NUFFIELD FOUNDATION TRAVELLING SCHOLARSHIP FOR FARMERS

Report of a study tour in the United Kingdom 1975

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ACKNOWLEDGEMENTS

I guess I shall be remembered by Mr David Younge at Nuffield Lodge and the Nuffield Farming Scholars Association in the U.K. as the reluctant Nuffield Scholar.

Having left a pregnant wife and young son in Australia, I spent the first part of my Nuffield tour having bouts of remorse and endeavouring to justify my decision to accept the Nuffield grant. It is a reflection on the system adopted by the Nuffield Foundation, and on the team of fellow scholars with me during 1975, that, by the end of my tour I was looking for more time to further my Horticultural observations before returning home.

I wish to thank the Nuffield Foundation for granting me a scholarship to study in the United Kingdom and am indebted to Captain and Mrs JS Stewart and all the members of the United Kingdom Nuffield Farming Scholars Association for all their hospitality and advice. While Horticulturists among them were in a minority, the U.K. Nuffield farmers were all selfless in offering me contacts and showing a real interest in my tour. Special mention must be made of Mr and Mrs John Tremlett of Southfleet, Kent, who were my host family and who made their house so open to me. Their hospitality personified all the U.K. growers and farmers introduced to me by Nuffield.

The staff at Nuffield Lodge and Mr David Younge, the Fellowship's advisor, were always ready with help and advice and the car so generously offered by the Milk Marketing Board proved to be indispensible.

I could not have wished for a more compatable team than those fellow scholars from Canada, New Zealand and Australia who with their wives and families joined me during 1975 and through whom I have a continuing interest in the Australian Nuffield Farming Scholars Association.

Finally, and most of all, I am indebted to my wife Carolyn, who, with the minimum of assistance from me produced a daughter during my absence and cared for our son, and to my parents and parents-in-law, who respectively undertook the oversight of my property and family.

INTRODUCTION

I came to the United Kingdom with a very limited Pome fruit background. My experience is chiefly in Mediterraen crops (Peaches, Citrus and Grapes) and I had applied to look at areas of common interest e.g. Frost Control, Fruit handling and storage, Integrated Pest management and weedicides.

While all of these areas were investigated, I soon discovered that the common ground was much broader than I had anticipated. As a result this report looks at "Containerisation" in training Apple trees and the implications of this technique to deciduous fruit growing in Australia. It investigates comparative systems of disease control, weed control and spray application in U.K. and Australian orchards and includes my observations about "Pick-Your-Own" and Meadow Orchards. These latter two were fascinating and valuable enough to me to have warranted all of my attention, but to do so would be to deprive oneself of other significant developments.

Limited time was spent looking at Frost Control and Fruit Marketing techniques principally because the achievements and frustrations in these areas seemed parallel in Australia and the U.K. Some time was spent with Australian fruit importers and with U.K. wine grape growers because of the common areas of interest we had.

Most of the pre-conceived ideas I had about U.K. Agriculture and Horticulture were proved wrong. The quantity of fruit (and grain and meat) produced in England is, I am sure, under-estimated by most Australian visitors. Fruit growing units proved to be of comparable size with similar techniques being adopted in the U.K. and Australia to solve most Horticultural problems. The concept of rental land was, of course, foreign to me. Climate and soil types were obvious variables but the most fundamental difference is the difference in population which results in England being an Importer of Horticultural produce while Australia is an Exporter. The application of this is developed later in this report.

Above all, this report is the result of living and conversing with English growers and U.K. Agricultural Industry leaders. It contains therefore my assessment of their comments. There is always the danger that international visitors tend to be shown only the best, but I did tour conscious of this risk. For the inevitable inaccuracies in this report I apologise. The reader may be sure that the inaccuracies result from my interpretation, not from what I was told. Without the assistance of those farmers who so freely conversed with me the tour would have been pointless and my observations shallow indeed.

APPLES AND PEARS

(a) ROOT STOCKS

Europe is famous for its work in the development of pome fruit dwarfing rootstocks especially in apples. The United Kingdom has been a major contributor to this work through the well known and widely used Malling Stocks.

It was my priviledge to spend some time at East Malling Research Station discussing rootstock developments with Dr McVittie and looking at the field work being done in Dwarfing stocks.

The demand is not for the smallest but for the optimum tree (ideally about 7' high). Precosity (fruiting ability) is a major consideration and the ability of a dwarf tree to support itself and a large crop is a problem. For this reason most dwarf stocks require staking or trellissing for support, hence the term - spindle orchards. The increasing cost of this additional support for each tree has led Luddington Research Centre to work with the MM106 stock deep planted and high worked, in the hope of achieving adequate anchorage.

The 55 year old M9 stock has dominated most spindle work, but such is the range of rootstocks now available that the selection of an ideal one is dependent on fruit variety, soil type and location and a little bit of luck. This selection has been more complex now that the Malling-Merton MM stocks have superseded Malling as the general recommendation for England. I have listed some observations about popular stocks below.

ROOTSTOCKS - IN ORDER OF IMPORTANCE	CHARACTERISTICS
M.9	The oldest of this list. Ideal for spindle work. Always needs stake because of brittle nature. Large fruit. Early maturity.
M.26	Cross between M.9 and M.16. Slow to bear. Poor branch furnishing but excellent crops have been produced on maturity.
M.M.106	Produces a tree of Medium size. Very popular although some find Cox on 106 unsatisfactory.
M.M.111	Very vigorous but can be controlled by light pruning. Useful in replant situations and light soils.
M.27	Very dwarf, but may be of real interest in Meadow Orchards. That is if budded trees continue to be used in intensive situations.

The selection of rootstocks has been further complicated (and improved) by the availability of E.M.L.A. virus free material in selected stock lines. While many growers are reluctant to make full use of these stocks until proven; consistent yield improvements of 35% ensure that they have a place in future U.K. plantings.

Dwarfing stocks and consequent spindle orchards, have resulted in a renewed debate on tree spacing, the ultimate end of which is the Meadow Orchard explained later in this report.

This tree spacing debate is elaborated in the next section but sufficient here to say that Mount Farms adviser, Maurice Banwell, believes that spindle orchards, well managed, should produce 1,000,30 pound units of fruit per acre by year 5.

Rootstocks (continued)

It seems appropriate to mention a further development in Dwarfing which has grown out of Irradiation work at Long Ashtom Research Station Bristol. Bud wood has been exposed to Gamma Radiation for selected time limits and the resultant mutants observed in the field. Initially this has been used to produce self-fertile strains of Cox (see pollination) but Mildew resistance, better flowering and, significantly, compactness of tree have sometimes resulted. Bramleys have also been exposed to radiation, hoping for frost resistance and compactness. Dr Campbell of Long Ashton points out that this is a 1,000 to 1 experiment with 6,000 mutants under observation in the field.

Also worthy of note is the work on Bramleys being undertaken by Bulmers Cider production. The traditional Cider orchard of huge trees under-grazed by sheep, has been replaced by Bramleys on Dwarf stocks MM111, M2 and MM106 and early results are promising.

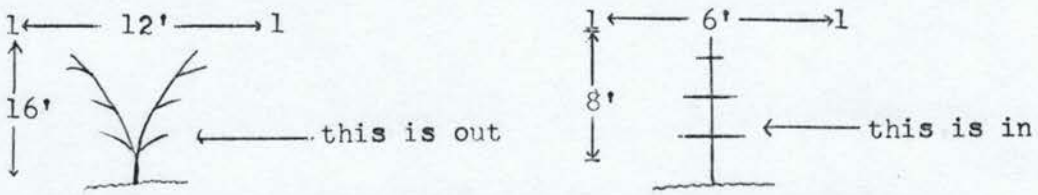
While dwarfing stocks for Apples offer many choices, Pears are rather restricted. Pears on Pear stocks have always been very vigorous and slow to bear. More success has been obtained with Quince stocks especially Quince C. While some compatability problems exist between Quince C and Williams Pears· Comice have produced 65% more fruit on E.M.L.A. Quince C than on Quince A at East Malling, over the past seven years.

All of this work reflects the virile approach to Pome fruit production typical of the U.K. By contrast Australian growers have settled for Northern Spy as their most common rootstocks. An attitude I now consider inadequate in modern Pome fruit production.

(b) TREE TRAINING

Spindles, spacing, pruning.

The emphasis on dwarf stocks referred to in the last section has resulted in a new approach to pruning, training and spacing Pome fruits in the U.K. In layman's terms the conventional Vase Shaped or Wine Glass tree with a short butt has been replaced with a Pine Shaped tree resembling the letter "A". This shape has been built around a centre leader with lateral fruiting wood. The intention is to keep this tree, by dwarf stocks and pruning techniques, to a height of 8'. The resultant orchards are known as Spindles.



I was surprised at the wide spread acceptance of Spindle planting in the U.K. where it seemed most new and rehabilitated orchards had moved into this technique. However, it would be wrong to create an impression of total acceptance of spindles - some excellent rehabilitative work has been done conventionally - Robert Sarson's Moat Farm at Maidstone was evidence of this.

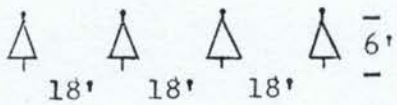
Some Horticultural advisers are concerned about the swing to Spindles, because of the individual attention needed to set a good Spindle tree into production. To quote Miss Barbara Seymour, "We must bear in mind that the Spindle-bush system is not for ranching, and for it to produce the best results growers must be prepared to give their trees individual attention

especially in tying down and training laterals." Probably the optimum spindle orchard is about 20 acres.

The acceptance of spindle-bush orchards has resulted from economic considerations; simply making it possible to grow fruit without using ladders, has been a major attraction.

This emphasis on Dwarfing trees has also given impetus to the age-old debate on Tree Spacing. The conventional 18' by 18' or 24' by 24' has given way to spacings of 12' by 6', 18' by 9' or 15' by 10'. The chief consideration is accessibility of fruiting wood to light.

This exposure to light has favoured the pine shaped spindle over the conventional "V" tree. In the time I spent with Malcolm Everitt at Hadenham he insisted on 80% as ideal light availability. Any figure below 60% light inception, creates problems. As a guide he suggests tree height over row width should be at a ration of 3:1. A figure which favours spindle development.



The art of Spindle orchard management or "containerisation" as it is known, is the art of exposing limbs to maximum light. This is especially important for Pollinisation as the next section will develop.

As the section on rootstocks indicated, a problem of Spindles and their dwarf stocks has been the anchorage of Dwarfing root-stocks when laden with fruit. This has meant all trees in these areas have had to be staked with individual posts or trellissed. A Spindle Orchard at 15' by 6' has 520 trees per acre (Conventional 24' by 24' 80 trees/acre). With Spindle Posts costing 40p each, (about the same as trees) alternative trellissing has been eagerly sought. I was interested in a taut nylon wire trellis, prepared by Clive Charrington at Matfield using posts at 24' and 3/16th" nylon wire, strained tight. The most attractive alternative to individual Stakes must still be the possibility of achieving firmer anchorage by deep planting. Growers have been reluctant about deeper planting because of the suckering which results, however the trend to higher bud unions to avoid splash phytophtora makes deep planting a possibility. The following chart, from work by M. Parry at East Malling, highlights the feasibility of deep planting Pome fruits instead of staking or trellissing. Evidence also suggests, some say categorically, that the higher you bud a rootstock the greater the influence of the rootstock will be.

Deep Planting Laxton Superbs on M.26:

	Depth of Planting: (inches below normal)			
	0	2	4	6
Total number of trees	18	18	18	18
Number staked after four years	4	1	0	0
Additional No. staked after eight years	5	2	0	0
No. with suckers after eight years	10	3	4	4
Accum. crop after 8 years (lbs/tree)	103	247	223	218

The key to success in spindle orchards is precosity (fruiting capacity). A tree carrying its maximum crop is unlikely to produce water-shoots. In fact any tree carrying consistent heavy crops will be dwarfed. Mr P. Clarke of E.K.P. was insistent that Australian Pome fruits especially in the Victorian Goulbourn Valley could be dwarfed without dwarfing stocks because the climate rogularly encourages heavy fruit

set. Obviously Spindle tree shape would have to be introduced to achieve this in Victoria.

To keep spindle orchards dwarf the centre leader on an A shaped tree is left untipped. This acts as a safety valve, absorbing excess energy that would otherwise be promoting unwanted growth. This central leader can be pruned after the tree has settled down to a consistent cropping pattern and is regularly setting sufficient fruit to discourage excessive growth.

Excessive growth is also controlled by using hormone growth retardent material containing N.A.A. This is sold commercially as "Tree-hold", and is applied to the pruning cuts. Conversely, a material known as "Off Shoot O", has been used to encourage branch development and fruiting on wanting areas.

Tree training for Spindles begins in the nursery. A "well feathered" maiden tree at 2 years makes the ideal starting point. The concept Eric Gun of E.K.P. asks Spindle growers to keep in mind is:

a. The first layer of feathers (branches) should occur at 3'3" and occupy 47% of the tree.

b. The second layer of feathers should occur at 5' and occupy 35% of the tree.

c. The third layer of feathers should occur at approximately 7' and occupy 18% of the tree.

d. On this ideal tree there should be about 30, 18" long almost horizontal branches. Those on the bottom will be longer, those on the top shorter.

Horizontal Branches are often achieved by the laborious task of tying down in the developing years. An ingeniously simple alternative, widely used by Peter Wheldon in Suffolk was to place a peg immediately above the wanted buds on the Central leader and forced the developing bud to follow suit.

Summer Pruning is another ideal way to train a Contained tree.

Figures from a patch of Spindles at Chris Crooks Faversham property indicate what can be done with trees at only 7' high:-
Planted 1969.

1970	50	30	lb.	trays	per	acre.
1971	100	"	"	"	"	"
1972	300	"	"	"	"	"
1973	450	"	"	"	"	"
1974	600	"	"	"	"	"
1975	750	"	"	"	"	"

The other aspect of successful Spindle Orchard work is the art of thinning an excessive crop to an ideal one. Work is experimentally underway to determine the number of fruitlets that ought to be left per centimetre circumference of the tree trunk. This work is also being done by Frank Gathercole at Loxton in South Australia to determine thinning rates for Clingstone peaches. Two unexpected discoveries have been made. First, it has been shown that thinning, although it increases fruit size, always reduces the actual weight of fruit harvested. Also, fruit has been thinned from a portion of the tree and left unthinned on the remainder, but the tree has still set a consistent crop the following year.

Most of my observations have been about Containing Apple trees but similar rules apply to Pears. Because Plums "feather" ideally in the nursery they were thought to lend themselves to "Containerisation". Unfortunately, every pruning cut has exposed plums to Silver leaf virus, so this

work has been frustrated. I did see Peter Vinson of E.K.F.S. training Plums on a mimimum prune basis. Only time will reveal his success in this work.

To my knowledge all of these observations are new to Australian Apple and Pear growers. Their reluctance to be involved with Dwarf stocks has meant that Australian Horticulture has done little or no work in Tree training for Containerisation, or in the consequent problems of anchorage or feathering.

It should be added that the work in Containing growth in Spindle Orchards, has had repercussions in Conventional groves. Chain saws were being extensively used to reduce tree height particularly in Bramleys. In every case, picking convenience and light inception were the criteria. "Tree-hold" - N.A.A. was being used on the resultant wounds to contain growth. As female labour undertakes the bulk of the U.K. Pome fruit harvest, and 1975 was the year of equal pay, there is little doubt that Conventional trees will continue to be lowered or replaced by the new science of Contained Spindle Orchards.

Mechanical Pruning Aids:

The absence of mechanical pruning aids in the U.K. surprised me. Apparently they have been used and discarded in favour of alternative tree training techniques.

The emphasis on a compact tree has meant that the hydraulic ladder, which has had widespread acceptance in Australia, has been tried and found wanting in English orchards. Muddier ground conditions and smaller trees have accounted for the demise.

While pneumatic snips are widely used, it seemed that their acceptance has not been as marked as in Australia. The softer nature of Pome fruit wood, and the widespread use of Chain-Saws to reduce older or vigorous trees, has limited the application of pneumatic tools.

(c) POLLINATION:

The major difference in the ability of Pome fruit to set a satisfactory crop between the U.K. and Australia is Pollination.

Nature's own Pollinator, the bee, is still the growers best weapon for achieving adequate pollination and bee activity is directly affected by daylight temperatures. Lower daylight spring temperatures are adversly affecting U.K. pollination rates. Obviously, the grower can assist by ensuring that the pollinators he plants are frequently spaced and flower consistently and simultaneously with the key crop.

Types of Pollinators are very much a matter of choice, but a good rule is to aim for overset. As Dan Neuteboom says "We can always take some off, but we can't put them on after blossom". This is especially true of Cox, where, in the U.K., Egremont Russett, Idared, Discovery, Golden Delicious, James Grieve, Lord Lambourne and McIntosh Red have proven reliable pollinators. In Conventional 20' by 20' orchards, Pollinators evenly spaced at 1 in 8 have been acceptable. In new Spindle Orchards, a typical pollinating arrangement has been two rows of Cox to one row of pollinator giving a ratio of 2:1. Clearly, in this arrangement the pollinating cultivar needs to be markable.

There are a number of pollination developments I noted during my visit and should like to list here:

(1) The use of the Flowering Crabb, Malus.

The growing demand for single variety orchards for simplicity of pruning picking and spraying, has led to Malus (flowering crabb) pollinators being squeezed in between normally planted trees at a ratio of 1:5. An equally attractive alternative has been to graft the pollinator on to a limb of the commercial tree. Both of these techniques have widespread U.K. acceptance.

(2) Bouquet Bags.

Many growers are apprehensive about the simultaneous flowering of pollinator and crop, and concerned about whether or not pollinators are frequent enough, during the critical five or six days of effective pollination period. As an insurance of adequate pollination I was interested in the simple use of bouquet bags. These are plastic bags of suitable flowering twigs from an appropriate pollinator. The bags contain water, rather like a vase, to ensure maximum blossum life.

Poles of Blossom:

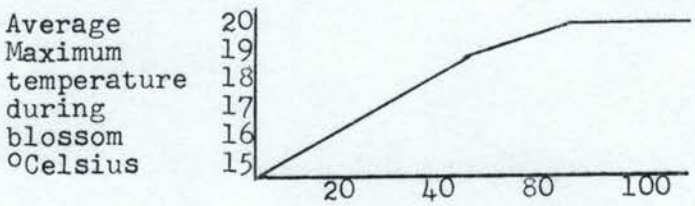
Leading Wisbech grower Claude Coates is an advocate of permanent alternatives to Bouquet Bags.

He suggests that suitably flowering trees be permanently grown in pots and strategically placed in orchard when in full bloom. These could be placed to make best use of the prevailing wind.

Obviously, a suitably dwarfing stock is necessary to exist permanently in a pot. A result would be maximum orchard space for the selected commercial variety. Pots of pollinator trees can be stored off of the orchard during winter months.

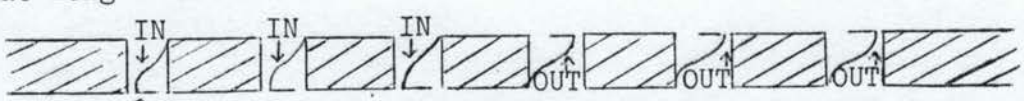
(3) Orchard Temperature.

On a farm walk on the property of Mr John Glass of Crowborough I was interested to learn that he had increased his daylight orchard temperature to improve bee activity and fruit set. By using Wax Burners during the day during blossoming he has lifted orchard temperature 2°C. As the graph below will show, average temperage during blossom has a dramatic effect on fruit yield. Similar lifts in orchard temperature may be achieved by careful use of windbreaks.



(4) One Way Bee Hives:

Another fascinating pollination development was the use of one way bee-hives forcing the bees to enter by one hole and exit by another. The exit hole is designed so that bees must walk through trays of selected pollen before leaving the hive. The impact of this is still being assessed and the problem of harvesting pollen is being investigated. An ingenious mechanism to make bee-hives, one way, has been prepared at Long Ashton:-



Each of these is a little spring set in the passage. It moves sideways to allow the bee to pass as he pushes.

Pollination (continued)

(5) Mechanical Pollination:

Mechanical Pollination, using an aerosol pack of pollen, or at Long Ashton using a turbair sprayer to dispense pollen have also been successful. Unfortunately best results are obtained on fine calm days when bees would probably be even more efficient. Other problems are the cost of pollen and the guesswork application rates. Work has shown that the use of any fungal or insect sprays during the effective pollination period can reduce pollination by half. Just the wetting of the blossom, is discouraging to the bee.

(6)

It should be said that some of the Irradiation work at Long Ashton has produced apparently self fertile Cox. This work involves exposing Hardwood to Gamma Rays and then grafting it to a rootstock. The buds that result are then budded to an appropriate rootstock and developments watched. All sorts of genetic peculiarities result and self fertile Cox has been one. This work is, however, not advanced enough to be conclusive. Work has also been done with Gibberellins, which are hormones sprayed on to encourage flowering and fruit set. Although there can be no question that these hormones work, little is known about how or why they act as they do, and future work will be directed to optimum flowering and application rates.

Undoubtedly, the use of G.A. following severe frost helps to ensure better shape of frosted seedless fruit and increases the crop.

(d) WEEDICIDES:

The Australian Horticulturist is, by U.K. standards, a reluctant user of weedicides. Climatic conditions have forced U.K. Apple and Pear growers to see Weedicides as a modern fruitgrowing tool. Extended wet winters which result in serious damage to soil structure when orchard row travel is attempted, have forced U.K. growers away from the conventional practice of soil tillage. In this situation the use of weedicides has allowed weed control without soil structure damage. Growers tend to be uneasy about total weed control by herbicides because of the erosion that may result. They also like the traction that grass cover affords, so weedicide strips are most popular. However there are a number of alternatives:

(1) Total weed control.

As the cost of mowing approaches the cost of paraquat or other herbicide mixtures; total weed control is considerable. A survey by Dr David Atkinson found that of 50 growers using overall herbicide as the following figures indicate. The work is on Cox on M.26.

Results 1972

Total Herbicide yielded - 9.4 kilos of fruit per tree
40% Herb. Strip 60% grass - 7.2 " " " " "
10% Herb. Strip 90% grass - 7.4 " " " " "

1973

Total Herbicide yielded - 21 kilos of fruit per tree
40% Herb. Strip 60% grass - 18 " " " " "
10% Herb. Strip 90% grass - 17 " " " " "

1974

Total Herb. Strip yielded - 14.5 kilos of fruit per tree
40% Herb. Strip 60% grass - 9 " " " " "
10% Herb. Strip 90% grass - 5 " " " " "

Weedicides (continued)

One problem with total herbicide control is phytophera, which, as a soil borne fungus, appears to be more damaging under the mud splash that herbicides permit. Another problem of total herbicide is the change in soil ph. from 6.2 to 5.5. Work at East Malling has shown that the acidic effect is not the result of applying herbicides but the effect of removing the herbage. These disadvantages can be largely overcome by using straw or lime or by encouraging moss growth. The latter has the advantage of being self-perpetuating, of minimising erosion and restricting further weed growth.

(2) Herbicide Squares:

One grower I visited, Basil Jones, at Seddlescombe, was using Herbicide squares around each tree in lieu of Herbicide strips. He had sufficient space between trees to travel across and felt he could mow more cheaply than herbicide. Some of these sentiments were echoed by Malcolm Everitt of Hadenham who showed to me Long Ashton work in which the removal of grass cuttings had reduced tree yield per acre.

(3) Bitumen Mulching:

Mr Bushnall of A.D.A.S. Canterbury also pointed to weed control work being done in Germany using Bitumen on Golden Delicious on M.4. This had three noteworthy effects. First it raised soil temperature by 7°C on a fine day, and by 3°C on a rainy day. Second, the Bitumen plots showed significantly higher moisture retention and thirdly, young tree losses were significantly reduced.

It is of interest that under Herbicide and Bitumen, root distribution tends to be total and even, but under herbicide strips, the tree roots are concentrated in the herbicide strip area.

Most of the weedicides and herbicides in use in Britain are available and known in Australia - Weedazol, Banlene and Timazine were the most common, with Eric Gun of E.K.P. recommending two doses of Weedazol at four pints per sprayed acre, rather than one dose of eight pints. In my experience this is sound advice.

Common weedicide recommendations were:

Malcolm Withnall - four pints Weedazol plus four pounds Simazine/sprayed acre.
Peter Wheldon - six pints Weedazol plus Banleen plus four pounds Simazine per sprayed acre.
All of these were typical of manufacturers recommendations.

Of particular interest to me, were the new products available and not yet released in Australia. Monsanto's translocated glyphosate herbicide, "Roundup" has widespread acceptance and appeared to be working especially well against hard to kill perenials such as couch. It will be of interest in Australia's irrigated areas against Johnson Grass.

The other interesting release was the Granular material, Casorow G. Granular herbicides were unknown to me before I arrived in the U.K., so I welcomed the opportunity to discuss them with two representatives from the Duphar company at Clive Charrington's. Ease of application, and the simplicity of incorporating these chemicals by watering them in, should make Granular herbicides of interest to Australia irrigators.

Also of interest was a report from I.C.I.'s Research Station at Jealott's Hill indicating that work had shown that Paraquat

Weedicides (continued)

had little harmful effect on soil microfauna. Concern has long been felt about the effects of herbicides on soil micro-organisms but Mr J.F. Newman, of Jealott's Hill, indicated at Reading University, that paraquat at commercial application rates had passed through earthworms, with virtually no ingestion. Furthermore, the number of some microarthropods and consequently the level of soil organic matter had increased.

Another new product was the "Herbi" weedicide applicator. Using an atomiser and concentrated chemical this device makes spot spraying simple. The atomiser is powered by torch batteries and a little bit of chemical goes a long way - a decided advantage over bulky knapsacks.

(e) INSECTICIDES, FUNGICIDES AND THEIR APPLICATION:

After four months in U.K. Horticulture, I formed the firm opinion that the difference in disease control emphasis in Australia and the U.K. could be largely related to climate. Insecticides play a major role in Australian pome fruit disease control but fungicides dominate the U.K. scene. Codling Moth, Red Spider and Mealy Bug are the major Australian Pear Pests in Irrigated areas. Black Spot is a serious fungicidal problem especially in non-irrigated areas of Australia.

Most U.K. Pome fruit growers have achieved Codling Moth Control by diligently spraying with Insecticides in the June 14th to 20th period. Apple Scab and Powdery Mildew continue to be problems. I suggest that the most common Australian pests are not as virulant in the U.K. because of the severe winter conditions which effect much higher over-wintering mortalities.

The use of Pheremone lures has also helped in Codling Moth control. These lures which are used in both U.K. and Australia contain female sex attractants which lure the male moth on to a sticky surface. These lures are not used as a control, but rather as an indication of those times when Codling Moth numbers are high enough to warrant spraying. Such selective timing not only allows economies of chemical use but also allows predator insects to build up numbers and assist in control.

The best illustration of this is Red Spider control. Hot weather conditions always produce the silvery dry leaves, evident of Red Spider damage. Orchards where insecticide application has been minimal and predator mites have thrived, never show the degree of Red Spider damage evident in orchards heavily dosed with organic phosphates. Pheremone traps are a useful tool in timing organic phosphate sprays for minimum application.

Another useful tool is the selective sprays now available. These sprays are most toxic to the selected pest. I.C.I.'s, Red Spider spray Plictran is illustrative of this.

Powdery Mildew

Powdery Mildew is a serious U.K. Apple pest. Work on its control has taken an interesting turn with investigation into Dormant sprays. Powdery Mildew was not a problem in the past when Dormant Lime Sulphur sprays were the norm.

Dr Ray Burchill, addressing an East Malling Members Day I attended, pointed out that Dormant Mildew affected buds are

Insecticides (continued)

usually slightly open. In November 1971 he sprayed infected trees with "Off-Shoot-O" and "Off-Shoot-T", (Chemical Pruning Agents) and achieved almost total eradication. Almost every shoot infected with severe mildew in the autumn produced foliage free from infection in the spring. Rates of 200 gallons per acre were used. This work is still experimental. Timing is critical and damage to trees can easily result. Powdery Mildew is estimated to cost growers $1.5m per annum in sprays and application, so Dr Burchill's work is of real significance.

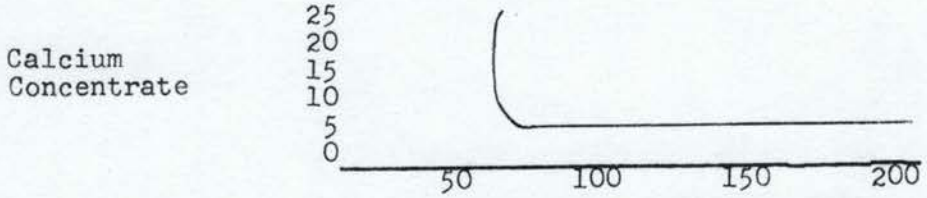
Fungicides

Benamyl (Benlate) has had widespread use in the U.K. to prevent storage diseases. It has been undeniably successful. Growers are concerned that the continued use of this material will result in Benlate resistant fungii developing. For this reason, Peter Wheldon of Suffolk had given up its field use altogether and was using Benlate exclusively as a pre-storage dip, rather than risk build up of Benlate resistance.

Powdery Mildew and Apple Scab fungicide controls result in growers spraying at intervals as close as weekly. The best spray programme I saw was being used by Allan Smith of Paddock Wood who achieved excellent mildew control with a nine spray application from April 27th to July 18th. The programme was based on Dispersable sulphur (not now commonly used) Mildothane, Morocide and Sulphur dust with culinary varieties getting Melprex as well.

Bitter Pit

Bitter Pit can occur in Apples at any time but usually shows up in store. Principally it is a Calcium related disease and is solved by Calcium sprays direct to the fruit. Care must be taken with concentrations and weather to avoid phototoxicity, which can easily occur. The English have found that Calcium concentrations are inversely related to mean fruit weight so Rootstocks that encourage smaller fruit have less Bitter Pit. Such a Stock is M.9. The relationship between Mean fruit weight and Calcium concentration is shown below:



Mean fruit weight in grammes.

Phytophera Syringae

The most worrying U.K. Apple disease. Notoriously unpredictable. The increasing incidence of this storage disease defies explanation. Some have felt that Benlate may have "cleaned-up" what was an antagonistic fungii and allowed phytophora to get out of control. However, orchards that have not used Benlate have not avoided phytophera.

Various dipping solutions have been used as the chart below indicates, but some feel that phytophera infection is always determined in the field,not in the bin.

Weeks in Store:- Dip Solution		6 Weeks	8 Weeks	
Control		63%	80%	
Copper Sulphate at	0.1%	20%	23%	
Sodium Carbonate 1.5% plus Sod.Phosphate	1.5%	27%	27%	% Phytoph
Captan	0.1%	0%	10%	
Panacide	0.1%	7%	17%	

Insecticides (continued)

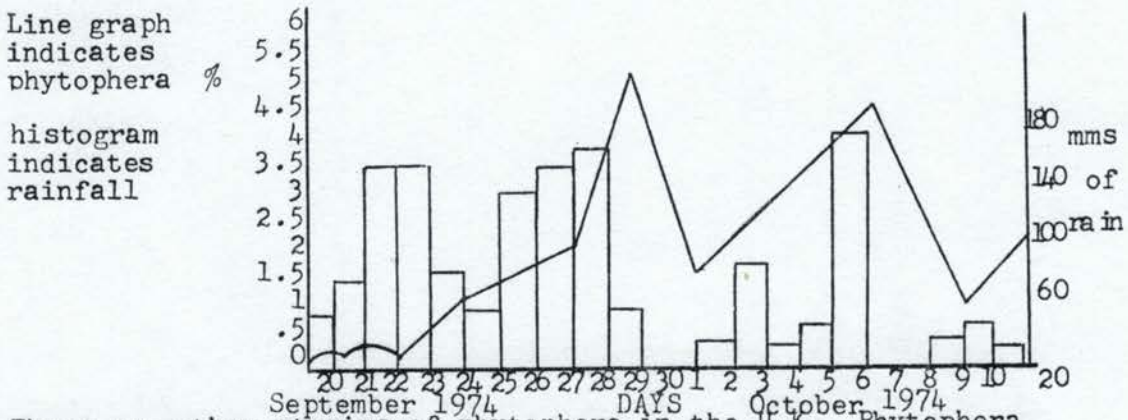
There is no doubt that phytophera infections are soil borne and possibly dirty water borne. The golden rule is to avoid mud contamination, especially of bins. The figures below, prepared by Mike Upstone of A.D.A.S. tend to be damaging in terms of Herbicide strips in orchards.

These figures were challenged by Eric Gun of E.K.P and scarcely erode the other advantages of Herbicide strips. I enclose them for interest. The variety is Laxton Superb:

ORCHARD	PICKING DATE	% PHYTOPHERA	HERB STRIP
A	October 11th - 24th	20	Yes
B	October 7th - 28th	3	No
C	October 7th - 18th	2	No
D	October 14th - 20th	50	Yes
E	October 7th - 18th	33	Yes

E.K.P. claim that they have had % of phytophera ranging from 2% to 20% on the same orchard on the same day regardless of Herbicide Strips.

One area of agreement about Phytophera Syringae - it's incidence is directly related to rainfall:



There are other strains of phytophera in the U.K. Phytophera Cactarum does not effect fruit but produces the church window pattern in tree butts. It may be controlled by copper sulphate sprays and is itself killed when temperatures exceed 25°C.

Snails

As snails have become a citrus industry problem in Australia (following wet winters) I was anxious to discover what U.K. snail controls are, and to determine whether or not Diquat and Paraquat herbicides are an effective poison. Dr Stevenson of Rothamsted assured me that herbicides have not poisoned snails and that the world wide cure (metaldehyde) has not been superseded.

Work at Rothamsted was in the use of latex as a carrier for Metaldehyde. This material was keeping Metaldehyde available, even during wet weather. A useful material in place of metaldehyde, has been the commercial chemical "Draza".

Spray Application

Some of the most informative time I spent in the U.K. was spent with Andrew Jackson at Ross on Wye, Wales. Formerly a Nuffield Scholar, Andrew is an inovative grower. While his property had a number of memorable techniques (mostly covered elsewhere in this report) most unforgettable were his methods of spray application.

Most U.K. growers apply less water per acre in their spray plants than their Australian counterparts. The U.K. average seemed to be about 60 gallons per acre while I am accustomed to approximately 150 gallons. Spraying speeds are also higher: U.K. being 3 to 4 m.p.h. Australian 1 to 2 m.p.h. Most U.K. plants generate higher volumes of air as a carrying medium for the spray mist, which is usually injected at lower pressures. Because of the unpredictability of the weather, U.K. growers tend to spray in windy weather rather than waiting for the possibility of a better day.

Andrew Jackson had two particularly fascinating plants. The first was a normal air-blast with three atomisers placed each side in the normal spray jet position. The atomisers were being powered by the tractor battery. Each atomiser was delivering 1.5 cc per minute, applying 3.3 gallons per acre. At 4 m.p.h. it was possible to cover approximately 10 acres per hour.

The other machine was a Mantis sprayer, built with one atomiser on each side. The atomiser was set just in front of an oscillating fan. This machine was carrying a specially formulated solution of spray and oil, permitting application rates as low as 2 pints per sprayed acre and a ground cover of 13 acres per hour.

The problem foreseen with such low applications is drift. The spray being applied is little more than a fog of concentrated chemical. While normal spray droplets are heavy enough to be controlled, this fog of chemical may easily drift beyond the crop being sprayed onto sensitive crops, or roofs being used for rainwater catchment. "Horticultural spraying, in all parts of the world, is recognised as a sadly inefficient means of controlling a pest. Only a small percentage (estimated as below 5%) reaches the target pest or is contacted by him. The remainder is wasted in unnecessary ground and leaf cover."

Work on spray application is also being undertaken by the Nationa Institute of Agricultural Engineering at Wrest Park, Silsoe. My visit there was hosted by Mr John Robertson. Within a specially constructed building, model sprayers are tested against various prevailing winds. Designs that show promise are prototyped for field testing.

Field tests are undertaken using a spray mix containing infra-red tracers. Plastic discs are strategically placed in the orchard at 160 per tree. The deposits of infra-red material on these discs after one spray pass is analysed to produce an efficiency percentage. By this technique optimum application and travel rates are calculated. The Drake and Fletcher machine being produced at Maidstone in Kent was the product of Silsoe research and recommendations. It featured a high capacity air-blast with a relatively low-pressure pump. Horse-power conserved by low pressure pumping was being used to drive the air-blast. The air blast had been forward mounted to minimise leaf and spray material pick-up, and designed to generate sufficient air to totally replace the volume of air around the tree as it passed. This criteria demanded a bulky air inlet which was proving problematic in confined rows.

Also of interest at Silsoe is the work being done with Atomisers. This work enabled patterns produced by Atomisers to be traced at various Atomiser disc speeds.

While I know of no comparable work in Australia, I was encouraged on my return to find that one Australian company, "Shearamister", is producing an Orchard sprayer with a wind displacement to horesepower consumed ratio, paralleling Silsoe's. I have forwarded details to the Silsoe staff.

(f) FERTILIZERS

Every Nuffield scholar, it seems, is amazed as I was, at the enormous winter fetilizer storage known rather disparagingly as Muck. With the escalating costs of manufactured fertilizers, the once despised muck is fast being recognised as a valuable fertilizer source. The role of barnyard manure in European Horticulture, especially in the production of top and berry fruits cannot be overlooked. I came to envy the U.K. growers this source of nutrient. True, I am not, as an Australian, forced to muck out during winter, nor to struggle with the difficulties of winter storage or spring spreading. In an age of interest in organic fruit culture and rising fertilizer costs, Muck is an attractive economic supplement.

Most U.K. growers who regularly apply muck find little need for doses of Nitrogen. Peter Wheldon of Suffolk showed me a patch of Cox with a 25 year history of muck application. This patch has had no nitrogen and compared favourably with the rest of his orchard which was receiving conventional doses of N.P. and K. At Luddington Hort, Station, Mr J Ingram (former Nuffield Scholar) showed me an area of strawberries being grown without Nitrogen but with regular doses of Muck. This is easily understood in view of the large quantity of straw and decaying matter in U.K. Muck.

The heavier nature of most U.K. soils means less leaching occurs than in their lighter Australian counterparts. This leaching is further complicated by the amount of water applied. The warmer Australian climate and the higher consequent levels of irrigation doubtless means that more leaching may well be occuring in Australian soils. Certainly the heavier U.K. soils are less demanding in terms of fertilizer requirements. Application rates vary according to the soil acidity and history of the plot.

On the Fens I found growers using up to 50 units of Nitrogen per acre but it seemed the U.K. average fell rather closer to 20 units of Phosphorus, 15 units of Potash and 25 units of Nitrogen.

Most progressive growers were regularly using soil and leaf analysis samples to determine fertilizer levels. These samples were also highlighting deficiencies in Manganese, Zinc and Calcium which were being corrected by foliar sprays.

Mr G White of East Mallings fruit nutrition section, showed me some interesting work on the demands that grass leys were placing on N.P. and K. levels. In trials using Cox O.P. on M.26 the removal of grass leys had increased growth by 40% and cropping by 30% over three successive years. The two tables below show fertilizer demands of an apple orchard.

TABLE I

N.P.K. TAKEN FROM SOIL IN POUNDS PER ACRE AT 200 TREES PER ACRE

	N	P	K
1. Five year old tree:	24	4	14
2. Five year old tree and fruit, leaves and prunings:	46	7	45
3. Rye grass ley:	500	50	375
4. Very good Rye grass:	2,000	250	2,000

TABLE II

ESTIMATED ANNUAL NUTRIENT REMOVAL IN POUNDS PER ACRE FOR 18 YEAR OLD COX II

	N	P	K	Ca	Ma
Prunings	8.5	1.4	6.5	9.5	1.2
Fruit	14.7	2.9	30.1	1.1	1.2
Total	23.2	4.3	36.6	10.6	2.4

(g) IRRIGATION

As the first South Australian Horticultural Nuffield Scholar I confess I immodestly expected to be teaching rather than learning about irrigation while in the U.K. Coming as an irrigator from the driest state in the driest continent in the world it seemed reasonable to suppose that a country such as Israel would be the place to find innovative irrigation. It was therefore something of a surprise to discover that Drip irrigation had its beginnings in the glasshouses of South Eastern England.

John Adlan of Cameron-Reed Irrigation was my principle contact. Having used a Nuffield grant to look at irrigation techniques in Australia he understood at depth the irrigation differences between our countries. As Cameron-Reed is an international firm, the developments in one part of the globe are quickly taken up in another.

As the major use of irrigation in the U.K. is to supplement an almost adequate rainfall, Drippers seem to be most popular in Horticulture. John assured me that much of the problems with Emitter blockage have now been alleviated by adequate sand filters. The fundamental requirement is a square foot of sand filter for every 16 gallons per minute of flow expected. Problems of bacteria build up in Dripper lines and of Iron Deposits when brackish water is used, have been solved by injections of Chlorine and Sodium Silicate respectively.

The heavier soils of the U.K. have proved ideal for Dripper application. Soil profiles in Apple orchards have revealed the "pear-shaped" wetted area beneath the emitter which is needed for optimum moisture availability. In the lighter soils of South Australia, Drippers have frequently produced profiles with too little lateral movement and, when combined with saline water this has resulted in a harmful concentration of Chloride salts which are not leached out of the rooting zone.

This wetting factor is further complicated by the degree of water deficit. I am accustomed to an annual rainfall of 8" and a consequent water deficit of approximately 30" resulting in a need for either heavy, or else constant irrigation. Conversely, most of my U.K. counterparts have a deficit of 8" making irrigation a supplementary and less essential, operation. Indeed, in some of the heaviest U.K. soils the economics of irrigation capital costs continue to be debatable. For these reasons the high capital costs of solid set over-head or undertree sprinklers are justifiable in South Australia while more portable dripper and microjet systems have proved popular in the U.K. Nevertheless, portable aluminium lines with knocker type sprinklers mounted on them are still the most common form of supplementary irrigation in U.K. orchards.

Availability of water is a problem common to both countries. In the U.K. when water is most needed it is least available, so "on farm" storage has become common. The investment that many growers had in reservoirs for winter catchment was easily justified by the alternative cost of 60p per 1,000 gallons for mains water. In South Australia there is simply not enough rain to make water catchment possible and, as the major water supply - the River Murray - is already over-committed no further plantings are permitted. This shortage of additional water is compounded by the problem of salinity. Sodium Chloride levels of 850 to 1,000 EC units have become common in South Australia and made over-head irrigation techniques unpopular because of the leaf absorption of Sodium Chloride. Fortunately for U.K. growers this is not a problem in England the major water chemical being calcium carbonate which deposits in irrigation lines but is harmless to trees.

Irrigation (continued)

The most common dripper application rate for apple orchards was six to eight pints per hour, which gave an effective application of 1,500 gallons per acre per day. By any standards this represents efficient supplementary irrigation water usage.

I should also comment on the use of solid set sprinklers for frost control. These sprinklers were set up to supply water at 1/8th" per hour. This frost control system is elaborated later in this report but the dual use of over-head sprinklers was worth noting.

With the trend to "contained" orchards and the emphasis on dwarfing stocks the English fruit-grower is also very conscious of the danger of allowing too frequent irrigations to "push" trees, designed to be dwarfing. This is not a problem I saw any evidence of, probably because those growers conscientious enough to develop "contained" or spindle orchards, are also too careful to make excess irrigation errors.

(h) MARKETING AND CO-OPERATIVES:

My experience as a Citrus and Stonefruit grower is dominated by Co-Operatives. Co-Operatives for processing and selling fruit and fruit products, co-operatives for purchasing Grower requisites and negotiating minimum market prices, even co-operatives for the supply of irrigation water. This South Australian based fruit grower enthusiasm for co-operatives has grown largely out of the necessity of growers to co-operatively package fruit in order to efficiently supply distant export markets.

This highlights an essential difference in marketing English fruit products and those in Australia. While the small home population forces Australian growers to seek exports, the large U.K. population (57 million) makes the threat of imports a major problem to English growers. Traditionally independent in outlook, English growers have tended to market their own produce on a local market, usually not more than 100 miles from the orchard. The larger growers have maintained this independent approach, reaping direct rewards for packing shed efficiency and marketing techniques. Smaller growers have been forced to form or join packaging and marketing co-operatives in order to compete with this efficiency of scale.

Significantly, during my stay in the U.K. as a Nuffield Scholar, the decision was taken by the people of England to continue in the European Economic Community. In the light of the European Economic Community encouragement by way of grants for co-operatives, this decision will doubtless give a boost to the grower co-operatives in the U.K. and further encourage the establishment of new grower groups.

No assessment of fruit growing co-operatives in the U.K. would be complete without comments about the two major fruit co-operatives: East Kent Packers and Home Grown Fruits. East Kent Packers, situated at Faversham, Kent, is essentially a grower co-operative. Advice about Horticultural Growing techniques with an on-farm service, Horticultural material purchasing schemes, extensive packaging, cool storing and marketing facilities all make up East Kent Packers.

The company handles 10% of the U.K. fruit crop and differs from Home Grown Fruits in that it packs its own fruit. It is extraordinary in that it's grower members are contracted to supply their fruit solely to the company. The only

exception to this rule is some berry crops. The concept of Pick Your Own is providing some new dilemas in the area of grower contracts. In 1975, East Kent Packers was made up of 65 members comprising 91 fruit farms and employing a staff of 600. Membership of the company must be by application and refusal is not uncommon. The record pack stands at 2¼ million 26 pound trays of fruit.

I am indebted to East Kent Packers and their Senior farm advisor Eric Gun for their hospitality. I was escorted through factory and field activities for two days, my every question was answered and one of their members, Mr Chris Crook generously hosted me during this time and insisted I return before my tour of the U.K. ended. The cool storage facilities at Faversham and Bysing Wood are without equal in the U.K. and, married as they are to the modern flotation packaging techniques, make an enviable facility for fruit grading and storage. After almost 30 years, the company has extensive records of each grower's fruit quality and of the storage life of each orchard area. This allows them to call and place separate lines of fruit strategically in the cool store and accurately predict its shelf life before release onto the market. Fruit is classed by random selection over the grader and beyond that point the individual grower identity is lost. Fruit market returns are "pooled" and growers are paid from the pool according to their random grading. Each grower is charged a retainer, or base rate per case, to cover such costs as Transport, Commissions, Depreciation, etc. Storage fees, however, are separate with the charge being calculated on a graded scale to 16 weeks. No additional charge is made beyond this point in order to encourage longlevity of fruit storage.

Between seasons, East Kent Packers cool stores anything it can, and prepacks and repacks whatever fruit fits reasonably into it's apple cycle. In my two day stay, I watched oranges and grapefruit from Israel and grapes from South Africa being handled. Company marketing is done on a commission basis by the "Sapphire" group (a world-wide organisation) and 60-70% of the crop goes to Supermarket chains.

The Horticultural "on-farm", advice service is clearly popular and provides a personalised consultancy service not possible from its Government equivalent, A.D.A.S. which is the extension arm of the Ministry of Agriculture, Fisheries and Food (M.A.F.F.).

By contrast, the grower co-operative Home Grown Fruits (H.G.F.) operates a specialist marketing service from its headquarters at River House, Canterbury. H.G.F. markets fruit on behalf of growers and grower groups who privately pick their fruit to supervised H.G.F. standards. Many of these growers pack their fruit in co-operative packing sheds and these sheds are in turn members of H.G.F.

Although my time with the H.G.F. team was limited, I could not help but be impressed by their marketing expertise and packing house discipline. With H.G.F. inspector Hugh Curtis, I visited the packhouse of Gaskains Ltd, at Selling Kent and gained an appreciation of the spot check techniques used by H.G.F. inspectors to maintain quality control. Over 270 growers rely on the H.G.F. organization to do their marketing.

Marketing is divided into two sections: That responsible for direct sales, e.g. supermarkets etc which accounts for 1/3rd of the selling throughput; and that responsible for commission sales, e.g. the 40 wholesalers operating on behalf of H.G.F. throughout the country.

Marketing and Co-Operatives (continued)

In general the H.G.F. staff endeavour to sell fruit with a minimum of transport involvement. Consequently, London and Southern markets tend to be serviced by Sussex and Kent growers and Scotland and Northern markets by Norfolk growers. Not only does this minimise transport costs, it also ensures that fruit arrives in optimum condition.

A typical "day" at H.G.F. could be said to begin late afternoon when member packing sheds telephone in with figures of packed fruit available for marketing the following day. This fruit is then directed into the retail markets or supermarket stores most conveniently available. The following morning a telephone link is established with each of the sales points to determine the prices paid, stock levels, fruit demand etc. Thus by 11 am the "feel" of the market has been established and each packer is telephoned and given a guide to the estimated fruit requirement that afternoon.

Ideally, this system allows H.G.F. to fill markets without flooding and obtain the best returns for its members. In reality the concept is only spoilt by the unexpected fruit arrivals from competitive packers and importers.

All H.G.F. growers pack into identical, distinctive H.G.F. cartons which are purchased in bulk for all sheds. This similarity of pack makes rigid quality control essential, and consequently H.G.F. is selective about which new growers it permits to become shareholders.

(i) GOVERNMENT ASSISTANCE AND GRANTS:

My short term analysis is that there is wider recognition by tax-payers in the U.K. of the essential roles of Agricultural and Horticultural Industries in their national economy than is the case in Australia. I make this observation because successive Governments in the U.K. have committed a greater percentage of treasury funds to directly aiding primary production than have Australian legislators. The analogy is, I confess, a difficult one to make. A great deal of money has to be spent in Australian Agriculture simply servicing remote Agricultural areas with essentials, e.g: water, power, telephone and in encouraging export markets but direct assistance to our farm production is easier to identify in the U.K.

The allocation of funds at up to 50% of total costs, as grants for capital expenditure, such as dairies or packing sheds, is almost unknown in Australia. At best, these concessions usually take the form of interest free loans for farm rationalisation. Although Capital Expenditure Grants in the U.K. are now restricted to co-operatives, there is no doubt that this availability of funds has, in the past, allowed many growers to embark on extensive packing shed and cool store programmes. From what I was shown and told, I think it fair to observe that some of these extensions resulted in over-capitalisation and better use of available funds would have resulted if some of these plants had been installed in co-operation with neighbours. This shortcoming has largely been rectified by the requirement under the E.E.C. agreement that such Grant monies go only to co-operatives, thus ensuring more realistic levels of throughput.

One comparison between the availability of treasury funds for similar Horticultural projects is made on the deciduous fruit tree pull programme below:

YEAR	COUNTRY	RATE/ACRE	SECURITY
1974	U.K.	A.$500	Agreement not to replant to Apples for five years
1974	Australia	A$300	Agreement not to replant for five years and mortgage over all property.

(i) Government Assistance and Grants (continued)

In both countries tree-pull schemes have been necessary because of over-production and growers have turned to alternative crops usually berry fruits or vegetables. These short-term crops have given more flexibility to orchard planning than is possible with long term tree fruit production. In both countries also, subsidies or grants can become very counter-productive especially if the industry includes them in its forward planning. U.K. growers m ake no secret of their dependence on the 50% grant available on Drainage installation costs and glasshouse growers were understandably alarmed that the refusal to continue subsidy on heating oil was likely to take the cost of heating an average glass house from $7,000A in 1972 to $18,000A in 1975.

(j) HORTICULTURAL EXTENSION SERVICES:

While each Australian State has its own Government Department of Agriculture and all of these Departments liase with a Federal Department of Primary Industry; the U.K. has a single Agriculturally legislative body known as A.D.A.S. (Agricultural Development and Advisory Services). (see footnote).

From a Horticultural standpoint, A.D.A.S. Advisory Officers situated in each regional office, fill much the same role as the officers of each State Department of Agriculture in Australia. It seems, however, that there is a greater dependence by Australian Horticulturists on Government advisory services than I saw evidenced in the U.K.

Clearly, the average U.K. Horticultural manager or proprietor is better qualified than his Australian counterpart. While the norm for English growers is to receive some specialist Horticultural education at a Horticultural College such as Wye, the norm for Australian, is to be state school trained and pick up Horticultural techniques from parents or farm managers. Those who attend Australian tertiary institutions in Agriculture or Horticulture, invariably take up postings in related activities (research, teaching, chemical firms, etc) but rarely in farm production. This disparity in qualifications may well account for the increased dependence that Australian growers seem to have on the extension services of their Departments of Agriculture.

Extension initiatives are similar with a dependence on printed handouts and organised field days or farm walks to acquaint growers with the latest trends. Horticultural research facilities in the U.K. are excellent. As I hope my next section will indicate, I spent some of the most interesting part of my tour looking at Apple production trends at Long Ashton and East Malling Research Centres. The extent of fruit production in England, and the continent's proximity to the European fruit scene, doubtless accounts for the imaginative techniques being used in research. Through the unique concept of having members groups and members open days, these Research Centres have a good relationship with growers. The grower members, on the other hand, have regular mailings and early notice of developments in their field of interest.

It must also be remembered that several of the major manufacturers of Horticultural Chemicals are English based and consequently the first releases of new Pesticides, Fungicides and weedicides are to English Growers, and much of the trial work for these chemicals is carried out at English Horticultural Research Centres.

While on the subject of extension, a comment must be made about Growers groups. Every Australian Nuffield Scholar is intrigued by and envious of, the single farmer voice known as the National Farmers Union (N.F.U.). Representing all

NEIL'S NOTE — In fact the Legislative body is the Ministry of Ag. Fisheries and Food (MAFF) of which A.D.A.S is the Extension Arm.

(j) Horticultural Extension Services (continued)

Primary Producers, Agriculturists and Horticulturists alike the N.F.U. is a powerful political lobby and has, as yet, no Australian equivalent. While friction between various commodity groups is inevitable, and apparent, the N.F.U. is a valuable tool for every U.K. farmer. My particular interest was however, in the local grower groups that have evolved in different Horticultural areas principally for the purpose of Horticultural extension.

I spent four days on a bus tour of Southern English Horticulture with the East Kent Fruit Society and also participated in two of their summer Farm Walks. Groups such as these have grown out of the grower's recognition of the need to be acquainted with the latest developments in their industry. These groups serve an essential role in bringing growers together, and so making it easier for A.D.A.S. officers to address growers and arrange demonstrations.

The South Australian equivalent of the East Kent Fruit Society group concept, is the Agricultural Bureau of South Australia. This group exists primarily to assist with Horticultural Extension. Because of its essential role in acquainting growers with developments in Horticulture and Agriculture it receives recognition and assistance from the State Department of Agriculture. While the South Australian group does not enjoy the autonomy of the E.K.F.S. for example, it does have some influence on the Department and is able to exploit Departmental facilities.

Mention must also be made of the Agricultural Machinery Research facilities at Wrest Park Silsoe. To my knowledge these facilities are without equal in Australia. Certainly the work being done on Pesticide application and Spray plants has no parallel. This work has world wide significance and fortunately for Australian growers, the results of this research are made freely available.

The other area of Horticultural Extension that must be listed is the work of the Horticultural Section of the Agricultural Training Board in the U.K. Unfortunately, I had but limited time to spend with Mr Tom Campbell, the A.T.B's Horticultural Training Advisor, and my observations are therefore scant. A.T.B. are available to train employees or groups of growers in special skills. There is a programme of Nation-wide courses available but opportunity is also provided for personalised courses. Best examples of these are in the fields of welding, handling and servicing new equipment, safety, pruning and grafting etc. Ideally, this training is timed to coincide with the practical implementation of these skills. For example, with grafting or budding, training officers can time the course so that there is an immediate opportunity to follow up with practical work.

A.T.B. officers may be employed on a part time or full time basis by groups of growers, Growers co-operatives or the like. Around 400 employees are necessary to justify the employment of a full time officer by a group of growers, who may claim from the A.T.B. a maximum of $A.7,000 for the officer's employment and administrative costs and up to $A1,600 for the officer's travelling.

II. TRENDS

(a) PICK YOUR OWN

Singularly, the most surprising development in U.K. Horticulture that I encountered was the wide acceptance of "Pick Your Own" (P.Y.O.) fruit sales.

I was simply not prepared for the magnitude of this concept nor for the rapidity of it's growth. Everywhere I went, Sussex, or Scotland, Kent, Wales, Worcester and Somerset, P.Y.O. was in vogue. As the name implies, Pick your own means simply opening your farm to the public, to help themselves to whatever, ready to harvest, produce you wish to sell.

There are a number of good reasons why P.Y.O. has proved so popular:

First there is the world-wide feeling by suburban bound people that they wish to get back to nature and that the farm fresh, just picked, produce is somehow more wholesome than anything else available. Allied closely to this has been the popularity of the home freezer, which allows fresh produce after picking to be available out of season. The freezer must be kept full to justify it's existence, and P.Y.O. provides the perfect family outing to economically add to the freezer and involve the whole family in the provision of "essentials".

Doubtless there are also economic reasons for a family choosing to patronise a P.Y.O. farm but I would suggest that these are secondary considerations and that the trade will continue, in spite of rising petrol costs.

From the farmers' point of view, it is the rising costs of harvesting and packing, especially with parity of wages for men and women, that makes P.Y.O. so attractive. This was the point stressed to me by Mr Basil Jones of Seddlescombe who had opened his farm to P.Y.O. two years ealier. He felt that picking costs would rise in the next three years from their present 12% to 20% of the produce return. On his first season with P.Y.O. he had been unprepared for the wide acceptance and felt he had "opened a floodgate". Parking had been a problem as had damage to immature fruit. However, he intended to continue with the concept and hoped to eliminate some of the problems by forward planning and visitor education. On his 140 acres he had disposed of 20-25% of fruit by P.Y.O. and farm gate sales in 1974.

P.Y.O. began and still has its main thrust in Berry crops, especially Strawberries, but its acceptance in Top fruit crops is inevitable, and limited only by the height restrictions that can be placed on fruit trees by pruning or spindle training.

I am indebted to Mr Richard Hiller of Bidford on Avon and his manager Mr Richard Beach for inviting me to spend the weekend of July 3rd and 4th on the farm assisting as I chose, with the P.Y.O. operation. Hillers would be one of the largest P.Y.O. farms in Britain. With 500 acres of farm land (on separate blocks) available for the public, they estimate that 1/3rd of their produce will be sold P.Y.O., 1/3rd to marketing and 1/3rd to processing. July 3rd and 4th 1975 proved to be a glorious summer weekend at the end of which, I had to confess, I had even been a little sunburnt-supposedly impossible for an Australian in the U.K.

An estimated (and to me incredible) 3,000 cars (or 10,000 people) arrived at Hillers that weekend, with families looking to pick Strawberries, Raspberries, Gooseberries, Beans and Peas.

(a) Pick Your Own (continued)

Top fruit were still immature. These people had come either because they were regulars, or in response to radio and newspaper advertisements. A free telephone answering service was available to tell which crops were at their best. Everyone received a plastic bag or cardboard box in which to place their picked fruit, and each container was embossed with a map pin-pointing the Hiller Orchards. Calendars indicating optimum picking times for various crops and recipe cards were freely available.

Tractor-trailer trains were supplied to transport people around, and all were made to feel as though they were free to pick whatever they liked. On checking out, each container of fruit was weighed with the customer getting the benefit of the doubt. Anyone who had picked more fruit than they intended were permitted to leave the excess behind at no charge, and this was sold at the Farm Shop.

There are of course difficulties with P.Y.O. As Mrs Ann Williams who also runs a P.Y.O. project at Seddlescombe says, "If you don't enjoy the public - don't do it." She has expanded her P.Y.O. activity to include a farm trail, an enormous array of old farm ploughs and two plough horses in the public display. P.Y.O. advocates have to accept being bound to their farms on weekends (for there is comparatively little week-day business) and growing a variety of crops to meet the public demand when every other grower is specialising. Location on or near a main highway or motorway is also important.

British fruit growers have large population centres at their doorstep and this is an important requirement. When one remembers that within 150 miles of Hillers farms there dwells the population of Australia, a perspective of the success of P.Y.O. in England and its much slower growth in Australia begins to emerge.

It is also imperative for P.Y.O. growers to have some alternative outlets for their produce. One weekend of poor weather can be disastrous if a particular P.Y.O. crop is waiting to be harvested. The capacity to move in with day labour to pick mature fruit, following those weekends when the public do not emerge, is essential to P.Y.O. success.

(b) MEADOW ORCHARDS:

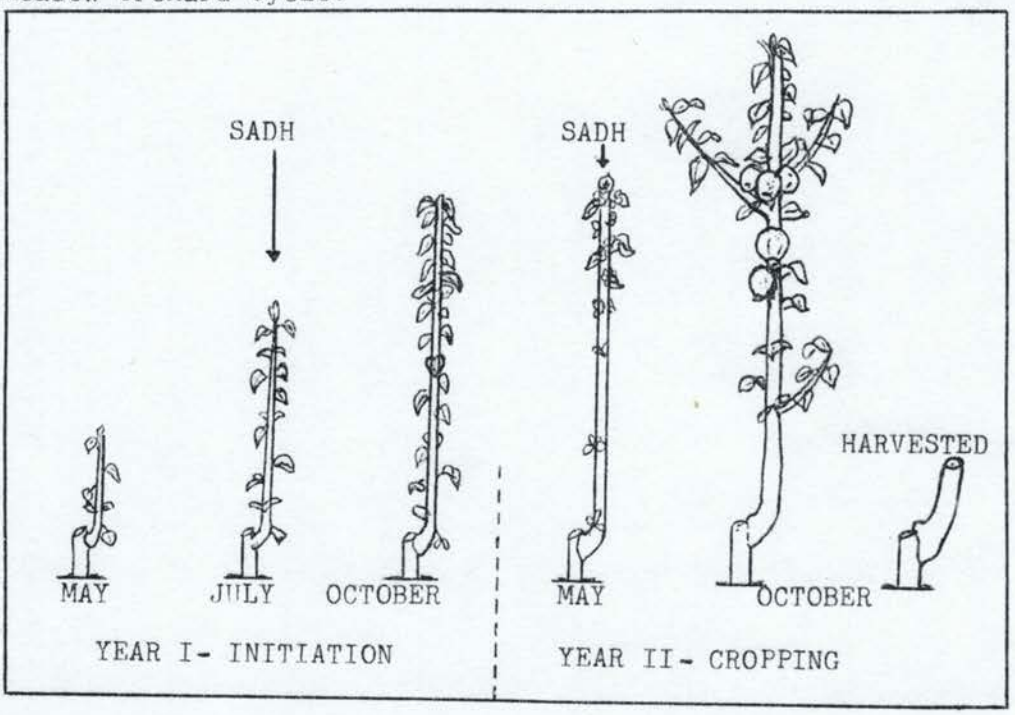
If the concept of P.Y.O. was surprising, the prize for the most fascinating part of my Nuffield Tour must go to the incredible Meadow Orchard.

In its simplest form the Meadow Orchard is growing fruit as one presently grows grain. Trees are spaced at 12" by 18" apart and crop on single leaders. The long term objective is to be able to simply mow off these leaders and their attached crop in a mechanical harvesting operation. Because this harvesting involves removing all of the fruiting portion of each tree, both the pruning and the harvesting operations are mechanised with the one cut. The work is of course experimental and not without its difficulties, but its long term effects on Conventional fruit growing are enormous. The removal of the fruiting wood in the harvest operation means that the year following harvest, the tree must grow its leader; on which the fruit will be carried the following year.

(b) Meadow Orchards (continued)

Fruit set is encouraged by spraying the tree with the growth retardant S.A.D.H. (Alar) which causes a cessation of vegetative growth and encourages the development of fruit buds in the axils of the leaves. Excessive tree growth during the second year may also reduce the crop because of the competition between vegetative growth and fruitlets, so a second S.A.D.H. is applied early in the fruiting year. Rates of Alar application are still being experimented with but concentrations of approximately 2,000 to 2,500 ppm appear to be the norm.

The pictogram below indicates the stages of growth in the Meadow Orchard Cycle.



Experimentation to date indicates that a harvested tree butt, remaining in the ground, can be encouraged to develop a single leader, allowing the process to be repeated. Obviously, more than one shoot will emerge following the harvest wound, but the unwanted shoots can be removed manually or mechanically or chemically so that successive crops will ensue. Meadow Orchards up to six years old are being worked at Long Ashton.

The idea of using a Meadow Orchard brings a new dimension to the question of tree spacing. Conventional Orchards are planted at up to 300 trees per acre; spindle bush Orchards may have densities of up to 2,000 trees per acre, but a Meadow Orchard at 12" by 18" spacings requires an incredible 200,000 trees per acre.

200,000 budded trees obviously represent an uneconomic level of capital cost so work is underway to find cheaper ways of propagating apple trees. One possibility is to produce them from hardwood cuttings. Some success has been achieved using long cuttings in well aerated rooting bins at a base temperature of 25°C. Significantly these cuttings appear to strike more easily if the mother tree has been sprayed with S.A.D.H. This discovery makes the harvested tops of meadow orchard trees ideal for rooting and further meadow orchard planting.

Although the Meadow Orchard only bears a crop every second year, yields per acre have been so high that it appears average annual yields would easily exceed those of Conventional plantings. The

(b) Meadow Orchards (continued)

table below is for Egremont Russet and indicates an average of about 23 tons per acre each cropping year but in work with Golden Delicious and Starkspur Golden almost 50 tons per acre, seems possible.

EGREMONT RUSSET ON MM 106

YEAR	FRUITS/TREE	YIELD TONS PER ACRE	MEAN FRUIT WEIGHT OUNCE
1971	7.3	24	3.8
1972	9.8	16	1.9
1973	4.9	21	4.5
1974	7.4	26	4.1
1975	6.0	28	4.8

I am indebted to Dr DC Luckwill of Long Ashton for the time he spent with me, and themembers of the East Kent Fruit Society, outlining the possibilities and frustration of Meadow Orchard development. The work is, I stress,. experimental but of interest to many deciduous crops. In Israel for example Meadow Orchards of Apricots have been experimented with.

A further fruit training possibility has also evolved out of Meadow Orchard work. This is the narrow hedgerow; comprising a single row of Meadow Orchard trees. These trees are supported on wire trellis and trained as vertical cordons to a height of 6'6". Further growth is stopped by an application of the growth retardant "Freehold", and lateral growth into the travel rows by hedging or spraying with S.A.D.H. By training onto the wires, this fruit is available for mechanical harvesting on a horizontal plane as compared to the vertical plane of the Meadow Orchard system.

(c) VARIETAL RIGHTS

This section of my report on Trends in UK Pome fruit production would be incomplete without reference to the work being done to establish Plant Breeders Rights. My time with Mr Harding, Director of the National Fruit Trials at Brogdale, highlighted this. Brogdale is attached to A.D.A.S. and is one of the 23 centres for experimentation run by M.A.F.F. At Brogdale over 2,000 different varieties of apples are on trial, all being tested for dwarfing, self fertilisation, disease resistance etc. Plant Breeders rights, are of course important to the work at Brogdale. An E.E.C. Plant Patent Scheme now exists with a branch in the U.K. and Brogdale is a registered testing station to determine whether or not a new variety deserves registration.

The criteria for registration is that a new variety must prove to be Distinct, Uniform and Stable. Branches of the Plant Patent Scheme have been set up throughout Europe.

The scheme will make it possible for the Breeder of a new variety to collect a royalty on future propogation, and it is hoped to extend this concept to include seedsmen. The legislation which protects the rights of plant breeders will of course only exist in countries registered under the scheme, but anyone can forward material for registration.

As yet no such scheme operates in Australia but the benefits of Patent rights in encouraging imaginative plant breeding should not be overlooked.

III. BERRY FRUITS AND VEGETABLES

As I said in my Introduction, few people appreciate just how extensive fruit growing is in the U.K. Even fewer, I'm sure realise the importance of berry fruits in the horticultural economy. As the table below indicates strawberry production alone reaches a staggering 50,000 tons per annum.

FRUIT: ESTIMATED OUTPUT IN THE UNITED KINGDOM

COMMERCIALLY SIGNIFICANT HOLDINGS

('000 TONNES)

	1970/71	1971/72	1972/73	1974/75 (Prov.)	1974/75 (Forecast)
Orchard Fruit					
Dessert Apples	255.8	287.6	194.9	273.2	193.0
Cooking Apples	182.0	151.7	150.2	172.6	139.3
Pears	65.0	63.8	48.8	43.3	45.5
Cide Apples	62.8	40.2	21.2	22.0	27.9
Perry Pears	3.9	3.8	2.5	1.7	1.9
Cherries	12.7	9.2	9.4	7.7	5.5
Plums	46.0	35.4	44.9	51.9	46.2
Others and Mixed	3.1	3.1	3.0	2.9	3.1
Soft Fruit					
Strawberries	44.9	50.4	48.9	53.2	55.9
Raspberries	18.5	14.3	15.1	15.6	21.4
Blackcurrants	20.1	22.9	25.6	20.9	21.6
Gooseberries	12.8	10.5	9.0	9.2	9.1
Red and White Currants	1.7	1.9	1.3	1.3	1.0
Logan and Blackberries	2.3	2.4	3.0	3.1	2.7
Others and Mixed	(a)	(a)	(a)	(a)	(a)
Glasshouse Fruit	0.3	0.3	0.3	0.4	0.4

Berry Fruits and Vegetables (continued)

My exposure to commercial berry growing and salad vegetable growing was nil prior to arriving in the U.K. My first farmer host John Tremlett was, however, a salad, vegetable specialist and so these brief comments seem appropriate.

I was surprised at the size of the salad vegetable operation. Paddocks of 100 acres were not uncommon with extensive use of weedicides in the culture. All harvesting is done by manual labour and I was impressed by the willingness of the staff to pull spring onions and cut rhubarb in the mud and sleet (snow if you ask me) of March 1975.

Some time was spent with Mr Harry Delaney, Rhubarb specialist at Stockbridge Experiment Station, York. An interest in irrigated rhubarb had been shown by some of my local growers in South Australia, and I was anxious to gain some information on rhubarb during my stay in the U.K. Useful information on optimum plant life, rejuvenation, planting distances, and weedicides was acquired, and the feasibility of mechanical harvesting discussed.

It was with Mr Jack Ingram at Luddington that I spent my most useful research into berry fruit cropping, and especially into the mechanisation of berry growing. At Hillers Bidford on Avon property, we watched the New Zealand raspberry harvester in action; and at Luddington Open Day the Silsoe Strawberry harvester was demonstrated. The harvesting success of this machine cannot be disputed but some work remains to be done on pip removal. A more upright simultaneously maturing plant is also needed from the plant breeders to perfect the technique. Also demonstrated were strawing down and weedicide machines for berry fruits. Jack Ingram was very helpful with advice on new varieties, weedicide levels and irrigation requirements in strawberries.

While much of this is unrelated to my present Horticultural practice the mechanical harvesting system being used for raspberries was working on a principle very similar to Australian Grape Harvesters, and interested me. The impact of Pick Your Own on the strawberry business and on strawberry harvesting will also be significant in the long term acceptance of Mechanical Harvesting.

Mr Ingram has also been involved in experimental work with mechanical apple harvesters. As with most tree fruits, bruising continues to be a problem but levels of damage as low as 20% are considered achievable. Mr Maurice Banwell, consultant to the Kent based Mount farms, contends that hand picking often gives 20% bruising and apple harvesting ought therefore to be economically possible especially on spindle plantings. It was also while with Jack Ingram that I was introduced to the Pattendon Black Currant harvester which has been successfully harvesting Black Currants since 1961.

Since this section of my report has been devoted to crops in which I had no immediate interest, I think it would be valuable to refer to the Agricultural tour in which Nuffield involved me with the other Nuffield Scholars for 1975. Although this tour had less relationship to my business than any of the other scholars I felt it was a valuable insight into English Agriculture. Two points must be stressed - First, there is no way I could have had the opportunity to see English Agriculture first hand had I not been a part of that tour and secondly, it proved to be an invaluable aid in getting to know the country, the people and my fellow Nuffield scholars.

IV. WINE GRAPE PRODUCTION:

The fastest growing horticultural crop in England (in terms of percentage acreage increase) is wine grapes. As a visitor from a major wine grape growing area this crop attracted my attention.

It is estimated that ten years ago there were less than twenty acres of vines grown in the open in the U.K. for the production of wine. In 1975 the area was in excess of 500 acres. Historically, English wine was grown and crushed by the Monks but the industry declined when King Henry VIII began to import his Claret from Bordeax.

Today, the world wide enthusiasm for grape growing seems to have gripped the U.K. and is, I suspect, based rather more on the romantic patriatism than on economic reality. Everybody, it seems, wants to produce a bottle of "his" wine rather than open a bottle of French or for that matter Australian.

My pessimistic remarks are prompted only by the harsh reality of the weather and the comparatively slow growth that I saw vines making in the U.K. Unless import restrictions are in vogue, the enormous production of French wines in more sympathetic weather conditions, just across the Channel must also make the economics questionable.

Mr Jack Ward of the Merrydown Wine Company at Horam, Sussex who hosted me for a day did not share my pessimistic outlook. His co-operative company is successfully crushing and maturing wine and following the summer of 1975 was anticipating a record crop in 1976. Merrydown produces a variety of fruit wines from their shareholders orchards. Black currant wines are made and over 20,000 tons of apples are crushed annually for Cider. The company has a huge cellar door sales market with over 40,000 visitors calling last year to see the winery and purchase the various fruit wines available. 6,000 gallons of wine was produced from growers grapes last year but Mr Ward expects the figure to be 10,000 gallons following the first "good" vintage.

Most of the vine varieties are European based, with Muller-Thurgau (Sylvaner Reisling) proving the most popular. This is a cold weather vine which has proved itself in the U.K. climate. The major disease facing vine growers is botrytis which results in rotting of the fruit, and can also attack the wood and buds. This fungus disease is most troublesome if wet weather occurs during ripening.

Whatever the difficulties, the English wine industry is on the move. Wine grape growers have established themselves into an organisation known as the English Vineyards Association. In eight years its membership has grown from 15 to 370. One cannot dispute that vines can be grown in selected parts of the U.K. but it does seem inevitable that English wine will be more expensive to buy than many imported lines. Just how many patriotic Englishmen will pay more for home-grown wines only time will tell, but I contend that with an estimated annual production of only two tons per acre the viability of wine grape growing in Britain will be largely dependent on national loyalty.

V. AUSTRALIAN FRUIT IMPORTS:

Three factors have largely eroded Britain's position as the principal importer of Australian Horticultural produce. These factors are, the decision to remain in the European Economic Community, the Australian inflation rate and the falling value of the Pound Sterling.

In spite of a diminishing market in the U.K., Australia continues for the time to maintain selling agents and supply as much produce as can be sold at reasonable prices. Three Horticultural Commodity Importers were of particular interest to me and I used my Nuffield Tour to become better acquainted with their marketing systems.

(a) THE AUSTRALIAN CANNED FRUIT BOARD:

Under pressure from Californian, Spanish, and South African suppliers, the Australian share of the U.K. canned fruit market continues to decline. This trend is likely to persist with increasing acreage of Canned Fruit in Italy and Greece. In an effort to recapture portion of a declining market the Canned Fruit Board have introduced a single selling group known as I.M.O. (Industry Marketing Organisation). Mr Ken Trapnell heads this group and uses as imaginative a promotion line as his budget permits. A new brand, "Australian Gold" has been introduced, Mr Rolf Harris of television fame is under contract and special occassions such as Test Matches are used to promote Australian Canned Fruit.

I.M.O. is endeavouring to be agent and middleman by making direct sales to supermarkets and food chains and involving these groups in Promotion activities. Buyers are encouraged to forward purchase or purchase fruit in Containers in an effort to relieve I.M.O. warehousing costs. With inflation in Australia and the falling Pound Sterling having pushed the price of fruit up 100% in twelve months, I.M.O. are fighting a loosing battle against E.E.C. Competition.

The Canned Fruit Board are especially critical of European Tariff barriers against Australian Canned Fruit. The Board contends that only 35% of the E.E.C.'s Canned Fruit requirements are grown in Europe. If Spain joined the Community this would rise to 45%. With Australian imports at four million cartons into an English market of sixteen million cartons, only economic barriers are preventing the I.M.O. selling more of my fruit.

(b) THE AUSTRALIAN APPLE AND PEAR BOARD:

Mr Ron Brown, a Tasmanian, heads this Australian importer of fresh fruit. Apple arrivals are supposedly scheduled to coincide with a shortage of English fruit. As Australian Apples are invariably dearer, I did not meet any English growers who were critical of Australian arrivals. Improved English and European cool store techniques are extending the availability year round of English apples and reducing the demand for more expensive Australian fruit.

Mr Brown arranged for me to meet Mr D McAlpine of the Australian Department of Primary Industry, and with him I went to Skegness to watch the freighter "Geesthaven" being unloaded in port. We also inspected at random, cases of fruit and noted the packing house number and date on cases with an undue amount of bruising or russetting.

I was unhappy about the way in which the fruit was handled on the docks. Cartons were left on pallets in the rain and then had additional pallets stacked on top of these wet cartons. Some of this fruit, later unpacked, was pressed almost square. Of most concern to me, however, was the total lack of concern

shown by the wharf staff.

Mr Brown also arranged for me to meet Mr JG Miles of Conolly Shaw Pty Ltd at Spitalfields Market. This firm are importing specialist lines of fruit. While I was with them a small consignment of Fewtral mandarins arrived from Mr J Blick's, "Golden Mile", property in Queensland. Mr Miles and I discussed the possibility of flying in Australian Peaches during January and February but this has since been abandoned because of the freighting costs. It would appear that as storage techniques and the wider climatic range of the E.E.C. extend the variety of fruits available to the U.K., only specialist lines will continue to be imported.

(c) THE AUSTRALIAN DRIED FRUIT BOARD:

A lack of enthusiasm by Australian growers for the labourious and not especially rewarding task of drying tree fruits and vine fruits has led to the demise of the Australian Dried Fruits market in the U.K.

Apricots and Sultanas have always been the mainstays of Dried Fruit Imports to England. A South Australian, Mr Ron Sage heads the Australian Dried Fruit Board. He has seen the levels of imported sultanas fall from 20,000 tons per year to 5,000 tons. Economic pressures have kept returns to growers from overseas sales comparatively low, tempting Australian growers to divert their sultanas to wineries and leaving the U.K. market open to the USA and Greece. Cash returns from world wide sales of dried vine fruits have further diminished as a result of undercutting by the Turkish and Greek governments. Apricots have suffered a similar fate, with Australian growers barely producing sufficient to meet home needs.

While the Australian climate produced the best sample of dried fruit in the world and this fruit commands a premium of A$20 to A$30 per ton, Mr Sage felt that the packaging could be improved. He showed me samples of stems that had been sent in by irate customers.

If this last section of my report has made depressing reading that is unfortunate. It is also the uncomfortable reality of the present state of Australian imports into a now E.E.C. based U.K. This opportunity to meet and talk with Australian trade representatives and to see at first hand their difficulties, would not have been possible for me but for the Nuffield Grant.

AUSTRALIAN NUFFIELD FARMING SCHOLARS DIRECTORY

Surname: ANDREW

Initials: J. N.

Name by which you are usually known: NEIL.

Degrees, prof. affiliation, honours, etc: MP.

Name of partner CAROLYN

Address: (Postal) 10 ADELAIDE RD
GAWLER
SOUTH. AUST. Post Code 5118.

(Private) 30 JANE ST.
WILLASTON S. AUST 5118.

Contact details:

Home: 08 85 223417

Work: 08 85 230555

Fax: 08 85 230511

Mobile 0418 823 633.

Email

Please include all area codes

(**** Please place an * next to the numbers you do not want published in the Directory.)

Subject of your study: HORTICULTURE

Countries visited: UNITED KINGDOM.

Current business or employment: MEMBER OF PARLIAMENT
COMMONWEALTH OF AUSTRALIA.

Off farm involvement in the industry and community:

(For your information attached is a copy of what is currently recorded for the Directory)

AUSTRALIAN NUFFIELD FARMING SCHOLARS ASSOCIATION

PLEASE COMPLETE AND RETURN NO LATER THAN MONDAY, 8 APRIL, 1996

Surname: ANDREW

Initials: JOHN NEIL

Name by which you are usually known: NEIL

Degrees, prof. affiliation, honours, etc: M.P.

Name of spouse: CAROLYN

Address: (if possible not more than four lines including postcode)

30 JANE ST

WILLASTON

SOUTH AUSTRALIA

Post code 5118

Telephone/Facsimile numbers you are happy to publish in the Directory:

Business: ( ) 0885 230555

Home: ( ) 0885 22 3417

Car: ( ) 018 823 633

Mobile: ( ) 018 823 633

Fax: ( ) 0885 230511

Subject of your study: HORTICULTURE - especially FRUIT + VEGETABLE PRODUCTION

Countries visited: UNITED KINGDOM

Current business or employment: (not more than 30 words)

MEMBER OF FEDERAL PARLIAMENT.

Off farm involvement in the industry and community: (not more than 30 words)

CHAIRMAN - COALITION PRIMARY INDUSTRY COMMITTEE.

JAMES HOADLEY

I feel this letter should be filed

Graeme Box

NEIL ANDREW MP
MEMBER FOR WAKEFIELD
SPEAKER OF THE HOUSE OF REPRESENTATIVES

29 June 2000

Mr Graeme Box
Chairman, Nuffield Australia

By facsimile : 03 5663 2390

Dear Graeme,

Thank you for your recent facsimile to me expressing concern for the displaced Zimbabwe farmers and your ideas of ways in which Australian Nuffields could assist the farmers if they were to become refugees in Australia.

I have been in regular contact with the office of the Minister for Immigration and Multicultural Affairs, the Hon Philip Ruddock, on the issue.

I have been informed that Australia has placed additional departmental staff in the Harare office to monitor the situation and to assist people wanting to emigrate to Australia. At this stage, the Minister has not put in place any special programs for those people wanting to settle permanently in Australia. Such people have to apply through the normal procedures.

I will continue to liaise with the Minister on the issue and let you know of any developments. I have forwarded a copy of your facsimile onto the Minister for his information.

I thank you for contacting me with your concerns and offers of assistance.

Yours sincerely,

Neil

NEIL ANDREW
Member for Wakefield

Electorate Office: 10 Adelaide Road, Gawler, South Australia, 5118
Phone: (08) 8523 0555 Toll Free: 1800 018 256 Fax: (08) 8523 0511

BRIEFS

Liberals choose new Speaker

Liberal Party MPs yesterday chose a virtual unknown to replace Mr Ian Sinclair as Speaker of the House of Representatives when Parliament resumes today. Mr Neil Andrew, who has represented the ultra-safe South Australian seat of Wakefield for 15 years, defeated his only other challenger for the position, Victorian Mr David Hawker, 44-16 in a ballot of MPs.