

Research and Development in Horticulture: What Should Be Funded and How Should it Be Adopted?

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INTRODUCTION

The public sector has a long history of involvement in rural research and development in Australia through the state departments of agriculture, universities and various other State and Commonwealth funded bodies. However, until the establishment of the Horticultural Research and Development Corporation (HRDC) as a commonwealth statutory authority in 1988, there had been no formal and specific mechanism for support for R&D in horticulture that encouraged direct industry contributions.

This relatively new industry equity in, and ownership of, the R&D has significant implications for the direction, development, conduct, and commercialisation of the program. This paper will focus on two specific implications:

- 1) What research gets funded?
- 2) How can we best ensure that outcomes are adopted?

However, before these issues can be adequately explored, it is important to have some understanding of the role and operation of the Corporation.

The Corporation's mission is to improve the sustainability, profitability, international competitiveness, and value of Australian horticulture through efficient use of R&D resources.

The Corporation acts to direct and coordinate the financial support for research and development for all horticultural industries including fruits, vegetables, nuts, turf, nursery products, and cutflowers and foliage. In partnership with industry, the Corporation identifies industry needs and priorities and funds research into these areas. This coordination role not only includes production, but also postharvest and processing research and development.

THE OPERATION OF HRDC

The Corporation provides R&D funding by attracting industry funds and matching these dollar for dollar with Commonwealth funds. Commonwealth funds are provided only for industry contributions held by the Corporation up to a ceiling of 0.5% of the GVP of horticultural industries. These are the only funds the Corporation has available in an ongoing sense to support R&D and close consultation is required with industry on the areas of expenditure of these funds.

Horticulture is a diverse and fragmented industry when compared to some of its rural counterparts. Few nationally cohesive peak industry bodies exist and those that do, do not have a long history of support for and involvement in research and development. In recognition of this, horticultural industries can contribute to R&D by three main mechanisms; ad-hoc voluntary contributions, voluntary levies, and statutory national levies.

Voluntary contributions are a means by which industries lacking national coordination can participate at an individual or regional level to specific R&D

projects or programs. Examples of this are the tropical fruit industries such as those represented by the Queensland Fruit and Vegetable Growers and the amenity turf industry. Voluntary contributions also allow industries, associations and individual enterprises associated with horticulture to participate in R&D support and benefit from the Corporation coordination and management and matching funds.

Some horticultural industries have a significant regional focus within which there is strong cohesion and common purpose. In such cases voluntary levies may be struck to address R&D needs specific to that industry. Examples of this type of arrangement are the mushroom, processing tomato, and canning fruit industries.

Where there is a recognised peak industry body that represents a significant majority of both producers and production, a national statutory levy may be introduced at the request of industry. Such levies are now in place for the apple and pear, avocado, citrus, chestnuts, cherry, custard apple, macadamia, nashi, nursery, potato, stone fruit, and vegetable industries.

Since its inception in 1988 the HRDC has funded horticultural research and development worth over \$70 million. The growth in the Corporation's expenditure is shown in Fig. 1.

It is important to appreciate that this growth has only been possible due to an increase in industry involvement. At its inception, the Corporation was supported by two levies, pome fruit and citrus, providing contributions of less than \$1 million. In 1995-96 the Corporation is supported by 12 levies and voluntary contributions from a wide range of industry participants providing over \$12 million. The 1995-96

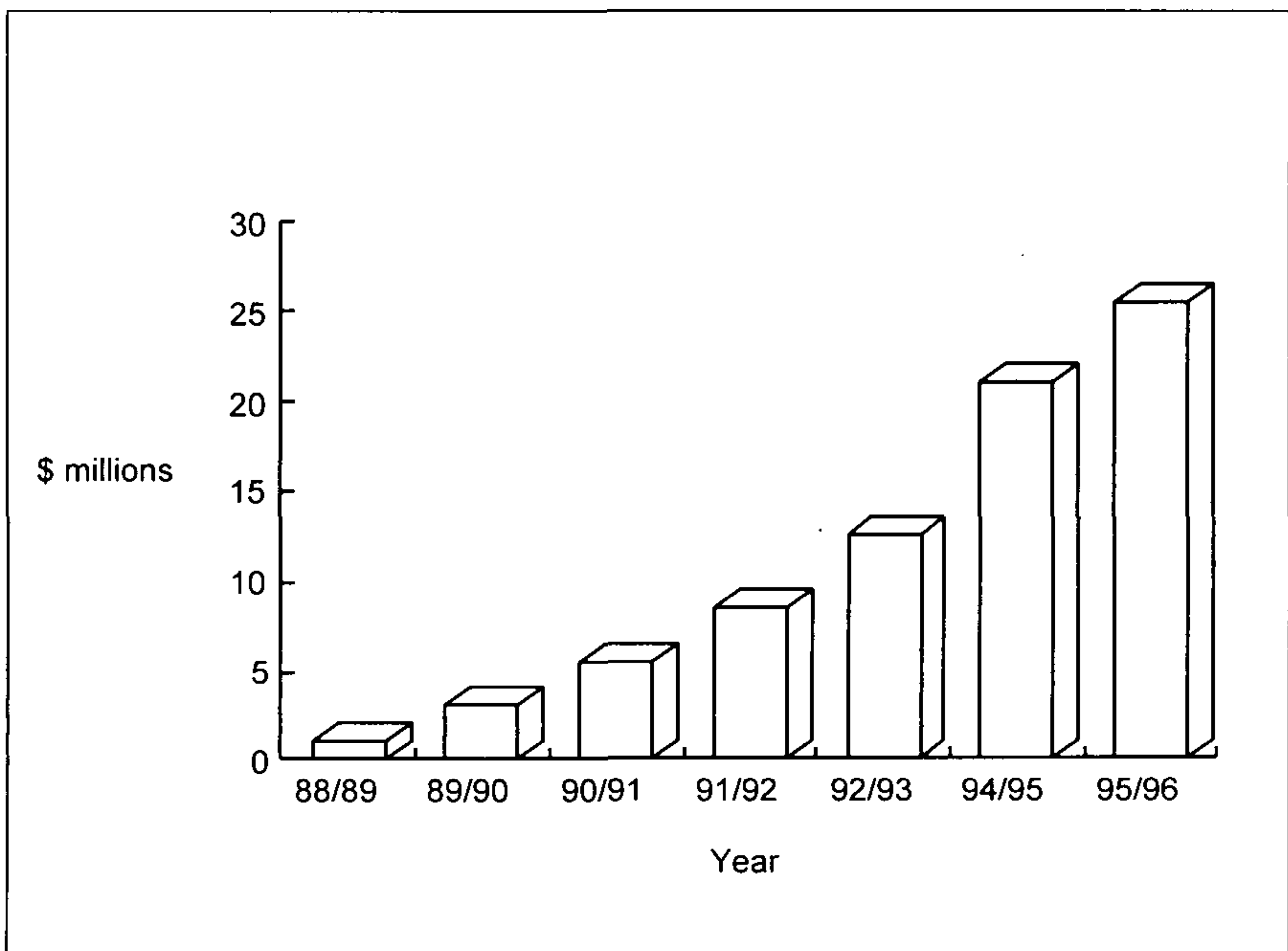


Figure 1. Annual R&D funding by HRDC: 1988-1995.

R&D programs of industries in partnership with the HRDC, in order of HRDC expenditure (highest to lowest), are :

- | | |
|--------------------------|----------------------|
| 1 Other fruit | 11 Turf |
| 2 Citrus | 12 Processing tomato |
| 3 Apple and pear | 13 Other nuts |
| 4 Vegetables | 14 Macadamia |
| 5 Potato | 15 Cutflowers |
| 6 Horticulture (general) | 16 Mushroom |
| 7 Nursery | 17 Avocado |
| 8 Cherry | 18 Disinfestation |
| 9 Other product | 19 Nashi |
| 10 Chestnut | |

The overall strategic objectives and priorities of the Corporation are established in the HRDC Strategic Plan. The Plan establishes 10 strategic areas of activity for the Corporation in 1995-96. These are, in order of expenditure (highest to lowest):

- | | |
|-----------------------|----------------------|
| 1 Pest/disease | 6 New/value added |
| 2 Genetic improvement | 7 Quality management |
| 3 Cultural/harvesting | 8 Disinfestation |
| 4 Technology transfer | 9 Marketing studies |
| 5 Postharvest | 10 Waste management |

However, equally important in the determination of the Corporation's R&D program are the individual Strategic Plans of the participating industries. There are 15 industry plans of varying sophistication and scope, however all represent a significant improvement over previous industry R&D planning and are a sound starting point for further development. National R&D Committees have been established by each industry to oversee the implementation their Strategic Plan.

THE DEVELOPMENT OF FUNDING PRIORITIES

While the ultimate responsibility for the R&D program funded by the Corporation lies with the Board, it is apparent from the process outlined above that what research and development gets funded is largely determined by the priorities established in each industry Strategic Plan and how that Plan is interpreted by the R&D Committee. The nursery industry's development of its Strategic Plan is a representative example of how this process occurs and some of the implications that flow.

The nursery Strategic Plan was developed at a meeting of representatives drawn from most industry sectors and all states in 1990. The plan documented the current situation and described the desired situation in 5 years. R&D objectives were then developed to get the industry from 1990 to 1995. It was an ambitious plan that concentrated on practical issues that affect farm productivity and costs such as cultural practices and pest and disease control. Nine key R&D programs have been established in two broad areas and Table 1 provides the total funding allocation, both levy and voluntary contribution, since 1990 against these priorities.

After 5 years there have been significant achievements in many of these areas and these have been well covered in other places. However, beyond the project-based

Table 1. Funding allocations against priorities: 1990-1995.

Priority	Description	Funding		
		Voluntary contribution	Levy	Total
A	Market research	\$80,000	\$179,000	\$259,000
B	Technology (in order of priority)			
1	Technology transfer	\$124,000	\$564,000	\$688,000
2	Pest/weed/disease control	\$290,000	\$872,000	\$1,162,000
3	Product handling	\$1,000	\$391,000	\$392,000
4	Soil quality and potting media	\$183,000	\$532,000	\$715,000
5	Varietal improvement	\$152,000	\$256,000	\$408,000
6	Efficiency and productivity	\$293,000	\$31,000	\$324,000
7	Irrigation	\$149,000	\$221,000	\$370,000
8	Value-added products	\$0	\$0	\$0
TOTALS		\$1,192,000	\$2,867,000	\$4,059,000

output, equally important components of the evaluation of the Plan are whether the priorities are right and whether the appropriate balance of funds has been allocated between them.

CONSIDERATION OF PRIORITIES

In any consideration of priorities a number of issues must be addressed including, but not limited to:

- What technical problems does the industry currently have?
- What technical issues may arise in the future?
- Can R&D provide a solution to these?
- Which issues, if solved, will produce the greatest benefit to industry?
- Are other sources of funds being directed toward particular areas?
- What public good may be derived from work in a particular area?

I will use the priorities of varietal improvement and technology transfer to develop some of these issues.

Varietal Improvement. It could be argued that the number of new plant varieties and lines that are released onto the market each year in Australia indicate that commercial forces are sufficient to fund new developments in this area. Indeed, many members of I.P.P.S. are active commercial operators in this field. Despite the interest of research agencies in an area of research where significant intellectual property may arise, there would appear to be no market failure to support R&D in new varieties.

It could also be argued that our vast and unique flora is one of the few competitive advantages the industry has over its international competitors. This resource will

become increasingly important as the industry moves to expand and develop export opportunities. If the development of this resource is not undertaken promptly and in a coordinated and strategic fashion, the opportunity it offers may well be lost to the steady stream of overseas growers that visit these shores looking for new material. Do individual industry members have the resources, the coordination, and the commitment to undertake this task? In addition there are many areas of basic botany, ecology, and molecular biology that require considerable work if the full benefit of our flora is to be captured and preserved.

Technology Transfer and Adoption. One of the most important implications of the industry's 50% stake in HRDC funded research is that of responsibility for the application of research outcomes. Funding for research and development is now directed toward priorities, and indeed projects, that industry has chosen. Researchers are encouraged to collaborate and liaise with industry wherever possible, and to include significant technology transfer components in their proposals. One could reasonably expect this to create a strong desire to receive and adopt the results of industry funded R&D, this has not always been the case. Even where individual companies or regional groups have provided voluntary contributions to support specific projects, the responsibility for dissemination and encouragement of adoption is often seen to lie with the researcher.

The effective dissemination of research outcomes and their profitable adoption remains the greatest challenge facing the Corporation. Unfortunately the attitude captured so well by the I.P.P.S. motto of "Seek and Share" appears to be a rare commodity.

The Corporation recently undertook a survey of information and communication needs in the nursery industry. The results shed some light on this problem. Over half of all those surveyed (60%) stated that they received none or only part of the information they require on research findings; while 80% said they had to adapt information when they did receive it, mainly because it was not regionally relevant enough. Encouragingly, just under half were prepared to send up to \$1000 a year to get the right information and 19% were willing to spend more than this !

As this Conference and indeed many of the activities of I.P.P.S. demonstrate, the most effective information exchange occurs in a social context. Of those surveyed 80% had attended an industry workshop, conference, or trade day in the last year. Such events were rated as the second most useful and efficient means of obtaining information bettered only by direct personal networks.

The Corporation acknowledges its responsibility to ensure that funded research produces practical outcomes and that these are presented in a useful and accessible way. It is however, ultimately the responsibility of individual industry members to adopt R&D outcomes for their own benefit and improved profitability.

While the Corporation has done much in recent times to improve the presentation, distribution, and usefulness of research outcomes, bodies such as the I.P.P.S. can play a vital role in creating industry interest and assisting in dissemination. I.P.P.S. has world renowned conferences and publications and is the focus of many important industry networks. HRDC, I.P.P.S., and, most importantly, the horticultural industries of Australia can all benefit from an improved use of these networks and information dissemination channels. The challenge for both HRDC and I.P.P.S. is to explore ways in which they can work together on this important task.