Good study points
+ othe

"B.A.A.T."

BULLETIN OF THE N.S.W. ASSOCIATION OF AGRICULTURE TEACHERS

WINTER 1993



PRESIDENT'S REPORT

Hello again,

Welcome to the Winter edition of BAAT.

Firstly I must congratulate Editor Stuart on a great first edition of BAAT. From the feedback we have had it seems like it has been useful for lots of members. Please keep the comments coming in, we would like you to tell us how things are going and what you would like.

Congratulations to our secretary, Debbie and husband Peter on the birth of their daughter during late May.

Lots of things have been happening on the Agricultural Education front.

The Senior Syllabus has been revised and presented to the Minister for approval to be distributed to the consultative network. It has been reviewed in somewhat of a hurry and does not altogether satisfy the Syllabus Committee but it is a start. The next proposed meeting of the Syllabus Committee is Tuesday, 27 July.

We have had some very positive feedback from the Rural Training Council of NSW and are looking for a member who may wish to represent our Association at Rural Training Council meetings. See the advertisement elsewhere in this bulletin for more details.

The executive have made submissions on behalf of the Association in relation to the status and location of Agriculture in the National Curriculum Statements. NSW Agriculture teachers are not the only ones concerned about the situation of Agriculture in these documents. The Queensland, South Australian, Western Australian and National Agriculture Teachers' Associations have also been making submissions in an attempt to improve the status of Agriculture in the National Curriculum.

It is very pleasing to see the amount of success Agriculture students are achieving and the publicity this is gaining our subject. Some of the more interesting things that I have come across are -

* West Wyalong High's success with their goats at Canberra and Sydney Shows;
* Quirindi High and Inverell High producing Champion and Reserve Champion steers at Sydney Royal. Quirindi steer going on to win the NSW Meat Industry Authority's Taste Test Competition and Inverell steer gaining the highest price at the Sydney Royal Show steer sales;
* Red Bend Catholic College and Wingham High combining to provide the Charolais steers that gained second place in the Stan Hill Trophy at the Sydney Royal;
* Woodenbong Central exhibiting seventeen steers at Casino Beef Week with considerable success on both hoof and hook;
* Kinross Wolaroi student winning the School Parader's Competition and going on to win the Open Parader's Competition at the Sydney Royal.

There are probably many other noteable achievements that have not come to my attention. All of these achievements only continue to demonstrate that we, in our subject, can achieve a high standard of student competency in the things that we do.

Don't forget the National Conference at Leura in January, 1994 and the State Conference at Lennox Heads in January, 1995. I think both will be worthwhile conferences.

All the best for the remainder of the year.

John Lee

JOHN LEE
PRESIDENT

AEC Curriculum and Assessment Committee

May 17, 1993

Mr J Lee
President
NSW Association of Agriculture Teachers
Glen Innes High School
Edward Street
GLEN INNES NSW 2370

Dear Mr Lee,

I refer to your letters addressed to Dr Boston and myself concerning agriculture in the national collaborative curriculum. Dr Boston has asked that I respond on his behalf.

While I acknowledge the important place that agriculture must have in any Australian curriculum it should be noted that the collaborative curriculum is not categorised and defined by subjects but by broad learning areas. Agriculture like many other subjects is therefore not specifically identified in the statements and profiles.

CURASS is taking action, however to ensure that there is a more adequate reference to agriculture in the national collaborative curriculum. This should allow school systems and schools to develop a suitable agriculture curriculum.

All learning area managers particularly the managers of technology, science and studies of society and environment are aware of your concerns and are working closely with the writers as they continue to develop the profiles in line with constructive responses from individuals and associations in the agricultural field. CURASS will, as a result, instruct writers to place agriculture more firmly in profiles and statements.

The learning area managers of the three areas mentioned above will ensure that the subject agriculture can be drawn from these areas. It is acknowledged that the subject is multi-disciplinary and should not be derived from the technology area alone.

It is likely that teachers of agriculture will be asked to provide some assistance with the wording of particular outcomes, pointers and even of work samples. Offers of this assistance have been made in the consultation process during the last few weeks and are appreciated.

Yours sincerely,

G G Weller
Executive Officer

New South Wales Government

Department of School Education

City Centre
Levels 13 14 & 15, 55 Market Street,
Sydney NSW 2000

Please address all communications to
N S W Department of School Education
Box 33, G P O, Sydney N S W 2001
Telephone (02) 561 8400
Fax (02) 561 8479

Our reference DG93.1429/CD93.129

Your reference

Ms Deborah York
Secretary
NSW Association of Agriculture Teachers
Barraba Central School
West St
BARRABA NSW 2347

Dear Ms York

The Director-General of School Education, Dr Ken Boston has asked me to respond to your letter concerning the representation of agriculture in the Design and Technology syllabus.

I wish to assure you that the Years 7-10 and Years 11-12 Design and Technology syllabuses do not replace existing Agriculture syllabuses and that government schools will continue to offer Agriculture as well as other courses in the Technological and Applied Studies Key Learning Area.

While Principals determine the range of courses offered and the allocation of staff to these courses, agriculture teachers clearly have a significant role in the planning and delivery of the Design and Technology courses in their schools.

Thank you for your interest in this matter.

Your sincerely

Lesley Lynch
Director of Curriculum
18/5/93

FROM THE EDITOR..

Firstly, thank you to those people who took the time to complete and return the evaluation sheets from the last issue. I hope readers will continue to let me know the types of items that you feel are important and necessary. I will do my best to publish anything requested, however, often it is you who can be of most assistance by sending anything that may be of interest to others.

Design and Technology appears to be requiring the most support and it appears while many schools seem to be successfully finding their way, a number are still in the "bamboozled" phase. It is the aim of the N.S.W.A.A.T. (if supported by you, particularly those successful schools) to publish a Design and Technology in Agriculture Resource Booklet, consisting of ideas and briefs in the Agriculture Context area. I am happy to co-ordinate this, however it will require require submissions from a variety of sources. If you have ANYTHING even though it may be rough and only at trial stage, consider those who may be totally lost and have nothing to go on. I have included in this edition some briefs/units already sent to me that may well serve as some initial stimulus. **PLEASE SEND MORE!!**

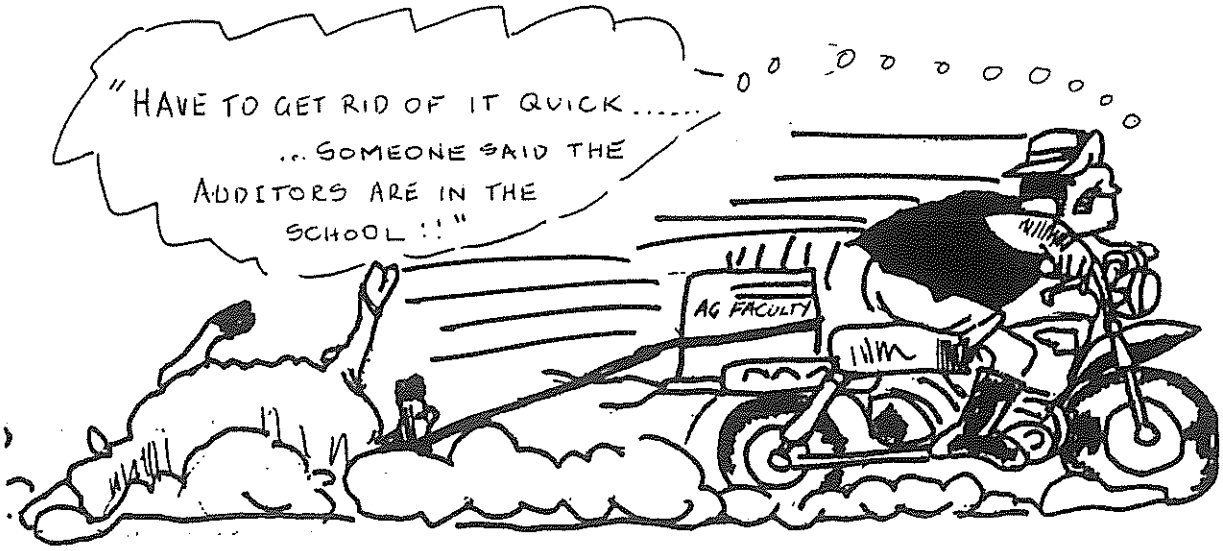
Thanks to those people who sent some notes and worksheets of which some have been included in this edition.

AGAIN, PLEASE CONTINUE TO SEND ANYTHING THAT MAY BE INCLUDED IN FUTURE EDITIONS.

As you are aware, this and future editions of B.A.A.T. will only be sent to current financial members of the Association. So if someone lets you know they did not receive this edition, remind them that $40.00 should have been sent to Joint Council (or paid through a local branch, conference etc) If however, they have sent fees, please ask them to contact me.

Have a successful Term 3 in '93.

STUART HEMMINGS
FARRER M.A.H.S. TAMWORTH.



BITS AND PIECES

***BUYING AND SELLING AT BARRABA!**

WANTED: An incubator, capable of handling 5o eggs, of various species. Auto egg roll preferred.

FOR SALE: Poll Dorset Stud rams at $100.00 each. (two only)

CONTACT... Peter Laffan at Barraba Central School
phone: 067 821104
fax: 067 821231

POSITION VACANT

N.S.W.A.A.T.

REPRESENTATIVE ON THE
RURAL TRAINING COUNCIL OF N.S.W.
COMMITTEE

The New South Wales Association of Agriculture Teachers requires a person to represent the Association at meetings of the Rural Training Council of N.S.W.

POSITION CRITERIA:

The applicant must be a current financial member of the N.S.W.A.A.T. and be able to attend meetings that are scheduled in Sydney, some of which are during school time.

A knowledge of current issues in Agricultural Education and the ability to communicate these issues to members of the Rural Training Council.

The successful applicant will be required to report to the N.S.W.A.A.T. membership via the associations bulletin, B.A.A.T.

CONDITIONS:

Some financial assistance may be available from the N.S.W.A.A.T. to the successful applicant.

ENQUIRIES AND APPLICATIONS:

THE PRESIDENT N.S.W.A.A.T.
MR JOHN LEE
GLEN INNES HIGH SCHOOL
EDWARD STREET
GLEN INNES 2370

Ph.W 067 321322
H 067 322636
fax: 067 321972

CLOSING DATE FOR APPLICATIONS:

END JULY 1993 OR A.S.A.P.(subject to B.A.A.T. publication date)

Senior Syllabus

The Syllabus Writing Team has completed the initial stages of the new senior Agriculture Syllabus due for introduction in Year 11 1994.

The syllabus is at draft stage only and has been presented before the Agriculture Syllabus Committee and supported with minor modifications. This means it now passes to the Board and Minister before the draft syllabus is circulated to the consultative network.

This network is your chance to have input to any reservations you may have with the new syllabus and it is my belief that schools are chosen at random on occassions. The writing team will meet from 13th -15th August to address changes needed to draft document as a result of consultation and to begin work on the support document and specimen exam paper. Any teacher who may have any material or reference material that could be published in the support document, please let me know and we can include it.
The new syllabus has been produced in terms of the "pathways" document and therefore has a Preliminary Course (essentially Year 11) and a Higher School Certificate Course (essentially Year 12).

The implications for teachers are important in that content matter and perhaps traditional teaching programs will have to be addressed. (major shift is toward agribusiness and sustainability in rural enterprises.)

AND ALL THIS IN THE NEXT 6MONTHS!!! (If that!)

So try to stay aware of the syllabus development and use any opportunity at branch meetings or gatherings to discuss the happenings to date. Although as a member of the writing team, I can let you know of any "unofficial" developments, I did include a list of Syllabus Committee members in the last B.A.A.T. Edition that you may wish to consult if you require any further information.

*** CATCHMENT MANAGEMENT FOR TEACHERS...**

Total Catchment Management has published a document **"Catchment Wise",** an information booklet for teachers and full of associated student activities. It could well be a handy resource for your lessons. Contact C.A.L.M. on 02 2286111 or fax 02 2286140. (no copyright exists on any material used by schools.)

*** CONFERENCE 1994...**

Don't forget that N.S.W.A.A.T. is to host the next National Agriculture Teachers Conference. I believe the venue will be the Blue Mountains and Jenni Wilkins at Muirfield Technology High School is heading the organising committee. If you wish to help or have any suggestions for the agenda please contact Jenni on 02 8722244. (see ad this issue)

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EDUCATION IN HEALTH AND SAFETY IN AGRICULTURE

Lyn Clarke
Agricultural Health Unit
Moree NSW 2400
April 1993

On-farm injury and illness is a significant problem for Agriculture in Australia

Although the problem has only recently been recognised, and although data are inadequate to properly define the nature and extent of the problem, enough is known for action to be taken at every point to reduce the impact of injury and illness in the industry.

- Tractors are associated with more work-related deaths than any other item of industrial machinery or equipment.
- More than 60 percent of farmers have a significant hearing loss caused by on-farm noise.
- Between 25 and 80 persons per 100 farms per annum attend Accident and Emergency Departments with injury, depending on the farming enterprises in the community.

The most common agent of work-related deaths on Australian farms are tractors

Tractors are associated with about 40 percent of on-farm work-related deaths on farms and many continue to be associated with tractor rollovers where an approved Roll Over Protective Structure (ROPS) has not been fitted.

Other agents associated with accidental death include:

- Other machinery
- Horses
- Vehicles
- others, such as grain suffocation

Injury on farms is associated with a wide number of activities and agents

As farmers typically use a wide range of machinery and equipment, in the context of a wide range of activities, producing a number of commodities, then it is not surprising that injury is similarly associated with a wide number of factors.

Important factors in causing injury include:

- horse riding
- Agbike riding
- repairing and maintaining farm equipment and machinery
- driving or riding on vehicles on farms
- animal handling
- manual handling

A number of other health problems may be associated with agricultural production

Other health effects are associated with agriculture. They include:

- Farm noise causing noise induced hearing loss
- Agricultural dusts (wheat and other grains, cotton, fodder etc) can trigger asthma in susceptible people
- Solar radiation is associated with high skin cancer rates, as well as heat stress
- Zoonotic diseases are problems in some industries - eg hydatid disease, leptospirosis
- Exposure to pesticides can cause immediate toxicity, and may be associated with longer term ill effects

The industry, through its peak bodies, is participating with government and rural networks to address the farm safety problem.

The Farmsafe network, at local community level, and at state and national levels, is attempting to address the problem and strategies which include the following elements are being developed:

- Data collection and monitoring
- Attention to legislative responsibilities for employees
- Education and training through formal programs
- Promotion of safety through field days, workshops and the rural media

An education strategy is seen as vital to a long term improvement in safety in agriculture

It has been generally recognised that safety skills should be developed at the same time that farming skills are developed. However, the underlying problem that has resulted in Agriculture having such a poor safety record is probably more deep seated than such a concept. There has been a more fundamental deficiency in education in agriculture - both in the formal and non-formal modes, and that relates to ***a lack of recognition of the importance of the human resource in agricultural production.***

Other industries, in developing improved management strategies, and in educating its workforce and particularly its managers, focus a great deal of attention to the development of the human resource.

That development will include not only the development of the technical production skills, but aims as a minimum, to ensure the wellbeing and safety of its workforce at all levels.

This focus of management attention includes workplace safety programs, but also aims to develop the necessary social and psychological skills required.

The typical Australian farmer has had to depend upon his or her own resources and experience in personally coping with the wide range of conditions associated with the industry.

As far back as the 1970s, management courses stressed that sound management involved a systems approach, with consideration of the total work environment - a system comprising (Figure 1):

- the technical subsystem
- the organisational (work organisation) subsystem
- the goals and values subsystem
- and the human, psychosocial subsystem,

- all within a wider social and economic environment,

- turning inputs into outputs.

Agriculture training has, by and large, focussed on the technical aspects, or the process of turning inputs into outputs, and the wider framework of markets and the economy.

More recently, there has been attention focussed on the conservation of the physical resources of agriculture, and the interface of agriculture with the wider community.

Attention has NOT been given to the development and enhancement of the wellbeing of its **human resource**.

It would appear that it is generally held that wellbeing should result purely from a sense of achievement from a financially successful enterprise, a notion that ignores the costs along the way in terms of lack of assistance to develop personal skills in coping with uncertainty, with risk to health and safety, with isolation, with farm family (the production unit) problems.

Education in safety management in agriculture is a good and practical method of beginning a reorientation of the industry, to development and protection of its human resource.

However, education should be built on a clear understanding of occupational health and safety principles.

One useful way to think about occupational health and safety is in terms of another system (Figure 2):

- the work environment
- within which the worker performs
- the particular work process with its tools.

The order of the above components also represents a **hierarchy of effectiveness of safety approaches**

Where possible, modification to the work environment to remove risk is the most effective. This reduces the dependency on the safety behaviour of people to protect, and would, for example involve building platforms to reduce the need for lifting heavy objects, designing dairies to reduce the need for bending and stooping of dairy operators, enclosing noisy machinery or engines to reduce exposure and remove the need for individuals to put on ear muffs.

Fitting of a ROPS on tractors will provide a level of inbuilt protection for drivers should an overturn occur and reduce risk of death.

However, such interventions are often long term and/or impractical for a lot of agricultural activity, and education in safety behaviour remains important, at least for the foreseeable future.

The basic safety management skills to be developed in any industry, including agriculture are now well accepted, and should be a component of agriculture courses.

The skills, or competencies, which are required for the Australian worker in Agriculture are:

1. Hazard identification

The student should be able to make an assessment of the farm workplace and any specific work process to identify hazards to health and safety.

To this end, Farmsafe Australia has developed and piloted a Farm Safety Checklist for use by farmers in that risk identification

2. Risk assessment

Students should be able to make an assessment of the nature and degree of risk associated with the hazard, in order to determine what action is appropriate to reduce risk.

There is now available resource material by way of fact sheets from government agencies in most states, and a home study course in Rural Safety has been developed by the Adelaide College of TAFE.

3. Hazard or risk control

While the solutions to reduce or control risk are not well established for a number of injury problems for agriculture in Australia, these are being identified for the commonly occurring problems, and resources are slowly being directed into this area.

The NSW Farmsafe Committee and the Farmsafe network is interested in assisting schools and teachers in the development of education programs in farm health and safety, and has welcomed the opportunity to discuss these issues with the Syllabus Committee.

ATTENTION SCHOOLS WITH ANGORA GOAT STUDS.

The Eastern Region Committee of A.M.B.A. (Angora Mohair Breeders of Australia Ltd.) would like to help you develop your goat flock to more closely represent the new animals being bred to-day by the introduction of Texan Genetics. Local members of the Association will be asked to contact you at your school and work out a program of assistance. If you are interested in this help contact the number below.

SCHOOLS NOT HAVING ANGORA GOATS but interested in using these animals for teaching and showing purposes should also contact the number below. Angoras are quiet, easily handled goats who do not see a fence as a challenge to their right of passage, who do not need large ammounts of expensive feed and who can be used for all husbandry procedures.

The Eastern Region is sponsoring a Schools Section in many local shows to enable competition between schools not against well established commercial studs and a judging competition ,for student of all age groups, which carries good prizes including an invitation to judge at the Sydney Royal Easter Show in the finals.

The contact people are :

Mr. Frank Wroe	or	Ms. Lyn Hood
"Vermont" Angoras		"Marlyn" Angoras
Ph. 048 785 296		Ph. 046 512 430
Fax 048 785 325		Fax 046 512 430

Early contact will enable the Association to develop a solid plan for the 1993/4 show season which starts with Albion Park Show in early 1994 Please at least enquire and perhaps talk to schools having Angoras for example Dudley Mercer at Bede Polding College Ph 045 77 6455 (work) or 045 67 7457 (home).

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HOW TO FAIL YOUR EXAMINATION

AN INTROSPECTIVE GUIDE

Ralph Gore
Willington Senior High School WA

The professional and deducated exam failer will shun the more obvious methods ie:- Don't write anything or leave after 10 minutes: Draw an elaborate candle as your only effort and add the caption "I hope this will shed some light on the subject". You could also forget to pin your $10.00 bribe money to the paper and risk instant failure! NO! NO! NO! There are more subtle ways of ensuring a glorious failure and at the same time leave exam markers frustrated and mystified. Below are a few tips which will help you to fail and have been used and tried by the best of failures in the past. However, in no way should you allow your individual initiatives to be stifled by these suggestions

1. PREPARATION
   Come to the exam exhausted (or) late after a hard night on the town, make sure you have a biro that will run out early in the exam or "bleed" all over the paper - be also prepared to help others fail by making rude noises during the exam or by annoying everyone when you flick your pen top without stop.

2. NEVER FOLLOW INSTRUCTIONS
   Do not check that all parts of the paper are there, never never put your name on the paper (it may be true that you get 5 marks for this!) ..... always number out of sequence and put parts of questions on different pages. Do the wrong number of questions, do the wrong number in each section, do all questions which have OR between them. Never allow appropriate time for marks gained - the ideal is to write for an hour and a half on a 5 mark question and run out of time on a 25 mark question. Always sign off with "Ran out of time" in case the marker forgets that you have only completed half of the paper.

3. START RIGHT INTO YOUR ESSAY
   without reading the question. As soon as your eye hits on one word write a general "once upon a time" story. Never indicate confidence - "I don't know much about this, but I'll have a bash at it anyway" OR "This lot is beyond me, I had gastro-wotitsname when this was done".

4. MAKE SURE YOU DRIVE HOME YOUR IGNORANCE
   with generalizations, never give facts and figures eg: "The Germans killed everybody during the war, even themselves" OR "Somebody had a lot to say about this issue but his name escapes me" OR "A definition of economic growth is where farmers get bigger cows and more milk by feeding them extra grass".

5. REALLY MESS UP YOUR EXPRESSION AND PARAGRAPHING
   you cannot absure really be without no sence out of it trying not to make. Write in one sentence paragraphs so that your essay reads like Mum's shopping list rather than the exposure of ideas. Pack your essay with useless material. Substitute "Today" with "In this very modern day and age" OR say "There is more to this than meets the eye" and end your essay on this enlightening note.

6. INSTEAD OF GETTING ON WITH YOUR ESSAY
   write little notes to your marker "Dear examiner, I have run out of ink and patience". "I could have answered a question on surfing, if they had included one". "My Mum will kill me if I fail". "Just a few lines (20) to explain why I did not have time to finish".

7. PUT EXTRA EFFORT INTO MESSING UP MULTI-PART QUESTIONS
   ignore any answer pages, scribble your answers on bits of paper and take them home with you - blotch out all alternative answers and make sure the examiner will be in no mood to give you any marks eg: "I'd like to meet the clown who set this paper". Mess up important names and dates "JOSEPH STARLON", "BENNY MUSCLINI", "JOHN MINEYARD CANES" and "MILTON FRIED BURGER". "WORLD WAR 111 BROKE OUT IN THE C20th ..... I think". BE SUPER SMART "You can read the real facts in my new book which is soon to be published". OR "Now I have provided you with all the stimulation I am sure you would like to reach your own conclusion about the subject."

   Finally if after all this dedicated application and energy you find you are still earning some marks you can always give up entirely and ... horror of horrors ... contemplate attempting to PASS!!!

TOUGH LUCK IN YOUR EXAMS!

Directive Terms Uses in An Essay (13)

When you write an essay, you are not merely asked to write down all you know about a particular subject. In any essay question you are given DIRECTIVE TERMS and these will govern how you go about answering the question.

The list below contains some of the Directive Terms you may meet.

Analyse — Separate or break up a whole into its parts so that you may discover their nature, proportion, function, relationship etc.

Comment — Make critical observations, even if they are fairly open-ended; However, your texts and lecture and discussion notes should provide sufficient guidelines and your own common sense should prevail.

Compare — Find similarities and differences between two or more ideas, events, interpretations, etc. Ensure you understand exactly what you are being asked to compare. For example, if asked to compare two poems, on which aspects should you focus? Should you be concerned with poetic techniques, philosophy and perspective, or both? Are you expected to include a comparison of personal, social and historical influences which affect the technique and philosophy? If you are unclear about such considerations, find out before you begin the essay.

Contrast — The remarks on 'compare' apply equally to 'contrast'. The difference is that you should concentrate on dissimilarities.

Criticise — Express your judgement regarding the correctness or merit of the factors being considered. Discuss both strong and weak points and give the results of your own analysis.

Define — Provide concise, clear, authoritative meanings. In such statements, details are not necessarily required, but briefly cite the boundaries or limitations of the definition. Remember the 'class' to which a thing belongs and whatever differentiates the particular object from all others in that class.

Describe — Recall facts, processes or events. You are NOT asked to explain or interpret. Try to provide a thorough description, emphasising the most important points.

Diagram — Present a drawing, chart, plan or graphic representation in your answer. Generally, the student is also expected to label the diagram and a brief explanation or description may be required.

Discuss	Present a point of view. This is likely to need both description and interpretation. Your opinions must be supported by carefully chosen and authoritative evidence.
Enumerate	Provide a list or outline form of reply. In such questions you should recount, one by one, but concisely, the points required.
Evaluate	Present a judgement of an issue by stressing both strengths and advantages, AND weaknesses and limitations.
Explain	Interpret the facts along the lines or a particular topic. Do not be trapped into describing events or summarising the plot. Your main focus should be on the 'why' of a particular issue, or on the 'how', with the aim of clarifying reasons, causes and effects. You are being tested on your capacity to think critically, to exercise perception and discernment.
Illustrate	This asks for an explanation; you may clarify your answer to a problem by presenting a figure, picture, diagram or concrete example.
Interpret	Explain the meaning of something and give your own judgement of a situation.
List	Give an itemised series or tabulation; such answers should be concise.
Outline	This asks for an organised description. Give the main points and essential supplementary materials, but omit minor details. Present the information in a systematic arrangement or classification.
Prove	To confirm or verify. You shoul establish something with certainty by evaluating and citing experimental evidence, or by logical reasoning.
Relate	When showing relationships, your answers should emphasise connections and associations in a descriptive manner.
Review	Re-examine, analyse an comment briefly (in an organised sequence) on the major points of an issue.
State	Express the high points in brief and clear narrative form. Details, and usually illustrations or examples, may be omitted.
Summarise	Provide a brief statement or an account covering the main points; omit details.
Trace	Give the development, process or history of a thing, event or idea, especially by proceeding from the latest to the earliest evidence.

SOURCE UNKNOWN

Ostriches - Who is burying their head in the sand?

The information in the following article was extracted from a number of articles appearing in "The Weekly Times", January 6, 1993.

Australia has about 7,000 ostriches, including chicks. About 60% of these birds are in Victoria.

Australia's ostriches are direct descendants of birds imported from Africa into Port Augusta, South Australia, in 1869.

These birds were "farmed" through the late 1800's and early 1900's to suppl the large and lucrative fashion industry of the time. With the decline in demand for ostrich feathers as a fashion item and the decreasing value of ostriches many birds were set free into the local environment. Subsequentl ostriches lived a feral existence in parts of South Australia for many years.

Efforts to rekindle an australian ostrich industry started about five years ago and in that time ostrich farming has mushroomed from nothing to be wort about $150 million in 1992. Chicks sell for $2,000-$3,000 for each month o age, and the going price for a two year old breeding pair is about $100,000

At this stage ostrich farming is a speculative venture and is still very largely a breeder-based enterprise. there are no established domestic or export markets for ostrich products, nor are there ostrich specific slaughtering or tanning facilities. At present a dead bird is worth nothing.

Based on South African returns the carcass of an adult ostrich would be worth about $600; if a market for meat, leather and feathers was to be developed.

The Australian Ostrich Association (A.O.A.) estimate that South Africa has 206,000 birds on farm and slaughter about 120,000 birds per year. this accounts for about 97% of the world trade in ostrich products.

Other countries with developing ostrich industries include the United State of America, Canada, Zimbabwe and Namibia.

A.O.A. predictions based on current growth trends indicate there should be about 100,000 birds on farms in Australia in 1998-99 with annual production worth about $24 million.

The South African industry is based on genetically superior birds produced by the hybridisation of three sub-species and the result of over 70 years o intensive selection.

A major problem facing Australian ostrich breeders is the potential economi threat posed by the importation of ostriches with better genetic potential. The Australian Quarantine Inspection Service (A.Q.I.S.) will begin allowing ostriches into its Cocos Island quarantine facility from about the beginnin of April 1993.

The South African Government has banned the export of live birds and fertilised eggs. However, there is potential at present to import ostriche directly from Canada.

On the world market the annual trade in ostrich products is worth about $A55 million. Leather is by far the most valuable product with a reported on farm value of about $A430 per square metre. This same leather has an

estimated retail value through manufacturers of $A1012 per square metre. Dr James Stewart, an experienced Zimbabwe ostrich farmer, estimates that feathers from Australian ostriches would only return about $20 per tonne and be suitable for feathered dusters. Feathers from South African birds, on the other hand, would return $150 per tonne.

The A.O.A., with more than 600 members, is concerned that world over supply and the rapid increase in emu numbers and slaughterings pose potential problems to the development of the ostrich industry.

Despite this and the lack of industry infrastructure to process ostrich products the ostrich industry in Australia continues to boom. Many producers are finding difficulty in maintaining sufficient supply of young stock to meet demand.

The lures of tax incentives, big profits, the promise of a full-blown commercial ostrich industry by the end of the decade, and the opportunity to be a farmer when your not being a farmer seem to be the incentives drawing people into the industry.

Many people investing in ostriches run their stock on a share basis or agistment arrangement with syndicated operations, never really farming them themselves.

In late 1992 the A.O.A. promoted two possible scenarios for potential investors in the industry. Both scenarios assume a low, rather than high hatch rate

* The investor buys a half share in a pair of adult ostriches for $50,000 which are then agisted.
  The birds produce 10 chicks and the investors share is 5 chicks.
  If the chicks are sold at 6 months of age the sale price is $50,000 leaving a net profit, after costs and tax, of $23,668.
  If the investor waits until the 5 chicks are 12 months old, the net gain is $44,261.

Alternatively -

* The investor owns the breeding pair outright for an initial outlay of $100,00.
  The returns offered are even higher. If the birds produce 10 chicks which are sold at 12 months of age, the investor makes a net gain of $103,382. This figure is arrived at after the birds are sold for $180,000 with deductions of $10,520 in costs and $66,097 tax (at 39 per cent).
  The costs associated with owning a breeding pair include insurance of $5,900, feed $320, contract incubation and hatching $2,500, feed for chicks sold after three months $450.

An alternative to these two scenarios are syndicates which ultimately offer a variation on sharefarming with a bit of pyramid-style profits mixed in.

During 1992 the A.O.A. received a Federal Government Grant of about $150,000 to enable a trial slaughter and market development program.

During late October 1992 ten birds were slaughtered and processed under A.O.I.S. supervision at the McPhee Export Works at Wodonga. The birds yielded a total of 222 Kg of meat. Four of the birds slaughtered were

grass-fed and showed no surplus body fat cover. This might suggest that th present method of grain feeding birds may not necessarily be the way to go in the future.

Ostrich eggs are usually hatched in an incubator. Imported US-made incubators are available for between $15,000 and $20,000 installed.

Ostrich eggs are large, weighing up to 1.5 Kg. They are incubated for 39 days at 36.5°C and need to be turned through 45 degrees daily during this time. Following the 39 day period of incubation eggs are transferred to a hatcher for a final three days before the chicks breakout of the shell.

Spring and summer is the recognised breeding season for ostriches, however, the laying habits of ostriches are unpredictable.

A Gippsland (Victoria) farmer, Allan Quirk, in his first ostrich breeding season reported that from four hens one laid 44 eggs, a second laid 32 eggs the third laid 3 eggs and the fourth had not laid.

A.O.A. projections suggest that as the industry develops price per bird wil decrease until it stabilises at a price that reflects the slaughter value o the birds.

ATTENTION: TEACHERS OF AGRICULTURE

TAMWORTH PRIME LAMB SHOW AND SALE

SCHOOL SECTION

What:

This year, Tamworth is hosting the state-wide
R.A.S. Prime Lamb Show and Sale.
Schools may enter pens of three lambs
in a school section (one class only)
or may choose to enter lambs
in the open competition
in specific weight ranges.

Cash prizes and trophies for all classes,
both hoof and hook
and assessment of live animals.

When:

August 25 - judging on hoof and sale at auction
August 26 - lambs to abattoir for slaughter
August 27 - judging on hook
August 28 - inspection on hook and
presentation of prizes/trophies

Where:

Indoor Arena, Tamworth Showground for Aug 25
Tamworth City Abattoir for Aug 28

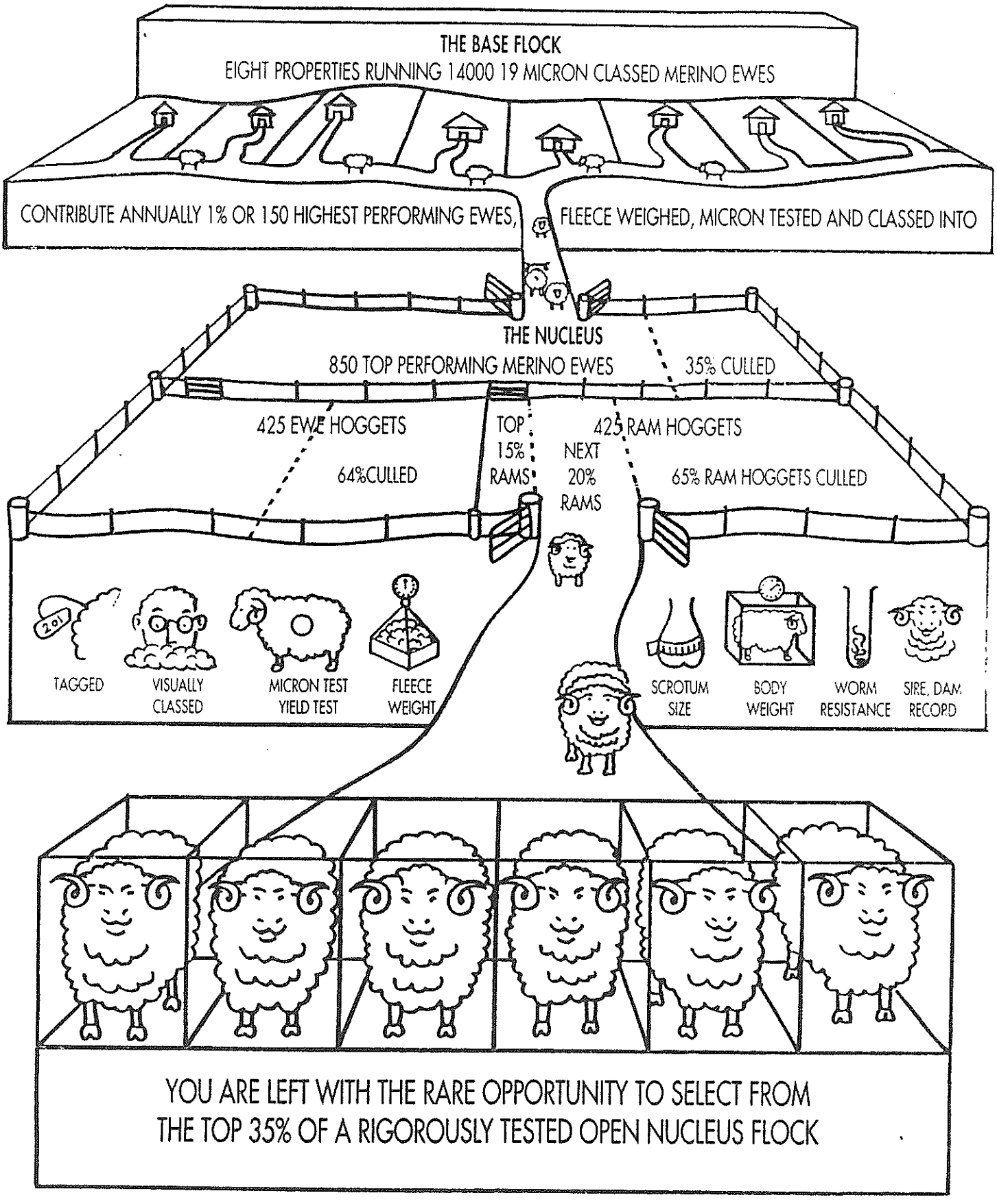
Cost:

Entry fee $5 per pen, no admission

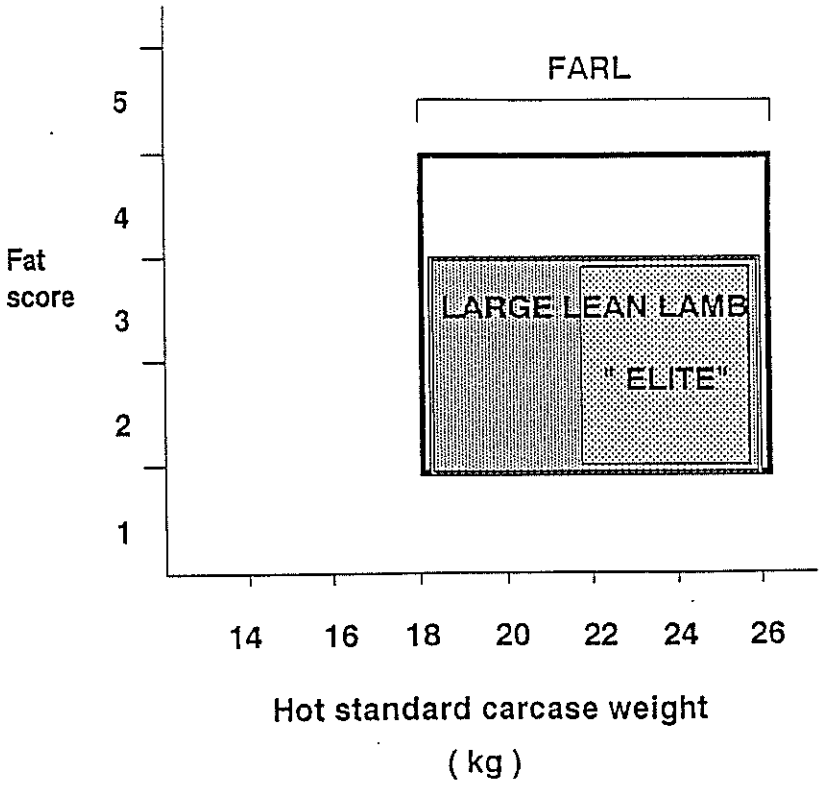
More Information/Entry Form(when printed):

Contact Wayne Chaffey, Tamworth High School
Phone 657888 Fax 621264

THE OPEN NUCLEUS SYSTEM



MARKET SPECIFICATIONS FOR LARGE LEAN LAMB



Market Specifications

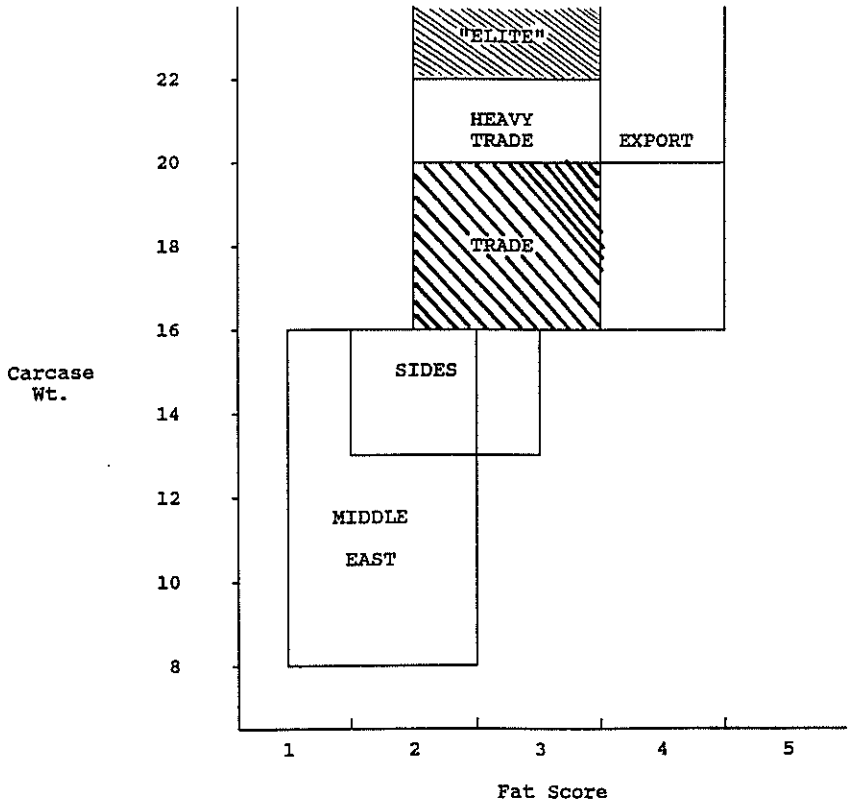
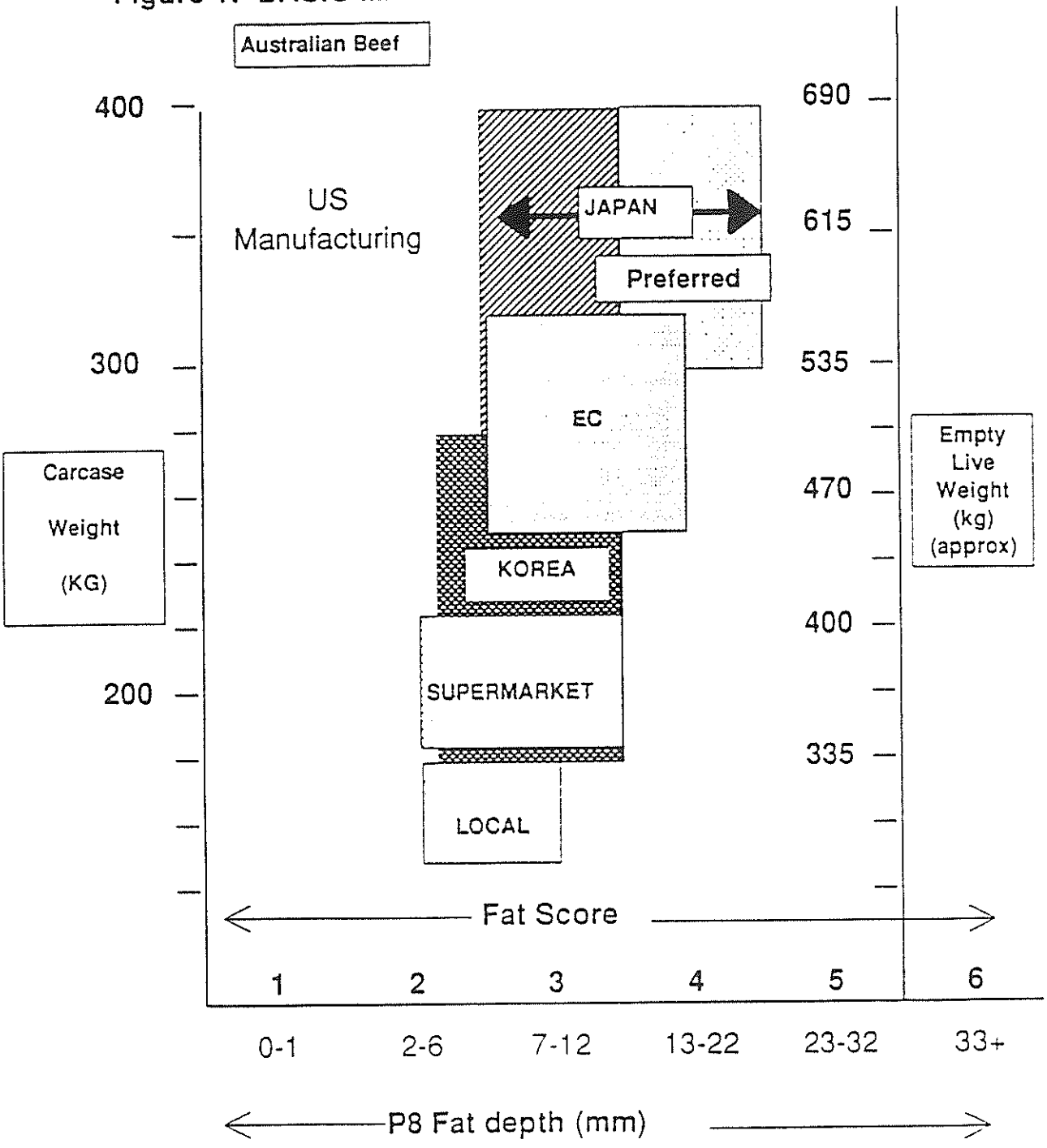


Figure 1: BASIC MARKET SPECIFICATIONS



Source: Bob Gaden, Special Livestock Officer (Beef Marketing), Armidale.

PASTURE QUALITY

This article is a continuation from our November Newsletter which discussed the variability of pasture moisture content.

How Much Protein Does your Pasture Contain?

The protein content of pasture is obtained by chemically digesting a sample and by multiplying the nitrogen content by 6.25, this is on the basis that protein contains 16% nitrogen. The result is the total protein or crude protein contained in the pasture.

From the pasture testing work which we have been carrying out, a large range in protein results have been found. These results can be summarised as follows:

Protein Results

Pasture Type	Lowest	Average	Highest
Kikuyu	7.6	14.0	21.6
Ryegrass/Clover	18.0	24.0	32.6
Forage Sorghum	7.5	12.3	18.2
Pasture Silage	11.4	14.5	16.5
Maize Silage	6.6	8.1	9.9

These results highlight the extreme variations in pasture quality, the following points should be noted;

- Summer growing, tropical type pastures are lower in protein than temperate pastures.
- Kikuyu based pasture is on average not supplying sufficient protein for optimal milk production.
- Ryegrass/Clover pasture is an ideal source of protein, in all the assays completed the protein content satisfies the cows total protein requirement.
- Ryegrass pastures which have gone to seed are expected to be much lower in protein.
- Extremely high protein levels of 25% or higher are found with early pasture growth following application of nitrogenous fertiliser.
- Very high protein levels in some situations can result in nitrate poisoning.
- Forage sorghum sampled prior to flowering has a reasonable protein content, there is however a sudden protein reduction as forage sorghum flowers and sets seed.
- Maize silage is low in protein.
- Protein levels found in pasture silage have averaged 14.5%. The actual levels are directly influenced by the quality of pasture put into the silage bale or pit. An over mature pasture will not make a high quality silage. In some situations the quality of silage produced has been poor. The feeding value is not of high enough quality to maintain milk production.

In summary, the pasture results demonstrate that for much of the year cows are grazing on pasture which does not satisfy their requirement for protein. When looking at nutrition it is important to keep in mind that the dairy feed used provides sufficient protein to balance the pasture quality. For this reason, Fielders offer a range of protein levels within our feeds.

FEED	PROTEIN CONTENT
DAIRY GOLD	18%
FULL ENERGY	16%
DAIRY BOOSTA	15%
GRAIN BALANCER	13%

As pasture conditions change through the year, so too should the particular feed in use. A higher protein feed where pasture is lower in protein.

In a following issue there will be further discussion on the quality of protein in terms of degradable and undegradable
(bypass) protein.

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Australian Agriculture on CD-ROM

Ag.ROUND is a CD-ROM which provides cost-effective access to information on primary production and processing in Australia today.

Obtaining relevant information when it is needed can be time consuming and expensive. **Ag.ROUND** brings together information on Australian agriculture in one convenient, easy to use and timely product.

In broad terms, **Ag.ROUND** covers plant and animal production and processing, animal husbandry, rural economics and sociology, agricultural engineering, the rural environment, food technology, forestry and fisheries.

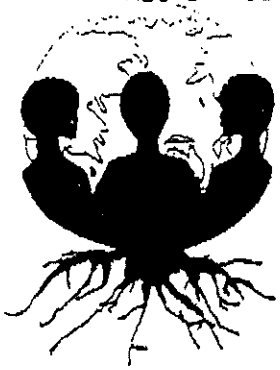
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- the 1991 edition of the *Australian Journal of Experimental Agriculture* as full-text images for direct viewing, printing or for accessing from the ABOA database via hypertext links.

CD-ROM technology brings database searching into the user's workspace allowing speedy retrieval of information which can then be browsed on-screen, printed, or downloaded and manipulated to produce reports in any desired format. Furthermore, **Ag.ROUND** is easy to use.

Ag.ROUND is to be released twice a year. An annual subscription of $525, or $195 for schools, TAFE colleges and public libraries, includes the current version and one six-monthly update. There are special terms for multiple orders and networking arrangements, as described over the page.

For further information on **Ag.ROUND**, please contact Tony Printers or Joy Sutton at CSIRO Information Services Branch, PO Box 89, East Melbourne Vic 3002, telephone (03) 418 7555, fax (03) 419 0459 or AARNET jes@[illegible].



Around the Nation Around the World

WOMEN IN AGRICULTURE

Australia invites you to participate in the
Inaugural
1994 INTERNATIONAL CONFERENCE
to be held at Melbourne University
on 1st to 3rd July 1994
The theme of the conference will be
" Women in Agriculture - Farming For Our Future "

The program will cover sustainable development, production, economics, environment and the role of women in each of these areas.

As a participant you and/or your organisation will hear and learn about these topics from national and international keynote speakers, workshops, panel and round-table discussions, formal and informal networking and international forums. Pre and post-conference farm tours will also be available.

This will be your opportunity to participate in an international forum addressing current concerns in agriculture by intergrating the experience, knowledge and skills of women in agriculture from around the world developing networks for future discussion, communication and action on national and international agricultural issues.

The conference is convened in recognition of the role of women in agriculture globally now and in the future.

● **To express your interest please return the portion below:-**

Name: .....

Address: .....

.....

Telephone: ..... Facsimile: .....

Area of interest, *e.g.* ☐ Women in Agriculture ☐ Environment ☐ Production

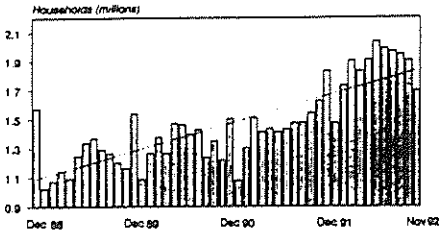
● **Please send to:** Networking Co-ordinator, Women in Agriculture,
Department of Conservation & Natural Resources,
7 Service Street,
BAIRNSDALE 3875, VICTORIA, AUSTRALIA.

Telephone: [051] 52 0400 *Facsimile:* [051] 52 0444

THE RETAIL MARKET FOR PIGMEAT

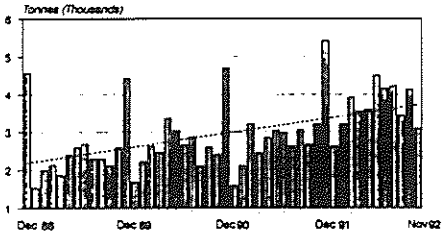
DECEMBER 1988 to NOVEMBER 1992

FRESH PORK BUYERS



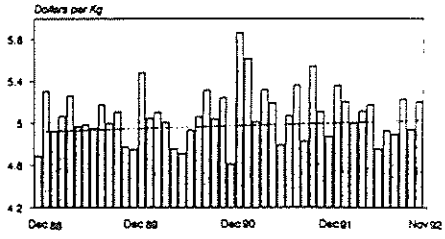
The strong increase in the number of households buying fresh pork continues.

FRESH PORK VOLUME



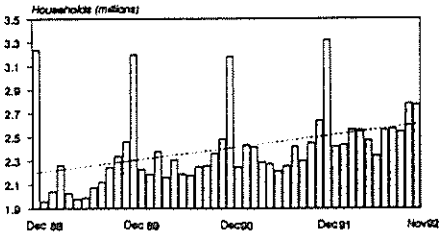
The increased volume of fresh pork purchased is evident on year prior.

FRESH PORK PRICE



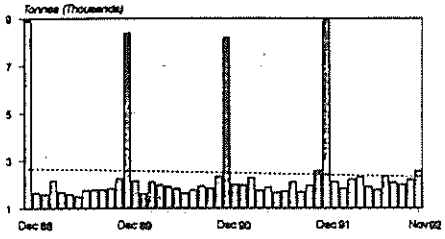
Very little change in the average price of fresh pork over the last four years.

HAM BUYERS



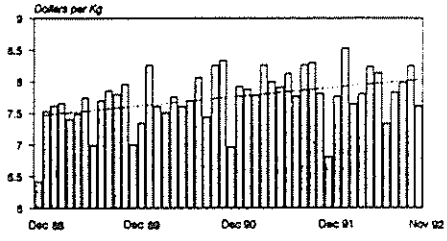
The number of pre-Christmas ham buyers continues to grow.

HAM VOLUME



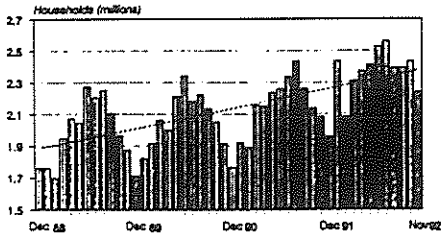
Other than December ham volume remains stable.

HAM PRICE



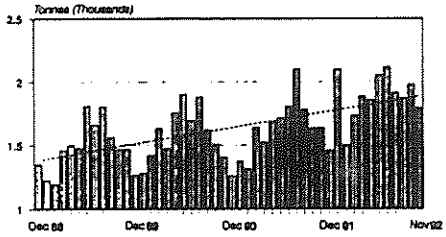
Trend remains positive although prices actually lower than prior year.

BACON BUYERS



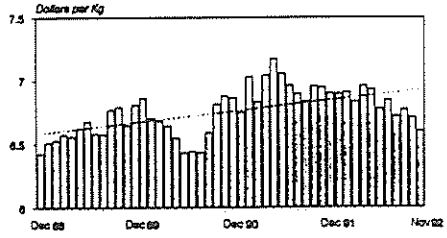
Strong increase in number of households buying bacon during 1992.

BACON VOLUME



Volume of bacon purchased higher than previous years.

BACON PRICE



Bacon prices fall below trend line in last six months.

Source: Audits & Panels of Australia (Roy Morgan Research)

1. THE OESTROUS CYCLE

This is regarded as the sequence of events from the time an animal is in **oestrus** (or "heat") until the next oestrus, providing pregnancy does not intervene.
The length of the oestrous cycle, the duration of oestrus and the time of ovulation relative to the onset of oestrus varies from one species of amimal to another

Animal	Length of oestrous cycle	Duration of oestrus	Ovulation time relative to onset of oestrus
Cow	21 days	18 hrs	10-15 hrs after end
Ewe	17 days	14 hrs	near end
Sow	21 days	52 hrs	2nd day
Goat	20 days	48 hrs	near end
Mare	21 days	5 days	1-2 days before end

Note
These figures are averages only and vary considerably between individual animals

2. THE ANNUAL BREEDING CYCLE

This refers to the pattern of oestrous cycles throughout the reproductive life of a female animal. Three patterns are found:

1. **Monoestrous animals**
   One oestrus followed by a long period of inactivity eg dogs, cats

2. **Polyoestrous animals**
   Oestrus occurs regularly throughout the year eg pigs, cattle

3. **Seasonally polyoestrous animals**
   Oestrus occurs several times but only in one season of the year eg sheep, goats (autumn), horses (spring)

In seasonally polyoestrous animals environmental factors determine the onset of reproductive activity. The pattern of daylength is the most important of these. Sheep and goats breed when daylength is decreasing while horses breed when daylength is increasing. This ensures that their offspring are born in spring. The influence of daylength on reproduction in sheep is further affected by the breed of sheep and by their nutritional status. Reproduction in poultry is also controlled by daylength. Female birds begin to lay eggs as the days become longer in spring. The decreasing daylengths of autumn stimulate **moulting.** Artificial lighting is used to increase egg production by lengthening the period during the year that daylength is increasing.

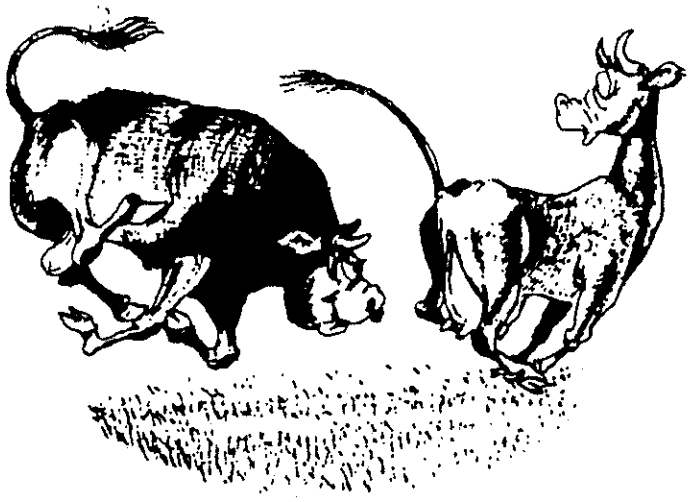
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THE HORMONES OF FEMALE REPRODUCTION

HORMONE	PRODUCED BY	ACTS ON	ACTION
Follicle Stimulating Hormone (FSH)	Anterior pituitary gland	Ovaries	Stimulates growth and development of follicles in the ovaries
Oestrogen	Developing follicles	Anterior pituitary gland	Inhibits FSH production Stimulates LH production
		Central nervous system	Causes behavioural changes so that the female will accept the male ie **oestrus** or **'heat'**
		Uterus	Stimulates development of the lining of the uterus (**endometrium**) in preparation for the implantation of the embryo
		Vagina, Vulva	Stimulates mucous production and swelling of vulva
		Mammary glands	Stimulates mammary growth and development of alveoli
Luteinizing Hormone (LH)	Anterior pituitary gland	Maturing follicles	Causes follicles to rupture and release ova ie **ovulation**
Progesterone	Corpus luteum Placenta	Anterior pituitary gland	Inhibits production of FSH, thus maintaining pregnancy
		Uterus	Stimulates development of endometrium
		Mammary glands	Stimulates development prior to parturition
Prolactin	Anterior pituitary gland	Corpus luteum	Stimulates production of progesterone in some species
		Mammary glands	Stimulates production of milk
Relaxin	Corpus luteum &/or placenta	Pelvic muscles	Relaxation of pelvis at time of parturition
Oxytocin	Posterior pituitary gland	Uterus	Stimulates contraction of muscles at mating (to aid sperm transport) and birth (to expel the foetus)
		Mammary glands	Stimulates contraction of alveoli thus enabling milk **'letdown'**

THE HORMONES OF MALE REPRODUCTION

HORMONE	PRODUCED BY	ACTS ON	ACTION
FSH	Anterior pituitary gland	Testes	Stimulates production of sperm cells
LH	Anterior pituitary gland	Testes	Stimulates production of sperm cells
Testosterone	Testes	Central nervous system	Controls male sexual behaviour and libido
		Sex organs	Responsible for development and maintenance





(12)

Incitec FERTILIZER GUIDE

This chart provides a guide to fertilizer use on a range of fruit, vegetable, tree and vine crops. Incitec's Analysis Systems offers Soil, Plant and Water testing, which will help as a guide to fertilizer use. For non-commercial producers with small areas, use of this guide should be adequate. The benefits of analysis apply more to large scale or commercial farmers to fine tune both yield and quality. More detailed information is available for each crop on request. Check for product availability with your local Incitec dealer. Not all products are available in all areas.

TREES AND VINES	RECOMMENDED PRODUCT	FERTILIZER RATE (PER APPLICATION)	NUMBER OF APPLICATIONS PER YEAR	COMMENT/TIMING
Apples and Pears Bearing trees	Crop King® 11, or Crop King 66 Greenleaf® Nitram®	500 - 1000 g/tree 1200 - 1400 g/tree	2 1	Apply in late winter and late spring. Use Crop King 66 on new orchards. Apply post harvest according to shoot vigour.
Avocado	Crop King Urea Crop King 7, or Crop King 77 (S), or Crop King 88, or Crop King Greengrove T.E.® - use only one application/year in place of one of the above.	60 g/tree 125 g/tree 180 g/tree 300 g/tree 450 g/tree 500 g/tree/year x age in years	3 2 2 2 3 3	Apply in Years 1, 2 and 3 only - in November, December and February. Year 1 - apply in September and January Year 2 - apply in April and September Year 3 - apply in April and September Year 4 - apply in April, September and February From year 4 onwards apply 500 g/tree/year x age in years up to a maximum of 5 kg/tree/year at 10 years of age. The fertilizer should be split to apply 40% in December - early January, 40% 4-6 weeks later (after fruitdrop) and 20% in April.
Banana	Crop King 7, or Crop King Q7 (K) or Crop King Banana Big K	250 g/stool	4	Apply in August, November, February and April
Citrus Established	Crop King 7, or Crop King 77 (S), or Crop King 88, or Crop King Greengrove T.E. Crop King Urea	375 g/tree x age in years 110 g/tree x age in years	1 1	Apply in July, up to 3 kg at 8 years and older Apply in September, up to 0.9 kg at 8 years and older
Custard Apple	Crop King 7, or Crop King 77 (S), or Crop King Greengrove T.E. - use only one application/year in place of one of the above.	150 g/tree x age in years	4	Apply in October, December, February and March up to 1.35 kg/tree/application at 9 years and older
Grape	Crop King 44	150 - 250 g/vine	1	Apply in late winter before bud burst.
Lychee Bearing trees	Crop King 7, or Crop King 77 (S), or Crop King Greengrove T.E. - use only one application/year in place of one of the above.	500 g/tree x age in years	1	Apply 4 weeks after fruit set. A small quantity post-harvest may be beneficial. Increase rate up to 5 kg/tree at 10 years and older. NOTE.- Trees should not be allowed to flush between late summer and the following spring.
Macadamia	Crop King 7, or Crop King 77 (S), or Crop King 88, or Crop King Greengrove T.E. - use only one application/year in place of one of the above	90 g/tree 130 g/tree 300 g/tree 400 g/tree 500 g/tree 1000 g/tree 1200 g/tree 1350 g/tree 1500 g/tree 1700 g/tree 1850 g/tree 2000 g/tree	5 5 5 5 5 3 3 3 3 3 3 3	Year 1 February, April, June, October and December Year 2 February, April, June, October and December Year 3 February, April, June, October and December Year 4 February, April, June, October and December Year 5 February, April, June, October and December Year 6 March, June, August Year 7 March, June, August Year 8 March, June, August Year 9 March, June, August Year 10 March, June, August Year 11 March, June, August Year 12 March, June, August
Mango Non bearing trees	Crop King 88	100 g/tree x age in years	2	Apply in December and May.
Bearing trees	Crop King 55	200 g/tree x age in years	2	Apply in December and March, up to 3 kg/tree/application at 15 years and older.
Papaw	Crop King 7, or Crop King 77 (S), or Crop King Q7 (K), or Crop King Greengrove T.E. - use only one application/year in place of one of the above.	900 g/tree/year	1	The fertilizer should be split to apply 50% pre-plant, 25% in April, 10% in September and 15% in November
Passionfruit After flowering	Crop King 7, or Crop King 88 alternating with Crop King Q7 (K)	250 g/vine 350 g/vine 450 g/vine	8 8 8	Year 1 Year 2 Year 3 Apply as a sidedressing every 8 weeks, alternating Crop King Q7 (K) with either Crop King 88 or Crop King 7.
Stone Fruit Bearing trees	Crop King 11, or Crop King 66 Greenleaf Nitram	1000 - 1600 g/tree 800 - 1200 g/tree	1 1	Apply in late winter. Use Crop King 66 on new orchards. Apply in February/March.
VEGETABLES				
Bean	Crop King Q5 Crop King Urea	900 kg/ha 150 kg/ha	1 2	Do not place fertilizer in contact with the seed. Sidedress once at 14 days after emergence and again at early flowering.
Beetroot	Crop King Urea Crop King 77 (S) Crop King Urea	200 kg/ha 125 - 250 kg/ha* 125 - 225 kg/ha*	1 1 1	Broadcast 7 - 10 days preplant. At planting. Sidedress when plants are about 10 cm high.
Capsicum	Crop King Q5 Crop King Urea	750 - 900 kg/ha* 125 kg/ha	1 1	Apply 7 days pre-plant. Sidedress after first fruit set in a band 15 cm from the plant.
Carrot	Crop King Q5 Crop King Urea	750 - 900 kg/ha* 125 kg/ha	1 1	Incorporate several weeks before planting. Sidedress when plants are 5 cm high.
Crucifers Broccoli/Brussels Sprouts/ Cabbage/Cauliflower	Crop King Q5 Crop King Urea	750 - 900 kg/ha* 125 kg/ha	1 2	Apply 7-10 days pre-plant. Sidedress 3 - 4 weeks after planting and again at heading or hearting.
Cucurbit Cucumber/Melon/ Pumpkin/Squash/Zucchini	Crop King Q5 Crop King Urea	750 - 1250 kg/ha* 125 kg/ha	1 1	Incorporate pre-plant. Broadcast when plants begin to run.
Lawns Maintenance	Crop King 88 Crop King Urea	600 kg/ha 100 kg/ha	2 6 - 10	Apply in late August and late February. Water all fertilizer in well. Apply every 6 weeks from October to June. The application frequency may be shortened to 4 weeks in summer.
Lettuce	Crop King Q5 Crop King Urea	900 - 1250 kg/ha* 125 kg/ha	1 2	Broadcast or band 7 days pre-plant. Sidedress 2 - 3 days after planting and again before hearting.
Onions	Crop King 77 (S), or Crop King 7	200 kg/ha	2	Apply at 2nd or 3rd true leaf stage, and again two or three weeks later
Pea	Crop King 7, or Crop King 88, or Crop King 77 (S) Crop King Urea	125 - 250 kg/ha* 50 - 125 kg/ha*	1 1	Apply at planting away from the seed. Sidedress, if required 14 days after emergence.
Potato	Crop King Q5 Crop King Urea	1200 - 1800 kg/ha* 125 - 250 kg/ha*	1 1	Apply at planting away from the seed. Sidedress after shoots have emerged.
Strawberry	Crop King 77 (S), or Crop King 7, or Crop King 88	250 kg/ha	4	To be incorporated at bed formation, and sidedressed every 3 - 4 weeks from heavy flowering onwards.
Tomato	Crop King 55, or Crop King Tomato T.E. Crop King Urea	500 kg/ha 650 - 800 kg/ha* 40 kg/ha	1 1 6	Apply 7 - 10 days pre-plant. At transplanting on light soils. Apply weekly up to first flower if required.

* Use the higher rates on sandy soils.

Note: Regular applications of Crop King Magnesium Sulfate as well as micronutrient amendments such as Crop King Bluestone, Crop King Zinc Sulfate Heptahydrate, Solubor®, and Sodium Molybdate may also be needed.

Fertilizer use recommendations are presented as a practical guide to good agronomic practice under most situations. Local soil, climatic and other conditions should also be taken into account, as these could affect plant response to fertilizer application. This wall chart covers use recommendations for the range of agricultural products marketed by Incitec Ltd and is not necessarily a complete guide.

PLEASE TURN OVER for further information

LIME AND DOLOMITE

Applications of these products may improve some of the following soil characteristics:
Acidity (low soil pH), poor soil structure and water penetration, availability of some plant nutrients, levels of calcium and magnesium and the active populations of some soil micro-organisms.

Liming materials are usually broadcast 2 - 3 months before planting or establishment at the following rates:

sandy soils - 2 t/ha
loam soils - 3 t/ha
clay soils - 5 t/ha

After application, the liming material is incorporated into the topsoil by subsequent cultivation.

FERTILIZING TREE AND VINE CROPS

Most tree seedlings are susceptible to fertilizer "burn". Do not place fertilizer or fresh manure in the planting hole and do not spread fertilizer any closer than 20 cm from the trunk of the tree. It is advisable to wait for the tree to start new growth before fertilizing.

Always ensure that the fertilizer is spread evenly over the circular area surrounding the tree, 20 cm out from the trunk and extending beyond the canopy approximately 20 cm. Fertilizer applied beyond the tree canopy allows nutrients to reach the area of most rapid root development and uptake, especially in young crops.

For recommendations giving an amount per tree x age in years, multiply the given rate by the number of years old the tree is. For example, the recommendation for citrus is 375 g/tree x age in years. A 5 year old tree should receive 1875 g in that year. That is, 375 g x 5 = 1875 g. When the tree is 8 years old it reaches its maximum requirement for its lifetime, so there is a set yearly application rate from year 8 onwards.

FERTILIZING VEGETABLES

Recommendations which quote kilograms per hectare (kg/ha) can easily be converted to grams per square metre (g/m^2) - to suit small backyard growers.

1 kg = 1000 g and 1ha = 10000 m^2 so 10 kg/ha is the same as 1 g/m^2

For example, the recommendation for Onion is 200 kg/ha of Crop King 77 (S). This is the same as 20 g/m^2 of Crop King 77 (S). Someone with a vegetable patch 10m wide by 10m long (= 100 m^2) should therefore apply 20 x 100 = 2000 g = 2 kg of Crop King 77 (S) over that vegetable patch.

Where a range of fertilizer is recommended (eg. 125 - 250 kg/ha*) use the higher rates on sandy soils and the lower rates on clay soils.

FOLIAR FERTILIZERS

Foliar fertilizers contain soluble nutrients, including trace elements, and are sprayed onto plant foliage. They are designed to rapidly supplement the plant's nutrient requirement to give the crop a boost or after times of stress.

Examples of stress situations where plants will benefit from the application of foliar fertilizer include after transplanting, poor soil structure, waterlogged conditions, water stress, insect attack, frost damage, hail damage, unfavourable pH and periods of heavy demand on nutrients (at flowering and fruit setting).

WARNING

The information contained in this publication is for use as a guide only. The use of fertilizers and crop protection products is not the only factor involved in producing a top yielding crop. Local soil, climatic and other conditions should also be taken into account, as these could affect crop responses to applied fertilizers and crop protection products.

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134/8/92 (Rev 3)

CROP KING

Greenleaf

Analysis Systems

ALL ABOARD THE GREEN TRAIN
... FINDING COMMON GROUND

GREEN TOPIC

Replacing Soil Nutrients

(Mineral or Organic Fertilizers)

World Population Growth

Over the past 50 years, the world's population has more than doubled, from about 2 billion in 1930 to 4 billion around 1975. It currently stands at around 5 billion, and is expected to increase by 3.5 billion (60%) to 8.5 billion by 2025.

To sustain the world's expanding population, advances in agriculture must match population growth.

The adoption of new technology and farming practices, based on scientific research, has made this possible. These include new high yielding crops and varieties, increased irrigation, management practices which conserve and make better use of moisture, the use of fertilizers to correct nutrient deficiencies and restore soil fertility, improved control of diseases and insects, and more effective weed control.

In the United States, maize (corn) yields increased by 250% from 1940 to 1980.

If such increases had not been achieved, more land would now be used for agriculture, land which in many cases would be less suited for farming than that already in use, land which may at present be under forest or wilderness.

Nutrient Depletion

Apart from climate, soil infertility is the single most important factor limiting crop and pasture yields worldwide.

In a natural or enclosed ecosystem, nutrients cycle through the soil - plant - animal system, and overall production levels are low.

To feed the world's growing population, much higher levels of production are required.

Nutrients are removed from the soil in farm produce; be it grain, fruit, vegetables, meat, milk, wool or cotton. These nutrients in turn must be replaced, if soil fertility is to be maintained. If not, the soil will become depleted of nutrients, and crop and pasture yields will fall.

Fertilizers are essential to maintain, or improve soil fertility, so farming can be both profitable and productive.

Plant uptake of nutrients

In 1840, the German scientist Justus von Liebig published his book, "Organic Chemistry in its Application to Agriculture and Physiology".

In it, he rejected the theory that plants obtained their food from humus. He showed that plants took carbon dioxide, water and ammonia from the air and the soil, and advocated the use of mineral fertilizers to supply other elements that might become depleted in soils.

Liebig was the first to demonstrate that plants take up nutrients in the inorganic or mineral form, and not the organic form.

Before nutrients present in the organic form can be used by plants, they must first be changed to the inorganic form.

Plants are not able to distinguish between the source of the inorganic nutrients they use, be they from the decomposition of organic matter or rocks and soil minerals, or from fertilizer.

Organic vs Mineral Fertilizers

There is no scientific evidance to show that food grown with organic fertilizer is more wholesome, nutritious, or better than that grown with mineral fertilizer.

The choice between an organic or mineral fertilizer should be based on such factors as cost and ease of application, not on a misconception that organic fertilizers are somehow better than others.

Organic fertilizers are not available in sufficient quantity to meet the total demand for fertilizer, either in Australia or overseas. They suffer from the disadvantages of low analysis i.e. they contain less nutrients per kilogram, low plant availability of contained nutrients, and difficulty in handling. They have to be applied at much higher rates than mineral fertilizers. Their use, on economic grounds, is largely confined to areas close to their source.

The Role of Organic Matter

Organic matter plays an extremely important role in the soil, as a source or store of nutrients, and in maintaining the soil's structure in a good physical condition.

Farming practices which maintain or improve the soil's organic status must be encouraged. These include pasture leys and green manure crops, the retention of crop residues, and reduced tillage practices. Cultivation accelerates the rate at which organic matter breaks down in the soil.

The use of organic fertilizers has negligible effect on overall soil organic matter levels.

For example, there is around 14 t of organic matter per hectare for every 1% organic matter in the top 10 cm of soil.

Considering that soil organic matter levels are typically higher than this, and organic matter is found throughout the profile, not just the top 10 cm, it can be seen that vast quantities of organic matter are present in most soils.

At typical application rates, organic fertilizers will not significantly change overall soil organic matter levels. It is therefore better to concentrate on sound management practices that return to the soil the much greater amounts of organic matter present in crop residues.

Fertilizers should be chosen on their effectiveness in supplying nutrients, not on the basis that organic fertilizers help improve the soil's organic status.

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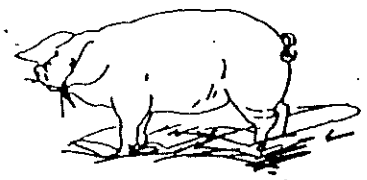
33. AGRICULTURE

BINDER
CATTLE
CEREALS
CORN
CULTIVATOR
DAIRY
DRILLS
FARM
FEEDSTUFF
FERTILISERS
FORK
GRAZING
GRUBBER
HARROWING
HARVEST
HAY
IMPLEMENTS
MACHINERY
MANURE
MILKING
PASTURE
PIGGERY
PLANTING
PLOUGH
POULTRY
REAPING
SEEDING
SHEAF
SHEEP
SOIL
SOWING
STOCK
STUBBLE
THRESHING
TILLAGE
TRACTOR

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

29. . . ON THE FARM

AERATOR
BARLEY
BUTTER
BYRE
CATTLE
COMBINE
COWHERD
CULTIVATOR
DAIRY
FARMYARD
FERTILIZER
FODDER
GRAIN
HARVESTER
HAYLOFT
HERD
INCUBATOR
IRRIGATION
KALE
LIVESTOCK
MAIZE
MANGER
MILK
OATS
PIGSTY
PLOUGH
POTATOES
POULTRY
REARING
SUGARBEET
TRACTOR
WAGON
WHEAT



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

DESIGN AND TECHNOLOGY

A programme of integrated Units by Scott Hollingsworth, Macarthur Girls Technology High School.

Programme 1: A Fungal Feast.

Unit 1: Constructing the mushroom farm

Context: The Built Environment.

Rationale: Most schools have space in store rooms, under stair-wells or under buildings which could be used for producing mushrooms. The process is simple and the materials are readily available, so that these spaces could be developed into successful production units.

Design Situation: The successful production of mushrooms requires control of their growing environment, particularly the temerature and humidity. The best results are gained by precise control, providing an environment of 25 C and 95 - 99% relative humidity for the vegetative stage and 19 C and 75 - 85 % relative humidity for the reproductive/harvesting strage. However, good results can be achieved without precise control.

Design Brief: Design and construct an enclosed space, in which temperature and humidity can be controlled to match the parameters in the design situation. This space should be large enough to contain the contents of at least one commercial mushroom kit (approx. 300 x 450 x 300 mm). The constructed cenvironment should also have some method of veiwing the interior and monitoring temerature and humidity without opening the enclosed space.

Resources and References:

NSW Mushroom Growers Association in conjunction with the Department of Agriculture, Rydalmere have produces a number of booklets on mushroom growing conditions.

Department of Agriculture (Biological and Chemical Research Unit), Rydalmere; (02) 683 9777.

Mushroom Growers Association; 2 Forbes St Windsor (045) 776877

Wet and Dry bulb thermometers (Hygrometers), plastic trays are available on requisitrion (Science section).

Plastic trays with clear lids and a heating pad are available on requisition (Agriculture section).

Polystyrene trays (the kind without holes) can be obtained from fruit shops or Kentucky Fried.

Programme 1: A Fungal Feast (continued)
Unit 2: **Operating the mushroom farm**
Context: Agriculture.

Design Situation: Mushrooms have two growth stages. The first is a vegetative phase in which the strand of fungal mycelium grow through the compost. For this to occur the fungus needs warm, very humid conditions. The second stage is where the mushrooms are produced. For this to occur, the fungus must be stimulated to produce the fruiting bodies. This is done by reducing both the temperature and the humidity. After being harvested the mushrooms can be used for a further design brief in the context of Food.

Design Brief: Utilising the controlled environment space constructed in the previous context, design and implement a production system that will enable mushrooms to be grown, harvested and marketed.

Resources: Mushroom kits are readily available from hardware stores, some nurseries and chain stores, eg Big W, BBC. These kits contain instructions outlining the processes.

Programme 1: A Fungal Feast (continued)
Unit 3: **Preparing mushrooms**
Context: Food.

Design Situation: Mushrooms are high in protein, complex carbohydrates and low in fats. They are easy to produce from recycled materials and so conserve resources. However, not many people use mushrooms, because they do not know how to prepare them.

Design Brief: Through research and experimentation using fresh mushrooms, you are to produce and market a mushroom recipe guide. This recipe guide should contain illustrations, where appropriate. You should also design a cover for the final compiled book.

Some basic thoughts on how Agriculture could fit into Design and Technology.

Peter Jones COLO HIGH SCHOOL
Scott Hollingsworth MACARTHUR GIRLS H/S

Introduction.

Using the flavour of the DAT Syllabus where the kids need to **design**, **make** and **market** a product, the following are just some of the possibilities in which agriculturalists could "play".

Needless to say teachers would need to consider the student's abilities and needs, teacher expertise that is available to be used and resources that are available.

There needs to be some sort of flexability built into the course structure as there are not many agricultural activities that can occur neatly within a 10 week block. For instance one could imagine students needing to escape from a Technics activity for 15 minutes while they check the progress of their crop.

Some Possible Design Projects For Ag. Teachers:

Growing some type of plants (either in soils or hydroponically). This could be vegetables, herbs, trees, flowers or even bean sprouts.

The students need to discover possible market and the markets particular requirements. The product needs to be researched - how it is grown, pests and disease, climatic requirements and cultural requirements etc.

The product would need to be grown and then sold. Packaging would need to be designed. The end product would be a year 7 or 8 student arriving home with at least some some plants or even a few dollars in the pocket.

Designing and making a simple hydroponic garden
There is lots of research available in this area. Students could use scrap materials or even different sized pots that have been filled with the one of the various mediums available.

The different types of nutrients, the various mediums, the types of plants that are suitable, the containers and the methods of watering systems that are used could allbe examined.

These containers could be sold with or without some type of plant material in them.

Making little hot houses
Students are able to construct different styles of glass/poly houses. If cost or resources are a limiting factor then they could make them for individual pots. Comparisons could be made between the various material coverings as well as those plants that are not covered.

This design project could be considered in the "Built Environment" prescribed context area.

Growing mushrooms
After researching the various climatic requirements etc.required to grow mushrooms students could set about trying to create this same environment. This crop is easily grown and has a ready market.

The Australian Mushroom Growers Association based in Windsor are only too happy to assist schools wishing to work with mushrooms.

This design project could be considered in the "Food" prescribed context area.

School Beautification
Students select an area of their school that needs some attention. They go about designing, and constructing gardens watering systems, lawns etc. The students may not be able to "market" this project so well but at the end there should be something very worth while.

This project could link well with the "Built Environment" context area.

Show bird production
As the title implies, students could move into the production of showing poultry. These animals could be kept in even non agricultural schools using some pretty crude facilities. There are many different poultry shows around the Sydney area (as well as the State). This animal activity could lead to the formation of Poultry Clubs at schools.

A problem associated with this activity is that birds need to be close to the point of lay (or older) at showing time. It means that this doesn't fit neatly into a 10 week period.

This project could link well with the "Liesure and Life Styles" context area.

Calf showing
A possible area of interest would be the breaking in and preparation of calves(cattle) for showing. There are several calf shows in the Sydney area. There would need to be some careful linking of the timing of this activity and the time of the calf shows.

This project could link well with the "Liesure and Life Styles" context area.

Producing Broilers
This activity fits well into a 10 week period. Many schools already have a broiler unit functing. Students could run the enterprise themselves after researching many areas associated with this type of production. It would be possible to have this activity pitched at a wide range of students. It could be possible for students to carry out food conversion figures and even calculate gross margins.

This project could link well with the "Agriculture" context area.

Sheep Coats
The technology associated with the need for sheep coats is not new. The skill of designing a functional sheep coat out of old layer bags is however a challange. there are lots of activities linked through to the growth of the fleece over a year, the most important part of the fleece that needs to be protected etc.

This design brief links the Home Economics Dept with the Aggies. This design project could also be considered in the "Clothing and Accessories" prescribed context area.

Aqua Culture
In this design project fish, yabbies or waterlillies would be grown. depending on the resources availble it may mean that you have just a couple of fish tanks in the back of the class room. (I wonder if there is a market for taddies ?)

Worm Farming
A simple design project that has a ready market with fisherpersons, composters, and gardners (what about restraunts ?) There are lots of experiments that could be done so as to develop the quickest growth rates.

Silk Worm Farming
This design project was probably the first attempt that many of the readers of this material had a go at making their first million dollars. "Silk worm farming" is one of the design projects that is written up in detail in this document.

Bees
This is an easy design project that is well documented. There is a ready market for bee products other than just honey. There are also many activities linked to this area such as designing a honey label to building supers.

Fibre Production or Oil Production
There are several different plants that could be grown so that a students could see the development of a plant product. This product could then be manufactured by the students so as to obtain the finnished product. Cotton, flax, kenaf, bamboo, lavender, tea trees are just some of the possible plants that could then be grown. The end product could be unbleached paper or fragrant oils.

Designing an Irrigation System
This design project could suit a wide range of student ability groups as the finnished product coud range from a few mini sprinklers on a piece of poly pipe to an automatically controlled system covering several gardens.

This design project works in with the "Engineered Systems" context area.
Soil Additives

Making a Multipurpose, Ergonomically Friendly Agricultural Tool
Under the "Manufacturing" context area, and with a link to the teachers in the technics are, students could produce a tool of their own design that would assist them with some activity on the farm.

Controlling Erosion On The School Grounds
Many schools have got some sort of soil erosion. By working on what has caused it and then repairing the damage students would not just be working in Design and technology but also working in the Environmental Education area.

Designing And Making An Information Package On Some Type Of Agriculture

One could consider this as a major assignment of sorts. The design project could be on hores, safety on the farm or anything. The completed product could take many different forms eg a vidio, a play, a book.

This design project could be under the "Information and Communications" context area.

Designing A Simple Recording System For a Farm

The role of computers could be brought in here with spread sheets and data bases. May be the students could even design something that could make the role of Ag. teacher just a little easier.

UNIT TITLE	Food for Thought.
CONTEXT	Food.
DESIGN SITUATION	Much of what we eat has been processed. Things are added and things are lost
DESIGN BRIEF	You are to prepare a fresh vegetable in such a way that you can compare the taste and recipe with a commercially prepared alternative. For example you might make tomato soup and compare it to a commercial canned soup. Before preparing your food design a marketing strategy to sell the product at school.
RESOURCES SKILLS - RESEARCH/	DIMENSIONS After harvesting your own grown vegetables or purchasing them you will need to research a recipe that can turn this fresh produce into soup or juice or another prepared food product. Compare this with the list of contents on the label of a commercial product. (Possible assessment.) • What are the differences? • What are food additives? • Does the commercial product contain food additive 621? What is 621? Why is this added to the food? • What other things have been added to the natural vegetable? Prepare your food according to the recipe. Organise other students or teachers to participate in a taste test of your recipe compared to the commercial food. You might fwant to do a blindfold test or a 'brand X'. • Which one did they like the taste of? Why? • Which one did they like the look/colour/texture of? Why? (Possible assessment task.) Research a market for your product around the school. Design a label, container and advertising that will enable you to market the product. Produce or recycle a container, produce lables, logos and advertising material using paint or draw packages on the computer that will assist you in selling your product. Present your marketing presentation to the class, detailing the features, benefits and advantages of your product over that of your commercial competitor.

(4C) Scott Hollingworth 1

YR 10

AQUACULTURE

DESIGN SITUATION

In the current economic climate, the ability of farmers to diversify and efficiently utilise all the physical resourses of the farm may be necessary to maintain economic viability.

One alternative form of agriculture which can use a previously under utilised area is aquaculture, where the farmer is able to use farm dams to raise and produce fish, invertebrates and plants.

DESIGN BRIEF

You, as managers of MACARTHUR PARK have decided to diversify from predominantly grazing enterprises into aquaculture. Your team is to research types of aquaculture, design an aquacultural system, construct, operate and market at least one type of animal or plant, grown under aquaculture.

DESIGN PARAMETERS

Each team will be supplied with a fibreglass section of pipe, 1200mm in diameter by 1500mm deep, which you may choose to use. There is also a communal electric water pump and lengths of PVC and polythene pipe.

Phase 1 Research

You will need to **investigate** various types of aquacultural enterprises and **consider** the practical aspects of farming these animals & or plants, as well as the potential markets for these products. How easy are stock to obtain? What are their nutritional requirements? How many can you raise? How long does it take before they are marketable? Does the final product have to be processed before it can be marketed?

(4) Scott Kellingworth

Phase 2 Design

After you have decided on what animals/plants your team is to produce, you will need to **draw up a plan** of how you will construct your tank. Are you going to use the 1200mm pipe supplied? if so, how are you going to waterproof the bottom? What materials are you going to use? If you are not going to use the pipe, what alternatives have you devised?

You will also need to **develop a systems operation diagram** for your aquacultural enterprise. What are the inputs you intend to use? What are the costs incurred? What processes and interactions are important to the successful operation of your aquaculture unit? What are your intended outputs from the system? How do you intend to monitor the operation of the system and the growth of your animals/plants?

Your team should **log all details** of intentions, actions and alterations, stating the reasoning behind all developments.

Phase 3 Construction and Operation

Once your team has agreed on a method of construction and operation you may **implement** your design. How did you seat the tank on unlevel ground? How successful were you at waterproofing the bottom? What alterations did you make to the initial design? What necessitated these changes?

Once you are satisfied that your unit is capable of supporting your chosen animals/plants you may **introduce** them. How successfuly were they introduced? Do you foresee any alterations to your system of operation?

Phase 4 Harvesting and Marketing

How is your produce going to be harvested? Will you have to re-stock your aquaculture unit from outside? Will you be selling your harvested outputs live? What processing, if any will you have to do to your harvested outputs before you can sell them? Where are you going to sell them? What sort of marketing strategies are you employing to create interest in your products?

Phase 5 Evaluation

How successful do you feel you have been in devising and implementing an aquaculture unit? What aspects would you change for your the next production run of your aquaculture unit? Do you see aquaculture as a viable form of agriculture?

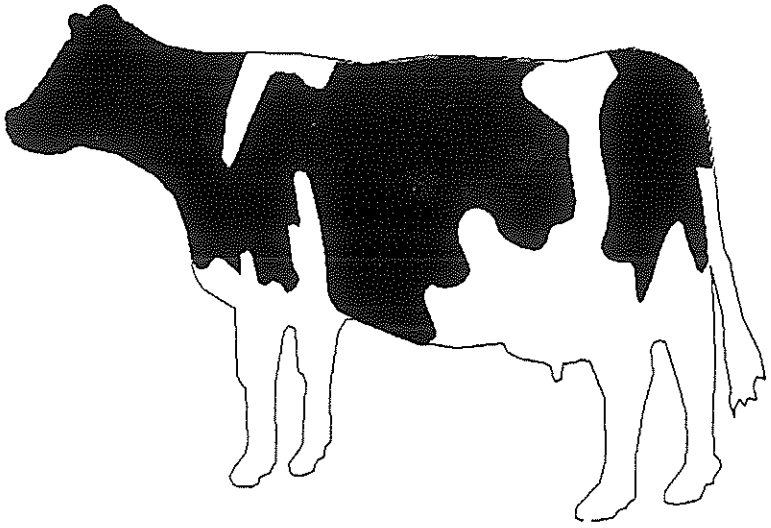
DESIGN & TECHNOLOGY PROGRAMME
UNIT 1 CONSTRUCTING A GREENHOUSE.

UNIT TITLE	Controlling the Environment
CONTEXT AREA	The Built Environment
DESIGN SITUATION	Many of the herbs and vegetables we enjoy only grow during certain seasons of the year. crops such as tomatoes grw best in summer. So, how can we alter the growing environment of these plants so that we can produce them out of season?
DESIGN BRIEF	Design and construct a simple hothouse that will enable you to grow tomatoes or other vegetable or herb crop as quickly as possible all year round.
RESOURCES PEOPLE / PLACES	A visit to a local nursery, the school farm (if you have one and it has a hothouse), the Dept. of Agriculture or a farm which utilises hothouses commercially will allow you to experience the differences between the internal environment of the hothouse and the natural environment outside. • What are these differences? • How are these differences created and controlled? • Ehat materials are used to construct these hothouses? • What other materials could be used?
INFORMATION	Many gardening or horticulture books will have ideas on how you can construct a hothouse. Using library and text book references **research** different designs and materials that could be cheaply obtained with the aim of constructing a small hothouse.
SKILLS RESEARCHING	Decide what types of plant(s) you would like to grow in the hothouse and **research** their growing conditions, particularly size of the plants at harvest, as this will have a direct bearing on the size of your hothouse. (Possible assessment task)
DESIGNING	**Prepare** orthogonal and perspective drawings of the designof your hothouse design. Include materials to be used and intended dimensions. (CAD excercise - Possible assessment task).
MAKING	**Discuss** the feasibibility of your design in class. **Construct** the hothouse according to you design.
EVALUATING	**Log** the stages of construction. **Record** changes to your design as construction occurs and **state** why these changes have occured.
COMMUNICATING	**Present** to review of your completed hothouse. Include reasons for final choice of materials and an **evaluation** of its performance. (Possible assessment task).
DOMAINS PERSONAL	Hothouses are becoming a feature of many backyards. Why is this so? They enable people to grow a range of plants previously impossible
COMMERCIAL	Many more commercial vegetable and cut flower farms use extensive hothouses. Why is this so? (There are cultural, historic, economic and technological reasons).
HUMAN IMPACT ENVIRONMENTAL ISSUES	Atmospheric pollution is contributing to a phenomenon known as the 'Greenhouse Effect'. How is this similar to the operation of a hothouse? Consider the materials used to construct your hothouse. Are threy recycled or recyclable? What materials could we recycle to construct a cheaper, more environmentally friendly hothouse?

DESIGN AND TECHNOLOGY PROGRAMME
UNIT 2 **HOTHOUSE PRODUCTION**

UNIT TITLE	Hot house production of vegetables.
CONTEXT	Agriculture.
DESIGN SITUATION	To be able to grow vegetables all year round, we need to provide them with a protected and controlled environment.
DESIGN BRIEF	You are to transplant seedlings into suitable contrainers and grow them to maturity in a controlled environment hothouse.
RESOURCES PEOPLE/PLACES	DIMENSIONS A visit to your local produce markets (e.g. Flemington) or a farm specialising in glasshouse production of vegetables will give you an idea of the range of vegetables available and some insight into the cultural requirements of these plants.
MATERIALS FINANCE	You will need to obtain seedling, growth containers, soil or potting mix and of course your constructed hothouse, or access to an already fabricated hothouse. Punnetts of seedlings cost $1.20 - $2.50 for a minimun of 12 plants. (Why use seedlings rather than grow the vegetable from seed?) Potting mix costs approximately $6.00/bag from your local nursery, and containers can be recycled from a number of sources: old pots, polystyrene fruit boxes, pep bottles.
SKILLS - RESEARCH/ INFORMATION - DESIGN - IMPLEMENT - COMPUTING - EVALUATING - COMMUNICATION INFORMATION HUMAN IMPACT ENVIRONMENTAL CONCERNS	You will need to research a number of factors regarding the growth of your selected vegetable(s), e.g. * How long does it take top grow to maturity? * How big does the mature plant grow? (It must be able to grow to maturity in the cotnainer you provide as well as the hothouse.) * What are its growth requirements in terms of soil, normal climate, water and fertiliser requirements? * Does it suffer from any pests or diseases? How are you going to tell if your hothouse is in fact causing the vegetable plant to grow more quickly? You will need to design a trial that will allow you to compare the growth and production of the plant(s) in the hothouse with plants of the same type growing in the natural environment i.e. outside. You will need to draw up a table so that you can record results. What are you going to measure? After establishing your trial you will need to record measurements of the temperature and humidity inside and outside the hothouse as well as measurements of how well the plants are growing. What aspects of plant growth could you measure? Once you have recorded measurements of how well the plants are growing and the temperatures (this needs to be done at least once/week) you can enter them in the computer and track the progress and final yield of your plants. What programme would enable you to do this? Present your evaluation of the performance of your hothouse to the class. * Did the hothouse cause the plant(s) to produce more? * Did they mature more quickly? * Did the hothouse cause greater or fewer pest and disease problems? * Did you have to use pesticides?
DOMAINS - COMMERCIAL PERSONAL	After harvesting your produce you have 2 options: 1. You may choose to markety the fresh vegetables. In which case: * Have you designed a marketing strategy? * Have you chosen a logo? * How are you going to package your produce? (Is it environmentally friendly?) 2. You may choose to eat the produce yourself. It which case go on to the next design brief.

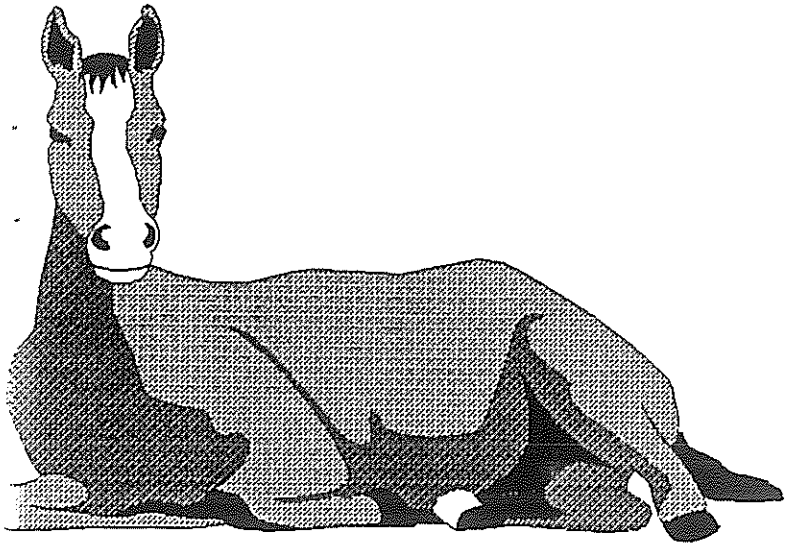
HAPPY AND HEALTHY ANIMAL HOLDERS



YEAR 8 DESIGN & TECHNOLOGY PROJECT

IN THE

AGRICULTURE PRESCRIBED CONTEXT



BY:

JOHN WALL
ROSARY COLLEGE,
TAMWORTH 2340.

YEAR 8 DESIGN & TECHNOLOGY UNIT 1

Unit Title: Happy, healthy, holders.

Prescribed Context: Agriculture/ Engineered Systems

Design Situation: Every animal, regardless of species, has to be restrained for some purpose at some time. The degree of restraint depends upon the reason for it. For some things a simple halter will suffice, but on occasion more severe measures are required. The important thing is to gear the degree of restraint to the need using the minimum necessary for the protection of you and the animal.

Keep in mind that domestic animals are not far removed from wild and that in some cases the more confining the restraint applied, the more they will struggle. Being restrained can be a frightening experience for an animal and they remember. The more traumatic their first experience is, the more difficult it will be to get them into a similar position next time it becomes necessary. If you are dealing with just a few animals, get them accustomed to mild restraint such as a halter early in life because it will make things much easier when they are older and larger.

Never forget that cattle, horse, and even mature pigs can hurt you badly. Much as we love them, they are animals and their actions and reactions are unpredictable.

Last, keep in mind that our primary advantage over animals is our capacity to reason. If you surrender that advantage and look upon restraint of the large farm animal as a contest of brute strength and determination, you will certainly lose and may get injured in the attempt. Be gentle, and compassionate, know what you want to do and how to go about it, and both you and your animal will fare much better.

Design Brief: Design a device which would enable a farmer to hold and lead a large farm animal. The device must be safe and humane for the animal to wear.

Prescribed Dimensions:

RESOURCES
People: Saddlers, Mr. Baker, Vets, Leather workers,

Materials: Raffia, Leather scraps, bailing twine, nylon & cotton rope, brass rings & buckles, chain & links.

Tools: Stanley knives, bolt cutters, pliers, glue,

Energy: In any manufacturing enterprise is an important consideration. Students should investigate the amount of energy required to make the products they have chosen to work with and take this into consideration when costing out materials.

Time: 6 weeks

Skills: Plaiting, animal handling, drawing, research, measuring, cutting, knot tying.

Finance: The amount of finance required will depend on the solution. Individual projects should not exceed ten dollars.

Information: Library, livestock behaviour text, Handy Farm Devices text, bush craft texts, bush leather work texts, show videos.

DOMAINS
Personal
Commercial/Industrial

Global: The project will be in the personal domain. However, it is possible that some of the products developed may have a commercial potential in the Australian Livestock Industry.

HUMAN IMPACT
Cultural Issues: Animals provide food and/ or transport in every country in the world. Restraining devices used in other countries will be examined briefly by students in their research into different materials suitable for the project. Students will also examine different mild restraint devices used by livestock handlers in other countries.

Environmental sustainability: This project will examine environmental responsibility and the effective use of resources in developing appropriate technologies. The students will become aware of the need for choosing a material to develop their restraint device that is renewable and the result of a sustainable system.

Ethics: Animal welfare is a prime concern of the designer working on animal equipment. Students need to be made aware of what cruelty is defined as, by both animal rights groups as well as the farming community.

Gender Issues: Some girls and boys may not have experienced the technologies and skills anticipated in this design project. It is essential that the needs of students are considered when demonstrating the technological processes and experimenting with a variety of tools.

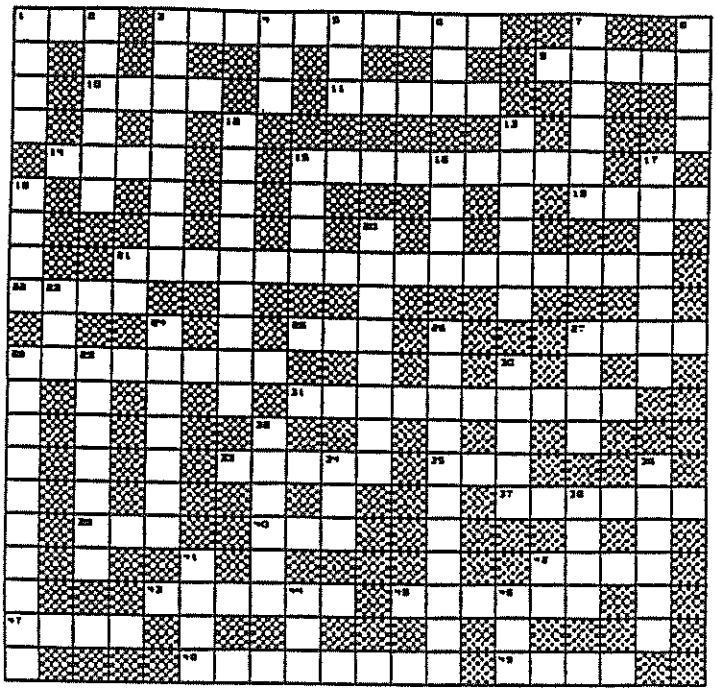
Historical Issues: The students will realise that the problem of how to restrain large animals to allow the treatment of injuries, etc. is not new. The students will investigate how animals were restrained in the past and how older designs can be modified for today's modern animal production enterprises.

Motivation: This project provides students with an opportunity to develop handling and husbandry skills with a large farm animal. Students will design a device that will benefit the animal as well as the handler.

Quality: A quality product will be durable, aesthetic and take into account the welfare of the animal. These characteristics of the product are the result of effective design, appropriate choices of materials and good manufacturing techniques.

John Wall
Rosary College,
TAMWORTH 2340.
04/02/93

PIGS IN AGRICULTURE



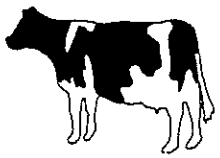
ACROSS CLUES

1. A L... OF DAY-OLD BREAD COULD BE PIG FOOD
3. OPPOSITE TO SMALL, BLACK PIG
9. GOLDEN RED TO MAHOGANY RED PIG BREED: D..O.
10. CRISPY BIT ON BACON
11. ELEMENTS NEEDED IN SMALL AMOUNTS
14. MATURE MALE PIG
15. SIMILARLY MARKED TO WESSEX SADDLEBACK
19. TO AVOID OVERCROWDING PIGS NEED A LOT OF ....
21. BLACK PIG WITH A WHITE BELT
22. PIGS ARE KEPT FOR ....
25. FEMALE PIG
27. '....Y PIG'
28. SIX TO TWELVE MONTHS OF AGE,WEIGHING 70 TO 100KGS.
31. SMALL WHITE? NO!
33. CAN THIS TYPE OF PIG PLAY RUGBY AND SING?
35. LEG JOINT
37. PIGS THREE TO FIVE MONTHS OLD WEIGHING 35 TO 60KGS
39. WOULD YOU DO THIS TO A DROWNED PIG?
40. SEVENTH OF A WEEK
42. NO FAT
43. CASTRATED MALE
45. PIG WRITING IMPLEMENT
47. NOT ODD
48. PIGLET DRINKING MILK FROM SOW
49. PIGS SHOULD DO THIS RAPIDLY

DOWN CLUES

1. .... AND OUT
2. A LITTER OF PIGS
3. ALL WHITE PIG WITH EARS THAT HANG FORWARD OVER THE EYES
4. TO SET
5. DRY? NO!
6. FACIAL TWITCH
7. PIGS STILL WITH THE SOW, AVERAGING ABOUT 6 OR 7KGS
8. NON-METRIC LAND MEASURE
12. BLACK PIG WITH WHITE ON FACE, FOUR FEET AND TAIL TIP
13. A FARROW OF PIGS
15. BOMB SCARES AT SCHOOL
16. FARMERS .... THEIR PIGS TO MARKET
17. PIGS TO BE KILLED FOR PORK
18. HOUSED PIGS CANNOT ....
20. ONLY REDHAIRED PIG BREED IN AUSTRALIA
21. WEIGHT (ABBR.)
23. ESTIMATED TIME OF ARRIVAL
24. SMELL DETECTOR
26. YOUR BRAIN SHOULD BE ..... ATTEMPTING TO COMPLETE THIS XWORD
27. ... OF PIG DOGS
28. ALSO CALLED A CHOPPER IS AN AGED PIG OF A HIGH WEIGHT
29. HELICOPTER OR BACKFATTER
30. PIGS 8 TO 15 WEEKS OF AGE WHICH HAVE NOT GROWN PROPERLY
32. AUTOMATIC .....
34. PIGS HOME
36. PIGS JUST TAKEN OFF THEIR MOTHERS
38. NOT SHUT
41. XMAS MEATS ON THE BONE
42. .. SPECS
44. YOU CAN GET A HAM SANDWICH AT PEATS RIDGE
46. GRUNTER

YEAR 8 DESIGN & TECHNOLOGY
HAPPY & HEALTHY ANIMAL HOLDERS
ACTIVITY LIST



The following activities have been used initially in a test run of this unit with a Year 8 technology and design class at Rosary College in Tamworth.

Activity Number	Activity Description	Activity Time
1.	What is technology sheet	50 minutes
2.	The Design Processes using fencing wire	50 minutes
3.	Brain Storming Spidergrams	50 minutes
4.	Computer design of company logo	100 minutes
5.	Looking at commercial halter designs/ leading trained cattle.	100 minutes
6.	Traditional Restraint methods worksheet	100 minutes
6.	Sketching restraint device prototype	50 minutes
7.	Manufacturing of protype halter using bailing twine	100 minutes
8.	Devise a material strength test	50 minutes
9.	Make a prototype out of bailing twine	100 minutes

(4E)

10.	Test prototype on animal	50 minutes
11.	Modify Prototype	50 minutes
12.	Manufacture Product	150 minutes
13.	Design Packaging	50 minutes
14.	Design Promotional Material	50 minutes
15.	Design 30sec Radio Commercial	100 minutes
16.	Display Final Product	50 minutes

Continued over...

WHO SAYS THERE'S NO MONEY IN AGRICULTURE??
Certainly not the Ag Teachers!!

"WITH THE GLOBAL BUDGET FUNDS DEPLETING RAPIDLY, THANK GOD FOR THE AG PLOT!!!



LESSON 1:

Aim: Define the word 'technology' and be introduced to the principals of the design process.

Activity 1: Ask students to place a tick alongside each word that they believe is a piece of technology:

ITEM	TECHNOLOGY	NOT TECHNOLOGY
Computer		
Combine Harvester		
Modern Wheat		
Hereford Cow		
Water pump		
Shovel		
Grinding Stone		
Hoe		
Fax Machine		
Cattle Crush		
Horse Bridle		
Fence Wire		

After completing the list go through it with the students and explainnthat every thing in the list is a piece of technology.
Ask students to write down their own definition of technology, compare this with the following definition from UNESCO in 1985:
" **to utilise tools, resources and systems to solve problems and to enhace control over the natural and man made environment in an endeavour to improve the human condition'.**

Activity 2:

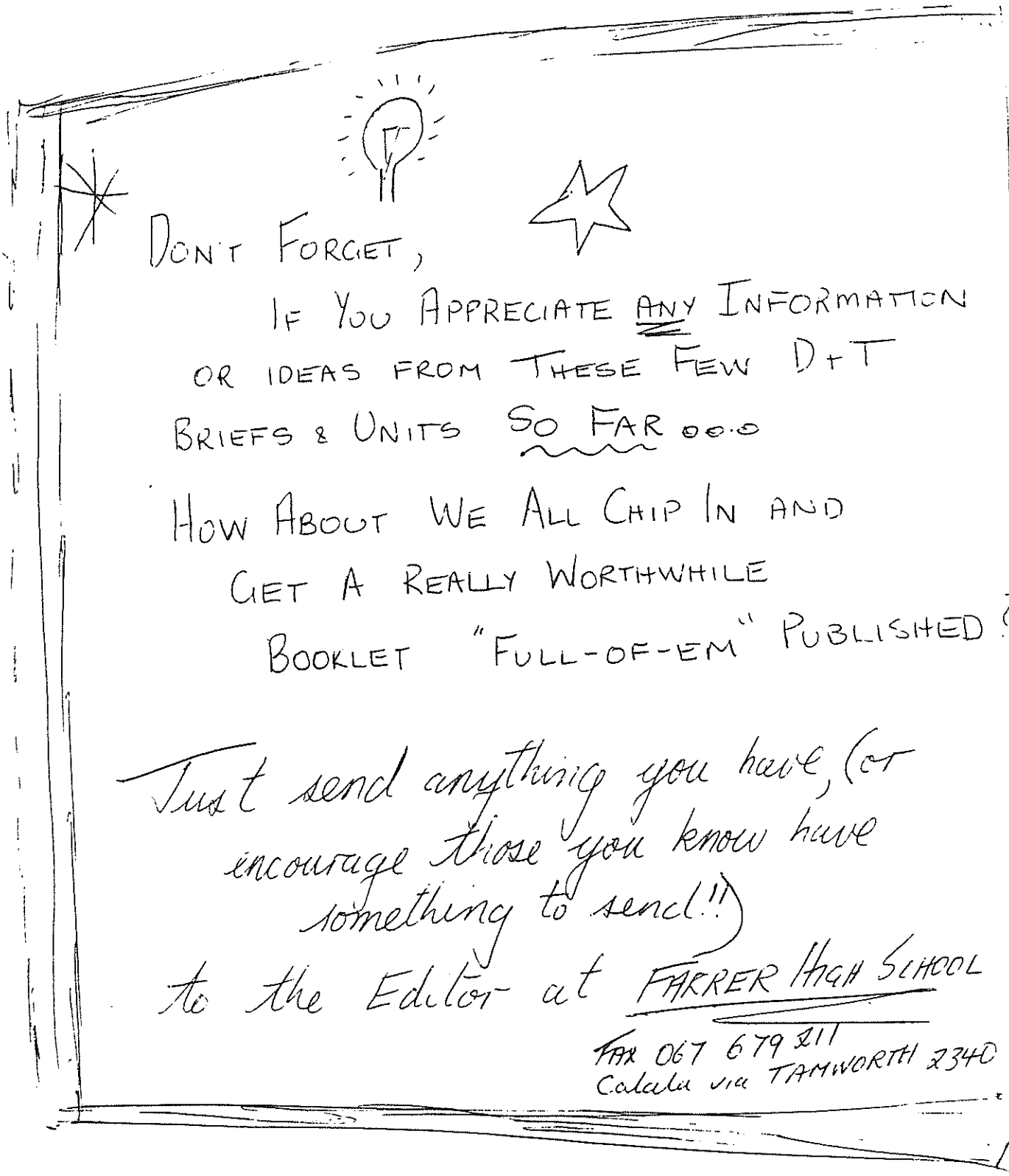
Explain to students the traditional role fencing wire has played in the repair and maintenance of farm machinery and farm structures. If possible find a piece of humerous poetry or a cartoon to help make the point that fencing wire is as important

piece of technology for the modern day farmer as it was for those in the early part of this century.

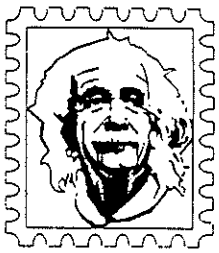
Give each student a small piece of soft fencing wire and ask them to design something that would fulfill a need in the classroom.

Activity 3:

Have each student present their design project to the class. After everyone has presented their design draw out from students the design process that the students went through in manufacturing their useful classroo item.



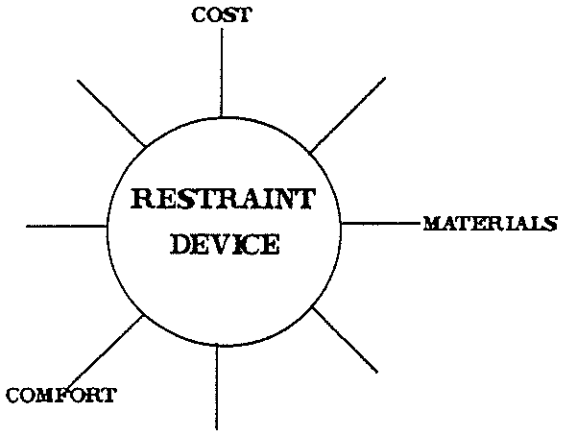
BRAIN STORMING
SPIDERGRAMS



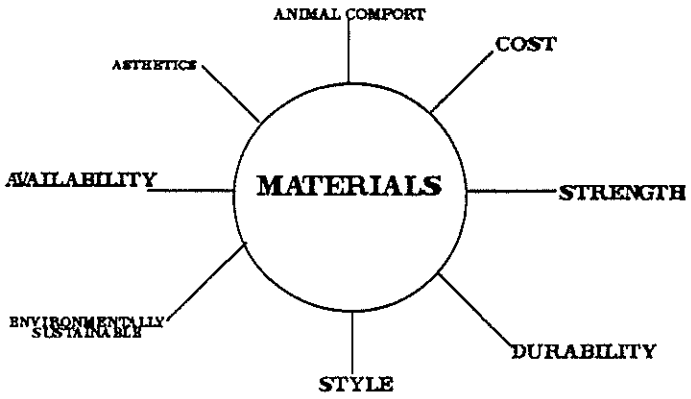
What is Brainstorming??

Brain storming is a process where you think about a word or a situation and then write down the first words or ideas that come into your head. Spidergrams are a form of brainstorming.

In the example below we have started a spidergram for the design of a restraint device for a large farm animal. Complete the spidergram (remember spiders have eight legs, therefore each idea will have eight relevent things we need to consider when looking at the word in the centre of the spidergram.



Once you have completed the spidergram above take each one of the words that you thought of and complete a new spidergram for that word. An example is shown below:



(52)

SPIDERGRAMS

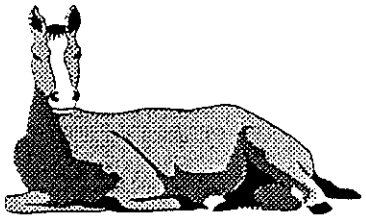
Fill the space below with
your very own spidergrams.

Start with the words 'restraint device'

MARK:

(53)

TRADITIONAL FORMS OF MILD RESTRAINT FOR LARGE FARM ANIMALS



Below are some pictures of different mild restrain devices that have been traditionally used by Australian and European Farmers. For each device shown list three advantages and three disadvantages for each type of device:

CATTLE RESTRAINT DEVICES:

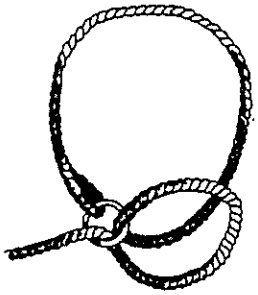
1. The Rope Halter:

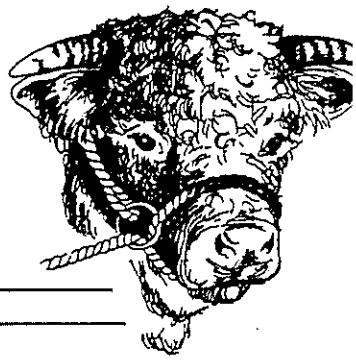


advantages: _____

disadvantages: _____

2. The Rope Halter with ring:



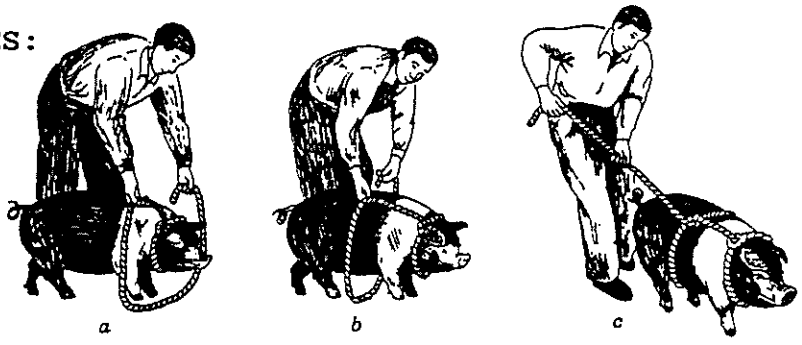


advantages: _____

disadvatages: _____

PIG RESTRAINT DEVICES:

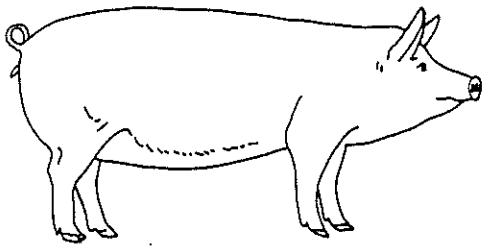
The Rope Harness:



advantages: _____

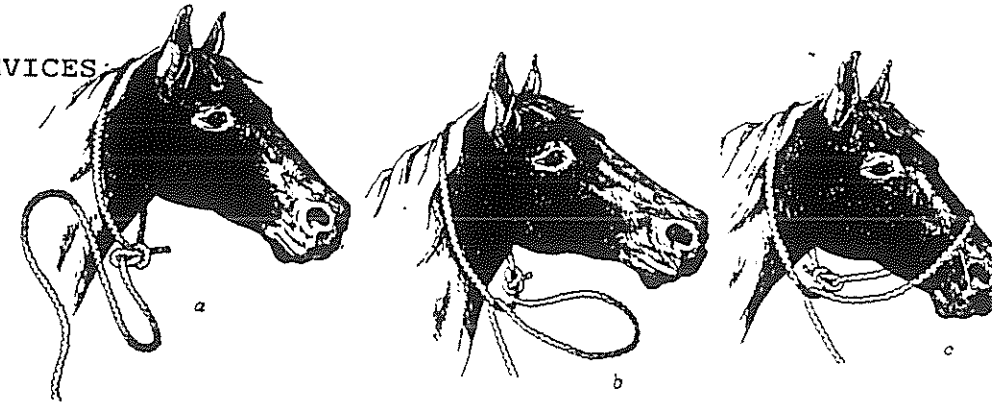
disadvantages: _____

On the diagram of the pig below draw your own restraint design. Why is your design better than the one shown above.



HORSE RESTRAINT DEVICES:

The lariet halter:



advantages:_____

disadvantages:_____

The leather halter:

advantages:_____

disadvatages:_____

SHEEP RESTRAINT DEVICES:

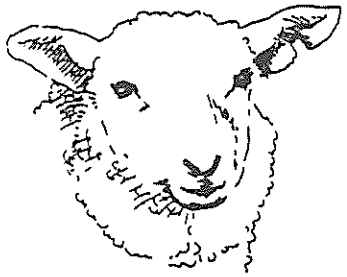
The leather show halter:



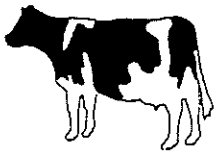
advantages:

disadvatages:

In the space below draw a device that could be used to restrain a sheep. What advantages does your design have above the leather show halter?



INVESTIGATING MATERIALS FOR HALTERS



INTRODUCTION:

Designers use many different types of materials when manufacturing halters and other restraining devices for large farm animals. What are some of the things you would need to consider when choosing what the type of material you will use for you restraint device?

STRENGTH TESTING:

Hopefuly you mentioned strength as one of the characteristics you would look at when selecting a material for your design product. In the space below draw a diagram of a strength testing device you could use to evaluate different materials.

TESTING MATERIAL SCIENTIFICALLY:

Materials testing is a science within itself. On the back of the page describe how you tested your materials. Remember to include such things as the aim, equipment, method, results (include a table and graphs if possible) and conclusion.

DECORATING AND STRENGTHING YOUR RESTRAINT DEVICE

INTRODUCTION:

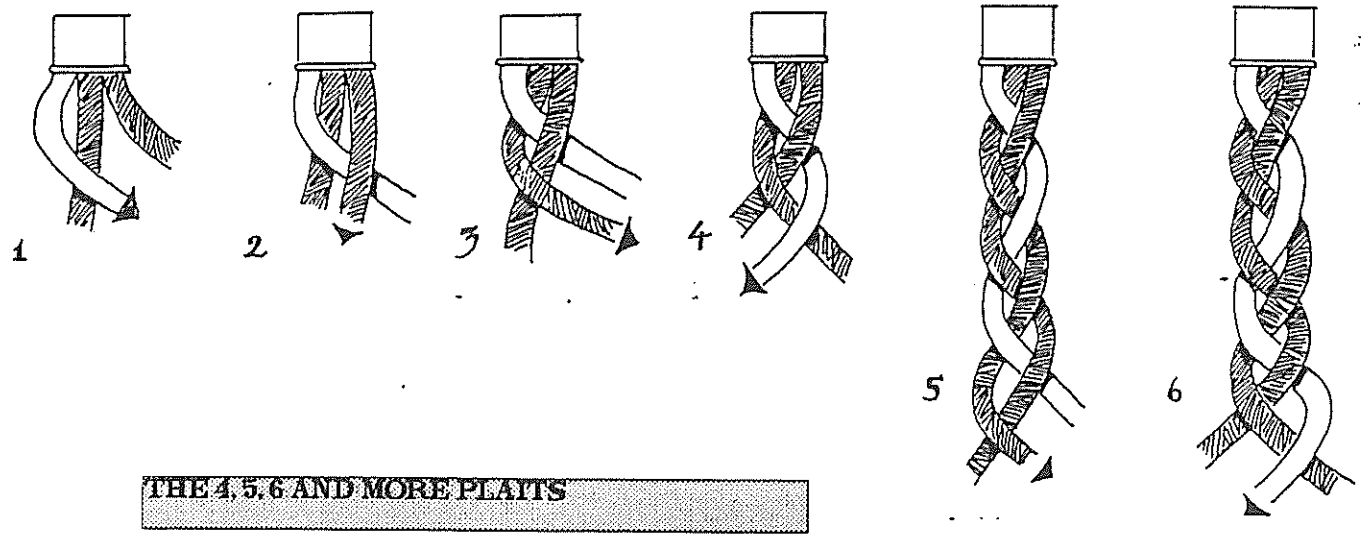
Whilst investigating materials for your restraint device you may have found that three or four strands of string are a lot stronger than a single strand.

Plaiting is a traditional bushcraft that enables strands of rope, leather or string to be joined together in a neat and decorative manner.

There are two types of plats used commonly by Australian craftsman, they are the **round plait** and the **flat plait.** The number of strands or strings in a plait also varies. The larger the number of plaits the wider the strap produced. In this sheet we will only look at the flat plait.

THE THREE PLAIT

This is the simplest of all plaits. It is worked the same way wether flat or round.



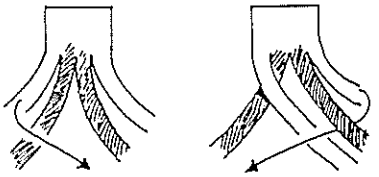
THE 4, 5, 6 AND MORE PLAITS

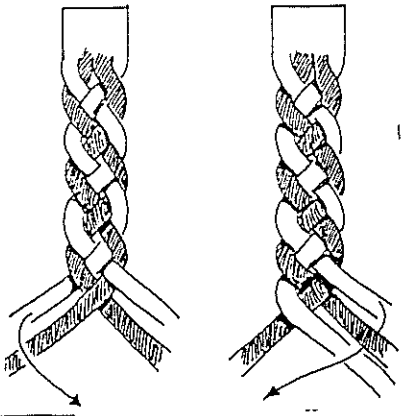
On the back page you will find explanations of how to plait larger nmbers of strands together than the three plait explained above.The general rules for flat plating are:

1. Divide Strand in the middle.
2. Take the outside left strand and move it to the middle in an over under order.
3. The outside right strand is then move to the middle in

the same sequence.

Four Plait (flat)

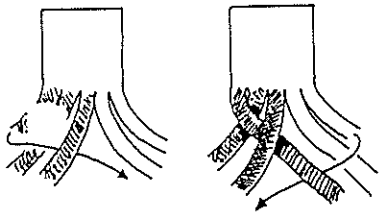


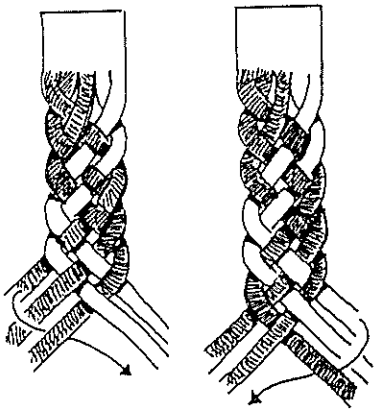


Bring the outside left strand over nd into the middle, then bring the utside right strand under-over. ontinue this sequence.

When finishing turn the job over

Five Plait (flat)

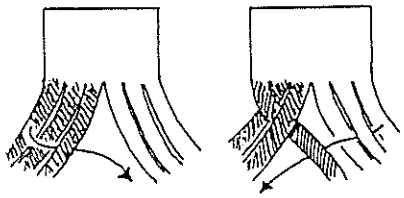


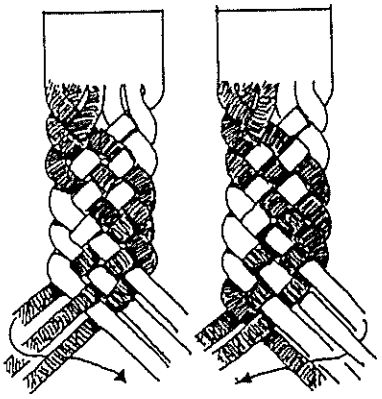


Bring the outside left strand over-under, then bring the outside right strand over-under.

Finish off the same way as the four plait.

Six Plait (flat)

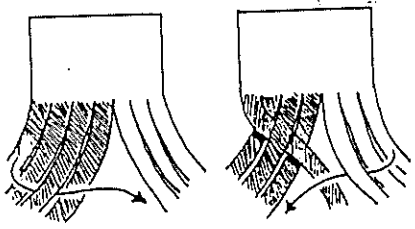


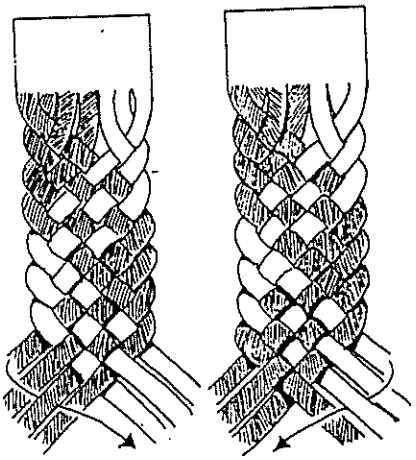


Bring the outside left strand over der, then bring the outside right strand under-over-under.

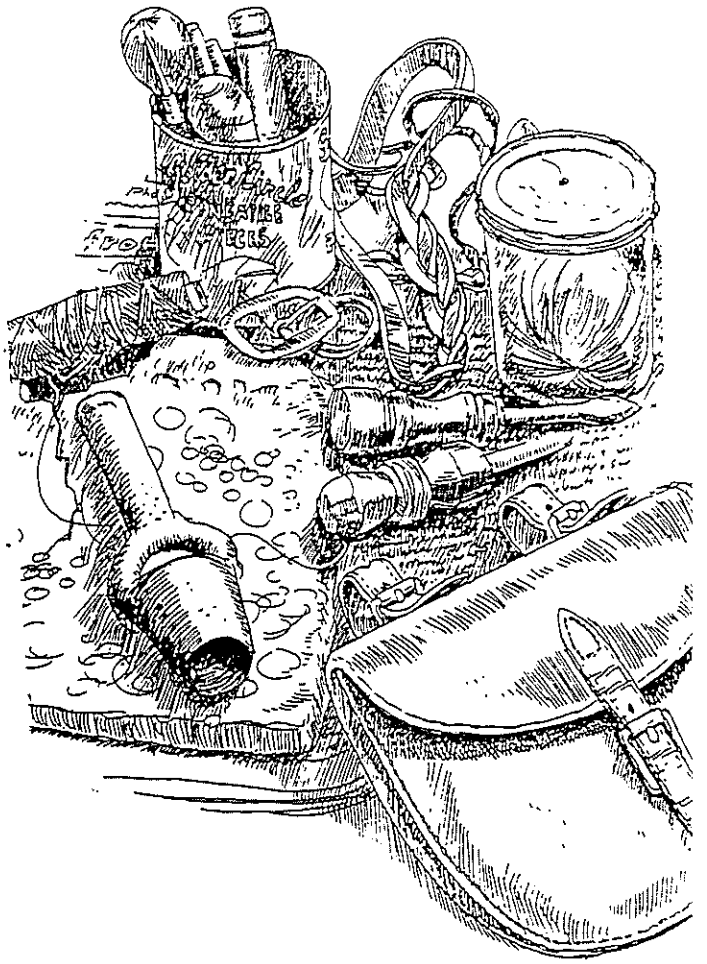
Finish off the same way as the four plait.

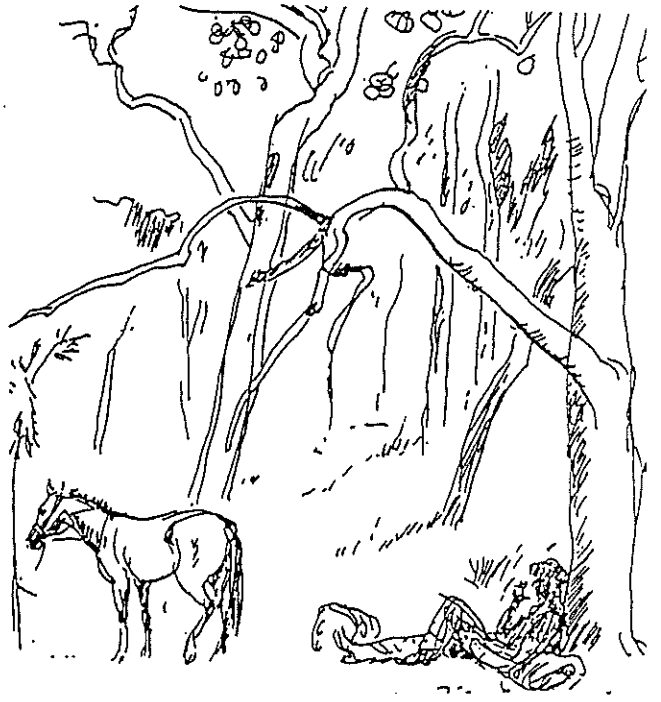
Seven Plait (flat)





Bring the outside left strand over-under-over, then bring the outside right strand over-under-over. Finish off the same way as the four plait.

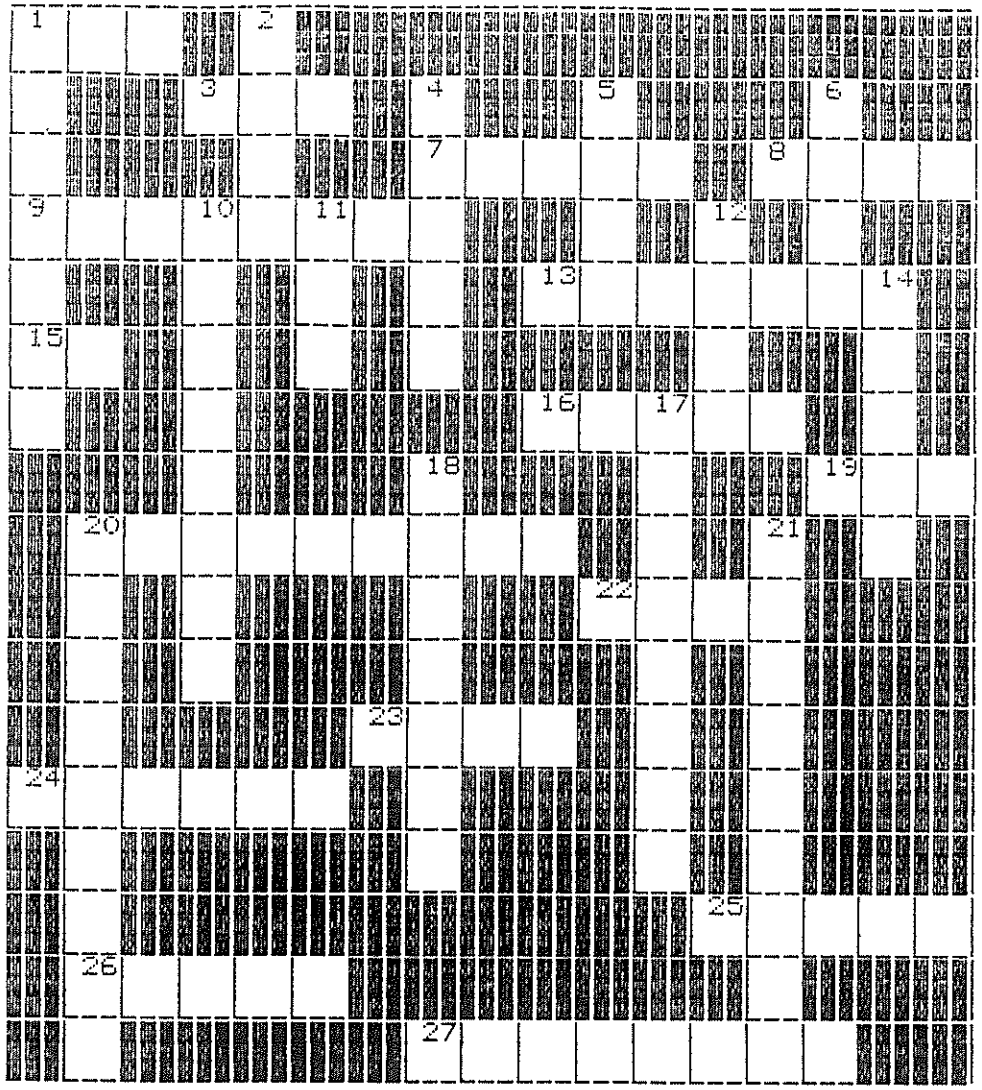




(5t)

Year 7 cattle breeds
year 7 breeds puzzle

FARRER AGRICULTURE
NAME_____



ACROSS EVALUATION COPY

1. .... taurus means european breeds of cattle
3. female beef animal after she has had a calf
7. beef breed, type of large sausage
8. name given to meat from cattle
9. scottish breed with very long hair
13. asian breeds of cattle belong to this group
15. initials for method of replacing a bull in a dairy
16. small insect like animals that affect cattle in Northern Australia
19. baled material often fed to cattle
20. breed that comes in red or white or roan colors
22. cows milking stalls in a dairy are called_____
23. mature male beef animal
24. the smallest of the dairy breeds, honey colour
25. the fatty part of the milk that floats to the top
26. Black beef breed origin in Scotland
27. large black and white dairy breed

DOWN EVALUATION COPY

1. large asian breed with floppy ears, hump, come in a range of colours
2. without horns
4. milk producing organ of a cow
5. head items that polled animals dont have
6. indian breed, hump behind head
10. beef breed, Red with white patches.
11. initials of Australian bred Dairy breed suited to the tropics
12. liquid product of cows extracted in a dairy
14. semen from a bull may be stored in a frozen state in a small plastic _____
17. italian breed, very large
18. a fermented milk product eg. yoplait is this
20. European breed, similar color to hereford but lighter
21. australian Dairy breed, red and large

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NATIONAL ASSOCIATION OF AGRICULTURAL EDUCATORS

Muirfield Technology High
Barclay Rd.
North Rocks 2151
July 30, 1993.

Dear Colleagues,

On behalf of the organising committee, I have great pleasure in inviting you to participate in the **Eighth Biennial Conference** of the N.A.A.E. to be held at the Mountain Heritage Country House Retreat Katoomba from **January 23-27, 1994**.

The theme of the conference is ***Technology Education For A Sustainable Future in Agriculture.*** In keeping with this theme the goals of the conference are

1. to facilitate the professional development of teachers of agriculture
2. to provide up-to-date information from producers, business and research institutions on current sustainable practices in agriculture
3. to provide a forum for the exchange of ideas on the impact of current and future directions in national agricultural and technological education
4. to increase the effectiveness of teachers of agriculture across Australia.

At this stage we are planning a comprehensive program with a variety of keynote speakers from rural business, research, education and support groups. Attached is a copy of the draft program, please note the conference tours which should allow interstate delegates to experience the diverse nature of agricultural pursuits in the region and allow for appropriate social interaction.

Travel:

All delegates are requested to arrange their own transport to and from the conference. Interstate delegates will be given details of methods of travel to Katoomba at a later date.

(6C)

Accommodation:

Mountain Heritage Country House Retreat Katoomba is a restored mountain guesthouse with excellent conference facilities (and pool) in the centre of the picturesque Blue Mountains of N.S.W. The management of Mountain Heritage have offered us very competitive rates for the duration of the conference including:

* a package of **$350 per person** twin share all breakfasts, dinners and 4 nights
* daily rates of $95 per person twin share dinner, bed and breakfast
* accompanying spouse dinner, bed and breakfast $70 per day
* accompanying children under 10, dinner, bed and breakfast $40 per day

Registration:

Full registration of $175 entitles delegates to admission to all confernce sessions, bus trips, lunches, morning and afternoon teas and the confernce dinner and J.S. Sutherland Memorial address

Daily registration of $50 entitles delegates to attend that day's sessions lunch and morning and afternoon teas.

Accompanying spouse and children are welcome on bus trips at a small extra cost.

Funding:

Now is the time to seek financial support to attend this conference. Make application to your school's human resource development committee and seek support at regional level. Remember registration, accommodation and travel costs to such conferences are tax deductible.

Deposits:

A $20 registration deposit per delegate is requested to reach the organising committee before September 30, 1993 to enable further planning.

Similarly a $50 accommodation deposit per delegate before September 30 will facilitate conference planning.

Cheques should be made payable to The National Association of Agricultural Educators (N.A.A.E.) a nd posted with the information sheet on the following page.

If you have any questions or suggestions about the conference please contact me as soon as possible . Looking forward to seeing you there!

Yours sincerely
Jenni Wilkins
Secretary N.A.A.E.

Jenni Wilkins

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DRAFT PROGRAM

EIGHTH BIENNIAL CONFERENCE OF THE NATIONAL ASSOCIATION OF AGRICULTURAL EDUCATORS.
Mountain Heritage Country House Retreat
Apex St. Katoomba, Blue Mountains, N.S.W.

JANUARY 23-27, 1994.

SUNDAY 23.

pm Arrival of delegates.
Registration.
Light meal/BBQ
Informal welcome.

MONDAY 24.

am Breakfast
Arrival and Registration of delegates.
Official welcome, introduction and opening of conference.
Morning tea
Conference address
Lunch

pm Conference address
Afternoon tea
Conference address
Dinner at Mt. Heritage and Biennial general meeting of N.A.A.E.

TUESDAY 25

am Breakfast.
Bus trip local area nurseries, mushroom growers etc.
Lunch at Mt. Heritage.

pm Conference address
Afternoon tea.
Conference address
Semi-formal conference dinner
and J.S. Sutherland Memorial Address at Mt. Heritage.

WEDNESDAY 26 (Australia Day)

am Breakfast.
Full day bus trip Western Slopes/ Tablelands of N.S.W.
Picnic/BBQ lunch

pm Bus tour continues
Dinner and wine tasting Mudgee Winery -bus return to Mt. Heritage.

THURSDAY 27

am Breakfast
Conference address
Morning tea.
Conference address
Conference close and farewell
Lunch (Checkout)

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EIGHTH BIENNIAL CONFERENCE OF THE NATIONAL ASSOCIATION OF AGRICULTURAL EDUCATORS

Technology Education For A Sustainable Future in Agriculture.

January 23-27 1994.

Mountain Heritage Country House Retreat
Apex St. Katoomba Blue Mountains.

To express your interest please return the portion below :

Name:_____
School/Organisation:_____
Postal address:_____
Telephone:_____ Fax:_____

*I have enclosed a $50 deposit for registration Yes/No
*I require interstate travel arrangement assistance Yes/No
*I require accommodation at Mt. Heritage Yes/No
*I have enclosed a $50 deposit for accommodation Yes/No

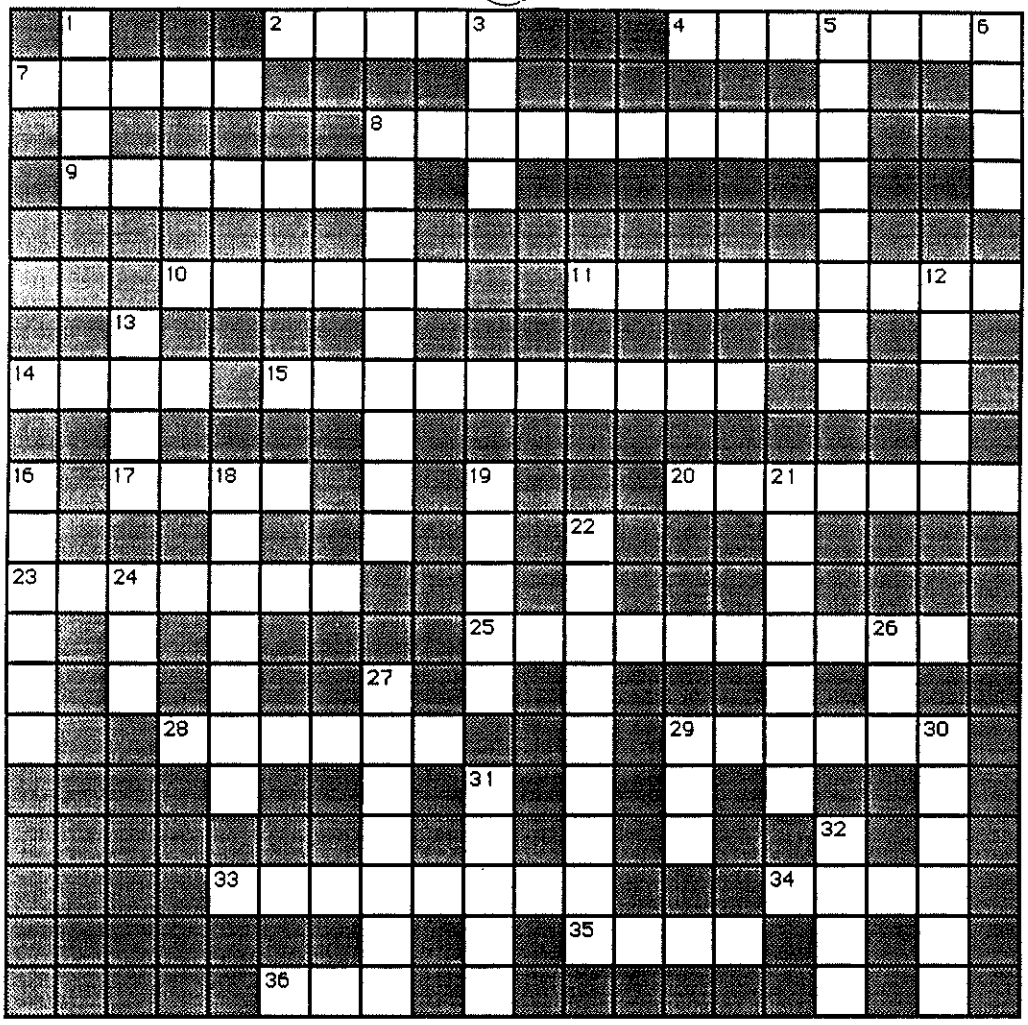
Please list names of accompanying spouses/adults/children who require accommodation.

Please send to: Jenni Wilkins
Muirfield Technology High School
Barclay Rd.
North Rocks 2151
ph. 02 8722244(school) & 02 5609969 (home)
fax. 02 8714106

before September 30, 1993

POULTRY

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Across

2. Small poultry that are used for meat.
4. A common breed of duck
7. Poultry meat can be purchased frozen or _____
8. The process of turning an egg into a chick
9. Eggs are a rich source of this
10. The light _____is a breed of fowl
11. A type of poultry that sometimes rests in pear trees!
14. The mouth of a bird
15. A breed of fowl that was developed in Australia and is black in colour
17. A type of poultry that likes water
20. The white part of an egg
23. A meat chicken
25. A system of housing commonly used for meat chickens
28. A female fowl before her first moult
29. A type of poultry that are popular at christmas time
33. Looking after newly hatched chicks
34. The correct name for a "chook"
35. A common ingredient in cooking
36. A mature female fowl

Down

1. The first part of a bird's digestive system
3. These chew on the skin and feathers of birds
5. Shining a bright light through an egg to check its quality
6. This part of an egg is yellow
8. _____ production systems are commonly used by poultry farmers
12. A type of poultry that rhymes with juice
13. Egg shells should be ____
16. A cross between two or more breeds
18. This mineral is needed to make egg shells
19. A breed of fowl_ _____ Island Red
21. The cage _____ system is commonly used to keep laying hens
22. Extensive poultry systems are also known by this name
24. A boiler is an ___ laying hen
26. Used to see with
27. A breed of fowl well known for its high egg production
29. A male turkey
30. The legs of some types of poultry are this colour
31. A baby fowl
32. Before you can eat a chicken you need to ____ it

APPLICATION FOR MEMBERSHIP TO THE N.S.W.A.A.T.

NAME:_____

SCHOOL:_____

SCHOOL ADDRESS:_____

_____

POST CODE: _____

SCHOOL PHONE:_____

SCHOOL FAX: _____

MAILING ADDRESS: leave blank if same as above.

_____

_____ _____

** Government School Non-Government School (Please Circle)

I ENCLOSE PAYMENT OF **$40.00** BEING THE SUBSCRIPTION FOR THE NEXT BI-ENNIAL PERIOD AS A FULL INDIVIDUAL MEMBER OF THE N.S.W.A.A.T.

OR

WE ENCLOSE PAYMENT OF **$60.00** BEING THE SUBSCRIPTION FOR THE NEXT BI-ENNIAL PERIOD AS A CORPORATE BODY MEMBER OF THE N.S.W.A.A.T.

OR

I ENCLOSE PAYMENT OF **$20.00** BEING THE SUBSCRIPTION FOR THE NEXT BI-ENNIAL PERIOD AS A STUDENT MEMBER OF THE N.S.W.A.A.T.

NOTE: THE BI-ENNIAL PERIOD ABOVE WILL CEASE AT THE JANUARY 1995 A.G.M. TO BE HELD AT THE NEXT BIENNIAL CONFERENCE. i.e. membership covers 2 years from 1993-1995.

Full membership from new members wishing to join in the second year of the biennium will be charged a pro-rata fee of $20.00.

PLEASE FORWARD YOUR COMPLETED FORM ABOVE **ALONG WITH YOUR FEE** TO:

JOINT COUNCIL
AGRICULTURE
P.O. BOX 577,
LEICHARDT 2040.

EVALUATION / QUESTIONNAIRE

*YOUR ASSISTANCE IN COMPLETING THIS EVALUATION AND QUESTIONNAIRE WOULD BE APPRECIATED AND WILL ASSIST IN THE PLANNING AND DEVELOPMENT OF FUTURE ISSUES.
*ANY ADDITIONAL COMMENTS ARE WELCOMED AND YOU ARE REQUESTED TO SEND ANY INFORMATION, WORKSHEETS AND RESOURCES THAT YOU FEEL WORK WELL FOR YOU AND THAT OTHERS MAY BENEFIT FROM.
*FEEL FREE TO BE ANONYMOUS IF YOU WISH.
*PLEASE RATE THIS ISSUE OF B.A.A.T. IN TERMS OF THE CONTRIBUTION YOU FEEL THE ARTICLES MAY HAVE TOWARD YOUR TEACHING, AWARENESS &/OR PROFESSIONAL DEVELOPMENT.
(placing a ***tick*** in the box next to the article is all that is required)

ARTICLE OR SECTION	VERY VALUABLE	OF SOME VALUE	VERY LITTLE VALUE
presidents report			
editors report (letters to editor in future??)			
farm safety notes			
alternate animal production			
crosswords/jumbles			
animal and plant data, notes and stats			
design and technology units			
Order forms/fliers/general resources			
essay instructions			
"Bits and Pieces" of information			

PLEASE LIST IN THE SPACE BELOW ANY **GENERAL COMMENTS** YOU HAVE CONCERNING **THIS ISSUE** OF B.A.A.T.

WHAT TYPE OF INFORMATION OR CONTENT **WOULD BENEFIT YOU MOST** IN FUTURE EDITIONS OF B.A.A.T.?

PLEASE TAKE A MINUTE TO FILL THIS OUT AND MAIL TO :

S.HEMMINGS (B.A.A.T. EDITOR)
FARRER M.A.H.S
CALALA VIA TAMWORTH 2340

OR WHY NOT *FAX STRAIGHT AWAY* TO FARRER ON **067 679451**
ANY MATERIAL YOU MAY HAVE FOR INCLUSION CAN BE SENT OR FAXED TO THE ME AT FARRER AT ANY TIME!!
LET'S MAKE THE INFORMATION FLOW GOOD FOR N.S.W. AGRICULTURE TEACHERS!! ITS YOUR JOURNAL! NAME AND SCHOOL: (optional) _____