

Australian wildflowers and orchids. *Botrytis* is the major pathogen affecting cut flowers in storage and transport. Some one hundred bacterial and fungal diseases have been reported in orchids, and many of them have been recorded in the Philippines, Malaysia, Thailand and Indonesia (Ganapathi et al. 1990).

While most diseases exist in all countries that are export destinations, and are less of a quarantine risk than are pests, they can cause considerable damage in plantation situations.

Pesticides are the main form of controlling pests and diseases in the flower industry in the case study countries. But there are increasing concerns in many communities about the extensive use of pesticides, and in tropical conditions pests can develop immunity very quickly. In some countries there is a problem in that the appropriate chemicals are not available because of regulatory controls that do not recognise the needs of the flower industry.

Pest control features in the R&D programs of RIRDC and HRDC in Australia and of PCARRD in the Philippines, and there has been extensive work on pests and diseases of orchids in Malaysia. RIRDC, for example, has funded research on field and post-harvest management of insects in native Australian cut flowers, chemical and biological control of certain mites, and pruning management insect control.

HRDC is funding, among other things, the development of a national management strategy for western flower thrip, the development of steam-air treatments for controlling diseases borne by flower seeds, and the development of control strategies for *botrytis*.

PCARRD has undertaken work on screening insecticides against mites on chrysanthemums, and surveyed pests and diseases of ornamentals in the highlands and diseases attacking anthuriums, chrysanthemum and roses.

In Malaysia and Thailand, research on pests and diseases of orchids has been undertaken at a number of universities (see, for example Abdul-Samad 1994), institutes such as the Malaysian Agriculture Research and Development Institute (Hamidah 1990; Lim 1990) and the ASEAN Plant Quarantine Center and Training Institute (Ganapathi et al. 1990), and government departments (Chouvalitwongporn 1994).

One aspect of pest and disease management that is perceived as a constraint on the development of the

industry is quarantine control, as it affects inward and outward flows of flowers and planting material. The main concerns raised by producers relate to management and procedural matters, rather than scientific issues. Australian participants at the working group meeting raised concern about the cost recovery policies of the Australian Quarantine Inspection Service on phytosanitary certification of export shipments and the effectiveness of resources devoted to preventing the introduction of pests and containment of outbreaks. In the Philippines the main issue relates to bureaucratic delays and unreasonable regulations affecting imports of planting material (see Lantican working group paper). In many countries, upgrading the ability of quarantine officials to identify and classify pests entering with floriculture imports is seen as an important management issue.

Although management and regulatory matters are at the forefront of growers' concerns, technical and scientific issues are also important as international trade in cut flowers and live plants expands. With the risk that pests and insects introduced with cut flowers can adversely affect other crops, the costs of inappropriate quarantine protocols may be magnified. By the same token, overly restrictive policies may act as an unwarranted barrier to trade. The success of national quarantine services in negotiating access to export markets and approving management practices in countries supplying imports must presumably be based on sound scientific knowledge and assessment of risks.

### **Cultural practices**

The lack of information about appropriate cultivation techniques such as soil preparation, propagation, planting densities, replacement of planting stocks, fertiliser and pesticide dosages and when to harvest is frequently identified as constraining the development of the industry. To a large extent this is a problem of dissemination, reflecting the fact that government extension activities have been slow in catching up with the rapid development of the industry, particularly in the production of temperate flowers. But much of the available information is not necessarily appropriate to tropical and semitropical conditions. Participants at the working group meeting suggested that there is a need for research to develop protocols for cultivating temperate flowers in the conditions that prevail in countries enjoying such conditions.

Agencies such as PCARRD, which has a well-established technology dissemination program for orchids, have included work on cultural management (PCARRD 1994c).

### Post-harvest practices and technology

Poor post-harvest management by growers and others in the transport and distribution chain — and its effect on vase life and product wastage — has been identified as one of the major reasons for limited success on export markets and slow development of domestic markets.

Cut flowers deteriorate after harvesting for a number of reasons including (Nair 1992):

- hastened ageing of tissue as a consequence of the break from the source of water and foods in the parent plant;
- reduced uptake of water because of damage to or microbial growth in the vessels that carry water;
- pathogenic attack due to organisms present at harvest and arising because of storage conditions; and
- noxious gases, particularly ethylene produced by ripening fruit and present in vehicle exhausts and cigarette smoke, which accelerate senescence. Some flowers produce their own ethylene during the ageing process, and some diseases induce ethylene production.

Poor handling and storage procedures can exacerbate all of these causes of deterioration (Table 23).

Considerable research on post-harvest management of orchids has been undertaken in Malaysia and Thailand and appropriate practices are well defined (Ketsa 1986, 1987; Lim 1994; Nair 1990; Nair and Arditti 1991; Nair, Idris and Arditti 1991; Nair, Tung and Rahman 1986). Protocols for handling temperate flowers in temperate conditions have been developed

in Europe, the United States and many other locations. A question that remains, however, is the applicability of these protocols to tropical climates.

It is not clear that all the post-harvest practices mentioned above are essential. For example, some Malaysian producers of highland orchids are able to export successfully to the selective Japanese market without the use of cool rooms or fumigation, even though exporters in Thailand use cooling facilities and automatically fumigate. And, as the proceedings of the working group continued, the value of additional R&D in this area was disputed. Some producers argue that the established practices are sufficient to assure quality and that the main issue is to ensure that these practices are effectively implemented.

### Market research and industry information

The limited information that growers have on consumer preferences and market requirements in domestic as well as export markets is seen as an important constraint on the development of the industry in many countries. Even in the Netherlands, market research and marketing knowledge are perceived to be areas of weakness in the floriculture industry (Haak, Tap and Haybroek 1992).

In some countries there is also a perception that wholesale and retail marketing systems are undeveloped and lack transparency (see Singh working group paper). This is said to lead to the inefficient transmission of information back to growers about the returns from quality control and post-harvest handling and from exploiting market niches.

The small scale of growers' operations and the fragmentation of the industry would go some way to explaining why there might be underinvestment in market research. Collaborative approaches to market

**Table 23.** Critical elements of harvest and post-harvest activities to minimise deterioration.

At harvest	Storage	Packaging and transport
<ul style="list-style-type: none"> <li>• Identifying and isolating diseased mother plants.</li> <li>• Removing field heat and minimising water stress.</li> <li>• Disinfesting — this may require fumigation.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintaining appropriate temperature control — the metabolic action of flowers is slowed at lower temperatures, but temperatures that are too low cause chilling injury.</li> <li>• Using preservative solutions including sugars, a biocide and an acidifying agent to extend longevity, stimulate bud opening and as a pulsing solution to help extend vase life.</li> <li>• Treating with ethylene inhibitors such as silver thiosulphate.</li> </ul>	<ul style="list-style-type: none"> <li>• Packaging flowers appropriately to protect them against damage — inadequate packaging or overpacking is a common cause of wastage.</li> <li>• Maintaining the cool chain during the transport process.</li> </ul>

research could overcome the scale problem — the successes of the Flower Export Council of Australia are evidence of this. However, collaboration may not eventuate if industry organisations are poorly developed, or communication and other infrastructure deficiencies inhibit cooperation.

There is evidence that non-government organisations and aid agencies have moved to fill this gap in some countries, as the USAID-funded market system

study for the Philippines industry attests (Foundation for Resource Linkage and Development 1993). It is also clear that foreign suppliers of planting material and technology, as well as firms involved in marketing in major import markets, are a growing source of market information, channelled through joint ventures and other collaborative arrangements that are being set up with local growers, or bundled together with material and advisory services.

# ACIAR and R&D for the Cut Flower Industry

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The purpose of this study is to provide information that ACIAR can use to support its evaluation of whether it should fund technical research and development in the cut flower industry.

Chapter 1 of this report suggested a framework within which ACIAR might address this issue, given its mandate and institutional objectives, and identified some of the elements of the information base that would be desirable to support this process. Subsequent chapters of this report have presented some of the information that is available.

As indicated in Chapter 1, a large number of factors must bear on ACIAR's evaluation of whether it should fund research and development in a particular industry. Some of these factors relate to the overall composition of ACIAR's research portfolio, and broader considerations of aid and development policy. This report cannot address these broader concerns. However, to help support the evaluation process this chapter lays out some of the issues that have emerged from the study and the deliberations of the working group that affect the framework proposed in Chapter 1.

## Emerging Issues

### Availability of information

Perhaps the single most important issue is the general paucity of consistent and reliable information on the cut flower industry in the five countries covered by the study. It is difficult to develop a clear picture of the size and structure of the industry, and even of international trade in cut flower products. This adds to the complexity of the evaluation question facing ACIAR. It makes it very difficult to undertake any evaluations of the possible returns from R&D for the industry and to identify with any confidence who the beneficiaries of R&D might be.

However, some broad features of the industry and the market it supplies can be identified, and these

may help in addressing questions about R&D. One strong impression that does arise from the data is that the industry is still relatively small in terms of the number of farmers involved, the area under cultivation and the value of production and consumption.

The small size of the industry is important because it places a limit on the welfare benefits that can accrue from successful research on the industry. For the cut flower industry to compete for public funding with larger industries (say, rice production or even other horticultural crops), per unit benefits of research would have to be extremely large. This study could not identify research projects that might have such large benefits.

### Industry and market structure

The industry produces a multiplicity of products, with varying market and production characteristics. Cut flowers are a luxury product, and fashion plays an important role in demand. This means that colour and other product characteristics sought by the market may change quite rapidly and that there may be limited time to reap returns from the development of new or varied products.

Broadly speaking, it is possible to identify two broad classes of product in the four ASEAN countries studied — orchids and the traditional temperate flowers — which require rather different technologies and are at different stages of development. (There is, of course, production of other tropical flowers, but typically little in the way of indigenous varieties.) In Australia, a comparable dichotomy exists between the traditional industry and the growing of native wildflowers.

In all countries the public sector plays almost no direct role in the industry. However, the degree of policy and institutional support varies, as the cut flower and the ornamental plant industries generally have only recently been seen as having potential for income generation and export development.

The processing chain is short and the main participants in the industry and market can be — a little simplistically — described as undertaking some or all of the following activities: plant breeding, plant propagation, growing, wholesaling, retailing and exporting. Manufacturers and suppliers of non-plant materials such as fertilisers, pesticides, weedicides and irrigation and other equipment are also important players. Overseas producers are an important source of planting material and other inputs.

In most of the countries, growing is predominantly undertaken on a small to very small scale. The fragmentation and lack of scale suggest that growers may have problems in undertaking socially valuable R&D. However, linkages with much larger and mainly international firms involved in other stages in the production and distribution chain are common. Frequently, these firms have been the catalyst for the development of the production of temperate flowers as they have sought to extend the periods of supply into the main northern hemisphere markets, to find lower cost production areas, to spread new development costs and to take advantage of additional growing seasons to accelerate plant breeding programs (Karingal Consultants 1994). These firms have developed a variety of strategies to capture returns from R&D and are major suppliers of technology throughout the world. However, they do not, as yet, appear to have focused to any great degree on the demands of growing temperate flowers in tropical conditions.

Market orientation varies between segments of the industry and between countries. In the Philippines, at the moment the industry is primarily oriented toward the domestic market. Thailand has long been a major supplier of orchids to the world market, but other flowers are produced almost exclusively to meet local demand. In Malaysia, the production of orchids and temperate flowers is predominantly export oriented, whereas in Indonesia, the focus is primarily on the domestic market.

Market orientation, and more particularly the price responsiveness of demand in markets, is important because it may determine, to some degree, who benefits from cost reductions that may result from successful R&D. In markets exposed to international competition, demand faced by the local industry is likely to be highly responsive to price changes. In this case, producers are likely to reap most of the benefits of supply enhancing or cost reducing innovations

(although if the innovation is readily applicable across a range of countries, world prices may fall to the benefit of consumers). Demand in domestic markets may be much less responsive to price changes, and if significant parts of the market are insulated from import competition, producers may find that cost reductions lead to lower prices, so that consumers appropriate some of the benefits from innovation. Given the income characteristics of the typical purchaser of cut flowers, consumer benefits from R&D affecting the industry may be accorded a lower weighting in public evaluation processes than in the case of R&D affecting consumer essentials and basic foodstuffs.

### **R&D in the industry**

In a limited study of this kind, it is difficult to get much information on the R&D activities of private participants in the industry. There is considerable work on breeding orchids under way in Malaysia and Thailand and, to a lesser extent, the Philippines, and some large firms operating tissue culture facilities are experimenting with new culturing techniques. Many growers, of necessity, undertake a range of adaptive research as they try to identify the products and practices that best suit the conditions on their farms.

The nature and extent of publicly funded and publicly undertaken R&D for the industry varies between countries. In Malaysia there is a strong tradition of work on orchids in universities and public research institutions, but little has been done on other flowers. In the Philippines a new program of centrally managed R&D that does focus on temperate flowers is being put in place. In Thailand, research on orchids is undertaken in some of the main universities. And in Indonesia, a new institute was recently established to carry out R&D on ornamental plants.

As already mentioned an important source of technology for growing temperate flowers is the plant breeders and traders in the major producing and importing countries.

### **Constraints, Opportunities and the Role of R&D**

Given the expanded international trade in floriculture products and the cost structures, agroclimatic conditions and indigenous floral endowment in the

Philippines, Malaysia, Thailand and Indonesia, there seems to be considerable potential for developing the cut flower industry (and related foliage and pot plant industries) in these countries. But a number of constraints are being experienced, and the knowledge base needs to be extended if the potential is to be realised.

Some of the constraints have their origin in government policies that may need to be amended and in public institutions that may need to be strengthened. For example, import regulations and quarantine controls may need to be streamlined to remove barriers to imports of technology embodied in planting material. Infrastructure and transport constraints, such as limited air cargo space and handling facilities for cut flowers, may be an inevitable consequence of the emerging nature of the industry. But there is a reasonable consensus that R&D and the dissemination of knowledge and new technologies, products and processes should be able to contribute to the development of the industry.

However, as discussed in Chapter 1, the issue for ACIAR is not just whether R&D could help the industry. Important questions concerning the size and distribution of the potential benefits, the role of the public and private sectors, the activities of national public R&D programs, the extent of regional spillovers, and the scope for collaborative research drawing on Australian expertise are all important.

Five broad areas where R&D might benefit the industry have been identified: breeding and the development of new varieties, management of pests and diseases, cultural practices, post-harvest practices and technology, and market research.

Considering the role for ACIAR in these areas involves trying to answer some general as well as more specific questions. Some general questions follow.

- What are the potential benefits and costs of research in these areas, and to whom would the benefits accrue?
- Can the private sector be expected to carry out adequate levels of research and make the results available to growers in the region? If not, what might be the most appropriate actions for governments to take to redress underinvestment?
- Are the issues and problems being addressed common across potential collaborating countries,

and are there spillovers to and linkages with other industries that bear on research funding decisions?

- Do the big gains on the knowledge front come from new research or from disseminating and adopting existing technologies and practices?

### **The benefits from R&D**

As discussed earlier, the distribution of benefits from R&D will depend a lot on the characteristics of the markets being supplied by growers. In addition, the mechanisms for disseminating research results may play an important role in how the benefits are spread within the growing community. In some of the case study countries, the flow of information to small scale growers is quite limited.

Certain types of research, such as breeding new varieties and selecting new indigenous flowers for commercial cultivation, have a long gestation period. Some evidence from the Australian experience suggests that the benefit–cost ratio of such research may not be very favourable when it is handled in the public sector.

### **Private sector involvement**

There is considerable private R&D supporting innovation in the industry in the case study countries. Some of this activity is being undertaken in the countries themselves, but a large proportion is being carried out overseas. The results of this external R&D are being passed on to growers embodied in planting material, chemical inputs and greenhouse technology, through the work of advisers and consultants helping with cultivation practices and through joint venture agreements.

The private sector is involved in breeding activity in most if not all of the case study countries. This activity has tended to concentrate on native wildflowers (Australia) and orchids, rather than temperate flowers. However, international plant breeders, particularly in the Netherlands and Japan, are supplying material for newly developed varieties to growers in the region. It is not clear, however, that the international breeders are focusing on the needs of growers in tropical regions, where pests and diseases and growing conditions may be very different from what is encountered in the northern hemisphere growing areas.

The main objectives of breeding programs are to develop new varieties to respond to or to set trends in

consumer preferences for a fashion item, or to provide greater resistance to local pests and diseases or better adaptation to local growing conditions. Experience suggests that successful breeding often produces very localised results as cultivars that do well in one environment may perform poorly in nearby areas. This also seems to be true of work on cultural practices.

Broadly speaking, the characteristics of breeding and cultural research tend to imply that it ought to be in the domain of the private sector rather than the public sector. However, there may be some regulatory and institutional impediments affecting incentives for private research and the flow of international innovations to local growers.

For example, the absence of plant variety rights legislation in Thailand, Indonesia and the Philippines may be limiting the flow of new varieties from overseas breeders. However, ways around this seem to be available, and it is not clear that enacting such legislation would substantially alter the incentives for local plant breeders. The experiences in Australia and Malaysia, where such legislation does exist, suggest that breeders find that the processes of registration are cumbersome and that enforcement is difficult. As a consequence they use other strategies to reap the benefits from research on breeding and varietal improvement.

In some countries, regulations inhibit flower growers' access to chemical inputs, and the small size of the industry may deter chemical companies from developing protocols for flower growing and for registering products in countries where this is a requirement. Presumably, the appropriate response of governments in such cases is to see if regulatory impediments can be streamlined.

Land tenure arrangements that may affect a wide range of agricultural activities may also work against growers undertaking long term investments in R&D. But inappropriate land tenure systems adversely affect a wider range of farmer decisions than just R&D and need to be addressed directly.

The extensive involvement of the private sector in important areas of research would suggest that the potential role for ACIAR in funding R&D would be limited. It is quite likely that niches are being neglected by the international, northern hemisphere based, private research efforts — for example, on exploitation of tropical species or adaptation of

temperate flowers to tropical environments. However, as the growing body of research on Australian native flowers that is being carried out in Israel and other locations indicates, market forces can stimulate international research on what may seem to be localised issues.

### **Commonality of issues and problems**

The evidence gathered in this study suggests that there is a range of generic issues that are common in all of the case study countries. What is not so clear is whether the results of research to address these problems would have common applications. Evidence suggests that the applicability of results from research on breeding and cultivation practices may be quite localised. On the other hand, market research on the requirements to satisfy major export markets may be widely applicable. However, while ACIAR has funded market research in the past, this has typically been limited to exploring the potential market for technologies developed by other ACIAR-funded activities.

In some areas there are important linkages with other industries, and potential spillovers in research activities that could influence decisions about public funding of research. For example, in the area of pest and disease management and in the specific field of quarantine controls there are important links between floriculture and other horticultural activities. Some of the pests that affect flowers also affect food crops, and methods for dealing with these pests could have spillover benefits (and work on these pests carried out for other crops could be applied to floriculture).

Similarly, environmental and health concerns that are prompting the search for alternatives to chemical pest controls and ozone depleting fumigants are common to many crop growing industries. In some cases, flower growing could expect to benefit from research undertaken for more economically significant crops. However, in other cases, such as the search on replacements for methyl bromide, more targeted research may be necessary, given that the characteristics of flowers differ from those of, say, fruit and vegetables.

### **Dissemination versus new research**

One of the key questions concerning the case for funding R&D in the area of cultural practices and post-harvest technology is whether the main problem being encountered in the case study countries is one

of dissemination and adoption, rather than inadequate research. There is a strong body of opinion among the more progressive growers that large gains in quality could be achieved from wider implementation of existing good practice. This view was reinforced by participants at the working group meeting.

The public policy issue here is to understand the reasons why growers are not adopting existing technologies and procedures. One reason may be that the market returns from higher quality products do not warrant the costs involved, or that the marketing systems are not sending clear signals about the additional returns that may be available. Industry efforts — sometimes supported by government agencies — to establish grading systems may help in the transmission of such information. It may also be that many small scale growers do not have management expertise and are not reached by extension services or the activities of grower organisations.

There may well be an important public sector role in improving the dissemination of information. However, as with market research, ACIAR typically restricts dissemination activities to technologies arising from research it has funded.

## Conclusions

A number of features of the cut flower industry and associated R&D — its size and market characteristics and the extent of private R&D — suggest that it is difficult to mount a strong case for ACIAR to fund R&D for the industry. Compared with other agricultural activities in which ACIAR is involved, the case for public funding of R&D for the cut flower industry

seems weak, and the economic returns do not seem to be large. In other words, even in areas where there may be underinvestment in R&D, the return from a dollar of ACIAR funding of cut flower R&D looks to be much smaller than the returns from funding in other industries.

This does not mean that there is no case for public sector interventions to improve the knowledge base of participants in the industry and to encourage innovation. The small scale of most growers and the apparent fragmentation of the industry suggest that collaborative funding and conduct of research may be difficult to organise. This is a problem that governments can help to overcome with interventions such as the R&D levy systems that operate in Australia.

It may also help if governments address problems created by the absence of legal protection of intellectual property rights. There may also be a useful role for the public sector in assisting dissemination of R&D results and information on best practices. And in some areas of public policy concern, such as environmental protection, quarantine control and occupational and consumer safety, there may be a role for direct funding of R&D, especially when issues extend beyond the boundaries of the industry.

However, at this stage, it is difficult to identify areas where the broad conditions set by ACIAR's mandate and institutional objectives are unequivocally met. In part, this may be a consequence of the limited base of information about the industry, and it is possible that, if the industry expands in response to the opportunities that seem to be available, the information base to support a role for ACIAR may develop.

# Appendix A

## List of Contacts

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## Appendix B: Additional Tables

**Table B1.** Estimates of cut flower production areas in selected countries, 1988.

	Area	Share
	ha	%
<b>Europe</b>	<b>25 982</b>	<b>44.1</b>
Italy	7 600	12.9
Netherlands	5 081	8.6
Spain	2 900	4.9
Germany	3 119	5.3
Greece	1 430	2.4
France	1 692	2.9
Czechoslovakia	650	1.1
Poland	629	1.1
Others	2 881	4.9
<b>Africa and Middle East</b>	<b>2 504</b>	<b>4.3</b>
Israel	1 483	25
<b>Asia</b>	<b>14 142</b>	<b>24.0</b>
Japan	13 089	22.2
Thailand	432	0.7
Hong Kong	343	0.6
Singapore	150	0.3
Indonesia	128	0.2
<b>North America</b>	<b>9 810</b>	<b>16.7</b>
United States	5 067	8.6
Mexico	4 250	7.2
Canada	493	0.8
<b>Central and South America</b>	<b>5 182</b>	<b>8.8</b>
Colombia	2 122	3.6
Brazil	1 000	1.7
Costa Rica	800	1.4
Guatemala	500	0.8
Honduras	400	0.7
West Indies	360	0.6
<b>Australasia</b>	<b>1 111</b>	<b>1.9</b>
Australia	1 111	1.9
<b>Total</b>	<b>58 916</b>	<b>100.0</b>

Source: Tayama (1988).

**Table B2.** Distribution of world imports of cut flowers, 1986.

	Value	Share
	A\$m	%
<b>Europe</b>	<b>1 990.8</b>	<b>77.6</b>
West Germany	978.1	38.1
France	221.1	8.6
United Kingdom	180.8	7.1
Netherlands	125.6	4.9
Italy	70.1	2.7
Belgium-Luxembourg	51.0	2.0
Denmark	37.9	1.5
Ireland	9.5	0.4
Greece	1.7	0.1
Switzerland	136.1	5.3
Austria	72.4	2.8
Sweden	60.5	2.4
Norway	30.2	1.2
Finland	12.6	0.5
Spain	3.1	0.1
<b>North America</b>	<b>486.2</b>	<b>19.0</b>
United States	442.9	17.3
Canada	43.3	1.7
<b>Asia</b>	<b>75.5</b>	<b>7.4</b>
Japan	55.1	2.1
Singapore	9.5	0.4
Hong Kong	10.8	0.4
<b>Middle East</b>	<b>8.0</b>	<b>0.3</b>
Saudi Arabia	4.9	0.2
Kuwait	1.9	0.1
United Arab Emirates	1.2	0.0
<b>Australasia</b>	<b>4.1</b>	<b>0.2</b>
Australia	4.1	0.2
<b>Total</b>	<b>2 564.5</b>	<b>100.0</b>

Source: Tayama (1988).

**Table B3.** Sources of Japanese imports of cut flowers, 1992.

	Value	Share
	A\$m	%
Netherlands	75.8	33.8
Thailand	49.5	22.1
Taiwan	20.5	9.1
New Zealand	19.3	8.6
Singapore	17.7	7.9
Australia	15.3	6.8
United States	7.8	3.5
Colombia	5.0	2.2
Mauritius	2.7	1.2
South Africa	1.8	0.8
Malaysia	1.3	0.6
Brazil	0.8	0.4
Israel	0.8	0.4
Spain	0.8	0.4
Mexico	0.4	0.2
Others	4.8	2.1
<b>Total</b>	<b>224.1</b>	<b>100.0</b>

Source: Kawata (1994).

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## **Working Group Papers**

# The Philippine Cut Flower Industry: Issues and R&D Interventions

Dr F. Lantican\*

The cut flower industry is a sunshine industry in the Philippines.

The domestic market for cut flowers has grown quickly because of:

- rapid population growth (2.4 per cent a year);
- the influx of tourists;
- the rising number of flower shops, hotels, banks and restaurants; and
- an increase in consumer awareness.

Once just a hobby, growing cut flowers is now a viable export industry with good potential for growth, given the country's inherent advantages of:

- tropical and semitemperate climates;
- competitive wages and location costs;
- strategic geographic location near major importing countries; and
- availability of production technologies to a limited extent.

## Production and Utilisation

Major cut flower cultivars are orchids, anthuriums, roses, gladioli, heliconia and chrysanthemums. In 1992 about 890 hectares in key supply areas in the country were planted to cut flowers, with a total production of 15.2 million dozen. Most local production goes to the domestic market.

## Foreign Trade

### Exports

Exports of fresh cut flowers (cut flowers and buds; roses and orchids) reached US\$340 600 in 1992 and increased further to US\$625 000 in 1993. In terms of quantity, fresh cut flower exports in 1993 were about

127 Mt, more than double the previous year's volume. The major markets for Philippine fresh cut flowers are Japan, France, Hong Kong, Spain and Guam.

The value of exports of dried flowers was negligible (US\$4100) in 1993 in contrast to the 1992 value of US\$152 000. The markets are fairly dispersed — the United States, Spain, France, Australia and the United Kingdom among others.

Despite the upward trend in cut flower exports, the Philippines has lagged behind its Asian counterparts such as Thailand and Malaysia in developing its export markets because local growers have failed to meet the foreign buyers' quantity and quality requirements.

### Imports

Imports of fresh cut flowers declined significantly from US\$337 400 in 1992 to US\$145 700 in 1993 partly because of the increase in domestic production brought about by the expansion in area planted to anthuriums, roses, orchids and gladioli. The major sources are Malaysia for chrysanthemums and Thailand for orchids.

## Issues Shaping the Development of the Philippine Cut Flower Industry

### Institutional support

The industry is currently supported by government agencies such as the Departments of Agriculture, Trade and Industry, and Science and Technology, and academia. Cut flowers are among the commodities included in the Bill on High Value Crops, the Department of Agriculture's Key Commercial Crops Development Program and the Department of Science and Technology's Science and Technology Agenda

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for National Development (1990s). This indicates the high priority given to the industry in terms of technical and financial support to promote the industry.

The private sector actively participates in the industry through cooperatives, federations and other non-government organisations. There has been a rapid increase in the number of cooperatives and associations (22) in major production areas. They provide:

- assembly points or marketing arms for the grower members' produce;
- venues for information dissemination and training of members about production and post-production technologies and practices;
- a source of planting materials, fertilisers and chemicals at lower prices; and
- a conduit of credit provided by the Land Bank of the Philippines.

The National Federation of Cutflower and Ornamental Plant Growers of the Philippines aims to unite its 16 member cooperatives nationwide. It arranged the visit of a Dutch mission to the country in 1992 and the sharing of experiences and expertise in anthurium and rose production with cooperative members in Visayas (Bacolod, Iloilo and Capiz) and Mindanao (Davao City, General Santos City and Cotabato).

Non-government organisations such as FRLD (Foundation for Resource Linkage and Development), SGU, Plan International and SVO have an active role in the industry.

- FRLD, in conjunction with DA-ASAP and USAID, conducted a comprehensive study of cut flower marketing systems in major production and demand areas in the country in 1992.
- They foster effective linkages between cut flower growers and propagators and breeders of quality planting materials, and between cut flower growers and potential buyers.
- They sponsored a seminar on the opportunities and prospects of the cut flower industry and invited resource persons from the United States, Singapore and Malaysia.

### **Government tariff and non-tariff barriers**

Breeders and growers who import planting materials to improve the quality of their planting stocks have complained of the high tariffs:

- 3 per cent for dormant bulbs, tubers, etc. and orchids in flasks;
- 10 per cent for orchids in community pots; and
- 50 per cent in July 1991 (reduced to 30 per cent in July 1995) for all others.

BPI procedures — centralised policy in granting import permits (Malate and Manila) — causes delays in imports of planting materials. Breeders and growers from Visayas and Mindanao argue that regional offices can perform such functions, which would eventually lead to savings in time, effort and resources. The processing of import documents can take as many as seven days and only the BPI Director signs all the documents.

The BPI also sets the limit on the number of flowering plants (8) and types (community pots and seedling types only) of planting materials to be imported.

The plant quarantine process results in high inspection and certification fees charged for import and export permits. Charges for these are based on the number of plants inspected by the plant quarantine officer. Because plant quarantine and customs inspectors are not familiar with all of the varieties and pests of imported plants, there are delays in the documentation and release of shipments, and wrongly prescribed treatments for perceived infestations. Phytosanitary certificates take up to seven days to be issued. The exporters should be allowed to treat their own plants following BPI procedures.

### **Inadequate infrastructure system**

Bad road conditions from the production sites to the demand centres is a major industry concern. Access to the major cut flower producing barangays in Benguet and Cebu is hampered by unpaved roads, especially during the wet season, which is the main cropping season for cut flowers. The road conditions are also responsible for delays in the delivery of produce to market centres and the high costs of transport.

Inadequate and inefficient communication facilities are also a problem. Orders are usually made by telephone but many transactions fail because of inefficient telephone systems.

Traders, particularly in Benguet and Davao City, complain of their inability to get timely information on prices and the supply and demand situation.

Growers rely on the phone for market and price information on cut flowers in demand centres. In areas where a telephone system is not available, growers rely on traders as their primary source of price information.

## **R&D support**

### *Production aspect*

Improving the breeding stock and mass propagation (through tissue culture and clonal propagation laboratories and nurseries) has focused on suitable cut flower varieties for cultivation in specific areas, new varieties from indigenous materials, and established cut flower varieties such as anthuriums and dendrobiums. It is hoped that the establishment of breeding centres in key cut flower producing regions will fill the need of growers for new planting materials.

Pest management requires understanding of the basic biological nature of the more serious pests (weevils, beetles, thrips and mites) and consequently the development of management strategies. Research covers biological control, including parasitoids, predators and pathogens; the searching capacity for parasitoids and predators; the rate of host consumption; the efficiency in reducing the host (pest) population; and the effectiveness of microbial pathogen (species and strain, and method of application).

There has been intensive research on diseases of cut flower planting stocks, with focus on perennial diseases that affect productivity, such as stem and root rot for orchids, bacterial blight for anthuriums, bacterial wilting for chrysanthemums, and corn rotting for gladioli. Newly discovered diseases must also be looked into. Studies must include effects on planting stocks, the seasonality of occurrence, the level of tolerance to chemicals, the habitats and the hosts to properly identify and control diseases. Potential biocontrol agents should be examined, and integrated control strategies should be developed.

Fertiliser and chemical application studies for culture management could be ideally conducted through a government and private sector partnership.

### *Post-production and marketing aspects*

The main objective here is to determine the post-production (packing house) operations that could be employed to extend the vase life of priority cut flowers (orchids, anthuriums, chrysanthemums and gladioli) and prepare the product for the market. Specific post-production operations that need to be investigated for specific cut flowers include the following:

- pretreatments of cut flowers (physical and chemical treatments) prior to packaging, to evaluate the vase life of presoaked priority cut flowers in various holding positions;
- pilot testing of modified atmosphere on priority cut flowers during storage and transport under simulated and actual transport to Japan, Hong Kong and Korea to evaluate the effect on the vase life of cut flowers;
- pilot testing of the use of ethylene absorbents during the storage and transport of cut flowers under simulated and actual transport to Japan, Hong Kong and Korea to evaluate the effect on the vase life of cut flowers; and
- verification trials on the applicability of developed alternative quarantine treatments on Philippine grown cut flowers.

### *Consumer preferences for specific cut flowers*

The study intends to identify specific cut flower types and varieties that are preferred by different consumer groups:

- by location — rural compared with urban;
- by income level — low, medium and high;
- by institutional buyers — hotels, banks, restaurants and fast food chains;
- by the characteristics of cut flowers — colour, size, stem length and maturity (for example, bud, half bloom or full bloom); and
- by packaging materials.

The study also aims to estimate the elasticities of demand for priority cut flowers that can be used in forecasting demand.

# The Present Cut Flower Industry in Indonesia

Dr B. Tjia\*

Old traditional methods of growing, transporting and marketing flowers are still in practice today in Indonesia. They are remnants of colonial days. Plants are mostly grown in open fields and are therefore exposed to environmental elements. Cultural practices rely mostly on cheap sources of production supplies — for example, manure for fertiliser — and maintaining motherstock with no improvements or other soil supplements. Protected growing under structures is very rare. Commercial cultivation of cut flowers for domestic use is influenced by the Dutch from colonial days, who used temperate region plants, which through decades of cultivation in this tropical climate have adapted to the local environment. These plants include polyanthus, roses, gladioli, Easter lilies, asters, chrysanthemums and dahlias.

The production of orchids has gained some momentum recently. Arandas, scorpion orchids and some other hardy species are grown under full sun. There is a trend toward growing other types of orchids, such as dendrobium, phalaenopsis and cattleya, under saran or other simple structures.

It stands to reason that the quality of flowers is not consistently good and depends on the time of year, since quality is dictated mainly by the frequency of rainfall during the wet season.

There is minimal disease and insect control — often none.

The harvesting and transporting of flowers to collection areas, markets, and/or the final consumer are done mostly without any knowledge of scientifically based information so as to increase vase life and aesthetic appearance. Village growers handle flowers pretty much as they do vegetables. Flowers are dumped on their side and stacked in open trucks. Frequently one or more people ride along on top of the flowers. They are unloaded in the same fashion — that is, tossed out of the truck onto the ground — upon arrival at the market.

\* Paradisa, Bogor.

The small scale growers living close to the city or market, transport their flowers neatly arranged on the back of a motorcycle through traffic jams in the heat of day (30–33°C), pollution from cars and dust.

Pretreatments and hardening processes are unheard of and no growers have refrigeration. Hence flowers are harvested and shipped in the evening of the same day. Collection centers and marketplaces do not have any cooling facilities either; nor do most florists. Flower arrangements are often delivered on the back of a bicycle or motorcycle, once again exposed to heat, car fumes and dust. Hence, flower parcels do not last more than one or two days at the final consumer's place except if they are orchids, carnations and anthuriums, with orchids lasting the longest. Roses will not even last one day in the home and are often delivered when fully open. The above practices cause the public to be less than enthusiastic about purchasing flowers.

There is the potential to increase flower sales if keeping quality can be increased. This is the reason why most consumers prefer orchids to other flowers, because of their longer vase life. Even the vase life of orchids can be improved by a factor or two.

Several cut flower operations belonging to wealthy conglomerates and individuals in Java and Sumatra are run in a more contemporary and professional way. These companies grow their products in greenhouses, have coolers at their farms and distribution centres, and hire overseas graduates or foreign growers and managers to run their operations. Consequently, they produce better and more consistent quality flowers because they are less affected by the prevailing weather. Not surprisingly, their products are flowers that are widely popular in western nations, such as roses, carnations, chrysanthemums, anthuriums and Asiatic hybrid lilies, which are mostly imported from the Netherlands.

Tropical plants abound in Indonesia, whether of endemic or imported origin, but they have not yet been as intensively cultivated and used as they should

have domestically, or explored as a possible export commodity. They include cut heliconias, gingers, calatheas and ornamental bananas and pineapples.

The following restraints confront the present cut flower industry in Indonesia.

- Conglomerates or wealthy individuals with big operations are not willing to talk to smaller scale growers or other interested parties in the business, let alone share information, because they themselves had to pay for the technology.
- Government involvement in, for example, research and dissemination of information on cut flower production is minimal. Research results gather dust in the library because there is no avenue to convey them to small scale growers in particular. There is little support and funding for the betterment of the

industry. However, the President recently promised to increase funding in the public sector for horticulture in general.

- Both public (state) and private universities do not offer any specific practical courses on ornamentals, cut flowers or flowering pot plants.
- There are no specialists available in the field of ornamentals, particularly in the post-harvest life of cut flowers and foliage, and flowering pot plants.
- Indonesian scientists still practise a closed system, in that they do not readily discuss their findings with colleagues in the same field.
- Literature is scarce in Indonesia and there is no grower magazine to help the small scale grower with more accurate and practical information.

# The Floriculture Industry in Malaysia

Mr M. Singh\*

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## Background of the Floriculture Industry

The floriculture industry is one of the agricultural industries that show impressive market potential. This industry has grown rapidly over the past decade. Traditionally, floricultural products have been divided into two main groups: cut flowers and ornamental plants and foliage.

In Malaysia, floricultural products consist mainly of fresh cut flowers comprising tropical orchids and temperate flowers. Ornamental plants are becoming more popular as part of the floriculture industry.

## Area

The total area devoted to the floriculture industry in Peninsular Malaysia in 1994 was around 1400 hectares. Tropical orchids accounted for 43 per cent of this area and highland varieties account for almost 28 per cent, the balance being cultivated with ornamental and landscaping plants, mainly in Selangor and Johor. The industry is characterised by small scale production spread over the whole country.

## Domestic consumption

According to a FAMA consumption survey, total domestic consumption in 1992 was M\$23.8 million. Estimated domestic consumption is currently M\$30 million or M\$1.70 per person — equivalent to 2–3 stems.

## Trade

While production and domestic consumption has increased rapidly over the past five years, of greater significance to the floriculture industry in Malaysia is its export performance. Exports increased from M\$23.1 million in 1988 to M\$59.1 million in 1992, but appear to have declined to M\$44 million in 1994.

Exports of fresh cut flowers are largely to the regional markets of Hong Kong, Singapore, Japan and Thailand. Other than a minor breakthrough to the United Arab Emirates in the Middle East, exports to other markets such as Western Europe remain small.

## Supply

Local production supplies most of the cut flowers and ornamentals in the domestic market though there are some imports. Local production increased from an estimated M\$8.14 million in 1986 to M\$34.3 million in 1990. Total local production in 1994 was estimated to be 221 million stems, with highland flowers accounting for 150 million and lowland flowers 71 million stems. Total imports of fresh orchids, other cut flowers and foliage amounted to M\$2.3 million in 1988, rising to M\$9.2 million in 1991 before tapering off a M\$3.2 million in 1994. Singapore, the Netherlands and Taiwan are the main import sources.

## Distribution

The producers themselves play a strong role in the distribution systems for floricultural products in Malaysia. About 75 per cent of producers distribute directly to local retail outlets and liaise directly with importers in overseas markets.

## Problems and Issues of the Floriculture Industry

Though the floriculture industry in Malaysia has made progress in recent years it is not without problems. Orchids, for example, have been cultivated in the country since the 1960s but have failed to make any major impact in local and overseas markets compared with the success of Thai or even Singaporean products in recent years. Some of the major problems facing the floriculture industry in Malaysia are now briefly discussed.

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### **Lack of new varieties**

As successful market penetration and expansion rely on product differentiation, Malaysia lags behind its competitors in developing new varieties of orchids. Breeding programs have not kept pace with changing consumer preferences in colours, blooms and other characteristics of the flowers. The scenario for temperate flowers is slightly better but only through adaptation rather than through R&D efforts.

### **High establishment costs**

The overhead costs in establishing flower farms are high — M\$200 000 for an orchid farm and an estimated M\$210 000 for temperate flowers per acre, excluding operating costs.

In the case of lowland flowers planting materials make up about 60–70 per cent of total costs while for highland flowers land development and sheds are the main cost contributors. While high overhead costs limit the number of entrepreneurs in the industry, difficulties in obtaining funds from financial institutions for a 'risky' business further compound the situation.

### **Limited cargo space**

Limited cargo space for floricultural products (as for fruits) limits market expansion for these very perishable products, especially temperate flowers. This, coupled with infrequent flights and wide price variations in overseas markets, makes floriculture a risky business. The recent increase in freight rates threatens to undermine Malaysia's competitive position in fresh cut flower exports.

### **Limited marketing facilities**

Limited sales outlets in the domestic market and limited marketing infrastructure (packing houses, fumigation, transport and cold-room facilities) are other problems. Such facilities at the farm level and point of export are inadequate and efforts are being made to address these in the Seventh Malaysia Plan.

### **Grades and standards**

Grades and standards are just being developed. In their absence trade practices are arbitrary compared with the grades and standards of the more developed markets. Standardisation in packing and labelling also needs to be addressed.

### **High import duties**

A more pressing problem now is high import duties imposed by neighbouring countries such as Thailand (60 per cent), Taiwan (35 per cent) and the Republic of Korea (25 per cent). Such duties are detrimental to the growth in exports of Malaysian fresh cut flowers to regional markets. Europe also has high duties during summer.

### **Other constraints**

Other constraints include limited market promotion activities, market information and market extension, poor market transparency, land shortage and stringent phytosanitary conditions imposed by certain countries, including Japan.

## **Market Potential for Floriculture**

While there are inherent problems and constraints facing the floriculture industry in Malaysia, the outlook for the industry is bright. Current problems in the industry are not totally insurmountable and action is already under way to minimise if not overcome them. It is expected that by the end of the current development plan some progress will have been made by the government, including the provision of facilities to ensure orderly growth of the industry. The private sector is expected to play a role in this respect.

The strategic options open to floriculture in Malaysia are in the choice of markets — domestic or export. In essence, both options are attractive. Market potential for floriculture can therefore be analysed at two levels — the domestic market and the export markets.

### **Domestic market potential**

Domestically the floriculture industry is enjoying steady growth. Trade in the domestic market has increased rapidly over the past ten years. Increasingly domestic production has been substituted for imports and imports of fresh cut flowers decreased from M\$1.17 million in 1980 to M\$0.40 million in 1994.

Domestic consumption was estimated at M\$2.44 million in 1986 and M\$24 million in 1992. On a per person basis, consumption was estimated to be M\$1.35 in 1992, up from about M\$0.47 in 1988. The current per person consumption of M\$1.70 is equiva-

lent to about 2–3 stems. Per person consumption is therefore very low, giving tremendous scope for exploiting domestic market potential in the years to come. Three factors will make this possible:

- greater economic development and the consequent rise in household incomes;
- a faster rate of urbanisation in the country; and
- an increase in the population.

Domestic consumption rose by about 65 per cent in the period 1986–90. Prospects look brighter over the next five years as there is no reason to believe that this cannot be increased further. It is estimated that per person consumption of fresh cut flowers will increase to M\$2.40 over the next five years, an increase of about 10 per cent a year. This would place domestic consumption at M\$49 million in 2000, M\$22 million above the present level. This in itself augurs well for the floriculture industry in Malaysia.

### **Domestic market strategies**

However, to fully exploit the domestic market potential, action must be taken on a broad front.

#### *Market promotion*

Market promotion by both producers and marketing agencies to increase consumer awareness and acceptance of fresh floricultural products needs to be stepped up. Such action is necessary to increase local consumption all year round. Current government programs including the annual Pesta Flora and other flower shows have helped to boost local consumer interest in fresh cut flowers.

#### *Mass merchandising*

A necessary prelude to developing the local floriculture industry is a mature domestic market for fresh floricultural products. Towards this end imaginative marketing strategies are needed to increase domestic demand. The traditional florist — with limited markets, promotional activities and high prices — can play only a limited role.

In large urban centres the strategy will entail enticing domestic consumers to buy from convenient, bulk display shelves for personal, casual use. Such a strategy points at mass merchandisers (supermarkets and hypermarkets) which have the obvious plus points — namely, detailed retail sales plans and

promotional budgets — that can be translated into high consumer traffic through their premises.

#### *Marketing infrastructure and channels*

While vegetable and meat wet markets, together with some florists, market floricultural products, more market outlets need to be developed. In most major towns in Malaysia there is a dearth of retail outlets for floricultural products. Kuala Lumpur may be an exception although its estimated 600 retail outlets are hardly noticeable. Cold rooms and refrigerated trucks for local transportation linked to centralised or regionalised collection and storage facilities prior to sale also will facilitate domestic demand by increasing marketing efficiency.

#### *Increased market transparency*

To sustain producer interest and viability there is a need to increase market transparency in the floriculture industry. The existing system, which includes consignment sales, does not pay premiums for good quality and the rules of demand and supply in pricing do not normally operate. The situation is further compounded by an 'open account' system of payment, which translates into late or even non-payment, high arbitrary discounts and commissions. In the face of irregular incomes to producers an auctioning system to increase market transparency is planned for implementation.

#### *Improvements in farm practices and post-harvest handling*

As consumers become more discerning, marketeers of floricultural products need to increase value-added activities such as grading and better product presentation to get a larger share of the consumer dollar.

### **Export potential**

The second and perhaps the more attractive strategic option open to the floriculture industry in Malaysia is to aggressively penetrate the lucrative export markets in East Asia, Australia, the Middle East and Western Europe. Over the past decade the country's export performance in floricultural products was good, and increasing exports will see rapid development of the industry.

Internationally, trade in floricultural products is growing. World imports of fresh cut flowers almost

tripled from about US\$2 billion in 1986-87 to about US\$6 billion. The annual consumption of flowers and plants worldwide is US\$43 billion and by 2015 will be double that.

Traditional suppliers of these products are being replaced by developing nations and there has also been growth in demand in new markets. The International Trade Commission (UNCTAD-GATT) has estimated that annual growth in floricultural trade has been about 15 per cent in the recent past.

In taking advantage of this growing world market for floricultural products, the Malaysian strategy in penetrating the export trade will hinge on a number of positive advantages.

#### *Exploiting off-production periods*

Out of the two main seasons for flowers — summer and winter — the latter offers scope for Malaysia. While the winter is a season of high demand it is also coupled with lower production in major consuming countries. Such a situation is also reflected in higher prices — about 15–20 per cent — offering market opportunity for countries such as Malaysia that do not have wide climatic variations. Floricultural products, including those that can withstand low temperatures, will find wider markets in the period November–April, which favours tropical countries.

#### *Increasing market share in world markets*

Total exports of cut flowers from Asian countries make up 10–15 per cent of total world imports. Growth in the past few years has been negligible even though trading volumes of cut flowers have doubled. Countries such as Malaysia, while having made inroads to world markets, have not kept pace with the overall growth in world trade. Educating consumers in Western Europe, the United States and perhaps even South Africa will create new markets. In addition to cut flowers, Malaysia also has potential to increase exports of potted plants and foliage.

#### *Proximity of emerging markets*

The Far East markets consisting mainly of Japan, Hong Kong, Taiwan, the Republic of Korea and Singapore offer the greatest scope for exports from Malaysia. The per person consumption in Japan is estimated to be one of the highest in the world at M\$120 a year. In South Korea annual per person con-

sumption is M\$30 and in Taiwan M\$15. Japan has enormous potential for further growth but its stringent phytosanitary requirements and grading, product presentation and, most importantly, price competitiveness demands must be met first.

#### *The competitive ringgit*

Over the past 2–3 years the competitive Malaysian dollar (ringgit) compared with the currencies of the newly industrialised economies has boosted floricultural exports regionally. The appreciation of the Taiwanese dollar in 1992-93 forced Hong Kong to look at cheaper import sources such as Malaysia from where about 50 per cent of its requirements are sourced. This competitive edge still prevails.

In terms of export projections, the trend over the next five years will see the industry sustain its present level of growth. On this basis, exports can be projected to increase slightly more than fourfold from the present level to reach M\$120 million by the end of the Seventh Malaysia Plan. The greatest limiting factor to increased exports of floricultural products in the next couple of years will be air cargo space.

#### **Export market strategies**

While there is good export market potential for a small producer such as Malaysia, it is important when developing and increasing the country's share of world exports to have effective marketing management of floricultural products that includes the following features.

#### *Quality and consistency of production*

Quality products imply quality control through post-harvest handling, including temperature management from farm to final consumer, fumigation to meet importers' requirements and good product packaging and presentation. Quality products, even when priced higher, sell well as against cheaper and poorer quality ones.

#### *Commercial cultivation*

Commercial cultivation must be the basis for cut flower production. This implies not only large scale production but professional management to meet requirements and suitable product mix.

### *Development of new varieties*

The industry must constantly have something new to offer. New varieties command higher prices, especially during the lead period of 1–3 years.

### *Brand names*

Brand names are important for image and discriminating buyers. The white lily from the Netherlands is sold as 'Casablanca' in Japan and has been a hit there.

### *Market promotion and research*

Sustained market promotion projecting high quality Malaysian produce does open markets and develops trade. The Dutch penetration of the Japanese market was through market promotion over a few years and an intensive consumer preference study. Malaysia does produce high quality orchids but these tend to be

associated with neighbouring countries, as exports are channelled through them.

## **Conclusions**

The floriculture industry in Malaysia appears to have got out of its gestation period over the past 2–3 years and is heading for growth over the next decade. While there are still critical problems to be resolved, these are not totally insurmountable. Close attention must be given to resolving these problems, with positive support from the government sector. The provision of adequate market infrastructure and a long term solution to inadequate air cargo space and services will have to be given top priority if the industry is to sustain its growth and develop further. It would then not be unreasonable to believe that the enormous growth in the floriculture industry overseas and in Malaysia in recent years will not continue.

# Cut Flowers in Thailand

O. Pituck and Dr S. Lekawatana\*

## Production

Thailand is a tropical country with a total area of 320 million rai (a rai is about 2.5 hectares). It is located between latitude 5°N–21°N and longitude 97°E–106°E. It is mostly flat, has an average temperature range of 23.7–32.5°C and high rainfall. The northern part of the country is hilly and relatively cool. The total agricultural area is 21.6 million hectares.

Only 6383 hectares are devoted to cut flowers — only 0.03 per cent of the total agricultural area. Seventy per cent of this area is in Bangkok and neighbouring provinces — namely Nonthaburi, Pathum Tahni, Nakhon Pathom, Samut Sakhon, Nakhon Nayok and Ratchaburi — where there has long been cultivation of flowers and ornamental plants. Since Bangkok is the centre of transportation, it serves as the centre of cut flower production, distributing the produce to all parts of the country. Moreover, the city has an international airport, facilitating the export of cut flowers.

The rest of the production area is scattered in big provinces with large populations and tourist attractions — for example, Chiang Mai, Chiang Rai, Nakhon Ratchasima, KonKaen, NongKhai and Songkhla.

The top five economic cut flowers of the country are orchids, jasmine, lotus, marigolds and roses. Their total area of cultivation is about 80 per cent of the cut flower cultivation area. These flowers are exported in large quantities. Other cut flowers that are in regular demand are chrysanthemums, milk weed, asters and gerberas. Thailand can also produce certain kinds of temperate flowers in the highlands of the north or areas that enjoy cold weather in the cool season — for instance, gladiolus, carnation, lily, gypsophilla, and alstromeria. These flowers are in great demand but the quantity produced is insufficient.

At present, the policy is to encourage cultivation and consumption of other tropical cut flowers, such as patumma (*Curcuma arismatifolia*), heliconia, anthurium, tuberose, red ginger and torch ginger, which can yield high quality flowers in all parts of the country. In the past they have not been very popular with consumers and growers.

The production of cut flowers in Thailand is determined by the market. That is, growers will start to cultivate or extend areas devoted to a particular flower only when they are certain of the demand. As many flowers cannot be produced in a short time, growers do not want to take any risk.

Some growers in certain areas begin to cultivate cut flowers through the suggestion of local collectors. They will buy the flowers and deliver them to the market. Thus the demand of cut flowers in Thailand can be estimated from the total production of all the flowers.

Farm numbers and production areas for selected cut flowers in Thailand, 1994.

	Number of farms	Production area	Average prod. area per farm	Production (stems)
	no.	ha	ha	million
Orchid	1 965	2 306	1.17	994.00
Jasmine	3 626	852	0.24	14.00
Lotus	483	704	1.46	19.00
Marigold	2 736	644	0.24	206.00
Rose	1 343	626	0.47	331.00
Chrysanthemum	1 086	160	0.15	101.00
Aster	621	65	0.11	na
Gerbera	825	59	0.07	20.00
Gladiolus	408	36	0.09	na
Gompherea	289	10	0.03	na

\* Flower and Ornamental Plant Subdivision, Horticultural Crop Promotion Division, Department of Agriculture Extension, Bangkok.

na Not available.

Source: Survey done by Department of Agricultural Extension.

There are about 11 720 growers of cut flowers in Thailand. Cut flower production in Thailand is carried out mostly by small scale growers on an average of 0.5 hectares per farm.

The largest production area per grower is allocated to lotus. This is because this flower is easy to care for and is mostly grown in former paddy fields. The second largest production area per grower is for orchids. This is because most growers have worked with orchids for a long time and they are quite well off. There are several companies with large production areas, making the average area per farm quite high.

The average area per farm cultivated for a particular kind of cut flower depends on the difficulty of its care and market demand. For example, for chrysanthemums, gerberas and gladioli, which are harder to take care of, the average area per farm is rather low. As for globe amaranth, which is easy to take care of but for which demand is low, it is planted in small plots around the house.

Most cut flowers are cultivated outdoors. An exception is orchids, which need to be in shade structures. The production cost of cut flowers is higher than that of field crops or of other horticultural products. Most growers do not fully or correctly use pesticides and fertilisers, and do not give the plants proper care. Growers generally use the same area for production for a long time, resulting in accumulated diseases from pests. The problem is solved by moving on to other areas. Therefore, at present the tendency is for cut flower production to move out of the outlying areas of Bangkok to neighbouring provinces.

The major problems in cut flower production in Thailand are:

- a lack of new varieties and good distribution systems;
- limited research on propagation, the control of pests and diseases, the quality of production and post-harvest handling;
- no commercial production of plant materials;
- no distribution of new technology and market information to growers; and
- a lack of capital on the part of the growers, which prevents them from using technology that is new and costly.

## Consumption

Consumption of cut flowers in Thailand depends on festivals and celebrations — for example, in January–February there is New Year's Day, the end of the school year and Valentine's Day. In summer, March–June, flower consumption is quite low as it is the vacation period and there are few festivals. Consumption increases in July, which is the month of graduation. After this month consumption decreases to the average level and remains so until November. It picks up in December. According to a survey of florists in Bangkok, the day of the highest number of sales of flowers is Valentine's Day, the month with the highest number of sales is December and the months with the least number of sales are April and May.

Cut flowers that are in biggest demand in the country are still those used as offerings to the Buddha — namely, lotus, orchids and roses. In major cities, however, tastes for cut flowers differ. Preference is given to exotic and high quality flowers. A survey of the favourite flowers of florists in Bangkok in 1993 showed lilies at the top of the list, with roses and carnations close behind. These are temperate flowers that have to be imported as they cannot be produced in great quantity locally. However, orchids and tropical cut flowers that are produced in the country are among the top ten favourites.

The use of flowers in Thailand can be classified on the basis of the following purposes.

- In religious rites, such as offerings to the Buddha, at ordination ceremonies, funerals and festivals. At present about 80 per cent of cut flowers are used for these purposes by consumers in urban and rural areas. They are in great demand on Buddhist holy days and important religious occasions. Popular flowers for these purposes are jasmine, lotus, marigolds and solidago.
- On celebration and other important days, such as New Year's Day, Songkran and Loy Krathong. Popular flowers on these occasions are marigolds, jasmines, roses, orchids and globe amaranth.
- For decoration in offices and buildings, such as restaurants, hotels, hospitals and department stores. Flowers for this purpose need to be of higher quality than those for the two previous purposes. Popular flowers are roses, gerberas, chrysanthemums and orchids.

- As gifts and congratulatory messages on various occasions, such as the opening of an office, wedding, graduation, promotion and Valentine's Day. Flowers for these purposes are of high quality. They are mostly gladiolus, chrysanthemums, roses, carnations, gerberas, gypsophilla and peacock, some of which are imported.

At present the demand for cut flowers for decorating offices and buildings and for gifts is increasing because of better economic conditions. People appreciate flowers more and there have been more campaigns about the environment and using natural objects.

In Thailand flowers are:

- put into bunches with decorative leaves and used as offerings to the Buddha;
- made into mixed bouquets for special occasions;
- arranged in baskets or bouquets;
- put into vases or arranged as decorations;
- made into wreaths and coffin decorations;
- made into garlands; and
- dried and made into pot pourri.

## Marketing

Cut flowers in Thailand are exported; distributed through local markets, and markets of neighbouring

provinces; and distributed through large flower markets or wholesale flower markets.

### Exports

Most growers do not export their products. There are export companies that buy flowers from growers and pack them in boxes ready for export. These companies grow flowers themselves but not sufficient to meet the demands of foreign markets. They, therefore, have to buy from growers. Cut flowers distributed in this manner are orchids. Most other cut flowers are exported by producers. Only some are distributed through exporters. If the quantity of flowers is less than market demand, the exporters will buy from growers whose produce is of high quality. Flowers that are distributed in this way are roses, chrysanthemums, lotus and ornamental pineapple.

### Distribution in local markets and neighbouring provinces

This kind of distribution is for low quality flowers whose consumers are in the province or neighbouring areas. Quality is not the main concern. The demand of local markets is generally constant and quite large on a daily basis.

Growers of the flowers for these markets do not make much use of production technology. They let

### Floricultural exports and imports by Thailand.

	1991		1992		1993	
	Quantity	Value	Quantity	Value	Quantity	Value
	tonne	US\$m	tonne	US\$m	tonne	US\$m
<b>Exports</b>						
Cut orchid	12 399	26.5	11 142	28.1	12 375	29.9
Orchid plant	920	3.6	939	3.5	911	3.3
Other live plants	643	0.9	778	1.2	950	1.0
Dried flower	680	2.1	971	2.3	601	1.6
Dried foliage	325	0.5	336	0.5	582	0.8
Cut foliage	45	0.01	87	0.1	95	0.5
Cut flower	35	0.1	9	0.02	9	0.04
Total	15 047	33.71	14 262	35.72	15 523	37.14
<b>Imports</b>						
Cut flowers	363	1.3	503	1.6	471	1.5
Other live plants	81	0.6	21	0.5	62	0.9
Total	444	1.9	524	2.1	533	2.4

the flower grow naturally without much care. Production cost, therefore, is low and growers do not lose money even though they sell their flowers at low prices. Growers generally sell their product to local merchants at low prices. These merchants then deliver the produce to retailers in the local markets where it reaches the consumers.

#### **Distribution through central flower market or wholesale flower market**

For this kind of distribution, growers have to produce in great quantities and must not be too far from the market. Local collectors, who may be growers themselves, will buy from individual growers. When they have collected flowers in sufficient quantities they deliver them to a central flower market or wholesale market in Bangkok or Pak Khlong Market. Retailers come here to buy flowers which they then sell to

florists, stalls and street vendors. Buyers are hotels and general consumers.

### **Pricing**

Prices vary according to demand, flower quality and the type of market and fluctuate in a year due to surroundings and climate. For temperate flowers that require low temperatures, the northern produce gets higher prices than that of other regions. For tropical cut flowers, average prices do not vary much.

When prices are high, imported flowers, most of which are temperate ones, are priced higher than local flowers. Prices of imported temperate flowers are higher between November and February and in July, while the prices of flowers produced locally are high in the three months, December, January and February. Prices are lower in September.

# The Export and Wildflower Sectors of the Cut Flower Industry in Australia

Mr K. James\*

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## Industry Overview

As is the case with other Southeast Asian floriculture industries, reliable industry statistics are not as readily available as is desired and are often inadequate or unreliable due to a variety of reasons.

How big is the Australian flower industry? Domestic production is estimated to be valued at A\$270 million at the farm gate and A\$350 million at the retail level. The production area is around 4000 hectares. Exports are about 10 per cent of domestic production and presently exports are valued at A\$26.67 million. The domestic production estimates vary from the 1993-94 ABS survey figures (A\$129 million at the farm gate). Until improved data collection is available, debate about the exact size of the Australian floriculture industry will continue.

## Australia's Unique Flora

Australia is an island continent of about 7.7 million square kilometres that has been isolated for millions of years. The climate varies markedly from the tropical north to the temperate south and from the arid centre to the moist eastern coast. Such climatic differences, combined with changes to topography and soils, provide a wide range of environments for plants, from tropical rainforests to barren deserts, alpine tracts and sandy plains. It is not surprising, therefore, that Australia has some of the most diverse and remarkable flora in the world.

There are 15 000 species of flowering plants, 500 species of ferns, conifers and cycads and a further 12 500 species of non-vascular plants including mosses, algae, lichens and fungi. The native flowers of Australia are renowned for their uniqueness.

Such individuality is reflected in the large number of endemic species of plants that are found only in Australia. It has been estimated that 33 per cent of Australian genera and a remarkable 85 per cent of species are endemic. The peak of their diversity and endemism is found in southwest Western Australia where many examples abound of large, spectacular plant groups that are confined to this region.

## Native Flower Production

The Australian cut flower industry has come of age in the past 15 years, with large increases in the number of growers and production and a leap forward in technology as well as in the range and quality of flowers produced. The industry is still expanding. It is widely accepted that there is significant growth potential in both the domestic and export markets.

Australia has several natural advantages that promote the opportunity to export flowers and foliage. Australia's varied climate gives many species an extended flowering season, which means a longer period of availability. An example would be waxflower, whose early seasonal production is in Queensland, mid-season in Western Australia and late season in Victoria. When this feature is combined with opposite selling seasons to those in the northern hemisphere and the diverse geographic regions suitable for floricultural production in Australia, it soon becomes apparent that Australia has the potential to produce and export a product range that caters for the world's growing demand of unusual and distinctive flowers.

Two major trends in the past decade have been the increasing interest in cultivating Australian native flora and increasing production of newer and more difficult to grow flowers. As well as a great increase in the diversity of flowers there has been an improvement in the quality and quantity of flowers available.

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\* Executive Secretary, Flower Export Council of Australia, Nedlands, Western Australia.

## Australian Floricultural Exports

As an exporter, Australia's inherent competitive advantage lies in the unique range of indigenous flowers it is able to offer the world market.

The Australian cut flower industry has several distinct sectors producing both traditional flowers, proteaceae and native flowers and foliage for the export market. Australian flower exporters are becoming increasingly aware that they must provide a stable supply of quality product, understand the market and their competition and undertake a well-planned marketing and promotional program aimed at specific countries and market segments.

If quality is managed and marketed effectively, the Australian floricultural industry is well placed to compete with growing volumes of new and unique flowers and foliage in the world marketplace.

Australia's cut flower exports have increased at an impressive rate over the past ten years. Exports rose

from A\$3 million in 1982-83 to about A\$26 million in 1994-95. In volume terms 1994-95 exports were 3661 tonnes to 40 different countries.

Australia exports some 170 different flowers and foliage. Ninety of these are considered significant export products and 15 major export products. The top export products are waxflower, kangaroo paw and *P. Leucadendron* species. The majority of these are now produced under commercial cultivation, but some are harvested from the wild. Most export flowers and foliage originate in Western Australia.

Fresh flower exports predominate. However, dried flower exports are increasing at a steady rate. Much of the indigenous Australian flora is well received by the international market as dried or processed product, mostly exported by sea. There are some 100 major product lines offered for sale by Australian dried flower exporters. The product range includes flowers and foliage that have been processed in some way, being air dried, bleached, dyed, preserved or

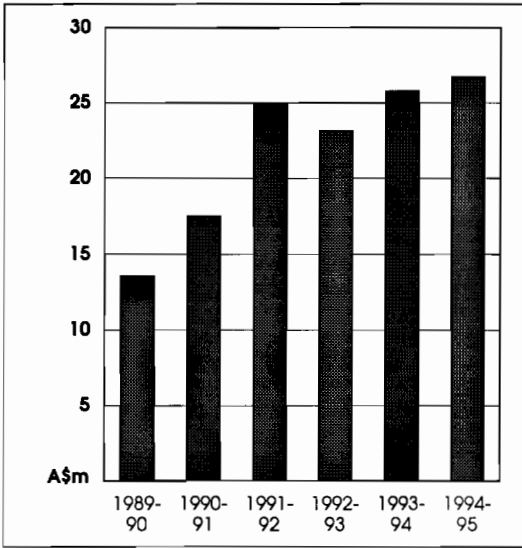
### Australian flower industry enterprises.

State	No. of enterprises	No. of employees	Value of production	Value of exports
<b>Queensland</b>				
Growers	200	800	\$28m	\$1.2m
Retailers	300	800-900	\$40-45m	
<b>New South Wales</b>				
Growers	700	2500	\$80-100m	\$2.1m
Retailers	650	1800-2000	\$90-100m	
<b>Victoria</b>				
Growers	1 000	2000	\$120-160m	\$1.5m
Retailers	700	2 000-2 100	\$90-100m	
<b>South Australia</b>				
Growers	230-350	400-500	\$20-30m	\$0.8m
Retailers	240-260	700-800	\$30-35m	
<b>Western Australia</b>				
Growers	300	800-900	\$40-50m	\$11.4m
Retailers	200-220	600-650	\$30-35m	
<b>Tasmania</b>				
Growers	140-150	420-450	\$6m	\$0.4m
Retailers	100-110	300-350	\$12-15m	
<b>Total</b>				
Growers	2 500-2 700	7 000-7 200	\$250-300m	\$17.4m
Retailers	220-2300	6 200-6 800	\$330-350m	

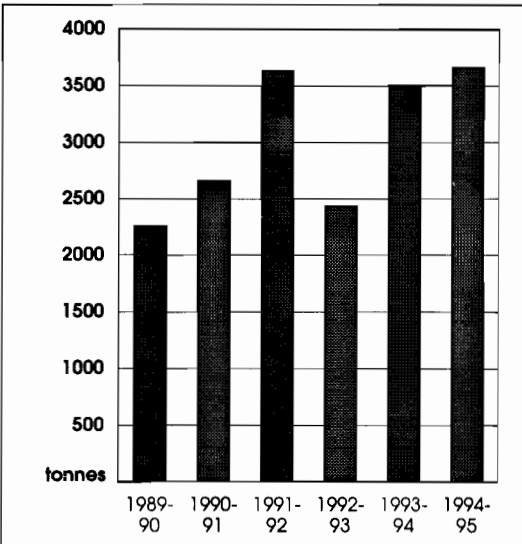
Source: Ruralcorp Consulting Pty Ltd (1992).

freeze dried. Many exports are made to order for special occasions. Most of the dried flower export industry is based in Western Australia.

Australia is also steadily increasing its nursery plant exports, with live plant sales valued at A\$5.23 million in 1993-94.



Australian floricultural exports by value.



Australian floricultural exports by volume.

Western Australia is the largest export state in value and volume terms, followed by Victoria and New South Wales. Orchids are the highest value export product, the majority being produced in New South Wales. Victoria, New South Wales and Tasmania are producing quality lilies, tulips, alstroemeria, limonium and statice for export. Queensland exports have shown marked growth in recent years.

Australia's major export customer for cut flowers and foliage is Japan. Japan takes 48 per cent of Australia's exports by value and 43 per cent by volume. The second largest market is the United States, accounting 18 per cent by value and 19 per cent by volume. The Netherlands and Germany follow, the Netherlands taking 8 per cent by value and 9 per cent by volume and Germany 7 per cent by value and 9 per cent by volume. These countries together with Switzerland, Canada, Hong Kong, Italy, Taiwan and Malaysia make up the top ten export destinations.

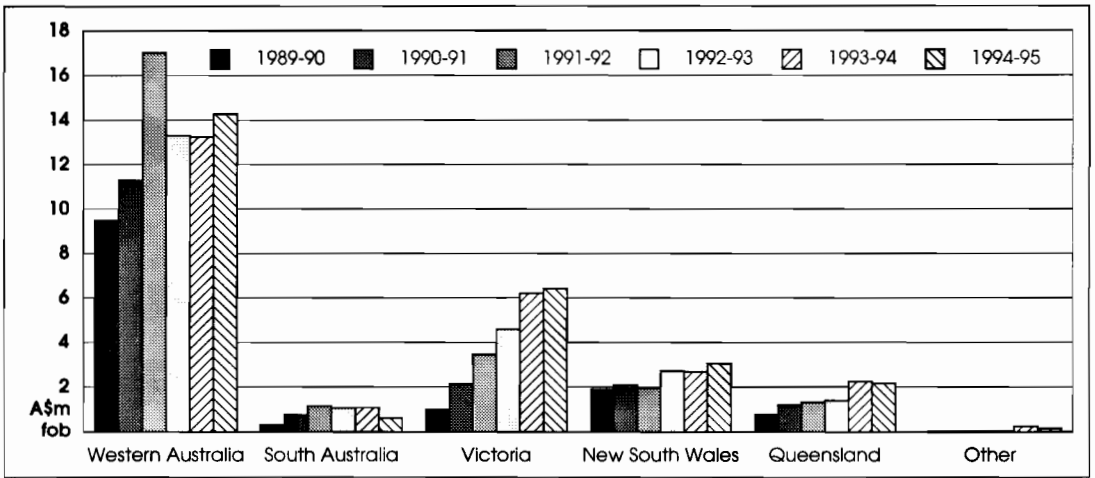
On a regional basis Asia accounts for 54 per cent of exports, North America 19 per cent and Europe 19 per cent.

The large increase in exports since 1988 is attributed to the development and overseas marketing programs for the native flora and proteaceae. The Flower Export Council of Australia has been the driving force behind Australia's numerous promotional programs undertaken in Australia's major export markets over the past five years.

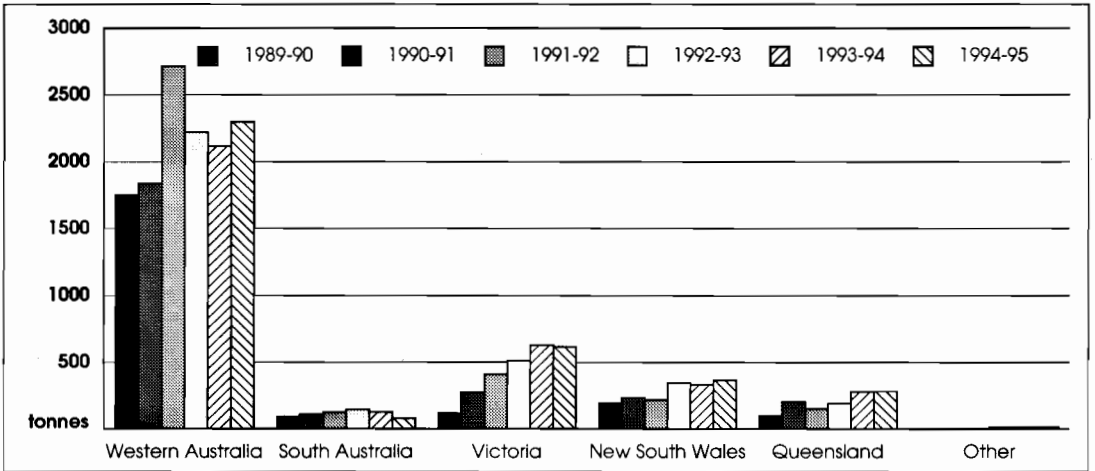
There is a growing world demand for Australia's unusual and distinctive flowers and foliage. And the unique flora and diverse geographical and climatic regions mean that Australia is well placed to supply this demand. Unfortunately, though, Australia has been slow to realise this and other countries, including Israel, New Zealand, Colombia and the United States, have developed export or domestic markets based on indigenous Australian flowers at Australia's expense.

### Floricultural Imports

In 1994-95 Australia imported cut flowers to the value of A\$8.05 million. Major import products were orchids, tulips, carnations and roses. These were sourced mainly from Singapore, Malaysia, Zimbabwe, the Netherlands and New Zealand.



Australian floricultural exports by value and state.



Australian floricultural exports by volume and state.

## Research and Development

Most R&D funding by government agencies, universities and commercial and private research companies has been directed toward Australian native flora.

The R&D sector of the Australian export industry has not been overfunded to date; rather it has been supported by government agencies which, with limited resources, have been innovative in their funding approach, undertaking numerous floricultural R&D projects jointly with industry.

Breeding and selection programs are gradually improving the range and quality of flowers commercially produced for export. Tissue culture and genetic engineering are two aspects of native flower research that are improving R&D results with Australia's export sector.

One of the most significant trends in the floriculture industry worldwide has been the research and development of post-harvest techniques and the adoption of new methods of treatment to prolong the life of fresh flowers.

## Summary of Australian floricultural exports.

	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95
<b>Value by product (A\$'000 fob)</b>						
Fresh flowers	6 931	8 705	14 879	16 765	12 335	10 422
Dried and preserved	5 664	6 478	8 803	5 373	11 524	14 343
Foliage	941	2 333	1 302	997	1 891	1 914
Total	13 536	17 516	24 984	23 135	25 750	26 679
<b>Value by product (tonnes)</b>						
Fresh flowers	1 091	1 317	1 985	2 402	1 722	1 518
Dried and preserved	1 033	956	1 411	817	1 572	1 858
Foliage	135	386	236	217	210	285
Total	2 259	2 659	3 632	3 436	3 504	3 661
<b>Value by state (A\$'000 fob)</b>						
Western Australia	9 494	11 291	17 020	13 313	13 248	14 281
South Australia	317	763	1 163	1 069	1 100	615
Victoria	1 019	2 144	3 466	4 599	6 309	6 413
New South Wales	1 887	2 090	1 958	2 725	2 697	3 045
Queensland	770	1 213	1 326	1 407	2 249	2 172
Other	49	15	51	22	247	153
Total	13 536	17 516	24 984	23 135	25 750	26 679
<b>Volume by state (tonnes)</b>						
Western Australia	1 751	1 839	2 716	2 224	2 119	2 300
South Australia	91	109	126	146	128	79
Victoria	117	273	412	515	629	616
New South Wales	194	232	218	347	334	366
Queensland	99	204	155	191	280	285
Other	7	2	5	13	14	15
Total	2 259	2 659	3 632	3 436	3 504	3 661

Source: Australian Bureau of Statistics.

Some Australian cut flower exporters have been quick to adopt these initiatives, but many still require a technology transfer transplant into their export operations. Such a transfer would certainly be the first step toward improving the quality of exports when they arrive at their destinations.

There is a growing awareness among exporters that correct temperature (especially the use of cool rooms), correct handling techniques, careful attention to hygiene (clean buckets and quality water) and the use of floral preservatives and silver thiosulphate (STS) to treat ethylene-sensitive flowers are essential elements to maintain quality export flowers.

Sensible product packing rates rather than over-packing, correct insect control measures and pro-

fessional fumigation procedures are also key areas for improvement in the Australian export system.

Arrival quality is one area Australia will target for improvement over the next 2-3 years. Australian export standards are slowly improving. However, Australia is still generally perceived to be a supplier of low value, average quality product. Clearly improved research and development programs will greatly assist the wildflower and export sectors of Australia.

The industry also needs to improve the range of varieties available for export by producing new colours and species and to increase the export season by encouraging extended production in various regional areas of Australia.

Performance of top 12 markets for Australian cut flower exports.

	1990-91	1991-92	1992-93	1993-94	1994-95
<b>Japan</b>					
Value (A\$'000 fob)	5 458	7 025	11 001	12 932	12 802
Volume (tonnes)	718	1063	1252	1427	1592
<b>United States</b>					
Value (A\$'000 fob)	2 297	4 015	4 691	5 485	4 891
Volume (tonnes)	430	571	630	816	721
<b>Netherlands</b>					
Value (A\$'000 fob)	1 643	1 329	1 824	1 979	2 186
Volume (tonnes)	289	220	310	397	358
<b>Germany</b>					
Value (A\$'000 fob)	1 320	1 497	1 181	1 778	2 044
Volume (tonnes)	324	255	369	341	343
<b>Switzerland</b>					
Value (A\$'000 fob)	517	733	722	588	756
Volume (tonnes)	98	103	89	84	87
<b>Canada</b>					
Value (A\$'000 fob)	253	377	571	754	638
Volume (tonnes)	61	65	68	116	98
<b>Hong Kong</b>					
Value (A\$'000 fob)	621	814	1 006	600	550
Volume (tonnes)	59	101	124	67	55
<b>Italy</b>					
Value (A\$'000 fob)	327	621	548	439	433
Volume (tonnes)	59	75	101	83	106
<b>Taiwan</b>					
Value (A\$'000 fob)	42	39	101	384	402
Volume (tonnes)	13	10	43	60	48
<b>Malaysia</b>					
Value (A\$'000 fob)	0	5	72	77	401
Volume (tonnes)	0	0	8	8	26
<b>Singapore</b>					
Value (A\$'000 fob)	137	550	198	432	357
Volume (tonnes)	23	7	34	47	41
<b>New Zealand</b>					
Value (A\$'000 fob)	322	195	217	123	298
Volume (tonnes)	29	17	19	13	55
<b>Other</b>					
Value (A\$'000 fob)	4 937	7 784	366	719	921
Volume (tonnes)	556	1145	399	45	131
<b>Total</b>					
Value (A\$'000 fob)	17 516	24 984	23 135	25 750	26 679
Volume (tonnes)	2 659	3 632	3 436	3 504	3 661

Source: Australian Bureau of Statistics.

## Strengths, weaknesses, opportunities and threats of the Australian floriculture industry.

Strengths of the industry	Weaknesses of the industry
<ul style="list-style-type: none"><li>• Southern hemisphere and opposite season</li><li>• Unique product</li><li>• Hardiness and good vase life of native flowers</li><li>• Reliable growing climate and cheap land</li><li>• Variety of climatic conditions</li><li>• Technology advantage over developing nations</li><li>• Competitive strategic advantage at present</li><li>• Large undeveloped gene pool of native flora</li><li>• Strong demand projections for Australian flowers and foliage in Japan to the year 2000</li></ul>	<ul style="list-style-type: none"><li>• Ease of entry to the industry</li><li>• Poor quality and image of Australian flowers overseas</li><li>• Poor R&amp;D to date</li><li>• High cost of operation and overheads</li><li>• Little overseas market research</li><li>• Undercapitalisation</li><li>• No available venture capital</li><li>• Lack of bankable documents (letters of credit)</li><li>• Low profit margin and high risk</li><li>• Shortage of air freight</li><li>• Low priority of flowers as air freight</li><li>• Lack of industry export ethos</li></ul>
Opportunities for the industry	Threats to the industry
<ul style="list-style-type: none"><li>• Develop niche markets in established markets</li><li>• Develop new Asian markets</li><li>• Develop new markets for high value native and traditional flowers</li><li>• Build more airspace out with more inbound tourism</li><li>• Lengthen the present flowering periods and season</li><li>• Develop superior new hybrid products</li><li>• Extend the seasonality in regional Australia</li></ul>	<ul style="list-style-type: none"><li>• Southern hemisphere country competition</li><li>• New Australian varieties being sold overseas</li><li>• High tariff levels in some countries</li><li>• Price undercutting by new and existing Australian exporters</li><li>• Heavy reliance on shipping through few ports (for example, Cairns)</li><li>• Poor reputation of some exporters</li><li>• Ongoing lack on industry leadership nationally</li><li>• Production volume in the west; air freight availability in the east</li><li>• Ongoing lack of understanding by industry of export ethos</li></ul>

To continue its export growth both the wildflower and export sectors will require a high level of research and extension support. This is needed to continue the development of new species, varieties and products, the improvement of cultivation technology and the extension of product seasonality.

Improved market research will be required to identify new market opportunities and facilitate the timely delivery of quality products to export markets.

These activities will need to be supported by well-planned, innovative and educational marketing and

promotional programs in established and developing markets.

Most R&D in the Australian export sector will need to be targeted at the key risk areas in the export chain. There will be real improvement in the quality of Australian floricultural products at their export destinations only when each segment of the export chain is foolproof.

The basic handling and distribution of Australian exports and associated key risks are summarised and presented as Figure 9 (p. 36) in this report.

# Perspectives of the Traditional Cut Flower Industry in Australia

Mr G. Lamont\*

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## Strengths and Opportunities

- Increasing consumption of flowers especially via supermarkets, following the trends in the United States and more recently Europe. Supermarkets in some states are presenting the consumer a better quality, more creative and better value for money product than they are in other states.
- Ready access to new germplasm from major breeders; no excuse for not having current varieties and clean mother stock. Consolidation of the number of suppliers of planting material.
- Centralised marketing system in Sydney, Brisbane and Adelaide with plans for a National Flower Market in Melbourne in 1996.
- Close proximity to expanding markets in Southeast Asia. Traditional cut flowers have a greater place in these markets than Australian natives do because of their 'soft' nature, year-round availability and greater versatility as feature as well as complementary flowers.
- Opposite season to northern hemisphere markets not such a major advantage with many traditional flowers that can be grown year round.
- Higher potential profitability of traditional cut flowers.

## Weaknesses and Constraints

- Lack of industry organisation and unity.
- Absence of industry statistics.
- Lack of market research and promotion.
- Absence of quality standards.

- Oversupply of flowers; wide range in quality; falling prices.
- Lack of appreciation among growers of the benefits of correct post-harvest handling.
- Small pool of R&D funds for traditional flowers compared with natives.
- Urbanisation of historical flower growing areas near Sydney, Melbourne and Brisbane.
- Threat of new pests and diseases — unprepared and inability to control; lack of registration of chemicals and long delay for biological control.
- Pesticide resistance; limited new chemicals registered for ornamental industries; phasing out of methyl bromide.
- Relatively poor training in horticulture at a tertiary level; few skilled horticultural managers.
- Greenhouse design needs to be better tailored to domestic environments.
- Diminishing resources from state departments responsible for agriculture (except in Victoria) available for research and advisory services.
- High cost of Australian Quarantine and Inspection Service for importing or exporting plant material.
- Almost total absence of the development of new varieties of traditional cut flowers within Australia; high dependency on Europe, Japan and the United States.
- Cheap imports of exotic flowers especially from developing nations such as Zimbabwe, Sri Lanka, Southeast Asia.

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