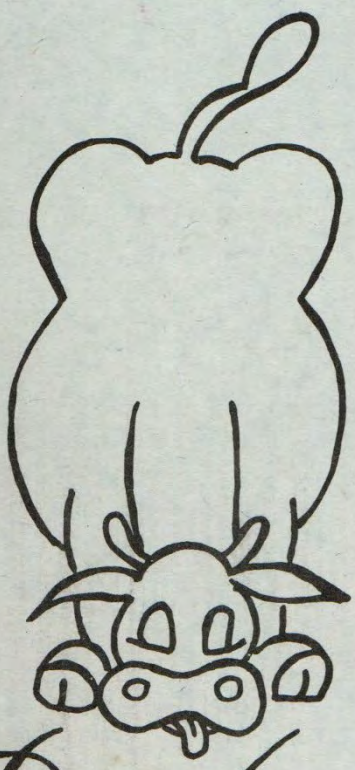
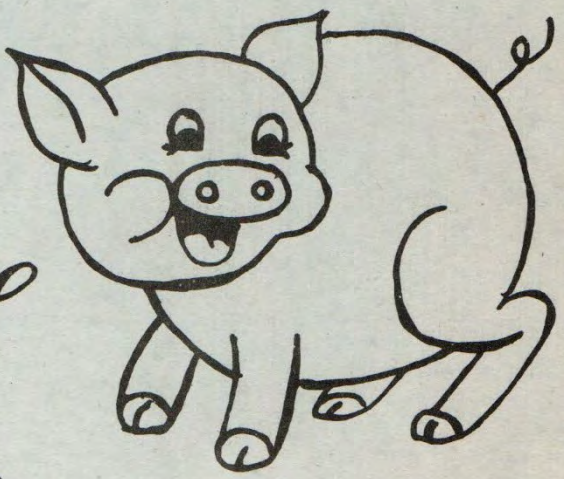
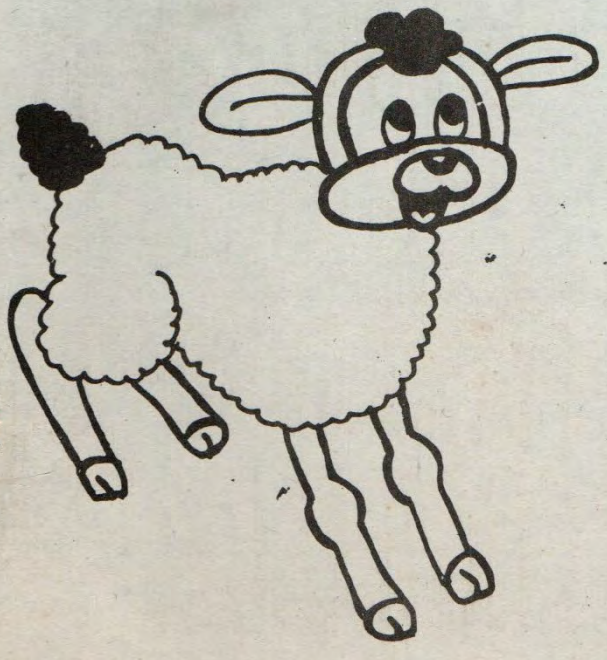


Bulletin of the N.S.W Association of ... Agriculture Teachers ...

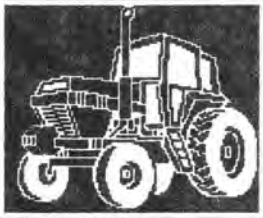
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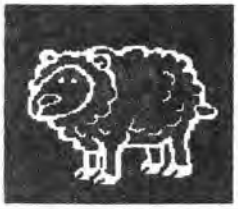


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PRESIDENTS REPORT

Welcome to all BAAT subscribers, first term in 1988 has already slipped by as we warm up for a hectic year leading up to the Biennial Conference in January 1989.

The past year has seen continued growth in our subject across the state, the interest behind this growth is a combination of Ag. Teachers efforts and student interest to explore the many aspects offered in Agricultural Studies. I think it is important to note that a similar growth is not occurring in all areas of the country. Victoria and Tasmania are really struggling to maintain interest amongst the association members and also within the schools.

At the time of writing this report NATA is rationalizing its financial problems which arose last year. Hopefully in the near future we will receive a copy of The NATA Journal. This will be published in BAAT to try and control the escalating printing costs.

Still on National Association matters. The National Conference is to be held in WA from 4/7/88 - 8/7/88. The venue is the Noalimba Centre, Kwinana WA. Unfortunately I wont be able to get across, but hopefully, Ian Foreman will make the journey. I'm sure Ian would like some extra company, from NSW. So maybe, if you were thinking about travelling west, now would be the time to consider that all the expenses are tax deductible. I don't think there will be much funding available.

If you are serious about the trip, I should have additional information in the next few weeks. Also to cover your tracks with the commissioner of Taxation, fill in a Department Inservice application form and send it to your local region. Who knows they may even pay the $50.00 registration fee.

I have received two nominations for the JA Sutherland award, to be made at the Biennial Conference. Any further nominations would be appreciated.

Two letters from Rodney Caveliers office appear in this issue, and they make interesting reading, especially the one concerning supplementary funding for school agriculture plots. These were promised at the last biennial conference. I wrote **THREE** letters to his office, before I received a reply.

Finally I would like to ask members for contributions for BAAT. The Hunter region is small and the few contributors are getting drained.

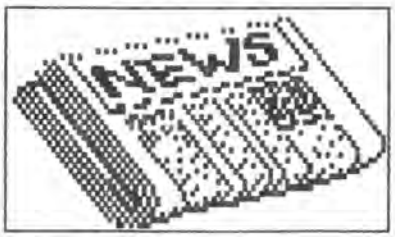
IVAN GANT.

TREASURERS REPORT

Many thanks to those who notified me of their change of status, or errors in the membership list. In some cases even *Double* paid their membership dues. It gave me great pleasure to return these cheques. Perhaps it could be treated as something like a *"Lotto Prize"*

If it reaches the printer in time there should appear an up-to-date membership list as at the 10/3/88. If there are still errors could you send me the correct information.

NIGEL COX Treasurer NSW AAT.
C/- Singleton High School
York Street
SINGLETON NSW 2330



Members with a point of view on these matters might write to me and I'll make use of these ideas in discussions.

DUNCAN SUTHERLAND

INSPECTOR OF SCHOOLS

MINI GRANT -

Bish Mikulski from Macksville was successful in gaining the $100.00 Mini Grant from over 400 entries.

He is currently using the Grant with a Year 8 - Module Ag class to improve an unsightly bank on the way to the Ag Plot. This is hoped to reinforce the principles of Soil Erosion and the potential to develop some practical skills along the way.

ANIMAL WELFARE -

Discussions are continuing between the Department and the Animal Research Review Panel to develop a code of practice and implementation procedures for schools. Non Government representatives have attended these discussions also, because the act applies as much to them as it does to state schools. It is hoped that the final details will be promulgated later this year or early next year.

One of the Animal Welfare Lobby groups is pushing a film called *"Hidden Crimes"* which purports to give a balanced account of the use of animals in research. It is graphic, horrific and in the opinion of Agriculture teachers who have seen it, biased to the point where it is unsuitable for showing to students and should not be used in schools. There is no doubt that these groups will continue to press this type of material, most of which is made overseas, in order to try and win the debate in the community and schools.

SIG NEWS -

The last meeting in November 1987 raised the following issues.

* Deputation of Federation officers on Animal Welfare Policy to meet with the Department of Education before then end of Term 4.

* Questionnaire for Agricultural Teachers to be sent by Federation before the end of term.

* Departmental Document on the *"Code of Use of Schools Farms"* in Federations hands. P.Crick, B.Ramsay, P.Hurst peruse and comment on its implications.

* Federation Officers asked to inquire on the provision of mandatory safety equipment for Teachers of Agriculture and Farm Assistants.

* Classifying committee for the Department of Education is still processing the acceptability and status of the HAC Diploma of Applied Science for teaching Agriculture & Science. Students appear to be having problems doing the necessary subjects which will qualify them for teaching.

SIG requests that the relevant Federation Officers approach the HAC to clarify the standing of the Diploma for teaching, so that graduating students in 1988 don't have the problems experienced by graduating students this year.

SUTHERLAND AWARD NOMINATION -

Shane Moore from Crestwood High School has been nominated for the JA Sutherland Award.

Qualifications -

* Diploma Applied Science HAC 1980
* Dip Education Sydney Uni 1983
* Shearing Ticket
* Qualified Horse Handler & Breaker.

Synopsis -

1973 - Jackaroo Orange area
1975 - Contract Shearer
1977 - Commenced Diploma HAC
1979 - Horse Trainer HAC
1980 - Graduated HAC
1980 - Trainee Manager Pig Improvement Company GJ & S Sargent
1981 - Assistant Manager (above)
1982 - Commenced Dip Education
1983 - Commenced Teaching at Cretswood High, still involved in shearing and horse breaking.

Resume -

An extensive resume was submitted that will be on display at the Biennial Conference in January. This will enable participants to have a fresh details of the contestants, and vote accordingly at the General Meeting.

A summary follows,

* Extensive development and expansion of the Agriculture plot, with a systems approach in mind and skill acquisition uppermost in his mind.

* A complex farming system developed with the following plan,

- expansion of available land
- provision of fencing
- a capable assistant employed
- most enterprises to generate an income where possible.
- maintaining a strict budget
- maximum community involvement

* A fat lamb enterprise has been set up with (polled dorset) a lambing percentage of 130%. The farm (2.5ha) is carrying 19 ewes, with a DSE of 48.

IAN SAUNDERS

Agriculture Dept.
Crestwood High School



I would like to take this opportunity to thank all of those people that supported BAAT in 1987. With the Year of the Bi-centennial, and everything else going on at school we may need reminding of the need to send in material to make OUR Bulletin work in '88.

Special thanks must be extended to David Cutts and the other industrious workers from Pennant Hills and surrounds. They have *already* produced a set of *suggested* answers for the 1987 HSC paper.

These are included at the end of this Bulletin, in Appendix 1 - SUGGESTED HSC ANSWERS.

Thanks again....

Several people have written in and made suggestions on how BAAT could be improved... this is GREAT...

Graeme Whan from Macksvile High, approved of the idea of the Systems Dictionary, and suggested some additions for the Essay Writing Techniques..

1. DON'T change the question to suit the knowledge you have on that particular subject.

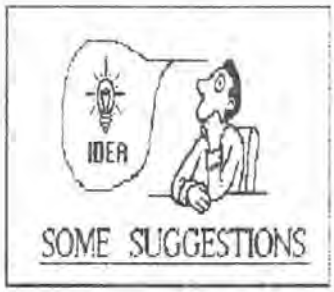
2. DON'T waste time on a question that is only worth a couple of marks.

Our Treasurer (Nigel Cox) has come good with some excellent resources from the Singleton Ag.Department. These include some good ideas for Profile reporting, and an integrated Assignment for Year 7 Ag classes. These are included in Appendix 3 - RESOURCES

I would like to start a new section in the BAAT, "*Ideas*". This section could include any simple ideas that have been designed to save time or improve production on the farm or in the class.

I have included a couple from our school, How about some others..

IAN FOREMAN.



OLD NEWSPAPERS -

Ever thought of a good use for those old newspapers lying around ??

Here at Morisset the supply of sawdust for our annual poultry trial was fast dwindling, and becoming an economic liability.

We borrowed a small paper shreader and started shedding the mountain of donated and collected Sunday papers.

This has formed an excellent deep litter for the poultry. It seems to be less prone to accidental spills of water, stays dry longer, and the birds come out of the shed a lot cleaner. So much so that a local processor has reduced the price for birds that have come off paper.

You could possibly crumple, or tear up the paper with an energetic Year 7 class and achieve the same results.

ANOTHER AG ELECTIVE -

Association members may be unaware that a number of NSW schools offer two agriculture based electives to school certificate level.

* Sheep Husbandry & Wool Science

Both syllabuses are approved by the Secondary schools board, copies of which are available from the Board,

PO Box 460
North Sydney 2060.

At the moment the Sheep Husbandry and Wool science course is being evaluated by a new committee. Why not join the strength and run this course in your schools in '88.

You will need to get a copy of the syllabus and discuss it with your principal and head teacher.

There are several people that you may contact for advice and assistance with the implementation of this syllabus,

* Bruce Ramsay - Directorate of Studies, Sydney.
* Bob Guest - Farrer Ag School
* John Scott - Hurlstone High
* Greg Webb - Umina High

FARM ANIMAL COMPETITION -

Are you having trouble providing enough animals for the students to show ? Or is the travelling becoming cost prohibitive ?

I found that I was confronted by the above, yet still wanted to involve the students in the skills associated with the presentation and showing of animals at local shows. I made a suggestion to the local show committee that a new section be created in the program for "*Pet Farm Animals*"

This section was called "*Dogs & Pets*", and carried an entry fee as well as financial and Ribbon Rewards.

Classes in each section were as follows,

DOGS

1. Pet Dog (entered & cared for by the student)
2. Pedigree Dogs
3. Working Dogs

PET FARM ANIMALS

* Calves, Lambs, Pigs, Goats, Foals

1. Any farm animal (to be led)

Points will be awarded for good conformation and presentation in the showing.

The show committee accepted the idea and threw the organization back at me. A copy of the Judging sheet that I devised is included in Appendix 3 - RESOURCES

RODNEY LEADS.....



IN EDUCATION

A reply to the Association re: The Promised extra Ag Funds.

Dear Mr Grant,

I refer to your letter concerning the issue of supplementary funding for school agriculture plots.

You are aware from my speech to your January Conference that Agriculture in NSW Schools receives substantial funding through a range of grants and programs. The range includes the Tractor replacement program, Basic equipment and the provision of facilities for Agriculture in 221 government secondary schools.

The Department provides funds, additional to these major cost items, for the seed and fertilizer grant and for minor works, repairs and maintenance. The outlay on seed and fertilizer averaged $783 per school in the 1986/87 financial year, with an average $1,362 per school being spent on minor works, equipment and repairs.

As I said at the conference, these latter sums are not in themselves particularly large but they supplement school running expenses and make significant improvement in the quality of the educational offering.

As you have indicated the Regional Directors have the responsibility of the administrative process through which the Department distributes these resources to schools. I encourage your association to approach Regional Directors, through the appropriate Inspectors of

Schools, to determine the local arrangements for allocation of funds for grants, equipment and repairs. I am sure that they will welcome your input to these processes at an appropriate level.

Again, let me commend your members for their unstinting and enthusiastic contributions to the education of the children in the schools of this state. It is largely due to their efforts that Agriculture enjoys its current growth in popularity.

Yours Sincerely,

ROD CAVELIER

MINISTER FOR EDUCATION

" I wonder how long it is since Rodney has bought a bag of fertilizer or if he appreciates the high cost of fuel, largely brought about by Government taxes, and world parity pricing ??"



This is dedicated to all those "Oldies" that are trying to come to grips with these new fangled computers. To be sung to the tune of Waltzing Matilda.

Out in his office the young farmer sits,
Lost in his world of Ks, bytes and bits,
Fixed is his gaze at the columns on the screen,
Struggling to puzzle out just what they mean...

Click goes the keyboard, Click! Click! Click!
Wild is his gaze and his hands move quick;
His Missus looks around as she brings a cup of tea,
And curses the invention of the Apple II e.

Data Base and DIF files, RAM and ROM and DOS,
Setting up a spread sheet - getting hot and cross;
Escape to Desk top menu, select and press Return,
Computing looks so simple, but its Bloody hard to learn!

Click goes the keyboard, Click! Click! Click!
His elbows are aching, his neck has a crick,
His sheepdog looks around and is beaten by a blow,
And curses the computer to obsess his Master so!

The afternoon is over and the kid is home from school
Runs to the computer and draws up a stool,
"Having trouble, Dad?" he says, "Can't you make it go?"
Visicalc or Multiplan - What d'ya want to know?

Click goes the keyboard, Click! Click! Click!
For kids its so simple it fair makes you sick!
Computing when you're older is medically a risk,
Cursing at the cursor may bring on a floppy disk !!!

==========

CAN DRENCHES BE TOO.. GOOD



==========

Ivomec the new release drench from Merk Sharp & Dome, may be a life saver for sheep farmers facing drench resistant worms, particularly the Barbers Pole worm. However its effectiveness in the future will be determined by how producers use it.

Already resistance to Ivomec has been detected in Barbers Pole worm in South Africa, and scientists say the same will happen here unless farmers adhere to strict drench rotating Programs.

Ivomec is the sister drench to *Avomec* the highly successful anthelmintic drench used in cattle. These drenches are known as avermectins, and are derived from a naturally occurring fungus, Streptomyces, that was discovered in the soil of a Japanese Golf Course. The substance was found to be toxic to a wide range of nematodes and insects, and other arthropods.

CSIRO researchers have suggested that 70% of sheep in Australia are now resistant to either one of the two existing drench groups (white or clear) while 10% are resistant to both.

Researchers are also very cautious of the initial success of this new drench. MSD Agvet itself used the launching to push the need for farmers to adopt a strategic drench management program such as Drenchplan and Wormkill programs promoted by the NSW Department of Agriculture.

Both programs try to make maximum use of the available drench groups by ensuring that sheep are not underdosed or overdosed, (either of which hastens development of resistance) and that rotations in the drench groups are used.

Drench treatments are timed with a view to reduce the level of egg build up on pastures. Under suitable conditions, the programs enable the worms to be controled with just two drenches a year.

The release of Ivomec will give farmers a third broad spectrum drench group to incorporate in these programs, extending the effective life of all three groups providing each is used according to an overall plan.

HOWEVER. . .

CSIRO researchers are claiming that these drenches may be *TOO GOOD*. Current research has confirmed that Avomec residues in Cattle droppings kill dung beetle larvae and reduce the number of eggs laid by adults.

The dung beetle program has been hailed as one of the worlds most successful experiments in biological control. The beetles imported from Europe, rapidly break down the cow pats to both boost pasture productivity and remove the breeding ground for flies.

CSIRO researchers are not saying that Avomec has by-passed any of the safeguards of the Australian chemical registration procedures, nor do they challenge the way in which it works. It is the very effectiveness of the chemical that concerns them. They fear that its efficiency in killing a wide range of insects for which it was not originally registered, could encourage overuse and misuse of the pesticide as farmers attempt to cash in on the immediate benefits Avomec offers.

This article was adapted from articles in National Farmer 101, and an article in the land.

IMPLICATIONS...

I believe that this article highlights many of the concepts that we are trying to stress to our senior students, and maybe useful as a class resource.

That principle that Agricultural problems are complex ones, and that many solutions are based on the expertise of *specialists*, rather than systems analysts, is made quite well. It also highlights the mess that can be made in the ecosystem when man intervenes in a non-systematic way.

==========

HOW YOU CAN TELL WHEN ITS GOING TO BE A

ROTTEN DAY !!!!!

==========

* You wake up face down on the pavement.

* You put your Bra on back the front and it fits better.

* You call suicide prevention and they put you on hold.

* Your Birthday cake collapses with the weight of the candles.

* You want to put on the clothes you wore home from the party, and there are'nt any.

* You turn on the news and they are showing emergency routes out of the city.

* Your twin sister forgot your Birthday.

* You wake up and discover that your water bed has broken, then you realize that you dont have a water bed.

* Your car horn goes off accidently and remains stuck on,as you follow a group of hells angels on the freeway.

* Your wife wakes up feeling amourous, and YOU... have a headache.

* Your boss tells you not to bother taking off your coat.

* You walk to work and find that your dress is caught in the back of your pantyhose.

* You call your answering service and it tells you, that its none of your business....

* Your blind date turns out to be your ex-wife ..

* Your income tax cheque bounces

* You put both contact lenses in one eye ...

* Your pet rock snaps at you....

* Your wife says "Good morning Bill....."
  and your name is George ...

AUTHOR UNKNOWN ..... But TROUBLED..

SUGGESTED HSC ANSWERS

SECTION I

ALL questions are to be attempted
Recommended time - 40 minutes

QUESTION 1.

For a *farm case study* which you have completed, state:

Location of the case study farm — Any Location) No Marks .....

Principal subsystems ..... — Any Subsystems) Awarded — Any Stated Area) Here .....

Approximate area of the farm ..... hectares.

(a) *Name* THREE subsystems of this farming system.

(i) ....

Any Subsystems e.g. Cattle, Sheep, Animal,
(ii) ..... Crop, Pasture, Plant, Soil, ...
Mico-organisms & invertebrates.

(iii) .....

(b) *Identify* TWO of the interactions which occur between any of the subsystems named in (a) above.

(i) .... Depends on subsystem named e.g. Sheep eat pasture .....
Micro-organisms breakdown organic matter in soil

(ii) .....

(c) *Read* the following description of a school farm.

FIELDVIEW SCHOOL FARM

The farm is located on 3 hectares adjacent to the school's playing fields. The farm has a boundary fence, internal subdivision fences and an underground irrigation system. Pastures are grown for the 10 crossbred ewes, a Poll Dorset ram and two cows. Hay is bought to supplement pasture during the year. The school sells wool to the local spinning group and on average ten lambs and two vealer calves are sold each year to the local butcher. Thirty laying hens are kept in the poultry unit and are fed on laying pellets and some green feed from the farm. The eggs are sold to staff and parents.

The orchard paddock has several kinds of fruit trees. Students prune and spray these trees at appropriate times during the year. The harvested fruit is sold at stalls in the town. At these stalls the students also sell vegetables which are grown during the year. The residues of these crops are grazed or incorporated into the soil.

(i) Select and *name* a plant OR animal production subsystem from the description of Fieldview School Farm above

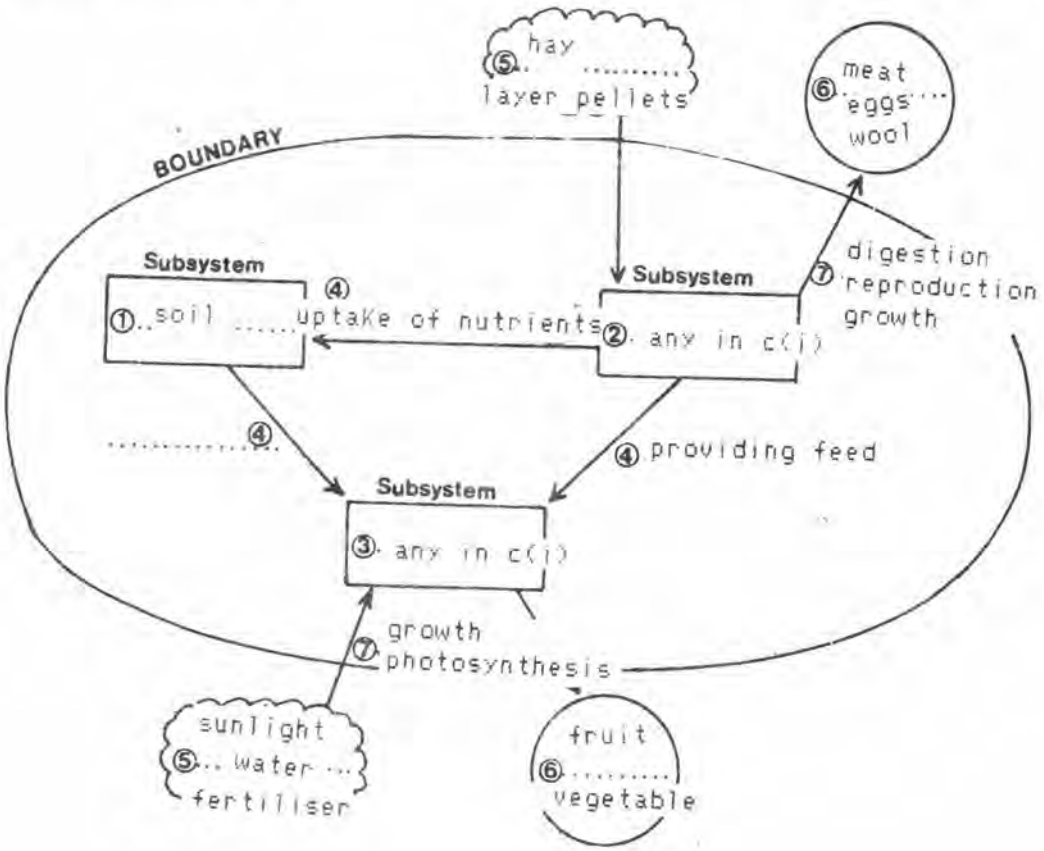
Production subsystem e.g. Animal - sheep, vealer, cattle, poultry
Plant - pasture, vegetable, orchard.

Total

(ii) *Fill in* the numbered spaces in Figure 1, relating your responses to the production subsystem named in (i) above. Using the description of the Fieldview Farm *name* ONE example of each of the following in the diagram below:

1. a resource subsystem
2. the production subsystem
3. another subsystem
4. an interaction
5. an input
6. an output
7. a process

Figure 1. A model of a production system on Fieldview School Farm



(d) *Identify* a goal of the manager of your case study farm which is similar to ONE of Fieldview School's farm.

maximum output for the minimum input.

Total

(e) (i) ***Identify*** **a goal of the manager of your case study farm which is different from Fieldview School's farm.**

(i) maximise profit (ii) attempt to be self-sufficient in feed

(ii) ***Account*** **for this difference.**

(i)school gets outside funds, place of Education & training
(ii)limited area - not possible at Fieldview

(f) ***Explain*** **how a factor outside the farm boundary can influence production on -**

(i) **your case study farm**

Dairy Co-op regulates milk quota of farm
efficient management leads to increase in quota therefore increased production.

(ii) **Fieldview School farm** Introduction of weed infested hay

producing weeds can reduce pasture quality & consequent reduction in production due to poor nutritional quality of weeds.

(g) ***Describe*** **how management can influence long term productivity of ONE production subsystem on -**

(i) **your case study farm** Resource Conservation Farming/Stubble retention -

maintains structure, retention of water is higher, minimal soil erosion.

(ii) **Fieldview School Farm** Introduce artificial lighting into

poultry shed - increasing output in long term by increasing output/bird

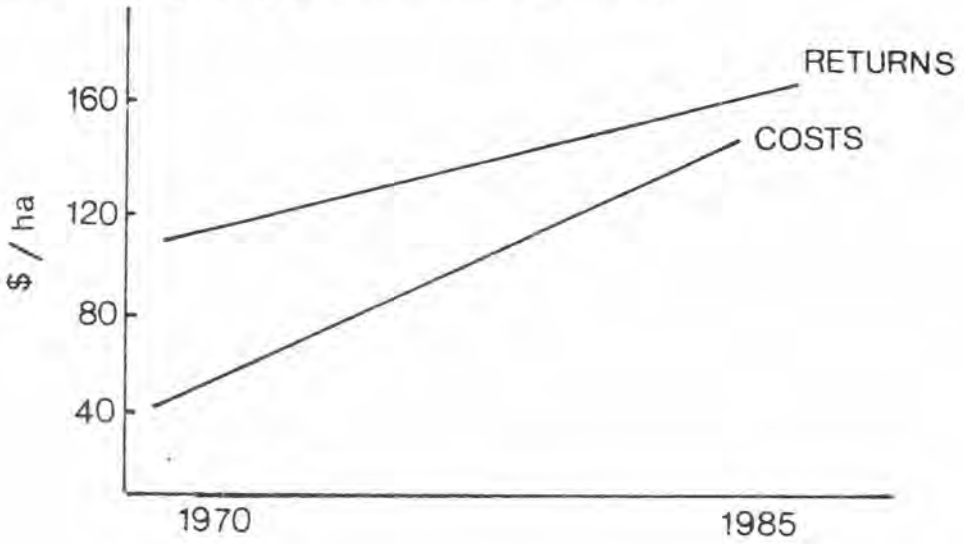
(h) ***Explain*** **how the profitability of EITHER your case study farm OR Fieldview School Farm could be determined.**

For the school farm: An analysis of all production subsystems in the form of gross margin where income (from vegs. broilers wool) minus variable costs (feed, chemicals) = profit.

Total

(i) The average costs and returns for crop production in Australia over the past 15 years are represented in Figure 2 below.

Figure 2. Average crop production costs and returns.



(i) For a named plant production system you have studied, *compare* the trends in its costs and returns with those shown in Figure 2 above.

Name of system e.g. Maize production

Comparison Trends are similar in maize production to the trend for the average Aust. crop production. That is, 'cost/price squeeze' where diminishing returns are being experienced as costs are increasing more rapidly than returns.

(ii) *Account for* the differences or similarities between the average trends and the trends for your named system.

Similarities in the trend of diminishing returns can be accounted for in that cost of prodn. (seed, fert fuel, labour) are rising at a far more rapid rate than prices being paid for the commodity as demand has not aided increases since the supply has been constant.

Total

QUESTION 2.

Note: It is important that you read the whole of this question before selecting the activity you name in part (a).

Select some practical work which you have carried out (on the school farm) and which you have enjoyed during your course.

(a) ***Name*** **the practical activity** (i) Dipping sheep

(ii) Allelopathic experiment of thornapple on wheat germination

(b) ***Describe*** **the main purpose of the activity.**

(i) Removal & inhibit external parasites so wool quality is maintained

(ii) To determine if thornapple will affect the germination of wheat

(c) ***List*** **THREE steps which were required in preparing for the practical activity.**

	(i)	(ii)
(i)	Selection of treatment to use	Collecting juices of thornapple
(ii)	Reading instructions	Decision on how to set up control and replications
(iii	Putting on appropriate clothes	Research possible outcomes

(d) ***Describe*** **how you carried out this practical activity**

(i) Sheep were run into race ..... picked up & put into dip (bath) ..... allowed into draining pens

(ii) 10 seeds were placed in ea of 20 petri dishes containing cotton wool ..... 5 dishes watered with distilled water & 5 with full conc. 5 with ..... half & 5 with quarter conc of T.apple records of germn. kept

(e) ***Discuss*** **ONE problem or difficulty you experienced during this practical activity.**

(i) Due to use of bath, handling of sheep when wet was very difficult

(ii) Quality of wheat was suspect which caused false germn. %

(f) ***Suggest*** **another way of doing this activity.**

(i) Suggest a modern spray dip be set up to avoid handling sheep after dipping.

(ii) Suggest using fresh certified seed with known germn. ability

Total

(g) What records do you consider appropriate for this activity?

(i)
Brand of chemical. Quantity of chemical used. Date done Calculate cost/head.

(ii)
% germn. / replicate. Average length of coleoptile. Germn. time of replicates.

(h) *Name* the subsystem to which the activity you have described belongs. *Explain* how the activity, or the results obtained from the activity, could improve the efficiency of the subsystem to which it belongs.

Name of subsystem .Animal Plant .....

Explanation The dipping of sheep is a preventative step taken to ensure sheep are maintained in good health & product is of high standard. High quality wool ensures premium prices & optimises returns.

Knowledge of results could be useful in deciding method of weed eradication as well as need for eradication to ensure prodn from subsystem is optimised.

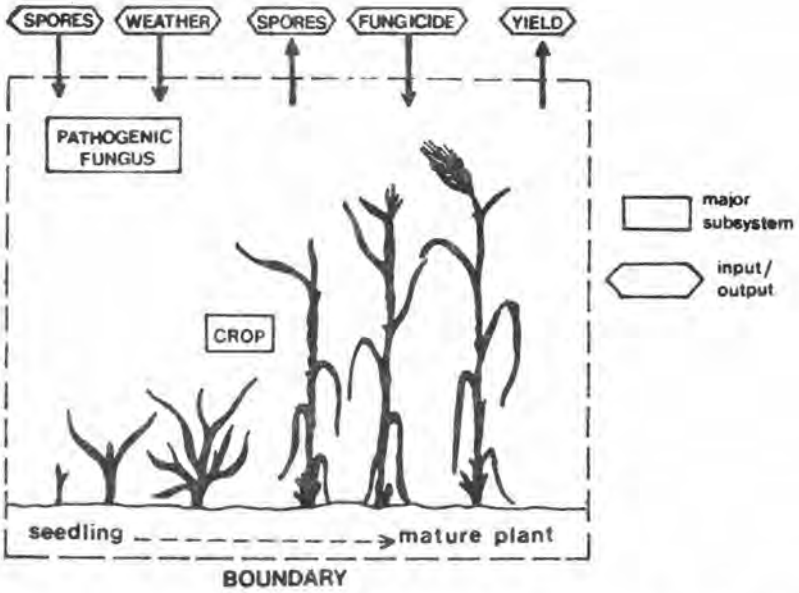
Total

SECTION II

Attempt *THREE* questions only from Section II
Recommended time - 80 minutes

QUESTION 1.

Figure 3. Crop/pathogenic fungus disease system



(a) The crop/pathogenic fungus system shown in Figure 3 is influenced by a number of factors, including weather and the application of fungicides.

(i) *Name* TWO components of weather which influence the interaction between the pathogenic fungus and the crop.

(A) Wind, rain, light, humidity

(B) Temperature, radiation

(ii) *Explain* ONE effect which weather has on this interaction.

Between plant and fungus (i.e. moist conditions & warmth increase fungal attack because they encourage fungal growth.

(iii) *Describe* TWO factors which a farmer must consider when deciding whether to use a fungicide.

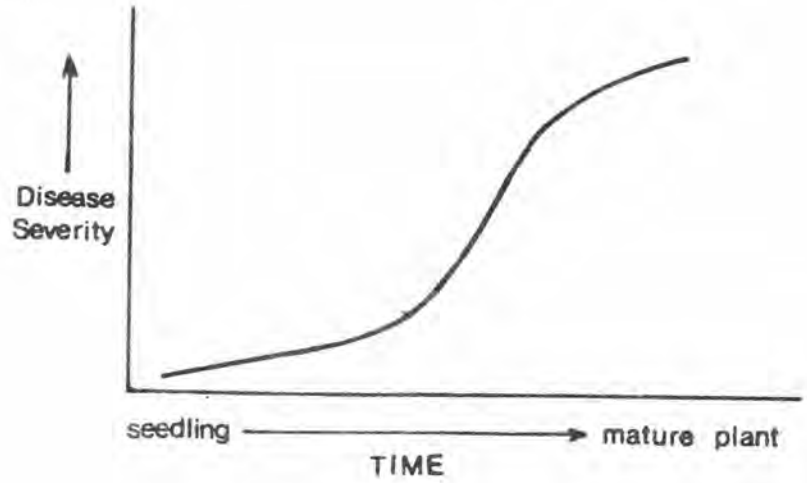
(A) Cost, Equipment required, Severity of attack

(B) Weather, Side effects

Total

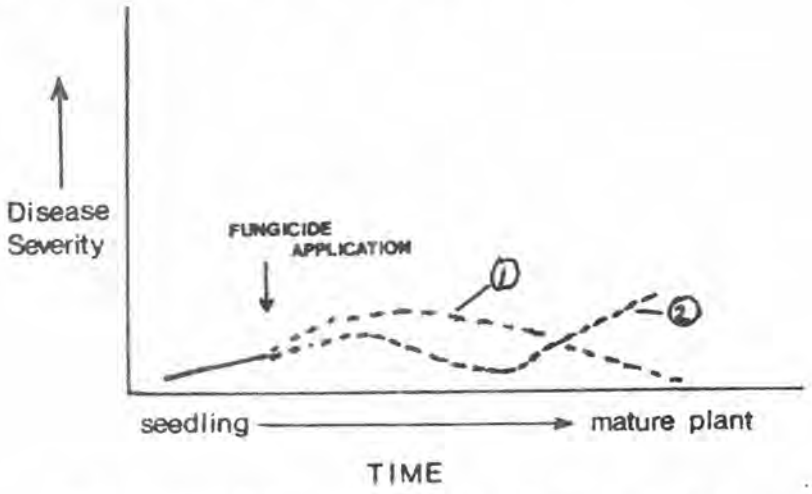
(iv)Figure 4 shows the severity of the disease in an untreated crop in the same season.

Figure 4. Disease severity and time



On the axes provided in Figure 5, complete the graph of the disease severity following the application of a fungicide.

Figure 5. Disease severity and time



(v) *Account for* the shape of the graph you have drawn on Figure 5.

..... (1) Time for fungicide to take effect .....

..... (2) Does not kill spores or some spores may be resistant .....

Total

(b) Effective disease or pest control depends on knowledge of the causal organism. *Explain*, using an example with which you are familiar, how such knowledge aids in the control of the disease or pest.

Any organism

Disease or host

Detailed control method

details of life cycle with reference to control

(c) Pest and disease causing organisms are subject to genetic change. ***Explain*** the significance of this for farmers.

Explanation of resistance or mutation

Effect on control measures

Explanation of alternative control measures

(d) Not all invertebrate interactions with plant production systems reduce yield. Give TWO *examples* where a farmer might actively promote these interactions to improve plant production.

e.g. Honeybees for pollination Earthworms for soil aeration

Labybeetles & hoverflies eating aphids or other examples

(e) (i) For a cropping system you have studied, *name* ONE input that a farmer cannot easily control.

Any input of climate e.g. light, heat, rainwater, frost, wind

(ii) *Name* ONE input which a farmer can easily control.

e.g. Nutrients, labour, irrigation water. Note: not a process

(f) *Describe* how a farmer attempts to reduce the risks associated with the input listed in (e) (i) above.

Limiting factor of wind; a farmer may construct/grow a windbreak so that cold or damaging wind effect will be reduced so his crop is given every chance to produce to genetic potential.

(g) *Describe* how a farmer decides on the level of the input in (e) (ii) above.

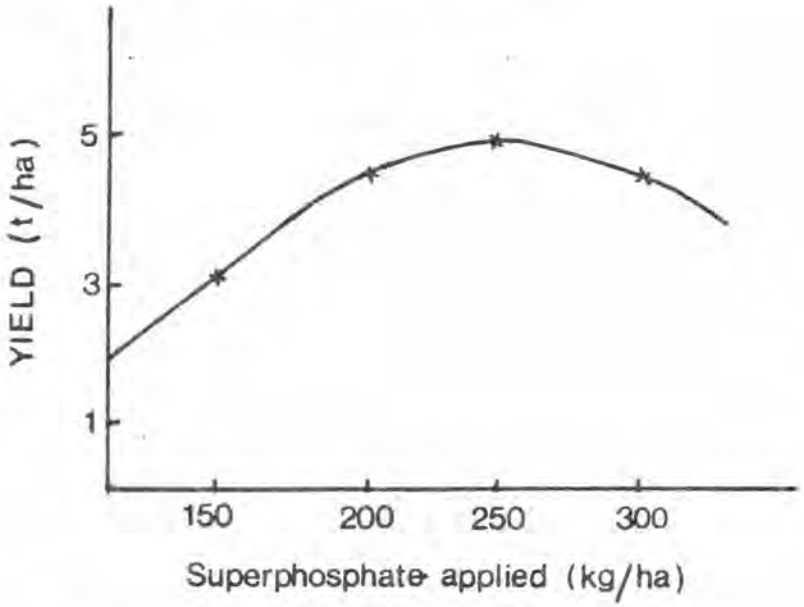
By using budgets to determine where marginal costs = marginal returns because this is the level of input that will give the maximum profit to the farmer.

Total

QUESTION 2.

(a) The graph below illustrates crop response to applied superphosphate.

Figure 6. Crop response to superphosphate



(i) At what application rate of superphosphate is plant yield at a maximum?

250 Kg/ha

(ii) *Explain* why in practice this rate of superphosphate application is rarely used.

At this rate of application, marginal cost would exceed marginal revenue. Most profit is obtained at the point where M.C. = M.R.

Alternative - Long term increase in soil pH would lead to reduced yield

(iii) *Indicate* ONE important piece of "on farm" and ONE important piece of "off farm" information a farmer could use to help decide on the appropriate superphosphate application rate. ** SEE BELOW

(b) In addition to soil nutrients, climatic factors strongly affect plant production. Briefly *describe* the problems of high and low temperatures for plant growth.

High temperatures cause increased transpiration leads to stomate closure resulting in decreased photosyn. & reduced growth rate

Low temps. cause reduced chemical reactions reducing photosyn. reducing growth rate.

Total

** 2.(a)(iii) On Farm - phosphate level of soil determined by testing — previous cropping history

Off Farm - Dept. of Ag. / Seed Merchant / fert.manuf recommendations.

Cost of Super/price recd.

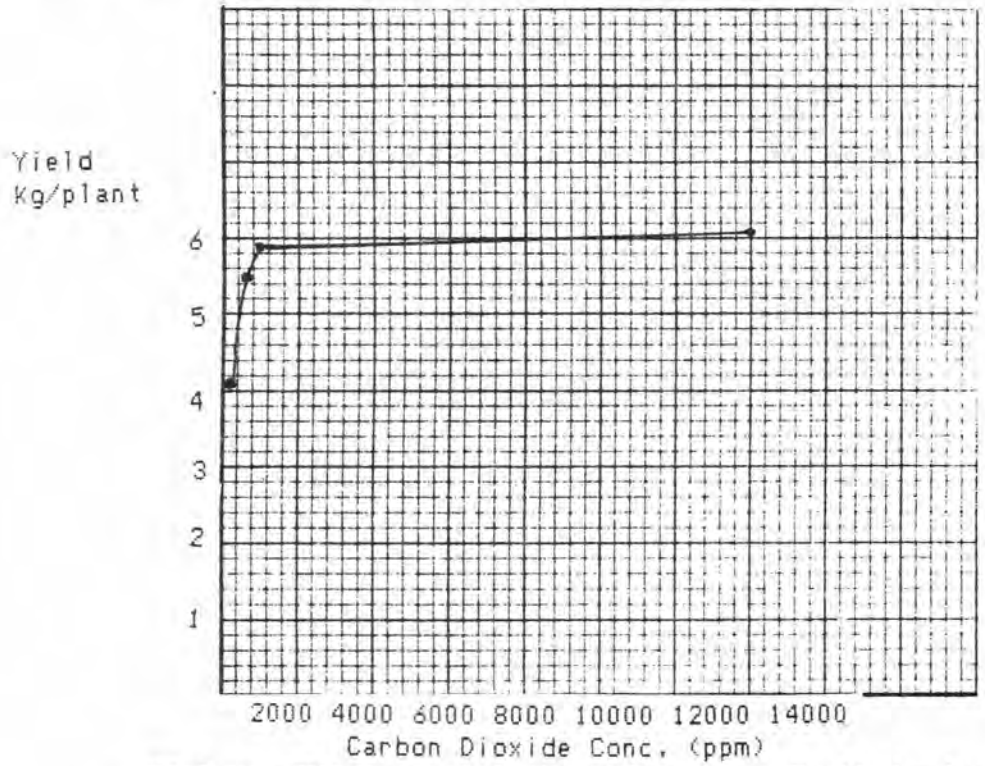
(c) The data in Table 1 were obtained in a glasshouse experiment.

Table 1. Carbon dioxide concentration and tomato yield

Carbon dioxide concentration (ppm)	Yield (kg/plant
300	4.36
600	5.50
1000	5.97
14000	6.07

(i) ***Plot*** the data from Table 1 on Figure 7.

Figure 7. Carbon dioxide concentration and tomato yield



(ii) ***State*** TWO reasons why increasing carbon dioxide levels does not cause proportional increases in yield.

(A) Gaseous exchange is limited by the number of stomata. ....

(B) May be other limiting factors e.g. sunlight, water. ....

(iii)***Name*** the process in plant growth which uses carbon dioxide as an input.

..... Photosynthesis .....

Total

(iv)Give ONE example of how a farmer can manipulate the rate of the process named in (iii) above.

Climate control can increase the rate of photosynthesis by maximising inputs e.g. water by installing irrigation.

(d) Another factor influencing plant growth is the availability of water.

(i) *Name* TWO characteristics of the soil which can affect the availability of water to plants.

(A) Structure

(B) Texture

(ii) For ONE such factor, *explain* how a farmer can improve the availability of water to plants by management practices.

Structure can be improved by the addition of organic matter e.g. by ploughing in a green manure crop or stubble retention, increases soil colloids increasing water retention & hence available water.

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

Water is required for major plant processes e.g. transpiration, translocation & photosynthesis. Is also required to maintain cells in a turgid state and prevent wilting.

(e) Plant leaves and roots are structures adapted to the function of collecting resources for the plant. For EACH of these structures *describe* this relationship between structure and function.

(i) Leaves

Leaves are flat & broad to collect radiation & stomates allow gaseous exchange for photosyn. & transpirational pull.

(ii) Roots

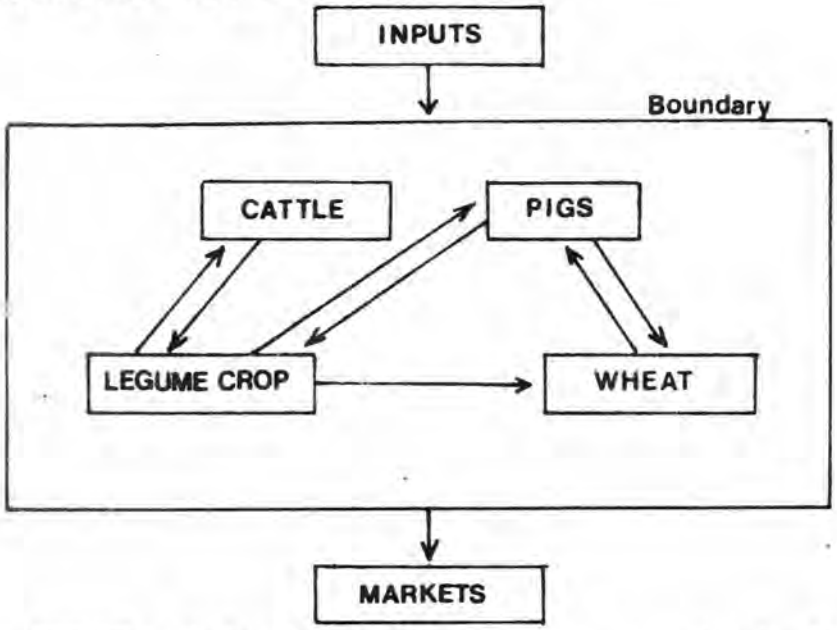
Root hairs provide large surface area for absorption of water & dissolved mineral salts.

Total

QUESTION 3.

Figure 8 below represents a system model of a mixed farm in northern New South Wales.

Figure 8. System model of a mixed farm



(a) *Name* THREE agricultural production subsystems operating in this system -

(i) Cattle Pigs

(ii) Legume

(iii) Wheat

(b) Interactions occur between agricultural production subsystems. From your study of Figure 8 -

(i) *Name* TWO subsystems which are interacting.

(A) Cattle/Legume Pigs/Legume

(B) Pigs/Wheat

(ii) *Identify* the nature of the interaction.

Nutrition - Feed / Effluent

Total

(c) In any agricultural system the invertebrate and microbial subsystems interact with the production subsystems.

(i) *Describe* TWO such interactions which could occur in the system depicted in Figure 8.

(A) Nodulation Type of micro-organism

(B) Digestion Decomposition

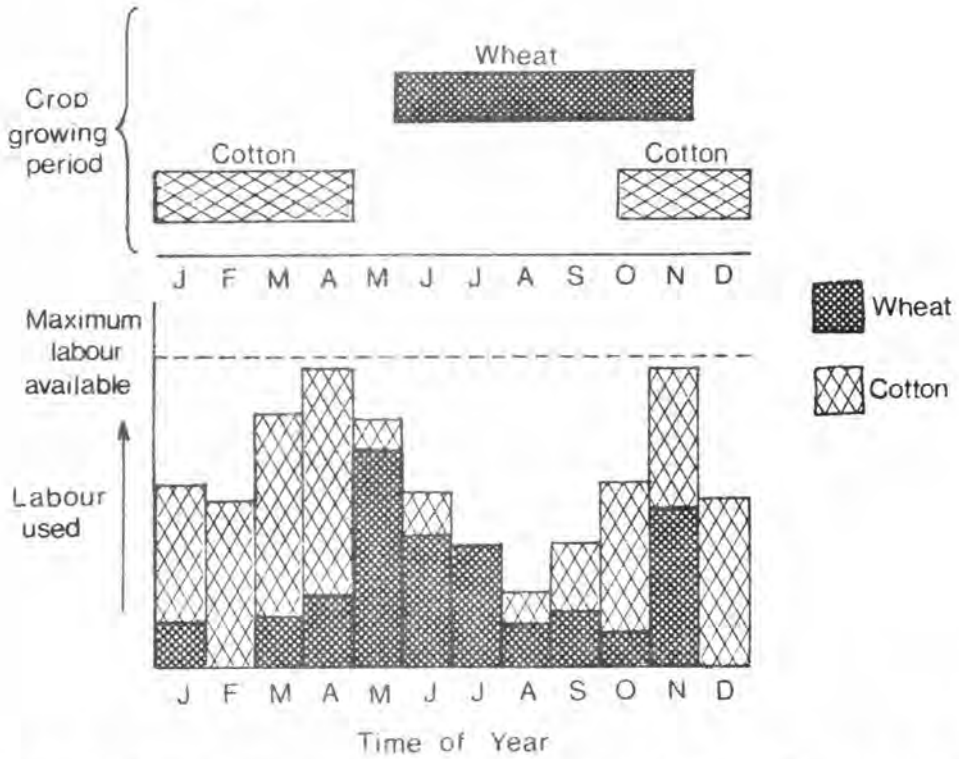
(ii) *State* ONE way each of the interactions in (i) above influence the productivity of its subsystem.

(A) .....

Any of above e.g. Type of m/o - activity & the benefit to the system

(B) .....

Figure 9. Crop growing period and labour use



(d) Figure 9 shows the crop growing period and the annual distribution of labour used on a farm growing wheat and cotton.

(i) *Name* TWO factors which determine when these cropping cycles occur.

(A) ..... Crop growing period .....

(B) Temperature, Rainfall, Frost, Varieties, Soil Temperature.

Total

(ii) *Name* THREE other factors which are important for high yields in agricultural crops.

(A) Factors NOT mentioned above e.g. Pests & diseases,

(B) Soil type / structure, Irrigation / Fertiliser / Management

(C) .....

(iii)The manager of this wheat and cotton farm wishes to consider the introduction of an additional enterprise. How can the data in Figure 9 assist in such decision making?

..... Indication of when labour is available .....

..... The possible introduction of a new enterprise .....

(e) (i) *State* TWO changes in labour use which have occurred since 1970 in the production of crops.

(A) .... Decrease in labour / increase in skilled labour .....

(B) ..... Age / Family / Sharefarming / Contract .....

(ii) *Describe* a major force which has led to such changes in labour use.

Economic force - name an innovation & describe its influence ...

.....

(iii)*Explain* how farmers have used ONE technological innovation to facilitate such changes in labour use.

e.g. Larger machinery Minimum tillage Plant genetics Chemicals

Shearing devices etc. & Explain. .....

(f) (i) *Describe* ONE way in which technological change has affected the type of labour required in agricultural production.

Skilled labour - Casual / Seasonal / Contract - Description .....

.....

(ii) *Describe* the influence such changes in production have had on -

(A) markets Increase quality Increase competition .....

..... Over prodction Expansion Gluts .....

(B) profitability Decrease in short term Increase costs .....

..... Increase in long term Increase production .....

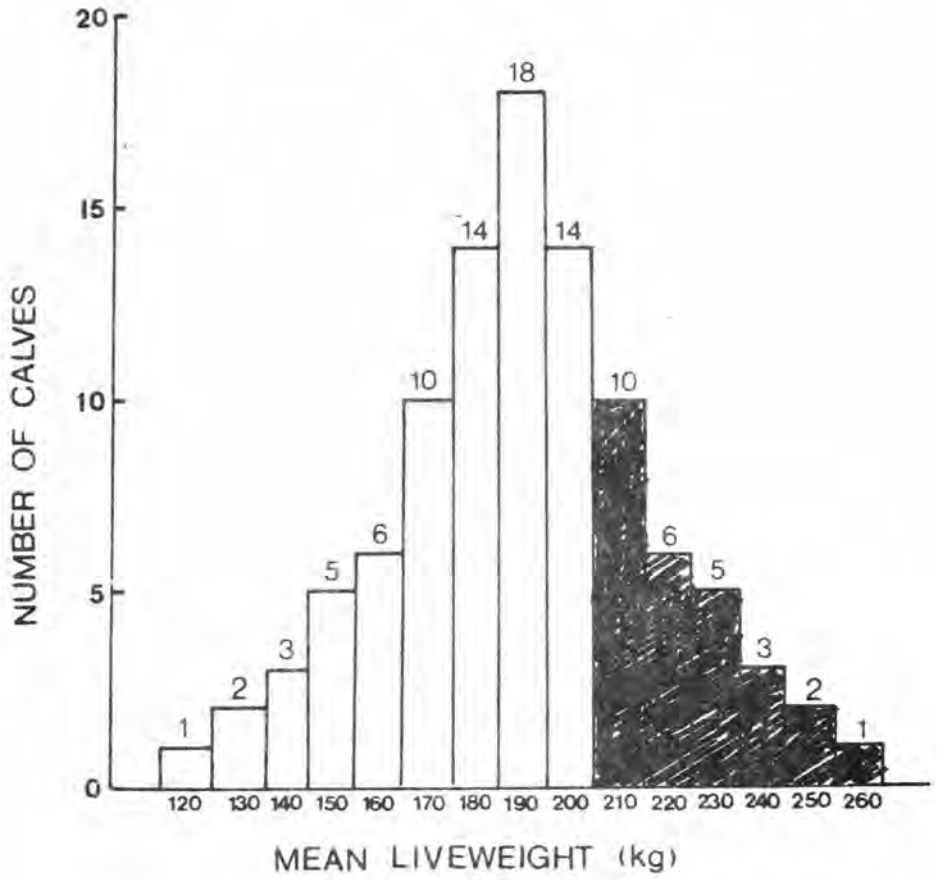
Total

QUESTION 4.

A cattle production company operates a production system that involves both breeding and feeding subsystems. They carry 270 breeding cows and replace approximately 10% of them annually with their best heifers (selected on weight at weaning). After weaning, the cull heifers and steers are grain fed in a feedlot to prepare them for market.

The weaning weight distribution of the 100 heifer calves weaned in one year is given below.

Figure 10. Distribution of weaning weight of heifer calves



(a) *Shade in* the portion on the graph in Figure 10 to show which heifers would be selected by the cattle company for use as replacements in the breeding herd.

(b) (i) *State* TWO environmental factors which could contribute to this weight variation.

(A) Disease

(B) Climatic variation

(ii) *State* ONE factor, other than environment, which could contribute to the weight variation in this group of animals.

(c) The difference in the average weaning weight of the heifer calves and the average weight of the selected replacements is called the **selection differential.**

(i) What is the average weaning weight of the heifer calves?

190 kg

(ii) *Calculate* the average weaning weight of the selected replacements.

$$\frac{(10 \times 210 + 6 \times 220 + 5 \times 230 + 3 \times 240 + 2 \times 250 + 1 \times 260)}{27} = 224.1\text{kg}$$

(iii) *Calculate* the selection differential. Show your working.

224.1 - 190 = 34.1 kg

(iv) How would the value of the selection differential change if the company replaced 25% of the breeding cows each year instead of 10%?

The value would change to 15kg since more heifers of a lower weight would be selected (av.=206.2kg) i.e. selection differential decreases

(d) At weaning the calves are vaccinated for enterotoxaemia (pulpy kidney). From your understanding of immunity, *explain how* vaccination affects treated animals.

The vaccine contains a weak (or dead) strain of the disease. When injected into the animal the animal produces antibodies which confer resistance to the disease if the animal contacts it again.

Total

(e) After weaning the steers and cull heifers are removed from the pasture and are grain fed in a feedlot for 90 days.

(i) Briefly *describe* the processes that occur in the rumen.

Microbes ferment food in the rumen - carbohydrates are broken down to Volitile Fatty Acids proteins are hydrolised to peptides & A.A's cellulose in particular can be digested. Microbial protein is synthesised. Vitamins B & K are synthesised. Regurgitation occurs. Churning & mixing with saliva occurs also.

(ii) *Explain* why the introduction of the calves to grain feeding should be a gradual process.

Grain poisoning (acidosis) may occur. Time is needed to allow rumen microbes to adjust to changed diet.

(f) The ration used for lot feeding of these weaners is shown in Table 2.

Table 2. Ration for weaners

Component (kg)		Metabolisable energy (MJ/kg of feed)
Sorghum grain	80.0	13
Sorghum stubble	20.0	7
Urea	1.0	-
Lime and salt	1.5	-

(i) What is meant by the term "metabolisable energy"?

Metabolisable energy is the energy available for use by cells.

M.E. = G.E. minus(energy lost in faeces, urine, gas)

(ii) *Describe* the process which enables cattle to obtain more energy from stubble than can monogastric animals.

Rumen protozoa & bacteria break down cellulose, a major constituent of stubble, & synthesise amino acids. Monogastrics do not have such microbes.

Total

(iii) Why is urea a component of ruminant rations but is not useful in the diets of pigs or poultry?

Rumen microbes are able to use urea as non-protein nitrogen to sythesise microbial protein which becomes available as protein to the animal.

(g) Lot feeding is a form of production which requires a large capital input.

(i) How can a farmer determine whether it is financially better to sell all the weaners or to invest capital in a feedlot?

Carry out a partial budget comparing the two options. i.e. (extra income minus income forgone) minus (extra costs minus costs forgone) If result is positive then investing in feedlot is financially better

(ii) *State* ONE measure a manager can use to reduce the effects of a potential fall in the market price for animal products such as lot fed cattle.

Diversify, invest in futures, make contracts for sale.

(iii) *Give* TWO reasons why market prices for beef cattle and many other agricultural commodities are characteristically variable.

(A) Quality of product varies, Quantity of product offered varies

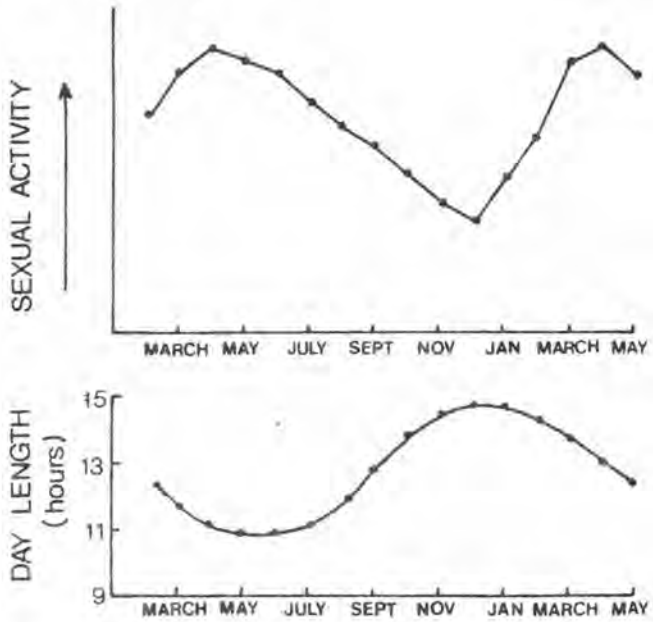
(B) Demand in a particular season, consumption trends, Seasonal conditions of supply etc..

Total

QUESTION 5.

Figure 11 shows the relationship between time of year and sexual activity in Romney Marsh rams and time of year and day length.

Figure 11. Sexual activity in rams



(a) *Describe* the relationship between time of year and sexual activity of rams.

„In summer months, (Nov. - Feb.) sexual activity is lowest .....

„In Autumn (Apr - June) sexual activity highest. .....

(b) Briefly *describe* the physiological system which regulates sexual activity in these rams in response to daylight.

The light affects the pituiary gland which produces a hormone ....

which, in turn, acts on the testes. .....

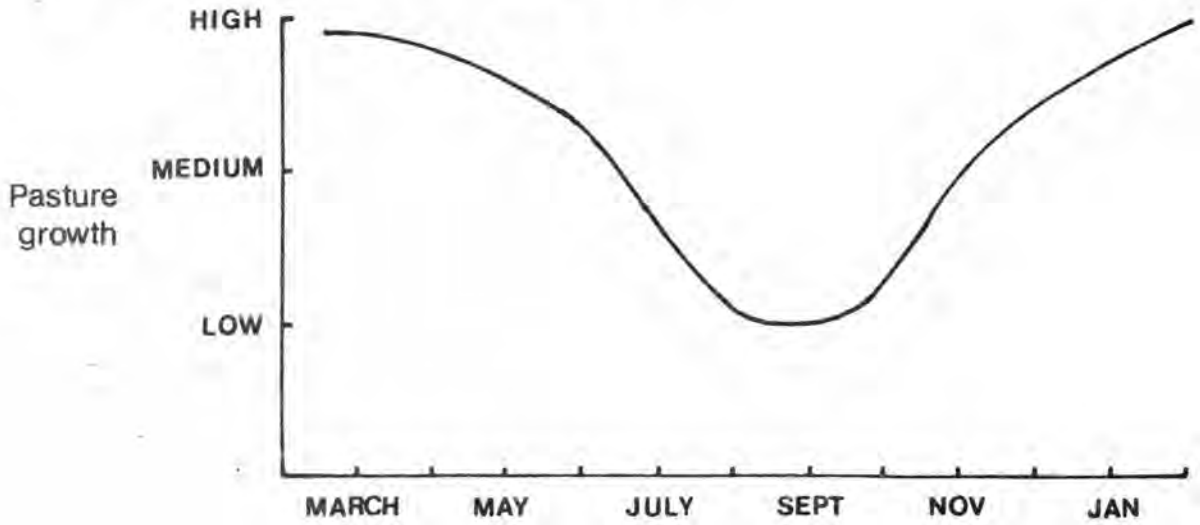
(c) Why is it important for an animal's physiological system to be responsive to environmental changes?

So that the young are born at the time of year when coditions are optimal for survival for both adults & offspring.

Total

(d) Figure 12 shows the relationship between pasture growth and time of year.

Figure 12. Pasture growth and time of year



(i) *Name* TWO climatic factors which influence pasture growth.

(A) Rainfall

(B) Temperature

(ii) *Explain* how the information provided in Figure 12 could be used to determine the best time for lambing.

Leading up to & after birth, ewes & lambs need high amounts of good quality fed therefore lambing should occur November to December.

(iii) It takes five months from mating to lambing in sheep. *Explain* how this information, combined with the information in Figure 11 (on page 22) and Figure 12 can be used to decide on a suitable time for mating sheep.

Farmer must provide adequate nutrition for ewes in last third of pregnancy and lactation whilst still joining at time of relatively high sexual activity of the animals.

(e) For an animal production system with which you are familiar -

(i) *Name* TWO major animal health problems which can be controlled by a chemical or antibiotic treatment.

(A) Mastitis

(B) Liverfluke

Total

(ii) For *each* of these problems *state* ONE standard chemical or antibiotic control method.

(A) Injection of antibiotics into the teats

(B) Drenching

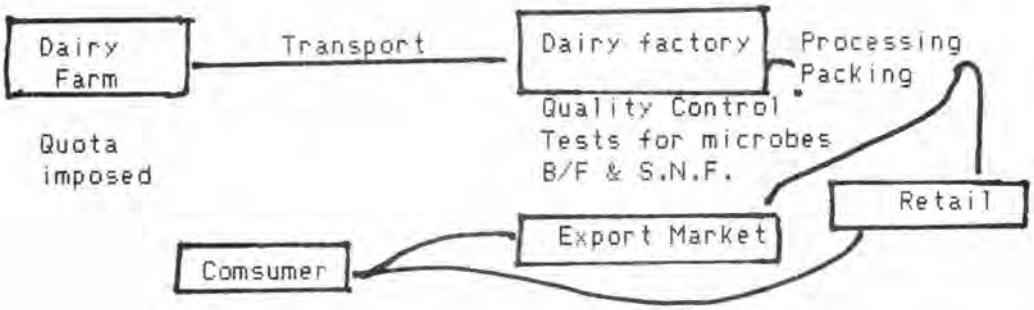
(iii) For ONE of the animal health problems named in (i) above *explain* how a farmer could incorporate ONE management technique which would reduce the need for chemicals or antibiotics.

Name of animal health problem Mastitis

Management technique Hygienic dairy conditions, wash cups & teats before milking, avoid over-milking hose down yards keep everything clean.

(f) Governments intervene in the marketing of some products from plant and animal production systems. For one such product you have studied -

(i) *Draw* a labelled diagram of a marketing process which involves government intervention.



(ii) *Describe* how the government intervenes in this marketing process.

Quantity control through quota system

Quality control by testing for B/F S.N.F. Microbes

(g) Briefly *explain* ONE effect on farmers' decisions of each of the following government policies -

(i) taxation policy If taxes are high, farmers will put money back into the farm to avoid paying large tax bills

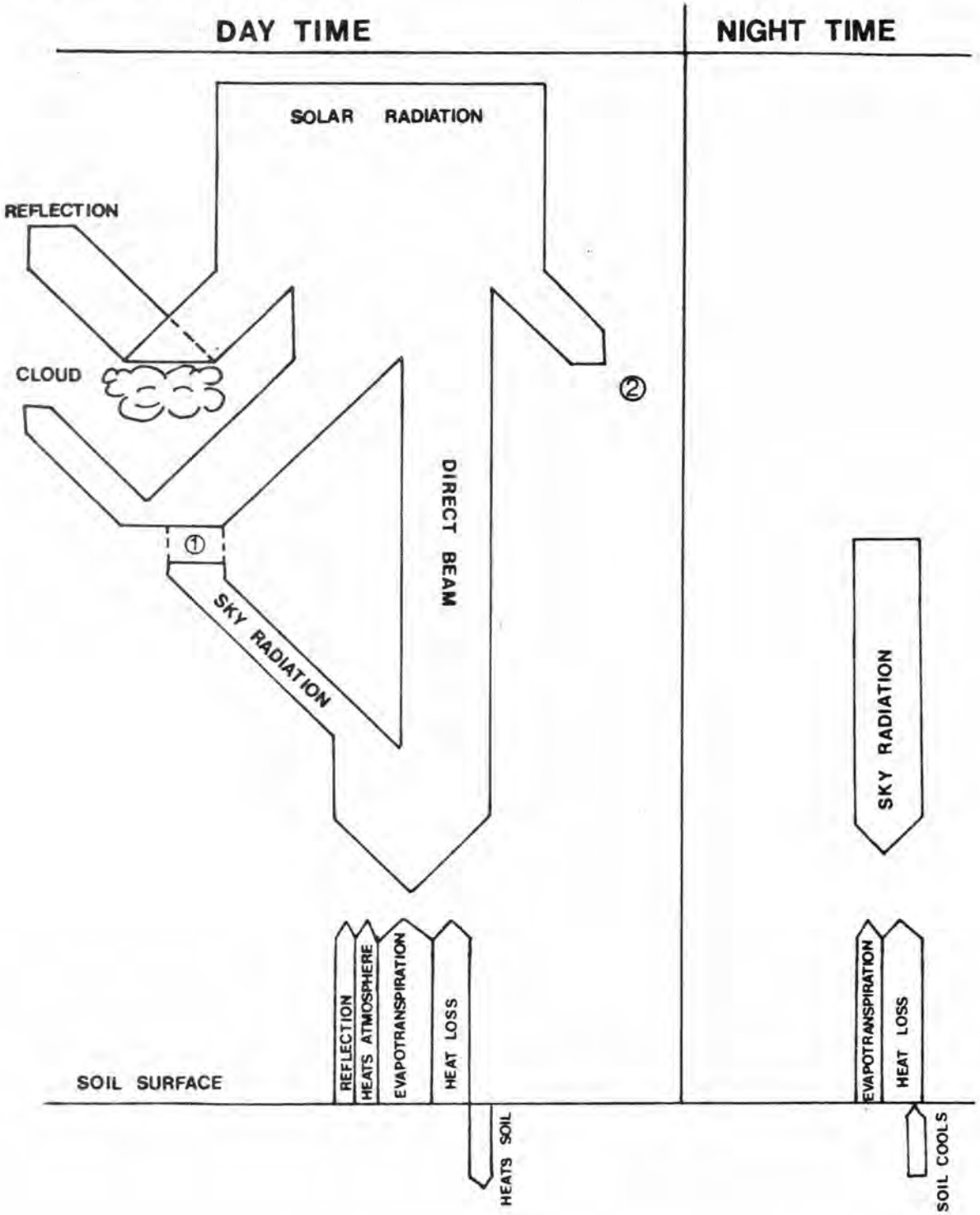
(ii) credit policy If interest rate are high, might decide not to borrow and delay improvements and not invest in capital improvements.

Total

QUESTION 6.

Figure 13 shows the radiation balance for early summer for daytime and night time in a temperate region.

Figure 13. Radiation balance



(a) (i) Using the information provided in Figure 13, *write out* a word equation to define net radiation.

net radiation = solar radiation - (reflection + heating atmosphere)

(ii) *Describe* the process occurring at point 1.

Scattering

(iii)What happens to the radiation at point 2?

Absorption

(iv)Briefly *describe* the effect on net radiation of a lot of cloud during the day.

More reflection and absorption by the atmosphere therefore less net radiation

(b) Approximately how much of the incoming radiation from the sun is used in photosynthesis?

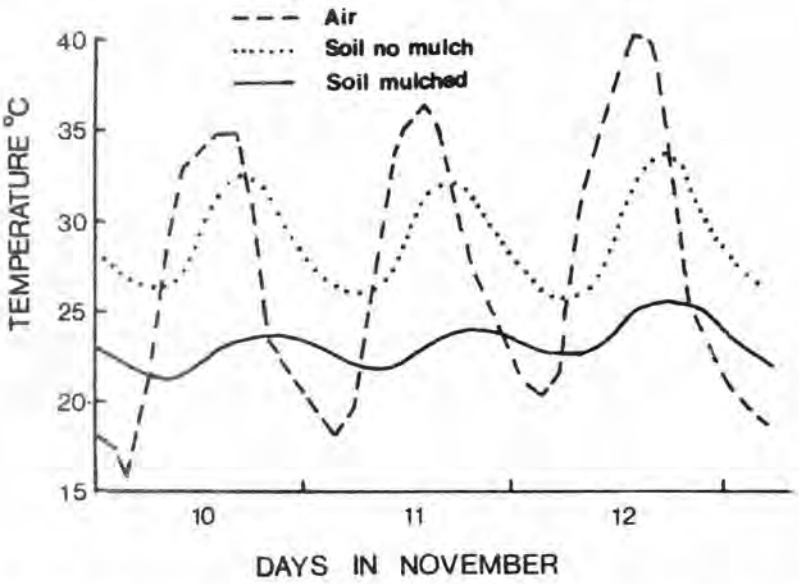
0.3% to 4.2% Figures vary.

QUESTION 6 continued overleaf.

Total

(c) Temperatures measured on three still clear days in November are graphed in Figure 14 below. The soil temperatures were measured at 10 cm below the soil surface. The mulched soil had been covered with 8 tonnes/hectare of light coloured straw.

Figure 14. The effect of mulch on soil temperature



(i) *Explain* why the air temperature fluctuations are much greater than those of the soil.

Air is less dense than soil & therefore has much less ability to retain heat.

(ii) Why do soil temperatures at 10cm depth lag behind the air temperatures?

- Transfer of heat through soil particles takes much longer

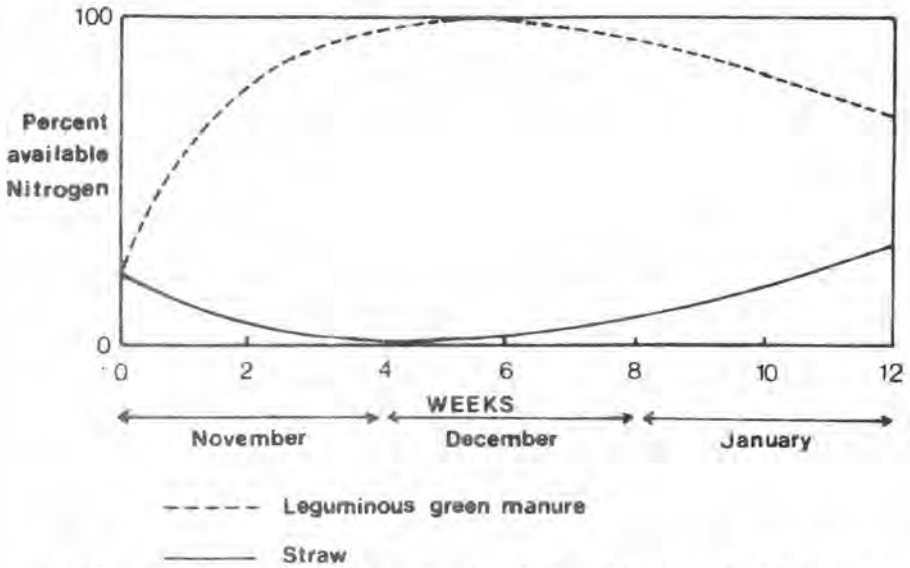
(iii) *State* ONE effect of mulching on the soil temperature.

Stabilises soil temperature

Total

(d) Two adjacent paddocks were used to compare the effect of straw and a leguminous green manure on the growth of a crop of sorghum. The data in Figure 15 show the effect of the straw and green manure added at week 0 on the nitrogen available to the sorghum crop. The carbon to nitrogen ratio of the green manure was 8:1 and of the straw 80:1.

Figure 15. Available nitrogen in soil



(i) If a crop was sown one week after cultivating in the straw, what would the consequences be for the emerging seedlings?

Stunted growth, yellowing due to Nitrogen deficiency

(ii) What strategy could you adopt at sowing time to deal with the changes caused by the addition of straw?

Add a Nitrogen fertiliser such as Nitram

(iii) *Describe* TWO other important consequences of adding straw to the soil and cultivating it in just prior to sowing the sorghum crop.

(A) Improve water holding capacity, improve aeration

(B) Improve structure,

(iv) What would be the effect of the added straw on the organic matter content of the soil at the end of December?

increase organic matter content

(v) When would be the best time to sow the sorghum crop in the green manured paddock, based on the information in the graph?

From 0 to 4 weeks

(vi) How would the leguminous green manure have affected the organic matter content of the soil at the end of December?

it would increase the O.M. content

Total

(e) The management of water supply to crops enables farmers to exercise some control over climate.

(i) *Explain* the consequences of each of the following for plant growth -

(A) evapotranspiration cooling effect, transpirational pull, stress ... assist the uptake of nutrients due to flow through plant .....

(B) soil moisture falling below permanent wilting point ..... loss of turgidity/wilting death of the plant .....

(C) soil moisture exceeding field capacity ..... waterlogging, reduced respiration in roots, leaching, denitrification

(ii) The rooting depth of a soybean crop on a particular soil type is 30 cm. Roots do not penetrate into this subsoil because it is too dense.

Table 3. Water storage in a duplex soil

Water storage (mm water)	
Field capacity	10
Permanent wilting point	5

Calculate the maximum water available for evapotranspiration by this soybean crop.

..... 10 minus 5 = 5 mm .....

(iii) The evapotranspiration rate of the soybean crop is 2 mm water/day. How long can the crop grow on the soil without an irrigation application if rain does not fall?

..... 5mm divide by 2 = 2.5 days .....

(iv) The soybeans are grown with an effective rainfall of 50 mm during the crop cycle. The growth period is 24 weeks (October to March). The soil is at field capacity when the crop is sown and when it is harvested. Calculate the amount of irrigation water needed by the crop if it is to be grown without moisture stress. (Show your working).

..... 24 x 7 = 168 days. Crop requires 2mm/day = 168 x 2 = 336mm

..... 336mm less 50mm effective rainfall = 286mm .....

..... Therefore irrigation water required = 286mm .....

Total

(f) The soybeans, which are a legume, are grown in a soil with a poor supply of available nitrogen. *State* ONE technique the farmer could use to ensure that the crop obtains adequate nitrogen.

..... Inoculate with specie specific Rhizobium bacteria. .....

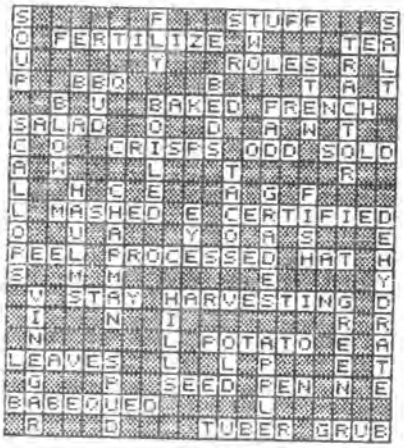
(g) The soil type is acid and releases manganese ions into the soil when wet. *Describe* TWO steps a farmer could take to reduce this problem.

(A) .. Drain soil / restrict watering .....

(B) .. add lime to reduce acidity .....

CROSSWORD ANSWERS FROM BAAT III 1987

POTATOES



Total

YEAR 7 - AGRICULTURE

LIVESTOCK TYPES ASSIGNMENT

Complete all questions or tasks in your books. Paste this sheet in your book and complete questions/tasks as you are asked.

Neat and correct recording will receive the highest grade.

The references for this assignment are:-

- Agricultural Studies Stage 1 Topic 5 - pages 170-245
- Introduction to Agriculture. Many chapters.
- "The Land" newspaper in the library.

1. Draw up a table in your exercise book on a new page with these columns and the headings shown. Complete the table.

Animal Group	Products Sold
Sheep	
Beef Cattle	
Dairy Cows	
Pigs	
Laying Hens	
Broilers	
Bees	

2. Write and complete questions 1 and 3 on page 171 of Agricultural Studies - Stage 1.

3. Visit a supermarket and list six items that come directly from the farm e.g. eggs.

4. Copy information from page 176 of Agricultural Studies - Stage 1 under the heading - What do animals eat ?

5. Copy table: Livestock terms from page 176 from Agricultural Studies - Stage 1.

6. Draw a plan of the sheep yards, showing the relative sizes of the pens, the feed growth and shelter areas. Use pencil and about one page in size.

7. Identify and describe the main sheep breeds on the Agriculture plot, namely - merino, Border Leister, Suffolk and the Hampshire Down.

8. Draw a diagram of a broiler chicken labelling the beak, comb, wattle, breast, wing, leg, tail, thigh.

9. Record the weight in grams of a broiler chicken over 4 weeks.

10. By using the diagram provided of a sheep - place in the following points - face, mouth, shoulder, ribs, feet, belly, loin, rump, tail, poll.

YEAR 8 AGRICULTURE
PROFILE REPORT
SHEEP HUSBANDRY

NAME _____ **DATE** _____

CLASS _____

	O	UG	G	S	NI	U
Record Book						
Effort Related To Ability						
Assignments						

.....has also mastered the following skills.

- ☐ Muster sheep between paddocks
- ☐ Yard sheep correctly
- ☐ Catch sheep safely
- ☐ Cast sheep
- ☐ Age sheep by dentition
- ☐ Drench sheep
- ☐ Vaccinate sheep
- ☐ Trim hooves
- ☐ Crutch sheep
- ☐ Discuss management of the school flock
- ☐ Recognise signs of illness in an animal
- ☐ Identify one ecto and one endo parasite of sheep
- ☐ Use resources to research sheep diseases
- ☐ Recognise signs of impending lambing

- ☐ Ear tag lambs
- ☐ Castrate lambs
- ☐ Taildock lambs
- ☐ Care for an orphan lamb

Comments: TOPIC TEST % ☐

_____

_____

YEAR 7 AGRICULTURE
PROFILE REPORT
INTRODUCTION TO AGRICULTURE

NAME _____ **DATE** _____

CLASS _____

	O	UG	G	S	NI	U
Record book						
Effort related to ability						
Assignments						

.....Has also mastered the following skills:

- ☐ Recognise several agricultural enterprises
- ☐ Muster the sheep in the school flock
- ☐ Collect the eggs from the school hens
- ☐ Restrain a lamb
- ☐ Close the farm gates after going through them
- ☐ Catch and weigh a chicken
- ☐ Collect and record data on aspects of the weather
- ☐ Measure air and soil temperatures
- ☐ Debate current issues in agriculture
- ☐ Collect information of an agricultural nature

Comments:

TOPIC TEST % ☐

_____

_____

NAME : _____

ANIMAL: _____

JUDGING SHEET

PET FARM ANIMAL COMPETITION

MERRIWA SHOW

INSTRUCTIONS:	Points will be awarded for good conformation and presentation under the headings listed.	
1. HAIR AND HIDE 10 points	HAIR: Healthy, Shiny, fine and soft. HIDE: correct thickness, loose.	POINTS:
2. HEAD AND NECK 10 points	EYES: correct size and shape, clear and bright. HEAD AND MUZZLE: - not too heavy for the animal, good muzzle and teeth for feeding. NECK: correct length for the animal.	
3. FOREQUARTERS 10 points	SHOULDERS: correctly positioned, strong LEGS: Square under body, strong, nearly straight	
4. BODY 10 points	HIPS: broad (characteristic of the animal) CHEST: deep, well filled (characteristic of the animal) BARREL: long, well rounded, strong rib support.	
5. HINDQUARTERS 10 points	PELVIS: - wide TAIL: - strong at base well shaped LEGS: - wide apart firmly set.	
6. ANIMALS, PRESENTATION IN THE SHOWRING 30 points	GROOMING: - handlers effort in presenting the animal (brushing, clipping etc.) HANDLING: - ability to walk the animal and present the animal to the judge	
	TOTAL POINTS: / 80	

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