Putting science into practice

Bill G. Casimaty

"Strathayr", Richmond, Tasmania 7025

Introduction

The path from the laboratory to the bank deposit is too long. The production of dollars from scientific research, both pure and applied, is basically the theme of this conference and I certainly applaud the Society for their efforts to speed up the conversion of knowledge to cash. My commercial interpretation of the conference theme may be provocative but I believe that this is appropriate during the opening sessions of a conference such as this.

My job as a farmer is to utilise the agronomic sciences together with the sciences of marketing and financial management in order to further the science of survival. As my survival depends on these sciences I must endeavour to apply the combined knowledge of many researchers and advisers with urgency but with some caution.

I interpret my invitation to speak at this conference as an indication that I am seen to <u>attempt</u> to put science into practice on the farm and certainly not because I have in any way succeeded with this task. However, I am

most dedicated to the cause and will continue to strive to pick the brains of scientists to help secure my financial position and to generate some employment and economic activity in the process.

In my youth I visited the Greek village in which my father spent his early life and I helped harvest and thresh wheat in Biblical fashion. Since then I have witnessed the steady reduction of the farming populations of all Western societies and wonder whether we farmers will become extinct. However, eating is unlikely to go out of fashion and we will survive provided that we can produce agricultural products at internationally competitive prices.

While at present we are forced to continue to increase production per labour unit just to survive, perhaps at some time in the future increased productivity may provide increased reward. Farmers become upset when militant groups achieve increased reward with reduced output. When will the camel's back break?

Environment

My farm near Richmond has an average rainfall of just under 500mm (20") per annum. The district was the granary for Australia during the gold rush era last century but farm size relative to rainfall is generally inadequate for traditional dryland sheep and cereal production today. However, we enjoy a maritime climate with dry summer harvest conditions. Our small temperature range is rare at such a high latitude with consequent high day length during the growing season. A district irrigation scheme is planned which will eventually service my farm provided it proceeds past the first stage.

I have always had a range of enterprises and currently produce turf, poppies, wool and cereals. This year we have a pilot commercial area of fennel and trial plots of onion seed, broad bean seed and evening primrose.

For twenty years mushroom growing was an important part of my farming activity. Six years ago I decided that my initial advantages of proximity to Hobart and its airport were no longer relevant. Rather than replace old sheds I reluctantly left the industry, though I found it difficult but necessary to put my rational perception of future prospects ahead of my emotional attachment to the crop. For controlled-environment factory-farm type fresh crops, I believe that you need to be near a major city to utilise scale of operation

economies. Mushroom growing provided me with experience in new product market development and an appreciation for the close connection between science and practice.

Following an overseas Nuffield Farming Scholarship in 1967,1 built my first irrigation dam and began searching for specialised field crops for which I could enjoy a market advantage. I have found that the relevance of agronomic science has dramatically increased with intensification and there is absolutely no doubt in my mind that this relevance will continue to increase.

My major crop is now turf and we have found that our dry natural climate is advantageous because our endemic grass weeds are annuals. Combined with this agronomic advantage we are close to the major city and abundant northbound cheap back-freighting is available. Harvest is rarely affected by rain and this is important in meeting construction deadlines. I mention these factors to illustrate that agronomic advantage alone may not always be adequate. In 1972 we developed a separate business entity in Victoria.

Communication

I am privileged to know a great number of gifted scientists and also a great number of highly skilled farmers. For some of my enterprises I communicate directly with scientists but for others I follow the leaders in the particular commodity. As it is impossible to have extensive one to one" communication between scientist and farmer, it is obvious that the most effective way to influence industry output is to increase the output of the leaders, as outlined by Peter Finlayson.

Many scientists appear to think farmers are stupid and no doubt the reverse often applies. This lack of mutual esteem is most unproductive and must be corrected. Problems associated with the blending of scientific knowledge and intuition with the practical problems of getting the job done are common both to scientists and to farmers. It is comfortable for either party to blame the other, but the plain fact of the matter is that unless results are achieved from research then everyone is a loser. I sometimes suspect that there are many researchers who are frustrated farmers and I know there are many farmers who resent the income security enjoyed by most scientists.

These are negative and unproductive reactions and I put it to you that we must jointly create the atmosphere where together we celebrate a successful financial pathway - where a scientist thanks the farmer for the practical implementation of his work and of course vice-versa. There is no room for a feeling that we are in different boats. We will either sink or swim together and we must recognise our total inter-dependence.

Variation in levels of application of science

Whereas in some areas of agriculture I may be keen to be a leader, in many of my pursuits I am a follower and I wish to draw a line of distinction between these two approaches.

Sheep

With our wool flock and pastures we follow generally accepted practices and try to use the skills of staff members and to keep in touch with progressive graziers and extension personnel.

Cereals

With cereals I reluctantly follow accepted practice knowing that we are badly out of date. While in Britain in 1967, I learnt that Proctor barley was being superseded but this week in 1985 I am still harvesting it. I have been a frustrated barley grower for many years. This lack of productivity improvement cannot be accommodated against the tide of rising cost/price pressures.

We are eagerly awaiting the release of Triumph barley and have commenced intensification of our cereal crops in expectation of a productivity leap. Genetic improvement is surely the cheapest method of increasing production. This season we have used nitrogen and irrigation and have sought more assistance from scientists. High quality low protein malting barley will I believe become a significant export commodity for Tasmania and it is most urgent that this possibility is pursued.

With wheat and triticale the current local market chaos will tend to perpetuate our position as a grain importer of ridiculous magnitude. Our white meat industries will gain short term advantage from free market wheat trading but, unless the local production of feed grain is encouraged, we may lose our white meat industries should (or rather when) freighting arrangements change. Farmers, scientists and businessmen must share responsibility for the level of our feed grain imports.

Poppies

With poppies we follow the advice of Glaxo and Tasmanian Alkaloid field officers though of course we try to understand the basis of their recommendations. As the final decision relating to herbicide expenditure is the responsibility of the grower, I also talk to leading growers and try to develop my own expertise with the crop. Of course the poppy industry is a classic case of the successful conversion of science to cash. Glaxo led the way to put Tasmania in the position of being accepted as the world's most efficient producer of pharmaceutical opiate, but I will leave that subject to Dr. Tom Davies.

Turf - Sod - Instant Lawn

Our major crop is turf which we grow at Richmond and also at Tallarook, 90 km North of Melbourne. As there are dramatic market implications to supply failure, this crop got priority during the drought. I do not enjoy applying stringent priorities, but I submit that farming is largely a question of priorities. On any particular day or any particular year priorities have to be established, though of course one tries to blend enterprises so as to avoid conflicting priorities as much as possible.

As my firm is market leader in Australian cool climate turf production, we operate at the frontier of technology transfer and occasionally of new technology. For instance we are becoming involved in sportsground design and construction, and at Queenstown on Tasmania's West Coast we are using mine slag and sand as a growing medium.

For this crop we communicate directly with agricultural scientists of various disciplines in both Tasmania and Victoria. Also I travel overseas to visit farms and attend conferences. For specialist market—sensitive crops the exchange of information between growers is greatest when the distance between the growers is great. I have had the benefit of meeting many top D.S. producers and turfgrass scientists. Some of them have subsequently visited our turf nurseries and continue to supply us with literature.

As well as asking questions of Australian and overseas scientists and growers, we carry out our own trials and try to expand our knowledge by observation.

I try to encourage staff members to watch for anything unusually good or bad in the knowledge that much is learnt by accident. We continually do test strips of different treatments and see if staff members who are not aware of the test strip can pick any effect. We cannot afford sophisticated trials but very often a test spray run across the headland of a turf paddock provides enough information to re—write our weed control procedures.

My simple philosophy is that I will try virtually <u>anything</u> new that one of my staff suggests but I endeavour to have my economic survival depend on <u>nothing</u> that is new. However, it is possible that in fact my firm's survival in Victoria could depend on finding a new approach to our red—and yellow— headed cockchafer problem. We have the opportunity to try methods that are not applicable to pasture situations.

Test strips don't send you broke but one overall mistake can. In any case even if an overall treatment is used it is essential to have a control area or else you worry whether your money was well spent. Of course subsequent climatic conditions will have a tremendous bearing but over a period we find that using the continuous observations of those frequently present and my own less frequent observations provides a few hunches on which to base further questions. In the case of our Victorian turf farm I am in a similar position to an outside consultant and my memory of the conditions during my previous inspection is of course clearer than the memories of those present all the time. The walk, talk, look and question method can, I believe, help put science into practice in a cost effective way. I love to walk and talk in the company of a scientist and a staff member and then on other occasions to go alone. There is an old saying that the best fertiliser is provided by the farmer's boots. I would add for new crop developments the scientist's boots are also essential.

Fennel

This year we are growing fennel for the first time. It is a pilot commercial area of two hectares and we hope to expand the area progressively. For this crop I simply follow the advice provided by the research scientist but naturally I am trying to learn from him.

As a classic example of the importance of timeliness, the day the fennel was sown the scientist involved asked for the pre—emergence herbicide to be applied that day as rain was threatening. After resolving a problem of conflicting priorities the spray was applied. It rained heavily that night and the area would have been almost certainly a total failure without that spray as it stayed wet for weeks. I cover this detail to illustrate the practical problem of not only knowing what to do but of getting it done given the daily priority problem.

Wine Grapes

We have had a small vineyard for a number of years and after years of failure we are looking forward to a successful harvest this year.

Evening Primrose - Extension provided by public sector scientist.

Onion Seed - Extension provided by private company.

Broad Bean Seed - Extension provided by extension officer.

Trial areas of these crops have been successful this season and hopefully commercial production will follow.

Sources of information

The mix of sources includes Australian and overseas publications, direct contact with leading farmers and scientists from Universities, Departments of Agriculture, commercial firms, consultants, and overseas scientists who specialise in Recreational Turf. Information also comes from observations of test strips, from staff, my brother-in-law who has background in European wine production, and my student son - an interesting mix of old and new. I find my contact with agricultural scientists most stimulating and believe that the Diploma of Agriculture such as I received at Dookie will not be adequate for tomorrow's intensive agriculturist.

I am constantly amazed at the excellence of much of the Agricultural research carried out in Australia but I continue to be appalled at the lack of urgency of commercial implementation of that research in some cases. Tasmania's future prospects in high technology agriculture are very well based but the job of realising our potential needs to be approached with urgency by all, not just a few. The speed at which any industry adapts new technology determines the viability of that industry. More and more of our competitors around the world are speeding up their application of new technology and to survive we must speed up the process of applying research.

Some scientists are too conservative. The comfort and safety provided by a long path between the acquisition of new knowledge and its application is no longer viable. There must be a way of qualifying recommendations so that it is clear that the farmer cannot hope to succeed with litigation such as with the Kangaroo Island oestrogen case. Holding back advice until all risks are removed will cause a wasteful slowing down of progress. I am forced to make judgements and decisions without having all the facts and I suggest that there needs to be an element of risk-taking by researchers, without suggesting that research should be any less scientific.

I totally reject the concept of trialling only at the level of traditional inputs. Please do not accept our shortcomings but show us what you think we should be doing. It is a farmer's job to take the final decision and to accept the consequences of that decision.

Principles

I have tried to use my own specific experience to present some of my opinions relating to putting science into practice and will outline some of these.

- Communication with farmers is essential to speed up commercial implementation. Please lift the self esteem and knowledge seeking of farmers and farm workers by asking for their opinions and observations. Try to educate them and tell them the facts even if they do not absorb it all.
- Showing him how to grow a commercial sized crop will impress him more than trial plots. Trial strips can be very valuable in encouraging the farmer to become observant.
- Try to understand the day today problems he faces with priorities and the practical problems of getting the job done even when he knows what to do. Also the influence of other factors such as his liquidity position etc.
- Research is not an end in itself.
- An initial high level of service and prodding may be required to improve productivity or to introduce a new crop, but that can be progressively reduced if the farmer is encouraged to develop his own expertise. Also his observations may help establish the basis for trials.
- Heavily qualified advice is better than no advice.
- Trialling at current levels of farming practices will not significantly help progress.
- Enterprise mix is probably the greatest decision a farmer faces. Help him make an intelligent assessment of the agronomic factors and urge him to study his market position.
- Maximising the output from any given level of input is the basic job of both scientist and farmer.
- Pioneer farmers live a dangerous life and need all the help they can get.
- Simple on-farm trialling mixed with observation can be a fundamental basis for agronomic improvement.
- For many farmers survival will depend on the work of scientists.

Conclusion

Agricultural research in Australia is of the highest order and I trust this conference will help its implementation with a high degree of urgency. There is a lot of excellent extension but we are here today to stimulate improvement.

I have not covered the many failings of farmers but have endeavoured to highlight the need to close the gap between science and practice.

I am privileged to have a lot of contact with highly motivated and successful scientists and I hope that more farmers come to enjoy that privilege. These matters are urgent.