

Lincoln College



UNIVERSITY OF CANTERBURY

**ADVICE TO PROSPECTIVE
HORTICULTURAL STUDENTS
COMMENCING PRACTICAL WORK**

How to get the most out of your practical work

This booklet has been written primarily for pre-entry Lincoln College Horticultural Diploma students. It will guide them during the year of practical work which must be completed before they begin their course at the College. However, it will be equally useful for Degree students during their course, and for horticulturists employing these young men and women. The information in this booklet will help employers to cope with many of the problems and queries that are certain to arise.

Each year approximately 300 young men and women commence work on horticultural properties for the first time. Of these approximately 12 per cent subsequently study horticulture at Universities. After completing their courses many return to horticulture while a proportion enter occupations serving the horticulture industry. All such students enter Universities in order to increase their knowledge of horticulture and its allied subjects. Diploma students wishing to enter Lincoln are required to complete a minimum of one full year's practical work prior to the commencement of their course on an approved horticultural establishment and Degree students complete their practical work in the summer vacation during their course. What these students often fail to realise is that this period of practical work can be just as important in contributing to their knowledge as the academic period of training in the University. Unfortunately, in a large number of cases, this period of horticultural practical work has contributed little to the student's knowledge and skill and has been largely wasted. Very often this is the direct result of the student not understanding why he is expected to work on nurseries, orchards, etc., or through employers not being prepared to spend sufficient time guiding their employees.

A student's wisdom is determined by his total factual knowledge and how this knowledge is applied to given situations and problems. Universities contribute on a broad basis to the student's factual knowledge and to the application of his knowledge to horticultural management and technical problems. On the other hand, the period a student spends as a horticultural employee has three functions.

Firstly to increase the student's factual knowledge, though this will be limited compared with the knowledge gained in an academic course.

Secondly to teach the student to apply his knowledge to given situations and overcome the problems involved.

Thirdly to teach the student the practical skills required for horticulture.

1. FACTUAL DATA

In this first case you will learn the more important facts relating to the particular establishment you are working on. This information becomes available during the course of the working day and is usually related to the particular jobs being undertaken. Unfortunately, an assortment of factual information is usually presented whenever certain jobs are considered. Much of this information is forgotten within a short time unless you learn to adopt a satisfactory recording system from the outset. Every evening you should spend at least half an hour reviewing the day's work in a diary and recording any facts arising from this work. At first this may seem to be a rather unnecessary requirement. However, it can become very interesting and quickly teaches you how to obtain all the factual information from a day's work and to develop an enquiring attitude to this work. Once you have obtained sufficient factual knowledge in this manner and have developed an enquiring approach, the work becomes much more interesting and you will begin to understand the reasoning used to make certain decisions.

Probably the greatest benefit from this evening exercise will be from the development of an enquiring mind and interested approach to the practical work being undertaken, provided you endeavour to determine every possible fact arising from each day's work.

(a) Basic Information:

In order to obtain sufficient basic factual information and to get a perspective of the holding as a whole, within a day or two of arriving, you should ask to see a map if one is available. If not, ask to have the boundaries pointed out and draw up a map as soon as possible. Following this find out:

The climate of the area: Annual rainfall and distribution, prevailing winds, length of winter, summer droughts, frosts etc.

The areas of the holding: Hills (separate into shady and sunny faces), flats, other (swamps, etc.), total.

Numbers of sections or departments: Orchard, Nursery, Landscape, Vegetable, etc., and the soil types of each of these.

Plants on property: Fruiting trees, varieties, rootstock. Nursery production - main lines, special lines. Canned, growing on, open ground, etc. In vegetable production check range of crops, type of market catered for, e.g. process, direct sale, auction.

Production figures: These may or may not be available but will be a useful guide if they can be obtained. It will probably require the confidence built up by diligent work to elicit this information in some cases.

Crop returns: In many cases this information can be gleaned by observation. It is important to know yields per acre or per glasshouse, etc., and prices ruling at different times. All statistics relating to crop production should be carefully noted as this will form the basis of any work study or other analysis to be undertaken later - perhaps in College.

These facts will give you a sufficient background to the establishment to understand the major management policies. However, you may feel that other important factors (such as machinery) relating to the nature and production of the property should also be recorded in this initial outline. If this is the case, include these under their relevant headings.

The idea behind this initial outline is to guide your thinking along the right lines at the start of your work. All too often these important details are not sought out until the student has been there for three or four weeks, by which time, a lot of information which would have been very useful if the broad outline of the business had been established, has been wasted. Some critical operations are covered in a few days and the opportunity to observe these could be lost. Budding, sowing, cutting production, etc., could be examples of this.

This brings us to the second phase of recording information. You have established the outline of the property and its production, it is now essential to record its actual management in two spring clip foolscap loose-leafed note books which can readily have pages added to them. The first of these is a Diary, the second is a Crop Record.

(b) The Diary:

The diary is for recording each day's activities in detail. Develop the sound habit of recording as many facts as possible relating to the day's work, each evening. This will quickly become a pleasant and rewarding pastime.

Recording Facts:

The following are examples from different students recording the same task, working in a Parks and Reserves Department.

- Student 1. Spent the day bedding out.
- Student 2. Planted out Petunias in a circular bed. Spacing 10" x 12". Mixed varieties used. Marked out concentric circles from centre point as a guide. Set sprinkler going.
- Student 3. Today was spent on bedding schemes. Circular bed by main entrance is to be planted with mixed Petunias. F1 Hybrids are used because of their good colour range and even growth habit. Boxes were well watered first to ensure no check was given. Circles were marked out concentrically from the centre, 10" apart and planting was done from the centre spacing the plants 12" apart. A North Westerly was forecast so the rotary sprinkler was used (Pope Premier).

Student 4. Today I had my first chance to plant summer bedding. Circular bed by main entrance is to be planted with mixed Petunias. This follows a scheme of winter pansies which had passed their best. (Aphid attacks hastened this). Bed was prepared in advance by hoeing off plants and clearing the debris. Area was rotary hoed and a dressing of blood and bone applied at 2 oz. per sq. yd. It was then heeled and raked over. Last week the area was sprayed over with Paraquat and the bed was perfectly clean today. (Leaflet on Paraquat in Horticultural Chemicals file).

Our boxes were soaked yesterday and set down ready for us. F1 hybrids are used because of their even growth and rich colourings. The seed is expensive because of the hybridising techniques but the colours are predictable and the mixture is much superior.

Using a string and peg, concentric circles were marked out 10" apart. The plants were laid out 12" apart and planted firmly starting at the centre and working to the edge to prevent walking on the plants. Plants were staggered in adjacent rows. There were only a few plants left - extras are always included to allow for weak plants to be rejected. Calculation is made assuming that each plant has 120 sq. in. One simply calculates the area of the circle in sq. ins and divides by 120 to arrive at the number of plants required. It was pointed out that this is a practical approximation. Our circle was $17\frac{1}{2}$ ' in diameter so the number was:

20% extra on yardage for shrinkage on consolidation. Stream may spate so allow for protecting bank with stonework.

Interesting method for estimating cost of laying lawn based on unit cost. Simply measured area in sq. yds and multiplied by 30c. Can be applied to quite a number of operations.

In the afternoon a collection of Hebes was expected for the holding area. Asked Mr 'X' why he didn't grow his own as they rooted so easily. He considered that this is the age of the specialist and that diversification meant that capital equipment, which was subject to steady depreciation, was not utilized to its fullest potential.

Not all the Hebes arrived in the first consignment and spaces were left so that other supplier's stocks could be included alphabetically without rehandling the first lot. I thought it a bit silly plunging the plastic pots as they don't lose water through their sides. However, it was explained that they keep cooler and stay steadier plunged.

Surprised to learn that Hebes costing 50c sell at 90c. Cost price nearly doubled! Seems excessive till account is taken of space occupied, handling, labelling, weeding and feeding during the next year. Apparently stocks are not available at all times of the year although there is a trend towards producing more container grown plants.

This is an example of an average working day and you may find that there is more to write about on some days than others.

(c) The Crop Record:

The second of your notebooks must be used as a crop book. You will have to decide whether to make this a record of individual crops or sections of the property. Each crop will be given a separate page or pages and all activities relating to that crop must be recorded. Firstly, background of the area and its soils, contour, aspect and topography should be detailed. Subsequently fertiliser applications, spraying, liming,

cultivation, thinning, mulching, harvesting, grading, packing and marketing must be recorded. Thus, in effect you will have a double entry recording system to be entered up each evening after work. Your diary must be filled in and then the particular detail affecting each crop must also be recorded.

Even if your work doesn't take you to each crop - and in a big business it won't - the progress of the work as a whole can be learned by a regular evening or weekend tour or by talking to the owner and his staff. Your second notebook can only be recorded properly if this is done.

If your practical work is in Parks and Reserves, then the area could be simply sub-divided geographically or may be divided into playing fields, flower borders, development etc.

In an orchard details of the kinds of trees, the stocks they are grown on, their spacing and age are included in the initial 'history'. Subsequent management procedures should be recorded in sequence e.g. spraying, frost-protection, sward maintenance.

In a large establishment it may be impossible to have first hand knowledge of each section. It would be preferable to do several sections well and fill the gaps with tours at weekends or discussions with staff.

The following is an example of the history and development of one section of a property used for strawberry growing.

SOFT FRUIT HOLDING

Strawberry Section ($\frac{1}{2}$ acre).

History. Had been in pasture many years. Stands higher than surrounding land which tends to be rather wet. Soil has high humus content and is easily worked. Drainage must be taken care of because of the high water table.

September 16th

Prior to cultivation Weedazol T.L. was used to control weeds. (Active ingredients are amitrol and ammonium thiocyanate). Used at 3 gal. per acre and excellent kill was obtained. Apparently these weedkillers are more effective on rapidly growing plants. Boom sprayer mounted on tractor did all the work in an hour before breakfast. No wind at this time.

October 1st

Area was ploughed to invert the twitch. This exposes the roots and is more effective than the rotary hoe for this purpose.

November 2nd

A bit of regrowth. Although some of this is showing characteristic purple and bleached leaves Mr 'X' considers that it is just as well to respray everything that is growing. Resprayed area with Weedazol due to rapid growth of some patches of thistle which weren't apparent on the first spraying. Used the knapsack this time for spot application.

November 10th

Cultivation with the tractor-mounted Howard Rotary Hoe.

November 17th

Used hydraulic harrows to kill sward of germinating weeds (mostly Fat Hen).

December 2nd

Cultivation as above. Dug out a few patches of perennials by hand.

December 16th

Routine cultivation. Question of catch crop or green manure crop discussed but Mr 'X' suggested soil had plenty of humus and that a soil imbalance might result so near planting time.

January 20th

After routine cults the mole plough was brought in to bury alkathene pipes for irrigation. System was planned by firm supplying equipment. System makes use of evening and night watering and enjoys special irrigation tariff. Pipes are buried 15" deep and standpipes are located at hedge rows using moveable surface lines with rotary sprinklers providing 1" rain per 8 hours. This soil (Waimairi peaty loam) with its high humus content can withstand quite heavy precipitation rates, without affecting structure. Application rates are to be based on difference between rainfall and evapotranspiration figures.

Strawberries will be planted through plastic in the autumn.

When you come to Lincoln College you will find these records will be invaluable to you for your course work, but realise that the greater the effort you put into this, the more benefit you will obtain eventually.

2. SOLVING HORTICULTURAL PROBLEMS - THE APPLICATION OF KNOWLEDGE

As well as learning facts, you have a second job to do. This is to learn how to apply the knowledge you have gained in a correct manner to solve horticultural problems. However, you can't hope to obtain correct solutions unless you have accumulated a sufficient background to factual knowledge. Unless the suggestions offered earlier are accepted, and the work is approached diligently and a real attempt is made to take an interest in all the activities, systematically recording the details, you are unlikely to obtain much benefit from your practical work. Subsequently, when problems arise, your total knowledge may be insufficient through lack of sufficient interest and recording of data when similar problems occurred earlier in your work.

To solve management problems, you must also have a good background to the extent of your problem. Problems vary in relation to the time span involved, the problem of setting a drill to sow a paddock or the packing of a case of fruit will take a few minutes. By contrast, producing mushrooms, for instance, to supply a steady year round market, will create a problem for some time and planning must commence months beforehand. The problem must be considered over a very long period and the difficulties anticipated. Because time is involved in many of these problems - (growing crops, supplying a market, meeting a special date such as flower growing for Mother's Day) - and seasonal variations occur, you must spend a long time on holdings to become familiar with the extent of these problems. Consequently a one-year pre-entry practical requirement is minimal for prospective Diploma students at Lincoln. You could not do justice to the course with less and two years wouldn't be too long.

It is imperative to realise that one year of work, carefully recorded, evaluated and considered in a constructive manner, as outlined previously, could be worth at least four or five years of badly planned practical work.

This practical period must be approached with the idea that a considerable amount of knowledge, both theoretical and applied, can be obtained, but only with a reasonable degree of diligence and self discipline. On a holding the responsibility for obtaining this information and recording it rests with the student and the sooner an interested and enquiring approach is developed, the better.

As your practical knowledge (your ability to apply your knowledge to given problems within a particular environment) develops and becomes demonstrably good, so too horticulturists become willing to pay more for your labour. The best worker is not necessarily the man with the best physique but, by contrast, is the man who is able to use his knowledge correctly and make the correct decisions when required to do so and apply this skilfully.

An award scale covers the minimum which an employer must pay. However, it is the desire of most employees to earn beyond this figure. The wage paid is the proprietor's estimate of the value of his labour. This is not constant from holding to holding but there is a well defined trend to pay more for capability and experience. Experience can only be attained with the passage of time but capability can be developed rapidly. Consequently, if you wish to obtain top wages you must be prepared to develop your capabilities as early as possible in lieu of experience which can only be obtained with increasing age.

3. THE DEVELOPMENT OF HORTICULTURAL SKILLS

To many people, all that is required to be a horticulturist is to develop the necessary skills to carry out the menial tasks which occupy a very large proportion of the time. Certainly this is true if you only wish to be a bad horticulturist. To be successful and efficient, it is essential to develop the ability to:

- (a) plan the overall operations in advance;
- (b) execute that plan by the application of the skills required to run the holding;
- (c) control the execution and timing of the overall plan, especially where several men are employed.

Thus skill is an integral part of the requirements of a good worker or manager. However, it is not the only requirement for a good worker and in consequence must be considered in its true perspective.

As a worker you will find that a considerable amount of skill is required for most of the jobs which you may be expected to carry out.

Applied Skill and Knowledge

Horticulture involves skill and knowledge. Some jobs involve skill, such as budding and grafting. Many jobs require more knowledge than skill to enable the horticulturist to exercise his judgement. For instance, the timing of fruit tree sprays or the time of lifting of an early potato crop - in relation to the price/yield ratio.

The nurseryman must not be competent in propagation techniques alone. He must be able to base his production on an assessment of space available, (particularly in later stages), buying trends etc. When selling he may have to resist offers which may clear him of special lines, excluding customers who buy a 'balanced' selection and form the bulk of his trade. Such decisions should be based on knowledge and insight.

Correct timing is perhaps the most important factor in management. Test your skill by attempting to determine the factors which influence timing.

As you learn each new skill, add to your knowledge also. As you learn the "how" find out the "why" and the "where".

For example, the technique of soil sterilization by electricity is simple to master. It is important to find out why this is done and what effect the process has on the physical, chemical and biological balance of the soil.

Statistics

Keeping records is a necessary part of management. A graph showing weekly sales and advertising costs may show the way to more efficient use of an advertising budget.

A record of tomato weights harvested may pinpoint poor truss set at a certain period. A record of grades picked and prices obtained could indicate the best variety of trees to plant.

The use for statistics may not be apparent at the time. Their usefulness develops as the habit progresses. It might be that several seasons elapse before anything of significance emerges. Bear in mind the Chinese proverb "The palest ink is better than the most retentive memory".

Horticulture and Horticulturists

The young person to be pitied is the one who begins work for the first time and finds to his horror that horticulture is much more complex and difficult than the prolonged holiday he had imagined it to be.

As a general rule, the aim of each horticulturist is to have a satisfactory "way of life" but at the same time he tries to earn a satisfactory income. If he works too hard, his "way of life" suffers and his health may break down, though his profits may increase. If he doesn't plan his work properly or doesn't work hard enough his profits will decrease and consequently his "way of life", the happiness of his family, may in turn be jeopardised. Thus it is essential to realise that the ideal management systems balance these conflicting interests and allow the owner to obtain a satisfactory if not a maximum profit.

On a broad basis, as a producer gets older, he tends to balance these conflicting factors - his daily work (determining profits) and his "way of life" - in a different manner.

When he is young, he will tend to work long hours in order to maximise his profits. He tries to develop his holding and build up an estate for his family and as a broad guide this group includes persons in the 20-45 age group.

After approximately 45, he begins to reduce his own amount of work in an endeavour to improve his "way of life". Generally at this age, mortgage commitments have been reduced and the "sufficient income" can be attained with less effort. If the taxation rate is high at higher income levels, he is inclined to feel that it reduces the effectiveness of his own work further and he may not work as hard to achieve what he believes is the desirable balance between his own labour and his "way of life".

From 60-75 horticulturists fall into a further category. At this stage in their lives, their financial requirements for a satisfactory "way of life" are not as high as in previous periods and their work load must cease. However, the requirements of their families may be quite considerable and at this stage growers commonly transfer the control of their holdings to relatives or sell out and retire to town.

Thus your employer will fall into one of these three categories or you may find that he is a border-line case between two of these. The age grouping gives you some idea of the usual balance between work and "way of life" for each of these men but this is not strictly so. Occasionally younger men fall into the last category and vice versa between the groups.

The grouping is also contingent on the man being successful.

Most horticulturists enjoy the work they do. However, the main aim in any business is profitability and such undoubted additional advantages as open air life, love of the work, etc., must never be allowed to compensate for poor returns on capital and income.

Horticultural crops tend to be specific to certain areas which particularly favour them, e.g. tobacco and hop growing in Nelson, citrus and sub-tropical fruits in Tauranga and Keri Keri, vegetable crops in the peaty soils of the Marshlands area of Christchurch and the fertile soils of Pukekohe.

The Nursery trade is not specific to any particular area and is not, in the case of wholesale nurseries, dependent on local trade. Many North Island nurseries supply carriage paid orders to the South Island.

Many factors determine the type of crops and varieties grown and you should attempt to determine these in the district in which you are working.

Landscaping will play an increasingly important role in the life of the community. Students trained specifically in this field will be operating in 1970 after training at Lincoln College. The scope of the work ranges from small private sections to hydro schemes and highways. The onus which rests with the landscaper is considerable as the life of the individual is affected at every level.

Conclusion

You must realise that the onus to study your daily practical work is on you. If correctly applied it will be very rewarding. Besides making your horticultural work much more enjoyable your course at Lincoln will be much easier.

Develop the habit of spending a regular amount of time each evening on your work and set yourself a given time to commence. If you do not do this you will have wasted a considerable amount of very valuable time.

Bear in mind this quotation from Newton:

'If I have succeeded in my inquiries, more than others, I owe it less to any superior strength of mind, than to a habit of patient thinking'.

ADDENDUM 1

Do's and Don'ts in Diary Keeping

- Do
- include correct names, both generic and specific, of plants seen and used (including weeds),
 - include details of varieties, rates of sowing, seed treatments given, periods of flowering, dates of maturity, etc.,
 - include correct names and rates of application for insecticides, fungicides, weedkillers, and fertilisers,
 - include precise details of how a job is done when you first do it,
 - attempt to get an idea of your productivity, and other people's - how much can reasonably be done in a specific length of time,
 - attempt to find the costs of materials, machinery, labour and so on,
 - make entries which build up a picture of the season's work in the various phases of horticultural activity,
 - consciously observe what is going on, and find out as many details as you can.

Don't

- include vague comments such as "sprayed weedkiller on asparagus today", or "scattered fertiliser on area for cabbages". Without the details of type of material used, rate of application, weather conditions, etc., this type of observation has no value,
- neglect to record something of interest merely because you did not do the job personally,

ADDENDUM 1 contd

Don't

- ignore to comment on "passive" items, such as plants coming to flower, the effect of weather and its effect on planting, sowing, or maturing dates,
- neglect to make an entry, simply because the job is the same as yesterday's job. Look for items which are worth recording - descriptions of fruit varieties, vegetable varieties, types of weeds - all can turn a chore into a job in which something can be learnt.

Conscientious Diary Keeping will help you get more out of your practical experience, and so help to improve your personal interest and efficiency.

ADDENDUM 2

FINAL REPORT

Horticultural activities are varied which means that the nature of a final report will vary depending on where your practical work has been done. The following pages are devoted to suggestions for the formation of your final report. The suggestions are by no means exhaustive and the information you provide will be of little value if hastily compiled in the last few days of the practical year. It should be a summary of all your notes and observations. The fact that the report has to be written should be borne in mind throughout the year and there is great merit in the idea that the framework could be built as your work progresses.

The following are the main classes of establishment that are encountered.

1. Parks and Reserves.
2. Landscape Gardener's Business.
3. Nursery Business.
4. Fruitgrowing (including berry fruit).
5. Market Gardening (including flower production).

Your particular establishment may contain more than one category - for instance berry fruits and vegetables. It may also include a retail outlet as well as a wholesale connection. This would be a good opportunity for interesting observations and could occupy several pages on such topics as "cost of retailing on a wholesale business" or "are door sales really profitable?".

Here are some suggested headings for the final report:

1. Parks and Reserves

General Location

Area

Components - playing fields, children's area, games facilities, alpine section, etc.

A copy of a site plan could facilitate this stage.

ADDENDUM 2 contd

Administration Council

Parks and reserves committee (finance committee).
Director and Superintendent.
Annual financial appropriation.
Staff. Foreman, workers, casuals.

Functions

List the various components and make comments on the use the public make of the amenities offered. Discuss the direction which future development will take. Discuss drawbacks - lack of parking, toilets, seats, etc. Criticise the area on the basis of the numbers of the public who use it.

Management

Describe the management of each component listed. For instance, the playing fields:

- (i) Machinery - cost, depreciation, replacement.
- (ii) Labour force required.
- (iii) Mowing and manurial programme.
- (iv) Weed control.
- (v) Marking out of lines, assembly of goal posts.
- (vi) Turf replacement, reseeding.

or Bedding schemes:

- (i) Extent.
- (ii) Species used, preparation, planting schemes, calculation of requirements.
- (iii) Propagation unit (this could involve a special chapter, see nursery section).
- (iv) Maintenance costs.
- (v) Successional suggestions.

Budgets and Estimates

- (i) Basis for maintenance costs. This could be annual cost per acre for playing fields. Sometimes the money is allocated on the basis of the number of people in the county the park serves.
- (ii) Estimates for new work proposed - give amount and detail of proposed work.

ADDENDUM 2 contd

- (iii) Break down of annual appropriation into salaries, wages, materials, machinery repairs, plants, etc., buildings, upkeep of sports equipment.

2. Landscape Gardener's Business

General Location

Area - yard, storage, holding nurseries, etc.

Type of work engaged in.

Ownership - private, limited company, Ministry of Works.

Staff

Discuss duties carried out by each member.

Describe ancillary trades which assist from time to time. e.g. earth movers, masons, carpenters.

Equipment List and detail uses of all equipment owned or hired by the firm.

Materials Describe everything used in construction. This should include prices, sources of supply, transport costs and any important facts relating to the estimation of quantities.

Plants (a) Sources of supply of various items are very important, e.g. specials such as Blue Spruce, Bamboo; large specimens generally.

(b) Describe the firms holding areas and their management. Mention wastage also.

Management Discuss under topics such as:

(a) Advertising.

(b) Continuity of work flow.

(c) Customer/contractor relationships.

(d) Time-sheets, brochures, price lists, etc.

Plans and Estimates

(a) Describe procedure, e.g. site visit, sketch plan, estimate with typical contract provisions.

(b) List standard schedules for lawn preparation, tree surgery, mason's work, rock work, pools, etc.

(c) Give charged out rates for various staff members and actual wages earned if possible.

ADDENDUM 2 contd.

- (d) Ascertain contingency factors, materials, mark up, travelling and living out expenses, etc.
- (e) Describe some typical works and give contract price and resultant profit.

3 Nursery Business

General Location of business.

Details of climate.

Description of surrounding towns.

Property Area, provide sketch plan.

Soil type (s). Contours.

Describe nursery layout - pathways, drainage, open ground, beds, glasshouses and frames, potting shed, storage facilities, etc. Water and electrical supply, heating systems.

Staff Numbers, duties, seasonal variations.

Facts such as wages and gross profit ratio could be included.

Stock (i) List main lines grown and numbers propagated.

(ii) Describe main selling seasons and grades etc., sold:
e.g. Winter - bare root or balled.

Summer-Autumn - container grown.

(iii) Sales outlets, transport methods.

Propagation Describe techniques, e.g.

Unit

Cuttings, Seed, Stock beds,

Mist, Soil Warming, Closed Frames, Soil Mixes, Containers.

Equipment

Prepare inventory, discuss merits and demerits. Mention additional items that would be desirable. Possible co-ownership of some items could be considered.

Management

(i) Advertising, catalogues, seasonal lists.

(ii) Market potential, market trends.

(iii) Captial reinvestment, repairs and depreciation.

(iv) Wage policy - bonus, superannuation, overtime.

ADDENDUM 2 contd

4. & 5. Fruitgrowing and Market Gardening.

The suggestions given in the previous three sections may provide ideas for the fruit and market garden section as well. A slightly different range of headings is suggested here for you to consider but it is not essential to follow these if you think another layout would be more appropriate.

You should aim to describe the property so that a person not familiar with it can readily picture what it looks like. The detail may be well known to you and it is easy to assume you have covered all aspects when in actual fact you have not done so. When possible include a sketch plan of the property showing all main and salient features.

Address and acreage

Reports should start with the name of the owner, the name and address of the property and the acreage. If information available, state whether freehold or leased.

Type of enterprise

Details should be given relating to type of enterprise, e.g. stone fruit growing.

Locality

Location and access should be described as exactly as possible. Detail should include distance from nearest town and type of road to property, e.g. main sealed road, metalled road.

Amenities

Discuss amenities available such as electricity, telephone, water supply, transport facilities, markets, mail delivery, school and school bus etc.

Soil type and topography

Under this heading include details of the soil type and related problems such as drainage. Is the land flat, sloping, frost free or subject to peculiar climatic conditions?

ADDENDUM 2 contd

Labour

Details should be given of labour employed and wages paid. Hourly rates or contract? Casual or permanent?

Crops, crop rotation and related problems

Description of crops grown should include such relevant information as quantities, varieties, stocks, fertiliser programme, estimate of yield. Cultural techniques, spray programmes and weed control, should be included. Age of orchard should be specified.

General layout, shelter, fencing

A critical survey under this heading should include details of shelter and fencing, general appearance of the property and other relevant observations.

Buildings (including glasshouses)

Include details such as construction materials, state of repair, suitability, and possible future life. If possible, estimate cost. Details of glasshouse heating and running costs are important. Discuss insurance on glasshouse or alternative safeguard.

Machinery and implements

In addition to general description include information on care and maintenance and general condition.

Marketing

Discuss marketing procedure - local or distant? Possibility of expansion. Include details of advertising.

Future potential

Discuss future possibilities and improvements. Is the property likely to be affected by housing development or industrial expansion? Discuss problems associated with these possibilities.

Budget

Try to prepare an estimated budget of income and expenditure for the current season.

ADDENDUM 3

References

The following list of references is suggested to help you gather additional information associated with your practical work.

- Knott : Handbook for Vegetable Growers.
- N.Z. Department of Agriculture Bull. No 342 : The Home Vegetable Garden.
- N.Z. Department of Agriculture Bull. No 310 : The Home Orchard.
- N.Z. Department of Agriculture : various bulletins on specific horticultural crops are available at a small cost from local offices of the Department of Agriculture. Local advisory spray programmes are also available free of charge.
- Hilgendorf : Weeds of New Zealand.
- Various D.S.I.R. authors : Plant Protection in New Zealand.
- United Kingdom Ministry of Agriculture, Fisheries and Food : Various bulletins on specific crops. Lists of bulletins should be available at local booksellers.
- Shorter Oxford Dictionary, or any other good dictionary.
- A good descriptive catalogue issued by any one of the leading New Zealand Nurseries.
- Baker : The U.C. System for producing healthy container-grown plants.
- Harrison : Handbook of Trees and Shrubs for the Southern Hemisphere.
- Harrison : Handbook of Bulbs and Perennials.
- Poole & Adams : Trees and Shrubs of New Zealand.
- The Royal Horticultural Society Dictionary of Gardening (This is in several volumes and costs in the vicinity of \$32. It is not essential but would be a valuable asset and a lasting reference).

You should also ask to see any Journals or Trade pamphlets which your employer receives. Some New Zealand Journals suggested for regular reading include :

- N.Z. Journal of Agriculture.
- N.Z. Orchardist.
- N.Z. Commercial Grower.
- N.Z. Gardener.

ADDENDUM 3 Contd

It is not essential to purchase any or all of these books but they will be useful to you at the College and in later life. The College office has a number of books for sale at discount rates but most of these are textbooks for academic work not included in the above list.

You will also find your local public library a source of valuable horticultural information and you are welcome to use the College Library during the course of your practical work if opportunity exists to do this on week days.

ADDENDUM 4

Textbooks

The following textbooks are recommended for the academic part of the course:

Dip. Hort. I

Horticultural Botany	a) Background to Gardening - W.O. James Allen & Unwin	\$2.55
	b) The plant kingdom - H.C. Bold 2nd edition Foundations of Modern Biology	
Systematics	Identification of flowering plant families Davis & Cullen Olive & Boyd	
Plant Propagation	Plant Propagation - Hartman & Kester Prentice & Hall	\$11.30
Plant Diseases	*a) Plant virus diseases in N.Z. D.S.I.R. Bulletin 108	\$1.35
	*b) Plant protection in N.Z. Tech. Corresp. Inst.	\$5.00
	*c) Tomato diseases and pests D.S.I.R. Bulletin	\$0.25
Soil Science	*Fertilizers for Farm & Garden Teakle & Boyle Angus & Robertson	\$6.25
Plant Pests	*Outlines of Entomology - Imms Methven 5th edition	\$2.50
Ornamental Hort.	*Handbook of trees & shrubs for the Southern Hemisphere - Harrison A.H. & A.W. Reed	\$4.25
Nursery Production	The U.C. System for producing healthy container-grown plants - Baker University of California	

Dip. Hort. II

Fruit Production	*a) Deciduous orchards - Chandler	\$7.15
	*b) Evergreen orchards - Chandler	\$7.15
	c) The Home Orchard - Dept. of Ag. Bulletin 310	\$1.10
Landscaping	*Landscaping for modern living - Sunset magazine	\$2.25
Vegetable Production	*Vegetable crops - Thompson & Kelly McGraw - Hill	\$8.00
Bookkeeping	Introduction to Accounting - R.B. Wheeler & W.M. Smyth	

* Available from the College bookshop at the price stated.