca-Cola was originally green.

It is impossible to lick your elbow.

The average number of people airborne over the US any given hour: 61,000

Intelligent people have more zinc and copper in their hair.

The first novel ever written on a typewriter: Tom Sawyer.

Each king in a deck of playing cards represents a great king in history:

Spades - King David

Hearts - Charlemagne

Clubs - Alexander, the Great

Diamonds - Julius Caesar

$111,111,111 \times 111,111,111 = 12,345,678,987,654,321$

If a statue in the park of a person on a horse has both front legs in the air, the person died in battle. If the horse has one front leg in the air the person died as a result of wounds received in battle. If the horse has all four legs on the ground, the person died of natural causes.

Q. If you were to spell out numbers, how far would you have to go until you would find the letter "A"?

A. One thousand

Q. What do bulletproof vests, fire escapes, windshield wipers, and Laser printers all have in common?

A. All invented by women.

Q. What is the only food that doesn't spoil?

A. Honey

In Shakespeare's time, mattresses were secured on bed frames by ropes. When you pulled on the ropes the mattress tightened, making the bed firmer to sleep on. Hence the phrase..... "goodnight, sleep tight."

It was the accepted practice in Babylon 4,000 years ago that for a month after the wedding, the bride's father would supply his son-in-law with all the mead he could drink. Mead is a honey beer and because their calendar was lunar based, this period was called the honey month, which we know today as the honeymoon.

In English pubs, ale is ordered by pints and quarts... So in old England, when customers got unruly, the bartender would yell at them "Mind your pints and quarts, and settle down." It's where we get the phrase "mind your P's and Q's"

Many years ago in England, pub frequenters had a whistle baked into the rim, or handle, of their ceramic cups. When they needed a refill, they used the whistle to get some service. "Wet your whistle" is the phrase inspired by this practice.

Believe it or not, you can read it.

I cdnuolt blveiee taht I cluod aulacilty uesdnatnrd waht I was rdgnieg. The phaonmneal pweor of the hmuan mnid aoccdnig to rscheearch at Cmabrigde Uinervtisy, it deosn't mttar in waht oredr a wrod are, the olny iprmoatnt tihng is taht the frist and lsat ltteer be in the rghit pclae. The rset can be a taotl mses and you can sitll raed it wouthit a porbelm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe.

~~~~~AND FINALLY~~~~~

At least 75% of people who read this will try to lick their elbow

# Beef Find-A-Word



|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J | L | Y | A | E | W | T | V | B | E | N | A | O | E | P |
| O | L | A | V | G | E | E | O | V | R | E | E | T | S | I |
| I | U | H | J | A | A | B | L | L | D | Y | C | F | A | N |
| N | C | M | I | L | N | A | S | N | D | O | M | A | H | K |
| E | T | A | N | I | C | C | A | V | N | E | I | R | C | E |
| L | T | N | Q | S | R | R | E | C | O | F | E | D | R | Y |
| P | E | J | O | E | B | T | E | K | R | A | M | F | U | E |
| U | A | G | T | I | A | N | F | O | D | D | E | R | P | U |
| B | G | S | A | R | T | F | A | T | S | C | O | R | E | M |
| C | U | R | T | R | Y | A | W | H | S | E | L | L | A | W |
| M | D | S | A | U | O | A | T | O | E | O | H | R | R | E |
| Y | A | T | T | I | R | F | R | S | C | I | K | G | T | I |
| C | E | R | H | C | N | E | R | D | E | E | F | U | A | G |
| E | S | A | E | S | I | D | S | N | T | G | L | E | G | H |
| B | L | O | A | T | I | C | K | S | L | L | U | B | R | Y |

BLOAT  
BRAND  
BULL  
CALVE  
CASTRATE  
CONCENTRATE  
COW  
CULL  
DISEASE

DRAFT  
DRENCH  
EARTAG  
FATSCORE  
FEEDLOT  
FODDER  
FORAGE  
GESTATION  
GRAIN

HAY  
HEIFER  
JOIN  
MARK  
MARKETS  
MUSTER  
PASTURES  
PINKEYE  
PURCHASE

SELL  
SILAGE  
STEER  
TICKS  
VACCINATE  
VEAL  
WEAN  
WEIGH  
YARD



# The Birth of a Calf.

## Calving Time.

Most cows can calve and produce a healthy calf without help from anyone.

Cows should calve in a clean, grassy and sheltered paddock. When calving time is near the herd should be regularly checked.

Before calving the cow should have enough feed to reduce the chance of metabolic diseases, milk fever and ketosis, and difficult births at calving time.

A farmer needs to keep accurate records so that the time of birth can be easily calculated. A farmer needs to know the:-

- previous calving dates;
- date(s) a cow was joined with the bull or AIed;
- sire used, and
- expected calving date.

A cow has a gestation period of 283 days. To work out the calving date a farmer can consult a Breeding Table or you can add 8 days and subtract 3 months from the joining date. For example a cow joined on 2<sup>nd</sup> July 2006 will be due to calve on about 10<sup>th</sup> April 2007.

## **GESTATION TABLE FOR CATTLE**

Based on 283 days gestation. The actual birth date may vary from the expected birth date by a few days.

| Date of Service | Date of Birth | Date of Service | Date of Birth |
|-----------------|---------------|-----------------|---------------|
| Jan. 1          | Oct. 10       | July 2          | April 10      |
| Jan. 8          | Oct. 17       | July 9          | April 17      |
| Jan. 15         | Oct. 24       | July 16         | April 24      |
| Jan. 22         | Oct. 31       | July 23         | May 1         |
| Jan. 29         | Nov. 7        | July 30         | May 8         |
| Feb. 5          | Nov. 14       | Aug. 6          | May 15        |
| Feb. 12         | Nov. 21       | Aug. 13         | May 22        |
| Feb. 19         | Nov. 28       | Aug. 20         | May 29        |
| Feb. 26         | Dec. 5        | Aug. 27         | June 5        |
| March 5         | Dec. 12       | Sept. 3         | June 12       |
| March 12        | Dec. 19       | Sept. 10        | June 19       |
| March 19        | Dec. 26       | Sept. 17        | June 26       |
| March 26        | Jan. 2        | Sept. 24        | July 3        |
| April 2         | Jan. 9        | Oct. 1          | July 10       |
| April 9         | Jan. 16       | Oct. 8          | July 17       |
| April 16        | Jan. 23       | Oct. 15         | July 24       |
| April 23        | Jan. 30       | Oct. 22         | July 31       |
| April 30        | Feb. 6        | Oct. 29         | Aug. 7        |
| May 7           | Feb. 13       | Nov. 5          | Aug. 14       |
| May 14          | Feb. 20       | Nov. 12         | Aug. 21       |
| May 21          | Feb. 27       | Nov. 19         | Aug. 28       |
| May 28          | March 6       | Nov. 26         | Sept. 4       |
| June 4          | March 13      | Dec. 3          | Sept. 11      |
| June 11         | March 20      | Dec. 10         | Sept. 18      |
| June 18         | March 27      | Dec. 17         | Sept. 25      |
| June 25         | April 3       | Dec. 24         | Oct. 2        |

### Signs of Parturition (birth).

- The udder of the cow enlarges 1 week to 1 month before calving. The udder becomes very tight just before calving. This is called springing.
- The udder of a heifer may start to develop from about half way through pregnancy.
- Colostrum is produced. Colostrum is the first milk that a mammal produces. It contains antibodies to help protect the newborn from disease and is high in fat and protein. It is thick, creamy in colour and sticky.
- The pelvic ligaments relax.
- Up to a week before calving the vulva swells up (up to six times its normal size) and becomes flabby. White, stringy mucous is secreted from the vagina.
- About 12 hours before calving the cow becomes restless, will not eat and removes itself from the rest of the herd.

### Stages of Birth.

| Stage | What goes on                                                                                                                                                                                                                                                                                                                                                          | How long does it last? |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 1     | <ul style="list-style-type: none"><li>• Contractions start, they occur every 15 minutes and last 15 - 30 seconds.</li><li>• Cow is restless, stands alone, maybe straining weakly.</li><li>• Waterbag becomes visible and soon ruptures head and forelimbs of the calf should be causing the cervix to dilate (open up to create a continuous birth canal).</li></ul> | 3 - 4 hours            |
| 2     | <ul style="list-style-type: none"><li>• Calf enters vagina</li><li>• Strong contractions occur and the cow is straining for 10 - 15 seconds every 2 minutes.</li><li>• Cow may stand or lie down.</li><li>• Once forelimbs appear the cow may rest before delivering the rest of the calf.</li></ul>                                                                  | 1 hour                 |
| 3     | <ul style="list-style-type: none"><li>• Uterus contracts rapidly to expel the afterbirth. This should occur shortly after the calf is born but may take up to 2 days. You need to watch for retained placenta as it can lead to infection and infertility.</li></ul>                                                                                                  | Up to about 2 days     |

Heifers often take longer to deliver and examinations should be delayed to allow them to fully dilate and deliver their calf.

### Birth Presentations



Normal anterior position



Anterior position, one foreleg retained. Head and foreleg must be pushed back, while retained leg is flexed and brought forward.



Head not forward. Push head and shoulders back and then bring head into position.



Normal posterior position. Frequently requires traction for delivery.



Breech position. While applying forward pressure to the rump, bring the hind legs into the pelvic position.



## **The Birth of a Calf.**

- Most cows have their calf without needing any help from people.
  - The cow should have a nice grassy, sheltered paddock to have her calf in.
- 
- The cow needs to be well fed so that she doesn't get sick when she has the calf.
  - The farmer should record when the cow was joined with the bull and what bull she was put with.
  - A cow has a gestation (pregnancy) period of 283 days, this is about 9 months.
  - To work out when a calf is due to be born you can add 8 days and subtract 3 months eg if the cow is joined on the 1/04/07 then you add 8 to 1 = 9 and 4 - 3 = 1 so the calf will be born on about the 09/01/08

### **Signs that the calf is about to be born.**

- The cow's udder gets bigger and becomes tight. This is called springing.
- The cow produces colostrum. This is thick, creamy and sticky. It gives the calf antibodies to protect it from diseases. It is also high in energy.
- The vulva, under the tail, gets big and loose. Mucus is secreted.
- The cow is restless doesn't eat and goes away from the other cows.

## Birth Presentations



Normal presentation.



Backwards presentation, but the calf should be able to be born.



Normal presentation, but the front feet are tucked down



Backwards (BREECH), the back legs are tucked down. It is hard for the calf to be born.



Normal presentation, but the head is tucked down



## The Birth of a Calf.

- Most cows have their calf without \_\_\_\_\_ any \_\_\_\_\_ from people.
- The cow should have a nice grassy, \_\_\_\_\_ paddock to have her calf in.
- The cow needs to be \_\_\_\_\_ fed so that she \_\_\_\_\_ get \_\_\_\_\_ when she has the calf.
- The farmer should \_\_\_\_\_ when the cow was \_\_\_\_\_ with the \_\_\_\_\_ and what \_\_\_\_\_ she was put with.
- A cow has a \_\_\_\_\_ (pregnancy) period of \_\_\_\_\_ days, this is about \_\_\_\_\_ months.
- To work out when a calf is due to be born you can add 8 days and subtract 3 months eg if the cow is joined on the 1/04/07 then you add 8 to 1 = 9 and 4 - 3 = 1 so the calf will be born on about the 09/01/08

### Signs that the calf is about to be born.

- The cow's \_\_\_\_\_ gets \_\_\_\_\_ and becomes \_\_\_\_\_. This is called \_\_\_\_\_.
- The cow produces \_\_\_\_\_. This is \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_. It gives the calf \_\_\_\_\_ to protect it from \_\_\_\_\_. It is also \_\_\_\_\_ in \_\_\_\_\_.
- The \_\_\_\_\_, under the tail, gets \_\_\_\_\_ and \_\_\_\_\_. \_\_\_\_\_ is secreted.
- The cow is \_\_\_\_\_ doesn't \_\_\_\_\_ and goes \_\_\_\_\_ from the other \_\_\_\_\_.

## Birth Presentations



presentation.



presentation, but the calf  
should be able to be born.



Normal presentation, but  
the \_\_\_\_\_ feet are  
tucked \_\_\_\_\_



Backwards (\_\_\_\_\_),  
the \_\_\_\_\_ legs are  
\_\_\_\_\_ down. It is  
\_\_\_\_\_ for the calf to  
be \_\_\_\_\_.



Normal presentation, but  
the \_\_\_\_\_ is tucked  
\_\_\_\_\_.

# The Birth of a Calf.

## Calving Time.

Most cows can \_\_\_\_\_ and produce a healthy calf \_\_\_\_\_ help from anyone.

Cows should calve in a \_\_\_\_\_, grassy and \_\_\_\_\_ paddock. When calving time is near the herd should be \_\_\_\_\_ checked.

Before calving the cow should have enough \_\_\_\_\_ to reduce the chance of \_\_\_\_\_ diseases, eg \_\_\_\_\_ fever and ketosis, and \_\_\_\_\_ births at calving time.

A farmer needs to keep \_\_\_\_\_ records so that the time of birth can be easily \_\_\_\_\_. A farmer needs to know the:-

- previous calving dates;
- date(s) a cow was \_\_\_\_\_ with the \_\_\_\_\_ or \_\_\_\_\_ed;
- \_\_\_\_\_ used, and
- \_\_\_\_\_ calving date.

A cow has a gestation period of \_\_\_\_\_ days. To work out the calving date a farmer can consult a \_\_\_\_\_ Table or you can add \_\_\_\_\_ days and subtract \_\_\_\_\_ months from the \_\_\_\_\_ date. For example a cow joined on 2<sup>nd</sup> July 2006 will be due to calve on about 10<sup>th</sup> April 2007.

## GESTATION TABLE FOR CATTLE

Based on 283 days gestation. The actual birth date may vary from the expected birth date by a few days.

| Date of Service | Date of Birth | Date of Service | Date of Birth |
|-----------------|---------------|-----------------|---------------|
| Jan. 1          | Oct. 10       | July 2          | April 10      |
| Jan. 8          | Oct. 17       | July 9          | April 17      |
| Jan. 15         | Oct. 24       | July 16         | April 24      |
| Jan. 22         | Oct. 31       | July 23         | May 1         |
| Jan. 29         | Nov. 7        | July 30         | May 8         |
| Feb. 5          | Nov. 14       | Aug. 6          | May 15        |
| Feb. 12         | Nov. 21       | Aug. 13         | May 22        |
| Feb. 19         | Nov. 28       | Aug. 20         | May 29        |
| Feb. 26         | Dec. 5        | Aug. 27         | June 5        |
| March 5         | Dec. 12       | Sept. 3         | June 12       |
| March 12        | Dec. 19       | Sept. 10        | June 19       |
| March 19        | Dec. 26       | Sept. 17        | June 26       |
| March 26        | Jan. 2        | Sept. 24        | July 3        |
| April 2         | Jan. 9        | Oct. 1          | July 10       |
| April 9         | Jan. 16       | Oct. 8          | July 17       |
| April 16        | Jan. 23       | Oct. 15         | July 24       |
| April 23        | Jan. 30       | Oct. 22         | July 31       |
| April 30        | Feb. 6        | Oct. 29         | Aug. 7        |
| May 7           | Feb. 13       | Nov. 5          | Aug. 14       |
| May 14          | Feb. 20       | Nov. 12         | Aug. 21       |
| May 21          | Feb. 27       | Nov. 19         | Aug. 28       |
| May 28          | March 6       | Nov. 26         | Sept. 4       |
| June 4          | March 13      | Dec. 3          | Sept. 11      |
| June 11         | March 20      | Dec. 10         | Sept. 18      |
| June 18         | March 27      | Dec. 17         | Sept. 25      |
| June 25         | April 3       | Dec. 24         | Oct. 2        |

## Activities

1. Calculate the calving date for a cow that was joined on 26<sup>th</sup> November.

\_\_\_\_\_

2. If a cow calved on the 26<sup>th</sup> December what date was she joined on?

\_\_\_\_\_

## Signs of Parturition (birth).

- The \_\_\_\_\_ of the cow \_\_\_\_\_ 1 week to 1 month before calving. The udder becomes very \_\_\_\_\_ just before calving. This is called \_\_\_\_\_.
- The udder of a heifer may start to develop from about half way through pregnancy.
- Colostrum is produced. \_\_\_\_\_ is the \_\_\_\_\_ milk that a mammal produces. It contains \_\_\_\_\_ to help protect the \_\_\_\_\_ from \_\_\_\_\_ and is \_\_\_\_\_ in \_\_\_\_\_ and \_\_\_\_\_. It is \_\_\_\_\_, \_\_\_\_\_ in \_\_\_\_\_ and \_\_\_\_\_.
- The \_\_\_\_\_ ligaments \_\_\_\_\_.
- Up to a \_\_\_\_\_ before \_\_\_\_\_ the \_\_\_\_\_ swells up (up to six times its normal size) and becomes \_\_\_\_\_. White, stringy \_\_\_\_\_ is secreted from the \_\_\_\_\_.
- About \_\_\_\_\_ hours before calving the cow becomes \_\_\_\_\_, will not \_\_\_\_\_ and \_\_\_\_\_ itself from the rest of the \_\_\_\_\_.

## Stages of Birth.

| Stage | What goes on                                                                                                                                                                                                                                                                                                                                                | How long does it last? |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 1     | <ul style="list-style-type: none"> <li>_____ start, they occur every _____ minutes and last _____ - _____ seconds.</li> <li>Cow is _____, stands _____, maybe straining weakly.</li> <li>_____ becomes _____ and soon _____, the _____ and _____ of the calf should be causing the cervix to _____ (open up to create a continuous birth canal).</li> </ul> | _____                  |
| 2     | <ul style="list-style-type: none"> <li>Calf enters vagina</li> <li>Strong contractions occur and the cow is _____ for _____ - _____ seconds every _____ minutes.</li> <li>Cow may _____ or _____ down.</li> <li>Once forelimbs _____ the cow may _____ before delivering the rest of the _____.</li> </ul>                                                  | _____                  |
| 3     | <ul style="list-style-type: none"> <li>_____ contracts rapidly to _____ the _____.</li> </ul> <p>This should occur _____ after the _____ is _____ but may take up to _____ days. You need to watch for _____ placenta as it can lead to _____ and _____.</p>                                                                                                | _____<br>_____         |

\_\_\_\_\_ often take \_\_\_\_\_ to deliver and examinations should be delayed to allow them to fully \_\_\_\_\_ and \_\_\_\_\_ their calf.

## Birth Presentations



\_\_\_\_\_ position, \_\_\_\_\_  
foreleg \_\_\_\_\_. \_\_\_\_\_ and  
\_\_\_\_\_ must be pushed  
\_\_\_\_\_, while retained \_\_\_\_\_ is  
\_\_\_\_\_ and \_\_\_\_\_  
forward.



\_\_\_\_\_ not \_\_\_\_\_. Push  
\_\_\_\_\_ and shoulders \_\_\_\_\_ and  
bring head into \_\_\_\_\_.



Normal \_\_\_\_\_ position.  
\_\_\_\_\_ requires  
\_\_\_\_\_ for \_\_\_\_\_.



\_\_\_\_\_ position. While applying  
\_\_\_\_\_ pressure to the  
\_\_\_\_\_, bring the \_\_\_\_\_ legs into  
the \_\_\_\_\_ position.



## Video - Beef Cattle Skills.

### Safety.

Serious injury and even death can occur as a result of handling stock.

1. List three of the safety precautions that are recommended?

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

2. Cattle are dangerous to handle because of their:-

- \_\_\_\_\_
- Speed
- \_\_\_\_\_ behaviour, and
- \_\_\_\_\_

3. Risk situations include:-

- Working \_\_\_\_\_ to animals in \_\_\_\_\_ and \_\_\_\_\_ yards.
- Working with \_\_\_\_\_ facilities.
- Working with too \_\_\_\_\_ animals at one time.
- Handling \_\_\_\_\_, freshly calved \_\_\_\_\_ and \_\_\_\_\_ animals.

You need to be alert, assess the risks and should not attempt any task if you are not confident.

### Golden Rules.

- Make sure that the cattle are well \_\_\_\_\_ of \_\_\_\_\_ before you \_\_\_\_\_ them. To avoid being \_\_\_\_\_ place your \_\_\_\_\_ on the \_\_\_\_\_ and have your \_\_\_\_\_ close to the gate.
- Always work \_\_\_\_\_ the \_\_\_\_\_.
- Be aware that when you have an animal restrained in a crush it can still move \_\_\_\_\_ and \_\_\_\_\_ so be careful.
- Check the \_\_\_\_\_ and \_\_\_\_\_ work properly on the crush before you \_\_\_\_\_ it.

### Animal Welfare.

A good health management program should include a vaccination and drenching program.

The manager should be aware of the diseases that may affect his stock and the signs that indicate that an animal is unwell.

Livestock should be checked regularly and you should act promptly if you think that there is a problem.

A manager should aim to meet the minimum requirements of the \_\_\_\_\_.

### Quality Assurance.

You reduce the risk of chemical contamination of beef products when you:-

- Use \_\_\_\_\_.
- \_\_\_\_\_ chemical \_\_\_\_\_.
- Obey chemical \_\_\_\_\_ periods.
- Recognise that some \_\_\_\_\_ are not \_\_\_\_\_ in some \_\_\_\_\_ eg the European Union.

Buyers are demanding more information about chemical treatments. This information is supplied in the \_\_\_\_\_.

Declaration (NVD) that must accompany \_\_\_\_\_ consignment of stock that pass through the saleyards.

Good handling facilities can limit \_\_\_\_\_ and reduce \_\_\_\_\_.

Features of good yards include:-

- \_\_\_\_\_ inner railings
- \_\_\_\_\_ fence lines.
- \_\_\_\_\_ and \_\_\_\_\_ wide enough for the \_\_\_\_\_ of animals
- \_\_\_\_\_ points if the animals are to remain in the yards for more than \_\_\_\_\_ hours.
- Well maintained grates, floors, yards and \_\_\_\_\_.

Stressed cattle produce \_\_\_\_\_ beef.

To \_\_\_\_\_ stress you can:-

- Handle the cattle \_\_\_\_\_ by allowing them to \_\_\_\_\_ at their own \_\_\_\_\_.
- Only use drafting \_\_\_\_\_ and electric \_\_\_\_\_ as a last resort.
- Keep aggressive \_\_\_\_\_ away especially when \_\_\_\_\_ and \_\_\_\_\_.

### Stock Handling.

Take advantage of basic cattle behaviour and design cattle yards with this in mind.

Where possible have the cattle:-

- move into a \_\_\_\_\_ receival yard.
- move up \_\_\_\_\_ into the yards.
- follow \_\_\_\_\_ as this ensures that the animals flow naturally.

You should also

- tie \_\_\_\_\_ away from the yards, avoid \_\_\_\_\_ and banging gates.
- move \_\_\_\_\_ around the cattle.
- only \_\_\_\_\_ fill the yards.

Cattle learn behaviours, so \_\_\_\_\_ work them through the yards in the \_\_\_\_\_ direction.

Cattle have almost 360 ° vision. Approach them at an angle of \_\_\_\_\_ to \_\_\_\_\_ ° to the \_\_\_\_\_ to gain \_\_\_\_\_ control.

Always remember to:-

- Plan activities to reduce the amount of \_\_\_\_\_ that you have to do.
- \_\_\_\_\_ up the yards before \_\_\_\_\_.
- Separate \_\_\_\_\_ and \_\_\_\_\_ to prevent smothering and \_\_\_\_\_.
- Use \_\_\_\_\_ canes to extend your \_\_\_\_\_.

### Drenching.

1. Why drench?

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2. Give two examples of internal parasites.

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3. Give two examples of external parasites.

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4. Up until approximately what age are young cattle susceptible to worms?

---

5. What should you do before using any chemical?

---

6. How do you calibrate the drench gun?

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7. What do you set the drench rate to?

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8. Where do you place the drench gun?

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9. Where should the cattle go after drenching?

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10. What other methods apart from oral drenching can you use to control internal parasites?

- ---
- ---

### Vaccination.

- It is most important to keep vaccine \_\_\_\_\_. You should store it in the \_\_\_\_\_ or an esky.
- You can reduce the risk of infection by not vaccinating if it is too \_\_\_\_\_ or \_\_\_\_\_.
- Needles are generally \_\_\_\_ mm and \_\_\_\_ gauge. They should be changed frequently eg after \_\_\_\_ injections, if the gun has been \_\_\_\_\_ or if the needle has been \_\_\_\_\_.
- You should always set and \_\_\_\_\_ the vaccination gun.
- You inject into the \_\_\_\_\_ to protect the \_\_\_\_\_. (This is a low value site.)
- Pull out the \_\_\_\_\_ skin, have the vaccination gun \_\_\_\_\_ to the animals \_\_\_\_\_ and push the needle into the \_\_\_\_\_, carefully avoiding the \_\_\_\_\_.
- \_\_\_\_\_ all treatments.
- Vaccination programs include:-
  - a) the initial shot at \_\_\_\_ months of age,
  - b) a second shot \_\_\_\_ to \_\_\_\_ weeks later, and
  - c) an annual booster shot.



### Ear Tagging.

Position the \_\_\_\_\_ in the \_\_\_\_\_ of the ear between the \_\_\_\_\_ vessels.

We now have the National Livestock Identification Scheme (NLIS) and all animals must carry this electronic tag before leaving the property that they were born on.

Other identification systems include:-

- tattoos
- ear notches and
- branding
- many producers still give their cattle their own individual ear tag that records information that the producer might require.



### Castrating Cattle.

Bulls are castrated because steers are: \_

- \_\_\_\_\_ to \_\_\_\_\_.
- quicker to \_\_\_\_\_.
- produce better \_\_\_\_\_ meat.

Methods of castration include:-

- \_\_\_\_\_
- \_\_\_\_\_, and
- \_\_\_\_\_

At what age is castration carried out?

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When must a Vet carry out castration using anaesthetic?

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Where is the incision made and why?

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Do you cut or scrape the cord?

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Sheep husbandry activities Name: \_\_\_\_\_

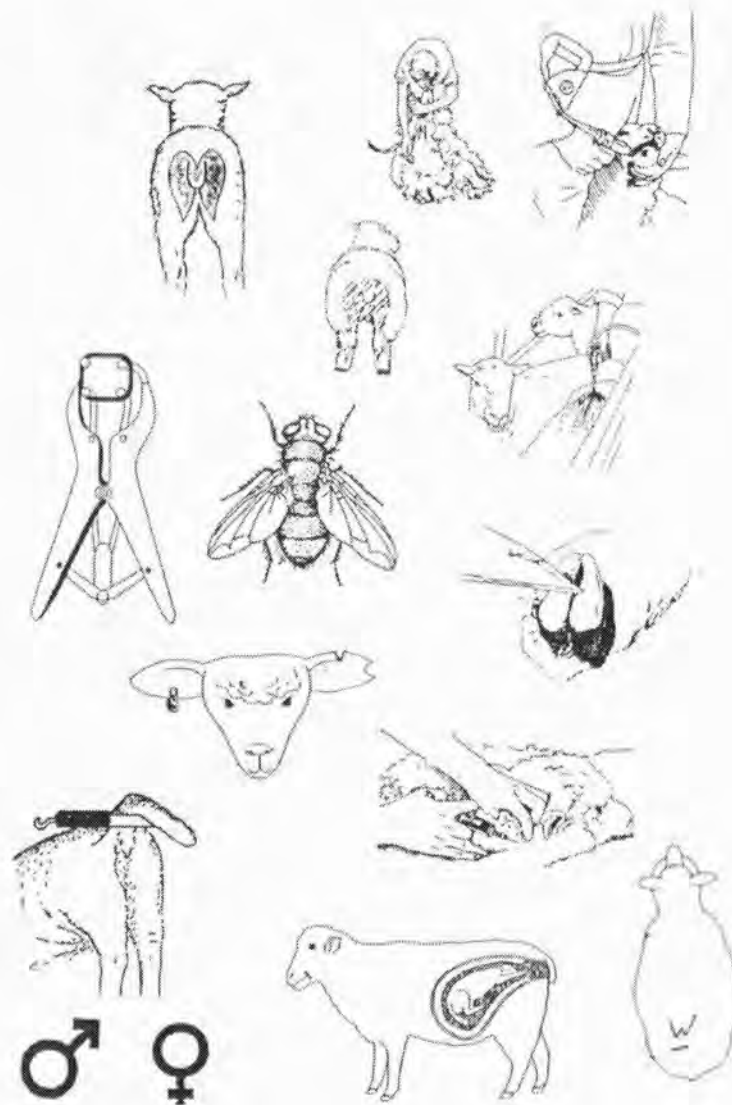
| Activity                                                                                               | What takes place?              | Why is it done?                 | When does it take place?<br>(age of animal or time of year) |
|--------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------|-------------------------------------------------------------|
| <b>Joining</b>                                                                                         | Rams are put in with the ewes. | To get them pregnant (in lamb). | At school farm in Autumn.                                   |
| <b>Lambing</b>                                                                                         |                                |                                 |                                                             |
| <b>Marking</b><br>This covers a whole range of activities that are done at the same time to the lambs. |                                |                                 |                                                             |
| <b>Ear marking<br/>or tagging</b>                                                                      |                                |                                 |                                                             |

## Sheep husbandry

All the things that a farmer does on a farm for the sheep are called husbandry activities. They are carried out throughout the year and are affected by such things as the age of the sheep, the climate, markets and pests. Some of the activities are on the worksheets attached.

### Instructions

1. Watch the video *Sheep: Handle with care*.
2. For each of the activities shown, fill in the table on the following pages.
3. At the end of the video, you will each be given an opportunity to brainstorm answers for any gaps.
4. The other half of this sheet shows pictures of the various activities that take place on a sheep-producing farm. When you have finished the written work, cut each picture out and paste in the appropriate place in the first column.



| <b>Activity</b>                           | <b>What takes place?</b> | <b>Why is it done?</b> | <b>When does it take place?<br/>(age of animal or time of year)</b> |
|-------------------------------------------|--------------------------|------------------------|---------------------------------------------------------------------|
| <b>Marking<br/>cont. Tail<br/>docking</b> |                          |                        |                                                                     |
| <b>Castration</b>                         |                          |                        |                                                                     |
| <b>Vaccinating</b>                        |                          |                        |                                                                     |
| <b>Drenching</b>                          |                          |                        |                                                                     |

| <b>Activity</b>  | <b>What takes place?</b> | <b>Why is it done?</b> | <b>When does it take place?<br/>(age of animal or time of year)</b> |
|------------------|--------------------------|------------------------|---------------------------------------------------------------------|
| <b>Dipping</b>   |                          |                        |                                                                     |
| <b>Jetting</b>   |                          |                        |                                                                     |
| <b>Shearing</b>  |                          |                        |                                                                     |
| <b>Crutching</b> |                          |                        |                                                                     |

| Activity    | What takes place? | Why is it done? | When does it take place?<br>(age of animal or time of year) |
|-------------|-------------------|-----------------|-------------------------------------------------------------|
| Foot paring |                   |                 |                                                             |
| Branding    |                   |                 |                                                             |
| Mulesing    |                   |                 |                                                             |

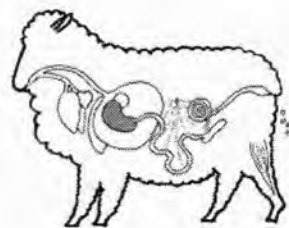
### Coco's Weight Gain.

[illegible]

[illegible]



## WORMBOSS

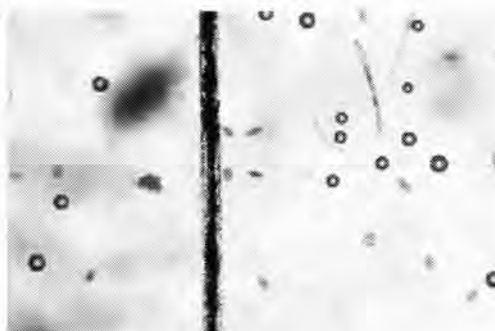


P W K H E N H D S R E T U I B Z E T  
A I O G C C W C O F V N R C J V V N  
R M G R N A O O F S J U W E I G H E  
A R E E M U M E R D E O S T U Y S I  
S N R K R B C O E B R C C M S E N D  
I D V S U T O T T C V A Q E P V K E  
T O R A L L C S O S N B L T M I J R  
E G K G R E F N S O V A I H A V L G  
Y R Q D L E T R I T B G P O N R A N  
N A B L K R S T E O O Y P D A U S I  
O M O C O G P I R V V X C E G S A B  
O C E L N R X A S L I N I D E D N L  
B H N U O R T I R T A L L C M H T A  
C L D S H O R E S E A R C H E W S C  
T O B Z R E S U L T T N V U N N A K  
X A R Y D E T A E R T C C A T W U W  
S U S T A I N A B L E C D E L M S Z  
N O B E L B A T C E J N I S M R O W

ABSORPTION  
ACTIVE  
BLACK  
BOT  
BROWN  
CHECK  
COLLECTED  
CONTROL  
COUNT  
DOSE  
DRENCH  
DUNG  
EFFECT

EGG  
GRAM  
INGREDIENT  
INJECTABLE  
LABORATORY  
LARVAL  
LIVERFLUKE  
MANAGEMENT  
METHOD  
NASAL  
ORAL  
PARASITE  
RESEARCH

RESISTANCE  
RESULT  
SCOUR  
SHEEP  
STOMACH  
SURVIVE  
SUSTAINABLE  
TOXIC  
TREATED  
WEIGH  
WORMBOSS  
WORMS



Name:- \_\_\_\_\_

## Sheep Worms.

The careful management of sheep worm parasites is very important. As we experience more resistance of worms to chemicals we need to become smarter in the methods that we use to control the problem.

The Australian Sheep Cooperative Research Centre (Sheep CRC) and Australian Wool Innovation Ltd (AWI) have developed WormBoss to help producers meet the challenges of sustainable management and control of sheep worms and drench resistant worms. WormBoss is available at [www.wormboss.com.au](http://www.wormboss.com.au)

This task requires you to access the above internet site and complete the tasks on this sheet.

Select worm management from the left hand toolbar.

1. What does the sustainable control of sheep worms involve?

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2. What is the aim of WormBoss?

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Select Worm Egg Counting from the left hand toolbar.

1. What is a worm egg count?

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2. Why would you carry out a worm egg count?

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3. How is the count result expressed?

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Name:- \_\_\_\_\_

Select Worm Egg Counts (WEC) from the left hand toolbar.

1. Outline the 2 ways that dung samples can be collected.

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2. Explain how the counts are carried out in the laboratory.

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3. Now select view worm eggs from the bottom of the page. Copy this picture and insert it in the space below.

4. Now select Virtual worm egg counting from the bottom of the page. Follow the instructions to count the worm eggs on the slide.  
How many worm eggs did you count?

---

Name:- \_\_\_\_\_

Select Worm Typing (larval culture and differentiation) from the left hand toolbar.

1. Why do you want to know what type of worm your sheep have?

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2. How is the test conducted?

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Select Total worm count from the left hand toolbar.

1. What does this count tell you?

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2. How is this count carried out?

---

Select Drench resistance from the left hand toolbar.

1. Describe how drench resistance in worms occurs.

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Name:- \_\_\_\_\_

Select Control without drench from the left hand toolbar.

1. You need to select one control method (from the left hand toolbar), other than drenching and outline what the method is and how it works.

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Select Control with drench from the left hand toolbar.

1. Select When to drench. How can you determine when to drench?

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2. Select Choosing a drench.

(a) What 3 things do you need to know/consider before you choose a drench?

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(b) List 3 ways drenches can be delivered to sheep.

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Name:- \_\_\_\_\_

3. Select Drenching technique from the left hand toolbar. Read the information and fill in the missing spaces in the passage below.

With all treatments there are a few simple tips to help to ensure \_\_\_\_\_ efficacy (effect):

1. Always \_\_\_\_\_ the \_\_\_\_\_ on the container of the \_\_\_\_\_ to be \_\_\_\_\_.
2. Shake the container to \_\_\_\_\_ the contents thoroughly before use.
3. Ensure that sheep get the \_\_\_\_\_ dose of the product. \_\_\_\_\_ a few of the \_\_\_\_\_ animals in the group to be treated and then \_\_\_\_\_ the \_\_\_\_\_ of the \_\_\_\_\_ on the basis of the \_\_\_\_\_ weight.

When using products with a greater risk of toxicity, such as levamisole and naphthalophos on groups of sheep with a wide range in liveweights, divide the animals up into smaller, more uniform groups and treat each with its correct dose to reduce the risk of toxic effects.

4. Double check dose calculations and \_\_\_\_\_ check drench \_\_\_\_\_ to ensure that you are \_\_\_\_\_ an \_\_\_\_\_ dose with a \_\_\_\_\_ glass or similar device.
5. To \_\_\_\_\_ an \_\_\_\_\_ drench, place the drench gun \_\_\_\_\_ the sheep's \_\_\_\_\_ rather than in the front of the mouth. This helps to ensure that \_\_\_\_\_ of the drench is delivered into the \_\_\_\_\_ for \_\_\_\_\_ effect.

\_\_\_\_\_ products should be administered \_\_\_\_\_ the \_\_\_\_\_ (\_\_\_\_\_) with similar care and technique as that used with \_\_\_\_\_.

Controlled-release \_\_\_\_\_ should be administered using the \_\_\_\_\_ designed for the specific \_\_\_\_\_ used.

Name:- \_\_\_\_\_

Keeping the sheep off feed before and after drenching can help more drench to be absorbed. However this should not be done for all drenches as the added absorption can mean that the sheep gets a toxic dose of the active ingredient.

Select Know your worms from the left hand toolbar. Look at the information on the following parasites and complete the table below.

| Parasite Name      | Description of Parasite                         | Effect on Sheep                                 |
|--------------------|-------------------------------------------------|-------------------------------------------------|
| Brown Stomach Worm | <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> | <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> |
| Black Scour Worm   | <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> | <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> |
| Liverfluke         | <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> | <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> |
| Nasal Bot          | <hr/> <hr/> <hr/> <hr/>                         | <hr/> <hr/> <hr/> <hr/>                         |

| MEMBERSHIP |      |      |      |       |                |             |                                                   |                |             |
|------------|------|------|------|-------|----------------|-------------|---------------------------------------------------|----------------|-------------|
| 2005       | 2006 | 2007 | 2008 | Title | Christian Name | Surname     | School                                            | Town           |             |
|            |      |      |      | Mr    | Lex            | KINGMA      | Visy Pulp & Paper Manager                         | TUMUT          |             |
|            |      |      |      | Mr    | Ben            | CASAURIA    | Visy Pulp & Paper Environmental Engineer          | TUMUT          |             |
|            |      |      |      | Mr    | Jim            | PRATLEY     | School of Agriculture Charles Sturt University    | WAGGA WAGGA    |             |
|            |      |      |      | Mr    | Bob            | GERMANTSE   | Hume Manager Forests NSW                          | TUMUT          |             |
|            |      |      |      | Mr    | John           | KENT        | School of Agriculture Charles Sturt University    | WAGGA WAGGA    |             |
|            |      |      |      |       | Annabel        | BOWCHER     | Education Officer Weeds CRC (VET Sector)          | WAGGA WAGGA    |             |
|            |      |      |      | Dr    | John           | HARPER      | School of Agriculture Charles Sturt University    | WAGGA WAGGA    |             |
|            |      |      |      | Mr    | Rod            | LAMBERT     | NSW Dept Primary Industries                       | ORANGE         |             |
|            |      |      |      | Mr    | Keith          | COLLIN      | Environmental Education Centre                    | WAGGA WAGGA    |             |
|            |      |      |      |       | Sandra         | MAYBURY     | Wagga Wagga Agricultural Institute, PMB Pirbright | WAGGA WAGGA    |             |
|            |      |      |      | Mr    | John           | TEMPERELY   | National Farm Injury Data Centre                  | MOREE          |             |
|            |      |      |      |       |                | KONDININ    |                                                   | CLOVERDALE     |             |
|            |      |      |      | Dr    | Scott          | WILLIAMS    | Australian Wool Innovation Ltd                    | PARKVILLE      |             |
|            |      |      |      | Dr    | Jim            | ROTHWELL    | Animal Health Consulting                          | TURRAMURRA STH |             |
|            |      |      |      | Mr    | Leigh          | RIESLEY     | John Deere                                        | CRESTMead      |             |
|            |      |      |      | Mr    | Geoff          | ROSENBERG   | Team Poly                                         | LONSDALE       |             |
|            |      |      |      | Mr    | Len            | BANKS       | Director NSW Agriculture                          | ORANGE         |             |
|            |      |      |      | Mr    | Michael        | CAMPBELL    | Livestock Officer                                 | TUMUT          |             |
| TRUE       | TRUE |      |      | Ms.   | Sally          | BANNERMAN   | SACEC Support Officer 3A Smalls                   | RYDE           |             |
|            |      |      |      | Mr    | Simon          | HELLAMS     | Business Manager CRT                              | WENTWORTHVILLE |             |
|            |      |      |      | Miss  | Tanya          | SPENCER     | Regional Sales Manager NSW/ACT                    | SILVERWATER BC |             |
|            |      |      |      | Mr    | Scott          | BOYLE       | Regional Skills Training Pty Ltd                  | LITTLEHAMPTON  |             |
|            |      |      |      | Mr    | Graham         | LEVETT      | Department of Education & Training                | DENILIQUIN     |             |
|            |      |      |      | Mr    | Witold         | PETRUSEWICZ | Incitec Pivot Fertilizers                         | MACGREGOR      |             |
| TRUE       | TRUE |      |      |       | Trevor         | SEWELL      |                                                   | Gorokan        | Life Member |
| TRUE       | TRUE |      |      |       | Peter          | JONES       | Chifley College Mt Druitt Campus                  | DHARRUK        | Life Member |
| TRUE       | TRUE |      |      |       | Tony           | BARNETT     | Walcha Central School                             | WALCHA         | Life Member |
| TRUE       | TRUE |      |      |       | Rod            | FRANCIS     | Charles Sturt University                          | WAGGA WAGGA    | Life Member |
| TRUE       | TRUE |      |      |       | Norm           | ROBINSON    |                                                   | DUNOON         | Life Member |
|            |      |      |      |       |                | THOMAS      |                                                   | ARMIDLAIE      | Life Member |
| TRUE       | TRUE |      |      |       | Jenni          | WILKINS     | Birrongo Girls H.S.                               | Birrongo       | Life Member |
| TRUE       | TRUE |      |      |       | John           | LEE         | Glen Innes High School                            | GLEN INNES     | Life Member |
| TRUE       | TRUE |      |      |       | Don            | BARTHOLOMEW |                                                   | TWEED HEADS    | Life Member |
|            | TRUE |      |      |       | Andrew         | COSBY       |                                                   | LANGWARRIN     | NAAE        |

|      |              |      |      |                                  |         |                                              |                     |      |
|------|--------------|------|------|----------------------------------|---------|----------------------------------------------|---------------------|------|
|      | TRUE         |      |      | Nigel                            | GRANT   | The Scots PGC College                        | WARWICK             | NAAE |
|      | TRUE         |      |      | Mal                              | JURGS   | Meningie Area School                         | MENINGIE            | NAAE |
|      | TRUE         |      |      | Lindsay                          | McNEILL | Western Australian College of Agriculture Po | CUNDEDIN            | NAAE |
|      | TRUE         |      |      | Rowland                          | CLARK   | Canberra Boys Grammar                        | CANBERRA            | NAAE |
|      | TRUE         | TRUE |      | Royal Agriculture Society of NSW |         | Show Grounds                                 | Sydney Olympic Park |      |
|      | TRUE         |      |      | Teacher Of Agriculture           |         | Monaro H. S.                                 | COOMA               |      |
|      | TRUE         |      |      | Teacher of Agriculture           |         | Albion Park High School                      | ALBION PARK         |      |
|      |              |      |      | Teacher of Agriculture           |         | Ariah Park Central School                    | ARIAH PARK          |      |
|      |              |      |      | Teacher of Agriculture           |         | Arthur Phillip High School                   | PARRAMATTA          |      |
|      |              |      |      | Teacher of Agriculture           |         | Asquith Girls High School                    | ASQUITH             |      |
|      |              |      |      | Teacher of Agriculture           |         | Bulahdelah Central School                    | BULAHDELAH          |      |
|      |              |      |      | Teacher of Agriculture           |         | Cambridge Park High                          | CAMBRIDGE PARK      |      |
|      | Atthur Kelly |      |      | Teacher of Agriculture           |         | Camden H.S.                                  | CAMDEN              |      |
|      |              |      |      | Teacher of Agriculture           |         | Castle Hill High School                      | CASTLE HILL         |      |
|      |              |      |      | Teacher of Agriculture           |         | Coolah Central                               | COOLAH              |      |
| TRUE |              |      |      | Teacher of Agriculture           |         | Goulburn High School                         | GOULBURN            |      |
| TRUE |              |      |      | Teacher of Agriculture           |         | Hay High School                              | HAY                 |      |
|      | TRUE         |      |      | Teacher Of Agriculture           |         | John Paul College                            | COFFS HARBOUR       |      |
|      | TRUE         | TRUE |      | Teacher of Agriculture           |         | James Ruse A. H.S.                           | CARLINGFORD         |      |
|      |              | TRUE |      | Teacher of Agriculture           |         | James Sheahan                                |                     |      |
|      | TRUE         | TRUE | TRUE | Teacher of Agriculture           |         | Kingscliff H.S.                              | KINGSCLIFF          |      |
|      |              |      |      | Teacher Of Agriculture           |         | Lithgow High School                          | LITHGOW             |      |
|      |              |      |      | Teacher of Agriculture           |         | Mater Dei Catholic College                   | KOORINGAL           |      |
|      |              |      |      | Teacher of Agriculture           |         | Moruya High School                           | MORUYA              |      |
|      | TRUE         | TRUE |      | Teacher of Agriculture           |         | Mudgee H.S.                                  | MUDGEE              |      |
|      |              |      |      | Teacher of Agriculture           |         | Narara Valley High School                    | NARARA              |      |
|      | TRUE         | TRUE |      | Teacher of Agriculture           |         | Narooma High School                          | NAROOMA             |      |
|      |              |      |      | Teacher of Agriculture           |         | Oak Flats H.S.                               | OAKS FLATS          |      |
|      |              |      |      | Teacher of Agriculture           |         | Red Bend Catholic College                    | Forbes              |      |
|      |              |      |      | Teacher of Agriculture           |         | Red Bend Catholic College                    | Forbes              |      |
|      | TRUE         | TRUE |      | Teacher of Agriculture           |         | St. Joseph's                                 | ABERDEEN            |      |
|      |              |      |      | Teacher of Agriculture           |         | Tenterfield High School                      | TENTERFIELD         |      |
|      | TRUE         | TRUE |      | Teacher of Agriculture           |         | Toormina High School                         | TOORMINA            |      |
|      |              |      |      | Teacher of Agriculture           |         | The Cathedral School                         | GRAFTON             |      |
| TRUE |              |      |      | Teacher of Agriculture           |         | Tomaree H.S.                                 | Salamander Bay      |      |
|      | TRUE         |      |      | Teacher of Agriculture           |         | Wagga W. Christian Col.                      | WAGGA WAGGA         |      |

|      |      |      |      |      |                        |                   |                                            |               |
|------|------|------|------|------|------------------------|-------------------|--------------------------------------------|---------------|
| TRUE |      |      |      |      | Teacher of Agriculture | Wyong High School | WYONG                                      |               |
|      |      |      |      |      | Librarian              | John Paul College | COFFS HARBOUR                              |               |
|      |      |      |      |      | Andrew                 | ABERCROMBIE       | Braidwood Central School                   | BRAIDWOOD     |
|      | TRUE |      |      |      | Brian                  | ADAMS             | Lithgow High School                        | LITHGOW       |
| TRUE |      | TRUE | TRUE |      | Bryon                  | ADAMSON           | Corowa High School                         | COROWA        |
|      |      |      |      |      | Joseph                 | AKONDA            | St John's Park High School                 | ST JOHNS PARK |
| TRUE | TRUE |      |      |      | Peter                  | ALCORN            | Shoalhaven High School                     | EAST NOWRA    |
|      | TRUE | TRUE |      |      | Bob                    | ANDERSON          | Knox Grammar School                        | WAHROONGA     |
| TRUE | TRUE | TRUE |      | Mr   | Charles                | ANDERSON          | Xavier Catholic College                    | SKENNARS HEAD |
|      | TRUE | TRUE |      | Mr.  | Graeme                 | ANDERSON          | TAFE NSW Riverina Insitute Primary Industr | WAGGA WAGGA   |
|      | TRUE | TRUE |      | Mr.  | Phil                   | ARMOUR            | Yass H.S.                                  | YASS          |
|      |      |      |      |      | Vicki                  | AUSTIN            | Terrigal High School                       | Terrigal      |
|      |      |      |      |      | Billinda               | AULD              | La Salle Academy                           | LITHGOW       |
|      | TRUE | TRUE |      |      | Attila                 | BABOS             | Mount Carmel College                       | YASS          |
|      |      |      |      |      | David                  | BAKER             | St. Gregory's College                      | CAMPBELLTOWN  |
| TRUE | TRUE | TRUE |      |      | Karlene                | BAILEY            | Inverell High School                       | INVERELL      |
|      | TRUE |      |      |      | Ian                    | BAIRD             | Murrumburrah High School                   | HARDEN        |
|      |      |      |      |      | Michael                | BALL              | The Armidale School                        | ARMIDALE      |
| TRUE | TRUE |      |      | Mr   | Colin                  | BARKER            | Lyndhurst                                  | LOVEDALE      |
|      |      |      |      |      | Liz                    | BARKER            | Barham High School                         | BARHAM        |
|      | TRUE |      |      |      | Sue                    | BEHAN             | Mackillop College                          | BATHURST      |
|      |      |      |      | Mr   | Paul                   | BOON              | Macarthur Girls High School                | PARAMATTA     |
| TRUE | TRUE | TRUE |      |      | Ian                    | BISHOP            | The Scots School Albury                    | ALBURY        |
| TRUE |      |      |      | Mr   | David                  | BLOWES            | Yeoval C. S.                               | YEOVAL        |
|      |      |      |      | Ms   | Valerie                | BOFINGER          | Tamworth H.S.                              | TAMWORTH      |
|      | TRUE |      |      | Miss | Georgie                | BOLAM             | Coleambally C. S.                          | COLEAMBALLY   |
|      | TRUE | TRUE |      | Mrs  | Karen                  | BROOK             | Albion Park High School                    | ALBION PARK   |
| TRUE | TRUE |      |      |      | Craig                  | BOURNE            | Singleton High                             | SINGLETON     |
|      | TRUE |      |      |      | Graham                 | BRAMLEY           | St Pauls College                           | KEMPSEY       |
|      |      | TRUE | TRUE | Ms   | Cathy                  | BREENE            | Oakhill College                            | CASTLE HILL   |
|      |      | TRUE |      | Mrs  | Amanda                 | BRIEN             | McAulay Catholic College                   | GRAFTON       |
|      | TRUE |      |      | Mr   | Keith                  | BROWN             | Grafton H. S.                              | GRAFTON       |
|      | TRUE | TRUE |      |      | Lisle                  | BROWN             | James Ruse Ag. High School                 | CARLINGFORD   |
| TRUE |      |      |      |      | Shane                  | BROWN             | Leumeah High School                        | LEUMEAH       |
| TRUE |      |      |      |      | Ron                    | BRYANT            | Mullumbimby High School                    | MULLUMBIMBY   |
|      |      |      |      |      | David                  | BUCKLEY           | Elderslie High School                      | Narellan      |

|      |      |      |      |              |             |                                  |                  |  |
|------|------|------|------|--------------|-------------|----------------------------------|------------------|--|
| TRUE |      |      |      | Denis        | BURNS       | The Henry Lawson High School     | GRENFELL         |  |
| TRUE | TRUE | TRUE |      | Tony         | BUTLER      | Tumut High School                | TUMUT            |  |
|      | TRUE | TRUE |      | Ms Leeta     | CAIGER      | Northholm Grammar S.             | ARCADIA          |  |
| TRUE | TRUE |      |      | Mr. Robert   | CAIN        | Hay War Memorial H. S.           | HAY              |  |
|      | TRUE |      |      | Mr. Carolyn  | CARDEN      | St. Johns Park H.S.              | BEROWRA HEIGHTS  |  |
| TRUE |      |      |      | Mr. Charles  | CASSELS     | Richmond High School             | RICHMOND         |  |
|      | TRUE | TRUE |      | Dale         | CHADWICK    | Gundagai High School             | GUNDAGAI         |  |
|      | TRUE |      |      | Ms. Megan    | CHANDLER    | Narara Valley High S.            | NARARA           |  |
|      | TRUE |      |      | Mrs. Sue     | CHALLACOMBE | Clarence Valley Anglican S.      | GRAFTON          |  |
|      |      |      |      | Mr. Rowan    | CHANDLER    | Uralla Central School            | URALLA           |  |
| TRUE |      |      |      | Caroline     | CLATWORTHY  | Macquarie Fields High School     | MACQUARIE FILEDS |  |
| TRUE |      |      |      | Lloyd        | CLEAVER     | All Saints College               | BATHURST         |  |
|      | TRUE |      |      | Ms. Caroline | COLEMAN     | Nothholme Grammar S.             | ARCADIA          |  |
| TRUE |      |      |      | Ms Helen     | COLMAN      | Molong Central School            | MOLONG           |  |
|      | TRUE | TRUE |      | Mr. Ben      | COOMBES     | Peel High School                 | TAMWORTH         |  |
|      | TRUE |      |      | Nigel        | COX         | Singleton High School            | SINGLETON        |  |
| TRUE |      |      |      | Ian          | CRABB       | Queanbeyan High School           | QUEANBEYAN       |  |
|      | TRUE | TRUE |      | David        | CROFTS      | The Scots School Bathurst        | BATHURST         |  |
|      | TRUE | TRUE |      | Ms Elena     | DAGHER      | Bossley Park H.S.                | BOSSLEY PARK     |  |
|      | TRUE |      |      | Alison       | DAHLENBERG  | St Francis College               | LEETON           |  |
| TRUE |      |      |      | Mrs Anita    | de la MOTTE | Bomaderry High School            | BOMADERRY        |  |
|      |      | TRUE | TRUE | Mr Gerard    | DELANY      | St Columba's High School         | SPRINGWOOD       |  |
|      |      | TRUE |      | Miss Erin    | DENNIS      | Lake Cargelligo Central School   | LAKE CARGELLIGO  |  |
|      |      |      |      | Rob          | DIMMICK     | Wellington High School           | WELLINGTON       |  |
|      |      |      |      | Lynette      | DOWNES      | Erina High School                | ERINA            |  |
|      | TRUE | TRUE |      | Michelle     | DOWSETT     | Blayney High School              | BLANEY           |  |
|      | TRUE | TRUE | TRUE | Mr Cameron   | DUSTING     | TLSC- The Entrance Senior Campus | The ENTRANCE     |  |
|      | TRUE |      |      | Guy          | FAHEY       | Albury High School               | ALBURY           |  |
|      |      |      |      | D            | FERRIS      | Toormina High School             | TOORMINA         |  |
|      | TRUE | TRUE |      | Mr. Aaron    | FLAGG       | Griffith H. S.                   | GRIFFITH         |  |
|      |      | TRUE | TRUE | Mr Rob       | FORSBERG    | St Josephs College               | HUNTERS HILL     |  |
|      |      |      |      | Ms. Lyndall  | FOSTER      | DET                              | RYDE             |  |
| TRUE |      |      |      | Greg         | FULLJAMES   | Yanco Agricultural High School   | YANCO            |  |
|      | TRUE | TRUE |      | Mr John      | EGGLESTON   | Woolgoolga High School           | WOOLGOOLGA       |  |
|      | TRUE | TRUE |      | Ivan         | GANT        | Merriwa Central School           | MERRIWA          |  |
|      | TRUE |      |      | Mr Simon     | GRAHAM      | Lightning Ridge C. S.            | LIGHTNING RIDGE  |  |

|      |      |      |      |      |          |           |                                |                   |  |
|------|------|------|------|------|----------|-----------|--------------------------------|-------------------|--|
|      | TRUE |      |      | Miss | Susanna  | GREIG     | UNE                            | ARMIDALE          |  |
| TRUE |      |      |      |      | Cliff    | GEORGE    | Peak Hill Central School       | PEAK HILL         |  |
| TRUE | TRUE | TRUE |      | Mr   | David    | GILLARD   | Wagga Wagga High School        | WAGGA WAGGA       |  |
|      | TRUE | TRUE |      | Mr   | Milton   | GOWER     | Macarthur Anglican School      | CAMDEN            |  |
|      | TRUE | TRUE |      | Mr.  | Clinton  | GRIBBLE   | St Paul's College              | PENRITH           |  |
| TRUE |      |      |      | Mr.  | Stewart  | GRIMMETT  | Woodenbong Central School      | WOODENBONG NSW    |  |
| TRUE |      | TRUE | TRUE | Mr   | Neil     | GRIFFITH  | Irrawong High School           | ADAMSTOWN         |  |
|      |      |      |      | Ms   | Julie    | HAEUSLER  | Centre for Learning Innovation | Strathfield       |  |
|      |      |      |      |      | Belinda  | HAIGH     | Trangie Central School         | TRANGIE           |  |
|      | TRUE |      |      |      | Andrew   | HARRIES   | Quirindi High School           | QUIRINDI          |  |
|      |      |      |      |      | Graeme   | HARRIS    | Farrer Ag High School          | VIA TAMWORTH      |  |
| TRUE |      |      |      | Mr   | J        | HARRIS    | Tweed River High School.       | Tweed heads       |  |
|      | TRUE | TRUE |      |      | Leonie   | HARRIS    | Frensham                       | Mittagong         |  |
|      | TRUE |      |      |      | Adrian   | HARRISON  | St Gregory's College           | CAMPBELLTOWN      |  |
|      |      |      |      |      | Bill     | HASZARD   | Mount View High School         | CESSNOCK WEST     |  |
| TRUE | TRUE | TRUE | TRUE | Mr.  | Ian      | HATHERLY  | Kinross Walaroi School         | ORANGE            |  |
| TRUE | TRUE |      |      |      | Colin    | HAWTHORN  | Red Bend Catholic College      | Forbes            |  |
|      | TRUE |      |      |      | Stuart   | HEMMINGS  | New England Regional Office    | TAMWORTH          |  |
|      |      |      |      |      | Karen    | HEAP      | Muirfield Tech High School     | NORTH ROCKS       |  |
| TRUE |      |      |      |      | Ian      | HEFFERNAN | Dapto High School              | DAPTO             |  |
|      |      |      |      |      | Brigitte | HERRMANN  | Plumpton High School           | PLUMPTON          |  |
|      |      | TRUE |      | Miss | Belinda  | HENDERSON | Tumbarumba High School         | TUMBARUMBA        |  |
|      |      | TRUE | TRUE | Mr   | Robert   | HENDERSON | Tomaree H.S.                   | NELSON BAY        |  |
|      |      |      |      |      | S        | HILLS     | Pennant Hills H.S.             | PENNANT HILLS     |  |
|      |      |      |      |      | Jayne    | HOFFMAN   | Alstonville High School        | ALSTONVILLE       |  |
| TRUE |      |      |      |      | Janet    | HOLMES    | Mulwaree High. School.         | GOULBURN          |  |
| TRUE |      |      |      | Mr   | Peter    | HOOD      | Narrabri High School           | NARRABRI          |  |
|      | TRUE | TRUE |      |      | Sue      | HOPE      | Goulburn H.S.                  | GOULBURN          |  |
|      | TRUE |      |      | Mr   | Mark     | HOPKINS   | Monaro H. S.                   | COOMA             |  |
| TRUE | TRUE | TRUE | TRUE |      | Peter    | HUMPHRIES | Deniliquin H.S.                | DENILIKUIN        |  |
| TRUE |      |      |      |      | Phil     | HURST     | Hawkesbury High School         | KURRAJONG HEIGHTS |  |
| TRUE |      |      |      |      | Stuart   | IRWIN     | Inverell High School           | INVERELL          |  |
| TRUE |      |      |      | Mr.  | Lachlan  | JAMES     | Scone Grammar school           | SCONE             |  |
|      | TRUE |      |      | Mr.  | David    | JOHNSON   | James Fallon High School       | LAVINGTON         |  |
| TRUE | TRUE | TRUE |      | Mr.  | Ken      | JONES     | Blayney H.S.                   | MANDURAMA         |  |
| TRUE |      |      |      |      | Ian      | JUDD      | Dorrigo High School            | DORRIGO           |  |

|      |      |      |      |            |             |                                  |                               |             |
|------|------|------|------|------------|-------------|----------------------------------|-------------------------------|-------------|
|      | TRUE |      |      | Joan       | KEIGER      | Karabar High School              | QUEANBEYAN                    |             |
|      | TRUE | TRUE |      | Howard     | KENNEDY     | B.O.S.                           | SYDNEY                        |             |
|      |      |      |      | David      | KENT        | Chevalier College                | BOWRAL                        |             |
|      | TRUE | TRUE |      | Pru        | KESBY       | St Mary's College                | GUNNEDAH                      |             |
|      | TRUE |      | Mr.  | Graeme     | KIDD        | St Catherines Cath. Col.         | SINGLETON                     |             |
|      | TRUE | TRUE | Mr   | John       | KILLEEN     | Bossley Park H.S.                | Bossley Park                  |             |
| TRUE |      |      | Mrs  | Kristina   | KING        | Monaro H.S.                      | Cooma                         |             |
|      |      | TRUE | TRUE | Mr         | Terry       | KIRBY                            | Bega H.S.                     | BEGA        |
| TRUE |      |      |      | Ilka       | KLEPPER     | Cootamundra High School          | COOTAMUNDRA                   |             |
|      |      | TRUE | TRUE | Mr         | Owen        | Dubbo Christian School           | DUBBO                         |             |
|      |      | TRUE |      | Mr         | Mykel       | Nagle College                    | BLACKTOWN STH                 |             |
|      | TRUE | TRUE |      | Mr         | David       | LAMROCK                          | ORANGE                        |             |
|      | TRUE |      |      | Mr         | Steve       | LANGMAN                          | The Riverina Anglican College | WAGGA WAGGA |
|      |      | TRUE |      | Mr         | Abdul       | LAWAL                            | Boorowa Central School        | BOOROWA     |
|      |      |      |      | Shayne     | LAWRENCE    | Raymond Terrace High School      | Via East Gresford             |             |
|      | TRUE |      |      | Judy       | LAWSON      | Lockhart Central School          | LOCKHART                      |             |
|      |      |      |      | Ian        | LEES        | Ulladulla High School            | ULLADULLA                     |             |
|      |      |      |      | Stephan    | LEHMAN      | South Grafton High School        | GRAFTON SOUTH                 |             |
|      | TRUE | TRUE |      | Mrs.       | Lynne       | LEOTTA                           | Northholme Grammar S.         | ARCADIA     |
| TRUE |      |      | Mr.  | Adam       | MACRAE      | Coonamble H.S.                   | COONAMBLE                     |             |
|      |      | TRUE |      | Greg       | McALPIN     | St Gregory's College             | CAMPBELL TOWN                 |             |
| TRUE |      |      | Ms   | Lisa       | McCALLUM    | Condobolin High Scholl           | CONDOBOLIN                    |             |
|      | TRUE | TRUE |      | Lynda      | McCALLUM    | St. Joseph's H.S.                | ABDERDEEN                     |             |
| TRUE |      |      |      | Angela     | McCANN      | St Josephs College               | HUNTERS HILL                  |             |
| TRUE |      |      |      | Patrick    | McCANN      | St Josephs College               | HUNTERS HILL                  |             |
|      |      |      |      | Jacqueline | McCARTHY    | Royal Agriculture Society of NSW | Sydney Olympic Park           |             |
|      | TRUE | TRUE | Miss | Johana     | McCARTHY    | Hillston Central School          | HILLSTON                      |             |
|      | TRUE |      | Mrs  | Melinda    | Mc COLL     | Dobbo College Sen Camp           | DUBBO                         |             |
|      |      |      |      | Lorna      | McGILCHRIST | New England Girls School         | ARMIDALE                      |             |
|      | TRUE |      | Mr   | Terry      | Mc GOLDRICK | Baradine Central                 | COONABARBRAN                  |             |
| TRUE | TRUE | TRUE |      | Ross       | McGREGOR    | Hurstone Agriculture High School | GLENFIELD                     |             |
| TRUE |      | TRUE | TRUE | Mrs        | Jacqueline  | McINTOSH                         | Crookwell High School         | CROOKWELL   |
| TRUE |      | TRUE | TRUE |            | Owen        | McLAUGHLAN                       | Canowindra H.S.               | CANOWINDRA  |
| TRUE | TRUE |      |      | Allan      | McMILLAN    | Wagga Wagga High School          | WAGGA WAGGA                   |             |
| TRUE | TRUE | TRUE |      | Maryann    | McRAE       | Hennessy Catholic College        | YOUNG                         |             |
|      |      |      |      | Brian      | MALLYON     | Bega H.S.                        | BEGA                          |             |

|      |      |      |      |      |           |           |                                           |                    |  |
|------|------|------|------|------|-----------|-----------|-------------------------------------------|--------------------|--|
| TRUE | TRUE | TRUE |      | ###  | Bruce     | MANKTELOW | Scone High School                         | SCONE              |  |
| TRUE | TRUE | TRUE | TRUE | Dr.  | Jennifer  | MANNA     | St Ignatius, Riverview                    | Lanecove           |  |
|      |      |      |      |      | Diana     | MARTIN    | Murwillumbah HS                           | South Golden Beach |  |
|      | TRUE |      |      | Mr   | Philip    | MATAR     | Colo H.S.                                 | NORTH RICHMOND     |  |
|      | TRUE | TRUE |      |      | Peter     | MATUS     | The Scots School Bathurst                 | BATHURST           |  |
|      | TRUE | TRUE |      | Mr   | Mick      | MELINO    | St Johns College                          | LISMORE            |  |
|      |      |      |      | Ms   | Christina | MIKAN     | Bass High School                          | BASS HILL          |  |
|      | TRUE | TRUE | TRUE | Mr   | David     | MULLER    | St John Evangelist Catholic H.S.          | NOWRA              |  |
|      | TRUE |      |      | Mr   | Peter     | NAPIER    | Orange H. S.                              | ORANGE             |  |
|      | TRUE | TRUE |      |      | Simone    | NEVILLE   | Tuggerah Lakes Secondary College          | BERKELEY VALE      |  |
|      | TRUE | TRUE |      | Mrs  | Bronwyn   | NIELSEN   | Tamworth Anglican College - Calrossy Camp | TAMWORTH           |  |
|      | TRUE |      |      |      | Trevor    | NEWMAN    | Nowra High School                         | NOWRA              |  |
|      |      |      |      |      | Steve     | NOTT      | Carinya Christian School                  | TAMWORTH           |  |
| TRUE |      |      |      |      | Craig     | O'BRIEN   | Mossvale High School                      | MOSS VALE          |  |
|      |      |      |      |      | Lisa      | O'BRIEN   | Farrer Memorial Agricultural High School  | TAMWORTH           |  |
|      |      |      |      | Mr   | Andrew    | OWEN      | Wellington Christian School               | Wellington         |  |
| TRUE | TRUE |      |      | Mrs  | Robyn     | O'LEARY   | Finley High School                        | Finley             |  |
|      |      |      |      | Mr   | Phillip   | OLIVER    | Bankstown Grammar                         | GEORGE'S HALL      |  |
|      |      |      |      |      | Leon      | PAIX      | Orange Christian School                   | ORANGE             |  |
|      | TRUE | TRUE |      |      | Adrian    | PALMER    | Wauchope High School                      | WAUCHOPE           |  |
|      |      |      |      |      | Heather   | PERKINS   | Wade High School                          | GRIFFITH           |  |
|      | TRUE |      |      | Miss | Belinda   | PINE      | Wee Waa H. S.                             | WEE WAA            |  |
|      | TRUE |      |      | Mr   | Graham    | QUINTAL   | Pennant Hills High School                 | BEECROFT           |  |
| TRUE | TRUE |      |      | Mr   | Stephen   | RAWLINSON | Pittwater H. S.                           | MONA VALE          |  |
|      | TRUE |      |      | Miss | Leisl     | REDMOND   | Coomoalla H.S                             | DARETON            |  |
|      |      |      |      | Ms   | Rosemary  | REILLY    | Student CSU                               | ALBURY             |  |
|      |      | TRUE | TRUE | Mrs  | Gail      | ROBERTS   | James Ruse Ag. High School                | MERRYLANDS         |  |
|      | TRUE | TRUE |      | Mr   | Peter     | ROBINSON  | Narooma H. S.                             | NAROOMA            |  |
| TRUE |      |      |      |      | Paul      | ROSS-NEW  | Kingswood High School                     | KINGSWOOD          |  |
|      |      |      |      |      | Dave      | ROBINSON  | Gloucester H.S.                           | GLOUCESTER         |  |
|      | TRUE | TRUE |      | Mr.  | Warwicke  | ROLFE     | Kadina H.S.                               | ALLSTONVILLE       |  |
|      |      |      |      |      | Richard   | SAID      |                                           | WAGGA WAGGA        |  |
| TRUE |      |      |      | Mr.  | Desh      | SALWAN    | Colo High School                          | NORTH Richmond     |  |
| TRUE |      |      |      |      | Brian     | SAWYER    | Kincumber H.S.                            | KINCUMBER          |  |
| TRUE |      |      |      | Mr   | Brett     | SHARROCK  | Mount Annan Christian College             | Narellan           |  |

|      |      |      |      |      |             |              |                                          |               |  |
|------|------|------|------|------|-------------|--------------|------------------------------------------|---------------|--|
|      | TRUE | TRUE |      | Mr   | Warwick     | SHAW         | Woodenbong Central School                | WOODENBONGNSW |  |
|      | TRUE |      |      | Mr.  | Alex        | SKLADNEV     | Dungog High School                       | Dungog        |  |
| TRUE |      |      |      |      | Christopher | SMIDT        | The Cathedral School                     | SOUTH GRAFTON |  |
| TRUE | TRUE |      |      |      | Jade        | SMITH        |                                          | SCONE         |  |
| TRUE |      | TRUE | TRUE | Mr.  | Paul        | SMITH        | Cowra High School                        | COWRA         |  |
|      | TRUE | TRUE |      | Mr.  | Peter       | SMITH        | Evans River K-12 S.                      | EVANS HEAD    |  |
| TRUE |      | TRUE | TRUE | Mr   | Geoff       | SPENCE       | Brisbane Water Secondary College Umina C | UMINA         |  |
|      |      |      |      | Ms   | Mandy       | STATHAM      | West Wyalong high School                 | WEST WYALONG  |  |
|      |      |      |      | Mr.  | Maxwell     | STEWART      | Bombala High School                      | BOMBALA       |  |
|      |      |      |      |      | John        | SURTEES      | Wingham High School                      | WINGHAM       |  |
| TRUE |      |      |      |      | Janet       | SWAN         | Dapto High School                        | DAPTO         |  |
|      | TRUE | TRUE |      | Ms.  | Vanessa     | TAYLOR       | Muwaree H.S.                             | GOULBURN      |  |
|      |      |      |      | Mr   | Leigh       | THATCHER     | Pittwater H. S.                          | Monavale      |  |
|      |      |      |      |      | Allan       | THOMAS       | Armidale High School                     | ARMIDALE      |  |
|      | TRUE |      |      | Mr.  | Brian       | THOMAS       | Koorringal H.S.                          | WAGGA WAGGA   |  |
| TRUE | TRUE | TRUE | TRUE |      | Ian         | THOMPSON     | Yanco Agricultural H.S.                  | YANCO         |  |
|      |      |      |      |      | Sheryl      | THORNTHWAITE | Gaiston High School                      | SPIT JUNCTION |  |
|      |      |      |      |      | Ben         | TOLL         | St John's College                        | DUBBO         |  |
| TRUE | TRUE |      |      |      | Stephen     | TRICKETT     | Billabong High School                    | CULCAIRN      |  |
| TRUE |      |      |      |      | W.          | VANRYSWYK    | John Paul College                        | COFFS HARBOUR |  |
|      |      |      |      |      | Ron         | VICTOR       | Morisset High School                     | MORISSET      |  |
| TRUE | TRUE |      |      |      | Peter       | WEARNE       | The King's School                        | PARRAMATTA    |  |
|      | TRUE |      |      | Mr.  | Gary        | WEBB         | CSU                                      | DENILQUIN     |  |
| TRUE |      |      |      |      | Michelle    | WEBB         | Coonabarabran High School                | COONABARABRAN |  |
|      | TRUE |      |      | Miss | Nicholet    | WESTERHOF    | Elizabeth Macarthur H.S.                 | BARGO         |  |
|      | TRUE | TRUE |      |      | Wayne       | WHALE        | St Paul's College                        | WALLA WALLA   |  |
|      | TRUE | TRUE |      |      | Rick        | WHEATON      | Oxley High School                        | TAMWORTH      |  |
| TRUE | TRUE | TRUE |      |      | Doug        | WHITE        | Manilla Central School                   | MANILLA       |  |
|      |      |      |      |      | Richard     | WHITE        | Balranald Central School                 | BALRANALD     |  |
| TRUE |      |      |      | Mr.  | Graham      | WILSON       | Mudgee High School                       | MUDGE         |  |
| TRUE | TRUE |      |      |      | Gary        | WINTER       |                                          | POTTS POINT   |  |
|      | TRUE | TRUE |      | Mr   | Paul        | WITHERS      | Nimbin Central School                    | NIMBIN        |  |
| TRUE | TRUE | TRUE |      |      | Beth        | WORTHY       | Sapphire Coast Anglican College          | BEGA          |  |
|      |      |      |      |      | Jan         | YOUNG        | Murrumburrah High School                 | HARDEN        |  |

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