

## Future funding for research and extension: a state department of agriculture viewpoint

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This paper is not written as an attempt to forecast future funding arrangements but rather will give an opinion on what they should be. The views will be presented from the perspective of the Western Australian Department of Agriculture - an organization with over 50% of its budget spent on research, and with the main responsibility for agricultural extension in Western Australia.

Questions to do with funding of agriculture research and extension can be summarized as:

- How much should there be?
- Who should pay?
- How should it be organized?

### How much research

Virtually all objective studies both in Australia and overseas have found high rates of return to agricultural research (1, 2). A number of Australian inquiries have recommended that research should either be increased or continue 'at least' at existing levels (3, 4, 5). These studies and reports were carried out where agricultural research represented a higher percentage of gross value of production (% GVP) than in Australia (e.g. the U.S.A.) or in Australia when research as a % GVP was no lower than at present. There is thus no reason to suspect that additional research now in Australia would not be profitable. Indeed, studies of net benefits from research carried out in the Western Australian Department of Agriculture have shown that the sum of benefits from a few selected successful projects give an annual return higher than the annual expenditure of the whole Department. Results of under-investment in agricultural research and development have also been blamed in the case of Argentina for a general decline in the economy of the country (6).

It seems clear that research and development expenditure for agriculture should be increased on the evidence currently available. It is difficult to discuss levels because there is some variation in the estimates of how much is spent at present as can be seen in Table 1. However an increase to 3% of agricultural GVP would appear warranted on the basis of cost benefit studies and by comparison with U.S.A., another country with major rural exports which has traditionally had a higher proportion of rural research spending than Australia (4).

**Table 1. Estimates of agricultural research and development expenditure in Australia as a % agricultural GVP**

Year	%	Source
1984/85	2.25	(7)
1984/85	2.47	(8)
1986/87	2.35	(7)
1987/88	2.79	(9)

### Who pays for the research

In modern organized societies a range of services which benefit particular sections of the community have commonly been funded by the whole community. Recently there have been strong expressions of opinion by many influential people in politics, business and the bureaucracy that the beneficiaries (i.e. farmers) should pay for the cost of the agricultural research and extension services they receive. However, this is not a reflection of any general community expression of opinion. Although the public may want lower taxation as a result of cuts in some kinds of public expenditure, a reduction in expenditure on agricultural research and extension (or research and development of any kind) does not appear as a target for such economies. Research appears to be more acceptable to the public than most other forms of public expenditure.

It is political theorists who have promoted the idea that public funds should not be used for agricultural research - not the public themselves.

Even if it were agreed that the beneficiaries should pay for agricultural research and extension it is not that clear who the beneficiaries are. Many studies on the impact of research on agricultural production have found that the consumers, rather than the producers, are the principal beneficiaries. Certainly, the longer term result of improving agricultural technology seems to be that food gets cheaper rather than farmers get richer. In Australia, where much of the agricultural production is exported, the beneficiaries may even be the citizens of another country. On the other hand, the maintenance or enhancement of export competitiveness may often be of benefit to the whole Australian community.

A third reason why it is equitable for the whole community to contribute to agricultural research and extension is that the management of the Australian economy currently still disadvantages Australian farmers engaged in broad-scale agriculture and producing export products. While this net disadvantage to farmers continues, providing research and extension services from community funds can be justified.

On the other hand there are some good reasons why agricultural producers and other agri-business should provide at least some of the research funding.

One reason is that they frequently benefit initially, even though in the longer term that benefit flows elsewhere. Another reason is that agricultural research and extension functions most efficiently when there is a close link between research, extension and industry (in the case of agricultural production, industry is usually represented by farmers). This close linkage, with its valuable two-way flow of information, may well be further enhanced if the farmer is contributing to research funding and thus identifies himself with the process.

#### *How should research be organized*

Because change involves disruption and consequent inefficiencies I suggest that the existing Australian system of agricultural research and extension should be modified to meet changing circumstances in preference to endeavouring to initiate a completely new system.

The present system is dominated by the public sector in research with the main agencies being the States' Departments of Agriculture, CSIRO and the Universities. Extension is principally an activity of Departments of Agriculture, with a large private component including consultants and agri-business. In the latter case extension blends with technical sales.

Funding comes from State Governments, Commonwealth Government, growers (industry) and private business. Private business contributions can come from a variety of mechanisms including donations, payments for commissioned research, or returns to commercialization. The whole topic of commercialization of research in public sector organizations has been recently reviewed (10) but because the total of all these contributions is small they are not separately identified in this discussion.

The source of funds for public sector agricultural research and development organizations is shown in Table 2.

The principal source of funds for most research organizations is "core funding" from the organization itself. The proportion of core funding employed by some public sector organizations is shown in Table 3.

**Table 2. Percentage of research and development funding from various sources (1987/88)**

Source	Western Australian Department of Agriculture (11) per cent	All Australian Public Sector Organizations (9) per cent
State	83	43
Commonwealth	9	45
Commodity levies	6.5	9
Private business	1.4	2

**Table 3. Percentage of research and development funding from core funds**

Organization	Per cent
Western Australian Department of Agriculture 1987/88 (11)	83
All Australian Public Sector 1987/88 (12)	84
CSIRO 1982/3 (7)	91
CSIRO 1988/9 (projected) (7)	82

### *Core Funding*

This is the most valuable type of funding for a research manager. It enables a longer term strategy to be adopted which means that upstream research can be funded where it is considered desirable.

Core funding enables advantage to be taken of the resources available (e.g. a specially good researcher) or a new breakthrough can be followed up with additional resources immediately. It allows the research manager to give balance to the overall programme where discontinuities arise as a result of unexpected termination of external funding or essential research areas left unfunded.

The criticism could be made that core funding depends for its success on the ability of the research manager(s). The answer to this is that no system will compensate for bad research management so the solution must always be to change the management, not the system.

### *Commodity Levies*

Commodity levies on an industry basis have a logical appeal because the system can be seen as equitable (user pays). They also help in priority setting because the industry can request research where it is needed by the industry members. In order to take advantage of a commodity levy system it is necessary to include sufficient industry members in the research councils/corporations for them to make their inputs as industry members and particularly for them to be able to feel involved and identify with the research process.

However, in practice, commodity levies as provided by Rural Industry Research Funds or research and development corporations have a number of shortcomings.

They do not provide very well for upstream research because emphasis is given to research which can be seen as likely to have immediate application. They do not provide for "whole farm" research on agricultural systems.

Depending on the composition of the research council/corporation and their executive staff, they may be reluctant to fund research into the resource base of the product, such as soil or pasture research for livestock commodities.

There seems to be a danger that the research and development corporations will want to fund research which has quick application and which directly affects the product at or close to the marketing stage.

It is not necessarily an integral characteristic of levy-funded rural research councils but at present, in Australia, the industry research funds exert too much leverage. Because they restrict their funding to certain expenditure categories and yet wish to select projects, they are drawing on the research organizations' core funding for buildings, administration, vehicles and other categories of research support expenditure.

The extent to which the high 'leverage' of rural research funds causes problems for research organizations depends on the proportional magnitude of rural research funding and their funding guidelines. When their contribution was in the form of supplementing research expenditure on projects also selected by the research organization there was no problem. At present there is a sufficient problem for an organization like a State Department of Agriculture that some modification - in terms of meeting overhead costs - is necessary.

#### *Funding From Business*

This is a minor source of funding at present as can be seen in Table 2. Such funding is to be encouraged because business makes a very small contribution to research and development in Australia compared with other countries. However there are problems for an organization if too much emphasis is put into generating income from commercial funding. Research staff spend their time trying to generate income rather than doing research (verbal communication from scientists in New Zealand).

The input of funds from business to increase the total amount of research is desirable so long as it does not invoke leverage.

#### **Changes needed**

##### *Core Funding*

Core funding of public sector agencies (either Commonwealth or State) is currently the major source of funds for agricultural research and development and extension in Australia and it should be maintained at present levels. Where possible, as in State Departments, the linkages between research and extension should be strengthened.

In CSIRO, which has been battered by endless reviews, a reduction of emphasis on further reviews, relevance, and applicability would probably improve the performance of the organization due to an uplift in morale. This is needed if CSIRO is to regain its position as Australia's flagship organization for strategic research.

##### *Rural Research Levies*

It is expected that industries will lift their contribution to rural research funds through the commodity levy system to the 0.5% of GVP level which the Commonwealth is prepared to match.

This increased level of industry funding must be matched by a reduction in leverage of those funds. At present the Western Australian Department of Agriculture receives 13% of its research funds from Rural Industry Research Funds (6.5% from industry) but this influences most of its total research programme. Particularly for the larger commissioned projects initiated by research corporations these must be fully funded in future, including adequate allowance for overheads such as research management, administration, buildings and other services. A second category of projects could be established in which the rural research councils/corporations would supplement existing projects based on and selected for core funding by research organizations. Such projects could fund particular items requested and agreed and overheads would not be needed. The problem with such projects is that the large number of little projects makes for expensive administration. Another possibility is to use block allocations for support in a specified area.

Another desirable change for rural industry funds would **be** to establish improved regional funding arrangements. This change will be needed if the funds increase in size and proportion of total research and development expenditure. A division of the levies is proposed similar to the present arrangements for the wheat research levy although the break-up could vary. Part of the funds would be devoted to Australia-wide industry needs including aspects such as export quality requirements. These funds could be disbursed centrally. On the other hand, production problems which tend to be specialized to the area of production, could be better assessed and funded on a regional basis.

If there is a separation of each industry fund into Australia-wide (Commonwealth) and regional (State) funding it would be sensible for commodities with common characteristics to be aggregated. This would reduce the number of funding bodies. At a regional level one funding council might serve several commodities.

### *Business Funding*

Although this source of funds is quite small in absolute amount it is starting to have an important and detrimental effect on co-operation between organizations. In order to maintain the co-operation which has existed up to the present between public sector research and development organizations we should better recognize the difference between:

- (1) Business donations or grants for research.
- (2) Commercialization of research results for the purpose of profit.

It is suggested that due to the requirements of confidentiality and the need to avoid complications from different funding sources the use of the second mechanism should be restricted to private business, private research institutes or specially separated commercial units in public sector organizations. There have been a number of cases already where arrangements made under commercial agreements have detrimentally affected co-operation between public sector research organizations. In practice the extraction of commercial benefit from research requires particular expertise which may be more effectively deployed by specialized organizations.

### **Extension**

The discussion in this paper has been almost exclusively devoted to research funding despite the title. In an applied research organization such as a Department of Agriculture, research and extension are very closely linked with on-farm problem identification by extension staff leading to laboratory or station research by research staff and then on-farm testing by extension staff or farmers, in a continuum. Such extension should continue in the same way, preferably core-funded. If governments were to resile from funding extension it would be necessary for this type of extension work described above to continue and perhaps be funded by block funding from commodity levies.

Other types of extension can be funded differently. Information on specific products or processes can be disseminated relatively cheaply. Agri-business carries out such information dispersal although public sector agencies are preferred because of their higher credibility.

Detailed whole farm management advice is mainly given at present by consultants as a commercial service. Probably there is a continuing role for public sector organizations in developing the tools for such management advice and making farmers aware of the benefits in groups or mass-media work.

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