



Australian Nuffield Farming Scholars Association

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**Report of the Study Tour to the
United Kingdom and Europe**

**By Cam McKellar
1992 New South Wales Nuffield Farming Scholar**

**SUBJECT:
Production and Marketing of Grain Legumes and Broadacre Herbs
Wye College Agricultural Business Management Course
Farm Aquaculture**

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CONTENTS

Introduction and Acknowledgements	1
Objectives and Title of Study	1
How Nuffield Works	1
Grain Legumes	2
Human Consumption	3
Broadacre Herbs	3
Fish Farming	4
Other Interests	4
Conclusion	5

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Introduction and Acknowledgments

It is a piece of dark green material, with a small red bulls head on a yellow bicycle wheel with wings as a motif; - some people would call it a tie; but for those of us that have had the honour of wearing it, know it is the passport to open doors of many kinds in agriculture throughout the world. It is the symbol of having been awarded a Nuffield Farming Scholarship.

Since being awarded my 'tie' in late 1991, I have met and befriended many, many people. To make this experience possible I have many people to thank.

Firstly the sponsors:

- Qantas, for impeccable travel arrangements
- State Bank of NSW
- Westpac
- H V McKay Charitable Trust
- Australian Nuffield Farming Scholars Association
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- Senator David Brownhill, National Party Senator for NSW.

To many others:

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- To my fellow Scholars: Warren Drynan (Qld), Tony Howie and Dennis Munro (NZ), Brent Wright (Can), Brian Crawford and Mike Doorman (Zim), Marc Henault (France) and Sasha Songal (Russia - observer).
- To my host farmer, the Honourable Oliver and Anne Walston and family of Cambridge. A man to whom I will be forever indebted for his outlook, contacts (both media and Agronomic) and generosity.

And the people who helped me in my endeavours throughout Europe and the UK.

Objectives and Title of Study

My original objectives were to study:

- Production and **marketing** of grain legumes for both human and stockfeed consumption.
- Production of broadacre herbs.
- On farm aquaculture.

I had also decided to keep my mind open on a range of enterprises. Including techniques for sustainable agriculture and survival in family farming.

The reason for setting these objectives were that I am farming in a family business on the black soil of the southern Liverpool Plains in northwest NSW.

We farm 2100 acres of which 1200 acres are irrigated and the rest being dryland cropping. Grain legumes namely Chickpeas and Faba beans have made up about one-third of our rotation over ten years or more. Legumes and black soil go hand in hand for soil sustainability thus my interest in looking at the production and **marketing** on my scholarship.

Another fascination has been herbs and essential oils. I have grown quite an area of Coriander and to branch out into these types of crops on a broadacre scale has got to be better than taking the very ordinary prices for mainstream crops such as wheat, barley and sorghum that our domestic and export markets offer.

The third topic was aquaculture or fish farming. This sounds an unusual topic for a broadacre farmer, however, we have a 70 acre dam built for our irrigation set-up and it seems as though fish, with its **marketing** potential, would be an exciting niche.

How Nuffield Works

I would like to explain briefly to readers and sponsors what happens on a scholarship before I deal with my findings.

As I said earlier, I was fortunate in being chosen to attend the Worshipful Company of Farmers, Advanced Course in Agricultural Business Management at the Centre for European Agricultural Studies, Wye College, University of London. This was held between the 12th January and 1st February 1992 and I was joined by 16 Englishmen and three Europeans from Italy, Germany and Hungary.

My position is an annual position made available by courtesy of the Worshipful Company for an overseas Nuffield Scholar. It was a three week live-in course broken into six major areas of study.

- 1 Agricultural Business Planning
- 2 Management, Accounting and Finance
- 3 Human Resource Management
- 4 The Marketing of Agricultural Products
- 5 Agricultural Policy and Politics
- 6 The Managerial Environment

These were given in lecture form with case studies to be done to put the lectures into practice. These were usually done at night after we had listened to an after dinner speaker. These included such people as Dr Leslie Berger - Agricultural Attache in the USA Embassy and Lord Carter, Front bench spokesman on Agriculture.

This course was a great help to me in that I became friends with all of my colleagues and this enabled me to get a much closer insight to European Agriculture. I stayed with many of these people in my cross-country of the UK later on. I also went back to Wye to use the library when I was in Kent.

I think Wye also gave me a deeper insight into how Brussels and the EC works and particularly how it affected English farmers and thus I could make a comparison back to our Australian situation. I then flew home and two weeks later flew back to the UK to start my scholarship with the other eight scholars.

We all met in London and were briefed by the Director of Nuffield UK, Mr Steven Bullock. A very hectic five weeks was in store for us in the UK, Belgium and France. It started by meeting the executive committee of Nuffield the first evening.

We were then introduced to the Agricultural Development and Advisory Service (ADAS). This is very similar to our Department of Agriculture equivalent in Australia.

We were fortunate enough to get a guided tour through the House of Lords and House of Commons with Sir Geoffrey Johnson-Smith, MP. We also had a long interview with the Australian High Commissioner in Australia House.

We also met with the National Farmers Union to get a feeling of what they do for their members and again how the European Community affects them.

We travelled from London to Brussels, via Wye College for a briefing on the EC, to be met by representatives of the NFU. We spent several days trying to fathom one of the monsters that plagues us in this country. Brussels is one of the more alive and growing cities in Europe and to see this one could say that agriculture is a by-product of the monster called the European Economic Community.

We went to Paris and the 'colonials' were amazed at the size and variety of machinery etc, at the 'Paris Exhibition'.

We also were amazed at the 'Rungis Markets'. Again the size (400ha) and the array of produce available from all parts of the world was incredible, including Eucalyptus leaves in bunches at \$4 and Wattle flowers at \$5. We understood these were grown in Spain and Portugal. In my travels through several markets such as Rungis, the Australian myth about being too far from these kinds of markets has been completely blown out of the water in my opinion, when you see fresh vegetables from all sorts of countries, from the African continent, South America and especially New Zealand. The exposure and **marketing** expertise the Kiwis have achieved in Europe has left us a decade behind.

We then went to Amien and were shown around the area by Philippe Quignon (last year's French scholar). This is a highly productive area of France and all the scholars, as farmers, were having withdrawal symptoms and enjoyed 'kicking the dirt' again.

Returning to England we spent the next two weeks touring north England visiting many past scholars' farms and businesses. We also attended several Agricultural Colleges and Research Stations.

At this point, the group separated to pursue individual studies.

Grain Legumes

Leguminosae is the second largest plant family in the world with some 13,000 species. No other family would make as great a contribution to the welfare of man as legumes. By far the larger proportion of leguminous plants through their symbiotic association with specialised bacteria that inhabit their roots are able to perform a unique function in fixing free atmospheric nitrogen, which later becomes available to other plant life via the soil through the living and dying processes of the bacteria.

The maintenance of nitrogen levels within the cycle of soil fertility from the outside source of the atmosphere is accomplished in nature by two processes by electrical storms during which nitrogen and oxygen combine to form oxides of nitrogen which then fall as rain, or by free living nitrogen-fixing bacteria in the soil, and of these, the specialised group that works in association with the roots of legumes is outstanding. They are known as rhizobium bacteria. The ultimate contribution of leguminous plants to the production of protein in all forms of life that make up the food chains of the world is enormous, nitrogen being the number one building block of protein. One way or another our own bodies would have received large contributions of nitrogen from the services of leguminous plants'.

Bennett 1979.

That explains my fascination of legumes especially grain legumes and their benefits to our black soils.

I concentrated on Faba beans (*Vicia faba*) and Field peas (*Pisum sativum*). I also saw a few chick peas (*Cicer arietinum*) in southern France but since my return I have read the report put together by the Australian Grain Legumes Committee's Market Research visit to India, Bahrain, Dubai, Iran, Turkey, Italy, Sri Lanka and the USA. This report has answered many questions on legumes to these regions that weren't obtainable in Europe.

Faba beans: in Europe seem to have two main markets: stockfeed and human consumption.

Stockfeed: is prepared in many ways for many different types of markets. Probably the most fascinating new preparation by an English firm called Favor Parker, was the extruding of Faba beans and Oilseed rape together. They call this product 'Extrupro' and it contains 23% protein and 21% pure rape oil virtually free of erucic acid. They are obtaining a much higher rate of metabolisable energy than could be merely obtained by grinding the seed. The beans tend to become the perfect carrier for the oil and avoid it all becoming sticky. It also has a shelf life of two months which is far greater than the other two commodities would last if crushed alone.

They also had a very good hydraulic vacuum bulk sampler that takes the sample on the way in and out of the truck for admixture etc. This is a problem in Australia at present, to try and get an accurate sample of a bulk load at delivery point.

Another fascinating part of the agronomy of Faba beans the Europeans are working on, is to breed the tannins out of the seed coat thus leaving you with a creamy/white coloured seed as opposed to the brownish colour of beans now. The advantages of this are in the end use of the bean these growth inhibitors or tannins are absent and the ME ratios are higher. This avenue probably needs more exploration in Australia to see if it would benefit our compounders and growers.

Different varieties of Faba beans also fit into the horse and birdfeed markets. They can also be used as silage.

Typical good yield (t DM/Ha) 7 to 10
DM at harvest (%)20 to 22
Crude protein (%DM)16 to 18
ME content (MJ/Kg DM)11

This may be enhanced with the inclusion of a cereal. Pea and bean crops used as fodder in my area has probably never been considered. However, because of higher stocking rates and outlets for silage developing it may be a consideration for the future.

Human Consumption

With this aspect of usage for Fababeans the main destination seems to be the Middle East. I was told quite emphatically that Australian marketers had come into Egypt and sold beans \$70/t under the existing business and basically put a ceiling in the price. I hope this does not happen regularly as it does our credibility and farmers returns no good at all, especially when we have a very acceptable quality product according to English traders.

According to all sources the Middle East could be an expanding market for Australian Faba beans in the future.

The agronomy of Faba beans would fill volumes and I'm not about to do that in this report, however I would like to table one or two interesting thoughts.

It has been noted that attention to requirements for phosphate and more particularly, potash will help alleviate infection of chocolate spot. However, there is a lot of work being carried out on breeding resistance to chocolate spot.

Some Russian field trials showed that the pre-treatment of the seeds with 0.01% of vitamins of the B Group increased seed yields by as much as 36%.

Fieldpeas: Fieldpeas to me was that crop that looked magnificent three weeks before harvest then fell over, went mouldy and was impossible to harvest and sold at a discount to faba beans and chickpeas. However this is not so any more. Both English and European (Dutch) varieties are now much more manageable than earlier varieties. They are now semi-leafless and nearly dwarf in stature. The plants are bound together quite tightly with the tendrils on the bushes and if you shake the crop vigorously it will move up to 10 metres away. This has the effect of holding the crop up and thus making it more harvestable. Most of these varieties have PVR and the two main players seem to be Cebeco and PBI. I heard reports of yields in Denmark up to 8t/ha: that even at 70% of this yield in Australia would make it very attractive.

Fieldpeas major use in the stockfeed market: They are usually compounded in mixtures to add protein to all types of stockfeeds in differing amounts.

Fieldpeas in my area may become more popular as the traditional discount they had to faba's and chickpea is now not as relevant.

The UK uses about 30% of its fieldpea production for human consumption. These are larger seeded varieties and a lot more care with presentation to the buyer is needed to come up to human consumption standards. On the other hand delivery standards for stock feed are not as stringent.

The price setter for peas and beans is Soy meal and Corn Gluten meal, a product I did not know about until now. Corn Gluten is a by-product of the glucose extraction process for confectionery. It contains the leftover Gluten, 3-5% oil, 20-25% protein, 6% fibre and it can be reprocessed to boost it to 60% protein. This seems to be a readily available import and substitutes very well into rations. These two products

set the price and aid level, firstly soy meal at 40% oil and 7% fibre (Chicago Broad of Trade) price and the availability of Corn Gluten basically set pea and bean price.

With the new EC reforms, the price paid for peas is about \$225-235/t and beans \$200 (the difference being historical premiums for peas over beans) and an acreage payment of \$400. This subsidy used to be paid to the end user but now it is paid to the farmer, but in effect gives a 'world price'! for the commodity to buy. Corn Gluten is about \$225/t (these prices may have changed dramatically in six months but the basic correlations would still be in place and would be set by end users with 'least cost rations').

Pea and bean acreages have been increasing steadily in the last ten years in Europe. However, with the CAP reforms, the general consensus is that the acreages will probably fall in favour of wheat and other higher gross margin crops and in some areas with non-subsidised crops. This again may help Australian growers to open up newer and larger markets in Europe.

Broadacre Herbs

This topic came about because of my growing of coriander - what I did not know was the diversity of a very exciting part of agriculture. Herbs and spices can be used in so many forms, from grain to powder, from fresh leaf to essential and medicinal oils.

In the form of grain, the world trade is not large compared to cereals etc, but it does rate for some commodities up to 30-50,000t. On the other hand, the world trade for some medicinal herbs is measured in grams.

Successful **marketing** is the key to success. This was brought home so many times throughout my travels and in this industry it is most critical. All of the operations I visited had a **marketing** plan in place, either direct to consumer or to a processor. One very good example of this was a French company that was growing 1300 Ha of mixed herbs. These were being sold fresh, dried and in a freezer pack. They sold their product all over Europe. The other extreme was many medicinal herbs being viably grown in one farmer's back yard.

Australia possibly has an opportunity to take advantage of our natural aromatic and medicinal plants as our fauna and flora are so unique by world standards. Farming herbs for grain does not need a lot of extra equipment than is normally on a grain farm. However, there are some a little unusual like parsley that is a biennial. The French grow it under Sunflower for the first year as a cover crop and the second year it will flower and set seed. Growing herbs for the fresh or oil market is different machinery wise, than for grain.

In the UK there was an area in Norfolk growing mint for a large company for mint sauce. This was basically forage harvested and taken straight to the factory to be processed. Time and distance was the limiting factor in this enterprise even though some of the crops had been in the ground for twenty years. I was also told of a large operation in the USA that was using the same harvesting techniques but then extracting the oil on farm to be used in chewing gum, cigarettes and many other products for flavouring. The American varieties yield much more oil (150kg/ha) than the European varieties (80 Kg/ha).

The dried herb market is similar in agronomy and harvesting techniques, however the drying of these plants is done in several ways. Depending on what herb some are very readily dried in long belt conveyor driers they are then graded so that only the leaf is used. Others take a very long

time to dry on shelves in 'drying rooms'. This is done to preserve the flavour and colour of the leaf.

There is an exciting opportunity for growing herbs in Australia but it has to be **marketed** properly! To quote a radical example of this, a farmer I met had a monopoly on a particular medicinal plant. He knew he had more than the market could stand, so he ploughed half of it out to keep the supply-demand - thus price, at a high level.

Fish Farming

As I said in my introduction, fish is a strange topic for a broadacre farmer, however I was looking more at techniques and ideas rather than anything specific.

I visited several salmon farms and hatcheries in Scotland, trout and carp farms in the UK and a fish farm that had taken advantage of the natural landscape and turned part of the Venice Lagoons in Italy into a very good enterprise farming sea bass, gilthead, mullet and breeding eels.

Again with the right **marketing** techniques, I believe there is a huge demand for fish both domestically and in South East Asia. The specific fresh-water fish that could be used in Australia are our native silver and golden perch. Some of the techniques that could be used for raising fish in Australia are the cages that are used in the lochs in Scotland. These cages are about 3m x 3m by 2m deep but are shaped like an inverted triangle.

These cages can hold about 1,500 kg of fish. They have a net in the bottom of this and it is cleaned weekly and this will collect all the dead fish, thus a count can be kept during the growing season to ascertain yields and growth rates.

One company we visited was importing 'fry', small fish, from Tasmania to promote earliness in their production to take advantage of higher price early in the season.

The harvesting method on one of the trout farms was very ingenious. It was simply a high volume low pressure pump that acted like a vacuum cleaner to suck the trout up. Then they were graded over a sizer, weighed electronically counted and put straight onto ice to be sent to the processing plant and not being touched by hands at all.

Each man on the salmon farms produced about 100t of fish p.a.; trout farms were about half that. However, the feed conversion ratios were both about 1.2kg feed to 1kg fish. Obviously very efficient converters compared to cattle at about 10:1.

In Italy the fish were harvested then packed either straight into ice or straight into freezing cold water to slow the fish right down but still keep it alive.

The Italians were also farming eels and the beauty with them was once they were caught they were held in wooden cages for periods up to one month to wait for the right **marketing** opportunity. They did not lose any weight while in the cages.

Another form of fish farming I found unusual as an Australian was recreational fishing. It was called selling 'rods'. The operation was a 'farmer' would have his rearing ponds for trout and a much larger pond, 2-4 ha in which he would stock a certain number of fish from the rearing ponds weekly. Anglers would then pay for the privilege, \$25 per day, to catch a maximum of four fish and pay for those as well. Most of these types of operations were not far from large population centres thus a possible limiting factor in Australia.

I feel fish farming could have some possibilities for greater development in Australia as long as it is **marketed** properly

as a quality product right from its infancy as we have everything going for us as far as clean water, growing temperatures, native fish and a waiting demand.

Other Interests

I feel I should make comment briefly on other subjects of interest I found while on my scholarship. Dr John Alliston, Dean of Agriculture, Royal Agricultural College, asked me about 2/3 the way through my tour, "had my attention focused on other things, they usually do". Here are some of these.

Organic and sustainable systems

I think fresh organic produce in the UK will probably die a natural death, however, some very good niche markets may survive. I say this for two reasons.

- 1 Normally produced fresh vegetables are very much cheaper now. At one time organic vegetables would command twice the price but now it is more likely to be 130-150% of vegetables price but in real terms is probably the same price as normally produced vegetables 4-6 years ago.
- 2 The other reason for the price decline is that the 'Yuppy' money seems to be drying up as the UK's economic position seems to be like ours was three years ago and worsening.

Organic grain may still have a small market especially if it is value added on farm.

I am not knocking the organic system at all, however, maybe the UK has found a compromise in what they have called 'Conservation Grade'.

This allows most types of farming to be carried out with strict records of all production details, including seeding, fertilising, spraying, feeding and veterinary treatments. For instance you could still plant a wheat crop in Australia and use Glyphosphate, up to 125kg/ha of Nitrogen in many forms, Single Super, Sulphate of Potash and an adequate range of insecticides and herbicides. I would suggest that probably 90% of the Australian wheat crop would fit into this category. Maybe we are missing a very easy **marketing** opportunity here as these products are commanding about a 20% premium over normally produced grain.

Dried flowers: again another niche market that had started from nothing and has turned into quite a business. One particular farm I saw was growing the product, drying and arranging it.

This could also lead onto 'Potpourri' - Another rapidly growing industry in France. Product was being imported from all over the world, it was stained with colour, aromatic oils added and packaged to put straight onto supermarket shelves.

Outdoor pigs: This was something I had never seen and again a great **marketing** job has been done. One operation I saw had 4,000 sows scattered all over the country in 300 sow units. This equalled one man and they were run quite easily on a radial system. The sites were rented and moved annually.

Not only were they grown but sold by the same firm in a way that portrayed the outdoor pig as a 'happy pig' compared to his indoor cousins that never see daylight or fresh air.

Environment: It would be possible to write volumes on this subjects, however, I would just like to make the point that we as farmers have to set our own environmental rules as quickly as possible before minority groups and government departments set the impossible rules first.

Sewerage: This is a product that we are not taking advantage of. My host farmer was using sewerage for sugarbeets near Cambridge. The beauty of this deal was the City Council delivered and applied the sewerage at no cost. The only drawback with sewerage as a fertiliser is the amounts of heavy metals but surely with some type of screening, it must be better than pumping our metropolitan sewerage straight into the ocean.

Green Fuel: Was a talking point all over Europe. I was surprised with the technology available and the relative ease of changing over, yet the reluctance to do so.

Rapeseed oil was the main component but for heating purposes such as furnaces etc, I saw corn cobs feeding a drying unit and every 2½ kg of cobs equated to 1 litre of oil. In Denmark they were using rotten grain to fire domestic hot water heaters. Hay was also being used in several forms. Cow manure and bean straw made a very good combination with the bean straw having 2½ times the heat value of wheat straw.

Fodder Beets: This crop could be an alternative grazing crop in southern Australia. The yields were up to 100 t/ha of beets plus the leaf that could be grazed as well. Farmers normally dig the beets and store them for winter use maybe here they could be paddock grazed to a certain point then worked with a chisel plough, etc, to dig up the remaining beets.

Machinery Rings: This concept has evolved from obviously the rising cost of machinery and the need to have so many different pieces of machinery, some that are only used very rarely. The concept is quite simple in that a person is employed to correlate all the machinery people are prepared to hire. This is then available to the user at specific times when it is free and a price per day or per hour is already set. The hire rate is then directly debited from the hirer's bank account so no problems can arise. These machinery rings seem to be gathering popularity in the UK and in one instance it had even developed to hiring a 'crop walker' or agronomist.

Aged Animal Care: Rather than send old horses to the knackery one rather unusual business was to bring all these old animals to one central farm where they were fed and cared for and the old owners and other people were the 'sponsors' for these animals.

Another interesting enterprise was a pet crematorium. This was doing reasonable business, especially with the BSE epidemic in the UK.

Eastern Europe: This part of the world is at a fascinating agricultural crossroad at present. A lot of western European money is pouring east and this was highlighted at the European Arable Farmers Conference in Hannover, Germany and also the European Arable Farmers Club both of which I attended. Old East Germany is now being bought up for several reasons:

- 1 once Germany re-unified East Germany was under the safety net of the EC, and
- 2 as figures that were presented in Hannover showed gross margins for farming in East Germany were better than West Germany because of land prices and economics of scale.

As for the rest of Eastern Europe a lot of money is going into Poland, Hungary etc, but infrastructure is a big problem as it is non-existent and once you have 'bought' it, 'old titles' may turn up.

I also found it ironic that Eastern Europe is breaking up into its old countries and western Europe under 'Mastricht' is heading for a united Europe.

Media: Coverage of agriculture in Europe is probably better than in this country for several reasons:

- 1 The amounts of money that taxpayers put into agriculture annually in the EC needs a lot of explaining, both for and against and all sides have to be aired.
- 2 The agricultural lobby is probably stronger in Europe and especially in France. I did my best to push our case and was interviewed on BBC radio twice and BBC TV once.

Conclusion

In concluding I would like to say that although I saw many different operations for different reasons the underlying theme for every successful business was **marketing**. I have tried to highlight that in this report.

The sustainability of agriculture relies on us and on us alone through **marketing** and lateral thinking. The reason I am so emphatic about **marketing** is two fold.

- 1 I believe Governments must not forget that agriculture is an annual renewable resource and given half a chance will put this country back on its feet again. Not only do we need help in the areas of production and distribution, but international marketing assistance is vital.
- 2 We hear of 'Level Playing Fields' they are a just like 'absolute zero' - fine in theory but can not be reached in reality. Of course I refer to protectionism from the US and the EC. We are told how much better off we will be when we have a settlement in GATT (General Agreement to Trade and Trade!). This I find hard to accept as agriculture is no longer a production problem but a social problem in protectionist countries. How can these farmers stay in viable business when 52% of the EC dairies have less than 10 cows? These types of figures can be shown in all commodity production in the EC. England is already paying some of its farmers to be 'caretakers' of the land, to freeze-frame it as it was and farm it under strict control to keep the 'Aesthetics' of the countryside so city dwellers can see the hedgerows and sheep!

This is what subsidised agriculture is all about to keep farmers off the dole queue and the proof that agriculture is a by-product of Brussels and the EC was three Lamborghini Countachs parked in one carpark in the Main Square.

I have concentrated on **marketing** throughout my report and to me 'lateral' thinking is best illustrated in this way:

L look at
A alternatives
T to
E enterprises
R readily
A available and
L losing

These two words go hand in hand for the development of successful agriculture in this country.

These views are interpretations and opinions formed from my study tour.

I would again like to thank the Nuffield Organisation for a lifetime experience.

Cam McKellar
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