

## Commercialization: the New Zealand experience

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In putting forward this topic, the conference organizers suggested an equation 'Technology plus people equals communication'. It is my contention that our objective must be technology adoption. Communication is one of the means whereby not only will this outcome be realized, but it is also critical to the dynamics, to the relevance, to the transformation of science into practice. Communication is an activity, not an outcome.

What I would like to do is to share with you our recent experiences as a department of State in what I am calling a science-technology-adoption continuum, and to describe the effects of these developments on our own people and on our clients.

First recognizable in 1982, and with increasing momentum since 1985, we have been engaged in an exercise in accountability. What had long been a pleasantly heart-warming, fuzzy, public-good justification for our continued existence, funded almost exclusively from annual appropriation from the Consolidated Funds, has had to be transformed into a series of contracts whereby identifiable outputs are to be delivered to clients for negotiated inputs. This has led on to consideration of the organizational implications, and to the operational characteristics which should help to enhance performance - to the structures and systems best suited to guide and encourage the vital human contributions needed to make this commercial version of a strategic science-technology development - technology transfer model really work and deliver to its full capability.

I need to set the scene - it is my judgement there are aspects of the general social, political and economic changes I will be describing which either are already or are soon likely to be recognizable in most so-called developed countries. To the extent that you can recognize any features-in-common with your own situations, it is my hope that a sharing of our experiences may be of more than just academic interest.

During the 1980s, the ballooning of Government expenditure in New Zealand was becoming politically unacceptable and economically crippling. At the same time, there was growing acceptance of the view that most, if not all, inter- and intra-sector decisions are best left to the sectors themselves to resolve. The jargon is the 'level playing field approach', where Government may need to set a few ground rules but should keep out of the actual decision-making. In our case, the Government has retained its influence in the health, education and social welfare areas, and it is maintaining a substantial input into what I will call strategic research. However, when it comes to the traditional production sections - forestry, mining, agriculture, manufacturing for example - Government has decided it is not in the game of 'picking winners'.

What has this meant to agriculture in New Zealand? For the farmers and horticultural producers, there was a decision in 1985 to remove all the major input and output subsidies in one hit - a reduction from \$NZ640 million to \$NZ87 million in one year, and dropping to \$NZ42 million in 1987/88. Translating this into the price received by a farmer for a prime lamb, this dropped from \$NZ21 in 1984/85 to \$NZ11 in the following year. At the same time, the decision was taken to reduce the annual appropriation to the Ministry of Agriculture - itself a substantial State 'intervention' as our true-blue economists keep repeating - in a series of steps whereby, in 1990/91, we were told to expect an allocation of \$NZ125 million, a reduction of nearly \$NZ50 million from the 1985/86 appropriation. In addition, moves were made by the Government to **explore** the opportunities for disposing of State assets, and for changing traditionally Government-funded, Government administered activities into a more commercially oriented structure - a State-owned Enterprise or SOE -or, where appropriate, to in fact dispose of the Government's investment 'in toto'.

Initially, the focus was on a down-sizing by weeding out 'inefficiencies', by dropping low priority functions, and looking for overall belt-tightening, but by the time of the 1985/86 Budget the challenge was offered to 'go commercial' - to have the opportunity, given certain ground rules, to earn revenue and thereby compensate for, perhaps even reverse, the reductions in Government funding.

I want now to concentrate on what this has meant to the Ministry of Agriculture and Fisheries, in particular on those parts responsible for our science-technology-adoption functions.

First and foremost, the Ministry decided it had to lift itself above its usual business - of struggling to provide today's responses to yesterday's problems - and try our hardest to be the architects of our own future in these turbulent times rather than leave it for someone else from outside to do it for us.

There is nothing like large, progressive cuts in funding to concentrate the mind. It was difficult to make rapid or significant moves in carrying out the Ministry's non-discretionary services, and the brunt of the problem had to be carried by those whose contributions were discretionary - mainly the research and extension groups.

There had been evidence already of the growing unsuitability of the traditional structure - of 10 technical divisions - to the current agricultural situation, and this was soon made obvious as we moved into our commercial mode. It was also important to recognize that there is no such state as 'partly commercial' - either you are commercial or you are not, and this applies to our statutory as well as our discretionary activities.

Early in 1987, we set up an internal working party which was charged with exploring whether or not the then structure of the Ministry was inhibiting our effectiveness, and if this was the case, what needed to be done. Within 6 months, the recommendation for change was accepted, four 'businesses' were identified, Establishment Boards were set up for each, and on April 1, 1987 MAF metamorphosed into MAFTech, MAFQual, MAFCorp and MAFFish.

I am now going to talk about MAFTech, the amalgamation of what has been the Agricultural Research Division and part of the old Advisory Services Division. MAFTech has defined its mission as 'Leading Effective Change in Agriculture'. It has identified three client groups - the Government itself, through the Minister of Agriculture; the agricultural industries,

for example, the dairy industry, the arable sector, the kiwifruit industry; and individual companies, farmers and growers. Having decided what business we are in, and having identified who are our clients, this grouping of resources into MAFTech reflects the reality of the science/technology adoption continuum. It should enhance our effectiveness - to use the commercial term, it should increase our competitive advantage - by removing any structural impediments to effective two-way information flows between science and its practice. Additionally, by having its own distribution network and delivery service, it should be possible for MAFTech to capture the financial rewards from its investment decisions in science and technology - the converse also applies.

I want to move from the broad rich picture to what all these goings on have meant to the people - to the people in MAFTech, and to some extent, to our customers. I need scarcely say that the situation internally was traumatic enough for staff without the background of widespread and dramatic rural downturns affecting the fortunes and the attitudes of our commercial client groups. If we had to choose the time to 'go commercial', we could not have picked a less auspicious period. Starting off in the 1985/86 year, under the old divisional structure, the imperative was to 'get out there and generate revenue wherever and however you can'. Scientists, technicians, farm and horticultural advisers all tried to turn themselves into salesmen. Though revenue targets have been exceeded - for example, \$14.8 million in 1987/88 as against a budget estimate of \$10 million; \$25 million last year compared with a budget figure of \$23.6 million - we have learned some important lessons in the process.

In *my* judgement, the most significant of our experiences in the first two and a bit years as the MAFTech business are:

- We have recognized the fact that our business is the delivery of three main goods - our science delivers research and technology, our technology transfer section markets this research and development, and the whole business provides policy information and analysis on the welfare, attitude and expectations of the agricultural sector to the Government.
- We have recognized the necessity for national focus and national organization in both our science and our commercial activities. We have retained a regional framework for powerful management/motivation/personal communication reasons, especially important in times of such rapid change, but what has been rather like four separate fiefdoms are rapidly becoming a much more cohesive whole. In the jargon, the Regional Managers are changing from largely line to largely staff roles. It is a matter of national direction with regional implementation, the Regional Managers being responsible for resourcing, focussing and translating the national effort into the appropriate local actions.
- We have recognized that, in our commercial mode, MAFTech's science is a cost centre, and we do not want to see our scientists rushing hither and yon, competing among themselves, trying desperately to generate revenue sufficient to compensate for the funding cuts by the Government and to thereby ensure their survival.
- We have recognized the fact that there is a very important difference between revenue and profit - it is an interesting commentary on our tradition and understanding that this has been one of the hardest lessons to learn.
- We have recognized the need to "contract-in" marketing and accounting competencies; this will help, as well as hasten, our commercialization.
- We have recognized the need to be able to enter into joint venture operations, to put up risk capital, and have had to engage in some 'fancy footwork' to develop a suitable, acceptable vehicle, which is called Techmark Services Limited. In fact, one of the most difficult, most time-consuming problems has been to find ways to adopt usual commercial practices while still constrained by the rules and procedures required of a Government bureaucracy in this investment, income, risk management area.
- We have recognized the importance of having our own industrial agreement and are currently on the verge of signing such a document which will do away with over 20 separate Occupational Classifications, each with its own entry qualification, salary scale, promotional formula and other provisions. We will have one system, one set of conditions, and people will be rewarded according to their particular contribution to MAFTech's fortunes.
- We have recognized - perhaps 'confirmed' would be more accurate - that to rely completely on demand-pull, on market-drive, on customer-requirements to determine priorities and activities is inappropriate for an organization with research and development responsibilities.
- We have recognized the value of a contestable-funding approach to both give a national focus as well as give an output, a result focus, to these investment decisions. Developing this approach intra-MAFTech should prepare us for the time when this same way of allocating the national science investment by Government will be used across all sectors.
- We have recognized the need for a form of contract to identify an outcome for every significant investment input - we, and the client, need to be able to recognize success, to be able to reward efficiency, to respond promptly to the unexpected, and to be prepared to quit when this is clearly the most realistic option.
- We have recognized the importance of our own management competence in this change process - it is not enough to know what skills are needed or what changes are required if the manager cannot communicate, motivate, cannot actively, effectively manage the human part of the process itself.
- We have recognized the reality that, **in** our present circumstances, MAFTech is no longer in the traditional agricultural extension business - we can no longer offer a free, on-demand service, available to all, and with some ill-defined client satisfaction/technical reputation as the measure of performance.
- We have confirmed the critical need to dedicate resources to get above the day-to-day turmoil and activity, to be maintaining what I call an environmental overview, to be positive and pro-active

in assessing how MAFTech should prepare and position to adapt to change. We have confirmed the need but are having difficulty in the execution.

- We have recognised the fact that, if we are indeed to lead effective change, if we are to survive, perhaps even prosper, in the prevailing circumstances, we have to stick close to the 'movers and shakers' in the producer-processor-marketer-agricultural servicing sections; we may want to hold on to the fattest of the 'milk cows' in our herd of commercial ventures, but too much contentment from today's successes is very likely to hinder, even prejudice, our performance in realizing tomorrow's opportunities.

I would like to go back and elaborate a little on some of these lessons we are learning.

This matter of contracts for supply of goods or services, for example. In my opinion, we have the best examples at present in the deal struck between the Policy section of MAFTech and our Minister. In return for \$NZ2.7 million, MAFTech will provide the Minister with specific information, with specified quality standards and timetables. If the Government decides on any action on the part of MAFTech arising from this information/intelligence, such services will be provided, at cost, from additional financial allocation. As for instance, MAFTech consultants were paid by Government from additional appropriate for the administration of the \$56 million Cyclone Bola agricultural assistance scheme in 1987. In the science area, we have recognized 16 centres of excellence - I will come back to this - and, for each, the outputs are negotiated in such terms as creating knowledge and understanding of new plants, new animals, new products, and new production systems.

We are working at sharpening up this articulation of outputs from investment inputs for that part of our science function being funded by Government. I am being ultra-simplistic, but the present set-up is that our strategic research - the basic and the blue-sky - is fully funded by Government; the more applied end, and the substantial investment needed to take the pure science through the technological developmental stages, are still being funded very largely by Government but we must be doing our best to move this to something nearer a 50/50 arrangement, the other 50% coming from the industry itself or in some combination of industry/individual invest or/our own re-investment programme from any profits we make; and the problem-solving, applied work which is carried out on a fully commercial contractual basis. When it comes to that important piece between science and its practical application, we envy what I understand to be the systems you have developed in Australia for partnership funding between industry groups and the State and Federal Governments. We are making progress with some sectors - dairy, some parts of horticulture, for example - but if we are to retain the overall resource base and research effort after 1990/91, we will have to make some major breakthroughs very soon.

To really harness the full national MAFTech scientific potential, to put MAFTech into its strongest commercial configuration, and to thereby put MAFTech in the best position to capture the contestable funding investment by the Government into research as a whole in New Zealand, we have re-grouped from four more or less autonomous regions into 16 'centres of excellence' - not centres in the geographic sense, but rather concentrations of effort. These 'science areas' are:

#### Animal

- Animal Physiology, Endocrinology Animal Reproduction
- Animal Genetics
- Animal Disease, Production

#### Plant

- Plant Biotechnology/Molecular and cellular biology
- Post-harvest Physiology and Processing
- New and Novel Crops
- Horticultural Plant Physiology
- Plant Protection and Market Access
- Soil Fertility and Fertilizer Technology
- Environment
- Agricultural Operations Research

## Industry

- Dairy Farm Production
- Deer

## Science Servicing

- Modelling
- Engineering

This year, all of MAFTech's science funding (\$NZ60 million) will be allocated on this basis. Each area or centre has a designated leader, responsible for managing the respective programmes on a national basis.

It has been agreed that investment from our annual appropriation into strategic science is written off in the year of expenditure. Somewhere, at a point to be negotiated, a cut-off will be identified along the continuum from strategic science to applied technology beyond which investment from appropriation will have to be taken into account in achieving a return on capital, in establishing market prices, in measuring our commercial performance.

For MAFTech's technology transfer business, four national commercial units have been identified, each with its own manager, its own budget, its own marketing plan. These are:

- Soil and Plant Services (80% revenue from Products, 20% from Services)
- Animal Services (80% revenue from Products, 20% from Services)
- International Services (90% revenue from Services, 10% from Products)
- Consultancy Services (90% revenue from Services, 10% from Products)

The plan is for these technology transfer businesses to be in a break-even financial position by 1990, and thereafter to become profit centres, generating surpluses for re-investment in the technology development area, and for a bit of 'product-push'. On this question of profitability, our experience from the first years of 'go out and earn wherever and however you can' has been:

- 80% of the revenue has come from 20% of the clients.
- Over 80% of accounts were for consultancy services costing less than \$NZ50.00, for which the transaction costs are unacceptably high.
- Total chargeable hours for consultants has been unacceptably low, often under 40% of time available.
- It took a long time to get around to developing a debt management policy, and we are not very good at managing it now we have one. The problem has been accentuated by the high proportion of small accounts.

Back in 1987, when re-assessing MAF's reason for being, and of seeing how best to organize itself to best perform the roles identified, it became clear that an important functional - and competitive - advantage lay in bringing closer together its research and advisory groups. The objective was a research arm closely linked with a marketing arm, together assessing opportunities, recognizing priorities for maximizing the relevance of and the return from investment in science and at the same time giving the vehicle for capturing directly some of the return from that investment which can be used for re-investment for further new products, new systems. Though there is this possibility for synergy, our experience is that it will not happen, or will not happen as well as it should, unless it is firmly and positively managed, even in the one business. The way we are tackling this is by designating individuals whose job responsibilities include a performance measure in effecting these linkages, and, as with most big organizations trying to win commitment from participation, and by encouraging relevant committee structures. In my opinion, this synergy is beginning to find expression, but there is a way to go yet, some old cultures and habits are still to be overcome. I believe, too, that the prevailing economic climate is providing a valuable spur.

Will - should - MAFTech remain as part of a Department of State? My own view is that, in the New Zealand scene, the likelihood is 'yes' to both questions. I believe there will continue to be substantial funding of strategic research in agriculture by Government and while this pertains Government will retain its own capability to carry this work - or most of it - itself. There may be an advantage in some re-

organization of responsibility for this research between Government departments, but this is another issue. I believe also that for as long as the Government finds it needs its own intelligence-gathering, information-analysing capability across the agricultural sector - and our experience is that even in a non-interventionist regime, the demand for intelligence and analysis is every bit as strong, if not stronger, than in the 'bad old days' - there will be a place for MAFTech with its links into and across the rural sector.

How have our own people reacted to all these goings on? Responses have varied, but if it is deeds, performance, that tells I believe the record is that they are responding very well. Staff numbers are down - about 150 out of a total of 1,500 - a number of these being older folk taking advantage of early retirement provisions, and some being a few of the better, more confident advisers who decided they would rather be fully commercial for themselves than be fully commercial for MAF. Referring specifically to the old Farm and Horticulture Advisory Officers, this group has been subjected to a major cultural change. From a general agricultural extension role, combining an educational with a social and economic welfare concern across all farm people, they have had to become consultants whose existence depends on delivery specified goods, on time, to identified clients, of whom the Government itself is a minor player. We have contracted-in marketing competence, both in each region as a specialist resource and also as the General Managers for our National Soil and Plant and Animal commercial businesses. We have had to be much firmer about the importance of national standards for such things as pricing policies, for performance standards, for public liability and for risk assessment and management. We have made a substantial investment in staff training programmes to better equip MAFTech people as well as money, has gone into the managers but substantial effort has gone into the more operational aspects necessary at the 'front line'. The competency to understand and apply the discipline involved in preparing a business plan for any significant investment decision may be intellectually straightforward, but is proving practically complex for those with no previous commercial experience. Giving the tools has been vital in effecting the change process. We have had difficulty in finding, and once found, in maintaining a good balance between a top down and a bottom up flow of ideas, of opportunities. The intra-regional links and loyalties, fostered by a regime of considerable regional autonomy, have tended to get in the way of the needs of today, but there has been a deliberate policy decision to leave the reins very loose, to let experience be the guide, to make the changes when time and mood are ready. As I assess it, morale is good - we know what is expected of us, we are recognizing and employing our strengths, and we seem to be forging good relationships with our client groups as we progress to our fully commercial mode. If the bottom line is the bank statement, we are continuing to exceed our revenue targets which have as their objective that MAFTech continues to be a dominant force in leading effective change in agriculture in New Zealand.

We are still climbing - often, stumbling - up a steep learning curve and it is premature to offer final conclusions. What I can say is that, using our recent experience to respond to the issue of 'Delivering the Goods', we had first to identify to whom - who are our clients - before we could turn to 'what goods'. "Delivering" really means putting to satisfactory use, as measured by the client. As for the people, for MAF it has been a matter of:

- tell me what you want me to do;
  - give me the tools to do the job;
  - tell me how I am getting on;
  - reward me in keeping with my performance,
- So simple, so obvious, so easy to say but how complex and challenging to actually put into practice.