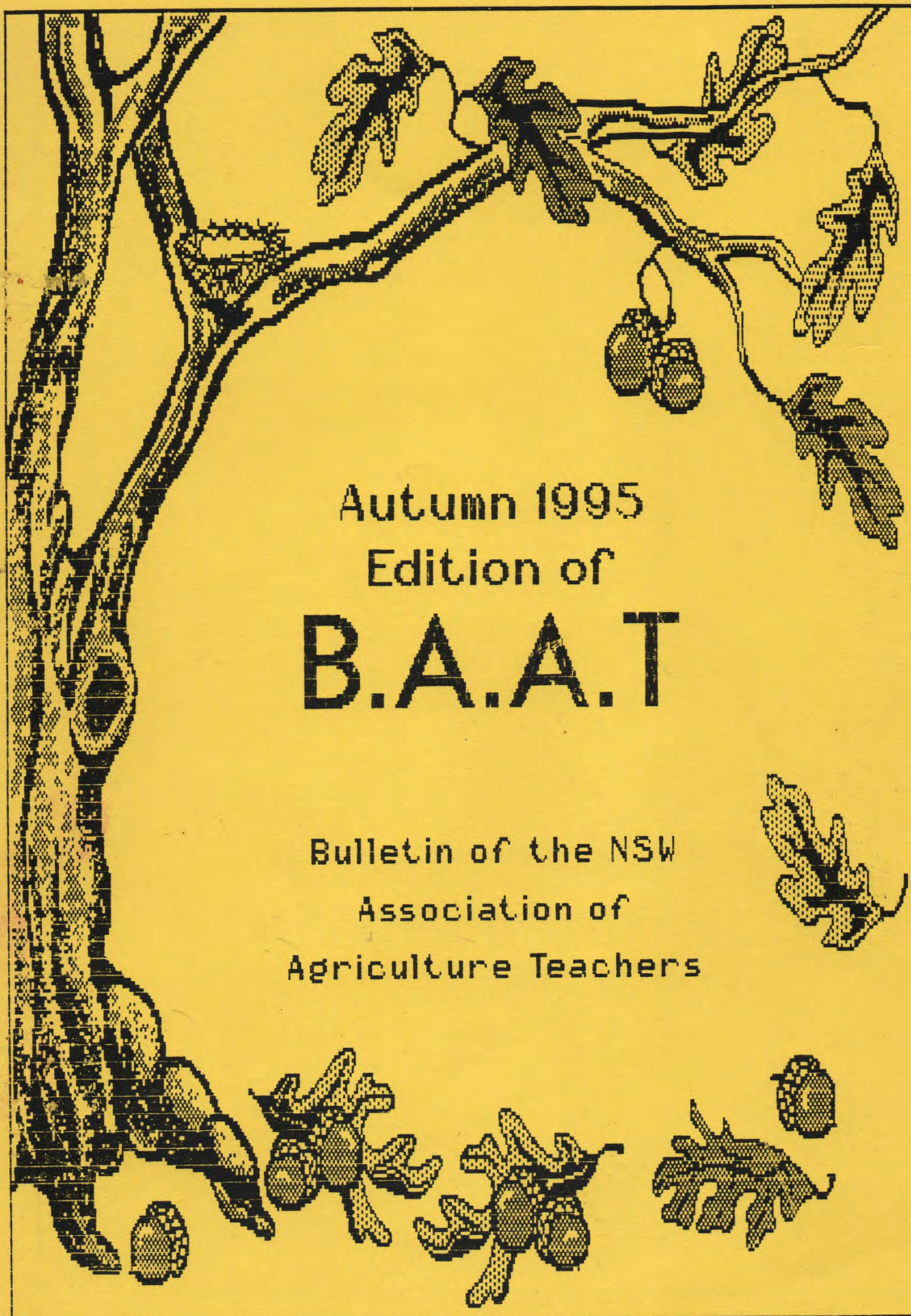


Autumn 1995
Edition of

B.A.A.T

Bulletin of the NSW
Association of
Agriculture Teachers

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Some thoughts from The Editor



The famous quotation attributed to Gene Fowler (1890-1960)

> *"Writing is easy. All you do is stare at a blank sheet of paper until drops of blood form on your forehead."*

Thanks to the response I have received, my first edition of BAAT has not provided the experience described!

May I take this opportunity to thank all those who have made the effort to provide material for our bulletin.

In his message, President Stuart wrote of the dynamic nature of Agriculture and I ask that those of you with something of interest may consider it for inclusion in the subsequent issues.

If you are in doubt concerning your item remember .....

> *"Imagination is more important than intellect!"*
> Einstein

.....
John Musgrave

ADDRESS YOUR CONTRIBUTIONS TO:

John Musgrave
Kadina High School
Kadina Street
GOONELLABAH NSW 2480
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KEEP THOSE CARDS AND LETTERS ROLLING IN.....!

PRESIDENT'S REPORT

I would like to feel that our Association is gaining a more professional outlook and is becoming more proficient in representing the views of our members. This developing professionalism is something that the Association must continue to develop and foster if our interests and involvement in Agricultural Education are to continue into the future.

During the past two years the Association has been involved in representing our interests in the National Professional Development Program. The National Association and particularly the Queensland Association have led the way in initiating a program to develop National Statements on Agricultural Education. We must continue to develop the links with other States in order to develop a unified voice in policy development.

The past two years have also seen a strengthening of links between our association and industry. This can be seen through links such as the Rural Training Council's accepting a delegate from our Association, the support given to our Association by the NSW Farmers Association and NSW Agriculture through Murrumbidgee College of Agriculture and Geoff Creek's requests for our support in various areas. We must continue to maintain and further develop industry links, particularly with the development of the new Rural Industries course that Jenni Wilkins talked about this morning.

I would also like to think the Association has had some influence in the development of the new 2 Unit and 3 Unit Agriculture syllabuses. Another important development we have seen is the appointment of Jenni Wilkins as Curriculum Officer (Agricultural Education) to the Board of Studies. At this stage I would like to thank Jenni for her input into Agricultural Education through her position with the Board of Studies.

We must thank all those who have been involved in the development of the 1995 Conference. It is the first time in the 20 odd years history of our Association that we have had the opportunity to have a Conference on the North Coast. We hope that we have the opportunity to have more Conferences in this area in the future, particularly if they are as successful and enjoyable as this one has been so far.

I would also like to thank Debbie York and David Grady for their assistance in keeping the Association running throughout the past two years. A big thank you must also go to Stuart Hemmings for his efforts as Editor of BAAT during the past two years.

In handing over to the new executive I hope they are able to maintain and strengthen the Association's influence in the guiding of Agricultural Education into the future.

John Lee
(President 1993-1995)

Congratulations to the Organising Committee of the 1995 Biennial Conference held at Lennox Head. This committee consisted of:

George Liddell
Jayne Hoffman
Mick Melino
Jim Hartley
John Musgrave
Ian Marriott

and their dedicated efforts ensured one of the most successful and professionally rewarding conferences and that this note be printed in the conference proceedings.

Moved - Bob Toule
Seconded - Stuart Grimmett
Carried

INCOMING PRESIDENTS REPORT

G'day,

A few words from your new NSW AAT President. At the last January Biennial Conference at Lennox Head, the new executive was elected as follows:-

PRESIDENT:

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On behalf of the new Executive I would like to thank John Lee and the previous executive for their efforts on behalf of the Asssociation and the gains they made for Agriculture Teachers. As with previous executives, a job was well done in the pursuit of excellence in a dynamic subject that all students need. It is as important as the bread and butter on the table.

The times are exciting as they are changing. As Agricultural Teachers, challenges are before us - don't let

them slide by. Be there in the forefront to increase your own professionalism and the impact and status of our subject area.

The new executive will represent you in this challenge and endeavour to promote Agricultural Education. Please feel free to contact any of the executive with your ideas/problems etc.

During the past months I have had the pleasure of meeting a number of Ag. Teachers covering a wide area of NSW (in the new Rural Industries Course training). It came out very forcefully that Agricultural Education is very strong and unique in its own right. I hope that some of these teachers can use BAAT to pass on ideas and show the creativity they are using to sell their subject.

Congratulations to those teachers who have set up a network of operators in their area. I know in the Orange District there is a strong contingent of aggies working together in particular with the new Rural Industries Course. This subject is essential to all Agricultural Educators.

I attended the Sydney Branch AGM and it was great to see the enthusiasm and the confidence of direction which they pursue.

For those who are interested in aquiculture, Arthur Seivens of Manilla is in the process of organising a Board Approved Course. An aquaculture development day was held at Manilla on 21st March. Out of this came valuable notes as well as the idea of running a course for accrediting teachers in Aquaculture in the near future.

The national Association of Agricultural Educators in conjunction with Queensland Agricultural Teachers Association is in the process of developing "a perspective for Australian Schools". This will no doubt add strength to our cause - Agricultural Education is essential to <u>all</u> students.

We have an excellent resource in Jenni Wilkins on the Board of Studies. She has collected a vast array of resources and knowledge in all aspects of Agricultural Education.

For successful Educating:

* Get involved with your local community, which will be glad to serve you the best it can.

* Perhaps your TAS consultant can help organise "a get together" of Ag. teachers in your area.

* Organise a network which will, no doubt, ease the individual load and help develop valuable resources.

* Check out the new Board Endorsed Course for Rural Industries.

Finally, to the successful conference in January at Lennox Head - the organisers have again been rewarded for their efforts. Nothing more than positive comments are being received. The many hours spent by the Committee has been worth every bit. Congratulations on a fine effort.

Have a successful 1995 and best of luck.

Stewart Grimmett

REGIONAL TAS CONSULTANTS

REGION	CONSULTANT	ADDRESS	TELEPHONE NO	FAX NO
Metropolitan East	Karyn O'Brien	Arncliffe Education Centre Cnr Segenhoe and Avenal Sts ARNCLIFFE NSW 2205	(02) 597 0036 (W)	(02) 597 7839
Metropolitan North	Neville Warner	Loggia Bldg, 20 George St PO Box 450 HORNSBY NSW 2077	(02) 477 0282 (S)	(02) 987 4984
Metropolitan South West	Ron Matthews	Miller Educational, Technology Centre, Miller PS, Cnr Shropshire St & Miller Rd MILLER NSW 2168	(02) 607 5804 (S)	(02) 607 5767
Metropolitan West	Anne Stevens	Seven Hills ERC, Lucas Rd & Morris St SEVEN HILLS NSW 2147	(02) 838 8959 (W)	(02) 674 6972
Hunter	Philip Thomson	NSW Government Offices 117 Bull Street,PO Box 488G NEWCASTLE NSW 2300	(049) 25 5889 (S) (018) 49 6202	(049) 25 5701
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North West	James White	Armidale ERC PO Box 96 ARMIDALE NSW 2350	(067) 72 9311 (S)	(067) 72 8143
Riverina	Robert Lange	Albury ERC David & Smollett Sts, PO Box 672 ALBURY NSW 2640	(060)41 1919 (S)	(060) 41 2972
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Western	Annette Ewins	NSW Government Offices 140 William St, PO Box 143 BATHURST NSW 2795	(063) 33 4435 (W)	(063) 33 4445

NSW Ag Teachers President — Stuart Grimmett — Woodenbong Central School — (066) 351488

NSW AGRICULTURE TEACHERS ASSOCIATION REPORT

N.S.W. AGRICULTURE TEACHERS ASSOCIATION.

The biennial Conference of the NSW Agriculture Teachers Association was held at Lennox Head in late January 1995. I attended in my role as a Technological and Applied Studies consultant and because of my interest and association with agriculture. I was delighted to see a number of familiar faces and to meet some of the newer agriculture teachers that are taking up the challenge.
The organisers provided an informative and enjoyable four day program with well chosen professional input. I came away with a range of new strategies and a wealth of information. The soil management display and demonstration provided some excellent teaching strategies and I am looking forward to the next opportunity I have to teach units with a soils component.

The conference raised an awareness of a number of important changes that are taking place in education at the present time. It is essential that agriculture teachers keep up to date with the future directions of the subject. An understanding of and involvement in Design and Technology will be very important. The implementation of a profiles and outcomes approach to teaching will occur in Year seven Design and Technology during this year. I urge teachers to be involved with these changes and to consider the implications for teaching and learning.

One of the participants at the conference was Jenni Wilkins. She is working at the Board of Studies and has been involved with the development of the Vocational Education course "Rural Industries". Jenni is an enthusiastic supporter of Agriculture and she provided valuable information on resources and other developments in the subject. I encourage you also to contact your Regional T.A.S. consultant if you need help with Agriculture or Design and Technology in your school. I have included a list of the consultants for your reference.

Special mention should be made of John Lee and his executive for the fine job they have done in managing the association over the past two years. I am sure the North Coast contingent who have taken on the new executive responsibilities will continue to run it professionally and provide an essential service to practising Ag teachers.

Congratulations to the organisers of the conference for a well structured, informative program with great hospitality.

James White
North West Region Technological and Applied Studies Consultant.

HSC EXAMINATION AND ANSWERS - 1994

SECTION 1

Attempt ALL questions.

Recommended time - 40 minutes

MARKS

QUESTION 1

Answer the following questions in relation to a farm you have visited, or in relation to your school farm. Read the whole question before choosing ONE subsystem.

Location of farm **Indicating location of farm**
Main production subsystems **Listing most enterprises on farm** 0

(a) (i) *State ONE of the production goals of the farmer.*
Listing a production goal, must have a verb ie. increasing profit or improve on quota. 1

(ii) *State ONE of the personal goals of the farmer in relation to the management of his/her farm.*
Listing a personal goal must be different to above, may be production or personal based. 1

(iii) *Describe how the farmer organizes his/her management and timing of production activities to meet each of these goals.*
Discuss what farmer "Does" to achieve the above goals and "when" they do them. 1 mark for production timing. 1 mark for production management. 1 mark for personal timing and 1 mark for personal management. 4

(b) *Select ONE of the main production subsystems.*
Name of production subsystem
List one subsystem enterprise on the farm. 1

(i) *Describe ONE interaction between the climate and the named production subsystem.*
1 mark for stating interaction and 1 mark for describing interaction and how it affects the subsystem eg. Rainfall and sunlight will affect photosynthesis which will affect dry matter production of the pasture -> dry matter stock will suffer and decrease production of milk. 2

(ii) *Explain how climatic uncertainty can affect management decisions in relation to the interaction described above.*
Candidate to state management technique - 1 mark. 2nd mark if student explains why and what farmer must do due to climatic uncertainty. A good answer unrelated to b(i) was still deemed to receive 1 mark. 2

(iii) *Name a salable product from the production subsystem*

Product

Must be related to production subsystem and not too processed ie. margarine.

NOTE: If product not related to production subsystem the answer receives 0.

State the quality characteristics of the product that are required by consumers.

Candidates to state what people want from the product ie. lean beef, low fat, no insect damage, chemical free. Must relate to product. 1

(iv) *Outline how the consumer requirements are met in the management of the subsystem*

Candidate to outline how the farmer achieves good quality products eg. lean beef. 1 mark for stating technique and 1 for explaining if candidate provides 2 or more techniques then 2 marks. 2

(v) Describe a management practice that the farmer uses to reduce uncertainty in market returns from this product.

Candidates to outline ways of reducing risk. 1 mark for stating method and 1 mark for explaining technique. 2 marks for a number of techniques. eg. irrigation, use of fertilizer, diversity, contracts. 2

(vi) *List TWO inputs to this production subsystem.*

1. **Two inputs of production must relate to production**
2. **system eg. feed, money, labour water, fertilizer.** 2

(vii) *Describe how changing ONE of the above inputs to the farm could affect the economic performance of the production subsystem.*

Candidate to state and explain change and effect on production - 1 mark. Extra mark given if student relates change to economic benefit eg. irrigation to increase yield results in improved profit. 2

(viii) *State ONE method a farmer can use to assess the economic performance of the production subsystem.*

Candidate must state how to assess for a profitable farm. ie. Gross Margin. Student must show knowledge of incurred costs and return from outputs. eg. use of partial budgets, linear programming, gross margins, net profit margins. We did not accept things like "profit" or "feed conversion ratios". 1

(c) *Name ONE weed causing a problem in either the plant or animal production subsystem.*

Weed .....

Subsystem .....

(i) *Outline a routine management procedure that the farmer carries out to control or prevent this problem.*

1 mark for listing one routine management procedure
1 mark for description or outline of that procedure

(ii) *State at which stage in the production cycle this management procedure is carried out.*

1 mark either for a relevant stage in weed growth cycle or stage in production cycle of plant or animal production cycle

(iii) *Explain why the timing of this management procedure is important.*

1 mark for linking it to (ii) above
1 mark for explanation.
NOTE: acceptable it candidates answered this in relation to the plants production cycle.

QUESTION 2

(a) *Figure 1 shows the relationship between agriculture, mining, and manufacturing in the Australian economy in the 1980s.*

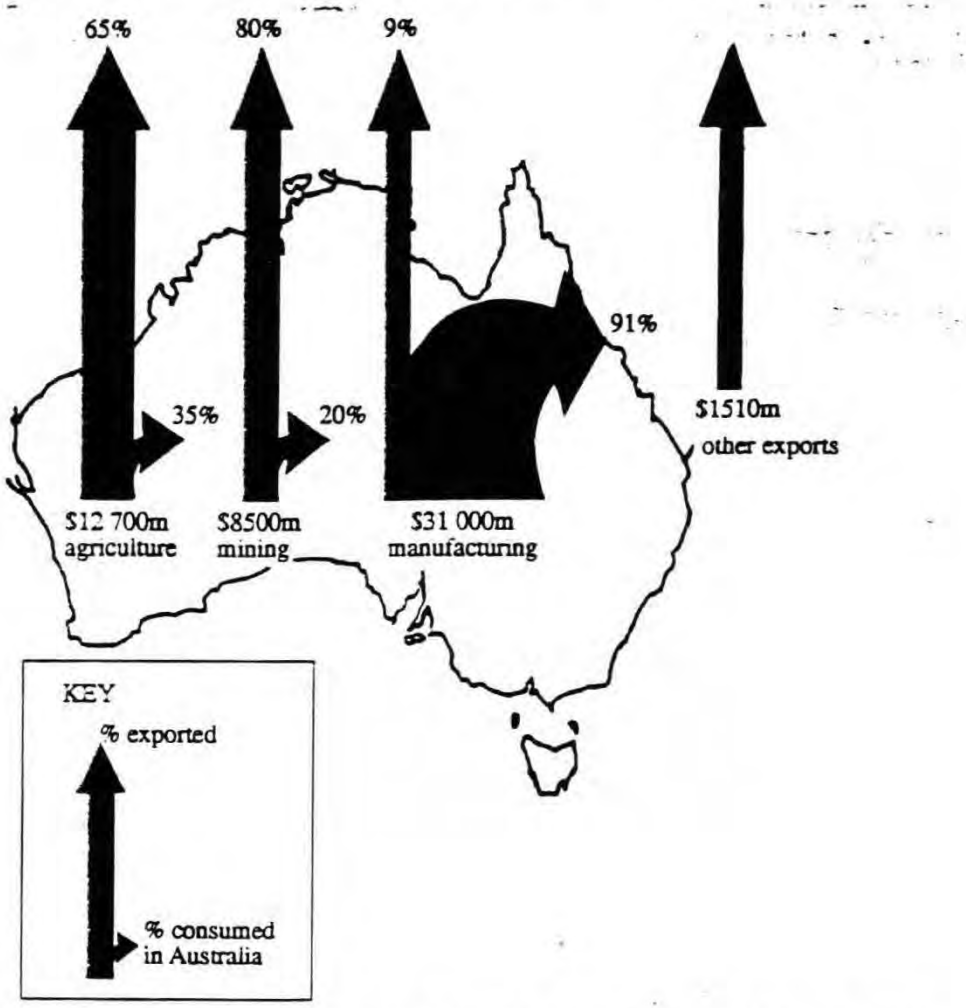


FIG 1. VALUE AND PERCENTAGE OF PRODUCTS CONSUMED AND EXPORTED FROM AUSTRALIA.

(i) *Calculate the dollar value of agriculture exports.*
1 mark for correct $8255 m (accepting without 000's or M).

(ii) *Explain why, compared with manufacturing, Australian agriculture is so dependent on international prices of products.*
1 mark for explaining why international prices affect Agriculture.
1 mark for comparing it to manufacturing.

(iii) *Name ONE agricultural product that is used in manufacturing, and name the manufactured product.*
Agricultural product .....(0)
Manufactured product
1 mark for any product that has undergone a change from raw Agricultural product.

(b) *Figure 2 shows the prices received for products sold and the costs paid by farmers for inputs for the years 1960-1990.*

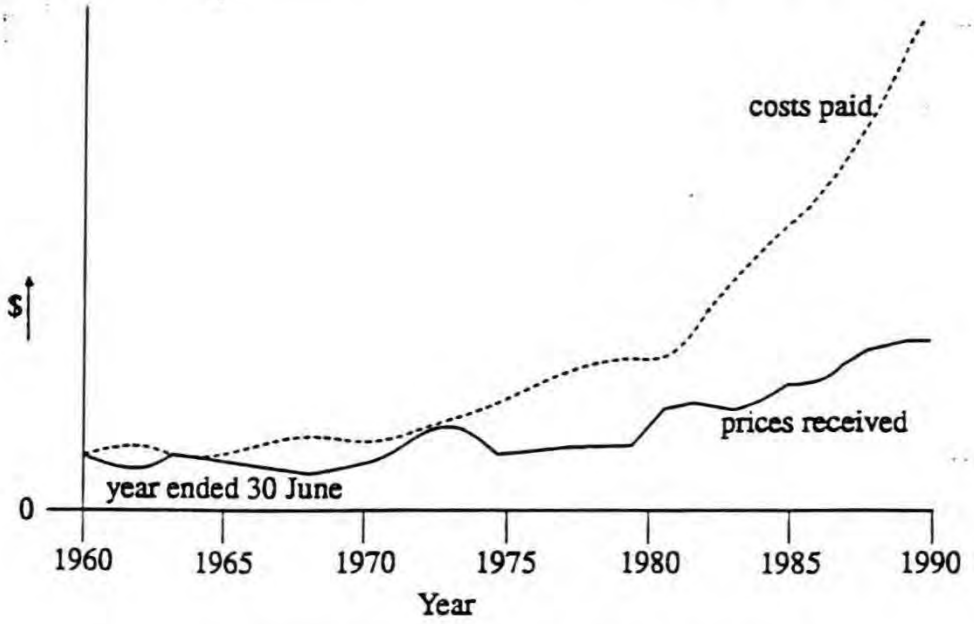


FIG 2. PRICES RECEIVED AND COSTS PAID BY FARMERS.

(i) *For the period shown, compare the trend of prices received for farm products sold with costs paid by the farmers for inputs.*

1 mark a trend in cost, 1 mark for trend in price OR
1 mark for increasing gap OR any combination of 2.

(ii) *Examine the trends from 1985-1999 shown in Figure 2. For a farm known to you describe ONE example of costs paid for inputs and prices received for products that follow the trends.*

1 mark for input costs (example).
1 mark for prices following the trend (output example).

QUESTION 3

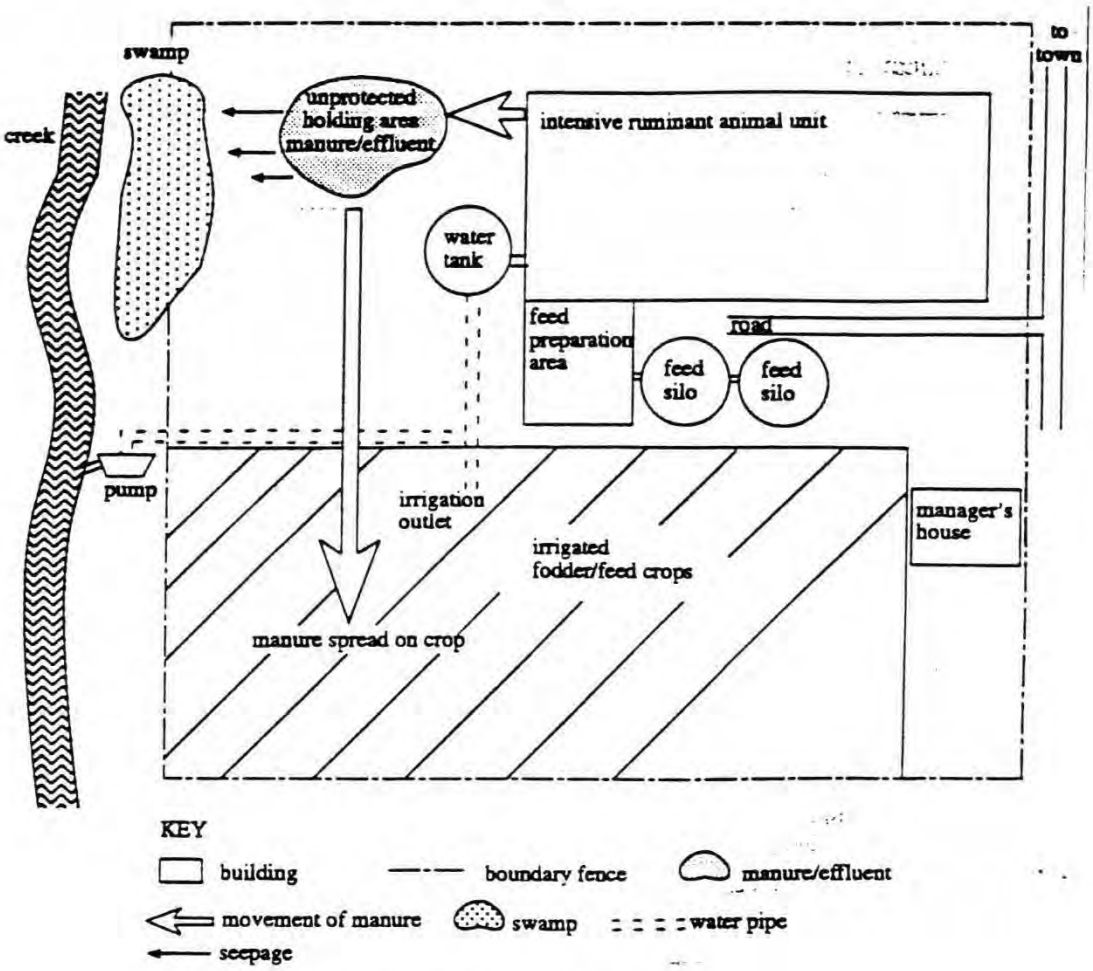


FIG 3. MODEL OF A FARM

(a) *Using the information provided in Figure 3:*

(i) *Name ONE input into the intensive ruminant animal unit from the farm system;*

Acceptable answers/feed/feed crops/management. 1

(ii) *Name ONE input into the intensive ruminant animal unit from outside the farm boundary;*

acceptable answers purchased feed/silo feed/ sunlight/livestock/construction materials/water 1

(iii) *Describe how this farm system could affect the off-farm environment.*

Manure affluent seeping into swamp OR }
creek flow affected by pumping OR } 2
colour/ }

Then 1 for the affect on the outside system

(iv) *Figure 4 is a systems model for the farm in Figure 3. The arrows indicate some selected interactions between subsystems.*

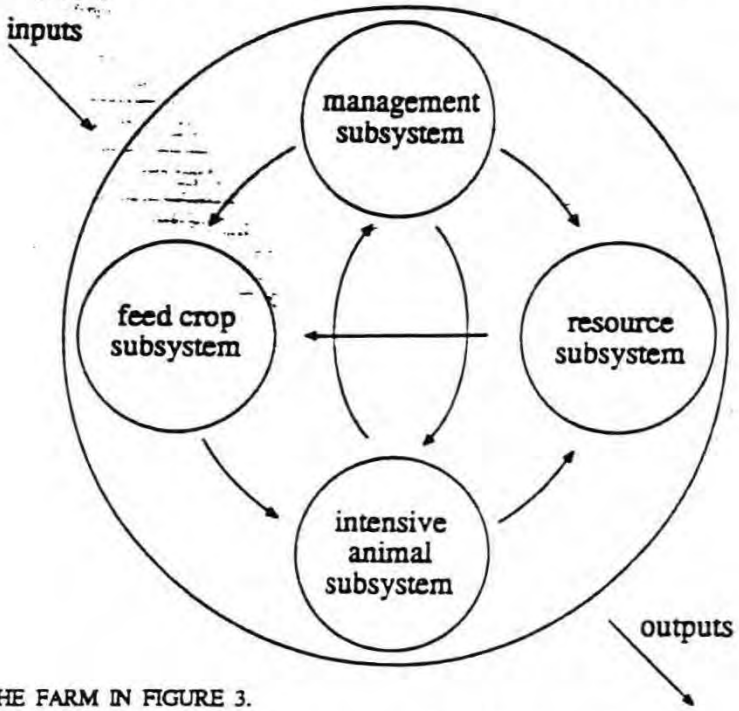


FIG. 4. SYSTEMS MODEL FOR THE FARM IN FIGURE 3.

From Figure 3 and Figure 4, state ONE example for each interaction listed.

Management to feed crop

ONE OF planting/Harvesting/Irrigation Timing/Food Prep/ Fertilizing application rate/Storage.

Management to intensive animal

Manure Removal/Feeding/Feed Prep/Water Husbandry.

Intensive animal to management

As above

Resource to feed crop

Soil/Water/Effluent/Sunlight

4

(b) *The farmer with the intensive animal ruminant unit would like to seewhether two new feed additives will improve the growth rate of animals. A trial is set up using 300 animals and three treatments.*

The three treatments are:

Treatment A	existing ration with no feed additive
Treatment B	existing ration plus feed additive *X*
Treatment C	existing ration plus feed additive *Y*

(i) *State the prupose of treatment A in the experimental design.*

1

CONTROL - OR answer strongly implies control

(ii) The 300 animals, containing both males and females, are being held in a large pen ready for the trial. Describe, giving your reasons, how you would select the animals to be used in each treatment.

1 mark - randomly select group of animals bias
1 mark - explaination of how.

2

(iii) *Describe how you could use replication in the experimental design.*

1 mark - for repeat on change in size of groups.
1 mark - description

2

(iv) *List TWO types of measurements you would make during the feeding period in this trial.*

1. **Measures - fat score/feed weight**
2. **Animal weight.**

2

(v) *Explain how you could analyse the final data to determine which treatment was the best.*

Lists of things - **1 mark**
One named and explained how used - **2 marks**

2

SECTION 11

of poor quality therefore some answers were difficult to decipher.

Attempt THREE questions.

Each question is worth 15 marks.

Recommended time - 80 minutes

QUESTION 4

Potato tuber-moth can significantly reduce the yield and quality of potatoes. Scientists have noted that the moth attacks potatoes by entering the soil through cracks.

Figure 5 shows the results of a trial where some potatoes were planted early and some late in the season. The effect of planting time on the number of potato tuber-moths was determined.

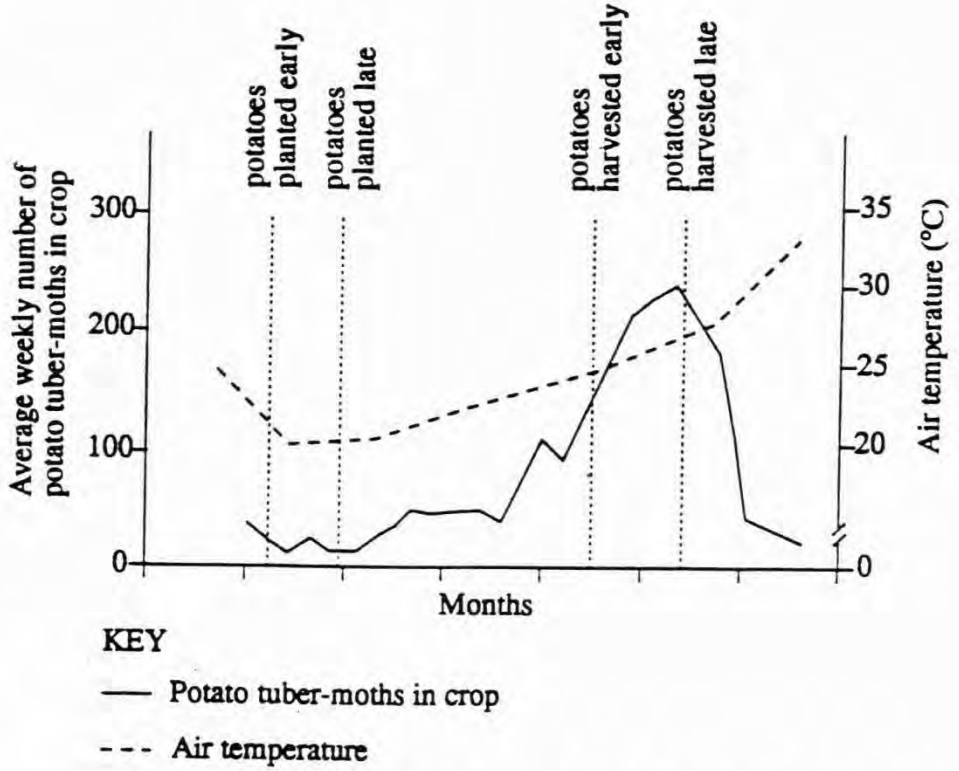


FIG 5. RELATIONSHIP BETWEEN MONTH, POTATO TUBER-MOTHS, AND TEMPERATURE

(a) *Examine Figure 5 and describe TWO factors that affect the population of the potato tuber-moths.*

(i) 1 mark for listing temp. 2 marks for describing increase in population as temp increases. 2

(ii) 1 mark for stating "potatoes numbers" or "food". 2 marks for describing increase in population as food source grows or source of nutrition increases OR planting time - early planting time means a lower population 2

(b) *Circle whether planing the crop early or late would maximize the yield of quality potatoes.*

EARLY *LATE* 0

Explain your choice

Harvested before moth population builds up OR Crop matures earlier, allowing it to be harvested before moth population builds up. 2

(c) (i) *List TWO pieces of information a farmer needs to develop an integrated pest-management approach for the potato tuber-moth.*

1. **Biological control available, recommended pesticides.**
2. **Crops to rotate, resistant varieties, alternative planting times** 2

NOTE: 2 DIFFERENT pieces of info were required.

(ii) *Explain how each piece of information would be useful.*

1. **Each answer must relate to c(i)1. and 2. 2 marks for explanation 0 for restating c(i)** 2
2. **1 mark = non related/poor explanation** 2

(d) *The soil in which the potatoes were grown during the trial was a heavy clay, which was prone to cracking when it dried.*

(i) *Explain why a clay soil would crack, whereas a sandy soil would not.*

Clay particles absorb H_2O and swell. They shrink as they dry out, allowing cracking. Sand particles do not absorb. 1 mark only for clays stick together and clods pull apart when dry. 2

(ii) *State TWO management activities that could improve the structure of a heavy clay soil.*

1. **Organic matter, lime, gypsum, dolomite**
2. **sand, pasture phase, perennial crop** 2

(iii) *Explain how ONE of these activities will reduce cracking in heavy clay soil*

Better structure by adding humus to form peds

CHECK **Ca^{++} floculation, sand add skeletal grains to form peds. 1 mark for O.M. breaks down to improve structure (Doesn't relate it to mechanism of soil cracking).** 2

(e) A further trial was conducted to find out if irrigation of these clay soils to field capacity could be used to help control the potato-tuber-moth problem. The following results were obtained.

Irrigation interval (days)	*Percentage of potatoes damaged by the moth*
4	5·0
8	9·1
12	16·0

State ONE conclusion you could make from the results.
Increased interval, increased moth damage 1 mark for conclusion. 0 for restating or simple interpretation eg. 4 days = 5.0 damage 1

(f) *The potato tuber-moth attacks potatoes by entering the soil through cracks. Explain how the irrigation interval could reduce the number of infected potato tubers in the clay soils.*

More frequent watering keeps cracks closed therefore no access for moths. Must mention interval or <u>more</u> frequent or increased regularity not just regular watering (1 mark). 2

(g) (i) *Putting a thick leaf mulch on the soil reduces moth damage to potatoes. Explain why this could be so.*
Physical barrier <u>OR</u> keeps soil moist reduces cracking. 2

(ii) *Describe any long-term benefits that mulching would have for the soil.*
Decomposed OM better structure, increased nutrients better infiltration, better aeration. (MUST MENTION 2 EFFECTS!) 2

(h) *Briefly describe an integrated pest-management system for a named plant-production system you have studied.*

Plant-production system..... 0

1 mark for 1 listed
2 marks for 2 listed or 1 explained
3 marks for 3 listed of 2 explained
4 marks for 4 listed or 2 well explained
5 marks for 5 listed or 3 well explained. 5

QUESTION 5

(a) *Figure 6 shows the relationship between age of the growing animal and dietary protein requirement.*

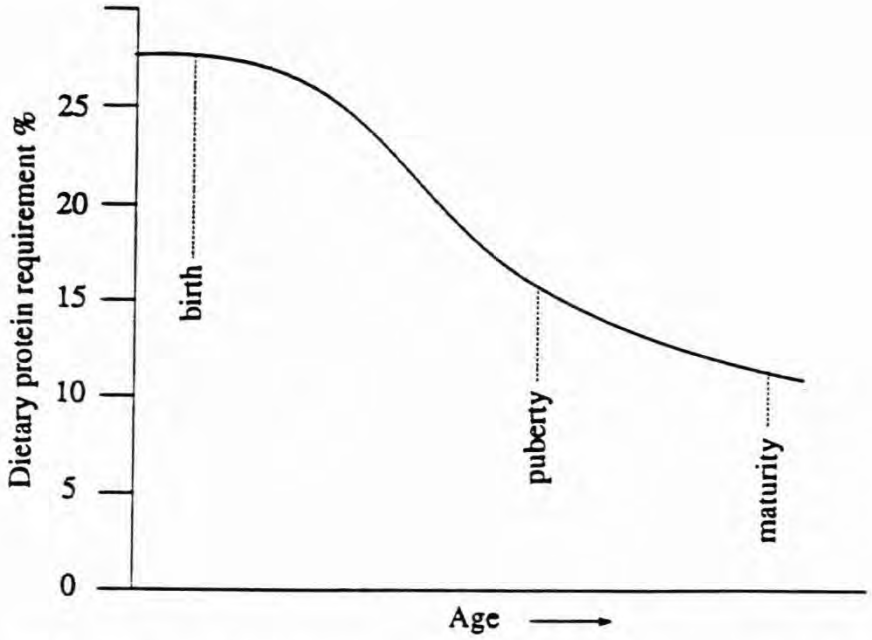


FIG 6. RELATIONSHIP BETWEEN AGE AND DIETARY PROTEIN REQUIREMENT.

(i) *Explain why dietary protein requirement changes with increasing age.*

Marks awarded to say (1) growth slows with age
(1) protein is needed to build body/muscle

(ii) *Explain why there is still a requirement for protein at puberty.*

(1) at puberty animal is still growing
(1) Protein is needed to build/change body shape/muscle

(b) (i) *For an animal system you have studied, state the normal age at puberty and the age when the animals reach maturity.*

Animal System .....

Due to different animals variations within breeds we accepted a range but paid consideration to the range given ie. that it allowed reasonable time between puberty and maturity.

	Lamb	*Cattle*	*Poultry*	*Pigs*
1. *Age at puberty*	**4-12mths**	**4-24mths**	**5-6mths**	**4-9mths**
	1 mark			
2. *Age at maturity*	**2-3yrs**	**2 1/2-4yrs**	**10-12mth**	**4-5yrs**
	1 mark			

Goats puberty 4-12mths maturity 2-3 yrs

NOTE: ***** NO MARKS WITHOUT UNITS *****

(ii) For animals from the system chosen in part (i), explain the differences you would expect in the carcasses of animals slaughtered at puberty compared with those slaughtered at maturity.

1 mark each for any 3 of these to a total of 3.
Puberty: light colour, low fat,* low muscle to bone ratio OR proportionately more bone and tender/moist.

Maturity:darker meat colour, high fat, *high muscle to bone ratio/more muscle, proportionately less bone and tough/dry.

(iii) For animals from the system chosen in part (i), explain the process of digestion and absorption of dietary protein.

1 mark each for Monogastric, ingest/masticate/go into crop
digest in stomach
gastric juice/pepsin/enzyme added
protein -> amino acid
ag absorbed in small intestine

1 mark each for Rumen, food broken down by microbes in rumen
cellulose converted to microbial protein in abomasum
protein digest by gastric juice
protein -> amino acid
absorbed in small intestine

(c) (i) Describe ONE process in the production of food protein for animals in which invertebrates or microbes have a role.

- ***Dung beetles break down manure, release nutrients to plant, eaten by animal 1 mark each point = 4***
- ***Microbes in rumen convert cellulose to protein which is then absorbed. 3-4 marks***
- ***Rhizobium in legumes fix nitrogen, available to plant, eaten by animal, Total 4 marks***
- ***Decay releases nitrates, done by microbes, nitrates taken by plant, animals eat. = 4 marks***

(ii) Name and explain TWO factors that may limit the way invertebrates or microbes participate in the production of protein.

1. **1 mark each name (to 2) 1 mark each reason (to 2)**
   eg. substrate type/whether type for organism to convert
   population fluctuations.
2. **Moisture level/reduce activity**
   Temperature/effects rate of micro org. activity
   Chemical residues, disease/retard activity or change temp.
   Environment (was accepted as a name)

(d) *Following the grain harvest in 1993, wheat prices for higher-protein wheat rose significantly. Lower-protein wheat prices remained static, while oats and barley prices fell.*

(i) Describe TWO ways a farm manager could use the above information in planning cereal grain sowings in the future.

1 mark each point of use (to 2) 1 mark each reason to justify (to 2).

1. **cycling of crop fertilise - to increase N level**
   choose high N wheat - get max price/profit
   not plant oats/barley - until price/demand improve
2. **Look at diversification - lessen effect market fluctuation.**

(ii) The farmer calculated a gross margin of $120/ha for wheat, $65/ha for oats, and $55/ha for barley for the 1993 crop. If cropping areas were increased, new and larger machinery would be required. Explain how this would influence any gross margin analysis.

Machinery a capital cost therefore no effect = 2 marks
Mention viable operating costs, fuel etc or increase area sown = 1 mark
Reference to equation = 1 mark

(iii) Because of the high prices for finished lot-fed cattle, the farmer also considers feeding low-priced grain to cattle that could be purchased.

List FOUR pieces of information that would be needed by the farmer to check the likely success of such a change.

4 correct reasons = 2 marks: 3 correct = 1 mark
2 correct = 1 mark 1 correct = 0 marks
Correct answer include: estimate future grain price, nutrient value of grain, management expertise, facilities for feed lot, additional feed required, availability of suitable cattle, cattle purchase price, predicted cattle sale price.

QUESTION 6

(a) *The grain yield of crops is affected by many factors, some of which can be controlled by the manager.*

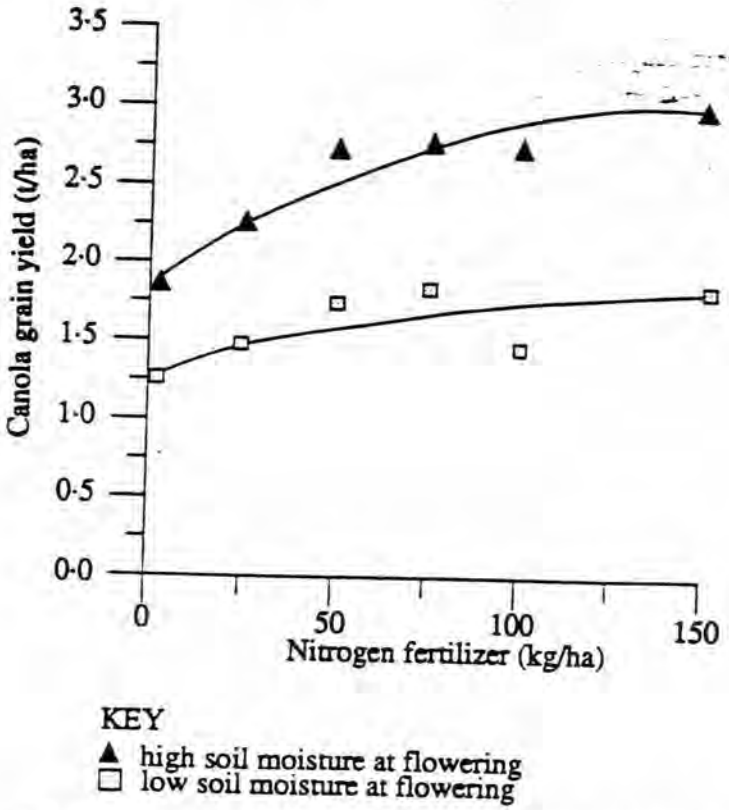


FIG 7. RELATIONSHIP BETWEEN AVAILABLE SOIL MOISTURE DURING FLOWERING AND APPLIED NITROGEN ON CANOLA GRAIN YIELD.

Using the information in Figure 7:

(i) *list the factors that affect grain yield in canola;*

If candidate lists many factors including irrelevant ones in terms of the graph above, then only 1 mark as we are testing the skill of interpretation not knowledge of factors affecting canola. For a long list including factors not on graph - 1 mark.

Soil moisture at flowering/4 0/water/nitrogen fertiliser/ N fertiliser/fertiliser rate. 2

(ii) *explain the relationship between available soil moisture at flowering and grain yield;*

As soil moisture increases so does grain yield (higher in context higher level of moisture 1 mark). 2

(iii) *explain the interaction between nitrogen application and soil moisture from the shape of the curves in Figure 7.*

Increased N leads to increased grain yield

Increased H_2O leads to increased grain yield

Reference to differences in shape of curves 3

(b) (i) *Artificial fertilizers are only one source of nitrogen for crops. State TWO other sources of nitrogen for crops.*
Any 2 for 2 marks
Legumes/clover/green manure crop/animal manure/stubble/ lightning (rain)/acid rain/mineralisation/humification
any 2 for 2

(ii) *In a grain crop, nitrogen levels in the soil affect more than grain yield. State ONE other crop characteristic affected by soil nitrogen level.*
colour of crop (yellowing)/growth rate/height/leaf growth/protein level/nutrient level/dry matter/more veg. growth and less reprod. growth. 1

(iii) *Explain how repeated cultivation of soils affects the level of soil organic matter.*
Any one of these answers - well supported.
* **↑↑ cult -> ↑ mineralisation of OM -> \ OM**
* **↑ cult -> ↑ soil structure -> ↑ aerobic condition -> ↑ OM**
* **↑↑ cult -> thermal conductivity -> microbiol. activity -> in OM** 3

(iv) *State ONE management method used to conserve soil organic matter in cropping systems*
Direct drill/zero cultivation/ ↓ tillage/mulching/↑ chemical usage/pasture rotation 1

(v) *Describe TWO factors that influence the way nitrogen is held in a soil.*
1 each for factors: 1 each for descriptions eg. texture/structure/teaching/pH/de nitrification/water infiltration rate/water logging/OM in soil/colloids. 4

(vi) *Explain ONE effect of over-use of nitrogen fertilizer on the environment*
1 mark for effect 2 marks for good explanation eg: Blue Green algae/soil acidification/toxic effects 3

(c) *State THREE effects that animals have on the productivity of soils.*

1 mark per effect eg: 1. pugging/compaction
2. addition of OM/manure
3. removal of minerals as animal product structure destruction 3

(d) (i) *Grazing-animals provide economic returns to farmers in a variety of ways. For a named grazing-animal enterprise, state TWO sources of income.*
Named grazing-animal enterprise 0
1. meat/wool/calves 2. lambs
(Must be united to enterprise)

(ii) For the named enterprise, state TWO inputs and explain how they could affect the economic return to the farmer.

1. Input.....
For 2 marks must link to economic return and input 2

2. Input .....
For 2 marks input must be linked to enterprise 2

QUESTION 7

(a) Examine Table 1, which gives the dressed weight price for cattle sold to different markets.

TABLE 1. CATTLE PRICES FOR DIFFERENT TRADE CATTLE TYPES.

LOCAL TRADE			
Carcass weight range	*Muscle score*	*Rump fat*	*Contract price* (c/kg Dwt)
yearlings 140–180 kg	A or B or C	6–12 mm	224–245
steers 180–220 kg	A or B or C	6–12 mm	228–242
EXPORT TRADE			
Carcass weight range	*Muscle score*	*Rump fat*	*Contract price* (c/kg Dwt)
steers 240–320 kg	A or B	6–22 mm	245–282
steers 320–400 kg	A or B	6–22 mm	266–278
cows 240 kg +	C or D	6–22 mm	205–215
Muscle score key A very heavy muscle ... E very light muscle			

(i) State the price range of steers sold to the local trade (cents per kilogram dressed weight).
228 - 242 or 14 range 1

(ii) From the information in the table, state the difference between cows for export and steers for export.
Contract price, muscle score, carcase weight 1

(b) (i) *Describe TWO factors that a producer considers before sending animals to the market*

FACTORS 1. climate
demand
2. condition of stock
price offered
market predictions

1 mark for factor: 1 mark for description
4 mk 2 fact + 2 desc: 3 mk 2 fact + 1 desc: 2 mk 2 fact ONLY: 1 mk 1 fact only

4

(c) *Figu e shows the markets for beef carcasses*

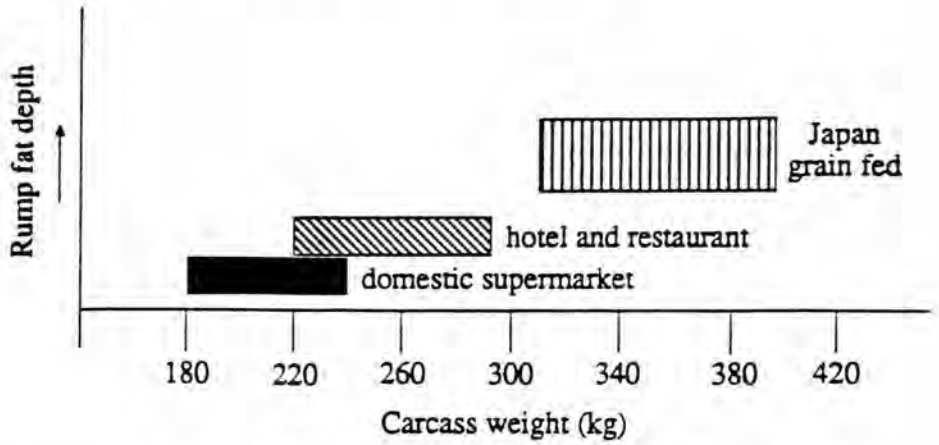


FIG. 8. MARKETS FOR BEEF CARCASSES.

Use the information in Figure 8 to answer the following questions

(i) *State the carcass weight range for the domestic supermarket*
180 -> 235 - 245 OR 55 to 65 No units needed

1

(ii) *Describe the relationship between carcass weight of an animal and the fat depth at the rump.*
↑ weight -> ↑ fat depth (rump) OR vice versa

2

(iii) *If the price of the supermarket product falls significantly, describe ONE option available to a producer supplying cattle to the domestic trade.*
change market (2 mk)
sell (justify)

2

(d) *For a farm product you have studied, describe ONE example of government intervention that has affected the marketing process.*

Name of product .....eg. wool..... (0 mark)
Name of intervention/process = 1 mk
Description of the intervention = 2 mk
eg: Govt drop reserve price scheme -> leaving stockpile; ↓ market confidence and ↓ prices.

0

3

(e) (i) *Explain why it is important for ruminant animals to be fed roughage.*

Anything cellulose, lignin based. Any suitable reason = 1 mk
eg: satisfy appetite, ↑ saturation, keep system moving.
1 very well explained & supported answer = 3 mk
3 reasons = 3 mk 3

(ii) *List THREE factors that would need to be considered to determine whether it is economically viable to set up an intensive animal enterprise in a particular location.*

Three distinct points
1. climate, transport costs, ext. costs
2. market proximity, labour availability
3. feed availability, stock supply, capital 3

(iii) *Intensive animal enterprises create potential environmental problems.*
Outline THREE environmental factors that need to be considered before an intensive animal enterprise is sited, so that it will meet with community acceptance.

1. eg aesthetics, effluent runoff, topography
2. smell/odour, dust, noise, stream pollution
3. proximity to neighbours
(3 statements ONLY = 2 mk: 2 statements ONLY = 1 mk: 1 statement ONLY = 0) 3

(f) (i) *Unlike farmers running intensive animal industries, farmers who grass-fatten their animals need to consider paddock and seasonal feed gaps. Describe TWO management techniques farmers could use to reduce the effect of seasonal feed gaps.*

1. 2 techniques + 2 descript = 4 mk
2 techniques + 1 descript = 3 mk
2. 2 techniques ONLY = 2 mk
1 technique ONLY = 1 mk 4
eg: conserve fodder (store hay): plant supp. (eg oats); irrigate; defer grazing; manipulate SR

(ii) *Explain why a farmer must take precautions when introducing ruminant animals to grain feeding*

DISCRIMINATE eg: allow time for MO to build up
grain bloat, acidosis 3

QUESTION 8

(a) *Soil nutrients removed by the vine and the fruit in growing a tomato crop are recorded in Table 2.*

TABLE 2. NUTRIENTS REMOVED BY A CANNING TOMATO CROP (kg/ha).

Yield (t/ha)	*Crop part*	*N*	*P*	*K*	*S*
45	fruit	128	19	145	15
	vine	92	20	225	0
	total	220	39	370	15

(i) *The farm manager mechanically harvests the tomato crop and leaves the vines to be ploughed back in. Using Table 2, determine the weight of each nutrient that will be removed if the farmer grows a 45t/ha crop.*

N = 128kg P = 19kg K = 145kg S = 15kg (All 4 correct 1mk) 1

(ii) *An analysis of fertilizers is recorded in Table 3.*

TABLE 3. FERTILIZER ANALYSIS.

FERTILIZERS	NUTRIENT PERCENTAGE			
	N	*P*	*K*	*S*
Nitram	34			
Urea	46			
Superphosphate		9		
Potash			49	
Grower 11	11	15	9	5
Grower 12	12	8	15	9
Greentop	20	5		21

The farm manager wants to apply the necessary amount of fertilizer to replace all the nutrients removed at harvest of the tomatoes without depleting the existing soil nutrient pool. Use Tables 2 and 3 to calculate how many kilograms per hectare of urea would be needed to supply the nitrogen requirements of a tomato crop yielding 45 t/ha Show your working.

Amt needed = 128 (1mk) x $\frac{100}{46}$ (1mk)-> link to 46% = 278kg (1mk) 3

(iii) *If tomato farmers wanted to use only one fertilizer, which fertilizer from Table 3 would they be most likely to choose? Explain*

Grower 12 (1mk)

Closest to <u>ratio</u> of nutrients needed (1mk) 2

(iv) *Explain why fertilizer, in practice, is not applied at a level to produce maximum yield*
Give concept marginal cost/marginal revenue (ie amt. extra output revenue not worth cost extra input) (2mk) above concept poorly explained <u>OR</u> 2 ecological concepts.
(1mk) ecosystem eg. could cause ↑ acidity 3

(b) *Describe TWO methods that a farm manager could use to determine how much fertilizer to put on a crop*
1. **Name method (1mk) eg. soil analysis; leaf analysis; fertilizer trial research information** 2
2. **Second Mark: description of how this is done or applies** 2

(c) *Apart from the use of artificial fertilizers, describe how a farm manager could supply the nutrient needs of a crop.*
Name alternative eg. green manure crop (1mk): what is this eg. legume (1mk) what affect on nutrients eg. N (1 mk) 3
2 alternatives but poor description (1mk)

(d) (i) *Other than the exchange of nutrients, list TWO interactions that occur between plants and soil.*
1. eg. water uptake 2. support (must have both for 1mk)

(ii) *Describe a process that occurs during one of the interactions listed in part (i) above* 1
Interaction 0
<u>Description</u> of process or <u>interaction</u> (2mk) 2
More generalised less specific answer = 1mk

(iii) *Describe ONE example of how a farm manager can manipulate the process described in part (ii) above.*
Must relate to (ii) Name example eg. irrigation (1mk) 2
Describe/reason (1mk)

(e) (i) *Name ONE management practice, other than adding fertilizers, that affects the yield and quality from a named plant-production system.*
Plant-production system 0
Management practice eg. irrigation; apply pesticides 1

(ii) *List the key measures of quality of the output from the plant-procuction system.*
Must have 2 (1 = 0 marks) Must be <u>quality</u> eg. size, colour, protein content. 1

(iii) *Explain how the farm management practice improves the quality of the output in the plant-production system.*
Must relate to management practice and how it <u>improves quality</u> in any one way. Answer which is not specific in terms of quality feature = 1mk only 2

(iv) *Explain how the farm management practice increases the yield of the plant-production system*

Must relate management practices and how it <u>increases yield</u> specifically if answer gives general comment only on how yield increased than 1 mk only. 2

(f) *Describe the relationship between the function and structure of a plant part used to collect chemical or physical resources.*

Plant part .....(0) 0

Must relate structure to function eg. leaf-broad; stomates trap light for photosynthesis; exchange of gases eg. flower attract insects for pollination

Nominating 1 function only = 1

Need 2 functions of the structure = 2 3

QUESTION 9

(a) *Figure 9 shows the protein percentage of two fodder-crop varieties during their growth phase.*

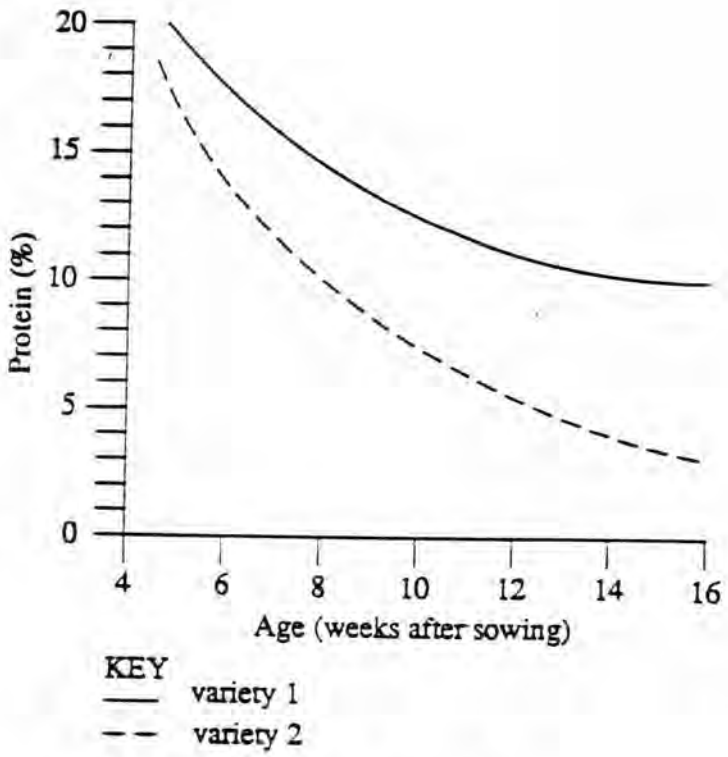


FIG 9. PROTEIN VERSUS AGE.

(i) *State the protein level of variety 2, eight weeks after sowing.*

10% - no other 1

(ii) *Describe the relationship between the age of the plants and the protein percentage of the fodder crop.*

* **Protein decreases as age increases = 1mk**
* **Indication of difference in rate of change = 1 mk** 2

(iii) *Which variety at the eight-week growth stage would be the best for young cattle or lambs? Explain your choice.*

* **Variety 1 = 1mk**
* **Young animals need high protein levels = 1mk** 2

(b) (i) *Table 4 shows the effect of soil temperature on seed germination of variety 1.*

TABLE 4

Soil temperature (°C)	*Germination percentage*
14	2
16	24
19	90

Using the information in the table, describe what recommendation you would make to farmers regarding planting of variety 1.

Plant into soils around 19°c OR warmer soil temperature. /

(ii) *State TWO factors that affect soil temperature.*

1. **Aspect colour texture surface cover, moist content (1mk)**
2. **Mulchnal rhythm seasonal change, Air temp. Amount of radiation (1mk)** 2

(c) (i) *The recommended sowing rates for dryland and irrigation situations for variety 1 are shown in Table 5.*

TABLE 5

Situation	*Sowing rate* (kg/ha)
Dryland	5–8
Irrigated	10–15

Describe what you would expect to happen if seed was sown in a dryland soil at 14kg/ha.

* **Any indicator of reduced yield (ie. growth) 1mk**
* **Water stress due to high population/competition 1mk** 2

(ii) Explain why adequate water is needed for plant growth.

Transpiration }
Photosynthesis }
Turgidity }
Cooling }
Germination }

Mention 3 = 3 mks
2 = 2 mks
1 = 1mk

Good explanation of 1 process = 3mks

3

(iii) Explain tow TWO management practices, other than irrigation, can be used to improve the availability of water to plants.

1. Mention relevant practice: Mulching, Weed control increase OM, Minimum tillage Fallowing (1mk)

2. Explanation = 1mk

4

(d)

TABLE 6. CROP RESPONSES TO APPLIED SUPERPHOSPHATE.

Superphosphate applied (kg/ha)	*Crop yield* (t/ha)
50	0·5
100	1·0
150	3·0
200	4·5
250	5·0
300	4·5

(i) Use the information in Table 6 to graph the crop responses to applied superphosphate.

Axes correct = 1 mark
Scales correct = 1 mark
Plotted correctly = 1 mark
* Minus 1 if histogram.
Minus 1 if started at zero

3

(ii) State at what rate superphosphate application results in maximum crop yield.

250kg/ha - no other = 1 mark (number must be correct)

1

(iii) *Explain why a deficiency of phosphorus in soil affects plant production.*

* Role of phosphorus - root growth — Respiration
  - cell metabolism / \ photosynthesis
  - fruiting - fruit
  - seed — 1mk 2

* Expanded on role = 1mk

Also 1 mark for mentioning deficiency symptom

(e) *For a plant-production system you have studied, describe the plant characteristics a plant-breeder is looking for in order to improve productivity.*

Plant-production system Relevant to answer

* Three factors - yield
  - quality
  - environmental suitability

Just 1 mentioned = 1: or 2 plus explanation = 3 3

(f) *Explain why plant-breeders use genes from `wild' species in plant-breeding*

Source of genes for: environmental suitability, = 1mk
: genetic diversity ie. disease resistance = 1mk 2

(g) *A farmer sowed some seed from a neighbour's uniform high-yielding crop. It produced a crop with variable growth and yield. Suggest a genetic reason for this result.*

1. Neighbour is using a hybrid/crossbred seed
2. Explanation or expanding on point - plants in second generation less homozygous due to reassortment of genes 1mk 2

QUESTION 10

In the management of an animal enterprise, the farmer wishes to achieve more salable product from the farm. Describe the genetic and reproductive techniques, and the management strategies, the farmer could target to achieve this goal.

MARKING SCHEME - THREE SECTIONS:

* GENETICS: 1 for brief discussion of each technique
  1 for linking technique to salable producer
  Max 2 for just listing techniques

  TECHNIQUES: - Breeding systems eg. lime, m-, random, selection, hentability
  - Genetic engineering (broad definition)
  - Progeny testing — 4 marks

* REPRODUCTION: 1 for brief description of each technique
  1 for linking technique to saleable product
  Max 2 for just listing techniques

* TECHNIQUES - AI, E,T. Progeny testing
  - Hormonal technology
  - Pregnancy testing
  - Natural mating systems 4 marks
* MANAGEMENT 3 examples described and linked to saleability of product.
  Max 3 marks for listing techniques
* TECHNIQUES - Nutritional
  - Disease control/Health
  - Lessening stress (relates to specific techniques no previously mentioned)
  - Housing, yards, transport
  - Market research
  - Cost/Return analysis
  - Ultrasound
  - Handling
  - Pasture production 7 marks

QUESTION 11

(a) *Using a plant-production system you have studied, compile a report to describe the following factors:*
* *species, seasonal growth habits, disease, and pests*
* *sowing and harvesting techniques, and equipment*
* *product yield, quality, storage, and marketing.*

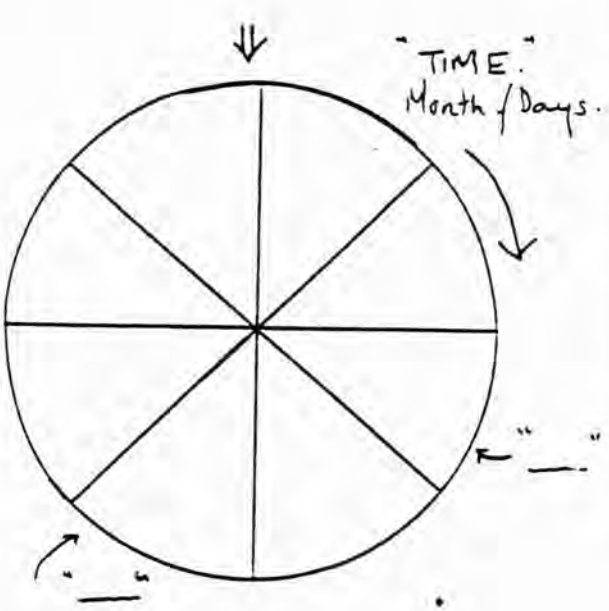
(b) *Construct and explain a management plan for this crop.*

MARKING SCHEME

(a) * Species eg. Potato: sebago/pontiac - certified seed
Barley: 2 row, 6 row
Grapes: cabinet, chardonnay 1mk
* Seasonal growth habits:
Grapes: deciduous, perennial, budburst in spring, ripe late summer
Potatoes: sprout autumn, grow in winter, mature spring 1mk
* Disease/pest - 2 common crop enemies - name, damage to crop/general effects
eg. Green vegie bug - nibbles leaves - reduces - photosynthetic rate
Phylloxera aphid on grape vine roots - impaired water uptake 2mk /4
* Sowing techniques/equipment:
specific soil preparation specific planting details
specific timing, specific machinery
eg. Barley: conventional cultivation for seed bed, seed planted at 100kg/ha at 1cm depth from a combine which also places fertilizer.
Grapevines: perennial crop, soil prepared, trellising advanced cuttings at 2.4m spacing 1 1/2mk

* Harvesting techniques/equipment: <u>specific</u> timing
  eg. <u>Lucerne</u>: cut at 5% flowering, conditioned, turned, windrowed, baled by baling machine at night
  <u>Wheat</u>: harvested at 12-14% moisture with cereal harvester 1 1/2mk
* Product yield - specific district/optimum qualitative figure
  eg. Potatoes/grapes 2tonnes/ha Cotton: 20 bales/ha 1mk
* Quality - qualitative evaluation/visual appraisal
  eg. field peas - sound & unscratched
  hard wheat - 15% protein 1mk
* Storage and Marketing
  <u>Wheat</u>: stored in a silo, trucked from farm to AWB or private buyers
  <u>Grapes</u>: crushed to wine, stored according to wine type, sold privately to retailers/exporters 1mk

(b) Construct a management plan for crop
Soil preparation -> product leaves farm
* time scale
* sequential calender of operations



MONTH.	OPERATION.

2mk

Reasons for timing of operations
Why plant now]
Why harvest now] AT LEAST 2
Why irrigate now]
Why spray now]
Why fertilize now]
* Diagrams -> Systems approach. Acceptable if explained.

3mk

SECTION 3

QUESTION 12

(a) *Describe the composition and properties of a major soil type in your region and comment on its genesis.*

(b) *Explain how knowledge of the composition and properties of the above soil type affects the soil management of existing agricultural systems.*

(c) *Evaluate whether existing practices are the most appropriate for the long-term fertility of the soil.*

MARKING SCHEME

(a) 1 mark for naming the soil type eg. red podzolic, non-calcic brown
3 marks for naming OR listing OR describing SIX properties (features/composition) of the named soil
eg. sandy loam; low pH; shallow A horizon; poor water infiltration; low CEC; red in colour; high fertility; good structure; etc 1/2 mark for each feature
1 mark for either naming the PARENT MATERIAL eg. Weanamatta shale
OR for describing how soils form through Weathering and erosion.

TOTAL OUT OF 5

(b) 2 marks each for 3 management practices/soil features with
1 mark for describing a management practice and
the second mark if this is clearly accurately linked back to a soil property.
eg. lime is used to raise soil pH so the soil is less acid. This increases nutrient availability

TOTAL OUT OF 6

(c) * 1 mark ONLY for a general value statement
eg. The management practice of stubble mulching is most appropriate for the long term fertility of soil

OR

* 2 marks each for 2 specific evaluations of 2 practices mentioned in part (b) where some reasoning for the "is most appropriate" OR "is not appropriate" is given.

TOTAL OF 4 MARKS

QUESTION 13

Production systems may be in harmony with microbes and invertebrate populations, or there may be the need for intervention by the farmer.

(a) *Using examples, explain how farm-management practices are used to reduce the effect that disease agents, parasites, and pests have on agricultural production systems.*

(b) *Discuss the need for an integrated approach to pest management in farming systems.*

MARKING SCHEME

(a) 3 marks each example - minimum 3 examples. Should mention control for pest, disease and parasite but can be of anything. Acceptable to have 3 examples eg. chemical biological, mechanical control.
1 mark each for naming a practice
giving an explanation of how it works
using a specific example

TOTAL MARK OUT OF 9

(b) 5 marks for discussion of need for IPM to include
- reason for a single methods failure eg. chemical resistance developing, contamination etc.
- advantages of IPM over the original method mentioned which includes an indication of the concept of integration of methods and systemic/ecological understanding of pest (disease agent ideally an example of a specific IPM programme is + be included
  * 2 marks for "need" in terms of why a single (or no) control failed
  * 1 mark for obvious understanding of IPM - define term

(c) 1 mark float.
  * 2 marks for discussion of benefits of IPM with a good example to illustrate

QUESTION 14

Farmers manage resources within the bounds of their ability and with imperfect information. They achieve their goals and aspirations by planning, organizing, and controlling production systems.

(a) Outline the goals and aspirations of a farmer with whom you have spoken.

(b) Describe the kinds of imperfect information, and to achieve the stated goals and aspirations.

(c) Explain how the farmer has organized and controlled one agricultural production system to take account of the imperfect information, and to achieve the stated goals and aspirations.

MARKING SCHEME STATUS

(a) Goals and aspirations:
State an example: profit, income performance parameters, standard of living 1 mk each with total up to 2
Explanation of each goal 1 mk each with total up to 2
Total up to 4

(b) Imperfect information:
State an example: weather forecasts, market reports, commodity prices, professional technical information
1 mk each with total up to 2
Explanation of each goal 1 mk each with total up to 2
Total up to 4

(c) Strategies for positively influencing risk:
Name a valid technique: fodder conservation, futures, diversification, professional technical assistance, investments 1 mk each with total up to 3
Explanation of each goal 1 mk each with total up to 3
Total up to 6
Floating mark to be allocated to either sections (b) or (c) 1
TOTAL /15

QUESTION 15

In intensive animal production systems, it can be argued that valuable plant products which could be used for human consumption are being utilized as stock feed.

(a) Explain the issues involved in this argument. In your explanation, consider:

- *feed conversion efficiency*
- *suitability of stock feed for human consumption*
- *demand for product from intensive feeding systems.*

(b) Discuss the social and environmental issues involved in intensive animal production systems compared with grazing systems.

MARKING SCHEME

(a) 2 marks allocated to each issue candidates were asked to consider (Total 6 marks)

1. FEED CONVERSION EFFICIENCY

We allocated marks to points such as:
(a) The FCE of moanagastic vs ruminants
(b) The reduced production time of intensive systems
(c) The increased value in changed plant -> animal protein
(d) The food pyramid and/or energy losses

* each point gained 1 mark maximum of 2
* If a point is particularly well discussed 2 marks may be given for that one point (this was rare).

(2) SUITABILITY OF STOCK FEED FOR HUMAN CONSUMPTION

We allocated marks (as above) to points such as:
(a) Low protein/quality grains are used as stock feed (or course graded grain)
(b) Stock ar given fed waste products eg from f
(c) Stock are fed different feed from those eaten by humans
(d) Rumnants are better aide to digest cellolose
(e) Animals better able to utilise downgraded grain

* marking scheme as above

(3) DEMAND FOR PROOVE FROM INTENSIVE FEEDING SYSTEMS

We allocated marks as above to points such as:
(a) demand for consistency and quality
(b) constant supply
(c) different marks eg aversion vs damesia

* marking scheme as above

(3) *DEMAND FOR PRODUCT FROM INTENSIVE FEEDING SYSTEMS*

(B) (Total 8 marks)

SOCIAL ISSUES (Total 4 marks

(a) INTENSIVE ANIMAL PRODUCTION SYSTEMS (2 marks)

We allocated marks to points such as:

(i) increased employment

(ii) community involvement in establishment

(iii) Animal wellane

(iv) Acmeric value

(b) GRAZING SYSTEM (2 marks)

(i) .....

(ii) Tradih way of life

(iii) Changes ad in traditional lifestyles

* 1 mark was allocated for each point

ENVIRONVEMTAL ISSUES (Total 4 marks)

(a) INTENSIVE ANIMAL PRODUCTION SYSTEMS (2 marks)

(i) Work ddisposal

(ii) Pollution problems (noise, odour)

(iii) Increased community a eg transport

(iv) limes and d.....

(v) vermin

(b) GRAZING SYSTEMS (2 marks)

(i) pollution problems (water ways)

(ii) .....

(iii)significant areas of land degredation

* 1 mark allocated for each point

QUESTION 16

For a grazing enterprise that you have studied:

(a) describe the techniques of pasture improvement;

(b) relate the management of improved pastures to the annual needs of the grazing animal;

(c) outline the economic factors that affect financial success of that grazing enterprise.

MARKING SCHEME - 6 marks

Interpreted as either establishment of new, exotic pasture OR improving quality yield of existing pasture. Possible to score many marks for "sowing" ie. a mark awarded for each sowing technique listed and another mark for each description. Rotational grazing NOT accepted unless described a change in pasture. Composition crops not accepted unless describing how it is used to improve pasture eg. crop rotation involving legumes which increase soil N thereby increasing growth of pasture the following year.

Floater: a forth technique listed OR a particularly good description(s).

(a) Up to 3 marks for listing/naming techniques.
Up to 3 marks for descriptions
1 floater -> especially good descriptions,
eg. "Fertilise" = 1 mark.
"Fertilise with spreader" = 1 mark.
"Fertilise to improve nutrient status of soil and growth rate of plants" = 2 marks.
"Water" = 1 mark.
2 descriptions + 2 techniques = 5 marks.
Many techniques = 4 marks.

(b) 5 marks
Link a management option to overcoming a feed gap or satisfying seasonal/lactational/etc. needs of animals = 2 marks each.
eg. sodseeding oats in Autumn helps to provide more Winter feed = 2 marks
Planting rye grass = 0 marks.
Planting rye grass to meet the annual requirements of cattle = 1 mark.
Management options related to specific animal needs = 2 marks + time = 3 marks.
General answer regarding nutritional needs of animals with describing pasture management or specific needs time = 1 mark.

(c) 4 marks
1 mark for each factor.
1 mark for explaining how it affects financial success.
1 mark for any cost eg cost of fertiliser, cost of labour = 2mks

QUESTION 17

Productivity of plant-production systems depends on the interaction of the genetic make-up of the plant and the environment in which it is grown.

(a) For plant-production systems with which you are familiar, discuss genetic and environmental interactions.

(b) Outline management practices the farmer can make to improve the evvironmental aspects of these interactions.

(c) Describe the role of the plant breeder in developing genetic types that can cope better with environmental factors.5

MARKING SCHEME

(a) *MENTION of a trait* — *1/2 each up to 2 marks*
DETAIL about a trait — *1 each up to 2 marks*
Sub-total 4

(b) *MENTION a management practice to help realise genetic potential* — *1/2 each up to 3 marks*
OUTLINE of practice — *1 each up to 3 marks*
Sub-total 6

(c) for each step in breeding as a STATEMENT of a breeding process — 1/2 each up to 3 marks

role of the plant breeder — 1 mark

Sub-total 4

Floater — 1 mark

TOTAL — 15 marks

QUESTION 18.

Good farfmers of the future will need to:

* be market orientated
* produce what the market needs
* receive premiums for the product sold
* be adaptable and responsive to change
* access and process information.

Discuss these comments in relation to farmers and/or farm systems you have studied.

MARKING SCHEME

In discussing this question, candidates were required to adequately cover the 5 points relating to good farmers of the future.

ie. - be market orientated
- produce what the market needs
- receive premiums for the product sold
- be adaptable + responsible to change
- access + process information

Maximum marks were awarded to candidates who, using SPECIFIC EXAMPLES, explained how farmers and/or farming systems:

1. Used their knowledge of the market make decisions on farming enterprises eg. market trends of local, domestic and export markets, consumer demands, value adding procedures, etc.
2. Translated this information into their management programs which enabled them to make decisions based on market demands/retirements. A good example was the identification and targeting of production for niche/speciality markets.
3. Capitalised on specific and/or opportunistic markets in order to receive premium (above average) process for products. In particular, reference to consistency of supply and/or quality should be addressed.
4. Attitudinal modifications to traditional methods or practices have seen producers adapting and responding to changing markets and technology.
5. Accessing all levels of "on-farm" and "off-farm" information in order to maximise production through the processing and analysing of data relevant to the enterprise. Students should outline how farmers use analytical tools such as gross margins, comparative analysis and budgeting in order to decide for change in production and productivity or confirm existing regimes.



BOARD OF STUDIES
NEW SOUTH WALES

35-51 Mitchell Street
McMahons Point 2060
PO Box 460
North Sydney 2059
NSW Australia
Fax (02) 955 3557
Tel (02) 925 8111
Our reference:
E82/01364
Your reference JC:PB
13 February 1995

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

Dear Mr Lee

I refer to the annual presentation of the Charles Mullavey Memorial Award, sponsored by the Society, to the students with the highest achievement in 2 Unit Agriculture and the student with the top score in the 3 Unit Agriculture project in the HIgher School Certificate.

The student with the highest academic achievement in 2 Unit Agriculture in the 1994 HSC was:

Ms Claire Louise Goldsbrough

Ms Goldsborough attended James Ruse Agricultural High School.

The student achieving the highest score for the 3 Unit Agriculture Project was:

Ms Jodie Sherwin

As you may be aware the results on which the Board of Studies recommends students for the award for 2 Unit Agriculture takes into account both the Moderated Assessment and the Higher School Certificate Examination.

The Board appreciates the role of the Association in recognising and encouraging excellence in the HSC program.

Yours sincerely,

J.S. Cook
Manager
Examinations and Assessment

SCHOOL AGRICULTURE COMPETITION - REVIVED

Our names are Gary Hansen and Michael Wall, and we are 3rd year degree students studying Systems Agriculture at the University of Western Sydney - Hawkesbury (formally Hawkesbury Agricultural College). Both of us are aiming at becoming Agricultural/Science Teachers once we finally complete our course.

An advantage of being at Hawkesbury, is that career direction plays an integral part of the whole program. In our first year of the course, we were gathering skills and competencies from a broad area (through set tasks, self initiated projects, etc), which enables us to analyse real world situations holistically, draw out the issues and solve problems.

This ground work lead us into the second phase of the course, where we lived with a farm family for 8 weeks, in a client based situation, analysing complex and real life issues on the farm. It was also our task to help our farm family improve their situation. This was carried out by working collaboratively with them to come up with a solution which best suited the family.

In our final year, projects are aimed at helping us to achieve some, or if not most, of the competencies required for our chosen career paths. The sort of projects which we are carrying out include learning projects (such as being a mentor for first year students), problem solving projects and situation improvement projects.

This is why we became involved with:

THE NSW AGRICULTURE COMPETITION

which is being

ORGANISED BY

THE SYDNEY BRANCH OF THE NSW AGRICULTURE TEACHERS ASSOCIATION

We heard that there was interest in getting the competition up and running again through one of our key resource people at Hawkesbury. From here we formed a network with the Sydney Branch, and we were invited to attend their meetings.

Our main role in this project is administrative. That is, we are helping to organise the printing, set up of the papers, computer marking as well as sponsorship issues.

The examination date for the paper will be on:

22nd August 1995

although the final date for the return of the entry forms for schools interested in participating is on the 22nd May 1995. If you haven't heard about the Competition and would like more information. please contact the Sydney Branch or Dave Buckley at Elderslie High School.

The Competition will be set out along the same lines as the Science Competition with 50 multiple choice questions. These questions were conceived at the Annual General Meeting of the Sydney Branch of the Agriculture Teachers Association. The Competition will be for Years 9 and 10 students and will be run only in NSW at this stage in time, with the possibility of being expanded in the future. Prizes will be given to the top students in each of the 10 regions and all students will receive the results of how they went in their region and within the state.

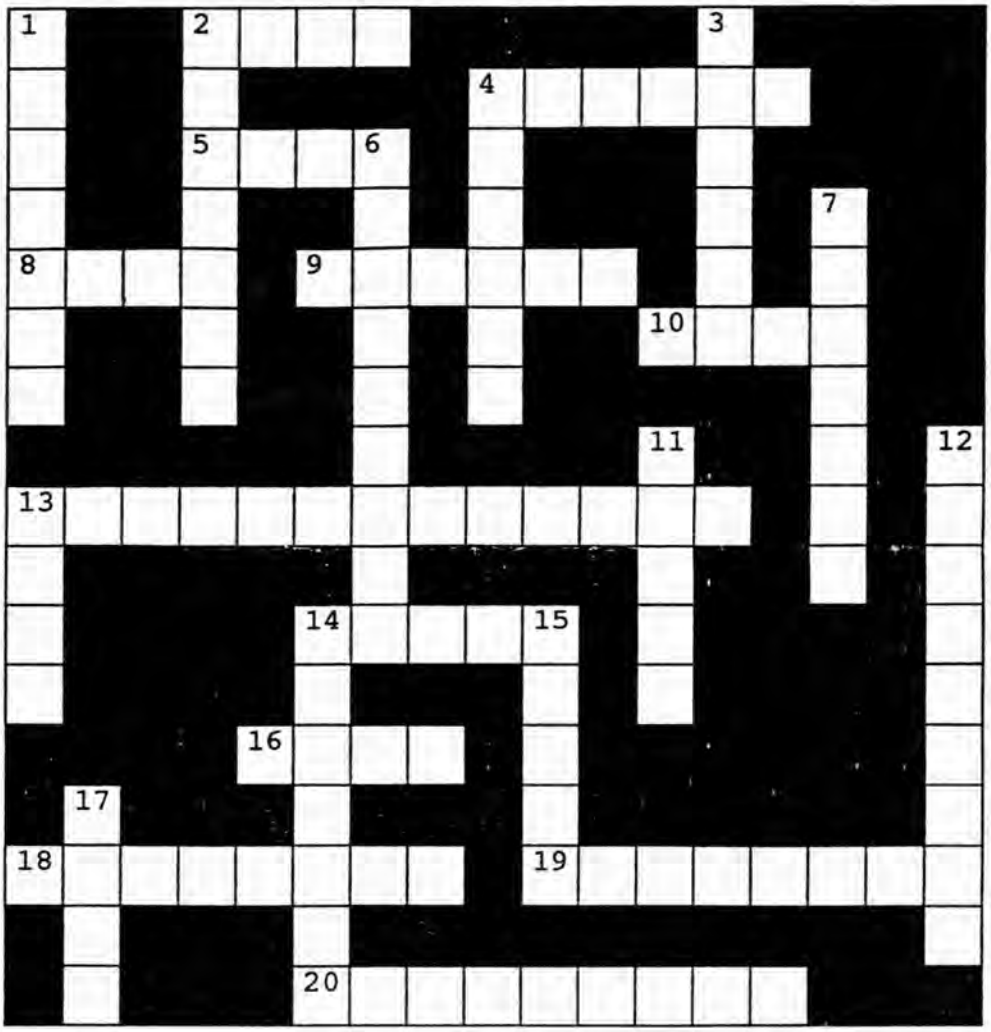
Overall, this project is a great opportunity for us and we are very excited about working with the NSW Agriculture Teachers Association.

CAN YOU PLEASE HELP US BY PROMOTING THIS IN YOUR SCHOOL TO MAKE THIS A UNIVERSAL SUCCESS.

Thanks, and we hope to see your school on the winning list.

Gary and Michael

year 7 agriculture NAME_____



ACROSS -

2. Thomas Sutcliffe.... important in developing refrigerated transport
4. Man who developed rust resistant wheat
5. convict who was first farmer in Australia
8. precious metal that pople rushed to so that there were no farm workers
9. Cattle King
10. name place where first crops were grown Farm....
13. method of chilling meat for export
14. major cereal grown in Australia
16. mountains that stopped westward development til 1813
18. make of header produced by H V McKay
19. landholder who raised sheep and took up land
20. army captain who helped found the wool industry

DOWN -

1. natural occurence that Kidman tried to avoid
2. reverend involved with merino sheep
3. sheep breed used for wool in australia
4. James Ruse and John Macarthur were thes
6. wife of John Macarthur
7. brothers who made machinery
11. stuff that plants grow in, Sydney ones were sandy
12. what Shearer brothers were famous for
13. plant disease of wheat
14. first name of Farrer
15. very large plants that made it hard for settlers to plant crops
17. mechanism that allowed us to plow over stumps

PENRITH SHOW 1995

For the third year in a row the schools section at the Penrith Show was a huge success. Support from schools was so great this year that we had the entire pavilion to ourselves.

Eleven schools in all competed for the $1000.00 prize money donated by the Penrith Star newspaper. The standard of display was exceedingly high, drawing many favourable comments from Show Society people and the general public.

The competition was divided into 2 sections. Firstly all competing schools must provide a static display in an area approx 2.5 by 3.5m. The theme for this years display was a star (due to the sponsor) Somewhere in the display was a star, the size and shape was up to the schools creativity. For the first time since the commencement of the schools section at the Show Colo High was "pipped at the post" for first place in the display. First place went to Cranebrook High, with Colo in hot pursuit in second place and new comer to the Show Bossley Park High in third place. Erskine Park High took out the prize for the best Star, with Caroline Chisholm Catholic High second and Cranebrook High third.

The second section of the competition was the categories where from a list of 22 categories schools could choose a maximum of 5 to enter. Categories ranged from wool sheep, meat sheep, honey, to pasture samples and potted plants. True to form Colo High came out trumps in this section, with Cranebrook High second and Erskine Park High third.

A poultry junior judging contest was implemented for the first time this year. Students were asked to place 6 Langshan and 6 Pitt Game in rank order and answer a few questions about each breed. Students from Colo High and Cranebrook High cleaned up most of the prizes between them. With over 80 students competing this was no mean feat.

There are a few people who made a big difference to the running of the Show and deserve our thanks. Gordon Mason from the Penrith A&I Society ran around like a headless chook looking after our every need. Without him the Show would not have happened. Jane Pearce and John Hawkins from Colo High ably organised the running and marking of the junior judging contest, a job they were roped into with little notice. The enterprising gentlemen form Cranebrook High, Paul Kerr & Greg Thompson saw to it that the staff and students attending the Show on the Friday were provided with a tantalizing BBQ lunch AND dinner. This was much appreciated by all.

I would like to extend an invitation to schools outside of the Sydney region to be part of the schools section at Penrith Show for 1996. Should you be interested or would like more information please contact either Peter Jones at Colo High or myself at Bossley Park High.
Colo:- ph 045 71 2011 fax 045 71 3391
Bossley Park:- 02 823 1033 fax 02 823 7533 home 046 55 1720

Participating Schools:-
Elizabeth Macarthur High, Caroline Chisholm Catholic High, Bossley Park High, Bidwill High, Prairiewood High, Dunheved High, Colo High, Elderslie High, Nepean High, Erskine Park High and Cranebrook High.

Tracey Watson
Secretary Sydney Branch NSW AAT.

POST SCRIPT

Dr Brian Gunn of Ciba-Geigy visited Bossley Park High and made a presentation on IPM to my Year 12 class. I was most impressed with the presentation as Brain was able to give the students information that I did not have access to.

Brian came armed with several handouts for students, one of which included an impressive definition of IPM. Brian discussed a plant disease, a plant pest and an animal pest that lended themselves to IPM. Handouts were provided for each of these situations. Although Ciba products were mentioned they were suggested as examples and not for commercial gain.

The talk nicely set up the next couple of lessons to build on the information Brian provided.

Brian will be returning to Bossley Park later this term to make a presentation to Year 12 Food Technology and Agriculture students on chemical residues in food.

Tracey Watson
Ag teacher, Bossley Park High.

ciba

Ag Ambassadors - at a school near you

For many years concern about the effects of the use of agrochemicals has stimulated wide-ranging debate on the risks and benefits associated with chemicals. This debate has changed the face of Australian agriculture, and, indeed, agricultural education.

Ag Ambassadors is a group of professionals working within the agricultural and veterinary chemicals industry who are available to speak with student and other community groups.

The objective of Ag Ambassadors is not to sell product or persuade students that the use of chemicals is good but to assist them in forming an appreciation of the role of the safe and sustainable use of agrochemicals in modern agriculture.

Ag Ambassadors presentations can be tailored to fit with your current teaching program.

Ag Ambassadors is a program initiated by Ciba Australia, a leading biological and chemical company dedicated to satisfying needs in agriculture while striving to achieve sustainable growth by balancing economic, social and environmental responsibilities.

Ag Ambassadors are located around NSW and Australia. To discuss how Ag Ambassadors can assist your school group, please contact Catherine Defina, Brian Gunn

NATIONAL ASSOCIATION OF AGRICULTURAL EDUCATORS - REPORT ON ACTIVITIES

Since being elected at the National Conference in Katoomba in 1994, the Executive of the N.A.A.E. have been very busy behind the scenes. Listed below is a summary of the more recent items which have been undertaken by your Executive.

1. TECHNOLOGY EDUCATION FEDERATION OF AUST (T.E.F.A.)
   Steps have been taken to have the N.A.A.E. accepted as a member of T.E.F.A.. T.E.F.A. is a central body formed from the stakeholders in the Technology K.L.A. and as Agricultural Educators have a large position in this K.L.A., the N.A.A.E. felt strongly about our inclusion. As yet no firm committment has been received but "behind the scenes" talks appear promising.

2. INCORPORATION
   Various methods of protecting your elected Executive from financial ruin due to law suits were investigated following a directive from the Katoomba Conference. Incorporation of the N.A.A.E., following legal advice, will take place via the Queensland system, hopefully in September 1995.

3. BADGES
   Lapel badges from the N.A.A.E. have been designed and constructed. These were released at the N.S.W. Conference at Lennox Head. They will be available at the Qld Conference in September and again at the Biannual Conference in January. SUPPORT THE N.A.A.E. - YOUR ASSOCIATION AND PROUDLY WEAR THE BADGE.

4. BIANNUAL CONFERENCE
   Anthony Jokantas from Victoria has reported that preparation for the Conference to be held this January at Tintern College, Ringwood East, Melbourne are well underway.

5. NATIONAL PROFESSIONAL DEVELOPMENT PROJECT.
   Members of the Executive have been heavily involved in the formulation of a statement on Agriculture for Australian High Schools as well as ideas for its alignment to the K.L.A.'s of Technology, Science and Study of Society and Environment.

   The paper was presented at the Lennox Head Conference but has been since the subject of review and re-writing following feedback from other States. A new version has just been printed.

PETER LYNES
SECRETARY - N.A.A.E.

AGM FOR SYDNEY GROUPS AS AT 28th February 1995

SYDNEY GROUPS:-

MET WEST

Peter Jones
Colo High School
Phone (045) 712011

MET SOUTH WEST

Tracey Watson
Bossley Part High School
Phone (02) 8231033

MET NORTH

Paul Udy
Galdstone High School
Phone (Could we have a number please? Ed)

MET EAST

Sheree Burke & Ian Judd
Menai High School
Phone (Could we have a number please? Ed)

The following information has been supplied by Mr. Bob Guest (Farrer). Note that the State R.T.C. is one of 20 Industry Training Advisory Bodies (ITAB's) and is the body responsible for advising the State Government on the training needs of the rural industries. The Editor

KEY FUNCTIONS OF STATE INDUSTRY TRAINING ADVISORY BODIES (ITABS)

Funding is provided by the NSW Board of Vocational Education & Training (BVET) to State Industry Training Advisory Bodies to perform the following key functions:

1 To develop a State Industry Training Plan

2 To contribute to the development of the national strategic plan for training in co-operation with the National Primary Industry ITAB

3 To participate in accreditation and recognition processes in accordance with the National Framework for the Recognition of Training

4 To promote training within industry

5 To work with public and private providers in the development of industry training programs

STATE ITAB RELATIONSHIPS

State ITABs have a pivotel role in advising their State Government and their National ITAB of the training needs of their industry in their particular state.

The training priorities identified by each State ITAB are used by the State Government to lobby the Australian National Training Authority (ANTA) at the federal level for State funding for vocational education and training. Similarly, the National ITAB uses the State plans to determine the national training strategies and priorities for each industry. ANTA then allocates funding to the National ITABs on the basis of industry needs.

State ITABs are therefore potential recipients of funding from both their State Government and their national ITAB.

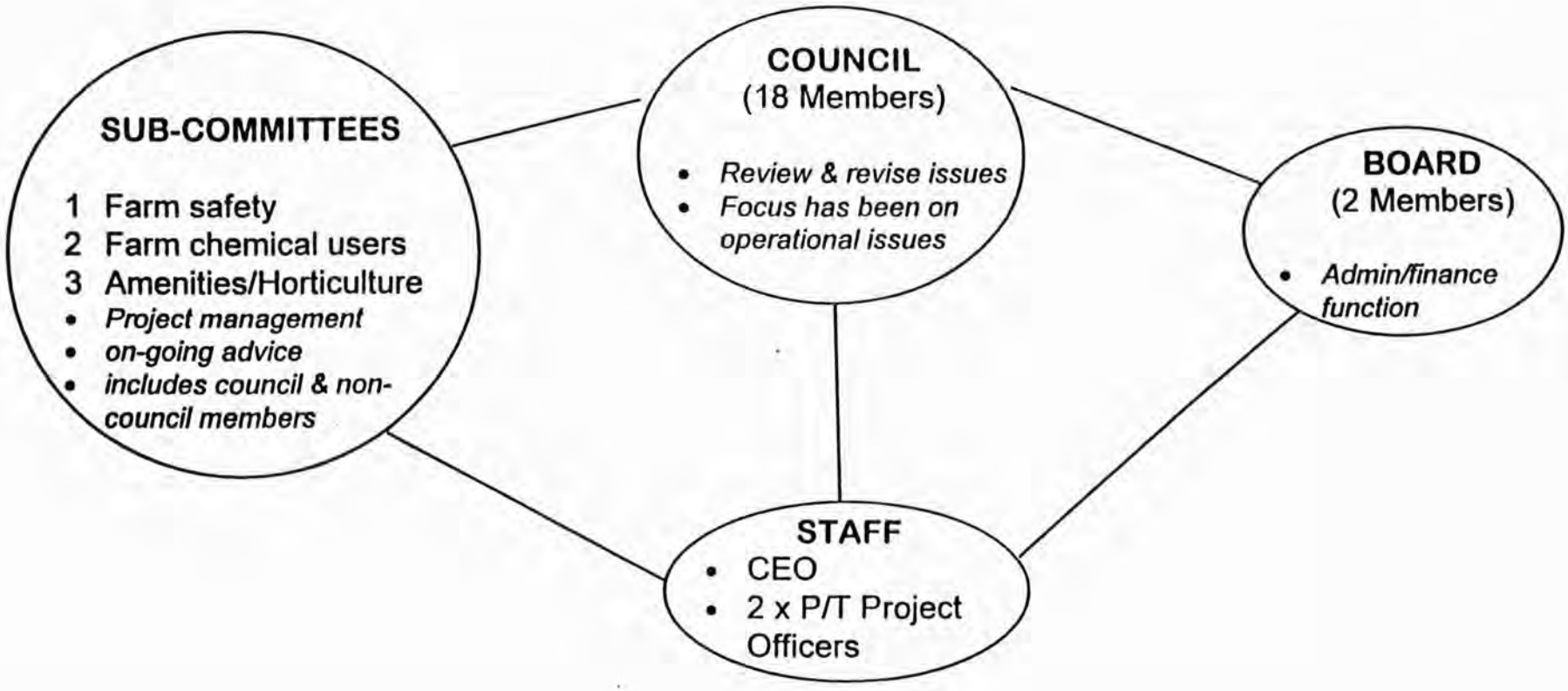
The State Industry Training Plan is the **KEY DOCUMENT** which forms the basis of advice given to State and National bodies, and the activities of the State ITAB.

In determining the training needs of each industry, State ITABs must consult with a wide range of "clients" across all regions of the state, including:

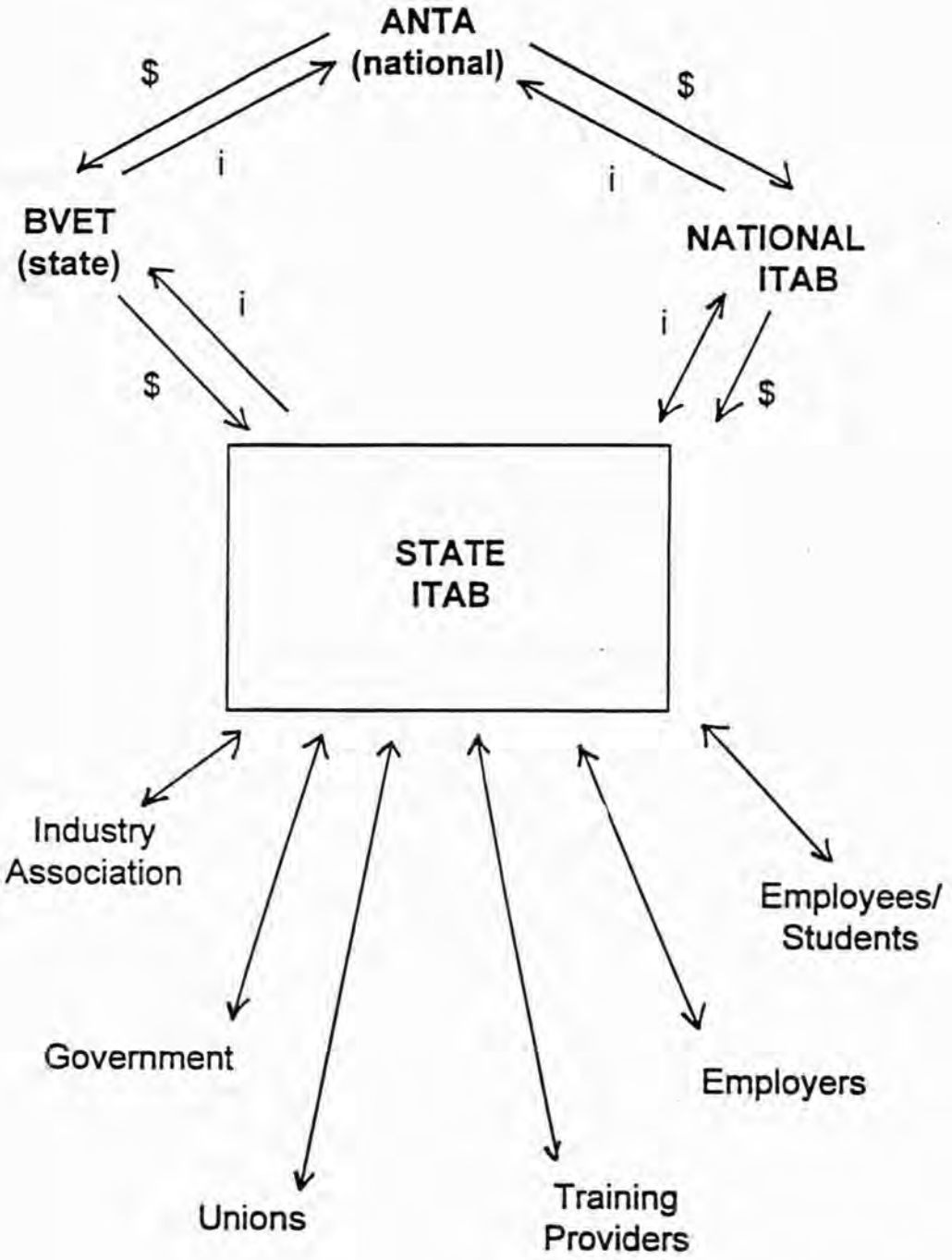
- industry associations
- government (local and state)
- unions
- training providers
- employers
- employees and students

The relationships between the State ITAB and its major client groups is simplistically shown overpage.

CURRENT ORGANISATIONAL STRUCTURE



STATE ITAB RELATIONSHIPS



ATTENTION!

Copy Deadlines

For second issue of BAAT
1st July 1995

For third issue of BAAT
1st November 1995

No contributions

No Issue!

Editor

DON (Bart) BARTHOLOMEW was an Ag. teacher for 36 years, teaching Ag. almost exclusively. He taught at Richmond District Rural School, Bega High, Murwillimbah High and Tweed River High. Murwillumbah High was selected as the pioneer school in NSW for introduction of Form Masters and Bart was one of these, along with John Clunne, Ken Hill and Ivan Eichorn. In 1975 he was appointed as the first Ag. adviser to the North Coast. Early on he was a Senior Assistant and retired as a Special Master. He retired at the end of 1985 and since then has been a District Governor of Lions, helping to establish Queensland's First Eye Bank. He also helped to establish the Open Learning Centre at Murwillumbah and is on the committee administering the Doug Moran Art Prize, the world's richest portrait prize. He is an active Lions member, painter, deep sea, beach and estuary Fisherman, punter and home brewer. His wife Lorna is a teacher and his son Wayne, won the World's Surfing Championship.

SOME REFLECTIONS OF AN AGRICULTURE TEACHER

by Don (Bart) Bartholomew

My 57th year was one month old. It was calm, sunny and clear. I was sitting alone in my boat about one kilometre off Palm Beach, waiting for a mackerel to bite, but I wasn't thinking about fish.

I was looking at the minute hand of my watch as it nudged 9am A few kilometres south, the bell had rung at Tweed River High School and for the first Tuesday of the school year since 1933 I wasn't there to hear it. I was free. I had retired. My 52 school years had closed off and another door had opened.

The following articles are my reflections on those 52 years, including 38 teaching agriculture. I explain about my early bush life and Hurlstone because they prepared me for the isolation of teaching agriculture in country schools. We were out teaching when today's students are in their 1st and 2nd year at Uni. We were alone and we had to stand on our own feet, often with poor resources. It was always demanding, often agonising and traumatic. Out of this came a proud race of teachers - we were agriculture teachers.

THE SOUTH COAST IN THE 30'S

I was a Moruya boy and in the thirties that meant something. We were isolated and we South Coast people knew that instinctively. The Princess Highway north and south was a gravelly, winding, corrugated umbilical cord petering out to a bullock track somewhere South of Bega and joining the railway at Bomaderry and northwards. We were joined to the Southern Tablelands via Brown Mountain west of Bega, the Dralven Mountain road west of Moruya and the Kangaroo Valley road west of Nowra. All were daunting.

The entire South Coast was suffering from the depression with many of my friends' dads out of work. The dole was supplemented by odd jobs, fish, parrots, rabbits and the sheer generosity of people who gave away corn, potatoes, pumpkins, squash, fruit and the prized gramma. Nobody went hungry but plenty went to school clothed in bleached flour bags and bare feet.

What of Education? With a constant procession of swaggies* passing our gates, some offering to chop the wood in exchange for a meal, one would conclude that there would hardly be an emphasis on education which would lead to a job. Not so. Surrounded by insecurity, the emphasis was on job security and for that, an education was required.

Swaggies were, in the main, single men who could not be paid the dole twice in a row in the same town. They must be seen to be looking for work. The dole was worth about 5/6 (55 cents) entitling the bearer to goods such as flour, sugar, tea and tobacco.

Fewer than 10 Moruya people had received a High School education and of these, one was my mother who attended Conservatorium High School and two were uncles Norman (Sydney Boys) and Keith Parbury (Parramatta High). Moruya Primary School had a super primary which went to Intermediate and the nearest High Schools were Bega and Nowra, so I simply accepted that I would go to Hurlstone as a boarder.

My young life had been magnificent. I accepted school as an essential part of my life and enjoyed it. My grandfather and two uncles ran the cheese factory, we were surrounded by friends and relatives who owned farms, a fine river ran through the valley and, best of all, we had rabbits. They might have been Australia's greatest pest but they were our life. We shot them, trapped them, poisoned them, ferreted them, ploughed them, dynamited them and killed them with sticks during floods. At 2/6 (25 cents) a pound they made us rich. Above all, they taught us about the Australian bush. My dad and other dads wouldn't allow us to shoot with others, so we roamed the bush alone. We would set off before daylight, go around our traps, skin the rabbits, re-set the traps, shoot on the way home, peg out the skins and go to school. The same routine after school, then eat, light the lantern and do the night patrol. The Australian bush is awesome at night with scampering and rustling animals, falling bark, flapping owls and now and again a falling gum tree branch. I was to be taught about character development much later.

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* "Swaggies" - swagman in Australian and New Zealand. A tramp carrying a "swag" (a traveller's or miner's bundle of personal belongings). An itinerant vagrant or beggar journeying on foot. [Oxford Dictionary].

AUSTRALIA AT WAR

1939 came. We bought our first car. I was in 6th class aged 10 and one Sunday night in September we sat around the wireless and listened to Prime Minister Menzies tell us that we were at War. My dad's brother had died in Belgium, some of my farming uncles were still shell shocked from 1918 and here we were at War just 21 years later. I had devoured their words as we sat in front of back-logs and they explained what it was like going "over the top". I felt I knew about War.

Posters sprang up on Telephone poles and shop fronts - WE NEED YOU - and young men swarmed to enlist, for may their first job. The town ran dances and raffles and every young soldier was presented with a watch - for some their first and last.

In 1940 I repeated sixth class because I was too young for Hurlstone, sat for an entrance exam and was accepted. The year was one of bleak war news with the Nazis overrunning Europe, the British Expeditionary Force being thrashed and evacuated from Dunkirk with massive loss of lives, equipment and fighter planes, mainly Hurricanes, shortly to be required for the defence of Britain.

HURLSTONE

Nothing had prepared me for the reality of Hurlstone. My parents had driven me 200 miles from Moruya, had done their best to introduce me to the new environment and people, then left. I discovered that great numb emptiness that comes with such a traumatic transition. I didn't know how to minimise the event. I couldn't run away from my fear and confusion. I didn't know whether to hide or who to run to, if any. But I didn't cry - bush boys don't cry!

That first Monday night I slept in a near empty "A" dormitory and buried myself. In the following days I was to learn that we had a prefect, Lloyd Wiliams, who had gained 10 A's in the Intermediate, that most of my 1st year associates were from the bush and that the two from Barnado Homes had done it much tougher than any of us. Gallagher and Burtt were an inspiration - taught us about adaptability by example.

Slowly we established friendships which survive to this day. Norm Thomas is one of these.

We were looking for the features which had made Hurlstone great. Hurlstone was one of eight 1st class High Schools in Sydney and had established an enviable academic and sporting record. We were daily reminded of past greats by looking up from the dinner tables to photos around the dining hall walls - past scholars, Wallaby players, politicians and heroes.

The great football coach, Mr. Turbot, was still there, as were the great teachers who had produced such magnificent results. I will never forget the noise made by the 1st grade football team returning by steam train to Glenfield after their first winter match of 1941 and their first victory. The earth shuddered and the walls reverberated to the Zulu like stamping as the team roared their War-Cry up the gravel path, between the school buildings and then down the middle of the dinner hall. HURLSTONE, HURLSTONE, Yes we are: etc etc. Great stuff to a 12 year old.

But this was war-time and Hitler and Togo didn't miss Hurlstone. Food and petrol rationing were in, as was austerity clothing and rationing, teachers were joining the services and not being replaced, auxiliary staff were joining up and school services suffering. Following Pearl Harbour and the lightning conquest of the Islands to the North of Australia, we went for long periods without teachers in some subjects. We dug deep zigzag trenches on the north side of the dormitories and trained in air-raid drill. Drills were exemplary. The siren would go and we would be out of the dormitories and into the trenches in two or three minutes.

The night the midget subs attacked Sydney an Airacobra blew up not many miles away. The siren sounded and most of us took to the corn fields. Who wants to be in a trench?

Perc Hindmarsh was our Principal through my five years and he was our War! Each Monday he would stand before assembly and explain the war situation - the Battle of Britain - North Africa - Russia, particularly Stalingrad - and our more relevant war with the Japs - the Coral Sea, Midway, Owen Stanleys (our first victory), Darwin and the sinking of the "Sydney". He made us aware that we could be invaded and my dad made me even more aware when he quietly gave me a rifle and bullets to take back to Hurlstone with a plan to meet him

and our family at some caves south west of Moruya if an invasion eventuated. It was never a certainty that I would make it.

By 1942 and for the remainder of the war Perc used to name the ex Hurlstone Serviceman who had given their lives and as the war progressed we knew more and more of them. When we were in 1st year they were the giants of 4th and 5th year. They were our cricket, football and prefect heroes and we knew them. The horrors of war will forever be stamped in my brain by the following incident. Tom Will, from the Burragorang Valley and I were close friends. I found Tom by himself sobbing. In his hand he held a telegram from his parents telling him that his brother Alex, an ex Hurlstonian, was missing off the Greek Coast believed dead. He had been flying Beaufighters. Tom's brother Alex was all that was great in brothers.

Perc Hindmarsh also invited we students to volunteer for war-work by working on farms from Fairfield to Camden. Fairfield then had many poultry farms and I worked on Australia's largest at that time - 10,000 chooks! The work was largely physical - feeding, cleaning, collecting, sorting, packing, delivering. Guess what we ate? You're right but anything was better than HAHS food.

By 1943 mates we expected back after the Christmas holidays weren't arriving. They were needed to run the farms, replacing their elder brothers, fathers and sisters. Our teachers were away fighting, our sporting teams had declined. The War had taken its toll. Hurlstone was no longer great.

1945 was a special year. Early on we filled in the trenches. Perc told us we were now winning. There were no Germans left in North Africa, France had been freed, the German border was being approached from all sides, then VE day. Some months later we heard about the atom bomb. No one had a clue what it was but after the second one the Japs threw the towel in and it was all over. We spent a night in Sydney celebrating, returned to the austerity of wartime, studied then sat for the Leaving Certificate, applied for tertiary education, cadetships, scholarships and results. We were `Farewelled' with a baked beans on toast banquet.

ARMIDALE TEACHER'S COLLEGE

I spent the Christmas holidays of 1945 bean picking and waiting. Eventually a letter arrived informing me that I had won a Scholarship to Armidale. Arriving at Armidale I discovered that Adolf hadn't finished with my life just yet. One million soldiers, sailors, airmen WAAFs. WRENS and their support staff had to be RE-ABSORBED into the Australian work-force. Norm Thomas, Charlie Fealy and I were the only three males accepted into ATC from all NSW schools. All the rest were ex-servicemen and women. It was a great reunion. I had now caught up with the Hurlstonians who had gone to War - Jack Ricketts, Laurie O'Neill, Austie Hayes, etc.

EX SERVICEMEN CHANGE ARMIDALE

These guys had fought a War. Some had been on the ground fighting in the front line, some had been pilots in fighters and bombers over Germany, some had been prisoners of the Japs, some had been sunk. All needed to be rehabilitated. Some were yellow and still taking atabrine to control malaria. No college rules or curfews for these boys. The pubs nursed them back to mental health and stability and the College girls showed them that love, and kindness and consideration and fun and laughing hadn't been taken away from them. Great days indeed. Norm and Charlie and I were 17 and enjoyed all the privileges of the ex-servicemen. A.T.C. made Hurlstone look pale.

Apart from that Mrs. Lincoln, what did you think of the opera?

Well, not much. There was a rumour going around that we Agricultural Science trainees were to be the new pioneers. Agriculture was about to spread far and wide through the schools of NSW. Our training had about as much relevance as looking down someone's throat to find out whether they can sing. Practice teaching did help. Alan Sutherland demonstrated that teaching could be exciting and of course, agriculture teaching more so than any other. He did inspire us and motivate us. He was a great lecturer and in late years a close friend.

But college did not prepare we agriculture teachers for teaching - no system could have.

To be continued in the following BAAT.

BEEKEEPERS SCHOOL AT TOCAL

Tocal Agricultural College is located in the Hunter Valley at Paterson. A two day course on Beekeeping will be held on 27th and 28th August, the cost being $120.00 including morning and afternoon teas and lunch.

A limited number of rooms for accommodation may be available - the Course Secretary can provide details.

ENROLMENTS
Contact the Course Secretary, Geraldine Bush, CB Alexander Agriculture College "Tocal" Paterson, 2421.
Phone: 008 025520 or 049 384262

The Program is as follows:-

Frid, 26th Aug PM Welcome and introduction of course students.
Discussion of course program and other topics students wish covered.
Video - Following the Honey Flow.

Sat, 27th Aug 8.30am

* Beekeeping Industry Structure in NSW
* Relationship with other Rural Industries
* Opening of the hive and examination
* Products produced from beehives
* Protective clothing
* Place in the world
* Structure of the beehive
* Beekeeping Associations

MORNING TEA
* Visit Pender Beekeeping Supplies
* Tour of factory and an opportunity to buy equipment.

LUNCH
* Assembling hive equipment; wood preservative; assemble boxes - lid, bottom, frames, comb foundation, painting - Practical.
* Finding and marking Queen Bees - Practical.

AFTERNOON TEA
* Moving hives - Practical
* How to select bee sites - points to consider
* Flora identification - Theory and Practical

TEA/NIGHT
* Slides on World Beekeeping - Russia, China, Solomon Islands, Germany, Korea, Australia, New Zealand.

Sun, 28th Aug 8.30am.
* Video - Endemic Bee Diseases in Australia
* Slides - Exotic Bee Diseases

MORNING TEA
* Examination of Diseased Combs and examine hives for Bee Diseases
* Team Quiz on identification of bee diseases and pests using colour slides

LUNCH
* Record Keeping
* Removing the honey crop
* Hive division
* Honey marketing

AFTERNOON TEA
* Queen rearing
* Questions on any aspect of beekeeping

The DesignTech Program

Design and Technology projects are having an increasingly Agricultural flavour.

DesignTech 94

This year sees a new name and identity for an exhibition with a long and successful history. Intech, which has run for the last nine years, makes way for DesignTech - an exhibition of outstanding major design projects from 1994 Higher School Certificate Design and Technology and Industrial Technology students. DesignTech 94 is stage 2 of a three year exhibition program sponsored by Pacific Power and presented by the Board of Studies NSW and the NSW Department of School Education.

DesignTech is a valuable source of information for the general public and for students and teachers. The exhibitions showcase outstanding student achievement and offer students and teachers an insight into designing and producing major design projects. The exhibitions also highlight the crucial partnership between committed teachers and their students. The development of major projects requires students to thoroughly research their own area of interest or need, develop design concepts and specifications and carefully plan and produce their project. All aspects of the process of designing and producing the project are documented in a folio. The Higher School Certificate examines both the project and the folio.

The Exhibitions

The DesignTech exhibition program for 1994/95 ran over a six month period and included six exhibition venues. It was open to the public for 119 days in total and around 400 000 people passed through the exhibitions. The details were as follows:

Venue	Date	Days Open	Numbers
Crown Central, Wollongong	19-25 Oct 94	7 days	110 000
Charlestown Square, Newcastle	29 Oct to 4 Nov 94	7 days	115 000
Park Beach Plaza, Coffs Harbour	7-12 Nov 94	6 days	50 000
Powerhouse Museum	17 Dec to 28 Feb 95	74 days	60 000
Bathurst City Centre	4-11 March 95	8 days	55 000
Griffith Regional Art Gallery	14-30 March 95	17 days	10 000

The Projects

Around 5750 major design projects were examined as part of the 1994 Higher School Certificate in Design and Technology and Industrial Technology. Over 250 major design projects were nominated for DesignTech 94 and of these a total of 55 have been displayed at different venues around NSW. The projects were selected on the basis of innovation, quality of management, use of resources to produce a quality project and interactive nature while on display.

As part of the 1994 Higher School Certificate assessment, teams of markers representing the Board of Studies travelled to all government and non-government schools throughout the state to mark the practical projects produced by students who presented for the Industrial Technology and Design and Technology examinations.

The marking teams identified exemplary exhibition projects with a "red spot". A panel representing the Board of Studies, the NSW Department of School Education and the Powerhouse Museum then made a final selection from photographs and detailed descriptions of the nominated projects. A core of 26 projects made up the 'On the Road' component, with an average of six projects drawn from the local area for each of the regional displays. The Powerhouse display consisted of 16 'On the Road' projects, along with 7 others.

Student Certificates

This year, for the first time, all students who responded to the red-spot notification received a certificate for having their major design projects identified as suitable for display. Students who had work selected for use in the exhibition program were presented with a certificate signed by the President of the Board of Studies, Mr Sam Weller and the Director-General of School Education, Dr Ken Boston.

The Alan Broady Memorial Prize

The Alan Broady Memorial Prize was first awarded in 1991. The prize is given by the University of Sydney as a memorial to Mr Alan Broady, the long-serving Head of the Industrial Arts Department of Sydney Teachers College/Sydney Institute of Education.

The prize was presented in Industrial Technology for Design and Craftsmanship Excellence in Wood. The recipient in 1994 was Mr Christopher Scheetz, St Pauls College, Walla Walla for his World Globe.

DesignTech 95

The planning for DesignTech 95 is well underway. Exhibitions are already booked for Wollongong in mid October 95, Newcastle at the end of October 95, Armidale the beginning of November 95. Negotiations with the Powerhouse Museum are occurring and it is anticipated that a second Sydney exhibition in Penrith or Campbelltown could eventuate. The program will flow into 1996 with exhibitions in Western Region and Riverina being considered.

Watch out for the DesignTech 95 poster in schools around September 1995. This year promises to be a most exciting program with around 7700 candidates commencing the Design and Technology HSC course.

Student Involvement 1994

Transportable Cedar Vanity Keiran Spencer (Griffith display) Industrial Technology, Ardlethan Central School A vanity unit designed for ease of transporting with a detachable mirror and basin.	**Garden Mulcher** David Ashton (Newcastle display) Industrial Technology, Avondale High School A petrol driven Mulcher with dual chopping action designed for use on household scraps through to 75mm branches.
Solar Powered Compost Tumbler Brett Sonter (Powerhouse & all regions) Design and Technology, Barker College, Hornsby An ecologically sound automatic composting system that uses electronic, solar and electric technologies.	**Chest of Drawers** Industrial Technology (all regions) Rohan Ward, Balmain High School A chest of drawers that utilises naturally occurring drift wood, found and recycled timbers.
Axcel-Gro Giovanna Scarfo (Powerhouse & all regions) Design and Technology, Batlow Technology High A 100% organic potting mix made from waste created as a by-product from a commercial cannery.	**Preparation Bench** Glenn Brockman (Newcastle display) Industrial Technology, Belmont High School A well constructed preparation table with in built chopping block, storage area and utensil rack.

Rocking Chair Paul Mintorn (Wollongong display) Industrial Technology, Berkeley High School A rocking chair that incorporates a hand carved seat and steam bent back, rockers and head rest.	**Freestyle Trolley** Jason Brown (all regions) Industrial Technology, Billabong High School A freestyle design for a carry trolley that incorporates high quality materials and a woven timber back.
Eggplant Adam Preston (Powerhouse) Industrial Technology, Billabong High School An interesting wood sculpture that incorporates fine timber work and contrasting natural wood colours.	**Computer Controlled Coil Winder** Bruce Bishop (Powerhouse & all regions) Industrial Technology, Bellingen High School A high quality coil winding system that utilises metal, electronic and computer technologies.
Blanket Chest Adrian Dawson (Bathurst display) Industrial Technology, Canowindra High School A traditional blanket chest that is well proportioned and has two storage drawers.	**Direct Drill Conversion** Wade Porter (Powerhouse & all regions) Design and Technology, Casino High School A unit that allows primary producers to convert existing machinery and farm by the 'zero till' method.
Sideboard Nathan Clausen (Griffith display) Industrial Technology, Catholic High, Griffith An Edwardian styled sideboard unit with a curved backboard and mirror.	**Seafood Restaurant Design** Cindy Lin (all regions) Design and Technology, Cherrybrook Technology High School Three separate environments are incorporated into a Seafood restaurant design for an exclusive resort.
Coffee Table Jeremiah Staines (Coffs Harbour display) Industrial Technology, Coffs Harbour Christian Community High School A unique design for a coffee table that incorporates contrasting timbers and curved slatted sides.	**Phone Table** Adam Anderson (Coffs Harbour display) Industrial Technology, Coffs Harbour Christian Community High School A telephone table with an individual seat design and front rail shape.
Datsun 120Y engine Russell Banks (Powerhouse) Industrial Technology, Edmund Rice College, Wollongong A well presented engine that has been overhauled mechanically as well as electrically.	**Pembroke Table** Michael Coughlan (Wollongong display) Industrial Technology, Edmond Rice College, Wollongong A drop sided Pembroke table designed specifically for use in areas of the home where there is a lack of space
Box Trailer Matthew Parks (Wollongong display) Industrial Technology, Figtree High School A registered box trailer that utilises the strength of steel and the durability and appearance of timber.	**The Trembler** Adam Brown (all regions) Industrial Technology, Fort Street High The development of an individually designed fishing lure and a marketing package which includes a promotional leaflet and prototype.
Egg Beater Mark McLaren (Powerhouse & all regions) Industrial Technology, Fort Street High School The traditional egg-beater has been redesigned with a high gear ratio and an innovative handle design.	**VW Kombi Icebox** Paul McGilvery (Powerhouse) Design and Technology, Gosford High School A unique and individually designed icebox produced from timber and glass fibre.
Mini World Amusements Allan O'Leary (Powerhouse & all regions) Design and Technology, Goulburn High Design proposal for an entertainment centre with the main theme being an 18 hole mini golf course.	**A Olympic Promotional Garment** Suzanne Quill (Powerhouse & all regions) Design and Technology, Henry Kendall High Images of the Olympic rings, the Sydney Opera House and the Harbour Bridge are created in this promotion garment.
The Bubble Trailer Glen Jones (Powerhouse & all regions) Design and Technology, Hunters Hill High An aerodynamic, lightweight trailer designed for carrying luggage while touring on a push bike.	**Semi-Acoustic Double Bass** Gareth Jones (all regions) Design and Technology, Hunters Hill High A semi-acoustic double bass purpose designed for Jazz incorporates organic curves and practical proportions.

Racing Go-Kart Trailer Brett Conroy (Coffs Harbour display) Design and Technology, John Paul College, Coffs Harbour A registered go cart trailer purpose designed and built to carry two racing go carts and accessories.	**Ag Bike Clothing** Julie Norman (Powerhouse & all regions) Design and Technology, Junee High School Purpose designed motorbike clothing that is waterproof, warm and has removable linings.
Model Bi Plane Andrew Lowry (Bathurst display) Industrial Technology, Kelso High School A 1/4 scale radio controlled model of a Marquart Charger bi plane.	**Bicycle Brake Activator** Paul Wilson (all regions) Design and Technology, Kincumber High An innovative development of a bike brake activator uses a twist system rather than a lever.
Portable Fridge Berrin Scholfield (all regions) Industrial Technology, Ku-ring-gai High School A 12 volt portable fridge system that exhibits a high quality finish and good insulation properties.	**HSC Design & Technology Handbook** Adam Davis (Powerhouse) Design and Technology, Masada College, St Ives A comprehensive student handbook designed and produced for the 2 Unit Design and Technology course. A 3 Unit Specialised Study that outlines a marketing strategy for the student handbook accompanies this Major Design Project.
Kiln-Formed Glass Lauren Nisbet (Powerhouse & all regions) Design and Technology, Northlakes High A set of individually designed glass pieces produced in the kiln using fusing, slumping and moulding techniques.	**Christmas Serviette Rings** Dusanka Bubalo (Powerhouse & all regions) Industrial Technology, Pittwater High School A set of specially designed serviette rings produced in sterling silver especially for use at Christmas time.
Set Designs for Macbeth Angie Matsinos (Powerhouse) Design and Technology, Port Macquarie High An innovative and creative set design for presenting Macbeth at the Sydney Opera House.	**Anaconda Coffee Table** Jamie MacDonald (all regions) Industrial Technology, Robert Townson High A unique design for a coffee table that includes a glass top and an intricately shaped timber base
Rocking Chair Andrew Blackett (Powerhouse) Industrial Technology, S.C.E.C.G.S. Redlands A rocking chair inspired by Sam Maloof that exhibits flowing lines and hand carved forms.	**The Chair** Benjamin McMillan (Powerhouse & all regions) Industrial Technology, St Catherine's High School, Singleton A distinctive yet functional piece of furniture developed using Australian hardwoods in the form of recycled railway sleepers.
Drums Daniel Kuit (Wollongong display) Industrial Technology, St Josephs Regional High School, Dapto A variety of drum styles that effectively use contrasting timbers and an interesting method of attaching the skins.	**Mix n Match Holiday Wear** Samantha Cunningham (all regions) Design and Technology, St Patricks College, Campbelltown A coordinated clothing collection designed specifically for holiday use.
World Globe Chris Scheetz (Powerhouse & all regions) Industrial Technology. St Pauls College, Walla Walla An outstanding example of a free-spinning world globe that has utilised segmented turning and lamination techniques.	**Round Pedestal Dining Room Table** Andrew Smith (Bathurst display) Industrial Technology, St Stanislaus College, Bathurst A round pedestal table with hand carved centre pedestal and four supporting legs.
Rocking Chair Matthew Brown (Bathurst display) Industrial Technology, The Canobolas Rural Technology High School A well crafted example of a rocking chair which incorporates repetitive turning and curved sections	**Salvaged Sam** Christopher Reeve (Powerhouse & all regions) Design and Technology, The Jannali High A single wall unit made from recycled building materials including bushfire-damaged fence palings. A 3 Unit Specialised Study that outlines an innovative application accompanies this Major Design Project.

Pinocchio & Jiminy Cricket
Shane McIntosh (Newcastle display)
Industrial Technology, Toronto High School
A bedroom furniture toy with hand carved as well as machined pieces that are designed to move in a puppet fashion.

Hydroponic Garden
Andrew Agostino (Griffith display)
Design and Technology, Wade High School
A system developed for growing plants in a nutrient solution without the use of soil.

DS 2000 - Car Design
Daniel Seddon (Powerhouse)
Design and Technology, Wagga Wagga Technology High School
A unique car design with distinctive aerodynamics and associated safety features.

Solar Powered Ventilation System
Nathan Scott (Powerhouse & all regions)
Industrial Technology, Whitebridge High
The use of flexible solar panels and custom-designed circuitry provide the basis of an efficient innovative ventilation system.

Safe Guard
Andrew Noad (Powerhouse & all regions)
Design and Technology, Yanco Agricultural High School
A guard specifically designed and produced to eliminate damage to the vehicle when attaching a trailer.

Hallstand
Belinda Blowes (Bathurst display)
Industrial Technology, Yeoval Central School
A traditional hallstand with steamed and laminated mirror surrounds, segmented umbrella holder and turned decorative spindles.

Blackwood Writing Desk
Murray Whiley (Griffith display)
Industrial Technology, Ungarie Central
An ergonomically designed writing desk produced for people over 1.8m tall.

Rad-E-Cate
Simon Plum (all regions)
Design and Technology, Wagga Wagga Technology High School
A system designed to eradicate noxious and unwanted weeds on a selective basis in an economical fashion.

Roll Top Desk
Jonathon Kvist
Industrial Technology, Wallsend High School
A well-crafted example of an old English-styled desk.

Chess and Games Table
Christopher Betts (Wollongong display)
Industrial Technology, Wollongong High
A dual purpose unit designed for use as a games table as well as a coffee table.

The Hunt
Derek Lewington (Griffith display)
Industrial Technology, Yanco Agricultural High School
A lockable cabinet designed for storing a rifle and as well as holding a cartridge belt and a stock whip.

AgHealth

AUSTRALIAN AGRICULTURAL HEALTH UNIT

PO BOX 138
MOREE NSW 2400
PH (067) 52 9222
FAX (067) 52 4025

AG. HEALTH FACT SHEETS **(30 cents each)**

- Noise & Hearing Loss
- Selection and Maintenance of Personal Hearing Protection
- Managing Noise Induced Hearing Loss
- Sunburn and Skin Cancer
- Rural Women's Health
- Child Safety on Farms
- Helmets for Farm Children
- Fencing the Farm House and Yard
- Farm Machinery Accidents
- Chainsaw Safety
- Agriculture and Asthma
- Safe Disposal of Treated Timber
- Eye Protection for the Farm Worker
- Farm Workshop Safety
- Pesticides and Human Health
- Personal Protective Equipment for Pesticide Users

PAPERS **($10.00 each)**

- "Profile of Farm Health and Safety - A Report of Farmsafe Australia" (June 1994)
- "Farm Injury in Australian Adolescents and Young Adults - A Literature Review" (January 1994)
- "Farm Injury in Australian Adolescents and Young Adults - An Injury Profile" (August, 1994)
- "Farm Injury in Adolescents and Young Adults - Focus Group Report" (September, 1994)
- "Human Health and Pesticides in Agriculture in N.S.W. - Issues, Programs and Future Directions for Health Workers" (June 1993)
- "Pesticide Exposure in Cotton Chippers in the Gwydir Valley, 1991-92" (December, 1992)
- "Pesticide Exposure in Horticultural Industries in Central, South East and South West N.S.W. 1992-93"
- "Options for Improvement in Farm Motorcycle Safety - Literature Review" (February, 1994)

GUIDELINES **($5.00 each)**

- "Farm Women's Safety Workshop - Guidelines"
- "Guidelines for Planning A Farm Safety Field Day for High School Students of Agriculture"
- "How to Conduct a Successful Hearing Conservation Field Day"
- "Youth Farm Safety Workshop and Activity Guide" (1994)

VIDEOS

The Australian Agricultural Health Unit has produced 2 videos and these are available for purchase **($30.00)**, namely:-

- "You don't have to yell at me!" - describes the problem of noise on farms and the risk of noise induced hearing loss. Duration - 12 mins
- "Nobody ever died to a cough" - explains the problem of respiratory disease in agriculture. Duration - 10 minutes

In addition the abovementioned the Unit holds an extensive video library covering such topics as:-

- Noise & Hearing Loss
- Asthma & Agriculture
- Tractor Safety
- Chainsaw Safety
- Horse Safety
- Emergency Safety
- Child Safety
- Pesticide Safety
- Safe Animal Handling
- Agbike Safety
- Farm Machinery Safety
- Manual Handling
- Hydatids/Zoonoses

Whilst there is no cost associated with borrowing the videos we do require a small fee ($5.00) to cover postage and handling. All videos are to be returned within 2 weeks. Due to their popular demand it is suggested that people contact the unit at least 2 weeks prior to when they are required.

OTHER RESOURCES AVAILABLE

- Farmsafe Australia Newsletter - produced bi-monthly - Please contact Felicity if you would like to be included on the mailing list (Free of Charge)

- Pamphlet produced by the NSW Farmsafe Committee titled "Don't Let Farm Noise Destroy Your Hearing". This pocket sized pamphlet presents everyday activities farmers are involved in and indicates the maximum exposure time before permanent damage to hearing occurs.

POSTERS

($1.00 each)

- Safer Work in the Farm Workshop "Protect Your Ears"

- Safer Work in the Farm Workshop "Protect Your Eyes"

- Safer Work in the Farm Workshop "A Quick Checklist"

- Ag Bike Safety "Reducing the Risk of Injury"

- Safer Horse Handling "This May be Comfortable, But this is Safer"

- Don't Let Farm Noise Destroy Your Hearing

* This poster was produced by the NSW Farmsafe Committee and is available free of charge to residents of N.S.W.

In addition to the abovementioned resources the Australian Agricultural Health Unit has an extensive resource library which may be drawn upon to provide you with any additional information. (Please not you may be required to assist with photocopying charges) .

Ms Mary Jane Mahony
Orange Agricultural College, The University of Sydney
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ORANGE NSW 2800

Management in Agricultural Education

Mary Jane Mahony
Orange Agricultural College, The University of Sydney

Understanding and improving management is one of the driving forces in agriculture today. Why? Those working in the agricultural sector and those preparing others for a future in agriculture must be productive in a high risk environment influenced by climate, fluctuating markets, changing technology and the increasing importance of managing people well. Good management is about planning, considering risks and benefits and making decisions based on understanding. Good management is about feeling in control. Undertaking professional development in this area could contribute to improving your teaching, your school's managerial activities and your career options. Orange Agricultural College, The University of Sydney, offers you the opportunity to study further in this area, and at your own time and place (by distance learning).

Some of the course units to be offered in Spring Semester this year include Agricultural Finance Management, Agrimanagement Systems, Alternative Agriculture, Foundations of Marketing, Research in Agricultural Education and Sustainable Farming Systems. These are postgraduate level units. They are part of formal award programs but can also be undertaken individually as professional development options. One unit is a quarter of a full-time semester study load (spring semester starts at the end of July and ends at the end of November).

All units expect you to tie theory to practice, usually through project work in a situation of your own choice. This is highly challenging, yet students report it is almost always immensely satisfying.

There are no compulsory residential schools. In most units students meet one another via teleconferences conducted through telephone links to students' homes.

The formal award courses in management are the Graduate Certificate (4 units), Graduate Diploma (8 units) and Master of Management (16 units). The College also offers the Graduate Certificate and Graduate Diploma in Sustainable Agriculture. These courses are 'nested' which allows progression with advance standing into the higher award courses, starting with the Graduate Certificate.

The application deadline for admission into one of these courses in Spring 1995 is 30 April. Professional Development Studies (PDS) enrolments may be taken as late as June subject to places being available. All management course options are fee-paying at $750 per unit (1995) plus other fees. The sustainable agriculture courses are HECs enrolments. PDS fees are $620 per unit for enrolment in any unit. Tax deductibility is quite possible, so it is worth getting advice from your accountant.

If you would like further information and an application, telephone (063) 635 511 or fax (063) 25 590 (attention Information and Marketing). If you wish to talk about the content and

A STIMULUS FOR IDEAS

THREE UNIT RESEARCH TITLES 1987

The following list of titles has been compiled from the research reports submitted for marking in 1987. The list has been provided to assist teachers and students when deciding on potential project ideas. Read it and realise what can be achieved. Consider all the variations that could be examined and then finalise individual student ideas.

The list has been provided not to be "pick the title" rather to provide a stimulus for new ideas.

1. RESOURCES SYSTEM

- The effects of ph levels on hydroponicaly grown Barley.
- Testing physical and chemical status of soil and a banana plantation. Cost associated and recommendation for future chemical use.
- Evaluation of the effectiveness of aeration on compacted soil in relation to pasture growth.
- A comparison of soils in our region using physical and chemical methods.
- Soil physics - to compare two major soil types and their effects on agriculture production.
- Effects of granulated polystyrene foam in soil for growing ferns.
- Effect of 2 growth Medias on the production of zucchini's.
- The effect of soil types on the dry matter content of Field Peas.
- The effects of liquid sludge on pasture growth and soil properties compared to superphosphate-gypsum.
- The effects of Mulch and Gypsum on soil surface caking to establish carrots.
- Soil management practice.

- Effects of reduced and increased rates of thrive (common fertilizer) on Lettuce seedlings.
- Nutrient deficiencies in oats and wheat using the latest technology with hydroponics.
- The yield variation between different wheat species and whether fertilizer effects these yields.
- The effects of inoculation on subterranean Clover growth.
- The effects of the fertilizer sulphate of ammonia on the growth of both the roots and leaves of the RAPHANUS SAVITOS (Red Round Radish).
- Effects of an acid soil on plant production.
- Effects of nitrogen on plant growth using garden peas and radishes.
- The response of acid soils in the Kempsey District to Lime.
- How varying rates of Phosphorus and Nitrogen effect early growth of Oats.
- The effects of fertilizers on yield in subterranean Clover.
- Nitrogen and Phosphorus response of Maize for silage.
- Effect of Different Calcium levels on the growth rate of Lolium Perenne under Hydorponic conditions.
- Effect of Concentration of Hydrogen Ions in solution on growth rate of young Lucerne in a Hydroponic production system.
- The effects of Nitrogenous Fertilizers.
- An Investigation into the effect of Nitrogen Fertilizer on the growth of Cape Horn and Sugar Loaf Cabbages.
- The response of Lolium Rigidum (Annual Ryegrass) to varying amounts of Nitrogen Fertilizer (Nitram.)
- To evaluation the use of Liquid Fertilizers in the production of the Pipino Plant (Solanum Muricatum).
- The effects of various Fertilizers on a mixed pasture in The Central Tablelands Region of N.S.W.

. The effects of Nutrient Solutions on the Germination of Lettuce Seeds.
. Comparison of slow release fertilizers.
. Trial of three hydroponic nutrients for winter Lettuce growing.
. Effects of Fertilizers on the growth of Oats, Soil, PH and Weeds.
. The effect of the Rate of Application of Nitrogen Fertilizers on Grazing Oats.
. Effect of different application rates of Urea on Ryegrass.

. The effects of calcareous gravel as a growing media to hydroponics.
. Effects of Nutrient deficiencies in Hydroponically grown Maize.
. Comparison of two different mediums for the germination and initial growth of tomato plants in hydroponics.
. Comparison of the growth of shallots in soil and in a recirculating irrigated medium (gravel) hydroponic system over four weeks.
. Effects of different methods of AERATION on the growth and survival of lettuce and celery seedlings in a Hydroponic system.
. The suitability of different media for plants in a Hydroponic system.
. The effect of Watering Frequency on the Hydroponic growth of Lettuce.

* Salination and barley.
* The causes, effects and control of soil salinity.
* Determining the effect Sodium Chloride has on a lettuce crop.
* Effect of different concentrations of Salt (NaCl)) solutions on the germination and initial 12 day growth of wheat and oat seeds.
* Effects of salinity on germination and early growth of subterranean clover.
* Effect of Hydraulic Conductivity of Saline Irrigation Water.
* The effects of Salinity on Germination rates.

* The effect of Tridan a pre-emergent herbicide on the early growth and development of three cereal crops Wheat, Oats and Barley.

* Pepino evaluation trial-light intensity effects on pollination and flowering.
* Effects of a constant temperature on the emergence of a winter cereal (Wheat) and a summer cereal (Maize).
* Climate analysis of growing months and seasons at Glenfield N.S.W.
* Effect of various sod seedling techniques on the establishment of Phalaris Sirosa.
* The minimization of Evaporation from the surface of Water Storages.
* The effect of differing methods of Irrigation on the harvesting weights of Lettuce.
* Erosion control aiding farm productivity.
* The effects of weather conditions upon the growth of young feel lot cattle.

2. **ANIMALS SYSTEM**

* To study different growth rates of 3 different types of chickens (all Cockerels) all fed same rations.
* The influence of nutrition on the growth rate of Broilers.
* The effects different stocking rates had on the final live weights and carcass weight of Broiler chickens.
* A comparison of the weights of Broiler chickens in a free range state and an intensive state.
* A comparison of the growth and food intake of Broilers under two different lighting regimes.
* Effects of diet on the egg production and weight of laying hens.
* Effects of common salt on the growth rate and food conversion ratio of Broiler chickens.
* Effect of crossbreeding on efficiency of animal food conversion.

* Effect of genotype and nutrition on growth rate of chickens.
* The comparison of raising ducks on wire and deep litter floor.
* Comparison between 2 commercially prepared feeds on carcass weight of ducks.
* Comparison of growth rates of Broiler Chickens.
* The effect of Linoleic Acid on Egg size.
* To determine the effects of temperature conditions on the growth rate of chicks from one to ten days old.
* A comparison of the effects of Red and White light on laying hens in a deep litter system.
* Determine whether amino-acids affect the growth of meat chickens using three different mixtures of feed having same protein level.
* Effect of temperature on weight gain and food conversion ratio in Broilers.
* The effect of protein composition on the live weight gain of Broiler chickens.
* The operation of debeaking day old broiler chickens results in a retardation of growth.

* The performance in terms of weight gains for store lambs on two types of production rations.
* Use of entire males and Cryptorchids in the prime lamb industry.
* A comparison of the growth rate/weight gains and subsequent carcass value (returns) of pure bred merino lambs and second cross lambs exposed to feed lot conditions.
* The comparison between a Benzimidazole drench and a Levamisole drench, in their ability to reduce the faecal egg counts of worms in weaner sheep.
* The effects of including salt in ration of lot-fed lambs.
* An investigation into the content of Butterfat contained in sheep's milk in relation to different feed quality.
* Effect of male hormones on the carcass composition and palatability of prime lambs.
* Growth rate in ewes, rams, wethers of tukidale sheep (mediums of wool weights, staple length and carcass quality).
* Drought feeding merino weaners.
* The effects of too high protein feeds on carcass development in lambs.
* The effects of castration and cryptorchidism on growth rate of lambs.
* The effects of castration on the carcass quality of second-cross lambs.
* The effect of egg yolk on the survival of ovine spermatazoa when being subjected to rapid cooling within a narrow temperature range.
* The effects of prefreezing temperatures on psot thaw survival of ovine spermatazoa.
* The effects of varying concentration of glycerol as a cryprotectant on the post thaw survival of ram (ovine) spermatazoa.
* A comparison between the use of a sheep drench versus high nutrition pasture as a method of controlling internal parasites in two year old merino wethers.
* A study of the relative weight gains and carcass weights in the progeny of three terminal second cross lamb sires:- Suffolk, Poll Dorset and Coolalee.
* A comparative growth study involving the weight gains of prime lambs.
* The effect of feeding high quality pasture as compared to a typical drought Supplementation Diet in relation to weight gains of lambs.
* Comparison of Merino bloodlines.
* Effect on environment on the fineness and strenght of Romney Marsh wool.
* Comparing first and second cross lambs.
* The role of Copper in fleece pigmentation.

* The effect of nutrition on wool growth.
* Comparison of hand-reared lambs with mothered lambs.
* The effects of pasture conditions on wool growth.
* The effect of Fecundin on fecundity of ewes.
* The comparison of growth rates between entire lambs and wether lambs.
* Effects of Dietary intake on Milk production, Protein and Butterfat.
* Comparison of the suitability of two different breeds of cattle - Santa Gertrudis and Murray Grey - Grown under feedlot conditions as determined by weight gains.
* The effects of a growth promotant, "Ralgro" on young cattle.
* Compensatory growth (after a setback in steers growth period).
* Effect of differing Dietary Protein on calf growth up to nine weeks of age by testing different rations for this period.

* * Early weaning in pigs.
* A comparison of growth rates and fat distribution of bacon pigs according to the sex of the animal.
* Early weaning in pigs.
* Effects of weaning ages of pigs on their daily weight gains.
* Does weaning age affect pig growth and development?
* Comparison of the growth and production in hybrid pigs.
* Comparing growth rates of Gilts and Boars.

* The effect of sprouting on the hydrogen cyanide potential of grain sorghum in dairy cow rations.
* Nutrition and farming methods of Australian freshwater crayfish.
* Effect of different drench types on the growth of weaner goats.
* Larval nutrition of the eastern King Prawn.
* Effect of certain drenches for the control of Nematodirus Spathiger.
* The effect of a specific Miticide-Ovicide on both egg and adult growth stages of two-spotted mite.
* The study of Mendel's law of dominant and recessive genes using wild type and vestigal winged fruit fly.
* To determine the differing profitability of lucerne chaff as opposed to lucerne cubes in a lot feeding environment under ad lib feeding conditions.

3. PLANTS SYSTEM

* Tagasaste - Tree Lucerne. Anamaecytisus Palmersis.
* Effects of strains and module formation on "Haifa" white clover.
* Effects of Nitrogen applied at 3 different rates to 3 different variety of Oats- Echinda, Blackbut and Cooba.
* The use of a legume in fodder crop production.
* Sorghum as a winter stand over crop.
* Effect of seed innoculation with Rizobium bacteria on the nodulation and dry matter production of lupins and feild peas during their vegetative phase of growth.
* Experiment to measure the growth of 8 winter cereal crops under grazing conditions.
* Comparison of forage Sorghums and Millet.
* A comparison between to oat varieties - Cooba and SAIA for grazing purposes.
* The productivity of Four Ryegrass varieties.
* "What is the best winter Ryegrass?"

* A comparison of dry matter yield and leaf area index of Phalaris Tuberosa and Medicago Satiua when planted in single species and as a mix.
* The effect of added Nitrogen, on the dry matter yield of HAIFFA white clover.
* Grazing cereals for use on the central tablelands region of N.S.W.
* The effect of different acidity levels in soil, on the growth rate of Unicrop lupin seeds.
* Comparison between new and existing Ryegrass species for winter feed.
* Effect of a Lime/Phosphorus interaction on the growth of Lucerne on an acid soil.
* Effect of inoculation of white clover seeds on growth and nodulation of subsequent clover plants.
* The effects of fertilizers and inoculation treatments on the nodulation rates of Lucerne plants.
* Maize silage production and the effect of temperature.
* The application of superphosphate on pasture in Souther N.S.W. with special reference to Lucerne pasture.
* Phosporus and Molybdenum requirements for S.W. slopes pastures with special reference to Lucerne.
* The contrast between inoculated and lime pelleted Lucerne to untreated Lucerne.
* The effect of Potassium Carbonate solution on the drying of Lucerne.
* The effect of Phosphorus on a subterranean clover based pasture in the Riverina region.

* Effect of a variation in hydroponic media type on lettuce growth.
* The effect of planting density of hydroponically grown carnations using the Growool slab medium.
* Comparison of three different hydroponic nutrient solutions and effectiveness economically and growth wise leased on small home management system of hydroponics.
* Comparison of Different Systems for growing Lettuce in Hydroponics.
* Effect of nutrient levels on lettuce grown hydroponically.
* Comparison of two hydroponic media on the growth of beans.
* The biological suitability of hydroponically grown barley as an energy source in dairy production systems.
* Lettuce ain't lettuce in hydroponics - an evaluation of the growth of two varieties grown hydroponically in the Nepean region.

* The effect of potassium nitrate on the germination of setaria sphacelata seeds.
* Effectiveness of Atrazine and 2,4-Damine on the weed population in hybrid sorghum.
* Comparing the effect of 2 different methods of Applying Tree Poison.
* The effect on the growth and developmetn of Wheat by Glean.
* The effect that Roundup, Garlon and Brush-off have on the Australian Blackthorn shrub and their economic viability to the farmer.
* The effect upon the control of Kikuyu grass by varying the concentration of the herbicide Roundup and area applied.

* Chemical growth Regulators in plants.
* An assessment of the different methods of sterilizing potting mixes and their effect on the subsequent germination and early development of lettuce seedlings.
* Comparison of rooting King Protea cuttings with Rootx-L or Seradix 2.
* Effect of Gibberillic acid (a plant hormone) on the growth and production of broad beans.

* The effect of the removal of the apical bud on growth and yield of a single pick harvest of brussels sprouts.
* To determine the difference in quality and quantity of tomatoes yielded from plants subjected to 3 different levels of pruning.
* The effect of fertilizer rates on flower production in Cherianthus Cheri.
* The effects of Giverellic Acid applied to two varieties of pea (Pisum Sativum) during their early stages of growth.
* Testing the effect of a high nutrient mix on the time Stocks take to flower.
* The use of Silver Thiosulphate (STS) in the preservation of Sim Carnations under long term cold storage.
* The effect of plant density on the vagetative yield of a leafy crop in hydroponics.
* Effect of Hormone Powder on Root Development of Branch cuttings.
* Effect of different propagating methods on the strike rates of Azalea Cuttings.
* Lettuce growth in different light and root mediums.
* Effect of Givverrellin on Potato numbers for seed production.
* Effect of Silver Nitrate on Vase Life of Gerberas.
* Grafting of Fruit trees.
* The effects of Auxin on the germination rate of an Australian native plant (Red).
* Comparison between the effects of silver nitrate, silver thiosulphate and silver thiosulphate combined with sugar and preservative on the vase life of sim carnations.
* To verify that tall and semidwarf varieties of wheat show different reactions to the application of Givverellic Acid.

* Growth comparison of Grain legumes versus wheat.
* Control of pests in Cabbages.
* Effects of inorganic and organic fertilizers on root growth.
* The influence of varietal difference on yield in zucchini marrows.
* Density and plant growth.
* Timing of inoculation of Soybean seeds.
* The effects of seed size on the germination rate.
* The effect inoculation of RHIZOBIUM bacteria has upon the yield of Pisum Sativum.
* The response of tomato yield to different plant population density.
* The effects of different densities of weeds grown in direct competition with oats by measuring both plant and seed weight.
* Test and investigate the germination rates and time period between chemically delinted cotton seed and naturally ginned cotton seed, the latter being left with a cover of linters.
* To determine the germination and initial survival rates of Lupin grain in varying salinity levels.
* The effect of bacterial inoculant on the root nodulation of Soybeans.
* The effect of sowing densities on the yield of green peas.
* Effects of salvia reflexa components on the plumule development of triticum sativa (Wheat).
* Soybean varieties on the mid north coast.
* Summer crop yields under conventional and direct drill tillage.
* The effect of herbicides as an overspray on figs.
* The effect of depth of placement of wheat seeds on emergence.
* The significance of growth substances for phototrophism.
* Weed control in snow peas.

* Effects of Datura Leaf washings on the germination and initial root development of Cruciferae seeds.
* Relevance of phenol test in distinguishing between various triticum vulgare varieties.
* Determine effectiveness of 'Austra-Sorb No.7' seed coat moisture retentive seed starter as claimed to increase emergence percent and speed of emergence.
* A study of Allelopathic Properties in plants.
* The effects on the germination of plants incorporating Harvest Residue.
* Thistle control.
* The effects of added molasses on the fermentation of Grass Silage.
* The suitability of Beeswax for the Waxing of Citrus Fruit in a small farm situation.
* The effect of mulches on the growth of Cabbages.
* The effects of Tillering of varying plant Neurities.
* The effects of grazing on tiller production.
* Methodology of Bio-Oynamic procedures and testing of the Bio-Dynamic spray "500" on the mid north coast.
* A study into the effects on seed germination and seedling establishment of a farmyard manure comprised of horse dung and straw.
* Seed Banks and Seed number estimation.
* The effect of water upon the growth of the root system.
* The allelopathic effect of stubble residue on the germination and growth of a new crop.

4. INVERTEBRATES & MICRO-ORGANISMS SYSTEM

* Nematodes in carrots.

* Litter beetle control in poultry sheds.
* Investigation of effects of different fertilizers on growth and well-being of earth worms over a ten week period.

5. SOCIO-ECONOMIC SYSTEM

* Relative yields and costs of winter forage crops on the mid north coast.
* The economics of Nitram applciations on Tetila Ryegrass.
* An economic comparison of intensive and Extensive Broiler Raising Systems.
* A comparative study of cattle in feedlot and pasture conditions with particular reference to weight gain and the economic advantages.
* Feedlotting economics.
* Intensive farming and marketing pork.

Farmsafe GLOUCESTER

Horse-related Injury Project
91 High Street
Taree 2430

1995 - PROPOSED TRAIN-THE-TRAINER PROGRAM

				(Instructor)
NORTHWEST	1.	Tamworth	March 6	NO
	2.	Armidale	May 15	NO
	3.	Coonabarabran	Sept 4	NO
	4.	Moree	Oct 23	NO
HUNTER	1.	Manning	March 7	NK
	2.	Maitland	May 22	NK
	3.	Singleton	June 6	NK
	4.	Lake Macquarie	Aug 1	NK
	5.	Raymond Terrace	Oct 17 (?)	NK
RIVERINA	1.	Griffith	April 4	MG
	2.	Albury	June 19	MG
	3.	Deniliquin	Aug 22	MG
	4.	Wentworth	Aug 23	MG
	5.	Upper Murrumbidgee	Nov 14	MG
NORTH COAST	1.	Oxley	April 3	NK
	2.	Summerland (x2)	June 13 (14)	NO
	3.	Clarence River	July 24	NO
	4.	Coffs Harbour	Sept 4	NK
	5.	Wollumbin	Sept 11	NO
SOUTH COAST	1.	Bega	May 1	MG
	2.	Queanbeyan	May 2	MG
	3.	Albion Park	July 25	MG
	4.	Nowra	July 26	MG
	5.	Wollongong	July 27	MG
WESTERN	1.	Bathurst	March 13	NO
	2.	Dubbo	May 29	NO
	3.	Forbes	Nov 7	NO
	4.	Broken Hill	Dec 4 (?)	NO



Why Choose Agriculture?

Warwick Moore
Committee for the promotion
of Agriculture as a Career
Dear Warwick,

I wish to convey a few thoughts about the promotion of Agriculture as a viable career option. Firstly I applaud the collaboration which has arisen. The fact that T.A.F.E., High Schools, Employers / Advisors (NSW Agriculture), NSW Department of School Education, and Universities have joined forces in this endeavour indicates a true commitment to the cause. This is the first time, in my memory, that educators and employers have sat down together in a collaborative way, not to push their own barrow but to support their collective industry.

I would suggest, to complete the circle, that we invite two students from a secondary school, and two university students, to join the group as equal partners, in order to gain insights and advice at that level. I believe that we should adopt a plan of attack, for the promotion of agriculture as a preferred career option, around "the Student is our Client". If we keep the needs of the student connected with the needs of the industry of agriculture it should give us a clear focus.

I have been thinking lately, about what we are trying to sell and I believe that we truly have a worthwhile product. The intrinsic nature of agriculture, as a lifestyle lends itself to the sorts of concepts which make for a satisfying career. In light of this I would like to suggest some ideas for discussion. These ideas are merely the result of a brainstorming session. I am acutely aware of the pecuniary perceptions that students use in order to guide career choices, but indications are that, given worthwhile information and a context to ground it, the perception can be penetrated. I am not advocating a "brainwashing" campaign, but I do believe that agriculture as a career option could have an infinitely higher profile. The profile I am suggesting is one based on some of the more wholesome ideas about agrarian culture and lifestyle. Remember that we are aiming to promote agriculture as a career, this has vastly different connotations to agriculture as "work" "or a job".

Agriculture as a career begins with an interest in the student, they can realise that interest through a variety of sources but what happens from that original spark, through to natural retirement from a satisfying, and mutually beneficial career, may depend on some of the things for which we, as a group of concerned specialists, are collaborating.

High Schools play an enormous part. The relationship between an Ag Teacher and their students is vitally important. My experience is that that relationship is uniquely mentor like, and that related to the variety of experiences which agriculture at school offers, makes for a rich and fulfilling atmosphere.
Agriculture Teachers are inspirational in helping adolescents:

* find out about how the world works through solving problems in agriculture.
* learn to nurture living things, understand how they function as a human being.
* realise their own strengths and weaknesses by being challenged to plan, act, reflect, modify.
* discover how other people 'work' by working in teams.
* foster real ideas about likes and dislikes relating to "quality of life" issues.
* manage personal growth and development in light of effort and achievement.
* develop deep personal pride in outcomes processes.
* liberate creativity and imagination leading to innovative ways of thinking.
* assimilate ideas about the sanctity of life, morality and ethics.

I am not saying that other teachers, let alone other people, do not influence the development of the person, but agriculture has a special place, and a special advantage, because of its connection with the natural world. The Agriculture Teachers, with which I have associated are, on the whole, uniquely caring and dedicated people. This positiveness which agriculture at high school offers, is overshadowed by a poor perception of the subject, or a lack of knowledge of what the career options are in agriculture, Agriculture is often associated with

menial tasks, and lower order achievement.
Nothing could be further from the truth. Agriculture presents more opportunities to develop life long learning skills than any other subject I know. Agriculture should be the reason kids go to school ! Just think of the variety of environments and agendas, which the subject encompasses

Agriculture at high schools has the capacity to be enormously influential in informing students of the *real reasons* to choose a career path.

Universities and TAFE drive home the established interest and quest for "quality of life" vocational and enterprise education, training, induction and practicum.

It is the student's perception of what is really important about choosing and deciding for the future, that is the real problem. Students, and the general suburban public, seem to have a hierarchical perception about certain professions and it seems that agriculture, as a career preference, appears to be low on the list. Students are easily swayed by lucrative job prospects perceived in other career areas, they may not wish to study away from the home environs, they choose to stay with friends, they rely on information based on myths about the status of subjects when deciding about courses.

We should aim our campaign at the inner person. *We should shoot for the heart.*

I believe that we should aim to penetrate the perceptions of high school, TAFE, and university age students in order to help them choose career paths from an informed base. To do this, I believe we need to appeal to the student's value and belief system.

A campaign based on a theme like "THE SPIRIT OF THE NATION" encompasses the sorts of ideas I am suggesting. Agriculture in Australia historically, has been a significant nation builder. I am not advocating that we project an image of a nation of farmers. I am convinced that perceptions about rural cultures, agrarian societies, country values, and "down on the farm living" are attractive to young people.

By rural culture I mean these sorts of ideas

- a slower gentler pace of living
- a spirit of collective community endeavour and team work
- a defined attractive quality of life
- a farm is a business and in most cases a home
- a sense of belonging to an identified community
- working for self as well as for others
- ideals about feeding and clothing the nation
- ideas about contributing to the nations wealth, growth, and development
- immediate rewards for effort
- tangible evidence of achievement
- responsibility for creating and nurturing living things
- a sense of responsibility created by being responsible for the welfare of living things
- ability to use initiative and enterprise in planning and innovating
- to influence and be influenced by overt, identified, shared, community values
- lives are linked to the cycle of the seasons, helping connect with the natural order of things
- there is an ethos of growing and producing
- one gets to harvest the results of ones labour
- an immense scope for diversity of though and action
- immediate feedback about production via market opinions
- agriculture industry workers are usually their own boss or work fairly independently
- there is a sense of mutual respect between members of the community

I feel that we have many themes within this kind of thinking which a marketing or advertising company could develop for us.

All of this leads me to ideas relating to the enormous breadth of career opportunities which agriculture and related industries offer. Imagine the systemic network created by say the racehorse industry, employment, leisure, gambling, entertainment, stock export, stock import import, training, education, technology transfer, knowledge transfer, design transfer. All mushrooming out the fact that somebody has the knowledge and skills for feeding-breeding-caring-rearing, horses !

So the idea is to appeal to a level of thought in the individual which penetrates their habitual superficial perceptions of agriculture in order to encourage a second thought. It is from this point that hopefully students will seek further information about courses careers etc. Each course would show a speciality of approach or niche of employment opportunity.

Intrinsic stimulus ideas about careers in agriculture.

WHY A CAREER IN AGRICULTURE ?

you can be valued for what and how you think about things
you can learn to solve problems
you can network with a variety of resource people
you can be innovative
you can work with environmental issues
you can be creative
you can mostly be your own boss
as a professional you can make a difference *with* as well as *for* people
you can work with plants and animals
you can help people solve problems
you can work outside
you can work with people
you get to work with farm machinery
you can be a farmer
your work can vary as the situation varies
your work could involve international travel

ISN'T AGRICULTURE JUST ABOUT FARMING ?

your career could be as an educator at TAFE, University, High School, Private Organisation or your own company.
your career could be negotiating information exchange and trading agricultural products for an import / export company
your career could be to develop rural communities by helping the people in them manage change
your career could be improving the reliability of food supplies, water and shelter for people in the third world
your career could be helping food and fibre sellers meet consumers' needs
your career could be advising farmers on how to farm differently or more efficiently
your career could be researching and developing better agricultural practices and/or products
your career could be using computers to : model and plan farms, maintain farm records, simulate better farm productivity, create programs to limit risk taking.
your career could be providing farmers with the things they need to do farming
your career could be servicing and maintaining farmers irrigation equipment and farm machinery
your career could be protecting the rural environmental
your career could be helping farmer producer groups and organisations operate more effectively

The career opportunities presented by agriculture, extend literally from the farmer's paddock to the consumers plate. It is up to us to present those opportunities as pathways which are accessible, interesting satisfying and achievable.

CAREERS FROM PADDOCK TO PLATE ?

Here is a number of agricultural careers to demonstrate the diversity and depth of opportunity.

RURAL REGIONAL DEVELOPMENT ADVISOR AND/OR FACILITATOR
TECHNOLOGICAL & FURTHER EDUCATION (TAFE) RURAL STUDIES TEACHER
UNIVERSITY LECTURER IN AGRICULTURE AND RELATED COURSES
MACHINERY IMPLEMENT DESIGNER
MACHINERY IMPLEMENT MANUFACTURER
FENCING CONTRACTOR
LABORATORY TECHNICIAN
AGRICULTURAL BUILDING CONSTRUCTOR
ECOLOGICALLY SUSTAINABLE BEEF CATTLE FARMER
ECOLOGICALLY SUSTAINABLE DEER FARMER
ECOLOGICALLY SUSTAINABLE POULTRY FARMER
ECOLOGICALLY SUSTAINABLE WOOL PRODUCER
NATIONAL PARKS & WILDLIFE RURAL RECREATION AREA MANAGER
PASTURE PROTECTION OFFICER
STOCK & STATION AGENT
FIELD RESEARCH ASSISTANT
ECOLOGICALLY SUSTAINABLE OIL SEED FARMER
ECOLOGICALLY SUSTAINABLE DAIRY FARMER
FERAL ANIMAL CONTROLLER
ECOLOGICALLY SUSTAINABLE GRAIN FARMER
FARM MACHINERY SALESPERSON
AGRICULTURAL MACHINERY TECHNICIAN
AGRICULTURAL CHEMICAL SALESPERSON
STATE & PRIVATE HIGH SCHOOL FARM ASSISTANT
ECOLOGICALLY SUSTAINABLE VEGETABLE FARMER
ECOLOGICALLY SUSTAINABLE ORCHARDIST
ECOLOGICALLY SUSTAINABLE HAY PRODUCER
FARM BUILDING DESIGNER
SOIL SCIENTIST
SOIL CONSERVATIONIST
ANIMAL & PLANT QUARANTINE OFFICER
RURAL WILDLIFE AREA MANAGER
SYSTEMIC GRAIN TRADER
AGRICULTURAL SHOW & FIELD DAY COORDINATOR
FARMSTAY HOLIDAY MANAGER
SMALL FARM COOPERATIVE MANAGER
HORSE STUD MANAGER
RURAL JOURNALIST
RURAL RADIO AND T.V. BROADCASTER
REGIONAL LIVESTOCK OFFICER
PLANT FIBRE PRODUCER
SUPERMARKET FOOD BROKER
RURAL ENVIRONMENTAL MANAGEMENT
NATIONAL PARKS PROTECTION & RESTORATION PRACTITIONER
WHOLE FARM PLANNER
RURAL PRODUCTS & SERVICES ADVERTISER
AGRICULTURAL COMMERCE FINANCIER
MARKETER OF AGRICULTURAL PRODUCTS
MARKETER FOR FARMER COOPERATIVES
WHOLE RIVER CATCHMENT AREA MANAGER
MANAGER OF RURAL PRODUCER GROUP
STRATEGIC WHOLE FARM PLANNER
AGRIBUSINESS ADVISOR & CONSULTANT
RURAL COUNSELLOR

AGRICULTURAL MECHANIC
IRRIGATION TECHNOLOGIST
RURAL TECHNOLOGY INNOVATOR
RURAL PRODUCER ORGANISATION EXECUTIVE
AGRO-CLIMATOLOGIST
ECOLOGICALLY SUSTAINABLE ANIMAL MEAT & FIBRE PRODUCER
ECOLOGICALLY SUSTAINABLE CROP FIBRE PRODUCER
EQUINE CENTRE MANAGER
LANDCARE FACILITATOR
AQUACULTURE & FISHERIES MANAGER
HIGH SCHOOL AGRICULTURE TEACHER
HIGH SCHOOL -T.A.S. DESIGN & TECHNOLOGY TEACHER (AGRICULTURE)
STOCK & STATION AGENT
AGRONOMIST
SCIENTIFIC RESEARCHER
EXTENSION OFFICER
ECOLOGICALLY SUSTAINABLE PIG FARMER
ECOLOGICALLY SUSTAINABLE LAMB PRODUCER
RURAL VALUER
RURAL AND PROPERTY REAL ESTATE SALESPERSON

and I haven't included horticulture.

I hope this paper is of some use in stimulating conversation.
Cheers



Ken Langford
UWS Hawkesbury
17 / 11 / 94

per James White - Armidale

THE PROJECT

To examine the effect of fertilizer rate on tillering and yield. This will be done by sowing Barley into rows and applying fertilizer at different rates to observe the effect on tillering and yield.

You will need to:

1) Keep records of the weather conditions during the growing season,

2) Assess the properties of the soil in which the crop is sown,

3) Make a record of the changes to the plants over the time of the trial,

4) Report on diseases and invertebrates which affect the development of barley,

5) Record weeds which appear in the crop and make a detailed report on at least one weed common to the region,

6) Report on the breeding of the variety of Barley,

7) Keep a diary on all work done on the project

The project should be written up as a major report and submitted for assessment at a date (to be set) after harvest.

Practical Project Diary

Date	Work Done	Time Spent

Problem 1 : Setting up the Trial.

1) Prepare a seed bed 5m by 2.5m

2) Mark out 11 rows each 5m long and 20cm apart

3) Apply fertilizer at the rates shown in the table below

Row	Fertiliser rate gm/row	kg/ha
1	nil	
2	12.5	
3	nil	
4	6.25	
5	6.25	
6	nil	
7	nil	
8	12.5	
9	nil	
10	6.25	
11	12.5	

4) Sow seed in all rows 5cm apart

5) Once the ears have emerged count - the No of tillers / plant
- the No of tillers / row

6) Graph the result to show the relationship between tillers per row and tillers per plant.

As an sideline observation, a plot will be established with zero till. Observations made should relate to the section of work on sustainable land management practices.

Questions

1) Find the meaning of the following words as they relate to biometry;

a) Randomisation.

b) Replication

2) What is a control in experiments? What are the controls in this experiment?

3) What does 'Stanardization of conditions' in agricultural experiments refer to? Has this been implemented in our trial?

Problem 2 Recording Weather

1) You are to record the amount of precipitation your trial receives and record it in a table form

eg

Precipitation

week of trial	1	2	3	25 etc.
Mon.				
Tue				
Wed				

2) Record the weekly maximum and minimum temperature and record in a table

eg

Temperature

week of trial	1	2	3.....	25 etc.
max.				
min.				

3) These tables should be accessed on a computer.

Problem 3 Soil PH

1) Take the soil sample and use a spatula to shape it into a 'volcano' on a tile.

2) Add several drops of universal indicator to turn the soil into a paste.

3) Sprinkle Barium Sulphate over the surface.

4) Read the PH from the colour scale provided.

5) The PH of the soil is _____

Questions

1) What could you do to increase the PH of the soil in your trial plot?

2) What effect does soil PH have on the availability of soil nutrients?

Problem 4 Soil Texture

1) Take as much soil as you can heap onto a 20 cent piece and moisten it until it feels like putty.

2) Squeeze it between the thumb and forefinger.

3) Press your thumb forward and try to form a ribbon.

4) If the ribbon forms easily and can be bent without breaking.
   CLAY
   If a ribbon forms but is easily broken.
   CLAY LOAM
   If the ribbon will not form.
   LOAM OR SAND
   If there is a gritty feeling.
   SANDY LOAM
   If there is a smooth feeling.
   SILT LOAM

5) The soil in your trial plot is texture type _____

Questions

1) Define soil texture.

2) How does soil texture affect plant growth?

Problem 5 Soil Moisture

1) Weigh out accurately 10g of soil and place in a crucible of known weight.

2) Place in an oven at 105'C overnight.

3) The difference between the original soil and the oven dried is the soil moisture content. The % soil moisture is calculated a

$$\frac{\text{moisture lost at } 105'C}{\text{weight of oven dried soil}} \times 100$$

4) Calculate the soil moisture % at four weekly intervals for your trial plot.

Questions

1) Graph the moisture content of the soil.

2) What happened to the moisture content? What effect did this have on the plants?

3) Explain how precipitation, run off and drainage relate to the amount of stored water.

4) Define effective rainfall.

5) What does the concept of growing season refer to?

6) Graph the general relationship between soil moisture content and the yield for a typical field crop.

7) Explain what your graph means.

Problem 6 Gypsum

1) Drop a 6mm dry fragment of soil into a beaker containing distilled water.

2) Leave it stand for 24 hours. If the fragment is surrounded by a milky brown halo, the soil will respond to gypsum.

3) If there is no milkiness, repeat the test with soil just wet enough so that it can be rolled between the fingers into a 0.3mm thread. Break a piece off and drop it into the water.

4) The effect of gypsum can be seen by adding a small amount of gypsum to the beaker of water.

Questions

1) Describe what happened in your experiment.

2) Would gypsum be beneficial and why?

3) Explain the effect of gypsum on clay flocculation and why it can improve the structural stability of some soils.

Problem 7 Growth Stages

1) Draw diagrams of the developmental stages of the barley plant for the time of the trial.

2) Your first diagram should be at emergence and then at approx. 4 week intervals until the wheat is ripe. This should be a series of about 7 fully labelled diagrams incorporating each stage of growth.

Problem 8 Weeds

1) Collect a weed from your plot of barley.

2) Press the weed. Adhere to a blank piece of paper and add the following labels;

common name
scientific name
date collected.

Questions

1) What effect do weeds have on a barley crop?

2) How would you control this weed?

3) Describe an integrated weed management programme that you could undertake?

Problem 9 Diseases

1) Find a disease that effects barley in this region.
Refer to agfacts, journals and library books

Questions

1) Common Name

2) Scientific Name

3) Cause

4) Symptoms

5) Control

6) Describe how you would control this disease using methods of integrated pest management.

Problem 10 Invertebrates

1) Find an invertebrate pest that effects barley in this region.

Questions

1) Common name

2) Scientific name

3) Damage it causes

4) Method of control

5) Describe an integrated pest management programme for control of this pest.

Problem 11 Barley Breeding

1) Name the variety of barley used in your trial.

Questions

1) Research how your variety may have been bred.

2) For what reasons would this barley be sown in this region?

Problem 12 Estimating Yield

1) Calculate the No of plants in a square metre _____A

2) Determine the av. No of tillers per plant _____B

3) Determine the av. No of spikelets per head _____C

4) Determine the av. No of grains per spikelet _____D

5) Find the av. weight of seed in kilograms _____E

6) Multiply A x B x C x D x E = kg/m2 _____F

7) Multiply by 10 000 to give kilograms per hectare _____G

8) Divide by 1000---------- tonnes per hectare.

9) Calculate the yield from each row of your trial.

The Way We Were

Rules for Teachers in 1879.

1. Teachers each day will fill lamps, clean chimneys before beginning work.
2. Each teacher will bring a bucket of water and scuttle of coal for the days session.
3. Make your pens carefully. You may whittle nibs to the individual taste of the children.
4. Men teachers may take one evening a week for courting purposes or two evenings to attend Church regularly.
5. After ten hours in school, you may spend the remaining time reading the Bible or other good books.
6. Women teachers who marry or engage in unseemly conduct will be dismissed.
7. Every teacher should lay aside, from each pay, a goodly sum for his benefit during his declining years so that he will not become a burden on society.
8. Any teacher who smokes, uses liquor in any form, frequents pool and public halls, or gets shaved in a barber shop, will give good reason to suspect his worth, intention, integrity and honesty.

RURAL INDUSTRIES

BOARD OF STUDIES
NEW SOUTH WALES

In 1995 the Board of Studies introduced a new vocational Content Endorsed Course in Rural Industries. The course enables students to achieve an industry recognized credential and will lead to expanded career and training pathways. The course is accredited by both the NSW Board of Studies and the NSW Vocational Education Training and Accreditation Board.

COURSE STRUCTURE

The Rural Industries Syllabus includes a 120 hour course and a 240 hour course. The 120 hour course comprises 5 core modules which must be undertaken by all students. There are no elective modules in the 120 hour course as this course will provide students with basic knowledge, skills and practice to enable safe and competent participation in a rural workplace. Within the 120 hour course there is provision to design the course program to accommodate different student needs and facilities.

In the 240 hour course, students will complete the 120 hour core modules and then elect a further minimum of 80 indicative hours from elective Group A modules, ensuring a breadth of experience for students. Further modules can be selected from either Group A or Group B electives to achieve a total of 240 indicative hours. This will allow students to pursue aspects of their specific interest within the rural sector to a greater depth or continue with broad and general experiences.

120 HOUR COURSE

Either
1 Unit x 2 Years
or
2 Unit x 1 Year

Module	Hours
The Rural Workplace	30
Communication Skills	25
Farm Chemical User Program (5533 A)	15
Farm Vehicles	30
Farm Maintenance A	20

120 Hour Course

All students complete all core modules - 120 hours.

240 HOUR COURSE

2 UNIT X 2 YEARS

CORE	ELECTIVE GROUP A		ELECTIVE GROUP B	
120	Livestock Handling	45 hrs	Livestock Husbandry	30 hrs
HOUR	Crops and Pastures I	40 hrs	Crops and Pastures II	20 hrs
CORE	Production Horticulture (5584J)	40 hrs	Horticultural Harvesting	30 hrs
MODULES	Farm Tractors (5584C)	40 hrs	Farm Small Engines (5584E)	24 hrs
			Welding and Thermal Cutting (NBB09)	36 hrs
			Hand and Power Tools (NBB07)	36 hrs
			Farm Maintenance B	24 hrs

240 Hour Course:

All students complete **all core modules**.
Students must complete **a minimum of 80 hours from elective GROUP A modules.**
Further modules can be selected from either **GROUP A or GROUP B modules to a total of 240 indicative hours**.

The modules listed below are TAFE modules:

- 5533A Farmer Chemical User Program
- 5584J Production Horticulture
- 5584C Farm Tractors
- 5584E Farm Small Engines
- NBB09 Welding and Thermal Cutting
- NBB07 Hand and Power Tools

TEACHER TRAINING

To teach the course teachers must have industry recognition. This means that Agriculture teachers must undertake a 12 day teacher training program which is administered by the Training and Development Directorate of the Department of School Education.

At this time, 25 teachers of Agriculture are undertaking the 3 stage training program.

The first stage of 3 days was spent at the Novotel, Brighton from March 1-3. Teachers were instructed in aspects of competency based training and assessment.

The second stage was spent on the campus of Kurri TAFE from March 13-17. Here teachers gained the necessary qualifications to be instructors in the National Farm Chemical Users Program and the Tractor Operation and Safety Course.

A further four days work place-based training will be carried out on farm at "Waterloo" via Narromine on May 1-4.

Those teachers currently undertaking the training include:

Peter Tait	Wingham High School
Alan Cooper	Ungarie Central School
Geoff Metcalf	Tullibigeal Central School
Frank Leaver	Barellan Central School
Lisa O'Brien	Yanco Agricultural High School
Gary Barratt	The Canobolas Rural Technology High School
Helen Kleinbergs	Molong Central School
Trevor Thompson	Orange High School
Sybil Adams	Trangie Central School
Peter Jones	Colo High School
Colin McQueen	Picton High School
Helen Roberts	St Johns Park High School
Damien Brookes	Yanco Agricultural High School
Jamie Thomas	Farrer Agricultural High School
David Grady	Inverell High School
Stewart Grimmett	Woodenbong Central School
Colin Dudley	The Scots School

Patrick McCann	James Sheahan Catholic High School
David Gell	Blayney High School
Neil Belling	The Riverina School
Greg Crowley	Orange High School
David Kent	Chevalier College
Wayne Warskitt	Farrer Agricultural High School
Peter Green	Junee High School
Jenni Wilkins	Board of Studies

For information about the Rural Industries syllabus contact:

Jenni Wilkins
Board of Studies
35-51 Mitchell St
McMahons Point NSW 2060
Phone: (02) 925 8165
Fax: (02)955 3557

For further information about future Rural Industries CEC teacher Training Programs contact:

Mr Ken Raison
Dept. of School Education
Training and Development Directorate
Teacher Development and Retraining Division
PO Box 423
Rozelle NSW 2039
Phone: (02) 556 0700
Fax: (02) 818 1460

Nationally Recognised Competencies

Most courses are based on nationally agreed competency standards, this means that students' credentials will be portable throughout Australia.

There are currently seven dual accredited vocational HSC courses:

- Industry Studies
- Retail Content Endorsed Course (CEC)
- Office Skills Content Endorsed Course (CEC)
- Hospitality Content Endorsed Course (CEC)
- Building and Construction Content Endorsed Course (CEC)
- Furnishing Content Endorsed Course (CEC)
- Rural Industries Content Endorsed Course (CEC)

NATIONAL PROFESSIONAL DEVELOPMENT PROGRAM PROJECT

PROGRESS REPORT

The Queensland Agriculture Teachers Association (QATA) is currently managing, on behalf of the National Association of Agricultural Educators (NAAE), a NPDP project. This project is part of the $60 million made available by DEET for professional development associated with the National Curriculum Initiatives (eg National Statements and Profiles).

The QATA-NAAE project proposal extends over a three year period and has been divided into three stages. A proportion of the proposed stage 1 funding was approved in 1994 and the submission for year 2 has been accepted but also with a reduction in funds.

The first phase of stage 1 involved the development, distribution, collation and analysis of the Agricultural Studies Survey sent to schools and other interested organisations or individuals late in August 1994. An advertisement in the Public Notices section of Saturday 27 August 1994 edition of the Weekend Australian provided the opportunity for additional interested parties to respond. About 650 surveys were posted with approximately 230 returned completed. Thanks to all respondents for the time and effort involved in completing a long and detailed document. Barry Tainton from the Queensland Department of Education analysed the wealth of data and compiled a comprehensive and interesting report. Barry's hard work is greatly appreciated and a brief summary of the survey report includes the following findings:

1. Little differences in responses existed between each of the States
2. Little differences in responses existed between teachers and other respondents
3. 99.5% of completed surveys believed Agriculture had an important role to play in p-12 curricula. (Only 1 response of the 230+ disagreed)
4. The majority of responses indicated that Agricultural curricula should span across a number of National Curricula Areas of learning
5. Respondents believed that Agricultural curricula can deliver a range of outcomes including tertiary preparation, general education and vocational education
6. Agricultural curricula are probably best delivered as discrete subjects
7. Respondents had (at best) little more than some knowledge of the National Curriculum Initiatives such as the Statements and Profiles, Mayer Competencies, AVC and the Training Reform Agenda.

The survey results were further analysed and presented as part of a discussion paper "Agriculture for Australian Secondary Schools" by Dr Rod Francis.

The second phase of stage 1 involved a Forum/Workshop with representatives of Agriculture Teacher Associations from each State and NAAE State delegates held at the River Plaza Hotel Brisbane on Saturday 19 and Sunday 20 November 1994. A total of 17 participants attended the 2 days with 2 delegates each from Qld, NSW, Vic, SA and WA; 1 from Tasmania; 2 additional NAAE executive members; 2 support personnel and workshop presenter Dr Rod Francis.

The aim of this weekend was to use the survey data and workshop discussion paper presented by Dr Rod Francis as a basis for the development and endorsement of a National Perspectives Statement on Agricultural Studies. This was followed by a Curriculum mapping exercise that started to dissect the National Statements and Profiles extract relevant strands and develop appropriate outcomes and pointers.

An additional part of the agenda involved each State delegate presenting an overview of Agricultural curricula as it exists in their State. The similarities (aside from assessment issues) between the States were very surprising with the following points almost universal across Australia.

1. A range of subjects equivalent to tertiary preparation and vocational training are offered across States. Varying levels of support for secondary vocational training from training providers seemed to exist both within and between States.

2. A general concern over the lack of specialist agriculture teacher training courses and the subsequent quality of graduates was expressed. As well as this human resource issue, all States were concerned about physical/financial resources and the effect the current downturn in rural industry was having on student numbers and resource allocation. It appeared student numbers and the level of resources available to agricultural sections varied greatly within and between States and often depended upon school/community perception of the value of agriculture.

3. All States are having to address issues arising from the National Curriculum Initiatives and in particular the Statements and Profiles. Concern over the place of Agriculture within the areas of learning was a major issue.

General agreement on the format and content of a "National Statement on Agriculture" for Australia secondary schools was reached. The statement has been prepared in a format similar to the Technology Statement and draft details the contribution Agriculture may make toward the Science, Technology and SOSE areas of learning. It was envisaged that this document could be presented to Administrators, Policy-makers, Industry, Parents and the community in general. The draft statement has been circulated for comment with the final endorsed Statement due to be released later in 1995.

The next stages of the project will focus on developing a teacher professional development package to support the National Statements and Profiles. More information on this stage of the project will soon be made available to each State Association.

In summary the feedback on this project has been very positive and encouraging. Agricultural education sits (hopefully) on the threshold of a nationally agreed Statement on the place of "Agriculture Studies" in the secondary school curriculum. Achieving this will be no mean feat given that the States could not even agree on a common railway gauge!!!

Paul Christensen

Paul Christensen
for the QATA-NAAE Management Committee

NATIONAL PROFESSIONAL DEVELOPMENT PROGRAM PROJECT

SYNOPSIS

Introduction

The major outcome of the QATA-NAAE Professional Development Program project has, to date, been agreement on the position of Agricultural curricula within the Areas of Learning of the National Statements and Profiles.
This paper is an attempt to answer some of the key questions associated with the processes that have lead to this outcome.

What is the position of Secondary school Agriculture curricula within the Areas of Learning of the National Statements and Profiles?

Agricultural curricula can be clearly linked to the 4 strands of the National Technology Statement but can also be associated with strands from the Science and Studies of society and environment Areas of Learning.

What evidence is there to support this position?

At the National Forum/Workshop held in Brisbane in November 1994, Dr Rod Francis presented a comprehensive paper that clearly established a rationale for agriculture to sit across 3 Areas of Learning. This Discussion Paper, "Agriculture for Australian Secondary Schools", has been included in this package.
Briefly Dr Francis proposed that the body of agricultural knowledge has and is advanced by processes that involve:

(a) problem solving or design, make and appraise processes associated with Technology and/or
(b) scientific method based agricultural research associated with Science.

However the body of agricultural knowledge should not be generated in isolation but must be considered within the social and cultural context in which it is developed and applied.
Agricultural education should reflect this and therefore must involve elements of Technology, Science and Studies of society and environment.

What further support is there for Agriculture to be linked with 3 Areas of Learning?

The document from the AEC Curriculum and Assessment Committee (CURASS) attached as appendix 1 acknowledges that a complete and suitable agricultural curricula could be drawn from the National Statements on Technology, Science and Studies of society and environment (SOSE).
The survey results and report provide additional weight to the view of agricultural curricula positioned across Areas of Learning. Question 11 of the survey sought opinions on the broad orientation of the future direction for agricultural curricula. Over 80% of respondents believed that agriculture should be multidisciplinary and NOT placed in one Area of Learning only. 45% of total respondents considered the Technology - Science - SOSE combination most appropriate.

To what strands of Technology, Science and SOSE can agricultural curricula be linked?

Participants at the Forum/Workshop completed a detailed analysis of the Technology, Science and SOSE strands and outcomes. This analysis indicated that agricultural curricula can address significant learning outcomes in:

(i) Technology Area of Learning strands of:

- DMA
- Materials
- Information
- Systems

(ii) Science Area of Learning strand of:

- Working scientifically

(iii) Studies of society and environment Area of Learning strands of:

- Resources
- Natural and social systems

In his discussion paper, Dr Francis adapts four components of cognition as described by Fleming to classify kinds of agricultural knowledge.
The relationship between the kinds of agricultural knowledge and strands from the Technology, Science and SOSE statements was examined and this information then used to identify the strands relevant to agriculture. This information is summarised in Table 1 below.

TABLE 1 Relationship between strands for a National Agricultural Statement and kinds of agricultural knowledge

Knowledge Strands	Scientific Concepts	Problematic Data	Agricultural Theory	Technical Skills
DMA	✓	✓	✓	✓
Materials	✓		✓	✓
Information		✓	✓	
Systems	✓	✓	✓	✓
Working Scientifically			✓	
Resources	✓	✓	✓	✓
Social and Natural systems	✓	✓	✓	

The strength of this relationship provides additional evidence of the position of agriculture as a learning area within the National Areas of Learning.

What are the advantages of linking Agriculture as an Area of Learning to Technology, Science and SOSE?

It is only by linking Agriculture as an Area of Learning to Technology, Science and SOSE that the resulting Agricultural curricula can be seen to be:

- multidisciplinary
- a learning area with significant value in its own right and not just an alternative to science
- focussed on student outcomes rather than inputs
- contributing significantly to developing outcomes from across 3 areas of the National curriculum
- indicative of the real nature of agriculture and hence an appropriate area of learning
- flexible and therefore adaptable to suit specific system requirements and community, school and student needs
- a learning area with intrinsic interest for a range of cultural groups and for boys and girls.

Summary

The position of Agriculture curricula in relation to the National Statements and Profiles has been established by the data and information generated from

(1) **Representations to CURASS**

(2) **Survey and Survey Report**

(3) **Discussion paper "Agriculture for Australian Secondary Schools"**

(4) **November 1994 Forum/Workshop Sessions attended by representatives from each State.**

The seven strands to which Agriculture as an Area of Learning can add significant learning outcomes are:

1.	Design, make and appraise	TECHNOLOGY
2.	Materials	
3.	Information	
4.	Systems	
5.	Working scientifically	SCIENCE
6.	Resources	STUDIES OF SOCIETY AND ENVIRONMENT
7.	Natural and social systems	

The advantages of developing Agricultural curricula that address outcomes from the Technology, Science and SOSE Areas of Learning should be acknowledged.

APPENDIX 1



AEC Curriculum and Assessment Committee

CURASS 3/93/6.12

1. Title of Report
The place of agriculture in statements and profiles

2. Background
A number of letters have been received from teachers of agriculture and the National Farmers' Federation, expressing concern about the coverage of agriculture in the statements and profiles.

Discussions have been held between the learning area manager for studies of society and environment and a representative of the Agriculture Teachers' Association of SA.

3. Summary
The agriculture teachers believe that the place of agriculture in the statements and profiles will be secured if it can be agreed that:

3.1 a complete Agriculture curriculum cannot be drawn from one particular national statement

3.2 a suitable curriculum could be drawn from the national statements on technology, science and studies of society and environment if the final versions of these statements include a stronger agriculure focus

3.3 meetings be held between the learning area managers and officers of the Agriculture teachers associations to ensure that pointers appropriate to agriculture are included in each of the three profiles.

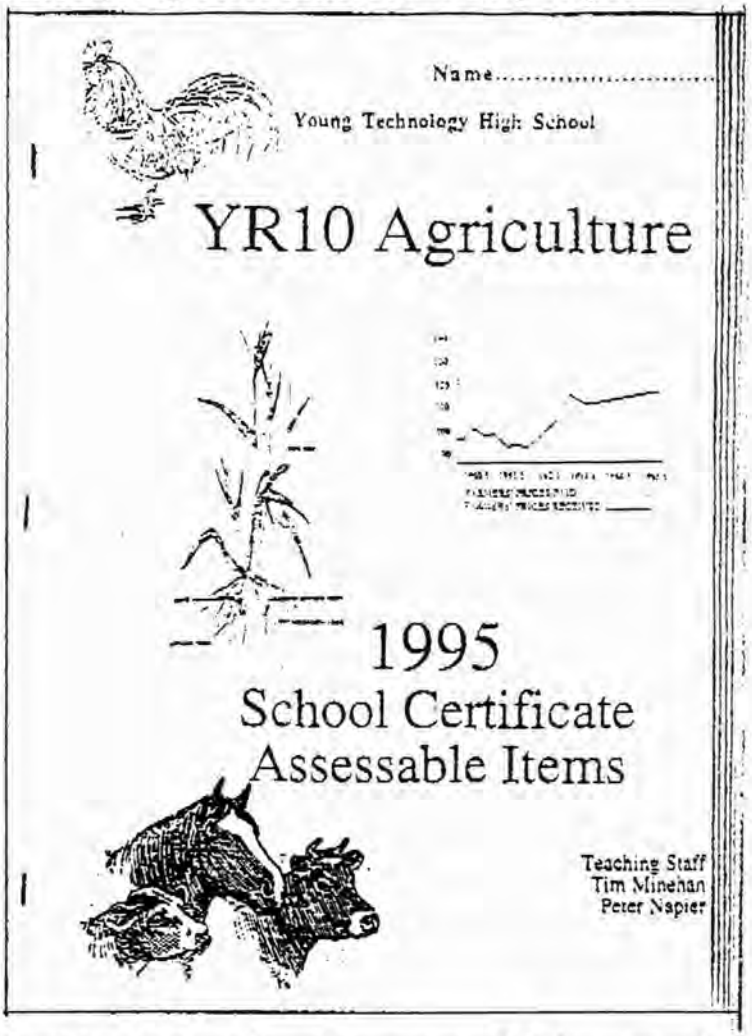
4. Recommendations
That points 3.1, 3.2 and 3.3 of the paper be accepted.

5. Action
Secretariat

Year 10 Agriculture School Certificate

We all know that this is an important year for pupils and Agriculture staff to have meaningful assessable items and for us as Agriculture teachers to provide clear directions to our charges and their parents early in the year.

The 20 page booklet produced by Tim Minehan and Peter Napier from Young Technology High School, may be of interest and help to you.



The booklet will outline nine assessable items and communicate to parents on course expectations.

A copy of booklet is $12
Cheque payable to Agriculture Department YTHS
enquires Mr Peter Napier
Young Technology High School - YOUNG 2594

If you think you would like the text contents of the booklet on disc for $15 then please indicate your interest and this may be arranged

See next Publication for further information regarding new publications from Peter Napier - Young Technology High School.

APPLICATION FOR MEMBERSHIP

TO THE N.S.W.A.A.T.

NAME: _____

SCHOOL: _____

SCHOOL ADDRESS: _____

_____ Post Code ____

SCHOOL PHONE: _____ FAX _____

MAILING ADDRESS: Leave blank if same as above.

_____

_____ ____

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

I enclose payment of $40 being the subscription for the next Biennial period as a full individual member of theN.S.W.A.A.T.

OR

We enclose payment of $60 being the subscription for the next Biennial period as a corporate body member of the N.S.W.A.A.T.

OR

I enclose payment of $20 being the subscription for the next Biennial period as a student member of the N.S.W.A.A.T.

NOTE: The biennial period above will cease at the January 1997 A.G.M. to be held at the next biennial conference, i.e. membership covers 2 years for 1995-1997.

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

Mr. Mick Melino
St John's College
PO Box 6
LISMORE NSW 2480

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