Independent Review of MIS Involvement in Horticulture

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Econtech Pty. Ltd.

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INDEPENDENT REVIEW OF MANAGED INVESTMENT SCHEMES (MIS) INVOLVEMENT IN HORTICULTURE

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PURPOSE OF THE REPORT
The specific purpose of this report is to conduct an independent study of the impact of Managed Investment Schemes on the Australian horticulture sector. It is not designed to provide any explicit strategic or policy advice.

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Executive Summary

Introduction

Managed Investment Schemes (MIS) are essentially shared investment schemes, whereby a group of independent investors invest in a particular project through a registered management vehicle. Initially these schemes tended to be within the forestry industry, but in recent years have diversified into commercial horticultural projects. At present there are a large number of MIS operating in a broad range of industries in horticulture including almonds, avocadoes, olives, citrus, mangoes, and table grapes.

To gain an understanding of the impact of MIS on horticulture in Australia, Horticulture Australia Ltd (HAL) in conjunction with Agriculture Investment Managers of Australia (AIMA) commissioned Econtech and Hassall & Associates (H&A) to conduct an independent study of the impact of MIS on the Australian horticulture sector. Importantly, this report provides information on the level and extent of MIS integration within the Horticulture Industry. While it broadly discusses a number of MIS related issues, it is not designed to provide any explicit strategic or policy advice.

Furthermore, while the existence of different corporate ownership structures relevant to horticultural enterprises is recognised, this report only focuses on those operating under a strict definition of Managed Investment Schemes.

Managed Investment Schemes in Australian Horticulture

In recent years there has been considerable interest and activity in MIS. According to AAG[1], in the 2005/06 financial year there were 68 agribusiness projects[2] that raised capital. This represents an increase of 19 per cent in new projects compared to the 2004/05 financial year and an increase of 60 per cent in new projects compared to the 2001/02 financial year. This growth was mainly generated by the horticultural sector, which accounted for 48 per cent of the offerings that raised capital. Indeed, the largest number of MIS schemes on offer in 2005/06 is horticultural, with 34 projects on offer.

On the basis of the area to be developed to crops with the capital raised during 2005/06, Western Australia will have the biggest amount of development with 53,700 hectares (or 40 per cent of the total area). Victoria, Tasmania and New South Wales will have similar development areas of between 15,000 and 19,400 hectares. The state with the least amount of development at 5 per cent, or around 6,200 hectares, will be South Australia.

In terms of the estimated gross revenue for MIS investors from the sale of their crops, AAG estimates that, in current dollar terms, 2005/06 projects will produce a total of $5.5 billion in farm gate revenue over the lives of the projects. After allowing for annual management fees and lease and crop marketing fees, AAG estimates that the net income to investors for 2005/06 projects would total approximately $3.3 billion.

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[1] Australian Agribusiness Group (AAG), *"Agribusiness MIS Industry End-of-year Round Up report 2005/06"*. All AAG estimates quoted in this section are sourced directly from this report. Importantly, due to limited information on the methodology used to calculate these figures, Econtech has not been able to evaluate the estimates.

[2] According to AAG's definition, agribusiness covers all sectors associated with the growing of products on the land. This includes traditional agriculture, viticulture, horticulture, aquaculture and forestry.

The AAG estimated that, of the $1,141 million raised in 2005/06, $510 million (or 45 per cent) will return to investors as a taxation refund. However, AAG also estimate that the amount of tax likely to be paid to the Government on the net project income (mentioned above), is approximately $1.5 billion[3], which is 3 times the tax deducted in 2005/06.

Overview of MIS in Selected Horticulture Industries

According to information provided by AIMA, the horticulture industries with highest level of MIS involvement are olive, almond, table grapes, citrus, avocado and mango. The following table summarises the importance of MIS for these particular horticulture industries.

Table A
Production and MIS Involvement in Selected Industries

Horticulture Industry	Actual GVP ($m) 2004/05 (a)	Projected GVP ($m) 2006/07 (a)	% of MIS investment of total industry production (c)	Number of MIS (d)	Hectares dedicated to MIS (d)
Almond	76.6	75.5	21-50%	22	9,055
Avocados	90.5	102.8	5-20%	2	1,155
Citrus	466.7	502.6	5-20%	4	1,302
Grapes (table)	197.3 (b)	N/A	5-20%	2	1,018
Mangoes	134.6	120.4	5-20%	3	771
Olive trees	N/A	N/A	51-70%	48	13,658

Notes:
(a) Source: Australian Horticulture GVP Estimation 2006/07, HAL
(b) Source: 2001/02 Value, Source: The Australian Horticulture Statistics Handbook 2004, HAL.
(c) Source: AIMA.
(d) Source: MIS Horticulture Overview, AIMA.

Impacts of MIS within the Horticulture Industry

The MIS projects in horticulture are expected to have an impact on resources and prices in the economy. These include impacting on land prices, water resources, the labour market and commodity prices. The analysis of each of these impacts is summarised below.

Impact of MIS on the Cost and Availability of Land

The total area of land devoted to horticulture is estimated to be 450,000 hectares[4]. The total area of MIS developments between 1999 and 2007 represents approximately 6 per cent of this estimate. This level of development is unlikely to have a significant impact on land prices for horticultural land, especially as some of the development has taken place in areas which do not suffer competition for land resources for urbanisation.

However, there is reported local competition for land that is suitable for further development in traditional horticultural growing areas. As the impacts of MIS are local, real estate agents

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[3] Assumes a top marginal tax rate of 46.5 per cent.
[4] Horticulture Australia Limited (undated), *"Horticulture's value to the Australian Economy"*.

were contacted in areas where there has been significant MIS development[5]. The agents generally noted that, in areas where there has been strong growth from MIS in recent years, there has been a general decline in the availability of land, and higher prices have been paid for land developed by MIS operators. This is most evident in the almond and table grape growing regions of Robinvale and Sunraysia – Mildura.

It is more difficult to estimate the impact of MIS on other areas, such as the citrus region of Riverland – Renmark, the Avocado region of Bundaberg, and the mango region of Mareeba. This is for the following reasons.

- The market around Renmark has currently plateaued as a result of limited water availability, small size of properties and over supply of wine grapes.
- MIS have bought large, already established, avocado properties in the Bundaberg region over the past few years and it is possible that this trend will continue in the future.
- Strong interest from buyers in Cairns for weekender/lifestyle properties in the Mareeba area appear to be driving the property prices in that region.

Impact of MIS on the Cost and Availability of Water

Water is often raised as an issue with MIS developments. Almonds are the most intensive water user on a per hectare basis (14.5 ML/ha), while mangoes need less irrigation water (5 ML/ha). Avocados, citrus, olives and table grapes have similar irrigation requirements (9 to 11 ML/ha).

The three main MIS crops most likely to have an impact in terms of water, at this stage, are almonds and table grapes, due to their water use and location in traditional irrigation areas.

- In the almond industry, recent MIS developments are utilising more water efficient systems than past developments. However, because large areas of traditionally dryland cereal production are being developed for almond production, there have been significant purchases of water. The majority of the water transfers to the Sunraysia region have been from areas in northern Victoria where broadacre irrigation is undertaken.
- In the table grape industry, water use is seen as the main natural resource issue because the MIS operations have been developed on dryland agriculture areas, which need to be irrigated. This has meant that there have been large purchases of water entitlements in a short period, which may have had an impact on local water prices for a short period.

It is possible that large developments may have had a temporary impact on a localised water market. The amount of the water entitlements in the Murray Darling Basin would mean that the likelihood of any sustained impact on water entitlement prices from MIS developments is minimal. There may be instances of market influence in smaller water sources outside the Murray Darling Basin.

[5] Elders Real Estate agencies in Riverland, Sunraysia, Bundaberg, Mareeba, Robinvale and Euston.

Impact of MIS on the Labour Market

The availability of labour is a challenging issue throughout Australia and, as is happening in many industries, the Agriculture sector is experiencing labour shortages. These shortages are occurring for both seasonal and ongoing work, and it appears that the problem is increasing.

In such a challenging labour environment, MIS and traditional farmers are forced to compete for labour, and the ability to recruit and retain workers becomes crucial. Importantly, in such an environment, the existence of MIS has two main effects. On one hand, with their scale and capital, MIS can offer better opportunities to attract and retain workers, making it more difficult for traditional farmers to fulfil their labour needs. On the other hand, the corporate farming model is more efficient than the small family farming model and uses better technology, which greatly improves productivity and means that the MIS are likely to require less labour than traditional farms.

However, the inadequacies of national data on industry employment requirements and the absence of detailed MIS and traditional farms vacancy data mean that it is difficult to assess the net real impact of MIS on the labour market.

Impact of MIS on Commodity Prices

At this stage, the actual effect that the MIS horticulture projects have had on commodity prices is very difficult to isolate because many MIS projects have only entered most horticultural industries within the last three to four years. However, two main points can be made about the likely economic effects as MIS projects become more significant within horticultural industries, as follows.

- It is likely that MIS projects will be able to achieve a lower cost structure than traditional farmers through economies of scale, greater investment in research and development, and through the adoption of best industry practices. As such, it is expected that MIS projects will be able to provide horticultural products at lower prices than smaller competitors. This could put downward pressure on commodity prices if local supply exceeds local demand.
- Some of these negative price effects could be counteracted by efforts to build demand. In general, MIS projects are in a better position than smaller enterprises to launch large scale marketing campaigns and raise foreign awareness. If MIS projects are able to leverage their marketing potential to create sufficient demand, then the price effects of increased supply may be partially offset in some industries.

Whether or not prices are depressed within domestic markets will depend on local demand for particular commodities and the extent to which Australia is either a net exporter or importer of the commodity. Australian producers are likely to be price takers in markets that exhibit high levels of international trade, so it may be that increased supply by Australian producers will have very little effect on the prices that they receive.

Importantly, it is difficult to distinguish cause from effect within the horticulture market, given the pre existing downward pressures on commodity prices. General economic theory indicates that growth of the MIS sector may lead to larger scale production, higher productivity and increased supply – all leading to lower prices. But it is equally valid to look from the opposite side. From this view, the pre-existing downward pressures on prices can be identified as necessitating larger scale operations such as MIS projects. In fact, there is strong evidence of a consolidation taking place within the horticulture industry which began long before MIS started to enter the industry and has been driven primarily by increased competition with international growers.

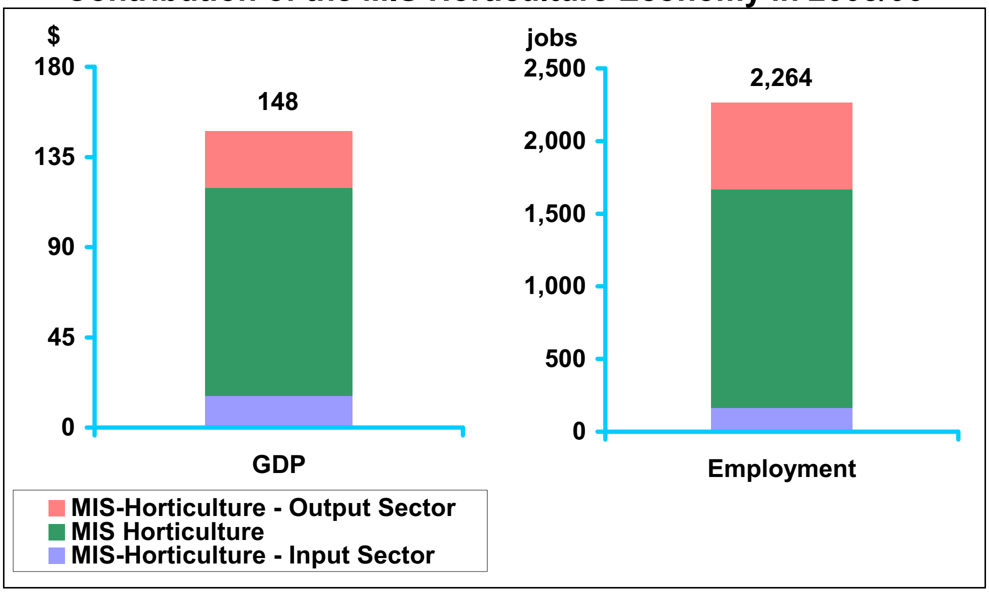
Current Contribution of MIS Horticultural Projects to the Economy

Similar to the horticulture industry in general, the contribution of the main MIS horticulture projects[6] to the Australian economy is not limited to the value of their production. They are also important to the Australian economy through their role as a supplier to, and consumer of the products of, other industries.

- As a supplier, the MIS horticulture projects provide raw inputs to other industries and, in particular, to the Fruit Product Manufacturing and the Food Retailing industries. For this report, the share of the Fruit Product Manufacturing and the Food Retailing industries output attributed to the main MIS horticulture projects is termed the "MIS-Horticulture-Outputs" Sector.
- Further, as a consumer, the MIS horticulture projects purchase inputs from various industries. The proportion of production of these industries that is used as an input by the MIS horticulture projects is termed the "MIS-Horticulture-Inputs" Sector.

The combination of the MIS Horticulture Projects *plus* the MIS-Horticulture-Outputs Sector *plus* the MIS-Horticulture-Inputs Sector is referred to as the "MIS Horticulture Economy". An estimate of the full contribution of the MIS Horticulture Economy to Australian GDP and employment is shown in Chart 1.

Chart 1
Contribution of the MIS Horticulture Economy in 2005/06



Source: Econtech's IOF Model

[6] The term 'main' is used to indicate the six major MIS industries as identified earlier, and focussed on throughout the report.

This chart shows that, by also including the contribution of the MIS horticulture projects up and down the supply chain, the current full contribution of the MIS Horticulture Economy is estimated at about $148 million in GDP and around 2.2 thousand jobs in 2005/06. This is equivalent to around 1.8 per cent of the total Horticulture Economy's[7] contribution to GDP and 2.0 per cent of the total Horticulture Economy's contribution to employment in 2005/06. Further, it is estimated that the MIS Horticulture Economy contributed around $258 million to Australian production in 2005/06 (or about 1.9 per cent of the total Horticulture Economy's contribution to Australian production).

Advantages and Disadvantages of MIS

This section assesses the advantages and disadvantages of MIS over other horticultural enterprises and identifies any positive and/or negative impacts of MIS on the Australian Horticulture Industry. This analysis is presented in two sections. The first section examines whether MIS investors receive any advantage over independent and family horticultural enterprises in terms of tax benefit or any other commercial measure. The second section examines the key attributes of MIS projects that have lead to both positive and negative impacts within the horticultural industry.

Analysis of MIS Tax and Commercial Benefits

MIS operate under Chapter 5C of the Corporations Act (2001) and a system of case law and tax rulings that distinguish them from other forms of "passive" investment[8]. The salient feature of an MIS that is granted by these provisions is that the investors within the scheme are deemed to be carrying on a business operation, which entitles them to deduct all of the non capital expenses incurred by the business allowed under Division 8 of the Income Tax Assessment Act 1997. However, in early 2007, the Federal Government indicated that changes are likely to be made to the tax treatment of MIS horticulture growers, which would mean that they are no longer able to claim non-capital expenses as tax deductions. The actual changes implemented will depend on the outcome of an ATO test case examining whether MIS horticulture growers are deemed to be carrying on a business operation.

Under the current tax arrangement, MIS have no explicit tax advantage over other horticulturalist enterprises. That is, all sole traders, partnerships and MIS based producers are considered primary producers, with all owners subject to the same treatment under the Income Tax Assessment Act 1997. As such, the real commercial advantage that MIS have over traditional farmers is their ability to attract capital and the depth of resources that are available to them.

As such, with the current tax treatment, smaller farming enterprises are likely to be out competed by MIS in the long run because of the difference in their resources and production volumes, not because of preferential tax treatment. The tax treatment available to members of a MIS has facilitated accelerated investment in large scale horticultural enterprises. This increased investment is putting pressure on traditional sole trader and partnership based farmers that compete with the MIS for resources.

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[7] The Horticulture Economy is defined as the Horticulture Industry *plus* the Horticulture-Outputs Sector *plus* the Horticulture-Inputs Sector

[8] http://www.asic.gov.au/asic/asic_polprac.nsf/byheadline/Managed+investment+schemes?openDocument , 19 December 2006

However, if the tax treatment for MIS growers is changed in line with the Federal Government announcement, MIS growers in schemes beginning after 30 June 2008 may not be able to claim any of their investment as a deductible expense. On one hand, these changes would bring the tax treatment of MIS investors in line with other forms of investment. However, on the other hand, this would mean that the horticultural MIS investors have a tax disadvantage when compared to other forms of farming enterprises.

The new tax treatment may only apply to MIS growers in schemes beginning after 30 June 2008. This is likely to lead to a substantial decline in the level of new MIS investment in horticulture. Since these changes would not affect existing MIS, traditional sole trader and partnership based farmers may still compete with current horticultural MIS for resources.

Key attributes of MIS projects

This section examines the key attributes of MIS projects that have both benefited and disadvantaged the horticultural industry. In particular, this section focuses on those attributes of MIS that distinguish them from traditional farming enterprises. The discussion is largely based on personal interviews and surveys conducted with industry representatives, and both MIS and non-MIS farm managers.

The key attributes of MIS projects that distinguish them from other horticultural enterprises can be grouped under three main headings. Each of these key attributes are listed below, and then discussed in turn.

- Larger Resources & Economies of Scale
- Corporate Management Structure
- Ownership & Incentives

<u>Larger Resources & Economies of Scale.</u>

One of the key attributes of MIS projects is the depth of resources they have access to, which allows them to operate on a very large scale. A number of horticultural industries have begun to experience the impacts of MIS operating large scale projects.

MIS projects have had an impact through greater investment in R&D and increased marketing efforts. Further, MIS are generally thought to be more efficient in terms of water use in most industries[9].

In particular, the almond and olive industries have benefited from the entry of MIS. For example, the growth in the almond industry has facilitated the development of protocols with Plant Health Australia, paved the way for the use of marketing consultants and allowed Australia to become more competitive in the international market for almonds[10]. Another example is in the olive industry, where it is believed that MIS entry has been very influential in raising the profile of Australian olive oil and building brand awareness in both domestic and foreign markets[11].

[9] AGRI MIS (Non Forestry), AIMA Fact Sheet, September 2006
[10] ibid
[11] Interview with non-MIS olive grower, 2007 (see Attachments B and C)

While MIS have made positive contributions to many horticulture industries, they have had negative impacts in others. In particular, MIS have had an impact on the prices of inputs, such as water, capital and services. This has put extra pressure on those smaller producers that compete with MIS for these resources, particularly in the current climate of continued drought and increasing import competition. For example, it is believed that MIS have contributed to increases in the price of water by competing in the market for water allocations, particularly in Victoria and NSW[12]. Another example is in the almond industry, where increased demand from the large MIS developments appears to have caused a shortage of seedlings[13].

Corporate Management Structure.

The corporate management structure of MIS is another important attribute that distinguishes MIS projects from traditional farmers. It is generally thought that this structure promotes a greater focus on costs and efficiency, a higher tendency to invest in R&D and a more market driven attitude. Further, it is believed that participants in an MIS operation generally have a higher standard of accountability[14], and this, in theory, should lead to better business outcomes. Finally, this structure has led to the development of a network of growers across product groups, allowing for greater access to market information[15].

Some industries have benefited more than others from the corporate style of MIS management. The olive industry, in particular, has been receptive to the MIS style of management. In this industry, olive MIS are seen to be the best managed and productive growers, and have guided other growers to a higher standard of operation and production[16].

Ownership & Incentives.

The final attribute that distinguishes MIS from non-MIS producers is the relationship between production and ownership. This relationship is very different for MIS, particularly in the incentives that this relationship creates in terms of production volume and outcomes.

The ability of MIS to raise capital is strongly related to the tax treatment of MIS owners as primary producers, and to the fact that MIS owners can buy a small share of a horticultural enterprise. This means that they do not need to shoulder the risk of investing the majority of their assets like a traditional grower would.

The positive impact that this has had, on the horticultural industry, has been to stimulate growth through investment. Furthermore, increased investment in MIS has also contributed strongly to regional development, pouring money into rural areas, contributing to the growth of infrastructure and creating jobs[17]. The investment that has been stimulated in MIS has also had a positive impact in some industries by giving traditional growers the option of

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[12] Interview with MIS almond grower, 2007 (see Attachments B and C)
[13] Interview with non-MIS almond grower, 2007 (see Attachments B and C)
[14] Interview with MIS mango grower, 2007 (see Attachments B and C)
[15] ibid.
[16] Interview with non-MIS olive grower, 2007 (see Attachments B and C)
[17] Fleur Anderson, 13 October 2006, *"Nats' move may ignite tax spat"*, Australian Financial Review, First Edition, pp7.

selling out to MIS, essentially providing a market exit option that would otherwise be unfeasible for most growers.

On the other hand, the tax status granted to MIS growers, compared to other investment, may distort incentives. This is in the sense that MIS companies are able to market their projects on the attribute of tax deferral as well as the underlying return on capital that the enterprise is expected to generate. Almost all of the non-MIS growers interviewed for this report believed that MIS projects do not actually have to make a return on investment to continue attracting capital, and they were worried that this would lead to oversupply in the market.

There is a concern that this, in turn, would lead to a glut in production. As yet, this outcome has not been realised, but it has caused a lot of growers to raise concerns about the intentions of MIS operators.

Conclusion

The information presented in this report suggests that MIS have had important positive impacts on the horticulture industries in which they participate and on the Australian economy as a whole. These benefits include, but are not limited to, the creation of jobs, the provision of greater access to technology, larger investments in R&D and innovation, more sustainable farm practices, skills development and knowledge transfer. Furthermore, this study shows that the full contribution of the MIS Horticulture Economy to the economy was about $148 million in GDP (or just under 2 per cent of the Horticulture Economy's contribution) in 2005/06 and the creation of around 2.2 thousand jobs in the same year.

While this report found that MIS have made positive contributions to many horticultural industries, there have also been some negative impacts. In particular, increased demand by MIS projects may have increased the prices of inputs, such as water, capital and services at a local level.

There has also been much debate over the current tax treatment of MIS investments. However, technically speaking, MIS do not have any tax advantage over other forms of farming enterprise. At present, both MIS and traditional farmers can deduct non capital expenses from their taxable income and are subject to the same rules under the Income Tax Assessment Act. As such, the real commercial advantage that MIS have over traditional farmers is their ability to attract capital and the depth of resources that are available to them.

If the tax treatment for MIS growers is changed in line with the Federal Government announcement, this is likely to lead to a substantial decline in the level of new MIS investment in horticulture. However, since these changes would not affect existing MIS, traditional sole trader and partnership based farmers will still compete with current horticultural MIS for resources.

1. Introduction

Managed Investment Schemes (MIS) are essentially shared investment schemes, whereby a group of independent investors invest in a particular project through a registered management vehicle.

In recent years there has been considerable interest and activity with MIS within the Australian horticultural sector. Initially these schemes tended to be within the forestry industry, but in recent years have diversified into commercial horticultural projects. At present there are a large number of MIS operating in a broad range of industries in horticulture including almonds, avocadoes, olives, citrus, mangoes, and table grapes.

To gain an understanding of the impact of MIS on horticulture in Australia, Horticulture Australia Ltd (HAL) in conjunction with Agriculture Investment Managers of Australia (AIMA) commissioned Econtech and Hassall & Associates (H&A) to conduct an independent study of the impact of MIS on the Australian horticulture sector. Importantly, this report provides information regarding the level and extent of MIS integration within the Horticulture Industry. While it broadly discusses a number of MIS related issues, it is not designed to provide any explicit strategic or policy advice.

Furthermore, while the existence of different corporate ownership structures relevant to horticultural enterprises is recognised, this report only focuses on those operating under a strict definition of Managed Investment Schemes.

This report is structured as follows.

- Section 2 outlines the current performance of the Australian horticultural sector.
- Section 3 provides a picture of the MIS in the Australian horticulture sector.
- Section 4 presents a more detailed analysis of the horticulture industries with highest level of MIS involvement and it is divided into six sections that analyse the following industries: olives, almond, table grapes, citrus, avocado and mango.
- Section 5 provides an economic assessment of the impact of MIS horticultural projects on the economy.
- Section 6 assesses the advantages and disadvantages of MIS over other horticultural enterprises and identifies any positive and/or negative impacts of MIS on the Australian Horticulture Industry.
- Section 7 examines MIS integration in Industry Representative Bodies and Programs.
- Section 8 provides an assessment of the relative performance of MIS, examines the involvement of MIS in product and process innovation and outlines the key attributes of MIS projects that have had negative and positive impacts on the respective industry.
- Section 9 presents the conclusions of the report.

While all care, skill and consideration has been used in the preparation of this report, the findings refer to the terms of reference of Horticulture Australia Ltd in conjunction with Agriculture Investment Managers of Australia and are designed to be used only for the specific purpose set out below. If you believe that your terms of reference are different from those set out below, or you wish to use this work or information contained within it for another purpose, please contact us.

The specific purpose of this report is to conduct an independent study of the impact of Managed Investment Schemes on the Australian horticulture sector. It is not designed to provide any explicit strategic or policy advice.

The findings in this report are subject to unavoidable statistical variation. While all care has been taken to ensure that the statistical variation is kept to a minimum, care should be used whenever using this information. This report only takes into account information available to Econtech and H&A up to the date of this report and so its findings may be affected by new information. Should you require clarification of any material, please contact us.

2. Current Performance of the Australian Horticultural Sector

This section outlines the current performance of the Australian horticultural sector and is divided into three sections. Section 2.1 presents estimates of the significance of Australia's horticulture industry. Section 2.2 outlines some of the key trends in global horticulture. Finally, Section 2.3 discusses the global competitiveness of the Australian horticulture sector and identifies some of the challenges facing the industry.

2.1 Significance of the Australian Horticultural Sector

In October 2005, Econtech prepared a report for Hassall & Associates titled "The Significance of the Horticulture Industry to the Australian Economy". This report estimated the significance of Australia's horticulture industry to the national and regional economies.

Econtech's study found that on average, the horticulture industry has contributed around 0.6 per cent (or about $3.9 billion) of GDP and 0.5 per cent (or $6.2 billion) of total Australian production, each year from 1998-99 to 2003-04. This means that the horticulture industry is the second largest sector of the broader agriculture industry in terms of contribution to national GDP.

In terms of the contribution of the industry to national employment, Econtech estimated that, on average, the horticulture industry has contributed around 0.6 per cent of national employment each year during the period 1998/99 - 2003/04. This is equivalent to about 60,500 jobs each year.

Additionally, Econtech's report showed that, on average, Australia has exported horticulture products worth about $0.8 billion in each of the six years between 1998-99 and 2003-04. This average is equivalent to about 0.6 per cent of the value of Australian exports over that period of time.

These large amounts of fruit and vegetable exports generate significant flow-on impacts in other sectors of the Australian economy. For example, Econtech's study shows that on average, Australian exports of horticulture products generated an additional $0.7 billion of Australian production in each of the six years between 1998-99 and 2003-04. This means that each dollar earned from horticulture exports created about another $0.82 of production in the economy.

Although the figures above are significant, they do not fully represent the contribution of the horticulture industry to the Australian economy, as horticulture is a significant supplier to and consumer of the products of other industries. The full significance of the horticulture industry, including the contribution to the economy through the interaction of the horticulture industry with upstream and downstream industries, was also estimated in Econtech's 2005 horticulture report.

Interestingly, Econtech's study found that on average, the horticulture economy[18] has contributed around 1.0 per cent of national GDP each year. This is equivalent to an average of about $6.9 billion of national GDP each year. This means that, on average, the

[18] The combination of the horticulture industry plus the horticulture-outputs sector (outputs from the horticulture industry used by various industries) plus the horticulture-inputs sector (inputs from various industries purchased by the horticulture industry) is referred to as the "horticulture economy".

horticulture industry has contributed an additional 0.4 per cent of national GDP each year between 1998-99 and 2003-04 in industries upstream (horticulture-inputs sector) and downstream (horticulture-outputs sector) of the horticulture industry.

2.2 Key Trends in Global Horticulture

The global horticulture sector is undergoing a period of change in response to global competition and evolving consumer preferences. Some of the dominant trends in the global horticulture sector are the following.

- *Globalisation* – A dominant trend in the horticulture sector is globalisation. Trade barriers are being progressively removed and markets are becoming accessible to low cost producers from around the world. As such, Australian producers will face increasing competition from imports in the domestic markets.
- *Supermarkets retail model* - McKinna et al (2006) noted that a key trend in agriculture is the "Wal-Mart retail model" which is characterised by global sourcing from larger, low cost producers, continuous improvement in supply chain efficiency and the adoption of closed-loop supply chains. The consequences of the wide-spread use of this business model is that many small family suppliers are being squeezed out of the supermarket channel and locked out of the supply chain, as they do not have the volume, capital or the management capability to supply global supermarkets. Therefore, as the influence of supermarkets in the horticultural sector grows, the market opportunities for smaller family business will continue to be eroded.
- *Increasing demands for better quality* – Globally, there is an increase in demand for better quality horticultural products. This pattern can be seen across the whole spectrum of food and beverage products as consumers are choosing better quality products with more specific characteristics, such as better guarantees of food safety, traceability, wellness and environmental management.
- *Branding* – A major trend occurring globally is the branding of food produce as a point of differentiation[19]. Private label schemes or 'generic' branding, whereby a product is sourced and packed under a retailer-owned brand, have been particularly successful in the United States and the United Kingdom[20]. The offering of private label products gives the retailer the ability to take margins at several points along the value chain and provides greater control over quality, price and range[21].

2.3 Challenges and Competitiveness of the Australian Horticultural Sector

In the last five years or so, Australia's position in international markets for horticultural products has declined. Australia's declining competitiveness in global horticulture can be seen in the flatness of the value of Australian fruit, nut and vegetable exports and the increasing imports shown in Chart 2.1.

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[19] Horticulture Australia Limited on behalf of the Australian Horticulture Sector (2005) *"Ensuring a profitable and sustainable agriculture and food sector in Australia"* White Paper, October 2005. Page 4

[20] McKinna et al Pty Ltd (2006) *"An Assessment of the Role of MIS and Corporate Farms in Australian Agriculture- A Policy Context".* Page 14.

[21] Foss, J (2000), *"Future Trends in the Global AgriFood Industry and Strategies for Australia to remain competitive"* 2000 Australian Nuffield Farming Scholar.

Chart 2.1
Australian Fruit, Nut and Vegetable Imports and Exports ($ m)

Source: McKinna et al Pty Ltd, "An Assessment of the Role of MIS and Corporate Farms in Australian Agriculture- A Policy Context".

Indeed, the Australian horticulture sector operates in an increasingly competitive and complex environment. Australia can play a valuable role in the global horticulture markets if it becomes globally competitive. Some of the major issues that are likely to influence the future competitiveness of the Australian horticulture sector are addressed in this section, which aims to present the key challenges and principal factors at play in determining the future competitiveness of the Australian horticultural sector. The key challenges outlined in this report are access to global markets, labour and production costs, supply chains, marketing and consumer preferences, and research and development. Each of these factors is now explained in turn.

2.3.1 Access to Global Markets

Generally, Australia's agriculture sector is strongly export oriented. Indeed, according to ABARE[22] (2006), agriculture accounted for around a quarter of Australia's merchandise exports in 2004/05 (at $30.4 billion). The horticultural exports averaged $1 billion during the period 2003/04 to 2005/06[23].

Importantly, trade in agricultural and food commodities is characterised by protectionist measures imposed by a number of countries to support their farmers' income. These measures distort global production decisions and international trade, reduce prices received and limit export opportunities.

Although the World Trade Organisation (WTO) has made considerable efforts to remove trade distortions and provide more access to markets, the agriculture sector remains one of the sectors with the highest trade barriers. These high trade barriers in global agriculture

[22] ABARE (2006), *"Agriculture in Australia"*
[23] Ibid.

disadvantage Australian farmers as they put severe downward pressure on the prices that Australian producers receive.

As noted by McKinna et al (2006) "although Australian average tariffs have decreased from more than 30 per cent to less that 5 per cent since 1970, and the imports of most agricultural products are now tariff and quota free, the OECD average for government support in this sector is around 30 per cent". As such, a crucial challenge to Australia is to continue "fighting" to create new and more open export markets for its products.

2.3.2 Labour and Production Costs

Australian horticulture is a labour intensive industry. Horticultural products have a high labour component to their production cost and labour availability and costs are two major issues in Australia.

As recognised by HAL[24], "The [horticulture] sector has a shortage of both permanent and seasonal labour. This creates bottlenecks and limits the ability of the sector to meet export and domestic market demands. There are significant issues of availability, reliability, skills variability and high turnover." Furthermore, Australian wages are relatively high compared to those paid by overseas competitors. Key international producers have access to much larger, low cost labour markets and labour is one of the major areas in which international competitors are able to achieve a cost advantage over Australian producers.

McKinna et al[25] also identify pay rates in agricultural industries as a major labour issue, noting that "the majority of full time agricultural jobs fall within the 'low pay group' compared to other sectors. As such, by comparison, farming jobs are less attractive because: they require more arduous work; demand longer hours (average 50 hours per week); are located in small rural areas; and offer fewer amenities or benefits". Again, this is in stark contrast to the conditions faced by Australia's international competitors, whom operate in labour markets with a relative abundance of low skilled workers.

Apart from the cost and availability of labour, the horticulture sector also faces relatively high production costs because Australia tends to have higher input costs. As noted by McKinna et al[26], "…Australia pays higher prices for packaging material than its counterparts overseas. To a large extent, this is because the Australian packaging market is smaller, controlled by a duopoly which restricts competition leading to increased prices. Other countries have more choice in suppliers and therefore prices are more competitive. Moreover, most of the farming equipment such as tractors and harvesters are imported which increases costs, not only for the equipment, but also for spare parts."

Therefore, keeping production costs down and ensuring access to suitable labour are both crucial factors in improving the competitiveness of the Australian horticulture sector in an environment of downward trending product prices and scarce labour.

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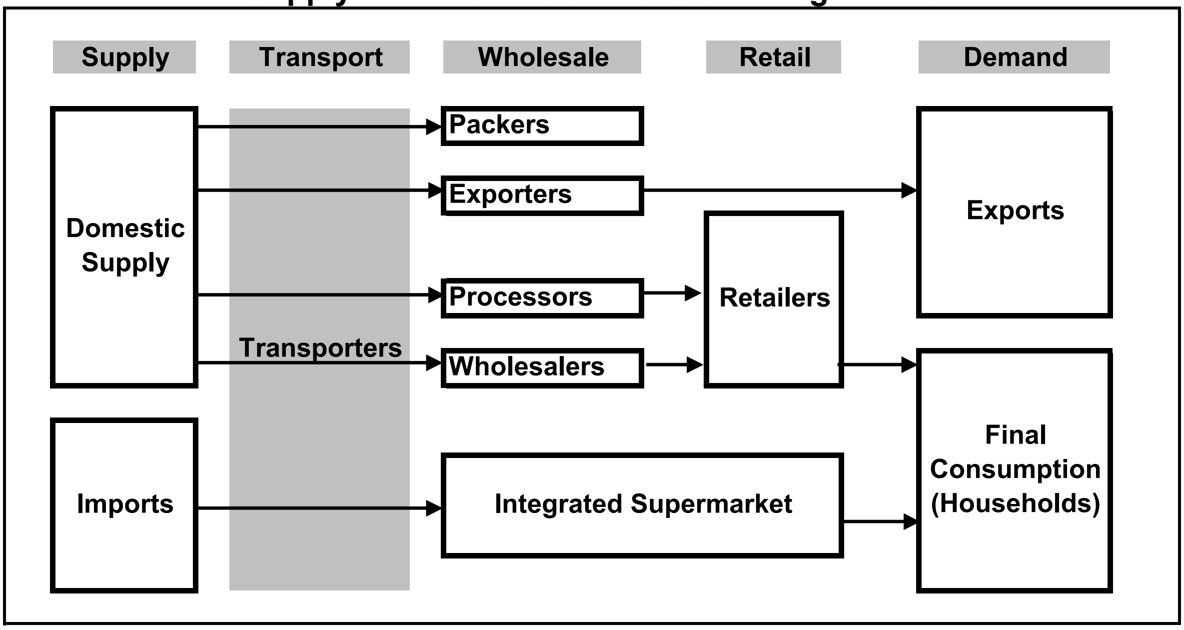
[24] Horticulture Australia Limited on Behalf of the Australian Horticulture Sector (2005) *"Ensuring a profitable and sustainable agriculture and food sector in Australia"* White Paper, October 2005. Page 17.
[25] McKinna et al Pty Ltd (2006) *"An Assessment of the Role of MIS and Corporate Farms in Australian Agriculture- A Policy Context"*. Page 25.
[26] Ibid, Page 26.

2.3.3 Supply Chains

This section investigates the horticulture sector supply chain structure. The 'typical' activities in the supply chain between production and consumption in the fruit and vegetable industry are shown in Diagram 2.1.

Diagram 2.1
Supply Chain for Fresh Fruits and Vegetables



Source: Centre for International Economics, "Horticulture Code of Conduct, A Regulation Impact Statement", July 2005.

Efficient and well linked supply chains are crucial to lower costs and to improve operating margins and financial returns to investors. As noted by HAL[27], "The continuous development of increasingly efficient and flexible supply chains for Australian horticulture products will be essential in meeting the changing demands of domestic and offshore consumers".

Therefore, to remain competitive, Australia's horticultural sector would require improving supply chains.

2.3.4 Marketing and Consumer Preferences

As mentioned in Section 2.2, consumer preferences globally trend toward higher product quality and food safety. Furthermore, greater awareness in the community of the nutritional value of fruit and vegetables in diets is being reflected in increasing demand for fresh produce[28].

As noted in ABARE[29], "with consumers globally taking more interest in the origins of their food and the processes underpinning its production, participants in the supply chain, from farmers to retailers, are positioning themselves to provide greater assurances about the health

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[27] Horticulture Australia Limited on behalf of the Australian Horticulture Sector (2005) *"Ensuring a profitable and sustainable agriculture and food sector in Australia"* White Paper, October 2005.
[28] ABARE (2006), *"Agriculture in Australia"*
[29] Ibid, Page 13.

and safety of the products they offer". As such, ensuring that Australian horticultural products meet the new consumer standard is central to the country's competitiveness.

2.3.5 Research and Development and Innovation

Innovation, research and development (R&D) and technology adoption is fundamental to a successful and competitive horticulture sector. Indeed, as noted by HAL[30], "R&D, innovation and technology play a valuable role in horticulture by improving:

1. on farm productivity;
2. packing, storage, processing and distribution in the supply chain; and
3. branding and differentiation of produce in the wholesale and retail markets."

Therefore, R&D, innovation and technology adoption are central to the success and competitiveness of the horticulture sector in Australia.

[30] Horticulture Australia Limited on Behalf of the Australian Horticulture Sector (2005) *"Ensuring a profitable and sustainable agriculture and food sector in Australia"* White Paper, October 2005. Page 13.

3. Managed Investment Schemes in Australian Horticulture

This section provides a picture of the MIS in the Australian horticulture sector and it is structured as follows. Sections 3.1, 3.2 and 3.3 present the definition of MIS, the 'typical MIS' structure and the history of MIS in the Australian horticulture sector. Section 3.4 provides an overview of the MIS in the Australian horticultural sector. Section 3.5 presents the horticulture industries with highest level of MIS involvement and describes how these industries were selected.

3.1 Definition of Managed Investment Schemes

A managed investment scheme (MIS) is essentially a collective investment, in which a large number of individual investors pool their resources into a mutually beneficial business investment. Generally, the scheme will employ a manager to operate the business on behalf of the individual investors who have no actual input into the day to day running of the scheme[31].

The essential features of a managed investment scheme are the following[32]:

- people are brought together to contribute money to acquire an interest in the scheme;
- money is pooled together with other investors or used in a common enterprise; and
- a 'responsible entity' operates the scheme. Investors do not have day to day control over the operation of the scheme.

Managed investment schemes cover a wide variety of investments, including many agricultural projects, and have no uniform legal structure. They must have a constitution which addresses specific issues but no form is specified, provided it is legally enforceable by investors[33].

3.2 MIS Project Structure

The 'typical' MIS project structure[34] is depicted in diagram 3.1. This diagram outlines who is involved in the MIS, the relationship between the different entities/MIS participants and gives a general overview of what the main entities do.

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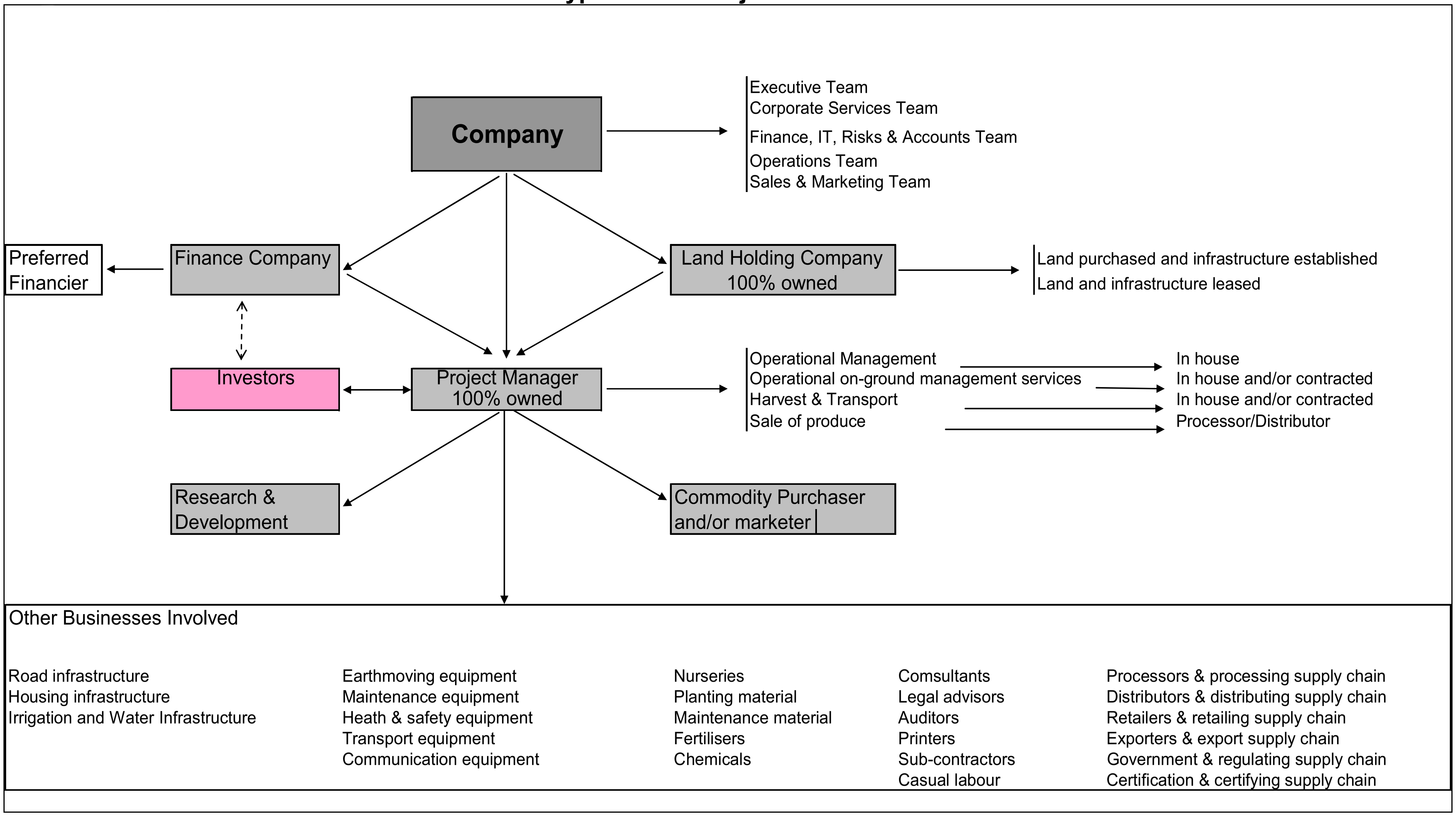
[31] http://www.asic.gov.au/asic/asic_polprac.nsf/byheadline/Managed+investment+schemes?openDocument , 19 December 2006

[32] Ibid

[33] http://www.rewardsgroup.com.au

[34] This project structure would apply to most MIS managers.

Diagram 3.1
'Typical' MIS Project Structure



Source: AIMA, "MIS Horticulture Overview"

3.3 History of Managed Investment Schemes in Australian Horticulture

Modern MIS started in 1998 with the introduction of the Managed Investment Scheme Act and at the same time the ATO introduced the system of product rulings[35]. The product ruling system establishes the tax consequences of investing in a particular product and is intended to provide certainty to potential investors in that product. Prior to 1998, MIS investments were promoted without the tax certainty that the ATO Product Rulings currently provide.

The product ruling system has led to an improvement in the standard of MIS investments. But it was not until independent research became prominent in 2000 that the commercial viability of MIS in sectors such as agriculture, viticulture, horticulture and forestry, was better analysed.

In 2000-01 the ATO sought to recover 'illegitimate' deductions on some pre-1998 schemes and many investors had to pay back the deductions with penalties and interest. These schemes were not MIS and had features not present in any schemes of today.

In 2002 the Australian Securities and Investments Commission (ASIC) released its Policy Statement 170 (PS 170) which provides guidance on ASIC's approach to the use of prospective financial information in disclosure documents and Product Disclosure Statements (PDS). This policy statement discusses when prospective financial information can or should be disclosed, what are reasonable grounds for stating prospective financial information, how prospective financial information should be disclosed and what information should be disclosed by a product issuer in the absence of prospective financial information[36]. The objective of PS 170 was to disallow financial forecasts that were not based on reasonable grounds and financial forecasts from project disclosure documents which were misleading and unlikely to be achieved.

The practical outcome of the PS 170 is such that disclosure documents for MIS are now unlikely to include financial forecasts. This means that a disclosure document cannot include information about the possible returns on investment. Therefore, investors and financial planners have to rely on independent research to obtain estimates of the likely returns on the investment and make informed investment decisions.

In recent years there has been considerable interest and activity with MIS within the Australian horticultural sector. Initially these schemes tended to be within the forestry industry, but in recent years have diversified into commercial horticultural projects. At present there are a large number of MIS operating in a broad range of industries in horticulture including almonds, avocadoes, olives, citrus, mangoes and table grapes.

Recently, substantial changes have occurred in relation to the tax treatment of MIS growers. In particular, the Federal Government has indicated that, as of 30 June 2008, MIS growers may no longer be able to claim non-capital expenses as tax deductions. This is discussed in more detail in Section 6.1.

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[35] The information in this section is mainly sourced from Australian Agribusiness Group (2004/05), *"What is Agribusiness?: What is it and Why Would you Invest in it? An Explanatory paper for investors and financial planners"*

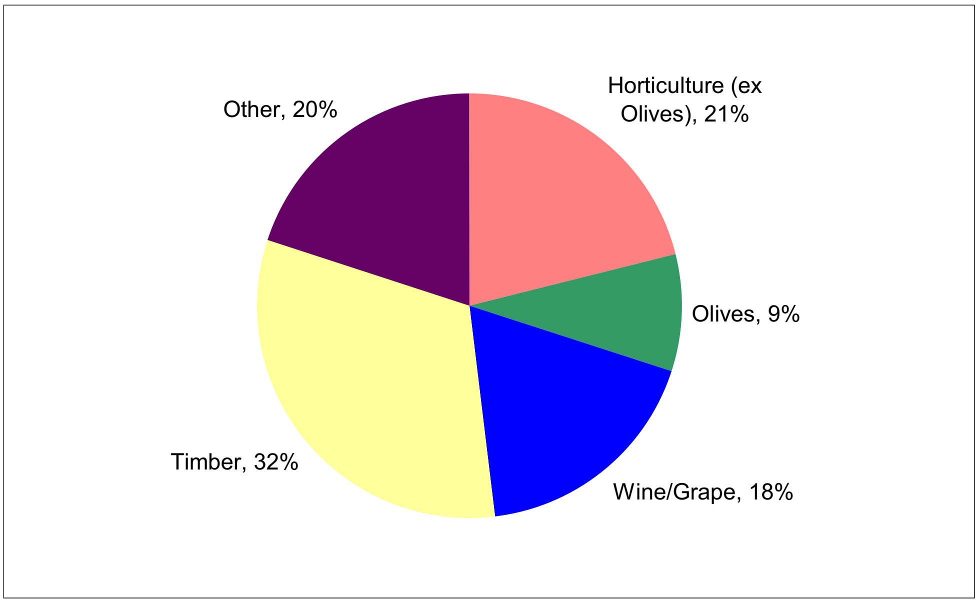
[36] Source: http://www.asic.gov.au/asic/pdflib.nsf/LookupByFileName/ps170.pdf/$file/ps170.pdf

3.4 Overview of MIS in the Australian Horticultural Sector

In recent years there has been considerable interest and activity in MIS. According to the "Agribusiness MIS Industry End-of-year Round Up report 2005/06" by the Australian Agribusiness Group[37] (AAG), in the 2005/06 financial year there were 68 agribusiness projects[38] that raised capital. Of these, 12 were projects that continued from the 2004/05 financial year and 56 were projects released in the 2005/06 financial year. This represents an increase of 19 per cent in new projects compared to the 2004/05 financial year and an increase of 60 per cent in new projects compared to the 2001/02 financial year.

Chart 3.1 shows that the 2005/06 growth in new projects was mainly generated by the horticultural sector, which accounted for 48 per cent of the offerings that raised capital (includes the olive and wine/grape industries). Furthermore, Chart 3.2 shows that investment in horticulture has grown rapidly in recent years. Indeed, as shown in the chart, the number of newly released horticultural projects (excluding olives and wine/grape projects) more than doubled in the 2005/06 financial year. Additionally, the number of projects in the olive industry also showed considerable growth in the number of projects released in the 2005/06 financial year, with 67 per cent more compared to 2004/05.

Chart 3.1
Proportion of 2005/06 Agribusiness Offerings that Raised Capital by Industry

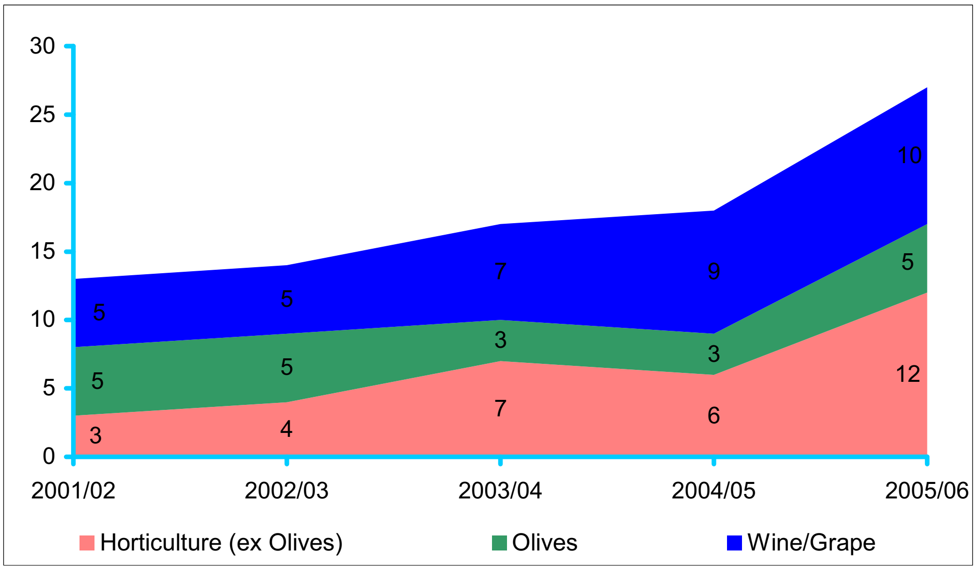


Source: AAG, "Agribusiness MIS Industry End-of-year Round Up report 2005/06".
Notes: (1) Agribusiness includes traditional agriculture, viticulture, horticulture, aquaculture and forestry. (2) Other includes projects in the following sectors: abalone, cotton, cropping, diversified, infrastructure, livestock (including beef cattle and chickens), pearls and truffles.

[37] The information in this section is mainly sourced from this report. All AAG estimates quoted in this section are also sourced directly from this report. Importantly, due to limited information on the methodology used to calculate these figures, Econtech has not been able to evaluate the estimates.

[38] According to AAG's definition, agribusiness covers all sectors associated with the growing of products on the land. This includes traditional agriculture, viticulture, horticulture, aquaculture and forestry.

Chart 3.2
Number of Horticultural MIS released by financial year (2001/02 - 2005/06)



Source: AAG, Agribusiness MIS Industry End-of-year Round Up report 2005/06.

The total number of MIS on offer in 2005/06 by industry is presented in Chart 3.3. As shown in this chart, the largest number of schemes is horticultural, with 34 projects on offer (including olive and wine/grape MIS). Some of the new horticultural industries available for investment in the 2005/06 financial year included apricots, avocados, cherries, macadamias, tomatoes and walnuts.

Chart 3.3
Number of Total MIS on Offer in 2005/06 by Industry

Source: AAG, Agribusiness MIS Industry End-of-year Round Up report 2005/06.

According to AAG, the capital raised by agribusiness MIS during 2005/06 totalled $1,141 million. This figure is 11 per cent higher than on the 2004/05 financial year and 280 per cent higher than the capital raised in 2001/02 ($300 million).

Table 3.1 details the breakdown of the capital raised by agribusiness MIS during 2005/06. As shown in this table, although horticulture raised a significant amount of capital ($316 million combining horticulture, olives and wine/grape), timber took the bulk of the capital. Furthermore, the capital raised for wine/grape investments decreased by 25 per cent when compared to the 2004/05 financial year. In contrast, horticultural and olive investments increased by 124 and 114 per cent, respectively, when compared to 2004/05 investment levels.

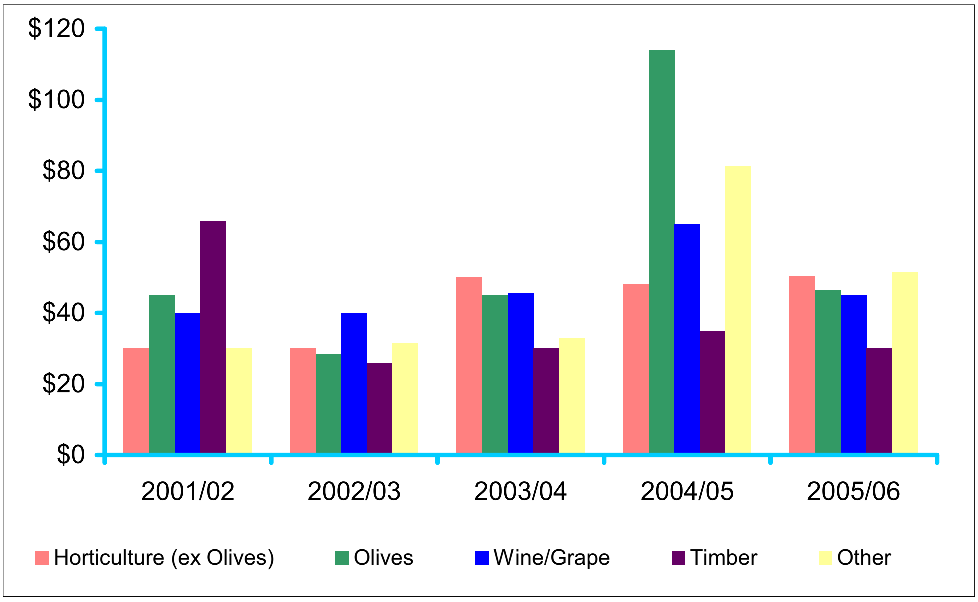
Table 3.1 Capital Raised by Industry

	Capital raised in 2005/06 ($m)	Change in capital raised from 2004/05 (%)	Share of projects in 2005/06 (%)
Horticulture (ex olives)	$181	124%	21%
Olives	$73	114%	9%
Timber	$698	-9%	32%
Wine/Grape	$62	-25%	18%
Other	$127	105%	20%
Total	$1,141		100%

Source: AAG, Agribusiness MIS Industry End-of-year Round Up report 2005/06.
Notes: (1) Data collected on a standardised basis with GST excluded. (2) Only capital actually paid in the year included. (3) Commitments for future payments are not included in the dollar figures. (4) Figures have been rounded.

Chart 3.4 shows the average project investment size by industry from the 2001/02 financial year to the 2005/06 financial year. According to AAG's report, across all projects, the average project investment was $44,000 per investor, with the median being $36,000. Compared to the 2004/05 financial year, both the mean and the median decreased during the 2005/06 year. Given that the total amount of capital raised increased in 2005/06, this means that more investors invested in agribusiness MIS offerings in the 2005/06 financial year than during the 2004/05 period. Indeed, according to AAG, the total number of investors in 2005/06 was close to 32,000, this figure represents an increase of 19 per cent on the 2004/05 year and an increase of 55 per cent compared to the level in 2003/04.

Chart 3.4
Average Project Investment Size by Industry and Year ($'000)



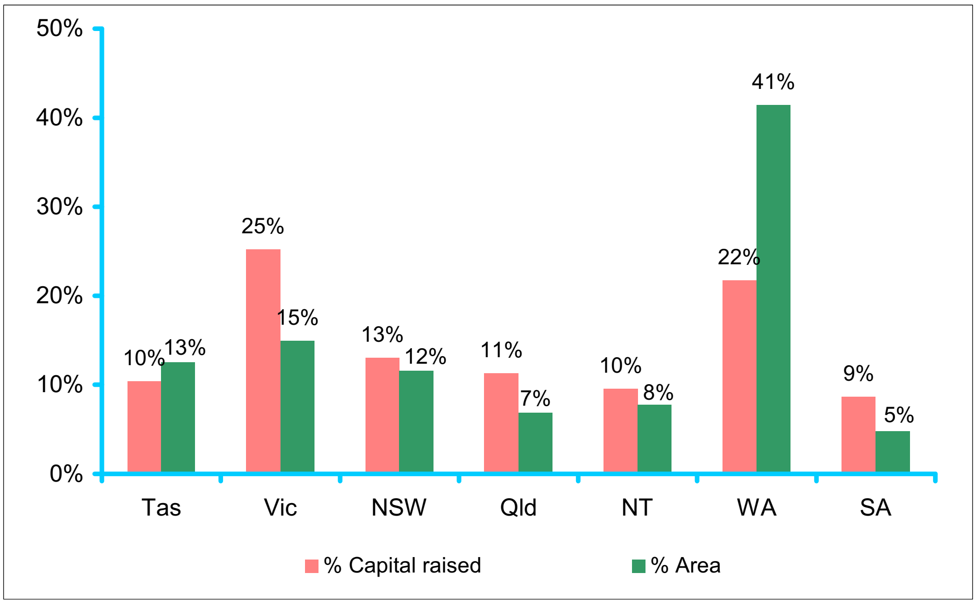
Source: AAG, Agribusiness MIS Industry End-of-year Round Up report 2005/06.

Chart 3.5 shows the location of 2005/06 MIS projects by percentage of capital raised and area. As shown in the chart, based on the location of the projects, Victoria and Western Australia received most of the capital raised during the 2005/06 financial year (25 and 22 per cent respectively) and South Australia received the least amount of capital (9 per cent or $100 million).

Similarly, on the basis of the area to be developed to crops with the capital raised during 2005/06, it is clear that Western Australia will have the biggest amount of development with 53,700 hectares (or 40 per cent of the total area). Victoria, Tasmania and New South Wales will have similar development areas of between 15,000 and 19,400 hectares. The state with the least amount of development at 5 per cent, or around 6,200 hectares, will be South Australia.

Chart 3.5

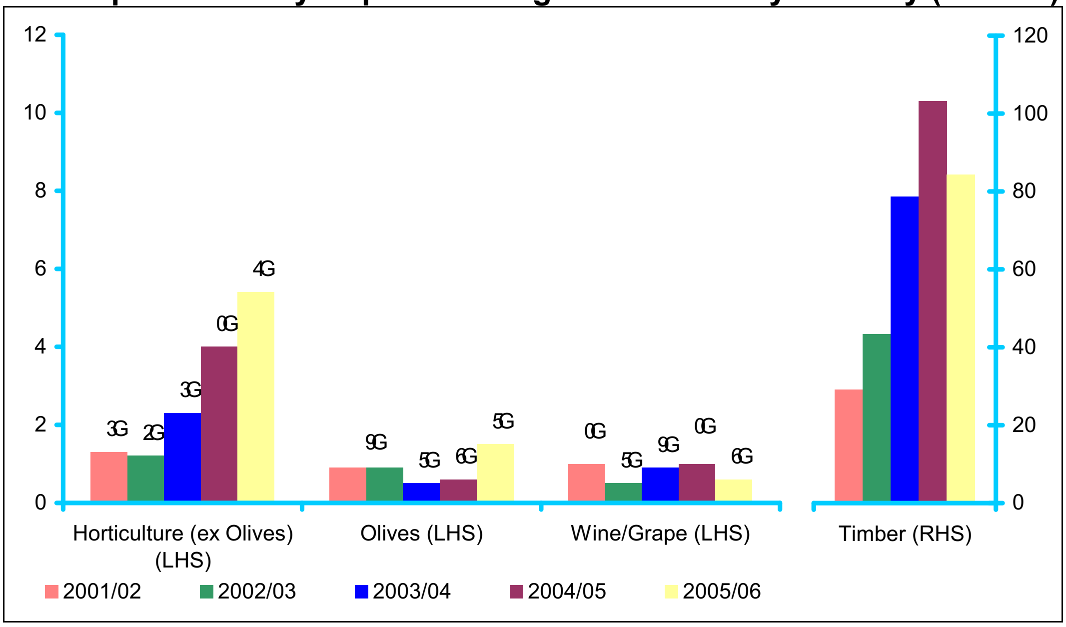
Location of 2005/06 MIS Projects by Percentage of Capital Raised and Area



Source: AAG, Agribusiness MIS Industry End-of-year Round Up report 2005/06.
Note: Figures have been rounded.

Chart 3.6 provides more details about the areas that will be developed to agribusiness crops. As shown in the chart, a significant amount of land (84,300 hectares) will be used to develop timber plantations within the coming months. According to AAG, approximately 600 hectares of vineyards will be developed, along with 1,500 hectares of olive groves and a further 5,400 hectares of other horticultural crops (this includes around 4,000 hectares of almond orchards).

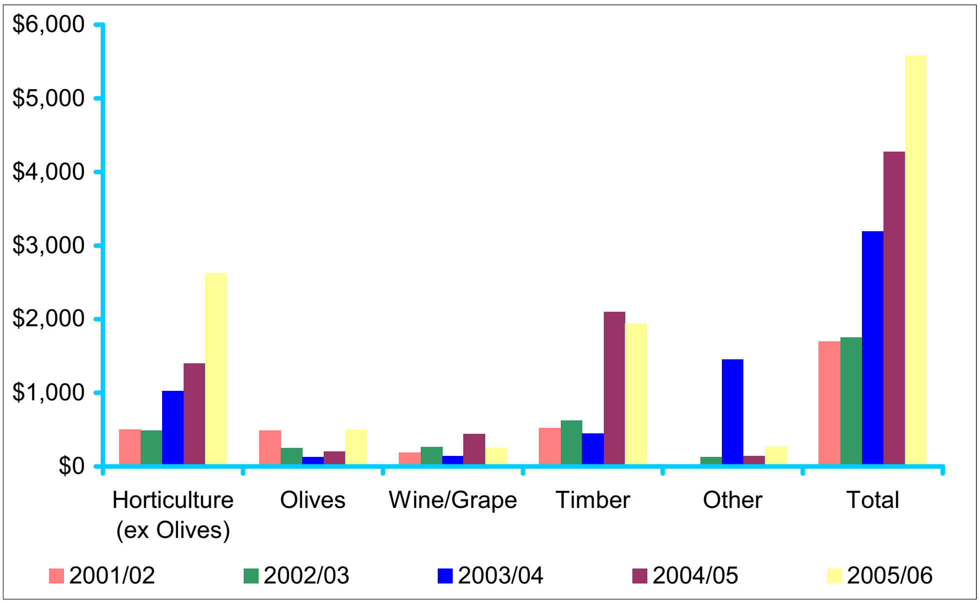
Chart 3.6
Developed Areas by Capital Raising Season and by Industry ('000 ha)



Source: AAG, Agribusiness MIS Industry End-of-year Round Up report 2005/06.

Chart 3.7 outlines the estimated gross revenue for MIS investors from the sale of their crops by industry. As shown in the chart, AAG estimates that, in current dollar terms (excluding any price or cost inflation), 2005/06 projects will produce a total of around $5.5 billion in farm gate revenue[39] over the lives of the projects.

Chart 3.7
Income Generated for Investors from Sale of the Crop by Industry ($m)



Source: AAG, Agribusiness MIS Industry End-of-year Round Up report 2005/06.
Note: Figures are gross income after harvesting costs but before any management fee.

[39] Farm gate revenue refers to gross income after harvesting costs but before management fees.

After allowing for annual management fees and lease and crop marketing fees, AAG estimates that the net income to investors for 2005/06 projects would total approximately $3.3 billion over the lives of the projects.

Importantly, AAG estimated that, of the $1,141 million raised in 2005/06, $510 million (or 45 per cent) will return to investors as a taxation refund. However, AAG also estimated that the amount of tax likely to be paid to the Government on the net project income (the $3.3 billion mentioned above), is approximately $1.5 billion[40], which is 3 times the tax deducted in 2005/06[41].

Furthermore, in addition to the income tax paid by investors, the product managers have to pay 30 per cent on the management, lease and crop marketing fees. Also, there will be tax paid on salaries and wages and GST paid to the Government. According to AAG estimates, when combined with the tax on net crop income, the industry contributes tax at substantially greater than 3 times the tax deducted upfront.

3.5 Horticulture Industries with Highest Level of MIS Involvement

To study in greater detail the key industries in which MIS participate, Econtech and H&A's first step was to identify the horticulture industries with the highest level of MIS involvement. To this end, Econtech and H&A asked AIMA to provide the following information by horticulture industry:

- MIS investment as a percentage of total industry production;
- level of current MIS investment (high, medium or low); and
- level of future MIS investment (high, medium or low).

The information provided by AIMA is detailed in Table 3.2 below. Based on this table, Econtech and H&A selected the following horticultural industries with the highest level of MIS involvement:

- olives;
- almonds;
- table grapes;
- citrus;
- avocados; and
- mangoes.

Section 4 presents a more detailed analysis of the MIS in these horticulture industries.

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[40] Assumes a top marginal tax rate of 46.5 per cent.

[41] Importantly, as mentioned before, due to limited information on the methodology used to calculate these figures, Econtech has not been able to evaluate the estimates.

Table 3.2
Horticulture Industries with Highest Level of MIS Involvement

Horticulture Industry	GVP ($m) 2004/05 (e)	Projected GVP ($m) 2006/07 (e)	% of MIS investment of total industry production (d)	Level of CURRENT investment (d)	Level of FUTURE investment (d)
Almond	76.6	75.5	21-50%	High	High
Apples	528.5	436.7	0%	Low	Low
Asparagus	48.4	68.1	0%	Low	Low
Avocados	90.5	102.8	5-20%	Medium	Low
Bananas	326.9	359.8	0%	Low	Low
Beans	6.2	6.7	0%	Low	Low
Berry fruit	68.7[a]	N/A	5-20%	Low	Medium
Broccoli	73.5	84.1	0%	Low	Low
Capsicum	80.2	100.1	0%	Low	Low
Carrots	76.6	75.5	0%	Low	Low
Cauliflower	48.8	60.4	0%	Low	Low
Chestnuts	6.8 [b] [c]	1.1	0%	Low	Low
Citrus	466.7	502.6	5-20%	Medium	Medium
Custard apples	5.0[b]	1.8	0%	Low	Low
Cut flowers	165.6	225.2	0%	Low	Low
Garlic	N/A	0.8	0%	Low	Low
Grapes (table)	197.3 [b]	N/A	5-20%	Low	Medium
Grapes (wine)	N/A	N/A	5-20%	Low	Medium
Kiwifruit	8.3	7.3	<5%	Low	Medium
Leeks	17.2[b]	4.3	0%	Low	Low
Lettuce	112.2	132.4	0%	Low	Low
Lychees	5.9(b)	3.5	0%	Low	Low
Macadamias	119.4	109.4	0%	Low	Low
Mangoes	134.6	120.4	5-20%	Medium	Medium
Melons	149.1	165.2	0%	Low	Low
Mushrooms	242.1	234.3	0%	Low	Low
Nashi	8.8	4.5	0%	Low	Low
Nursery	602.6	725.0	0%	Low	Low
Olive trees	N/A	N/A	51-70%	High	High
Onions	144.0	166.2	0%	Low	Low
Pears (excl.	89.2	89.4	<5%	Low	Low
Pecan nuts	8.4	2.6	<5%	Low	Low
Pineapples	33.5	35.6	0%	Low	Low
Potatoes	433.6	574.5	0%	Low	Low
Pumpkin	48.3	59.2	0%	Low	Low
Spinach	N/A	2.3	0%	Low	Low
Spring onions	144.0	26.6	0%	Low	Low
Summerfruit	266.2[b]	N/A	5-20%	Medium	Medium
Sweet corn	72.2	59.5	0%	Low	Low
Tomatoes	76.6	75.5	<5%	Low	Medium
Walnuts	0.1	0.3	5-20%	Low	Medium
Zucchini	22.6[b]	8.3	0%	Low	Low

(a) Source: Value of Agricultural Commodities Produced, 2004-2005, ABS.
(b) Source: 2001/02 Value, Source: The Australian Horticulture Statistics Handbook 2004, HAL.
(c) Estimate.
(d) Source: AIMA.
(e) Source: HAL, “Australian Horticultural GVP Estimation 2006/07”.

4. Analysis of Selected Horticulture Industries

The previous section provided a general picture of the MIS in the Australian horticulture sector. This section presents a more detailed analysis of the horticulture industries with the highest level of MIS involvement and it is divided into six sections that analyse the following industries: olives; almonds; table grapes; citrus; avocado and mango.

4.1 Olives

4.1.1 Olive Industry

According to information by RIRDC[42], the Australian olive industry is very old, with the first plantings occurring in 1800 in Sydney. The Australian olive industry experienced a resurgence in the early 1990's, when the increased popularity of Mediterranean cuisine triggered an increased interest in the production of olives in Australia.

The world market for olive oil is a mature one, with supply and demand balanced. The global consumption of olive oil in 2004/05 was estimated at 2.8 million tonnes, with the production of olive oil recorded at the same level (2.8 million tonnes)[43].

Australia is a comparatively small producer of olive oil, accounting for only 0.6 per cent of world production with 4,500 tonnes in 2004/05[44]. In contrast to its modest production, Australia's consumption of olive oil was estimated at 35,500 tonnes, with a per capita annual consumption of 1.9 litres[45].

With limited production, Australia currently exports only a small volume of olive oil – approximately 397 tonnes in 2004/05. In fact, Australia is a net importer of olive oil, with imports to Australia estimated at around 32,000 tonnes in 2004/05[46].

4.1.2 MIS in the Australian Olive Industry

The MIS sector has been the main driver behind the growth in investment in the Australian olive industry. Indeed, according to AIMA, approximately 4.9 million olive trees are grown under the MIS structure[47]. Importantly, as shown in Table 3.2, the expected level of future investment in olive MIS is high.

Chart 4.1 shows the number of MIS and the land dedicated to MIS in the Australian olive industry. As shown in the chart, there are approximately 13,658 hectares of land dedicated to MIS olives groves and around 48 schemes.

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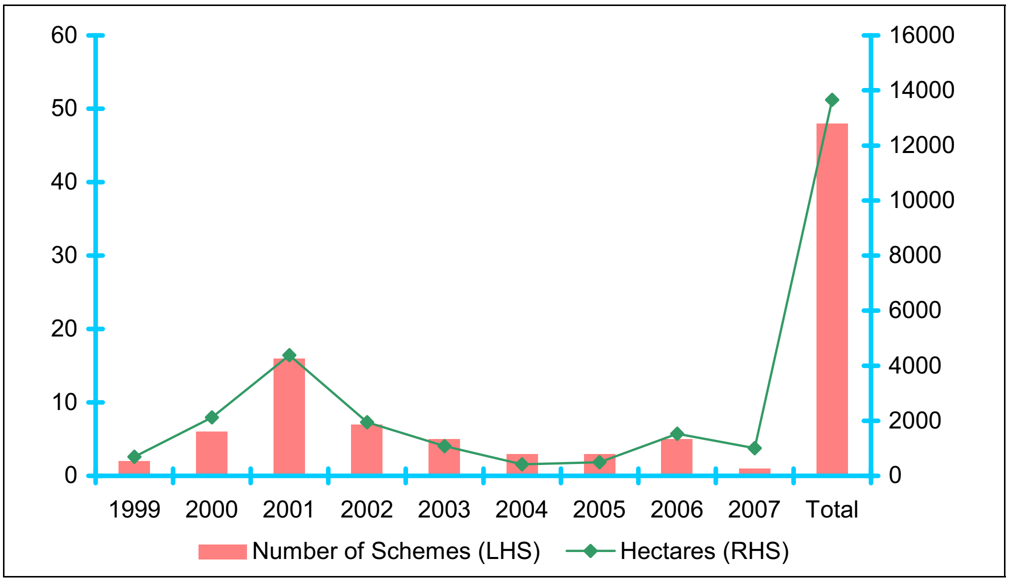
[42] Rural Industries Research and Development Corporation (RIRCD), *"Research and Development Plan for the Australian Olive Industry 2003-2008"*.
[43] Great Southern, *"2007 Organic Olives Income Project, Product Disclosure Statement"*.
[44] Ibid.
[45] Ibid.
[46] Ibid.
[47] AIMA, *"MIS Horticulture Overview"*, 2006.

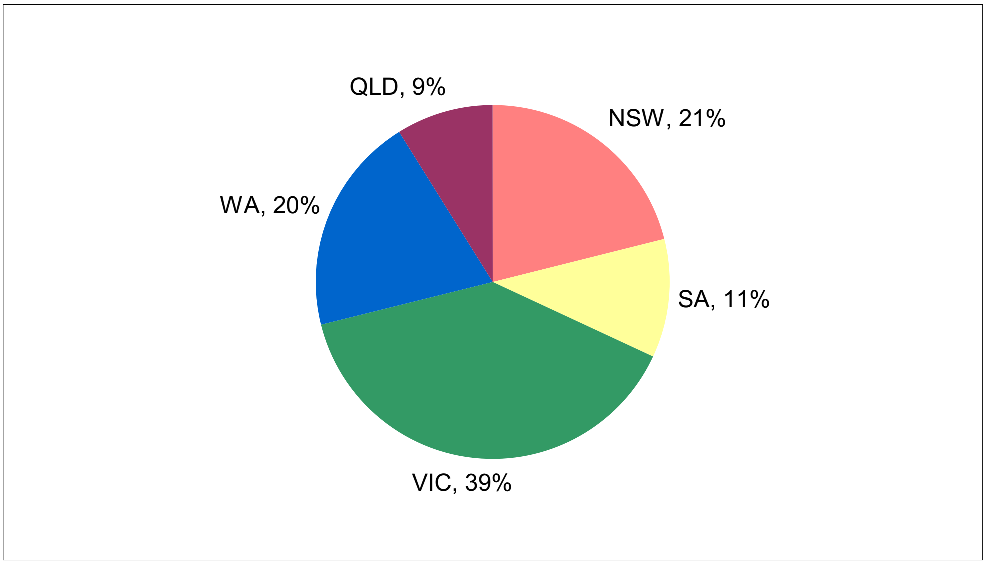
Chart 4.1
Number of MIS and Hectares of Land Dedicated to MIS in the Olive Industry



Source: AIMA, "MIS Horticulture Overview".
Notes: (1) All figures were sourced from data provided in Product Ruling statements issued by the Australian Taxation Office since 1999.

Chart 4.2 shows the location of MIS olive projects. Importantly, this chart shows that Victoria accounts for the majority of MIS olive plantations, having 39 per cent of the total area.

Chart 4.2
Location of MIS Olive Projects



Source: AIMA (sourced from ATO Product Ruling Database).

4.2 Almonds

4.2.1 Almond Industry

The global almond industry has grown significantly in the last 10 years. Almonds are grown in 40 countries, but the world's largest producer and exporter is the United States (in particular the state of California), which contributes over 80 per cent of the world supply[48]. In contrast, Australia contributes only around 2 per cent of the world supply, producing only 11,775 tonnes of almonds in 2004/05[49].

Although only a fraction the size of the world industry, the Australian almond industry has been growing at an annual compound rate of approximately 11 per cent since 1960[50] and it is currently undergoing a period of accelerated growth. Indeed, almond production is expected to increase threefold to approximately 50,000 tonnes in 2012[51]. The main drivers of this increase in production are strong global demand growth for almonds as well as Australia's ability to compete in price and quality with United States almonds.

4.2.2 MIS in the Australian Almond Industry

MIS are crucial to the Australian almond industry, as they represent approximately 48 per cent of the total land dedicated to almond orchards in Australia[52]. According to AIMA, approximately 2.4 million almond trees are grown under the MIS structure[53]. Importantly, as shown in Table 3.2, the expected level of future investment in almond MIS is high.

Chart 4.3 shows the number of MIS and the land dedicated to MIS in the Australian almond industry. As shown in the chart, there are approximately 9,055 hectares of land dedicated to MIS almond orchards and around 22 schemes.

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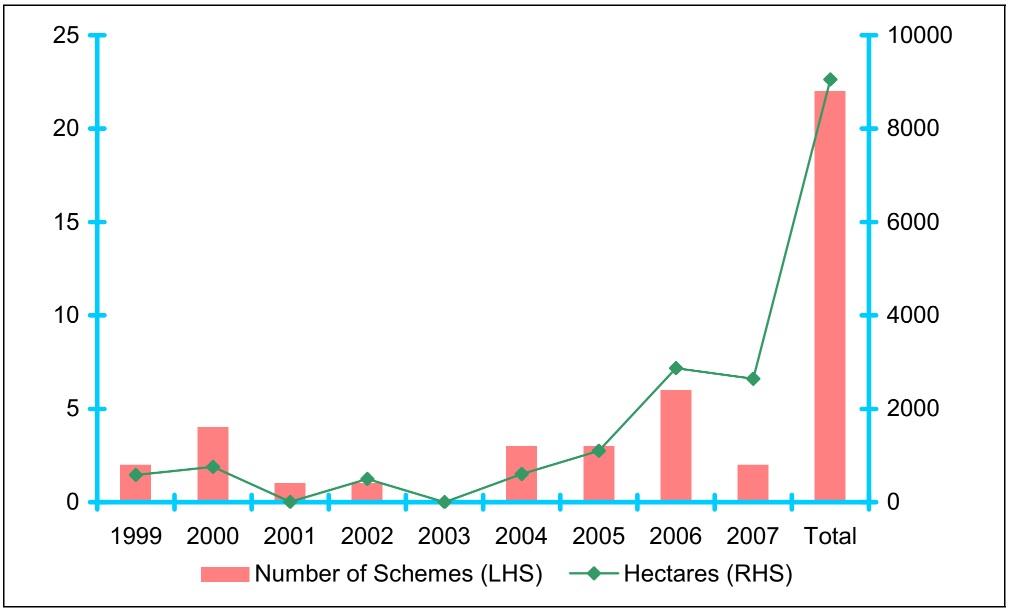
[48] Timbercorp, *"2006 Timbercorp Almond Project. Supplementary Product Disclosure Statement"*
[49] Horticulture Australia Limited, *"Australia Horticulture GVP Estimation 2006_07"*
[50] Greater Southern, *"2007 Almond Income Project. Product Disclosure Statement"*
[51] Ibid.
[52] AIMA, *"MIS Horticulture Overview"*, 2006.
[53] Ibid.

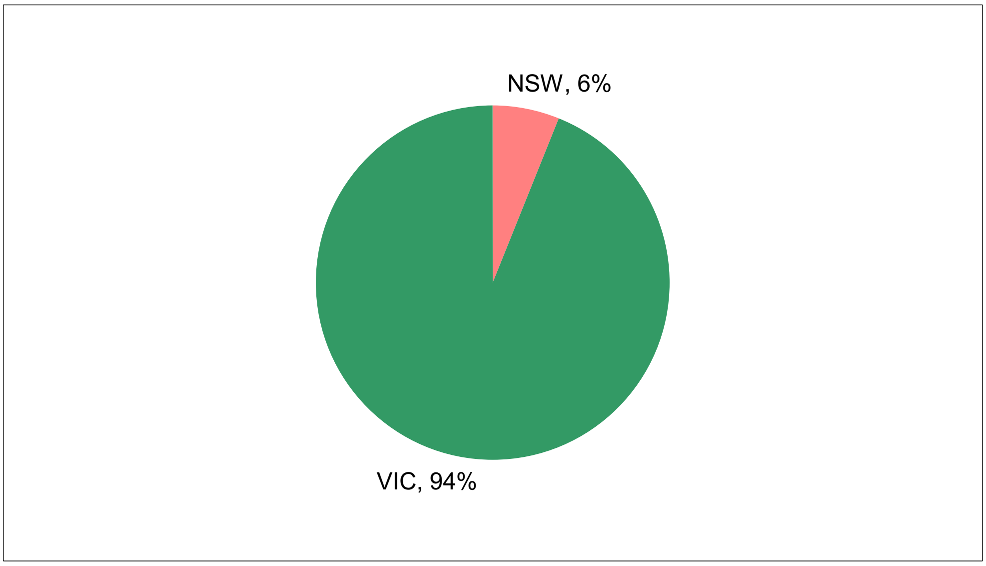
Chart 4.3
Number of MIS and Hectares of Land Dedicated to MIS in the Almond Industry



Source: AIMA, "MIS Horticulture Overview".
Notes: (1) All figures were sourced from data provided in Product Ruling statements issued by the Australian Taxation Office since 1999.

Chart 4.4 shows the location of MIS almond projects. This chart shows that Victoria accounts for the majority of the MIS almond plantations, with 94 per cent of total MIS plantations by area.

Chart 4.4
Location of MIS Almond Projects



Source: AIMA (sourced from ATO Product Ruling Database).

4.3 Table Grapes

4.3.1 Grapes Industry

In 2003, the global supply for table grapes totalled approximately 11 million tonnes. Of these, roughly 15 per cent was contributed by producers in the southern hemisphere[54]. Importantly, the majority of table grapes produced are sold in the domestic markets of the nations that grow them, with only around 20 per cent sold in export markets[55].

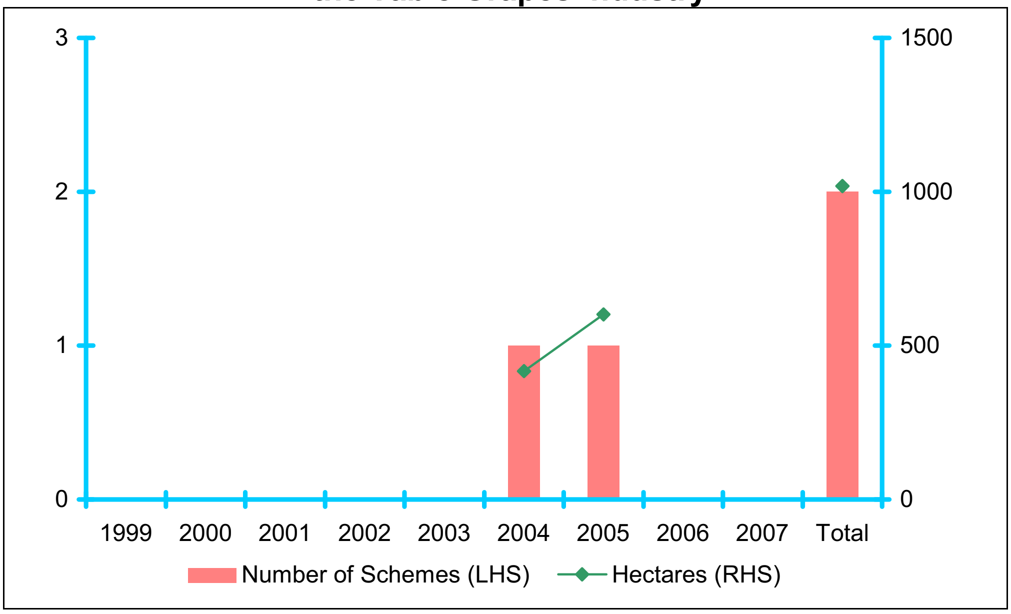
In global terms, Australia is a relatively small producer of table grapes, accounting for only around 1 per cent of the world's production and less than 2 per cent of world exports. Nevertheless, the production of table grapes in Australia has doubled in the last decade as a result of increased domestic consumption and strong export growth. Indeed, Australia's exports have increased approximately fourfold during this period[56].

Table grapes are grown commercially in all Australian mainland states. However, the bulk of Australia's domestic crop continues to be produced in the Sunraysia region of north-west Victoria and south-west New South Wales (Mildura, Robinvale and Euston).

4.3.2 MIS in the Australian Grapes Industry

MIS's contribution to the table grapes industry is between 5 and 20 per cent according to AIMA. Importantly, MIS investment in this area is expected to increase in the future, moving from low to medium, as indicated in Table 3.2. Chart 4.5 shows the number of MIS and the land dedicated to MIS in the Australian table grape industry.

Chart 4.5
Number of MIS and Hectares of Land Dedicated to MIS in the Table Grapes Industry



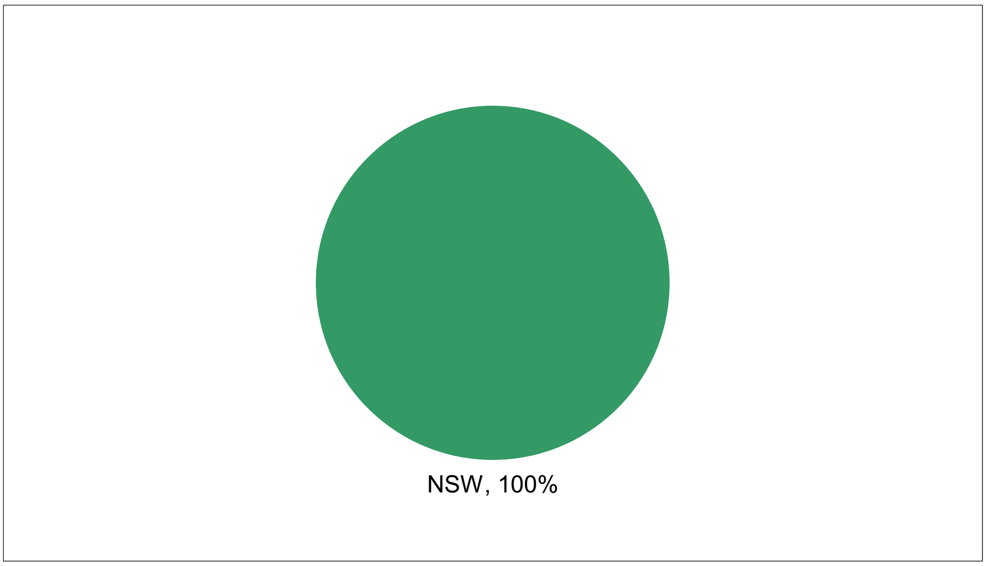
Source: AIMA.
Note: Includes established and committed plantings.

54 Timbercorp, *"2005 Table Grapes Project, Product Disclosure Statement."*
55 Ibid.
56 Ibid.

As shown in the chart above, currently there are only two MIS table grapes projects, accounting for approximately 1,018 hectares of land. AIMA informed Econtech and H&A that the only company offering table grapes MIS at the moment is Timbercorp.

Chart 4.6 shows the location of MIS table grape projects. This chart shows that all of the MIS table grape projects are situated in NSW.

Chart 4.6
Location of MIS Table Grape Projects



Source: AIMA.

The number of investors in table grape MIS is relatively small compared to other types of horticulture, with only 507 investors. This is in part a reflection of the nature of the industry, which is also quite small, and supplies its product primarily to domestic demand. Further, the average table grape MIS investment is $49,583 and the average land allocation per investor is roughly 0.81 hectares.

4.4 Citrus

4.4.1 Citrus Industry

Over the last two decades, the global production of citrus has experienced continuous growth, reaching an annual production level in 2004 of approximately 105 million tonnes, half of which was constituted by oranges[57].

World citrus consumption has also increased over the past decade from approximately 19 kilograms to 22 kilograms per capita. Of the global production, only 10 per cent is exported as fresh fruit, 33 per cent is processed into juice products, and the remaining 57 per cent is consumed domestically as fresh fruit.

Australia produces an estimated 700,000 tonnes of citrus each year[58]. In line with the national economy, the real value of citrus gross production has increased by just over

[57] Timbercorp, *"2005 Citrus Project, Product Disclosure Statement."*
[58] Ibid.

4 per cent per annum between 1999/00 and 1991/92. Growth in the real value of citrus exports has increase at an average rate of 14 per cent per annum between 1988/89 and 2000/01. Australian consumption of fresh fruit per capita has been stable over the last few years, although there is a trend towards the consumption of more fresh fruit and juice compared to processed citrus products[59].

Approximately 90 per cent of the citrus produced in Australia is grown in the Riverland region of South Australia, along the River Murray in southern New South Wales, northern Victoria (Sunraysia and Mid-Murray), and the Central Burnett region of Queensland. The remaining 10 per cent of citrus is mainly produced in Western Australia[60].

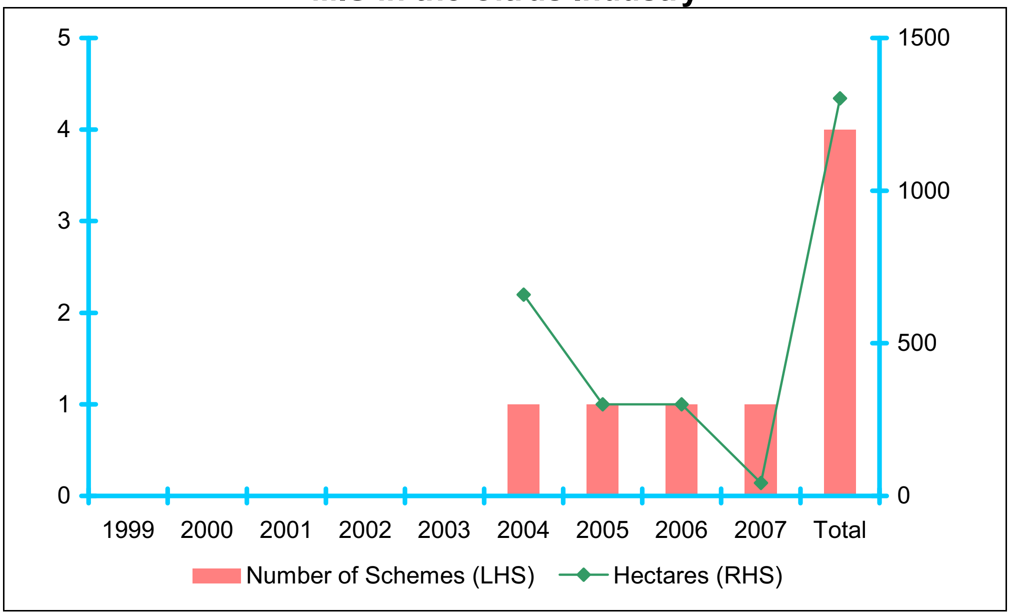
Australian citrus imports are small. Since 1988/89, imports as a proportion of total available fresh citrus fruit in the Australian market have ranged from 1 to 3 per cent[61].

4.4.2 MIS in the Australian Citrus Industry

MIS in the Australian citrus industry are estimated by AIMA to account for between 5 and 20 per cent of total production. The level of investment is expected to remain steady over the next few years, as indicated in Table 3.2.

Chart 4.7 shows the number of MIS and hectares of land dedicated to MIS in the Australian citrus industry. As shown in the chart, there are currently four MIS projects and 1,302 hectares of land dedicated to citrus MIS. AIMA informed Econtech and H&A that the only company offering citrus MIS at the moment is Timbercorp.

Chart 4.7
Number of MIS and Hectares of Land Dedicated to MIS in the Citrus Industry



Source: AIMA.
Note: Includes established and committed plantings.

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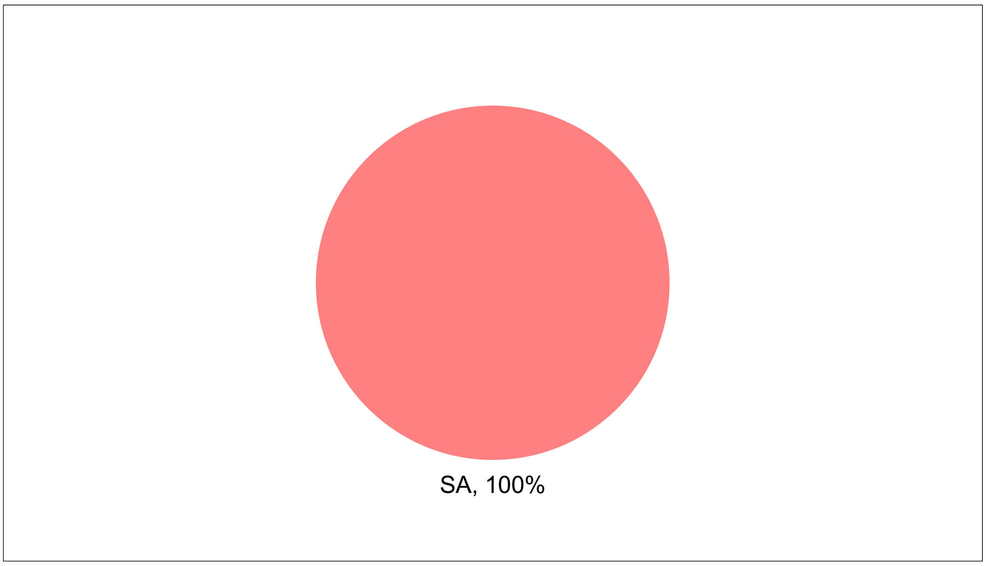
[59] Timbercorp, *"2005 Citrus Project, Product Disclosure Statement."*
[60] Ibid.
[61] Ibid.

Chart 4.8 shows the location of MIS citrus operations, which (like table grapes) are situated entirely in one region, South Australia, and operated by a single investment provider.

Chart 4.8
Location of MIS Citrus Projects



Source: AIMA.

The number of investors in citrus MIS is fairly small, at only 240 people. Nonetheless, the average investment in citrus MIS is generally higher than other types of horticulture, with an average investment of $89,789. The average land allotment per investor is also large at 5.4 hectares. These statistics indicate that MIS citrus investment is characterised by a small number of investors that make relatively large contributions, as opposed to the almond and olive MIS industries that are characterised by a large number of relatively small investors.

4.5 Avocado

4.5.1 Avocado Industry

Avocados are cultivated commercially in over 50 countries. Mexico dominates the total world avocado production, accounting for 36.8 per cent of the world production. The second biggest producer is the United States, with 7.9 per cent of world production. In contrast, Australia accounts for around 2 per cent of world production[62].

Avocado production in Australia has increased rapidly in recent years, from 12,926 tonnes produced in the 1993 season to over 32,000 tonnes in 2004/05 (worth around $65 million per annum[63]). Australia's recent consumption of avocados also continues to rise, and is now at a level of around 1.8 to 2.0 kilograms per person per annum.

The avocado industry in Australia is dominated by production from south-east Queensland, with significant production in North Queensland, Toowoomba, northern New South Wales, south-west Western Australia, Sunraysia and Riverland.

[62] Timbercorp, *"2006 Avocado Project, Product Disclosure Statement."*
[63] Ibid.

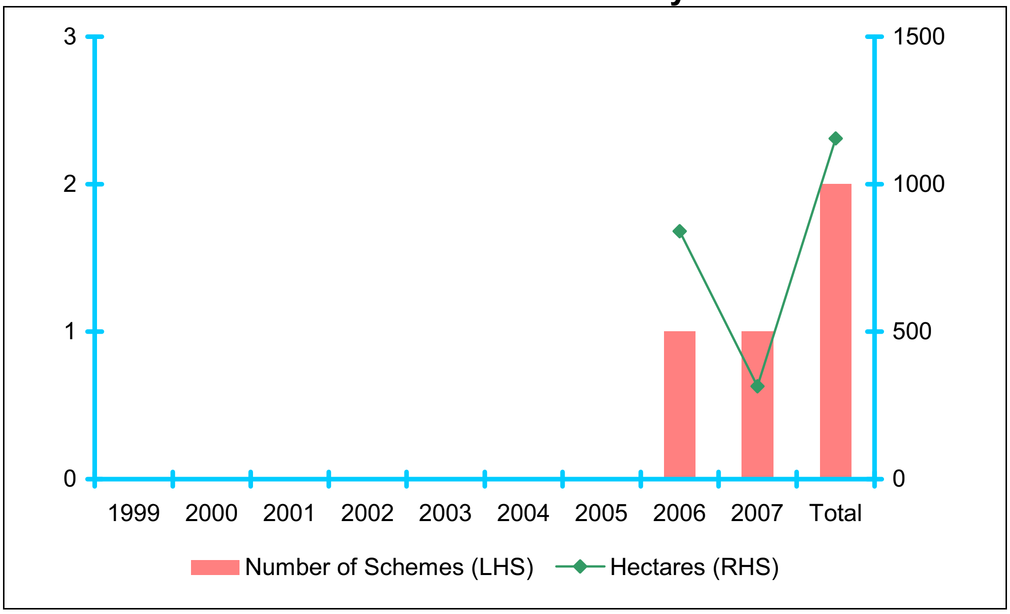
Australian avocado export levels are small, with only around 500 tonnes being exported per year. This constitutes less than 0.2 per cent of world exports.

4.5.2 MIS in the Australian Avocado Industry

AIMA estimates that MIS account for 5 to 20 per cent of the total industry production, although investment in MIS avocado projects is expected to decrease as a proportion of total investment in the industry (Table 3.2).

Chart 4.9 shows the number of MIS and hectares of land dedicated to MIS in the Australian avocado industry. As shown in the chart, there are currently two projects and 1,155 hectares of land dedicated to avocado MIS. AIMA informed Econtech and H&A that the only company offering avocado MIS at the moment is Timbercorp.

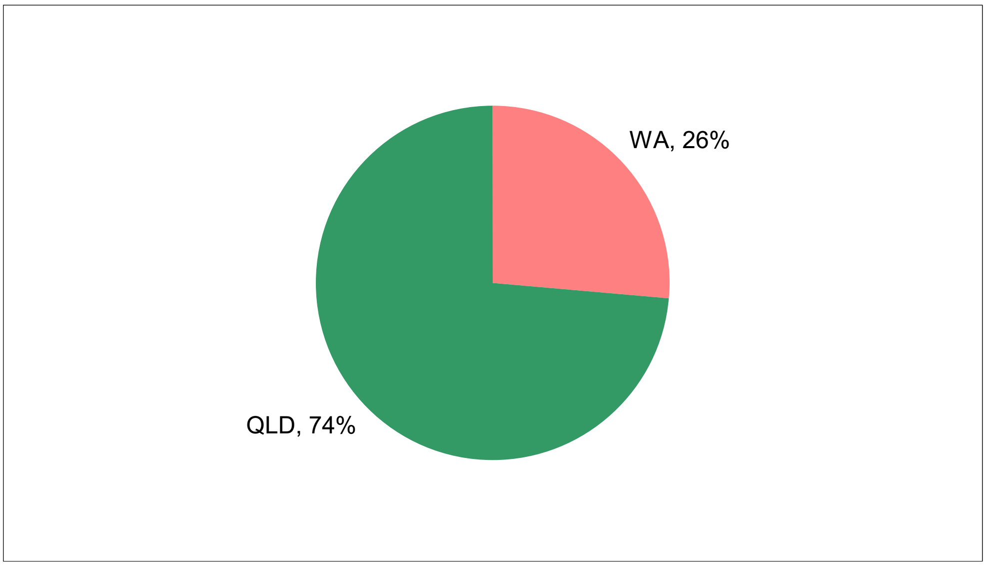
Chart 4.9
Number of MIS and Hectares of Land Dedicated to MIS in the Avocado Industry



Source: AIMA.
Note: Includes established and committed plantings.

Chart 4.10 shows the location of MIS avocado projects, with around one-quarter located in Western Australia and the remaining three-quarters located in Queensland. Further, there are 467 individual MIS investors in the avocado industry, with an average investment of $67,182. The average amount of land per investor is 2.47 hectares.

Chart 4.10
Location of MIS Avocado Projects



Source: AIMA.

4.6 Mango

4.6.1 Mango Industry

The world production of mango is principally centred in Asia, which accounts for more than 75 per cent of the world's mangoes. India is the largest of the mango producers with estimated production ranging between 50 and 60 per cent of the world's annual production[64].

Most of the world's supply of mangoes is consumed in the country of origin. For instance, in 2002, only around 2.6 per cent of the world's production was traded in export markets. The only major exporters of mangoes are Mexico and Brazil, which predominantly supply the United States and European Union markets.

Australia's production of fresh mango has significantly increased over the last 10 years, from around 2 million trays in 1991/92 to over 7 million trays in 2004/05. Furthermore, the production trend for the Australian mango industry is estimated to be increasing at around 8 per cent per year[65].

Around 80 per cent of Australia's crop is produced as fresh produce and 20 per cent is processed. Importantly, of the production of fresh fruit, 90 per cent is sold on the Australian domestic market and the remaining 10 per cent is exported to a range of countries including Singapore, Hong Kong, Japan, Malaysia, Saudi Arabia, the European Union and the United Arab Emirates.

Over the last five years, Queensland has produced approximately 65 per cent of all the mangoes grown in Australia. Production in the Northern Territory accounted for

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[64] Timbercorp, *"2006 Mango Project, Product Disclosure Statement."*
[65] Ibid.

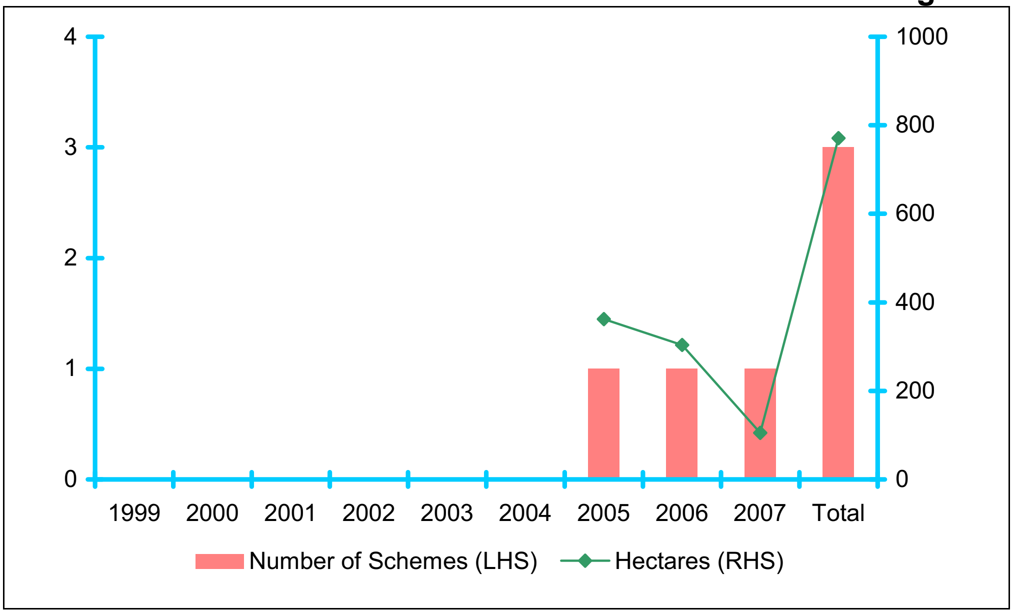
approximately 28 per cent of national mango production, and the Carnarvon and Kununnurra regions (WA) account for around 6 per cent of Australian mango production.

4.6.2 MIS in the Australian Mango Industry

Mango MIS account for 5 to 20 per cent of the total output in the industry, as estimated by AIMA. MIS investment levels in this industry are expected to remain steady over the next few years, as shown in Table 3.2.

Chart 4.11 shows the number of MIS and the land dedicated to them in the Australian mango industry. The area of land that is currently dedicated to MIS mango projects is small at 771 hectares and there are currently three projects. AIMA informed Econtech and H&A that the only company offering mango MIS at the moment is Timbercorp.

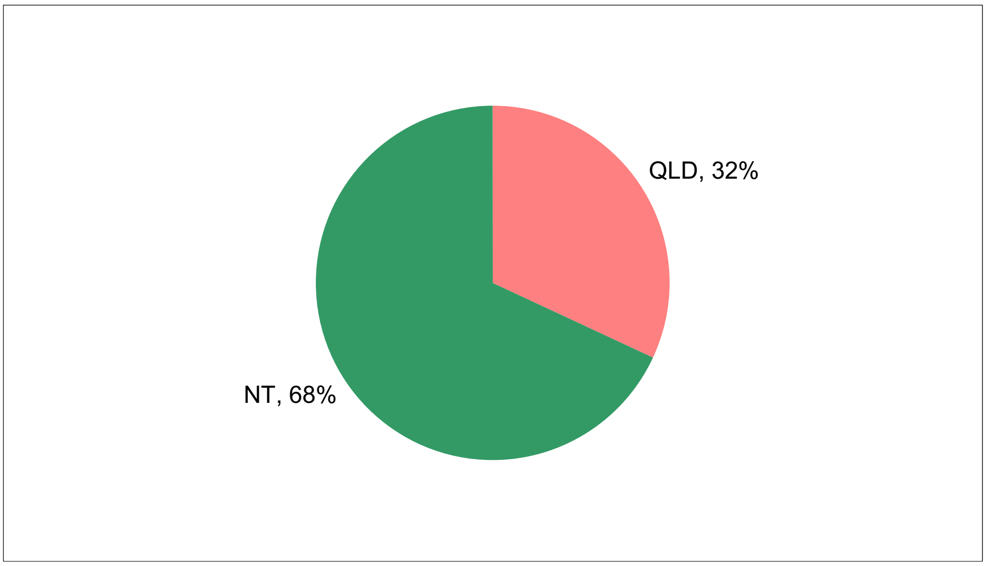
Chart 4.11
Number of MIS and Hectares of Land Dedicated to MIS in the Mango Industry



Source: AIMA.
Note: Includes established and committed plantings.

MIS mango projects are located in both Queensland and the Northern Territory, with around one-third located in Queensland and two-thirds located in the Northern Territory. Chart 4.12 provides a visual representation of these statistics.

Chart 4.12
Location of MIS Mango Projects



Source: AIMA.

There are currently 411 investors in MIS mango projects, which is again relatively small in comparison to olives and almonds. The average investment in MIS mango projects is $45,579, with each investor holding roughly 1.86 hectares of land.

4.7 Summary

Table 4.1 provides a summary of production and MIS involvement within the selected industries.

Table 4.1
Production and MIS Involvement in Selected Industries

Horticulture Industry	Actual GVP ($m) 2004/05 (a)	Projected GVP ($m) 2006/07 (a)	% of MIS investment of total industry production (c)	Number of MIS (d)	Hectares dedicated to MIS (d)
Almond	76.6	75.5	21-50%	22	9,055
Avocados	90.5	102.8	5-20%	2	1,155
Citrus	466.7	502.6	5-20%	4	1,302
Grapes (table)	197.3 (b)	N/A	5-20%	2	1,018
Mangoes	134.6	120.4	5-20%	3	771
Olive trees	N/A	N/A	51-70%	48	13,658

Notes:
(a) Source: Australian Horticulture GVP Estimation 2006/07, HAL
(b) Source: 2001/02 Value, Source: The Australian Horticulture Statistics Handbook 2004, HAL.
(c) Source:AIMA.
(d) Source:MIS Horticulture Overview, AIMA.

5. Economic Assessment of MIS Horticultural Projects

The previous section provided a detailed analysis of the horticulture industries with the highest level of MIS involvement. This section provides an economic assessment of the impact of MIS horticultural projects on the economy.

This assessment entails two distinct steps. The first step is to estimate the direct impact of the MIS on the Australian horticulture industry (presented in Section 5.1). The second step extends the direct impacts to estimate the current contribution of MIS horticultural projects to the economy (Section 5.2).

5.1 Direct Impacts of MIS within the Horticulture Industry

5.1.1 Impact of MIS on the Cost and Availability of Land and Water

Australian horticulture has been a growth sector of the Australian economy for the past 10 years. The Gross Value of Production (GVP) has grown at 6.6 per cent and production at 1.2 per cent, per annum. The diversity of the sector has been crucial to sustaining growth. This growth itself has the potential to impact on land and water resources devoted to horticulture. It is estimated that the horticultural industry covers approximately 450,000 hectares and on average extracts 2,570 gigalitres for irrigation of crops annually[66]. This amount of water is estimated to be 17 per cent of total water extracted for irrigation annually across the nation.

MIS Impact on Cost and Availability of Land

Official land valuations take into account the value of comparable property sales when estimating changes in value over time. Land values do not include houses and other improvements such as channels and drains. This is called the unimproved value, meaning the amount a parcel of land could be expected to sell for at the date of valuation, assuming that no improvements exist on the land.

The key drivers of land values are returns and improvements to the terms of trade and productivity. These are all important drivers in farm land use decisions. Land prices are likely to increase in areas where there is competition for land between industries, areas where there is a concentrated area or pocket of rapid development, areas where there is a relatively small amount of prime agricultural land, or areas where there is a limit on the land that can be developed to access irrigation supplies. These conditions will necessitate an increase in land prices over time.

Valuer general sites contain information relating to land prices. However, it is difficult to draw conclusions of the impact of MIS on the value of land from the data available in these valuer general sites. For example, in 2005 in the shire of Mildura there were only 2 sales reported of holdings classed as orchards. Further, NSW only report benchmark property prices. However, it is reported that average sale prices for rural land in general in Victoria increased by 12.8 per cent from 2004 to 2005.

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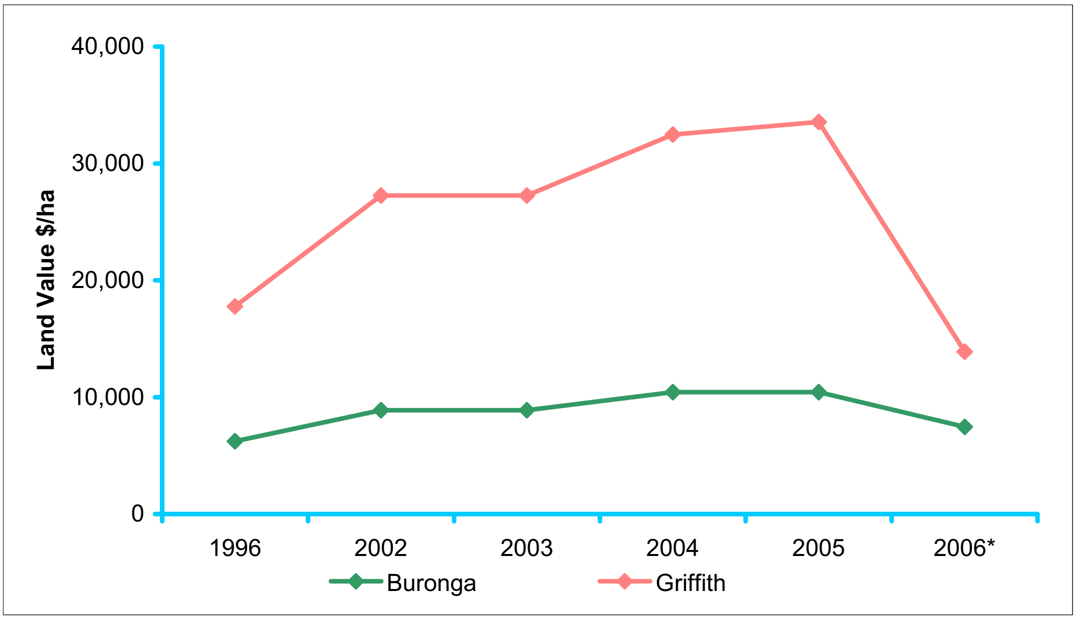
[66] Horticulture Australia Limited (undated), *"Horticulture's value to the Australian Economy"*.

Land prices have increased across all classes of rural properties over the past 10 years since 1996 in NSW. NSW land and property information[67] estimates that tablelands grazing properties have increased in value by a factor of 2.44 from 1996 to 2005. Wheat properties have increased by a factor of 2.5. During the same period, citrus properties in Griffith and Buronga increased by factors of 2 and 1.67 respectively. Elders Rural also reported the average sale price of broadacre land climbed 44 per cent in 2003-04, from $536,000 to $770,800[68].

Chart 5.1 below examines the value of citrus properties over the past decade in two benchmark NSW citrus regions. Changes in property values in these regions indicate that the value of horticultural land has increased rapidly. However, much of this increase may also be due to the water entitlements that were linked to this land.

Chart 5.1
Value of Citrus Properties over Time



Source: NSW Department of Lands (2006).
* Based on land value only as water entitlements are separated.

However, any analysis across reported land sales is unlikely to pick up any impact of MIS schemes given the small number of sales. Discussions with real estates across the regions highlighted that any impacts on land prices are localised[69]. As the impacts of MIS are local, real estate agents were contacted in areas where there has been significant MIS development.

The agents generally noted that that in areas where there has been strong growth from MIS in recent years, there has been a general decline in the availability of land and higher prices have been paid for land developed by MIS operators. It was identified that in the Sunraysia region of Robinvale, MIS operators have purchased dryland wheat properties up to

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[67] NSW Department of Lands (2006), "*NSW Country Land Values, Specialised Rural Properties*" http://www.lands.nsw.gov.au/valuation/nsw_land_values
[68] Elders, 2005.
[69] Elders Real Estate agencies in Riverland, Sunraysia, Bundaberg, Mareeba, Robinvale and Euston.

10 kilometres from the Murray River, with the intention of purchasing water to develop the property into an irrigated horticultural crop operation[70].

It was suggested that the supply of land with reasonable access to the Murray River is now almost exhausted and this has contributed to a reduction in properties in the market. Further, the prices paid by MIS operators for dryland wheat properties has been at a significant premium to typical values. Dryland wheat properties, which were typically valued at $500 per hectare, have attracted prices of up to $3,000 per hectare. It would seem that increases in land prices will affect those horticultural businesses that are competing for land to develop larger scale operations.

The impact on land prices for traditional operators will depend on whether there are limits to supply for the land that is needed for MIS projects.

The table below shows the typical prices per hectare for developed horticultural properties. Local real estate agents indicated that the cost of land has plateaued as a result of the current drought. This is because much of the value associated with these properties resides in the water entitlement.

Table 5.1
Value of Horticultural Properties in Key Production Areas

Region	*Industry*	*Land Values ($/ha)*
Riverland, South Australia	Citrus	7,500 (no water)
Sunraysia	Table grapes	35,000 - 45,000
Bundaberg, Queensland	Avocados	20,000 - 30,000
Mareeba, Queensland	Mangoes	6,000 - 10,000 undeveloped
Robinvale, Victoria	Almonds	25,000 for irrigated developed 1,000 - 2,000 for dryland development
Euston	Olives	2,900 – 7,400

Source: Discussions with Elders Real Estate agencies in each region.
Notes: based on value provided by NSW Department of Lands for Buronga.

Each of the regions identified in the table above, are now discussed in turn. The discussion focuses on the current property market in each region.

Riverland - Renmark

The market around Renmark is flat at the moment as a result of the availability of water, small size of properties, and over supply of wine grapes. There is little activity in the market. Larger developments bought into larger private properties several years ago and these were developed into horticultural areas, which have brought in water from outside the region.

Sunraysia - Mildura

MIS have had an impact on the horticultural property values in the Sunraysia-Mildura region. In particular, property values have been driven up by the attached water values, which have been increasing as water becomes scarce.

[70] Based on discussions with Elders Real Estate in Robinvale.

Bundaberg

Over 40 per cent of avocado production in the Bundaberg and Childers region of Queensland is now produced by MIS operations. Typical horticultural properties with good quality red soils in the immediate Bundaberg area are priced between $20,000 and $30,000 per hectare, with improvements. The size of these properties may range from 40 to 100 hectares, with the larger properties likely to sell in the lower end of the price range.

MIS have bought large, already established, avocado properties in the region over the past few years and it is possible that this trend will continue in the future.

Northern Queensland - Mareeba

The Mareeba and Burdekin regions of northern Queensland produce around 65 per cent of Australia's mangoes, or close to 40,000 tonnes.

There has been demand for blocks which were originally used to grow tobacco before that industry declined. These blocks are now essentially undeveloped bushland and are valued at around $6,000 per hectare. For cleared and/or developed horticultural land, prices range from $8,500 to $10,000 per hectare.

MIS operators have purchased properties in the area over the past two years. However, this activity is not necessarily driving demand in the market. There is also strong interest from buyers in Cairns for weekender/lifestyle properties in the area. This demand has driven recent sales beyond prices that could be expected based on returns to agricultural production.

Robinvale

There is a large area developed and operated by MIS in the Robinvale region of Victoria, particularly by the almond industry. Although almonds have been grown in the region for over 25 years, the magnitude of development has been significant in recent years.

Most of the development has taken place on previously dryland wheat farms, which have traditionally had a value of $500 per hectare. However, in recent years, properties in locations which are desirable for almond production under MIS (such as those with access to water) have sold for between $2,500 and $5,000 per hectare. The demand for these properties has been slowed by drought over the past 2 to 3 years, though demand is still relatively strong with some 8,000 hectares being developed into almond plantations annually in recent years.

MIS Impact on Cost and Availability of Water

In Australia water is currently owned and managed by the States and Territories. Individual users and water providers extract water from a river or groundwater aquifer, and use this extracted water under a conditional statutory licence.

Water entitlements and allocations go by various names across the different jurisdictions. A water access entitlement[71] is the perpetual or ongoing entitlement to a share of water from a

[71] See in particular NWI Clauses 28 and 33.

specified consumptive pool, as defined in the relevant water plan. Whilst water access entitlements ostensibly represent 'shares' to a consumptive pool they also commonly include a notional 'volume' in Mega Litre (ML) that may or may not be made available in any particular year. The volume made available for extraction is called the allocation.

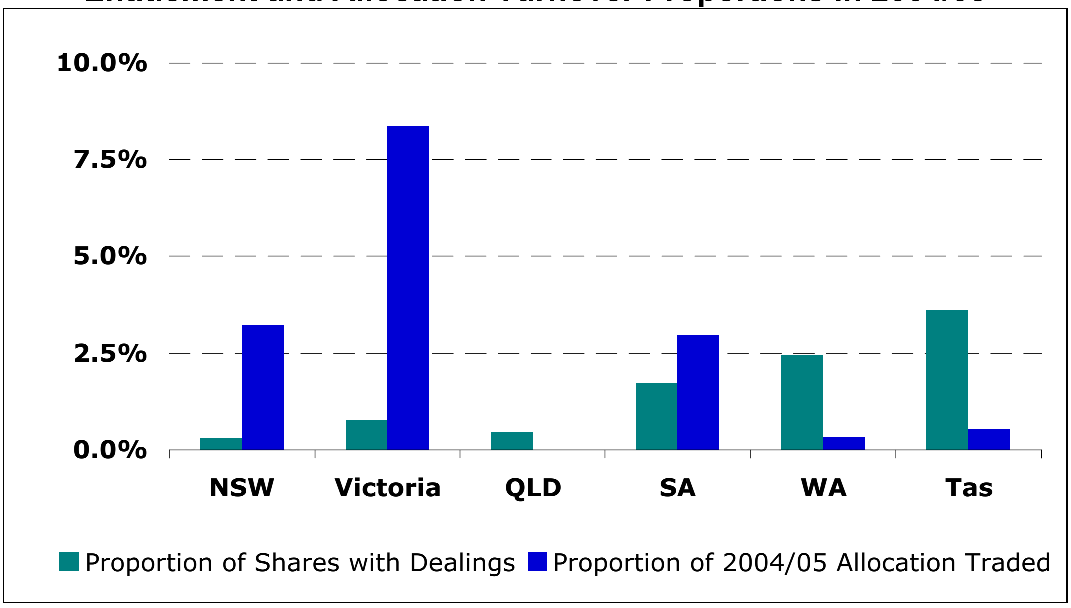
A water allocation[72] is the specific volume of water allocated to water access entitlements in a given season, defined according to rules established in the relevant water plan. Trade in water entitlements is commonly called Permanent Trade. Trade in allocations is commonly called Temporary Trade.

The regulated southern rivers of the Murray Darling Basin (the Murrumbidgee, Murray, Goulburn and Lower Darling Rivers) support the largest, relatively contiguous, market for water due to their connected nature.

Current levels of turnover are probably depressed by several temporary factors. These include uncertainty over water access reforms, commitments to existing enterprises, aversion to realising capital gains by water users, constraints on the ownership of licences, and dry climatic conditions (that limit allocation volumes and raise concerns over future security of access).

Chart 5.2 below identifies the proportion of water allocations traded in 2004/05 across each state, with Victoria showing the highest proportion of allocations traded. The chart shows that the market is relatively active for temporary trade.

Chart 5.2
Entitlement and Allocation Turnover Proportions in 2004/05



Source: Australian Bureau of Statistics (2006) Publication No. 4610.0.

In larger water markets the value of water generally reflects the marginal value to the dominant irrigation activity in the region. Across the southern Murray-Darling Basin the dominant users of marginal volumes of water are irrigated pastures and rice. In many

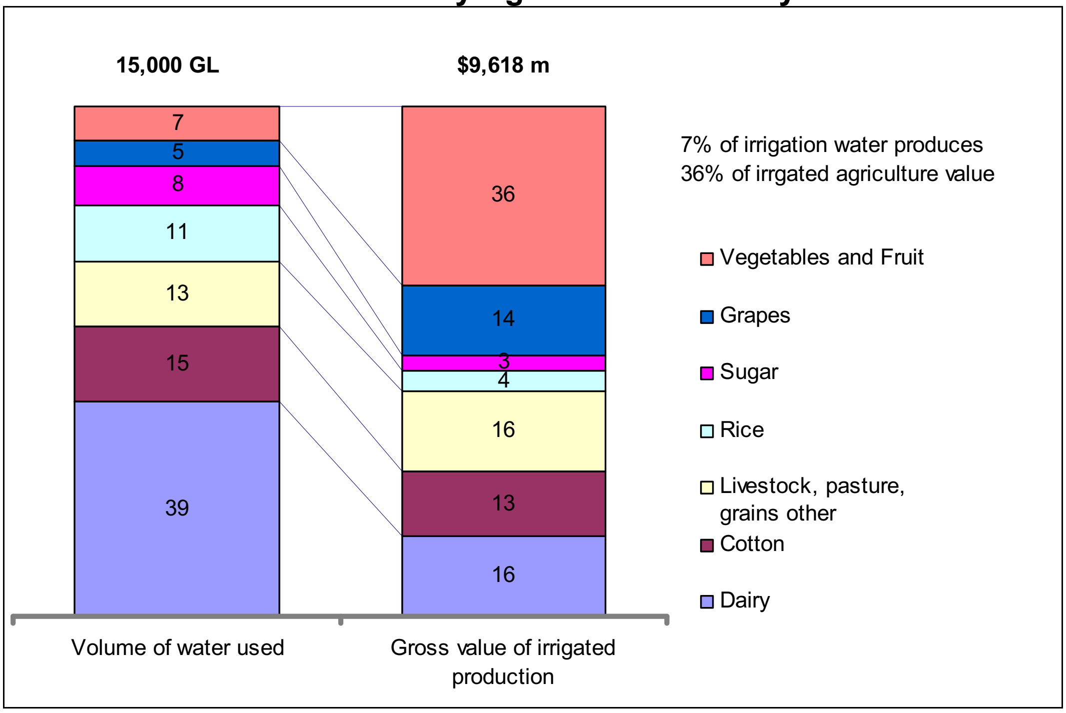
[72] NWI Clause 29.

coastal areas of Queensland and northern NSW it is sugar, and in some regions it is horticulture.

The gross margin[73] per ML of applied irrigation water for pasture and broadacre annual crops has been significantly lower than gross margins for most horticultural activities.

Recent estimates indicate that horticultural crops use about 17 per cent of total irrigation use[74] and produce over 40 per cent of Australia's irrigated production. A comparison of value across industries provided in Chart 5.3 highlights that the irrigation water use of horticultural industries across the agricultural sector is relatively small.

Chart 5.3
Water Use by Agricultural Industry



Original Source: ABS Water Account Australia 2000–01, 4610.0; Natural Heritage Trust, Australia's Natural Resources 1997–2002 and Beyond.
Notes: The volumes of irrigated water come from 1996–97 data, the gross value of irrigated production from 2000–01 data. The exact proportions may have changed between the two time periods, but it seems clear from other sources that a small proportion of water produces a large proportion of the value.

Reported Price Trends

The reported prices paid for many types of water access entitlements has increased substantially over the past decade, driven by increasing scarcity, improved security and specification, and other factors generally affecting asset valuations. The value of the end use varies significantly within and between water sources.

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[73] Farm gate revenue less variable production costs.
[74] ABS 2002/03.

It can be generally stated that water prices have increased over the past decade. However, the prices paid for statutory water access, be they entitlements or allocations, are ultimately driven by the value that a water user will derive from that water in its end use. The water market is also relatively large, as recent policy changes have increased the transferability of water entitlements, thus increasing the size of the market.

Impacts on Water Resources by Industry

The information in this section has been collected in consultation with representatives for the respective industry associations. A full list of these associations has been provided in Attachment D.

Almond Industry

The main almond growing areas include the Riverland region in South Australia, and the Sunraysia and Robinvale regions of Victoria. Production has grown from 7,000 tonnes in 1998, to around 20,000 at present.

MIS developments are considered to have undertaken the appropriate planning for newly established plantations. These developments are utilising drip irrigation instead of sprays which means they are more water efficient than past developments.

Some industry participants see the diversion of water to almond production as a negative impact of MIS because of the relatively high amounts of water used. This is due to large areas of traditionally dryland wheat production being developed. The majority of the water transfers to the Sunraysia region have been from broadacre irrigation in northern Victoria.

Citrus Industry

It is known that MIS have been buying water and properties with water allocations in recent years. However, the majority of MIS are looking for orchards with development potential. There are examples of large properties of up to 2,000 hectares being purchased, which are planted over a number of years in several stages.

Avocado Industry

A significant level of avocado MIS projects are relatively new in the industry. According to Timbercorp, production from MIS now accounts for approximately 17 per cent of national output and 40 per cent of the regional output in the Bundaberg/Childers region of Queensland.

Mango Industry

There are no significant natural resource use issues in the mango industry. The only issue may be water in South East Queensland and Carnarvon in Western Australia, but again it is likely to be an issue that can be overcome. Water is not an issue in the Burdekin/Mareeba region, the Northern Territory or Kununurra.

Olive Industry

MIS is seen to have had a positive impact on natural resource use in the olive industry, through more efficient water use and by lifting the productive value of water. Water has been transferred from less efficient systems to low volume, monitored systems (e.g. flood irrigation to drip).

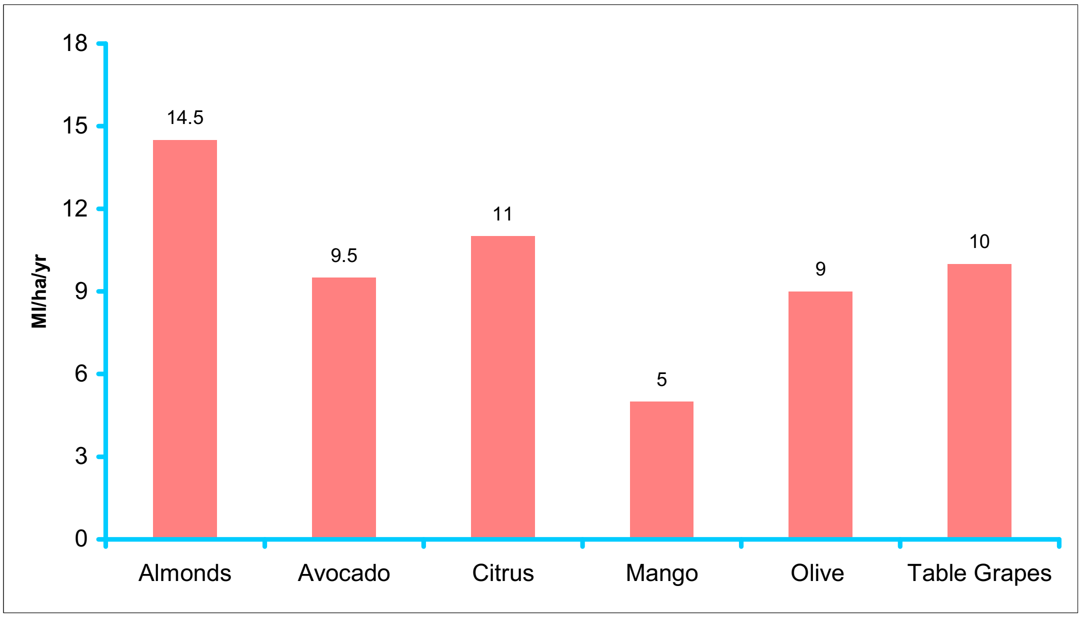
Table Grapes Industry

In the table grape industry, water use is seen as the main natural resource issue. This is because the MIS operations have been developed on dryland agriculture areas, which need to be irrigated. This has meant that there have been large purchases of water entitlements in a short period associated with establishment. These purchases may have an impact on local water prices for a short period.

Summary of Impacts on Water

Chart 5.4 provides a guide to horticultural crop irrigation water use on a per hectare per year basis. As indicated, almonds are the most intensive water user, while mangoes need less irrigation water. Avocados, citrus, olives and table grapes have similar irrigation requirements.

Chart 5.4
Typical irrigation level by crop

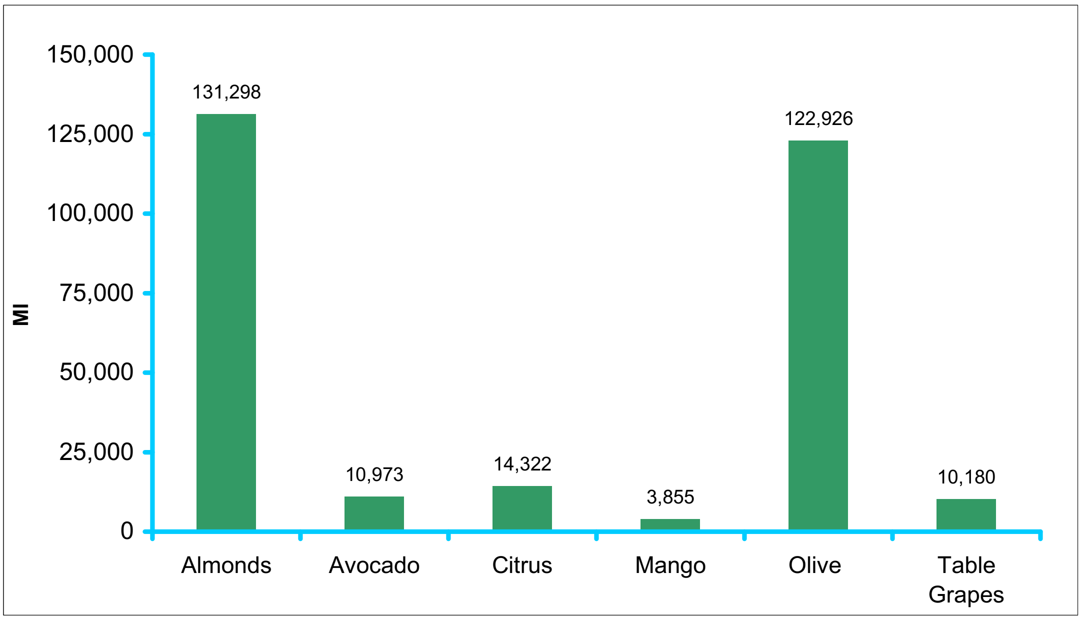


Note: Typical estimates only and these rates will vary greatly with season, location and yield. They are provided only as an indication of the water entitlement required for MIS development.
Sources: Personnel communication, Maxine Shakey, Ross Skinner, Terry Campbell. Estimates provided were location specific and will vary depending on evapotranspiration and management techniques.

Chart 5.5 shows the total estimated water entitlement requirements for MIS development over the last seven years. If these volumes had been purchased in a thin water market, such as is currently the case[75], they may have led to an increase in the price of permanent trades. However, many of the purchases required for these developments would have happened in more typical allocation years.

The total water use estimates required by MIS developments between 1999 and 2007 has been generated using the estimated areas of total MIS development by industry and the estimated level of water use by hectare for each crop. The figures represent the annual water use required at full development.

Chart 5.5
Estimated Water Demand by all MIS Developments (1999—2007)



Note: Based on total MIS developments as at 2007, as provided by AIMA; and water use estimates from Chart 5.4. For simplicity, this chart assumes that all MIS developments are irrigated.

It would be useful to be able to compare these total water entitlement estimates required by MIS developments with the volumes in the relevant water markets. However, a full comparison is challenging as not all water market systems have reported volumes and prices.

However, given that much of the development has taken place in along the Murray River, it is useful to compare the supply with demand in this system. The amount of water that was transferred in the northern Victorian water market over the period 2000/01 to 2005/06 was 308,684 ML[76]. If we assumed that the all the MIS development in almonds, citrus and table grapes identified earlier in this report were located in this particular area of Victoria, these developments would represent less that half of the market volume for water during this entire period. It should be noted that this estimate is likely to be an overestimate the proportion of the market, as it is based on all MIS developments since 1999.

[75] The market has been thin in the recent years due to the drought and uncertainty regarding the future direction of water policy.
[76] Watermove, 2007.

It is possible that a large development may have had a temporary impact on a localised water market. The amount of the water entitlements in the Murray Darling Basin would mean that the likelihood of any sustained impact on water entitlement prices from MIS developments is minimal. Currently, any impact will be dwarfed by planned entry into the market of various Government entities sourcing water for environmental purposes. There may be instances of market influence in smaller water sources outside the Murray Darling Basin.

5.1.2 Financial Impact of MIS on Traditional Family Farming Enterprises

Any financial impact of MIS on traditional family farms could be felt two ways:

1. prices impacts for the products; and
2. competition for inputs.

The information in this section has been collected in consultation with representatives for the respective industry associations. A full list of these associations is provided in Attachment D. These impacts are based on the knowledge and perceptions of the associations with which consultation was undertaken.

Almond Industry

Discussions with a representative of the almond industry revealed an industry perception that the industry is going 'too hard, too fast' and problems of over supply may arise in the future when newer tree plantings mature.

There may be some competition between MIS and traditional operators in terms of labour resources, though being a contract harvested crop means this is less of a problem than for other industries. Pressure on nurseries to produce planting stock has also been a problem in recent years due to the rapid growth of the industry. As a result, the industry has had difficulty maintaining quality assurance of stock.

The key concern is the effect on supply as plantings mature.

Avocado Industry

The perceived primary impact on the industry to date has been the negativity generated amongst existing producers. However, the situation on the east coast is different to the west coast. In Western Australia, MIS have started to develop additional capacity and increasing the supply of avocados. It was estimated that MIS have doubled the planted area in WA, whereas in the east MIS have bought existing properties.

The main concern expressed by traditional operators is that MIS have an advantage over traditional operators in two ways. The first is through perceived taxation benefits (this is discussed in more detail in Section 6.1). The second is that MIS have an advantage in terms of better access to capital resources. There are concerns that a market downturn and lower returns for products could be withstood by MIS but not smaller producers.

The key concern is the effect on supply if there is a downturn in demand.

Citrus Industry

The Australian citrus industry is large and well established. The industry is export focused and much of the MIS development has involved planting traditional export varieties. It is suggested by the Citrus Industry Association that there needs to be an associated investment in improving access to overseas markets to sustain this development. Concerns have been expressed by traditional producers that the large scale of MIS properties will draw labour resources used for picking and pruning away from smaller producers.
The key concern is the effect on supply in markets and competition for labour resources.

Olive Industry

MIS have had a positive impact on traditional olive producers through generating market awareness of Australian olive products. MIS are seen to have a positive overall impact on the olive industry by giving critical mass to the industry. Production is currently increasing to fill market demand and establish an Australian product both domestically and internationally.

There are no significant concerns regarding supply effect or competition for inputs. This may be due to a less geographically concentrated development in the industry.

Table Grapes Industry

Table grapes are both labour and management intensive. The two main impacts of MIS on traditional operators is through the labour supply and price. However, water is also recognised as an issue with much of the MIS development taking place on traditional dryland areas. This has meant that MIS operations have had to purchase water in large volumes during the development stage of the MIS.

There are also concerns that MIS draws a large amount of labour away from traditional farmers. This effect is expected to be exacerbated this season as the production of MIS reaches maturity and a lot of workers will be needed.

The key concern is the effect on competition for inputs and, to a lesser extent, quality concerns.

5.1.3 Impact of MIS on the Labour Market

The availability of labour is a challenging issue throughout Australia and, as is happening in many industries, the agriculture sector is experiencing labour shortages. These shortages are occurring for both seasonal and ongoing work, and evidence suggests that the problem is increasing.

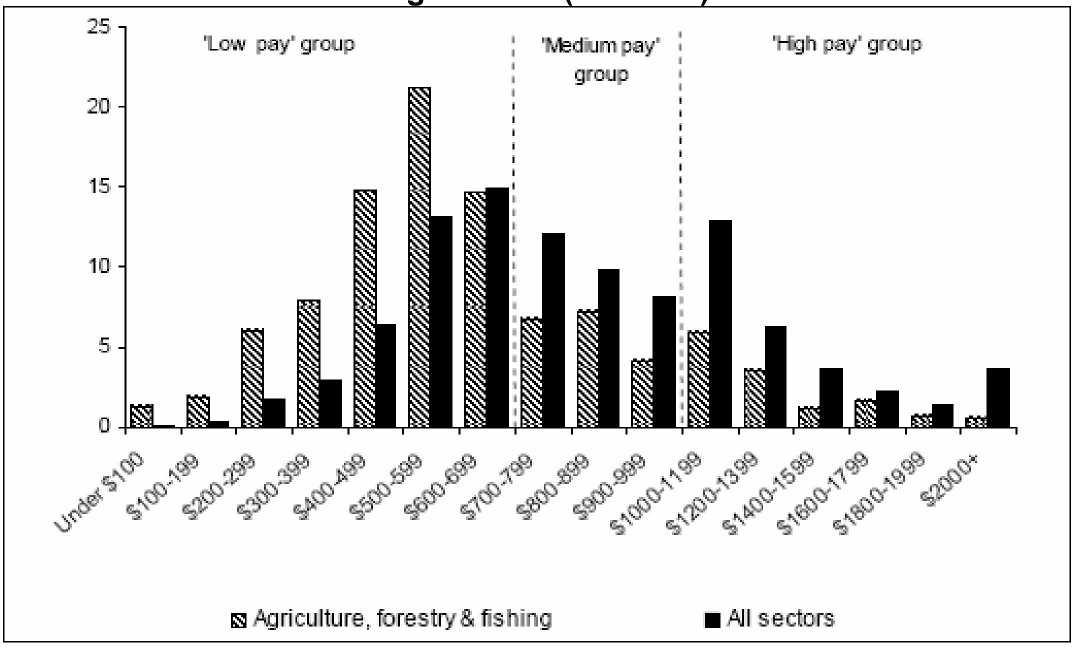
According to the NFF[77], prior to the beginning of the drought in late 2002, labour shortages were already being felt in many sectors of the agriculture industry. The 2002 drought also had an important impact on the agricultural labour market, as it resulted in a loss of 100,000 jobs in the industry over an 18-month period. Furthermore, many of these agricultural employees left the industry permanently and also left regional Australia to work in larger

[77] National Farmers' Federation (2005), *"Labour Shortages Action Plan"*

towns or cities. Indeed, the NFF states that, "according to recent ABS statistics, only 30,000 of those jobs lost during the drought have been recovered and the industry across Australia is calling out for workers".

Agricultural pay rates, when compared to other industries where similar skilled and semi-skilled workers can find jobs (e.g. mining, construction and manufacturing), have also had a significant effect on agricultural labour shortages. Indeed, as shown in Chart 5.6 on the next page, the agricultural sector has a high proportion of relatively low paid employees compared with other sectors of the economy. Furthermore, according to the Productivity Commission[78], "the median weekly earnings for full-time paid employees in agriculture in 2003 was $575. This was around one third lower than the median weekly income for all full-time employees ($769), making agriculture workers the lowest paid workers in the economy".

Chart. 5.6
Distribution of paid employees by weekly full-time earnings [a], August 2003 (Per cent)



Source: Productivity Commission (2005), "Trends in Australian Agriculture". Pg. 108.
a) Data refer to weekly earnings in main job for full-time paid employees and exclude the self-employed and other family labour which account for around half of the agricultural workforce. Following McLachlan et al. (2002), the three groups were structured so that each accounted for as close to one third of total employment as possible – low, medium and high accounting for 40, 30 and 30 per cent respectively of Australia's total employment.

In such a challenging labour environment, MIS and traditional farmers are forced to compete for labour, and the ability to recruit and retain workers becomes crucial. Importantly, in such an environment, the existence of MIS has two main effects. On one side, with their scale and capital, MIS can offer better opportunities to attract and retain workers, making it more difficult for traditional farmers to fulfil their labour needs. On the other side, the corporate farming model is generally more efficient than the small family farming model and uses better technology, which greatly improves productivity. Hence, MIS are likely to require less labour than traditional farms.

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78 Productivity Commission (2005), *"Trends in Australian Agriculture"*. Pg. 107.

However, the inadequacies of national data on industry employment requirements and the absence of detailed MIS and traditional farms vacancy data mean that it is difficult to assess the real net impact of MIS on the labour market.

5.1.4 Impact of MIS on Commodity Prices

It should be noted upfront that, at this stage, the actual effect that the MIS horticulture projects have had on commodity prices is very difficult to isolate. This is due to the fact that MIS projects have only entered most horticultural industries within the last three to four years and, thus, have had little time to materially affect the supply and demand of commodities (with the exception of the olives and almonds industries, which are dominated by MIS projects). As such, the following assessment looks at the likely economic effects as MIS projects become more significant within horticultural industries. This forward looking assessment will then be followed by a brief examination of actual price movements within selected industries.

The impact that MIS projects have on particular horticultural commodities will depend largely on the specific circumstances within those industries, although some general economic arguments can be made in relation to the impact that large scale MIS operations will have on the price of horticultural commodities as a whole.

The Current State of the Australian Horticulture Market

The price of commodities within the horticulture market is determined by the supply and demand of commodities, and also by the competitive dynamics within the market. As such, the effect that MIS projects will have on commodity prices depends on how they affect the supply and demand for commodities and how they change the competitive relationships between the different parties within the market.

Currently, there are a number of factors that are likely to put continuing downward pressure on commodity prices.

Generally speaking, both global and domestic demand for horticultural products has been stimulated by increases in population and wealth over time. However, supply has exhibited a tendency to outgrow demand and has consequently led to a reduction in the real price of commodities over time[79]. With a slowing of global population growth, and continued technological improvements and production methods, it is likely that the terms of trade for horticultural farmers will continue to be eroded throughout the future. Chart 5.7 in the next page shows Australian farmers' terms of trade over time. As shown in this chart, the terms of trade have clearly been eroded throughout the years.

The Australian horticulture market is strongly influenced by the competitive disparities that exist between suppliers and buyers. The Australian horticulture market is characterised by a large number of small suppliers that sell their produce to a small number of powerful buyers. To be specific, the two major retail grocers, Coles and Woolworth's, have up to a 65 per cent share of the fresh food market, depending on category[80]. This share is up from 12 per cent in

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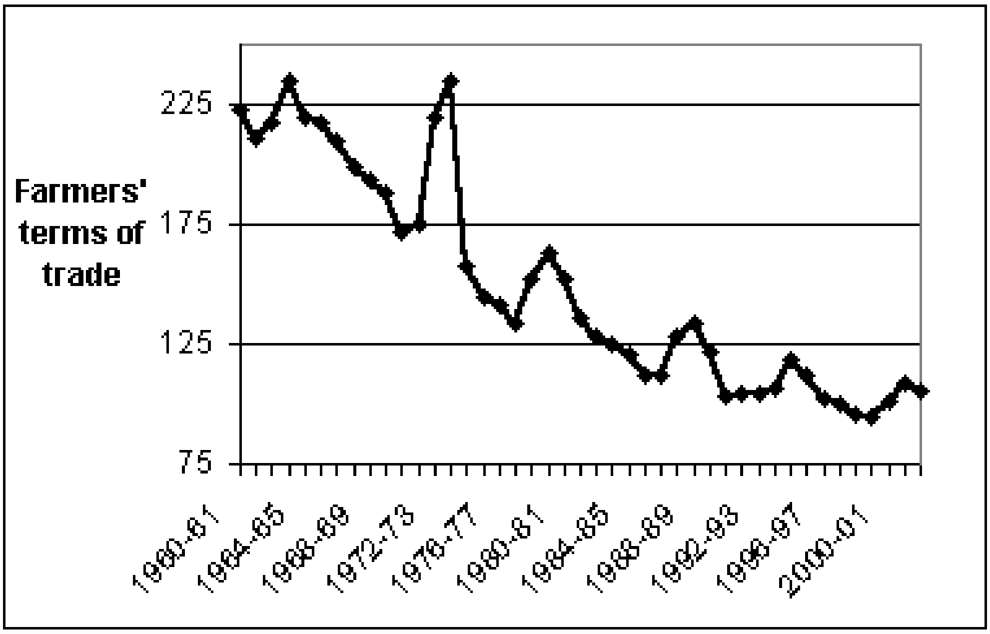
[79] D. Pannell, R. Kingwell, *"Economic Trends and Drivers Affecting the Grain Belt of Western Australia to 2030"*, available http://cyllene.uwa.edu.au/~dpannell/dp0407.htm , accessed 29/1/07.
[80] Timbercorp Limited, *"An Assessment of the Role of MIS and Corporate Farms in Australian Agriculture – A Policy Context"*, McKinna *et al* Pty Ltd Strategic Insights.

1985 and highlights the massive shift in market power that has been facilitated by the adoption of a low cost, bulk buying retail model. As such, farmers and growers of horticultural products are individually too small to negotiate good terms of trade for their product, and commodity prices are kept close to cost price in most industries.

Chart 5.7
Australian farmers' terms of trade over time



Source: ABARE, 2003, "Australian Farm Surveys Report 2003", pp. 88.
Base year = 1997/98.

The Likely Impact of MIS Horticulture Projects on Prices

Although it is difficult to examine the actual effect that existing MIS projects have had on horticultural commodity prices, it is likely that they will be able to achieve a lower cost structure than traditional farmers through economies of scale, greater investment in research and development and through the adoption of best industry practices. This is because MIS projects have the resources to produce on a much larger scale than traditional farmers, and can also justify investing in expensive labour saving machinery which will ultimately lower the cost of production.

It is expected that MIS projects will be able to provide horticultural commodities at a lower price than smaller competitors, whilst at the same time increasing the supply of horticultural products in local markets. The implication of this is that horticultural MIS are likely to cause a supply increase, and are in a cost position that would allow them to out compete smaller suppliers in any resulting price competition. Whether or not any price competition actually occurs within horticultural markets will depend on local demand for particular commodities and the extent to which Australia is either a net exporter or importer of the commodity, as Australian producers are likely to be price takers in any markets that exhibit high levels of international trade.

Based on the consultation process carried out for this study, it is clear that within some of the industries where MIS projects currently have a high level of involvement, there are fears that MIS projects may cause a glut in production. Critics have pointed to the West Australian viticulture industry as an example in which over investment is thought to have contributed to the current glut in the production of wine grapes.

Avocados Australia is another industry body that is concerned that aggressive expansion by MIS within their industry may adversely affect future avocado prices. In particular, it is thought that overinvestment by MIS may disrupt the pattern of sustainable growth that the avocado industry has experienced over the last five years[81].

Nonetheless, some of these negative price effects could be counteracted by efforts to build demand, particularly by efforts to build foreign demand through marketing and greater access to export markets. In general, MIS projects are in a better position than smaller enterprises to launch large scale marketing campaigns and raise foreign awareness, due to their greater scale and resources. If MIS projects are able to leverage their marketing potential to create sufficient demand, then the negative price effects of increased supply may be partially offset in some industries.

For instance, MIS projects within the citrus industry have focused on planting traditional export varieties rather than those preferred in the domestic market[82]. This should allow for growth in output without adversely affecting domestic prices. MIS projects within the olive industry have also contributed strongly to building international awareness of Australian olive oil, working on brand development and providing the critical mass of production needed to open up significant export pathways[83].

The outcome for the mango industry is mixed in regards to whether exporting is a feasible option. Before being exported, mangoes must undergo heat treatment to stop the spread of fruit flies. This treatment may make competing on the export market, against low cost producers like Brazil and South Africa, too expensive. Nonetheless, the Mango Industry Association believes there is room for the expansion of domestic demand, which would somewhat counteract a fall in prices brought about by increased supply[84]. According to data from AC Nielsen Home Scan, only 32 per cent of the domestic population currently purchase mangoes, which equates to a consumption of roughly 5 mangoes per capita every year[85]. These statistics indicate that there is ample room for expansion within the domestic mango market.

Importantly, it is difficult to distinguish cause from effect within the horticulture market, given the pre-existing downward pressures on commodity prices. General economic theory would dictate that the growth of the MIS sector would lead to larger scale production, higher productivity and an increase in supply which would all lead to lower prices. However, it is equally valid to look at the market from the opposite side.

From this view, the pre-existing downward pressures on prices can be identified as necessitating larger scale operations such as MIS projects. In fact, there is strong evidence of a consolidation taking place within the horticulture industry which began long before MIS started to enter the industry. According to ABARE, the number of commercial horticulture

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[81] Timbercorp Limited, *"An Assessment of the Role of MIS and Corporate Farms in Australian Agriculture – A Policy Context",* McKinna *et al* Pty Ltd Strategic Insights.
[82] Ibid.
[83] Ibid.
[84] Ibid.
[85] Timbercorp, *"2006 Mango Project, Product Disclosure Statement"*

farms in Australia has halved over the 40 years to 2001, while the average farm size increased by roughly 50 per cent[86]. It may be that the MIS projects will not cause a fall in commodity prices, but are actually a response by the market to consistently decreasing prices and increasingly difficult production circumstances.

Changes in Market Dynamics

It is likely that the wide spread proliferation of MIS horticulture operations, combined with the general consolidation taking place within the agricultural sector, may lead to a change in the dynamics between suppliers and buyers in the future.

As mentioned previously, the balance of negotiating power currently rests with retailers, given the concentration of the retail market and the dispersed nature of horticultural production. If MIS operations continue to gain momentum and the horticulture market achieves a significant consolidation, it is likely that producer's terms of trade would be improved in the mid term, within domestic markets.

Nonetheless, in the long run, a continued trend towards globalization and increased competition with low cost foreign producers is likely to erode any increases in commodity prices that could be gained by a power shift within domestic markets.

Price Movements in Selected Industries

Charts 5.8 to 5.13 show the actual price movements for a selection of horticultural commodities over the ten years beginning in 1995/96[87]. The commodities have been selected subject to relevance and availability of data. The prices represent Gross Unit Values, and are defined by the Australian Bureau of Statistics as the unit value placed on commodities at the point of sale i.e. in the market place.

Chart 5.8 shows the movement of Olive prices over the ten years beginning in 1995/96[88].

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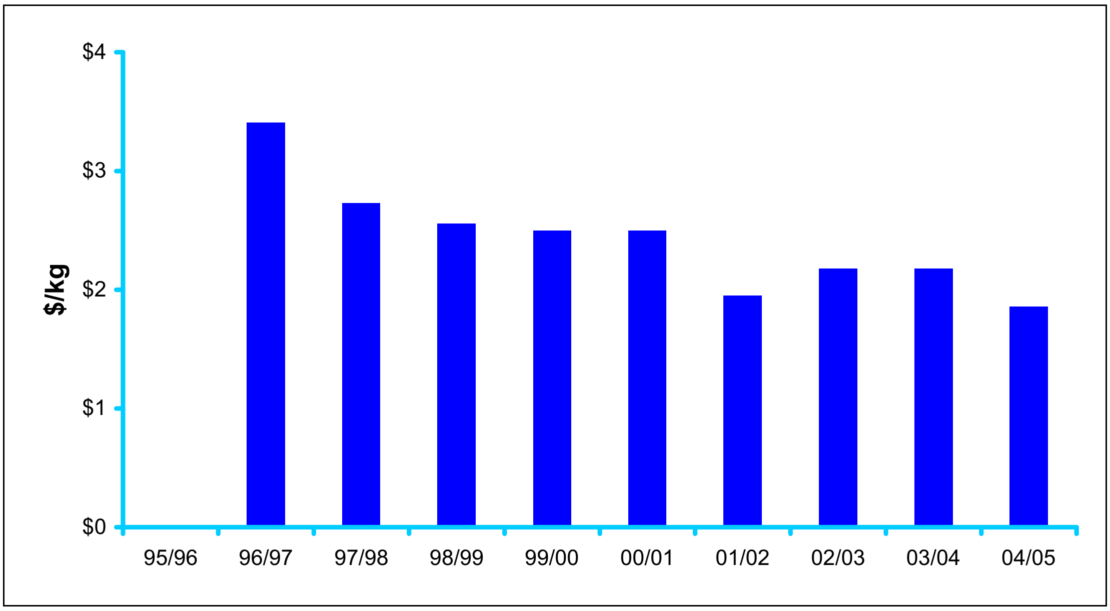
[86] "*Farm size and productivity*," Australian Bureau of Agricultural and Resource Economics 2002, referenced in NAB Media Release, "*Rural Adjustment – Here to Stay*" , available at http://www.national.com.au/About_Us/0,,62415,00.html

[87] All price data for charts has been sourced from ABS publications *"7113.0 – Agriculture - Australia"* and *"7503.0 – Value of Agricultural Commodities Produced – Australia" with additions made using data from "Australian Horticultural GVP Estimation 2006/07"*, HAL.

[88] Note that price data for olives was unavailable in 1995/96.

Chart 5.8
Olive Prices over Time



Source: ABS

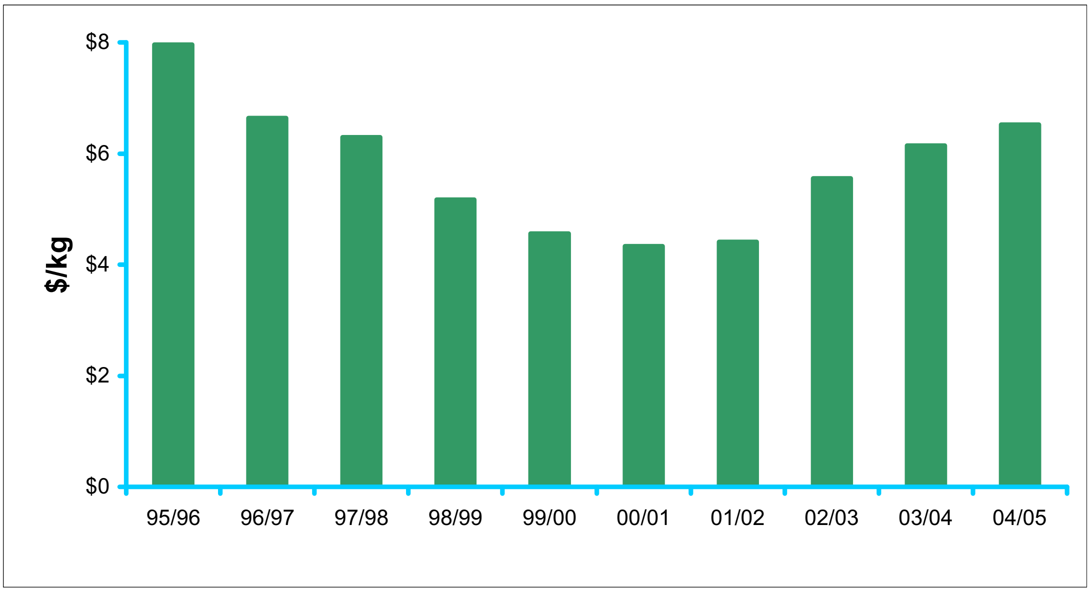
Interestingly, the price of olives has exhibited a general downwards trend over the past 10 years, which may in part, be related to the operation of MIS within the industry. The mid 1990s saw a surge in Australian demand for olives and olive oil, which was primarily filled by foreign imports of olive products. As such, the price of olives jumped dramatically in 1996/97 to a price of $3.41/kg, from a previous price of $0.88/kg in 1993/94. Since then, the price of olives has levelled off. This can be attributed to both increased supply from overseas imports and in part to the growth of the Australian domestic olive industry, which has been driven primarily by increased MIS investment.

Whether or not the price of olives has been adversely affected by MIS involvement in the industry, or whether the price has simply returned towards a long run average is hard to determine. Interestingly, the price movement between 2003 and 2005 has been slightly negative, which does correspond to a period in which MIS plantations have begun to mature.

Chart 5.9 shows the movement of almond prices over the ten years beginning in 1995/96. Almond MIS projects began entering the industry in 1999[89]. While the chart shows a fall in price around 2000, it is not likely that this is the result of the 1999 MIS projects for two reasons. First, it is unlikely that these projects would have reached the stage where they were producing almonds at any significant level. Secondly, it appears that this price drop may have been part of an earlier downward trend. Interestingly, the price of almonds begins an upward trend in 2003, which is a period in which MIS investment is increasing. As such, it is unlikely that the historical price movements in the almond industry have been significantly impacted by MIS activity.

[89] Survey of Industry Bodies, 2007 (see Attachment A)

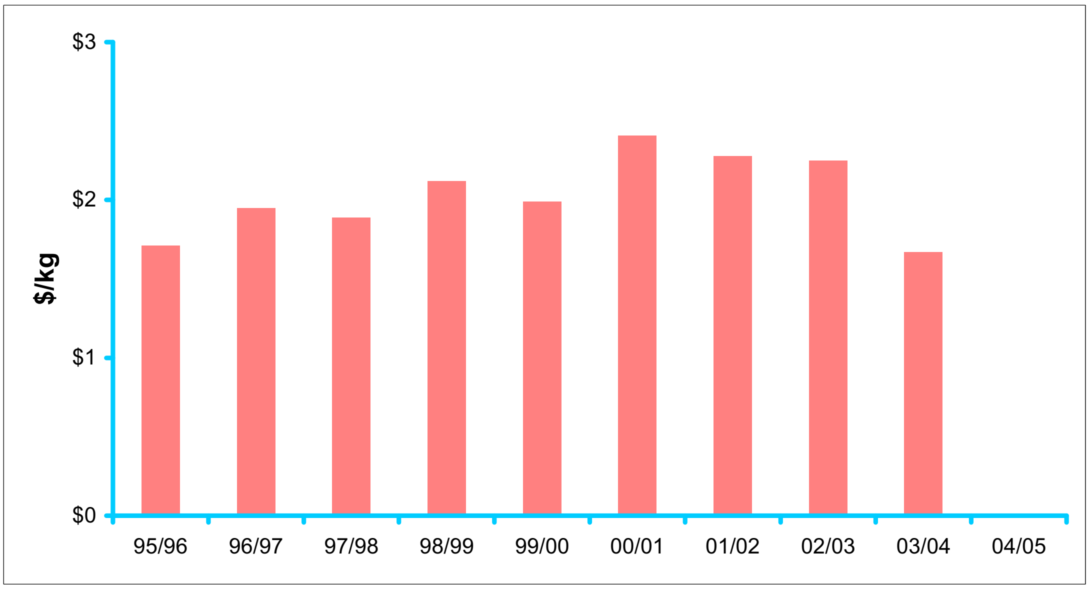
Chart 5.9
Almond Prices over Time



Source: ABS

Chart 5.10 shows the movement of table grapes prices over the ten years beginning 1995/96[90]. The price movements exhibit a slow historical upward trend (between 1995 and 2001), followed by a slight decline over the next three years. However, it is difficult to equate such a phenomenon to the involvement of MIS within the industry given the relatively immature stage that MIS production has reached. MIS began entering the industry in 2004 and have not yet reached a stage of full maturity, so MIS impacts on supply and prices have yet to be realised.

Chart 5.10
Table Grapes Prices over Time

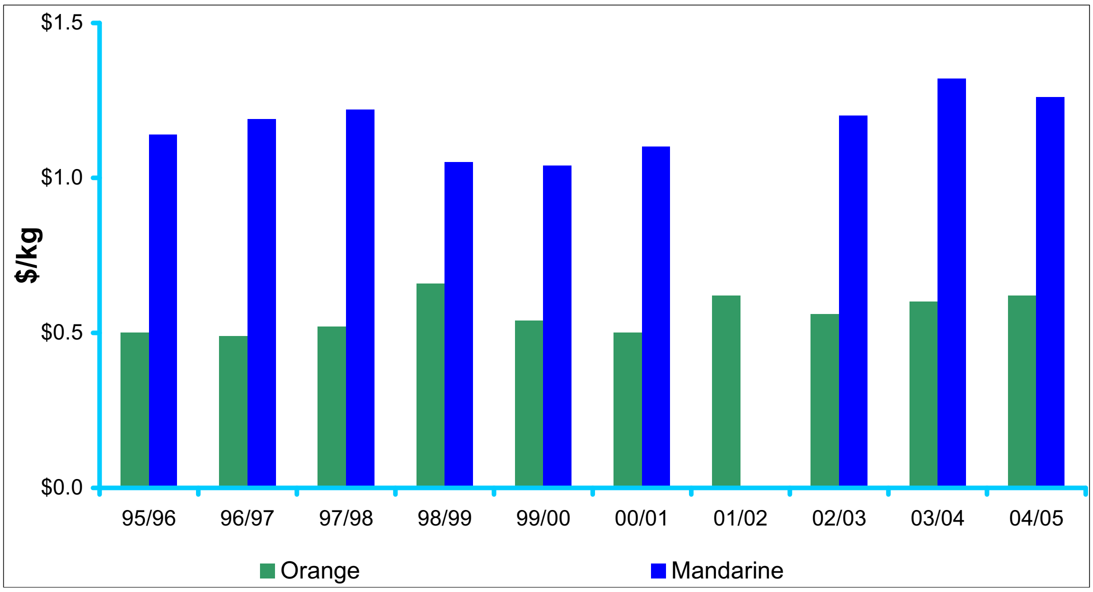


Source: ABS

[90] Note that price data for Table Grapes was unavailable in 2004/05.

Chart 5.11 illustrates the movements of orange and mandarin prices over the ten years beginning 1995/96.

Chart 5.11
Orange and Mandarin Prices over Time



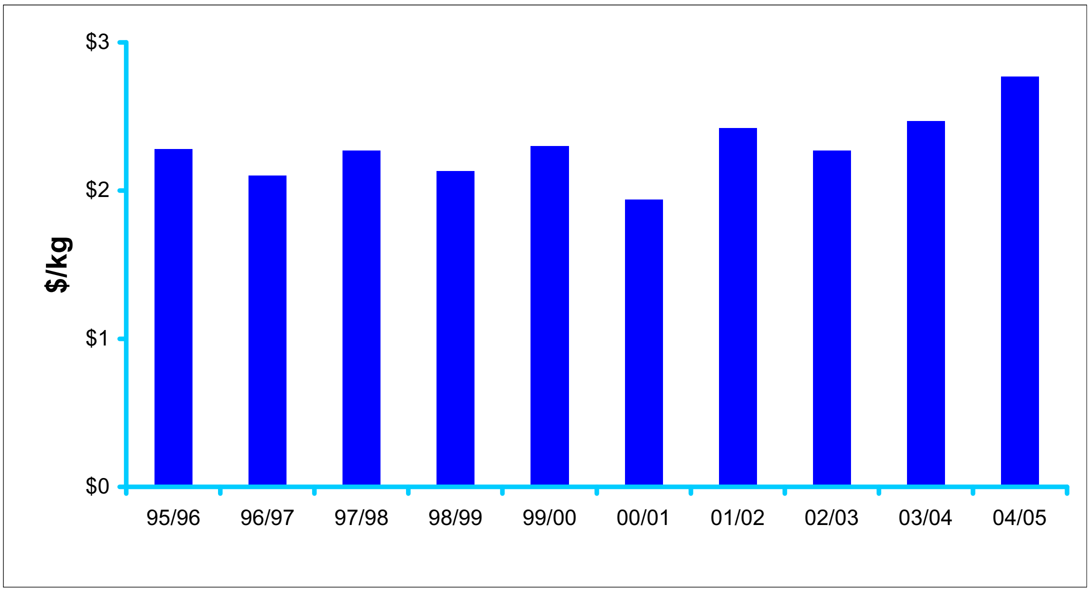
Source: ABS

Chart 5.11 shows movements of orange and mandarin prices[91]. The chart shows price increases between 2003 and 2004, following a price decrease in 2000. The price movements for both these products are difficult to relate to MIS production. Notably, 2003 was the year in which MIS entered the citrus industry[92], when Timbercorp purchased a number of orchards. As such, it would appear that the entry of MIS projects in the industry corresponds with an increase in price. However, it is unlikely that this movement is based on MIS production, as a one year time frame is too short for there to have been a significant change in production. More likely, the price movement is the result of an unrelated shock within the industry.

Chart 5.12 shows the price movements of avocadoes over the last ten years, and shows a modest upward trend between 1996 and 2000, followed by a healthy appreciation between 2003 and 2005.

[91] Note that price data for Mandarins was unavailable in 2001/02.
[92] Survey of Industry Bodies, 2007 (see Attachment A)

Chart 5.12
Avocado Prices over Time

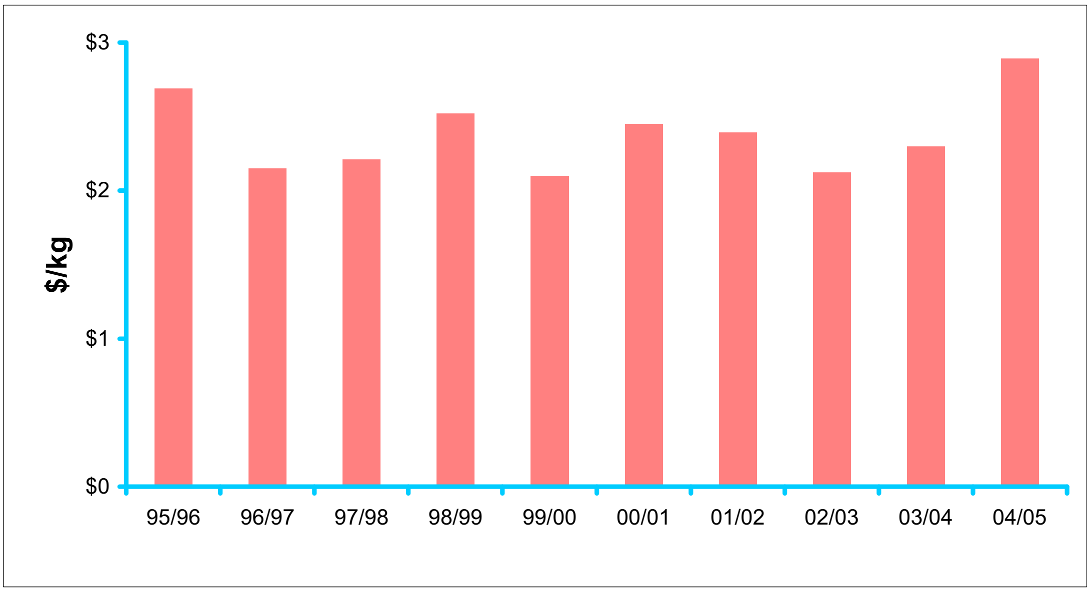


Source: ABS

These price movements are consistent with the steady growth in demand and production that the avocado industry has experienced over the past five years[93]. With many factors at play affecting the final price, it is not possible to isolate the impact of MIS on avocado prices. However, as MIS only became a significant producer within the industry in 2005[94], it is unlikely that there would be any significant impacts at this early stage.

Chart 5.13 shows the movement of mango prices over the last ten years.

Chart 5.13
Mango Prices over Time



Source: ABS

[93] Survey of Industry Bodies, 2007 (see Attachment A)
[94] Ibid

MIS began entering the mango industry on a significant scale in roughly 2001, and have continued to do so over the last five years. Again, this chart shows little in terms of shocks that could be associated with the entry of MIS. However, given the growth potential of the domestic market for mangoes[95], increased supply is less likely to have a strong negative effect on prices. The trend of increasing prices between 2002/03 and 2004/05 can be related to steadily increasing demand and production within the industry, as well as general inflationary effects.

In general the ABS industry price data (presented above) does not show any real price drops that could be associated with an increase in supply from the entry of MIS to date, with the exception of the olive industry which has had the longest period of MIS involvement. Nonetheless, price movements within the olive industry did exhibit a sharp increase in the mid 1990s, so it is difficult to say whether or not the subsequent levelling off of prices is entirely MIS related or is simply trending towards a long run equilibrium price. It should be noted that MIS in most industries are still in the very early stages and crops have not yet reached maturity, so MIS related changes in supply and commodity prices are unlikely to have occurred yet. As such, the results of the above examination must be deemed inconclusive.

[95] Timbercorp, *"2006 Mango Project, Product Disclosure Statement*".

5.2 Current Contribution of MIS Horticultural Projects to the Economy

This section now looks at the contribution of the main MIS horticulture projects[96] to the Australian economy. This is in terms of their contribution to production (as measured by Gross Domestic Product or GDP) and employment.

Econtech recently conducted similar analysis for the Australian Farm Institute, which estimated the role of agriculture in the Australian economy. The results of this study were presented in the report titled *Australia's Farm-Dependent Economy: Analysis of the Role of Agriculture in the Australian Economy*. Econtech developed the Input-Output Farm (IOF) model to estimate the role of agriculture in the Australian economy and to gauge the overall dependency of the Australian economy on agriculture. The IOF model is also used in this report to estimate the contribution of the MIS horticulture projects.

This report provides results for both GDP and employment. The diagram below shows that the significance of the MIS horticulture projects can be assessed using a number of different industry measures. The measures are:

- employment;
- GDP; and
- production (or revenue or sales).

Figure 5.1 shows how these measures relate.

Figure 5.1
GDP versus Australian Production

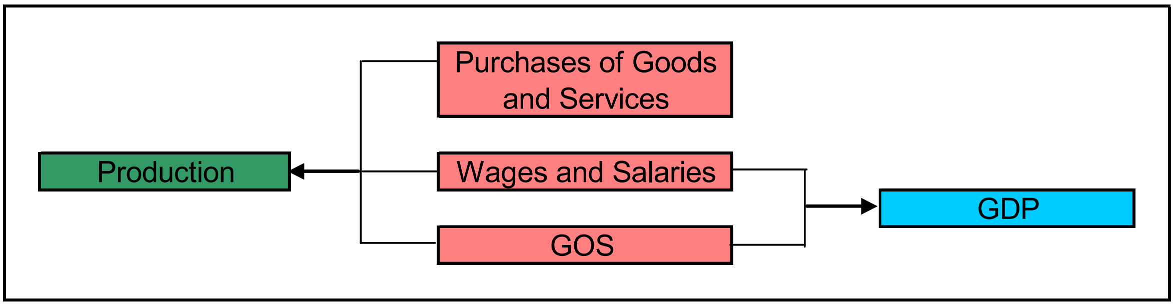


Figure 5.1 shows the difference between Australian production and GDP.

- Production refers to the total value of good and services produced. It is calculated as the goods and services purchased plus wages and salaries plus gross operating surplus (GOS).
- In contrast, GDP refers to production less the goods and services used. Thus GDP is equivalent to wages and salaries plus GOS.

In general, when measuring the contribution of the MIS horticulture projects, this report focuses on the contribution of these projects to value-added (or GDP) rather than Australian production. This is important because it removes the problem of double counting goods and services as they flow through the economy. The contribution of the main MIS projects is also discussed in terms of the contribution of the total horticulture sector.

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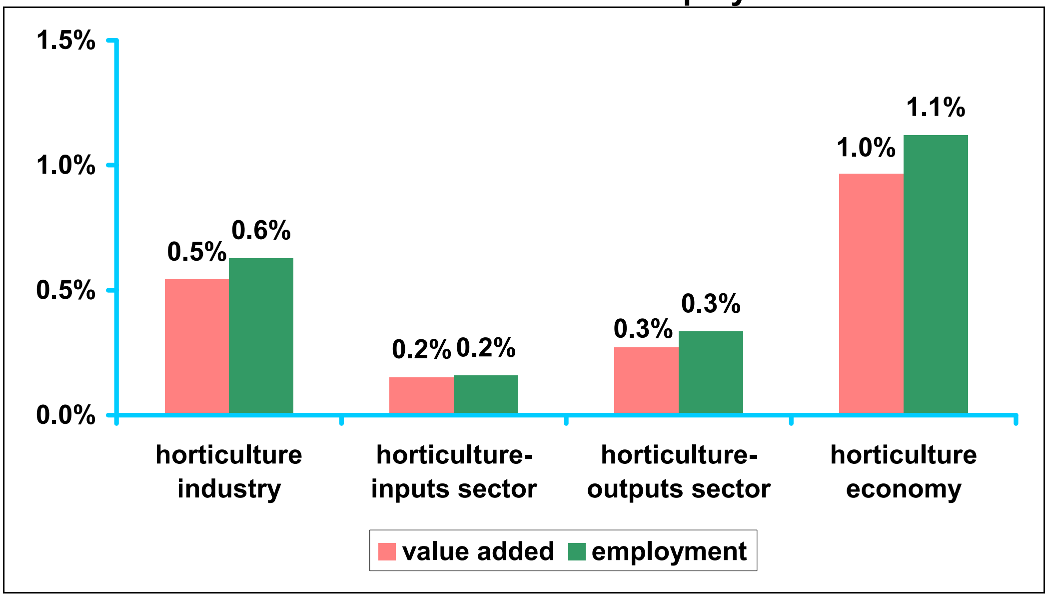
[96] The term 'main' is used to indicate the six major MIS industries as identified earlier, and focussed on throughout the report.

5.2.1 Contribution of the Horticulture Economy

As discussed in Section 2.1, in October 2005, Econtech prepared a report for Hassall & Associates titled "The Significance of the Horticulture Industry to the Australian Economy" (referred to henceforth as "the 2005 Horticulture report").

Chart 5.14 summarises the results from the 2005 Horticulture report. The contribution of the Horticulture Economy included both the horticulture sector's direct contribution to production and employment (horticulture industry) and also its contribution through its role as a supplier to, and consumer of the products of, other industries. This distinction is explained in more detail in the following section.

Chart 5.14
The Contribution of the Horticulture Economy to Australian Production and Employment



Source: Econtech 2005 report on "The Significance of the Horticulture Industry to the Australian Economy".

The chart above shows that the 2005 Horticulture report found that, on average, the Horticulture Economy[97] contributed around 1.0 per cent of national GDP and 1.1 per cent of national employment, each year for the six years up to and including 2003/04.

This report now examines the proportion of the Horticulture Economy's contribution that is provided by MIS projects.

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[97] The combination of the horticulture industry plus the horticulture-outputs sector (outputs from the horticulture industry used by various industries) plus the horticulture-inputs sector (inputs from various industries purchased by the horticulture industry) is referred to as the "horticulture economy".

5.2.2 Contribution of the MIS Horticulture Economy

Similar to the horticulture sector in general, the contribution of the MIS projects is not limited to their value of the production. This is because the MIS horticulture projects (as with the horticulture sector in general) also have an impact on the level of production in other industries. They are also important to the Australian economy through their role as a supplier to, and consumer of the products of, other industries.

As a supplier, the MIS horticulture projects provide raw inputs to other industries and, in particular, to the fruit product manufacturing and the food retailing industries. For this analysis, the share of the fruit product manufacturing and the food retailing industries output attributed to the main MIS horticulture projects is termed the "MIS-horticulture-outputs" sector.

Further, as a consumer, the MIS horticulture projects purchase inputs from various industries such the fertiliser, and the transport and storage industries. The proportion of production of these industries that is used as an input by the MIS horticulture projects is termed the "MIS-horticulture-inputs" sector.

In this report, the combination of the MIS horticulture projects *plus* the MIS-horticulture-outputs sector *plus* the MIS-horticulture-inputs sector is referred to as the "MIS Horticulture Economy". This is similar to the methodology used in a number of previous studies examining the significance of particular industries in the Australian economy, such as agriculture, horticulture and plantation forestry.

Thus, this report extends the analysis in the 2005 Horticulture report to estimate the contribution of MIS projects to the Horticulture Economy. The first step in estimating the contribution of the MIS Horticulture Economy to GDP is to estimate the size of the main MIS horticulture projects. This section provides broad estimates to this effect based on the approximate MIS share on each horticulture industry discussed in Section 3.5. These shares were originally presented in Table 3.2, and are reproduced in the table below.

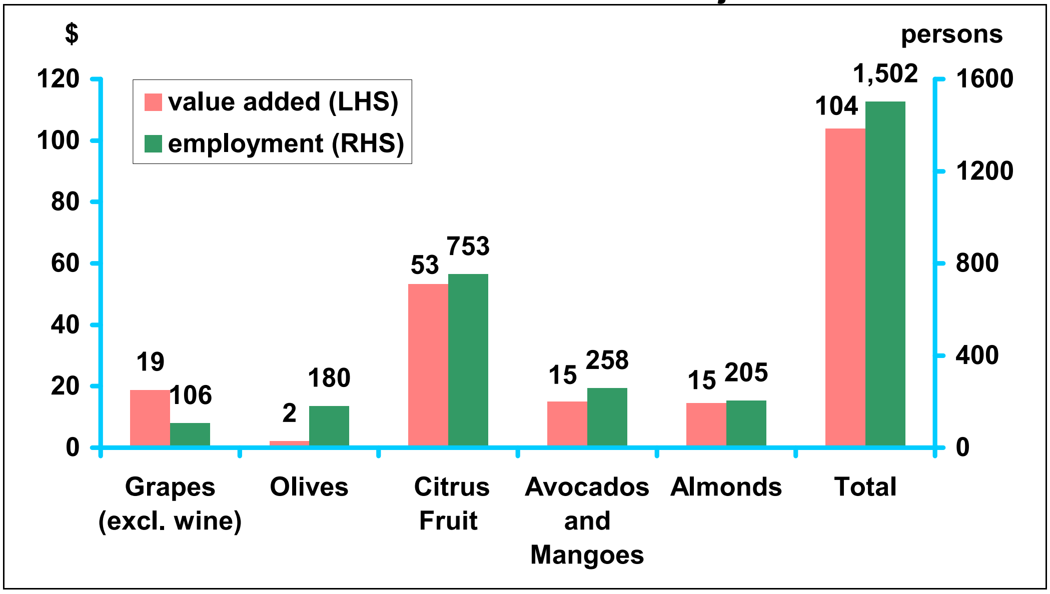
Table 5.2
Horticulture Industries with Highest Level of MIS Involvement

Horticulture Industry	% of MIS investment of total industry production (1)	Estimated share of Production in 2005/06 (2)	Estimated share of Employment in 2005/06 (3)
Almond	21-50%	35%	35%
Avocados	5-20%	12.5%	12.5%
Citrus	5-20%	12.5%	12.5%
Grapes (table)	5-20%	12.5%	5%
Mangoes	5-20%	12.5%	12.5%
Olive trees	51-70%	60%	75%

Sources: (1) Extract from Table 3.2; (2) Estimate based on midpoint of (1); and (3) Estimate based on MIS employment figures provided by AIMA.

The shares in the table above were used to split production and employment, in each of the above horticulture industries, into that relating to the main MIS horticulture projects and that relating to other producers. The resulting size of the main horticulture projects is shown in Chart 5.15.

Chart 5.15
The size of the Main MIS Horticulture Projects in 2005/06

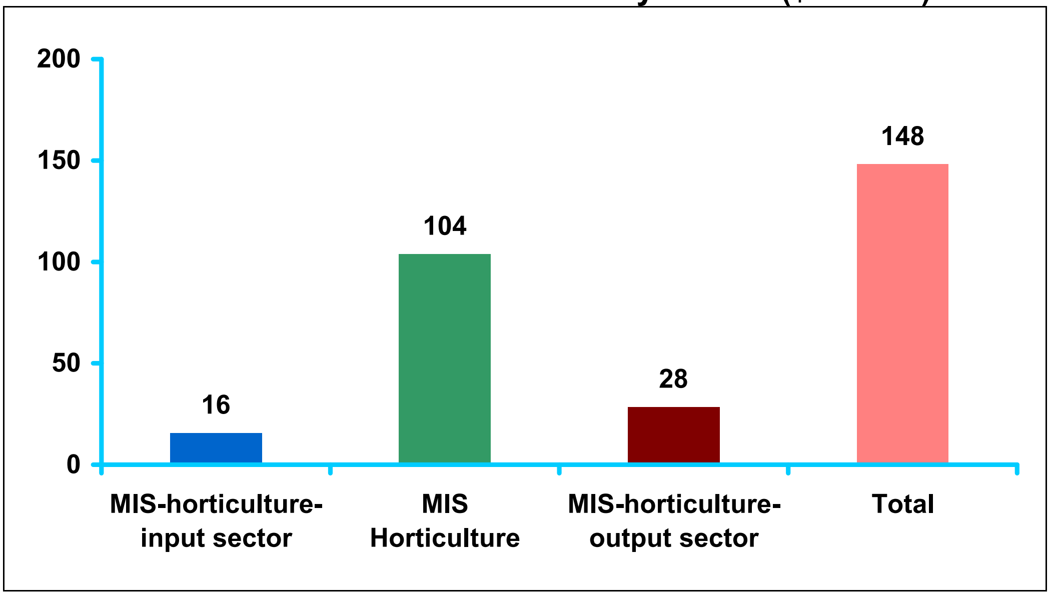


Source: IOF Model.

As shown in the chart above, it is estimated that the main MIS horticulture projects contributed about $104 million in value added and around 1,500 jobs in 2005/06. This is equivalent to about 1.3 per cent of the total Horticulture Economy's contribution to both GDP and employment.

However, as discussed above, the direct contribution of the MIS horticulture projects is only part of the story. The full contribution of the MIS Horticulture Economy also includes the MIS-horticulture-inputs and MIS-horticulture-outputs sectors. An estimate of this full contribution to Australian GDP is shown in Chart 5.16.

Chart 5.16
Contribution of the MIS Horticulture Economy to GDP ($ million) in 2005/06



Source: IOF Model.

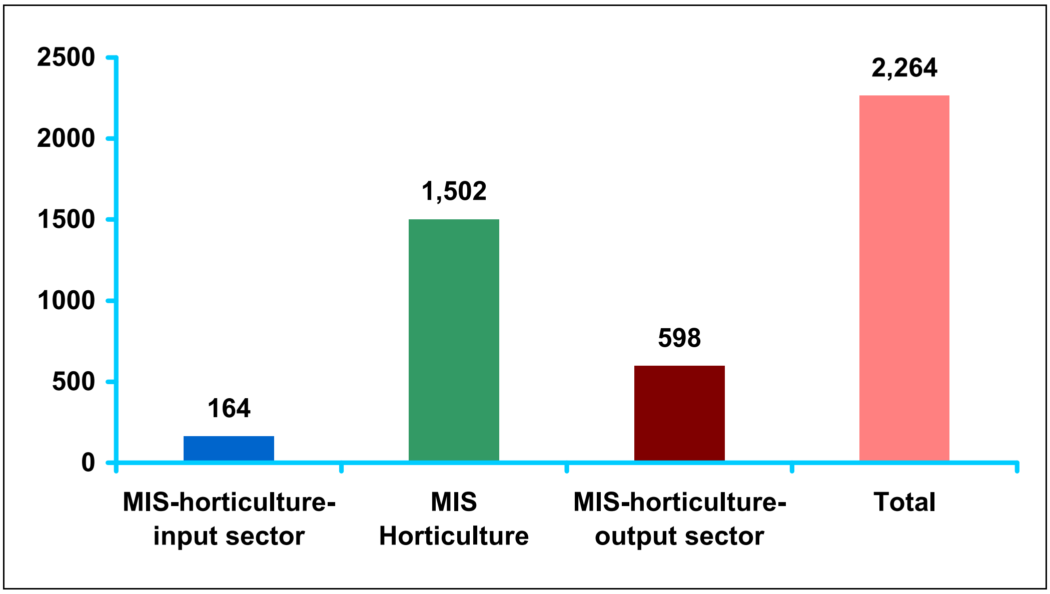
Chart 5.16 shows that, by also including the contribution of the MIS horticulture projects up and down the supply chain, the current full contribution of the MIS Horticulture Economy is estimated at about $148 million or around 1.8 per cent of the total Horticulture Economy's contribution to GDP in 2005/06.

For example, horticulture industries use a number of services provided by the agriculture services sector, these include fruit picking and fertiliser spreading services. Thus, production in the main horticulture products will stimulate output and employment in the agriculture services sector.

While GDP is the most appropriate measure when examining the contribution of an industry to the economy, there is also interest in what this means in terms of Australian production. It is estimated that the MIS Horticulture Economy contributed around $258 million to Australian production in 2005/06 (or about 1.9 per cent of the total Horticulture Economy's contribution to Australian production).

Chart 5.17, below, shows that the current full contribution of the MIS Horticulture Economy to employment is estimated at around 2.2 thousand jobs (or 2.0 per cent of the Horticulture Economy's estimated contribution to employment) in 2005/06.

Chart 5.17
Contribution of the MIS Horticulture Economy to Employment (jobs) in 2005/06



Source: IOF Model.

6. Advantages and Disadvantages of Horticultural MIS

This section assesses the advantages and disadvantages of MIS over other horticultural enterprises and identifies any positive and/or negative impacts of MIS on the Australian Horticulture Industry. This analysis is presented in two sections. Section 6.1 examines whether MIS and their investors receive any advantage or disadvantage over independent and family horticultural enterprises, in terms of tax benefit or any other commercial measure. Section 6.2 assesses the impact of MIS horticultural projects on regional economies and communities.

6.1 Analysis of MIS Tax and Commercial Benefits

MIS operate under Chapter 5C of the Corporations Act (2001) and a system of case law and tax rulings that distinguish them from other forms of "passive" investment[98]. The salient feature of an MIS that is granted by these provisions is that the investors within the scheme are deemed to be carrying on a business operation, which entitles them to deduct all of the non capital expenses incurred by the business allowed under Division 8 of the Income Tax Assessment Act 1997.

Under the current tax arrangement, MIS have no explicit tax advantage over other horticulturalist enterprises. That is, all sole traders, partnerships and MIS based producers are considered primary producers, with all owners subject to the same treatment under the Income Tax Assessment Act 1997. As such, the real commercial advantage that MIS have over traditional farmers is their ability to attract capital and the depth of resources that are available to them.

Media articles have pointed out a concern among horticulturalists, who believe that the tax deductions allowed under MIS give these projects an unfair advantage in attracting investment over other investments. This, in turn, is putting pressure on traditional sole trader and partnership based farmers that are forced to compete with the MIS for resources. Furthermore, some farming interest groups have suggested that there is a real difference between a person who invests in a MIS as a means of tax deferral, and someone who relies on farming produce as their primary source of income; and that tax laws should recognise such a distinction[99].

The real concern of most small farming businesses is that they are unable to compete with the larger monetary resources of MIS. Horticulturalists in some rural communities believe that competition from MIS is artificially inflating land and commodity prices, and that without a change to taxation policy, most "mum and dad" farmers will be forced off the land by big business[100]. Some traditional farmers are also concerned that MIS are creating wealth by taking advantage of their taxation treatment and have no real focus on land productivity, sustainability or the long term profitability of the horticultural industry[101].

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[98] http://www.asic.gov.au/asic/asic_polprac.nsf/byheadline/Managed+investment+schemes?openDocument, 19 December 2006.

[99] Fleur Anderson, 15 December 2006, *"Tax deductions grow on trees"*, Australian Financial Review, Second Edition, pp5.

[100] Carmel Egan, 17 December 2006, *"Tax breaks for city farmers under fire"*, Sunday Age, First Edition, pp3.

[101] Rosslyn Beeby, 4 October 2006, *"Australians subsidising $1.4b tax scheme"*, Canberra Times, pp3.

There are questions as to the extent of the impact that MIS are actually having on the horticulture industry. In practice, they currently make up only two per cent of agricultural production[102]. Whether or not MIS are actually distorting property and commodity markets is also uncertain, as inflation in areas where MIS operate could well be linked to other economic and seasonal factors.

Despite the perceived threat that they pose to traditional farming lifestyles, there are a number of economic arguments that speak in favour of MIS.

Even though opponents of MIS claim that they do not promote long term profitability and create market distortion, it is likely that MIS will actually be a source of growth in the horticulture industry. MIS spread risk across a large number of investors, and the tax deductibility of expenses shares the risks between investors and the state[103]. These features have facilitated a much higher rate of investment than otherwise would have been possible, with MIS accounting for $316 million of investment in horticulture in 2005/06[104]. This increased investment has directly created thousands of jobs over the past decade, and a number of politicians from rural areas are stressing the importance of the opportunities that MIS provide to country communities[105].

Furthermore, MIS allow for economies of scale within the horticulture industry that cannot be achieved by the fragmented market structure that currently exists. The horticulture and wider agriculture industries are characterised by a large number of small producers, with ABARE estimating roughly 95 per cent of farm businesses are either sole traders or partnerships[106]. As such, individual businesses are usually of insufficient size to achieve the economies of scale that would allow for lower production and marketing costs. It is also very costly for small businesses to conduct their own research and development. In contrast, MIS generally facilitate production at a higher volume, and are generally more competitive with international products and organisations. International studies have also shown that R&D returns on agriculture and horticulture are abnormally high, suggesting that current investment in R&D is too low[107]. As such, MIS are likely to facilitate advancement in the industry through their higher investment in R&D, with any improvements in methods and practices being passed on to the industry as a whole.

As mentioned above, technically speaking, MIS do not have a tax advantage over other forms of farming enterprise. Both MIS and traditional farmers can currently deduct non capital expenses from their taxable income and are subject to the same rules under Division 8 of the Income Tax Assessment Act 1997. The real issue stems from the fact that the tax treatment available to MIS investors has been used as a selling point for MIS investment, and has facilitated a large scale investment in horticultural farming that is analogous to share

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102 AGRI MIS (Non Forestry), *"AIMA Fact Sheet*", September 2006.

103 RIRDC, *"Economic Effects of Income-Tax Law on Investments in Australian Agriculture*", RIRDC Publication No 05/078, Lacey, Watson and Crase, May 2005.

104 AGRI MIS (Non Forestry), *"AIMA Fact Sheet*", September 2006.

105 Fleur Anderson, 13 October 2006, *"Nats' move may ignite tax spat*", Australian Financial Review, First Edition, pp7.

106 RIRDC, *"Economic Effects of Income-Tax Law on Investments in Australian Agriculture*", RIRDC Publication No 05/078, Lacey, Watson and Crase, May 2005.

107 Alston, J.M., Chan-Kang, C., Marra, M.C., Pardey, P.G. and Wyatt, T.J. (2000) *"A Meta-Analysis of Rates of Return to Agricultural R&D*", *International Food Policy Research Institute*, Research Report 113, Washington, D.C.

ownership in corporations. For this reason, opponents to MIS have suggested that the tax treatment of MIS investors is unfair when compared to other forms of investment, and there is a concern that MIS are attracting investors that do not have a real interest in the profitability and sustainability of the industry over the long term.

The full impacts of MIS entry into horticultural markets are yet to be realised, given that most horticultural MIS projects have not reached maturity, and have not yet significantly contributed to production in most industries. Furthermore, recent developments related to the tax treatment of horticultural MIS growers are likely to have a significant impact on the future level of MIS involvement in horticulture.

On 6 February 2007, the Assistant Treasurer, Peter Dutton, announced that the government would allow the ATO to run a test case against the MIS industry and to begin drafting a new Tax Ruling that would redefine the tax status granted to MIS growers[108]. The government has also ruled out legislating to protect MIS growers tax status for agricultural investments, as was done earlier this year for forestry MIS. Peter Dutton stated that the effect of the likely change would be to "place investments in non-forestry agribusiness managed investment schemes on the same footing as other passive investments in agriculture"[109].

The original premise under which agricultural MIS operated was that investors within MIS were deemed to be carrying on a business operation, which entitled them to deduct all of the non capital expenses incurred by the business[110]. The subsequent ATO draft ruling[111] puts forth the position that MIS investors are not carrying on a business, but are actually passive investors within an agricultural enterprise. Further, it argues that their investment within MIS is the capital cost of acquiring an interest in the scheme and cannot be regarded as a non-capital (and hence deductible) expense under Division 8 of the Income Tax Assessment Act 1997. If the revised ATO interpretation is approved in a test case (which has yet to be identified), MIS growers in schemes beginning after 30 June 2008 may not be able to claim any of their investment as a deductible expense.

Despite an appeal from horticultural MIS industry bodies, and a number of back bench coalition MPs, it is likely that the proposed changes will go ahead as planned, with a transitional period of one year (the draft tax ruling is set to come into effect on 30 June 2008) being given for the MIS industry to adjust to the changes.

If the tax treatment for MIS growers is changed in line with the Federal Government announcement, this is likely to lead to a substantial decline in the level of new MIS investment in horticulture. However, since these changes would not affect existing MIS, traditional sole trader and partnership based farmers will still compete with current horticultural MIS for resources.

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[108] Fleur Anderson and Jemima Whyte, 8 February 2007, *"MPs furious over tax scheme decision"*, Australian Financial Review, First Edition, pp1.
[109] Nassim Khadem, 7 February 2007, *"Tax breaks on horticulture investment schemes face July 1 deadline*", The Age, First Edition, pp3.
[110] See Division 8 of the Income Tax Assessment Act 1997.
[111] TR 2007/D2, 11 April 2007, available at www.ato.gov.au.

6.2 Impact of MIS Projects on Regional Economies and Communities

The impacts on regional economies and communities can be positive or negative and can vary depending on the group within the community. The following summary by industry provides an indication of the issues facing communities where MIS development is taking place.

The information in this section has been collected in consultation with representative for the respective industry associations. A full list of these associations in provided in the Attachment D. These impacts are based on the knowledge and perceptions of the associations with which consultation was undertaken.

An important impact on regional economies is the investment generated from MIS developments. These developments are typically large scale agricultural developments which utilise a range of local suppliers of products and services, which can inject significant amounts of capital funds into the local economy.

These positive impacts may be offset by MIS influenced social changes. These social changes arise as production moves from a traditionally family owned industry structure to one of managers and workers on a property.

As when gauging other effects of change, the level of impact is correlated to the significance of the change on a particular or localised area and the length of history of an industry.

6.2.1 Almond Industry

In Robinvale, the positive regional impacts that were reported include rising labour demands as traditionally dry land wheat areas are planted out with almonds. This has been particularly important to the regional community, as industries such as wine and citrus are experiencing a glut in production. The almond industry is also utilising the service industries of the region.

MIS are seen to have had a positive impact in Mildura, where they assisted in successfully lobbying against the development of a waste dump in the region.

6.2.2 Avocado Industry

The views on the impacts of MIS in the avocado industry differ by region. In eastern Australia the main issue identified was the distress generated amongst existing producers. In the west, there are actual production impacts and potential changes in returns as production in the region increases.

6.2.3 Citrus Industry

It is difficult for the industry to determine whether MIS are having (or will have) a positive or negative impact on the citrus industry, because MIS have only been involved for three years. However, the initial view is that the impacts are likely to be positive in terms of generating investment, assisting with technology adoption and participating in the industry.

Similarly, with industry-wide impacts, it is difficult to determine the impact of MIS at a regional level. However, based on the above view, it is likely to be positive.

6.2.4 Mango Industry

In Mareeba (northern Queensland) MIS has provided producers who wanted to exit the industry with a means of doing so. This is particularly the case for larger scale operators who would, otherwise, have had no market for their commercial mango operations.

The Australian Mango Industry Association believes that MIS in the mango industry can increase supply because there is more potential:

- in terms of consumer demand in the domestic mango market; and
- for growth in export markets, which are yet to be developed.

6.2.5 Olive Industry

MIS have had a positive impact at a regional level by providing regional scale to olive operations. This has particularly assisted the industry by attracting much needed expertise from overseas and by driving climate-specific R&D.

6.2.6 Table Grapes Industry

According to industry representatives, there are concerns that MIS draw a large amount of labour away from traditional farmers. This concern is expected to be exacerbated this season as the production of table grapes by MIS reaches maturity and a demand for labour is increased.

7. MIS Integration in Industry Bodies and Programs

7.1 Membership Structures and MIS Involvement

This section looks at each of the main MIS horticulture industries' representative structures and, in particular, at the MIS involvement in these industry bodies. A key issue in the industries, which is likely to differ somewhat across each, is the impact of MIS on the voting structure within each horticultural industry. Consultation has been undertaken to determine the extent of this issue across these industries, with the results reported below.

The majority of horticultural industries' membership structures are still operating on a one farm - one vote basis, and this is certainly the case where industries are more fragmented. Votes are generally allocated to MIS operators on the basis of an operating entity, though this is not always the case. There have been cases where more votes have been allocated to MIS entities.

The aim of the membership structure, particularly through the allocation of voting rights, is to provide equity in the industry decision making process and to consider the perspectives of key contributors to the industry. As an industry becomes less fragmented, or when one of the more major players increase their contribution to the industry, it is likely that there will be further review of the membership structure.

Importantly, the peak industry body is able to develop any membership model that is perceived to 'best fit' the industry. HAL's role in this process is largely an advisory one, to provide advice to the peak industry bodies on behalf of the Government. In particular, HAL's role is to ensure that the adopted membership structure is 'fair' for all stakeholders.

7.1.1 Olive Industry

The Australian Olive Association (AOA) represents olive growers in Australia. The AOA accepts membership from any interested party, and there are two forms of membership available:

- direct membership with the Australian Olive Association; or
- indirect membership, which is obtained through an olive growing region based association.

MIS in the olive industry are well represented at the industry level and are well accepted by the industry at large.

The industry is relatively new and needs all participants to work together to resolve major issues. Boutique growers have realised that industry based issues apply to all producers, and the MIS sector has applied its scale and resources to help resolve these industry issues to the benefit of all producers.

7.1.2 Almond Industry

In the almond industry, the main industry representative body is the Almond Board of Australia. This board has been in existence since 2002.

There are two forms of memberships for almond industry participants under the Almond Board of Australia, full and associate membership. The membership fees associated with these memberships are used to fund the activities of the Board. The differences between the two memberships are:

- full membership is available to industry participants such as almond growers, processors and marketers; and
- associate membership is available to organisations which provide supplies to the almond industry and to any other interested organisations.

MIS are generally well represented in the almond industry, having a representative on the Executive Committee. The industry is perceived to be progressive and united, and the MIS operators are generally well accepted by the industry.

The Almond Board of Australia is about to re-write the industry constitution to provide for industry representation of MIS and traditional operators without dominance by either group. With the current constitution there is scope for the MIS to outvote the industry in the future and so changes are being made to ensure that this will not be the case.

Stakeholder consultation has been undertaken within the industry and both MIS and non-MIS producers are happy with the proposed changes.

7.1.3 Table Grapes Industry

The Australian Table Grape Association (ATGA) is the peak industry body for the Australian table grape industry. ATGA is made up of 1,200 growers from all around Australia. The major growing regions include the Sunraysia and Murray Valley region in Victoria, Riverina in New South Wales and South East Queensland[112].

Each table grape region is represented on the industry board through a nominated representative of that region. All growers have the opportunity to be a member of their table grape association at the local level, and to participate in the nomination of their representative for the ATGA Board.

It is considered that MIS are under represented in the ATGA. It was suggested that MIS do have the opportunity to participate in the industry but have opted not to do so. The ATGA is not aware of any MIS members at the local level in any region.

It was the view of an industry representative that MIS are not well accepted by the industry at large, to the extent that there is generally a feeling of animosity towards these organisations. The reasons cited for the lack of acceptance include the current tax treatment of MIS investors. It is also considered that MIS operations are unlikely to have the knowledge and skills to achieve the best on farm outcomes and production possible, which has broader implications for the industry.

[112] ATGA website (http://www.atga.com.au)

7.1.4 Citrus Industry

Australian Citrus Growers (ACG) was established in 1948 as the national peak body of the Australian citrus growing industry. The citrus industry organisational structure is based on nine grower member associations under the Australia Citrus Growers peak industry organisation.

These organisations are based on production areas, and include:

- South Australia – Citrus Growers of South Australia Inc;
- Victoria (Murray Valley) – Sunraysia Citrus Growers Inc;
- Mid-Murray Citrus Growers Inc;
- Queensland – Growcom;
- New South Wales – Leeton Citrus Growers Inc;
- Griffith & District Citrus Growers Inc;
- Narromine Citrus Growers Association;
- Western Australia – WA Fruit Growers Association - Citrus Council; and
- Northern Territory – NT Citrus Growers Association Inc.

Australian Citrus Growers has three further associate members, which are the following state statutory boards.

- Murray Valley Citrus Board
- Citrus Board of South Australia
- Riverina Citrus

It was the view of a representative of the ACG that MIS are generally under represented within the industry, given their proportion of production and industry ownership. This is particularly the case given the new role of MIS in processing and marketing citrus fruit. However, MIS have largely retained farm managers on their properties so that working relationships are maintained.

The acceptance of MIS within the industry varies from region to region. Producers in the Riverland region of South Australia are, broadly speaking, accepting of MIS. It was reported that some growers in Queensland have expressed some interest in selling their properties to MIS organisations. Growers in NSW and Victoria are predominantly concerned about the expansion of MIS in the citrus industry.

The concerns of growers in the NSW and Victorian Murray region are not specific to the citrus industry and representation, but related to MIS in general. The main concern expressed is that the development of large properties operated by MIS will compete for resources.

7.1.5 Avocado Industry

Avocados Australia Limited is the peak industry body in Australia for avocado producers. Avocados Australia was formed in 2003, replacing the Australian Avocado Growers Federation (AAGF).

There are five classes of membership available in the avocado industry under Avocados Australia. These are:

- grower members – for commercial avocado growers;
- associate members – for processors, wholesalers, retailers, exporters and transporters of avocados;
- affiliate members – for consumer groups, service industry participants, educational organisations, and groups with a non-commercial interest in the industry; and
- honorary members and Life members - which are granted by the Board.

It is considered that MIS are well represented at the peak industry body level, with the manager of the Bundaberg MIS operation on the Industry Board. This member is seen by industry as a credible addition to the board, having been a part of the industry before working for MIS producers.

However, MIS are generally not well accepted within the industry. For example, in Western Australia there is actual hostility toward MIS producers within the industry. The main reason provided to explain the hostility is the large amounts of capital and resources MIS enter the industry with. These resources are perceived to give them an advantage over traditional producers. There are also fears that the market will be distorted by oversupply.

From an industry perspective, MIS have entered the avocado industry because the past five years has seen the industry growing, and returns have been stable to increasing. There is concern in the industry that MIS could impact on that growth and development, and negatively affect the sustainable approach to growth adopted by the industry to date.

7.1.6 Mango Industry

The Australian Mango Industry Association (AMIA) was established in 1999 to represent the Australian mango industry. AMIA has two forms of membership available depending on whether the party is a grower or other interested party. These types of membership are:

- ordinary membership – available to mango producers and allied industry members; and
- associate membership – for parties or people associated with the mango industry but are not ordinary members.

Examples of associate members include children, spouses and employees of an ordinary member. Associate members have all the participation rights of an ordinary member, but are not eligible to vote.

It is considered that MIS are well represented within the industry, with two of the seven directors on the industry board having connections with MIS operations. Although this was not a deliberate outcome, it has allowed MIS operations to have industry representation. It has been suggested by the Australian Mango Industry Association that if MIS are still part of the industry in the future, then it will be up to the industry to decide how to better incorporate them in the industry body. This will also depend on the view that MIS take on the AMIA's role in the leadership of the industry.

There are mixed views within industry for the acceptance of MIS. The main issues of contention are the tax treatment of MIS growers, the volume of production being grown by MIS and the impact of the quality and flavour of the varieties grown by MIS that traditional operators generally regard as being inferior.

7.1.7 Summary

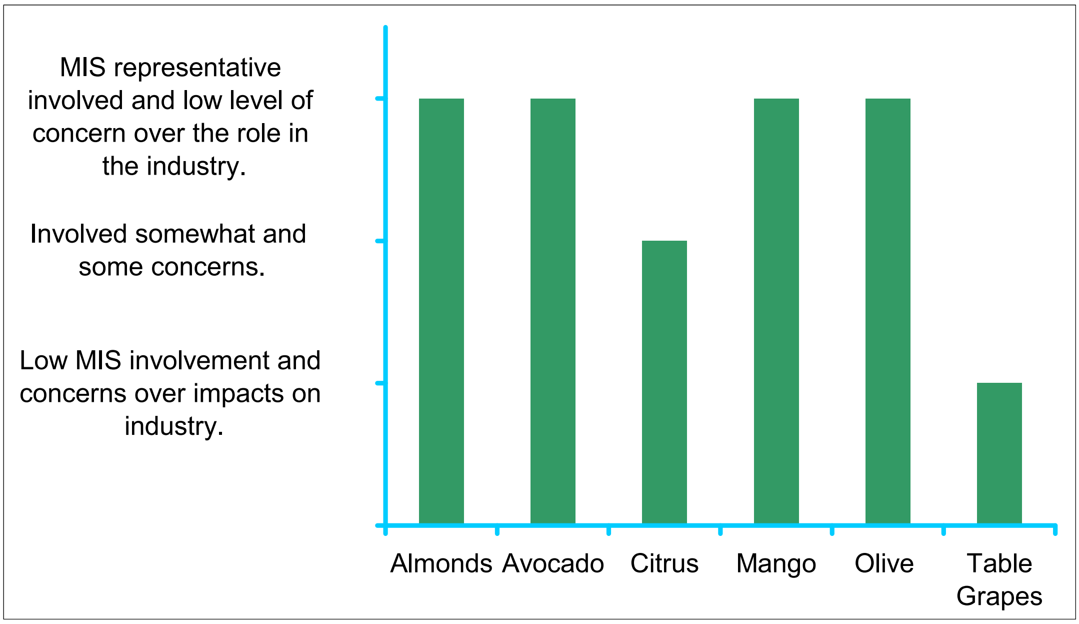
The perception of involvement in the industry representative structures varies between industry, and in some cases between different regions within an industry.

Chart 7.1 attempts to summarise and compare the perceptions within the industry regarding MIS. The two themes that came out of the discussions were as follows.

1. The level of representation is dependent on individuals who have a history of involvement.
2. Newer industries that have recently developed and also recently formed a representative structure have less concern regarding MIS in general.

The olive, mango, avocado and almond industries broadly show an acceptance of MIS within the industry and some level of participation from MIS. The table grape industry, on the other hand, has seen no MIS participation in the industry structure and is concerned about the impact of MIS on the quality of production, demand for inputs and producer returns.

Chart 7.1
Level of MIS involvement in Industry Structure and concern of the role of MIS



Source: Hassall & Associates Industry Survey, 2007.

There is likely to be a need for review of the membership structures that have seen significant growth in the role of MIS in their industry. This may not necessarily mean that there is change but the opportunity to discuss perceptions, fears and potential impacts should be provided to members. These discussions should include input from MIS operators. It is important that the value of R&D and any marketing activities undertaken as an industry is demonstrated to all levy payers.

A fair membership model and allocation of voting rights which reflects the needs of all industry participants and stakeholders should be based on common principles. It will be important for the membership structure to be developed in consultation with MIS stakeholders, to ensure that they are engaged in a positive way that reflects the participation of MIS operators in the industry.

7.2 Industry Levies

The collection of an industry levy is broadly uniform across industries. It is also broadly uniform across MIS and non-MIS producers. In all of the main MIS horticulture industries, the levy is calculated on an output basis, such that a specified amount is paid from returns per unit of production.

As the levies are calculated in the same way across industries, the implications within each industry will be similar. The larger the industry and the higher the output, the more levy will be generated. MIS operators are not exempt from this levy collection system and therefore are also required to contribute.

Horticultural industries with national levies have an Industry Advisory Committee to guide the use of industry funds across investment in the industry. The funds are used in areas such as research and development and marketing[113].

In the industries with significant MIS involvement, such as almonds and olives, levies generated by MIS producers account for a significant proportion of industry funding. In the almond industry in particular, it has been identified that the additional revenue generated from the growth in the industry over the past decade (which is largely attributable to MIS) has allowed the industry to develop to a professional level and provide much higher R&D and marketing services to industry participants, than would otherwise have been possible.

[113] Avocados Australia, 2006.

8. Performance Measures

The previous sections have provided a range of different information relating to horticulture MIS. This information included the size and extent of MIS projects within different horticulture sectors, the perceived impacts of these projects on the sectors and other producers within that sector, and the estimated contribution of these MIS to the economy in general. This section extends this analysis one step further by using case studies to examine the performance of horticulture MIS projects compared to the performance of traditional owner operators in the same industry.

8.1 Relative Performance of MIS

A telephone survey of MIS operators and selected traditional owner operators was carried out to gauge some of the key differences between their operations. The questionnaires used for this survey are presented in Attachment B. Because of the very limited sample size, it should be noted that this technique can only provide broad indications of relative performance. Further, because of the high degree of variability between industries, extreme caution is required when interpreting averages.

It is also prudent to note that all of the projects and farms vary in their degree of maturity, which will affect the yield per hectare and water use per tonne statistics. These variations have been explained where possible.

The indicators used to assess the relative performance of MIS can be grouped under two key headings.

- Characteristics of the business - hectares, production, labour and resource use.
- Business operations - Human resources management and development, investment in technology and R&D, quality management, marketing strategy, and use of natural resources.

The aim of this analysis was to examine four producers per industry – two MIS operators and two individual growers (non-MIS). In some cases, where MIS are relatively new to the industry, data was only available for 1 MIS (citrus and mangoes). In other cases, more than 2 non-MIS interviews were conducted to ensure appropriate comparisons could be made across the sector (almonds and olives). Finally, two MIS horticulture industries (table grapes and avocados) are not included in these case studies, as it was not possible to get data from both MIS and non-MIS producers in these industries[114].

The following summarises the case studies for each industry that have been analysed in this report.

- Almond Industry – 2 MIS project and 4 non-MIS
- Olive Industry – 2 MIS and 3 non-MIS
- Mango Industry- 1 MIS and 2 non-MIS
- Citrus Industry- 1 MIS and 2 non-MIS

[114] For table grapes, the only MIS project appropriate for this analysis is currently undergoing a restructure. For avocados, it was not possible to interview any non-MIS avocado producers at this point in time.

8.1.1 Olive Industry

Around 70 per cent of total olive oil output is produced by MIS operators, which are concentrated in Victoria and Western Australia. Some 2.7 million olive trees have been planted in Victoria, with a number of significantly large growers located in the state's North West. It is expected that by 2008, around 50 per cent of Australia's olive production will be supplied from Victoria.

To examine the relative performance of MIS olive projects, this analysis looks at a number of key performance indicators for two MIS and three non-MIS olive projects/producers. The results for these olive projects/producers under these key performance indicators are shown in the table below.

Table 8.1
Olive Industry - Performance Indicators

	Hectares	Production (tonnes) per Ha	Production per employee (a)	Water Use (ML/Ha)	Water Use (ML/tonne)	Production cost per Ha (C)
MIS 1	511	4.9	258.6	3.5	0.7	$2,207
MIS 2	654	6.4	365.5	42.0	6.5	$4,069
Farm 1	85	1.4	49.7	2.4	1.7	$2,706
Farm 2	130	5.4	68.6	16.2	3.0	$3,462
Farm 3	6	0.1	0.6	1.3	11.4	$1,333

Source: Econtech/H&A survey (see Attachment B and C)
Notes: (a) employees refer to full-time equivalent, and it was assumed that part-time workers work an average of 3 days per 5 day week and casual (seasonal) workers work an average of one month per year. (b) Production costs are based on non-capital recurrent costs.

MIS 1 is a large producer in terms of hectares and, to a lesser extent, volume. This volume result is because its crops have not yet reached full maturity. Given a current yield that is substantially less than estimates of mature production, MIS 1 is surprisingly efficient. It is the second most productive user of land and water per hectare, and is also the most efficient in terms of water use per tonne produced. It also has one of the lowest levels of expenditure on non-capital costs per hectare. As such, MIS 1 is a good example of the efficiency that can be gained through large scale production and investment in the latest production/processing technology. Despite its size, MIS 1 invests very little in training its staff, although it does provide basic activity based training for employees and operations based training for contractors. Investment in innovation and R&D is high for MIS 1, which may be one of the reasons that it is so efficient. MIS 1 uses a fully document and integrated ISO9000 quality assurance program, and has a comprehensive written management plan. MIS 1 also uses a specialist advisor and peer advice for marketing decisions.

MIS 2 is also very large producer, and is the most productive in terms of both land use and production per employee, which is likely related to investment in labour saving technology. Nonetheless, it is by far the highest user of water in terms of mega litres per hectare, and other than Farm 3 (which has a very small volume of production), is the highest user of water per volume of production. It also has the highest levels of expenditure on non-capital costs per hectare. MIS 2 provides a high level of training to employees, covering human resource management, soil and irrigation techniques, management and OH&S. They have also recently invested quite a lot in R&D and processing and harvesting equipment. MIS 2 uses the WQA (Woolworth's) HACCP quality assurance system, as well as conducting on site sample tests in one of its two accredited laboratories. It has a written management plan and uses a specialist advisor for making marketing decisions.

Farm 1 is a medium sized producer, and with the exception of Farm 3, has the lowest rate of production per hectare. Production per employee is also low when compared to the two MIS, although it is comparable to that of Farm 2. This may be an indication that farm producers are generally more labour intensive than MIS producers. Farm 1 is the most efficient user of water per hectare, and the second most efficient user of water per tonne of production (being less efficient than MIS 1 as a result of Farm 1's lower yield per hectare). Farm 1 is also competitive in terms of costs per hectare. Farm 1 provides management and food processing training to its employees at a moderate cost, and invests in R&D on an ad-hoc basis. In terms of product and process innovation, Farm 1 invests at a relatively high rate. Farm 1 uses the fully document and integrated HASSAP quality assurance program, and has a written management plan covering a wide range of strategic issues, including marketing and sales. Farm 1 does not use specialist advice for marketing, and only uses peer advice to a small extent, preferring to conduct most of its marketing operations in house.

Farm 2 is another medium sized producer in the industry, but would be considered fairly large for a traditional farmer. It is comparable to the MIS producers in terms of output per hectare, but produces less output per employee than either MIS. This is comparable to Farm 1, and may indicate that farm producers are generally more labour intensive than MIS producers. Farm 2 also uses a high level of water, with one of the highest levels of mega litres used per hectare, and the third highest level of mega litres used per tonne produced. Farm 2 also incurs relatively high recurrent costs, making it the most expensive per hectare after MIS 2. Farm 2 spends little on training its employees, and provides basic training in chemical usage, fork lift licences and Occupational Health and Safety Training (OH&S). It spends a medium amount in R&D, and also owns a state of the art processing facility that meets all HACCP requirements. Product samples are also sent to an IOOC accredited laboratory prior to commercialization. Farm 2 has a comprehensive written management plan, and uses peer advice, but no specialist advice, for making marketing decisions.

Farm 3 is a very small producer (6 hectares), the owners of which have other primary sources of income. As such, it suffers from the inefficiencies expected of producing on such a small scale, and has a production level per hectare and per employee that is far below any of the other producers. This is illustrative of the difference in economy between small and large scale production, although this is an extreme case. Farm 3 has the lowest use of water per hectare, but is by far the most inefficient in terms of water use per volume produced. This is again reflective of the small scale of production. It is also the cheapest in terms of non-capital cost per hectare, which is largely the result of having no real labour costs (there are only two part time employees that do not take a wage) and very small recurrent costs. Due to the fact that Farm 3 is basically a hobby farm, and has no paid employees, it provides no training, and does not undertake any investment in R&D beyond personal research. It also has no documented quality assurance system, although produce is sent to an accredited laboratory for testing prior to sale. Farm 3 does have a limited written management plan, and does not use a specialist advisor to market its product. It should be noted that Farm 3 is a good example of a 'boutique' grower, and farms of this size are not uncommon in the olive industry, although their production makes up a small part of the industry overall.

The following points summarise the main observations across the key indicators, discussed above.

- Production per hectare was comparable across the MIS and the largest of the non-MIS farms.
- The MIS's have significantly higher level of labour productivity. This could reflect a difference in capital resources, in that MIS are more likely to have invested in labour saving technology than traditional farmers. This theory is supported by the fact that until recently the olive industry has been very small, and has only recently grown to a size that could justify investment in expensive harvesting machinery. This means that most small producers may not have invested in machinery yet.
- The water usage of MIS 2 was surprisingly high, whilst the water usage of MIS 1 was very efficient, which is inconclusive in comparing the water efficiency of farms to MIS.

Turning now to the business operations side of the analysis, four initial observations can be made.

- Investment in R&D tends to be skewed towards the larger producers, in that the larger the size of the farm or project, the more they invest in R&D.
- All of the producers use sample testing to ensure the quality of their product, and all but one employ a fully documented, fully integrated quality assurance system.
- The level of training provided by producers varies across both size and category, with some of the large producers providing minimal levels of training to staff, and one of the smaller producers investing a relatively large amount in training staff. It should be noted that most producers provide some level of basic training which includes OH&S and activity based training.
- All of the producers have written management plans that address production objectives and the protection/use of natural resources. Most of these plans also extend to training and marketing objectives, although only the MIS producers consult specialist marketing advisors.

8.1.2 Almond Industry

The main almond growing areas in Australia include the Riverland region in South Australia, and the Sunraysia and Robinvale regions of Victoria. A majority of the MIS operations in the almond industry are located in Robinvale, with MIS now contributing more than 50 per cent of industry output.

To examine the relative performance of MIS almond projects, this analysis looks at a number of key performance indicators for two MIS and four non-MIS almond projects/producers. The results for these almond projects/producers under these key performance indicators are shown in the table below.

Table 8.2
Almond Industry - Performance Indicators

	Hectares	Production (tonnes) per Ha	Production per employee (a)	Water Use (ML/Ha)	Water Use (ML/tonne)	Production cost per Ha (C)
MIS 1	700	0.1	3.2	5.7	0.0	$5,807
MIS 1b	700	3.6	0.0	0.0	3.5	$5,807
MIS 2	1,004	2.9	60.0	7.0	2.4	$6,474
Farm 1	200	3.0	75.0	15.0	5.0	$6,000
Farm 2	17	2.4	9.5	13.0	5.5	$2,647
Farm 3	450	2.9	82.3	15.0	5.2	N/A
Farm 4	450	1.6	23.7	8.9	5.7	$4,444

Source: Econtech/H&A survey (see Attachment B and C)
Notes: (a) employees refer to full-time equivalent, and it was assumed that part-time workers work an average of 3 days per 5 day week and casual (seasonal) workers work an average of one month per year. (b) Production costs are based on non-capital recurrent costs.

MIS 1 is a relatively young producer that expects to produce its first harvest in March 2007. As such, its production estimates for this year (MIS 1) are poor in comparison to the other projects that are producing at a higher level of maturity, and hence have a higher yield per tree. Estimates of mature productivity measures (MIS 1(i)) are comparable to the other projects. MIS 1 provides a wide range of training to its employees, including Horticulture certificate courses, machinery and equipment training and compulsory OH&S training, as well as basic on the job training for all employees. They invest a modest amount in R&D at roughly $25,000 a year, and employ a comprehensive, fully documented and integrated HACCP quality assurance system. MIS 1 has a written management plan and uses a specialist advisor for marketing decisions.

MIS 2 is a very large producer in terms of both hectares and volume. This project is relatively productive, with a competitive rate of production per hectare and the best economy in terms of water use per tonne produced. Nonetheless, MIS 2 spends the most money on production, which is a result of its high labour costs. This is an interesting result, given the project's competitive rate of production per employee. MIS 2 invests a large amount in staff training, which covers areas such as irrigation, chemical use, agronomy and OH&S. They also invest a relatively large amount into R&D, and employ the Woolworth's WQA HACCP quality assurance system. MIS 2 has a written management plan and uses a specialist advisor for marketing decisions.

Farm 1 is a medium size producer, which is notable for its high rate of production per employee. It also has the best rate of water use per tonne produced out of all of the non-MIS farms, although has a slightly higher use of water compared to the MIS projects. Farm 1 also incurs the highest non-capital costs of the non-MIS producers, and spends the second highest amount per hectare out of all of the MIS and non-MIS producers interviewed. Farm 1 invests a modest amount in R&D and product/process innovation. Like the MIS producers, Farm 1 uses a HACCP quality assurance system, and also provides training to its staff which covers a range of TAFE courses. Farm 1 has a written management plan, but doesn't use a specialist advisor or peer advice for marketing decisions.

Farm 2 is a very small producer, with a planted area of only 17 Hectares. While Farm 2's yield per hectare is comparable with the other farm producers, it uses a high level of water in terms of both mega litres per hectare and mega litres per tonne produced. It also has one of the lowest levels of labour productivity (production per employee). Farm 2 has the lowest cost per hectare, which is reflective of the fact that it is a family farm that spends very little on labour (3 full time employees, including family members who do not earn a wage). Further, given its small size, Farm 2 spends little on R&D, but does provide training to employees and employs a third party audited quality assurance system. Farm 2 has a written management plan and uses peer advice for marketing decisions.

Farm 3 would be considered very large for a traditional farmer, and its productivity measures reflect the fact that it is able to achieve economies of scale. It has a competitive rate of production per hectare and has the best level of labour productivity (production per employee). Nonetheless, its use of water is not optimal, with an expensive rate of mega litres used per hectare and per tonne produced. Farm 3 provides a median amount of training to employees, which covers a system of standard operating procedures as well as diplomas in horticultural management. Investment in R&D is relatively low for Farm 3, which pays the industry levy for shared R&D at 2c per kilo, and employs a part time technical officer who is responsible for undertaking trials and other research. Farm 3 uses a fully documented and integrated quality assurance system, the SQF2000 QA system. Further, Farm 3 doesn't have a written management plan, but does use a specialist advisor for marketing decisions.

Farm 4 is another large traditional producer, which incurs a relatively low non-capital cost per hectare. However, Farm 4 has the lowest level of production per land and water use. This is an interesting result, indicating that Farm 4 has been unable to achieve the economies of scale that might be available to it. Farm 4 provides a high level of training to its employees in terms of expenditure, and covers activity specific training, as well as compulsory OH&S training. Farm 4 spends a lot in R&D, although the respondent stipulated that they considered R&D to cover the entire process of trialling new planting areas and techniques, and general replanting. Farm 4 also employs an extensive quality assurance system which is complemented by sample testing of any commercial produce. Farm 4 has a written management plan and uses both a specialist advisor and peer advice for marketing decisions.

The following points summarise the main observations across the key indicators, discussed above.

- In general, the MIS and non-MIS operations tended to utilise land at similar rate of productivity (based on MIS 1's estimated yield at maturity, and excluding Farm 4).
- Labour productivity (in terms of production per employee) was also comparable across the categories. There were two exceptions; in the very small producer and in Farm 4.
- The MIS producers appear to use water more efficiently than the non-MIS producers, in terms of both mega litres per hectare and per tonne produced. This appears to support the argument that MIS employ superior methods of irrigation.
- The more efficient producers tended to be more expensive in terms of non-capital cost per hectare, indicating the higher cost of productivity across all categories.
- Farm 4, although very large for a traditional farmer, had lower results across a number of efficiency measures, lending credence to the argument that MIS employ more efficient production techniques and irrigation systems than traditional farmers.

Turning now to the business operations side of the analysis, four initial observations can be made.

- All producers are investing in new technology and product/process innovation regardless of the size of the operations, although the level of spending does not always equate to greater efficiency in production.
- The producers differed in the level of formality employed in their business operations. Most producers had a written management plan, but the MIS operators had a greater focus on marketing and customer relations than the non-MIS producers. Only one of the non-MIS producers included a marketing and sales provision in their management plan, and only half employed a specialist marketing advisor.
- All of the producers had integrated new ideas/techniques in water use efficiency into their production methods to some degree in the last 12 months.
- All of the producers employ an accredited quality assurance system, with most using a HACCP system. Also, all of the producers send product samples to independent laboratories for testing before commercialisation.

8.1.3 Citrus Industry

The majority of the citrus farms operated by MIS are located in the Riverland region of South Australia, near Renmark. In this region, it is estimated that MIS accounted for approximately 1,700 ha of citrus orchards.

Traditional operations in the Riverland region are characterised by small, family owned farms stemming from the soldier settlement era, with 75 per cent of growers in the Riverland having properties less than 10 hectares in size and 90 per cent less than 20 hectares.

To examine the relative performance of MIS citrus projects, this analysis looks at a number of key performance indicators for one MIS and two non-MIS citrus projects/producers. The results for these citrus projects/producers under these key performance indicators are shown in the table below.

Table 8.3
Citrus Industry - Performance Indicators

	Hectares	Production (tonnes) per Ha	Production per employee (a)	Water Use (ML/Ha)	Water Use (ML/tonne)	Production cost per Ha (C)
MIS 1	450	48.3	65.8	8.0	0.2	$2,818
MIS 2	0	0.0	0.0	0.0	0.0	$0
Farm 1	3	28.0	58.3	12.0	0.4	$10,000
Farm 2	30	27.5	165.0	8.8	0.3	$5,333

Source: Econtech/H&A survey (see Attachment B and C)
Notes: (a) employees refer to full-time equivalent, and it was assumed that part-time workers work an average of 3 days per 5 day week and casual (seasonal) workers work an average of one month per year. (b) Production costs are based on non-capital recurrent costs.

MIS 1 is considered to be a very large producer (450 hectares), in comparison to the average citrus farm which would be less than 20 hectares. Its production per hectare is superior to any of the other producers, and it also incurs a non-capital cost per hectare that is much lower than any of the other producers. This is reflective of the productivity gains that can be made by producing on a larger scale. Nonetheless, production per employee for this project is comparable to Farm 1 and is far less than that of Farm 2. This is because MIS 1 has a very large labour force, and is also in a stage of expansion, which requires more employees than would normally be the case. MIS 1 is also one of the most efficient users of water. MIS 1 provides an extensive range of training to staff, including both job specific training and certificate level training in horticultural management and irrigation. MIS 1 also participates in a number of staff training programs run by TAFEs and Universities, which cover topics including leadership, time management, project management, risk analysis and finance. Further, MIS 1 invests heavily in R&D and employs a number of interrelated quality assurance systems including an ISO9000 system and HACCP system. MIS 1 has a comprehensive written management plan and employs a specialist marketing advisor.

Farm 1 is a relatively small producer, with only 3 hectares of planted crops. It has the lowest level of production per employee and the highest water use (per hectare or tonne). Interestingly, Farm 1 has a higher level of production per hectare than Farm 2 (which is ten times as large). Farm 1 has particularly high non-capital costs per hectare, even though its labour and recurrent costs are low. This is most likely due to its small size, and again illustrates the difference in efficiency that can be gained by producing on a larger scale. Farm 1 spends a relatively large amount of money on staff training every year ($30,000), given the fact that it employs only two part time staff. The training covers fruit picking/harvesting management courses. R&D investment is limited to the industry levy, although investment in new product/process innovation is relatively high at $20,000. Farm 1 uses a HACCP quality assurance system that is fully documented and integrated, and also employs a specialist advisor for marketing advice. It does not have a written management plan, nor has it changed production management in any substantial way.

Farm 2 would be considered a large traditional producer at 30 hectares, although this is dwarfed by the size of MIS 1. Farm 2 is has the lowest level of production per hectare, but is quite competitive in terms of the other productivity measures. In particular, Farm 2 is by far the most labour efficient producer, and follows MIS 1 closely in terms of water use. In terms of non-capital cost per hectare, it is middle of the range (spending roughly half as much per hectare as Farm 1 and almost twice as much as MIS 1). Farm 2 has what it would consider as very experience personnel and, as such, does not offer ongoing training to staff. It does invest a fairly large amount in new equipment each year, but invests a minimal amount in R&D (which consists of paying the industry levy). Farm 2 employs no quality assurance system other than by personally testing the produce as it matures – first by eye and, later, by actually taste-testing the product. The business does not have a written management plan and does not rely on peer advice in relation to marketing, although a specialist advisor is used to some degree.

The following points summarise the main observations across the key indicators, discussed above.

- The MIS, whilst a more productive user of land, has a relatively low level of production per employee. Farm 2 has by far the highest level of production per employee. Farm 1, whilst being very small in comparison to MIS 1, has a level of production per employee that was only marginally less than MIS 1. This result is unusual in that the other industry case studies have generally found that MIS are less labour intensive than farm producers.

- Water efficiency across the different producers was very close, and would lead to the conclusion that MIS and farm producers are using water at a similar rate across the industry (given that even the very small producer had water use rates that were close to that of the large MIS).
- The non-capital costs per hectare were substantially lower for the large MIS producer, reinforcing the economies of scale argument that is associated with MIS.

Turning now to the business operations side of the analysis, four initial observations can be made.

- There appears to be a variation in the degree to which owner operators invest in new technology that seems to be size related. That is, it appears that it is the larger farms, with economies of scale, who can afford to invest.
- The business operations of small producers in the citrus industry appear to be somewhat informal, as neither of the farm producers had a written management plan, and only one of them employed a quality assurance system. It also appears that some owner/operators manage their farms on a part time basis and may have paid employment in other occupations.
- The level of training across production types appears to differ dramatically. Where the farm producers provided training, it focused on fruit picking/harvesting management courses. In contrast, the MIS operation provided its staff with a very wide range of training that was both compulsory and elective, allowing them to develop particular staff members to fill management and specialist roles. This variation in training levels would be largely driven by the much larger size of the MIS, which has 120 full time and 350 part time staff. In comparison, the farm producers both have no more than 7 staff in total.
- The MIS producer was far more interested in production management innovation than the farm producers. Coupled with the fact that the farm producers were able to compete with the larger MIS in most productivity measures, and the fact that the workforce of the farm producers was very experienced, leads to the conclusion that the citrus industry is a mature industry in which a large number of small producers are able to operate at fairly efficient level due to experience curve effects[115].

8.1.4 Mango Industry

The Mareeba and Burdekin regions of northern Queensland produce around 65 per cent of Australia's mangoes or close to 40,000 tonnes annually. The mango industry has grown in the area in recent years, utilising land previously used for tobacco production. This land has remained largely unproductive since the decline of the tobacco industry. MIS operators have bought into existing mango properties in the area over the past two years, which has allowed some of the larger producers to exit the industry.

To examine the relative performance of MIS citrus projects, this analysis looks at a number of key performance indicators for one MIS and two non-MIS mango projects/producers in

[115] The experience curve effect states that the more often a task is performed, the cost of doing it becomes lower i.e. as a producer become more experienced, their cost of production falls. More formally, each time cumulative production doubles, the unit cost of production will fall by a constant percentage. In this case, farm producers have the experience necessary to lower production costs, whilst the MIS producer is inexperienced and will incur higher unit costs.

the Katherine and Darwin areas in NT. The results for these citrus projects/producers under these key performance indicators are shown in the table below.

Table 8.4
Mango Industry- Performance Indicators

	Hectares	Production (tonnes) per Ha	Production per employee (a)	Water Use (ML/Ha)	Water Use (ML/tonne)	Production cost per Ha (C)
MIS 1	135	3.6	81.5	1.8	0.0	$6,630
MIS 1b	135	8.1	0.0	0.0	0.2	$0
MIS 2	0	0.0	0.0	0.0	0.0	$0
Farm 1	323	6.2	133.9	2.6	0.4	$3,715
Farm 2	156	6.4	88.5	4.2	0.7	$0

Source: Econtech/H&A survey (see Attachment B and C)
Notes: (a) employees refer to full-time equivalent, and it was assumed that part-time workers work an average of 3 days per 5 day week and casual (seasonal) workers work an average of one month per year. (b) Production costs are based on non-capital recurrent costs.

MIS 1 is the smallest of the three producers, which is unusual (in that the MIS analysed in the other horticulture industries operate on a larger scale than traditional farmers). MIS 1 is a fairly recent project, and only had its first productive season in late 2006. This means that the current yield is much less than will be expected at maturity. As such, the production per hectare of MIS 1 is substantially lower than for the other non-MIS producers. However, if calculated based on estimates of the mature yield (MIS 1(i)), production per hectare improves substantially. Interestingly, the production per employee for MIS 1 is comparable to Farm 2, even at an immature stage. In terms of water use, MIS 1 is the most efficient, and this is achieved through its new, state of the art irrigation system. Nonetheless, MIS 1 is the most costly of the producers in terms of non-capital cost per hectare. This is most likely the result of its smaller size, with the non-MIS farm producers achieving economies of scale. MIS 1 offers a wide range of internal and external training to staff, covering topics such as irrigation management, equipment use, pest identification and OH&S. Further, the project has invested heavily in R&D over the last five years, particularly in the development of the Calypso mango variety. MIS 1 also uses three quality assurance systems; Freshcare, HACCP and SQF2000, all of which are fully documented and integrated. MIS 1 has an extensive written management plan and employs a specialist marketing advisor.

Farm 1 is a large producer that benefits from economies of scale. Its production per hectare is comparable to both Farm 2 and the predicted output for MIS 1, and it produces a significantly higher amount of mangoes (by weight) per employee than either of the other producers. In terms of water use, Farm 1 uses a similar level of water per hectare and per volume of output as MIS 1, and less than Farm 2. Farm 1 also incurs less non-capital costs per hectare, compared to MIS 1. Farm 1 provides activity based training to most employees, which is particularly important given the large number of casual employees that work in the harvesting season. Permanent staff are also provided with management training whilst all employees are given OH&S training. Farm 1 invests only a modest amount in R&D, paying the industry levy and conducting some on farm trials. It does employ an SQF2000 and HACCP quality assurance system, which is fully documented and integrated. Farm 1 does not have a written management plan and does not use a specialist advisor or peer advice when making marketing decisions. Rather, it maintains a relationship with wholesalers who in turn make more direct efforts in marketing the product to the end users.

Farm 2 is a medium sized producer, with roughly the same amount of hectares as MIS 1. Farm 2 has a comparable rate of production per hectare with that of Farm 1, and also with the mature crop estimates of MIS 1. Farm 2 has less production per employee than Farm 1, with Farm 2 currently employing more staff per hectare out of the two producers. Further, of the three mango producers, Farm 2 uses the most water per hectare and per volume of produce. Farm 2 offers TAFE level management training to its full time management staff and basic levels of training to causal employees, and has invested heavily over the last couple of years in new equipment and R&D. Farm 2 has a HACCP quality assurance system and keeps documentation of fruit quality. Farm 2 has a written management plan that covers production objectives and the development of natural resources, and also employs a specialist advisor for marketing decisions.

The following points summarise the main observations across the key indicators, discussed above.

- The MIS crop is still at an immature stage, which makes it difficult to make comparisons with other, more mature operations. However, based on estimated output at maturity, the MIS should be able to achieve a rate of production per hectare that is comparable, if not higher, than the two non-MIS farms.
- Farm 1 has more production per employee and uses less water than Farm 2, reflecting the gains that can be achieved through economies of scale. Farm 1 also spends less on non-capital expenses compared to MIS 1, which is also a likely result of its greater scale of production.
- MIS 1 uses less water than Farm 1 and 2, despite Farm 1 having a size advantage. This is probably because MIS 1 is a relatively new project, so it has been able to employ the most technologically advanced irrigation system from the beginning of operations. However, it should again be noted that the MIS crop is still at an immature stage, so water consumption is likely to change as the crop matures.

Turning now to the business operations side of the analysis, four observations can be made.

- The level of training provided to employees of the MIS is greater than that provided to either of the non-MIS producers, although all producers provided management training to full time staff and basic training to casuals. The greater level of training provided by the MIS is not the result of more employees, but rather through a more in depth approach to employee development.
- The level of R&D was not related to the scale of production, as both MIS 1 and Farm 2 had invested more in R&D than Farm 1 over the last few years. Farm 1 limited R&D to on farm trials.
- The largest producer did not have a written management plan, and did not consider it to be necessary to the running of a successful business. All of the producers had quality assurance systems, although the MIS system was more comprehensive. It appears that owner/operators felt that detailed documentation, in itself, did not lead to better performance, but was simply an investor requirement for MIS.
- Producers in the mango industry have built close relationships with wholesalers and consider working with them and having a supply contract to be very important. It appears that producers in the mango industry see wholesalers as their main source of market information, and rely on them for marketing their product to the end consumers.

8.2 MIS and Innovation

This section analyses the impact of MIS on the horticulture sector in terms of production advancements, research and development (R&D), innovation and skills development. This analysis is based on information collected in the consultation process with industry associations referred to in Sections 5.2 and 6, and on information collected from the case studies referred to in Section 8.1. Similar to the discussion in the previous section, the analysis in this section is presented for the following four industries: olives, almonds, mango and citrus.

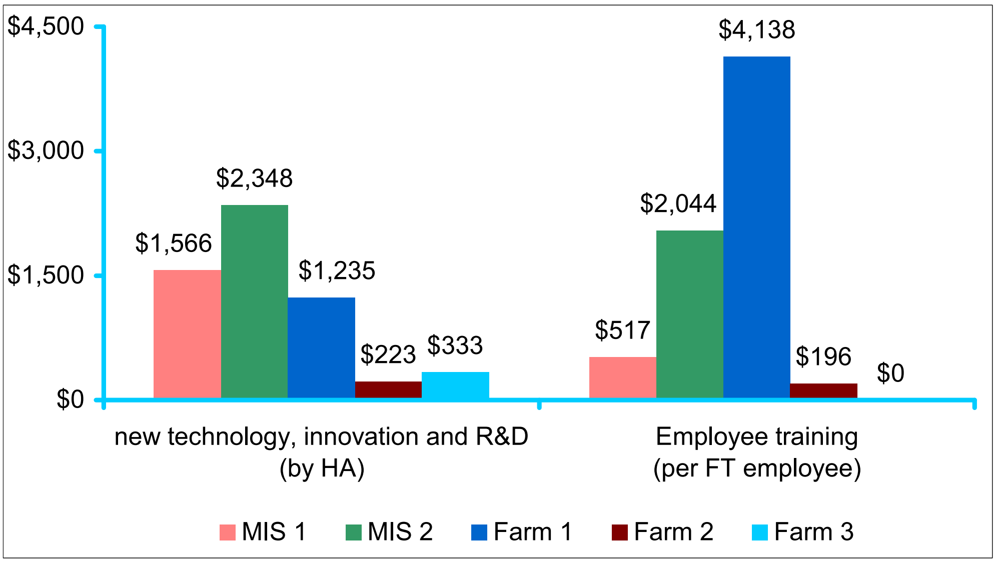
8.2.1 Olive Industry

The information collected during the consultation process with the olive industry suggests that the impact of MIS on technology adoption in the industry has been positive in terms of providing scale and resources to the industry. Furthermore, it was suggested that the MIS have contributed to enabling the development of mechanisation within the olive industry, especially with harvesting. MIS have also assisted with the development of new ways of operating, including harvesting technology, tree training methods and advances in tree nutrition. This has provided a market advantage to both MIS and the olive industry as a whole.

Chart 8.1 shows the average expenditure in employee training (per full time employee) and the average expenditure in new technology, innovation and R&D (by Ha) for five case studies in the olive industry. As shown in this chart, both the olive MIS projects and traditional olive farms invest significantly on new technology and R&D. Importantly, on average, the MIS olive projects invest more than the traditional farms by hectare of crop. This reflects the fact that MIS usually have larger monetary resources than traditional farms.

Chart 8.1, also shows that both MIS and traditional farms in the olive industry contribute significantly to the development of their employees' skills. From the olive farms/projects contacted, only one did not provide any training to employees and this is because it is a very small family farm (8 hectares) and there are only two family members as employees. The other four farms/projects stated that they provide different training to their employees, ranging from activity based training and management training to soil and irrigation courses and food processing training.

Chart 8.1
Average Expenditure in a Typical Year for Employee Training and New Technology, Innovation and R&D for Case Studies in the Olive Industry



Source: Constructed by Econtech with information from the Case Studies Interviews.

8.2.2 Almond Industry

The information collected during the consultation process with the almond industry suggests that technology is being developed and adopted on the large MIS farms, which is being passed on to the industry through field days held by MIS producers and through the industry body.

It is considered that MIS operators are out-performing the industry. Although no major contribution is made toward export development outside the payment of the levy, exporting in the almond industry is closely tied to the 3 main processors and marketers, which together process around 95 per cent of production.

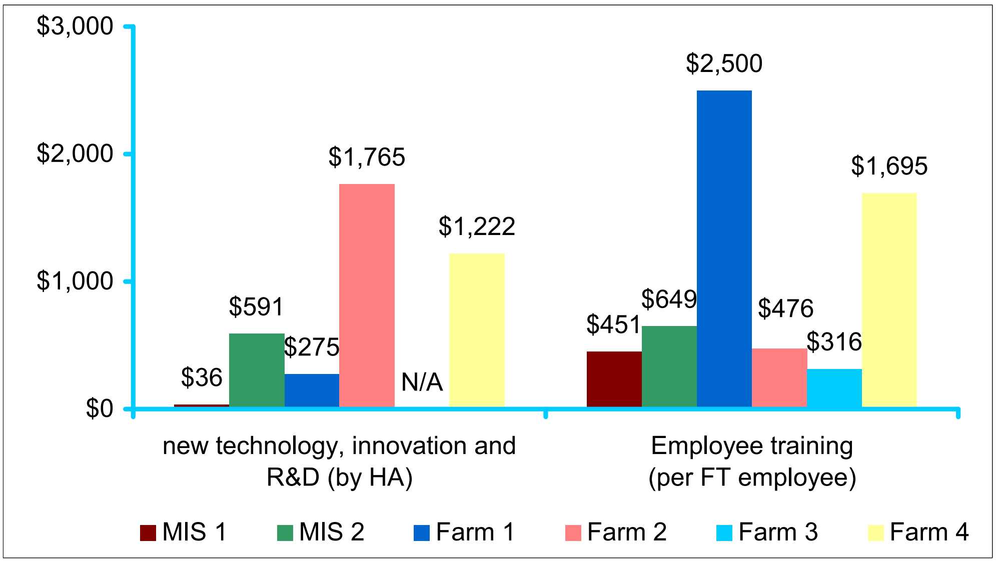
The almond industry is currently developing new varieties and root stocks for poorer soils with funds contributed by the entire industry, including MIS.

MIS operate in a similar way to the rest of the almond industry, with the key difference being denser plantings. However, both the MIS and industry have undertaken some experimentation with planting density and agronomy.

Chart 8.2 shows the average expenditure in employee training (per full time employee) and the average expenditure in new technology, innovation and R&D (by Ha) for six case studies in the almond industry. As shown in this chart, most of the almond farms/projects interviewed invest on new technology and R&D. In contrast to the other five farms and projects, Farm 3 only contributes to R&D through the industry levy for R&D. Furthermore, Farm 3's owner indicated that he was unsure about the annual amount he typically spent in new technology and/or process and product innovation.

In contrast to the MIS projects analysed in the olive industry, Chart 8.2 suggests that, on average, traditional farms invest more on R&D than the MIS almond projects by hectare of crop.

Chart 8.2
Average Expenditure in a Typical Year for Employee Training and New Technology, Innovation and R&D for Case Studies in the Almond Industry



Source: Constructed by Econtech with information from the Case Studies Interviews.

Chart 8.2 also shows that both MIS and traditional farms in the almond industry contribute significantly to the development of their employees' skills. Importantly, not only did these farms/projects provided 'general' OH&S training and induction training for casual employees, many of them provided their staff with horticulture certificate courses from TAFE, diplomas in horticultural management and training in several different areas such as irrigation, agronomy, chemicals, equipment use, etc.

Interestingly, traditional farms are spending more on R&D per hectare than MIS, and are also investing more money in employee training per employee than either of the MIS that were interviewed.

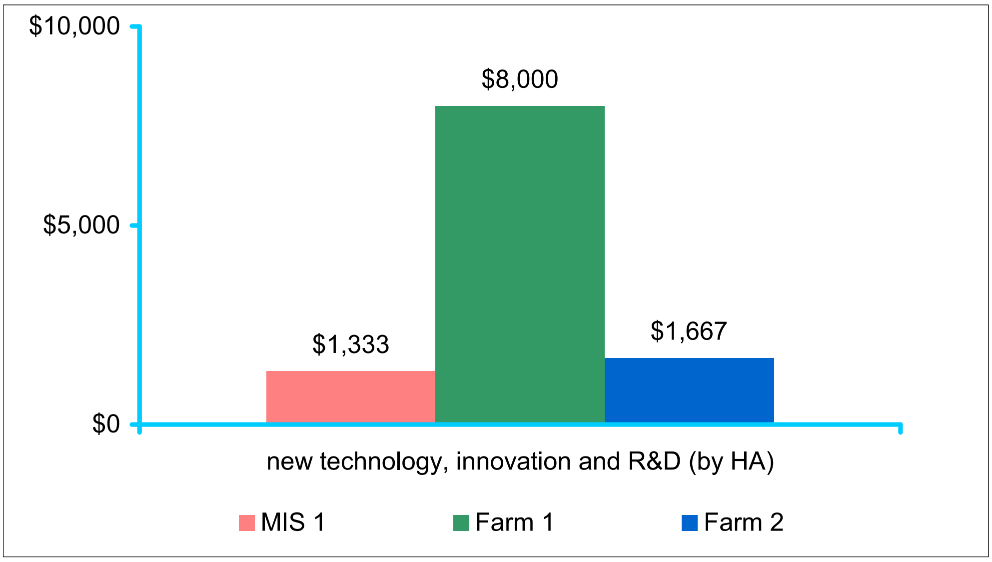
8.2.3 Citrus Industry

MIS have adopted a best practice approach to development, which involves establishing a large amount of capital intensive infrastructure. The typical development includes mounding, fertigation, dams and generators.

During the consultation process with the citrus industry, the industry representatives indicated that, although there have not been any new products or approaches to production developed by MIS, the MIS have adopted best practices and latest technologies.

Chart 8.3 shows the average expenditure in new technology, innovation and R&D (by Ha) for three case studies in the citrus industry. As shown in the chart, on average, the traditional farms interviewed invest more in new technology and R&D than the MIS citrus projects by hectare of crop.

Chart 8.3
Average Expenditure in New Technology, Innovation and R&D (by Ha) for Case Studies in the Citrus Industry



Source: Constructed by Econtech with information from the Case Studies Interviews.

With respect to skills development, one of the three farms/projects contacted (Farm 1) does not provide any training to its employees and indicated this is because they employ experienced people and hence it is not necessary to do any training. The other traditional farm interviewed indicated that they spend approximately $30,000 per annum in employee training.

Importantly, although the citrus MIS project interviewed for this study did not provide Econtech and H&A with the annual cost of the training provided to employees, they indicated that employees are provided with a range of training such as, but not limited to, job specific training, certification, OH&S training, legal compliance training, certificate level II and III in horticulture and irrigation management, leadership management and frontline training, and career development and skills enhancement programmes for senior staff.

8.2.4 Mango Industry

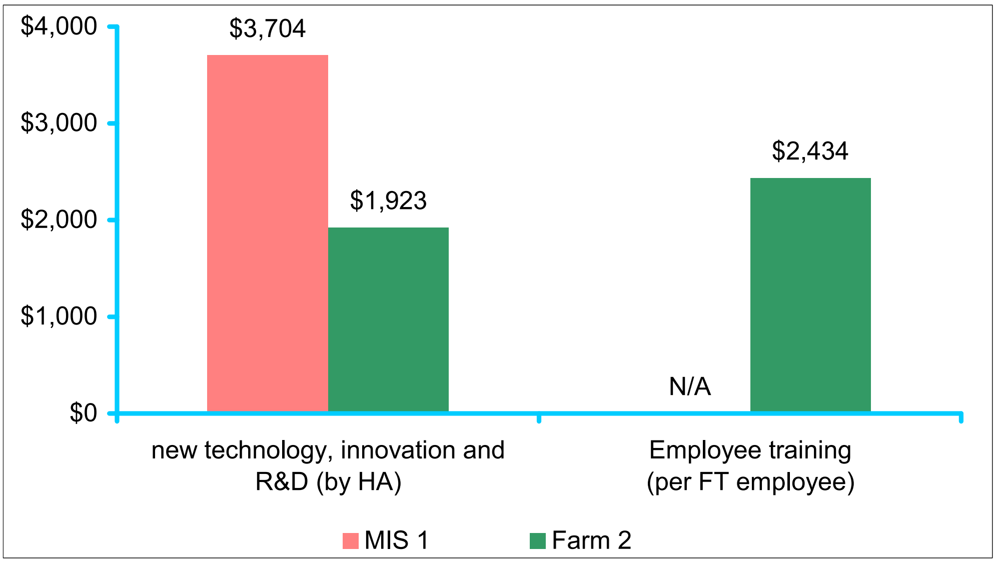
The industry representatives indicated there is no evidence to indicate a positive or negative impact on technology adoption by MIS. However, they also indicated that the industry is facing important challenges that the MIS could help to address, creating a positive outcome for the industry as a whole.

Interestingly, according to Product Disclosure Statements of Mango projects reviewed by Econtech and H&A, MIS have been investing significant resources in developing new mango varieties, such as the Calypso variety. This contribution of the MIS to the mango industry was also highlighted by the Australian Mango Industry Association.

Chart 8.4 shows the average expenditure in employee training (per full time employee) and the average expenditure in new technology, innovation and R&D (by Ha) for two case studies in the mango industry. Although only two case studies are shown in this chart, a third interview was conducted with a traditional mango farm. This third case study is not shown in the chart as the farmer indicated that he only contributes to R&D and innovation through the R&D industry levy and that, although he provides OH&S training and local best management practices training to his employees, he could not provide an estimate of the cost of this training.

With respect to the other two case studies, Chart 8.3 shows that, on average, the MIS mango project analysed invests more in technology and R&D than the traditional mango farm interviewed. This difference in investment is likely to reflect the difference in scale and resources between the MIS and the traditional mango farms.

Chart 8.4
Average Expenditure in a Typical Year for Employee Training and New Technology, Innovation and R&D for Case Studies in the Mango Industry



Source: Constructed by Econtech with information from the Case Studies Interviews.

Importantly, although the mango MIS project showed in the chart did not provide Econtech and H&A with the annual cost of the training provided to employees, they indicated that employees are provided with OH&S courses, irrigation management training, pest identification training and equipment use induction. Farm 2 indicated that they provide employees with TAFE courses and they provided induction training for casual employees.

8.3 Key Attributes of MIS Projects

The following section examines the key attributes of MIS projects that have lead to both positive and negative impacts within the horticultural industry, focusing on those attributes of MIS that distinguish them from traditional farming enterprises.

An important preliminary note is that many of the expected economic effects of MIS projects have not, as yet, been realised in practice. This is largely due to the fact that MIS involvement in most horticultural industries is still only in the preliminary stages, and at this point, MIS represent a fairly small part of the horticultural industry as a whole. It is likely that the impacts of MIS within the horticultural industry will become far more evident over the next few years, as MIS projects reach maturity.

This section will attempt to examine the actual affects that MIS projects have had on the horticultural industry. However, a review of the economic theory behind the operation of MIS projects is necessary when examining the positive and negative impacts that they may have.

8.3.1 Economic Theory

As discussed in Section 6.1 of this report, the MIS projects are expected to impact on the horticultural industry primarily in terms of the economies of scale that a large horticultural enterprise could achieve. Other impacts also include the effects that increased competition is likely to have on input and output prices.

Essentially, horticultural MIS projects allow a sharing of risk that facilitates a higher level of investment in horticulture. Traditional farming enterprises are generally family owned businesses that are either sole traders or partnerships, and are not the kind of business structure that small or even institutional investors can include in a diversified investment portfolio. In contrast, investment in MIS projects operate in a similar way to corporate share ownership, in the sense that investors can buy an interest in a horticultural business that entitles them to a share of that business. In this way a large number of investors can pool their resources to create a large horticultural enterprise.

Thus, MIS projects are able to raise a substantial amount of capital that can be used to create a horticultural enterprise that is far larger than most traditional farming businesses. As such, MIS projects benefit from the fact that they are larger than most traditional farms, and can produce on a bigger scale, achieving lower per unit costs i.e. economies of scale.

This means that it is likely that MIS projects will impact on the horticultural industry in a number of different ways, some negative and some positive, depending on which perspective it is viewed in.

On the one hand, the larger size of MIS projects allows for a more efficient approach to most aspects of the business, and facilitates a higher level of investment in R&D, marketing (both domestically and internationally) and labour saving technology. As well as further lowering the costs of production, increased R&D development is likely to have positive flow on effects for the industry as a whole, as studies indicate that most agricultural industries currently under invest in R&D[116].

The fact that MIS projects may be able to lower the costs of the horticultural industry is likely to become very important in the coming years. As mentioned in Section 5.1.4, the entire Agri-food industry is facing increasing pressure from international competitors as well as retailers to deliver a high quality, traceable product at a much lower price[117]. As such, it is likely that some small players within the horticultural industry will be squeezed out as the pressures on producers' increases, and large business models (such as MIS) may be necessary for the Australian horticulture industry to remain competitive.

On the other hand, as MIS projects enter an industry, they will increase the competition for inputs (such as land, water, seedlings and services to horticulture), which will have a negative impact on smaller players. MIS may also increase the supply of commodities within the markets they enter, lowering the prices that producers receive for their products. Both of these effects are likely to put pressure on smaller farmers, who may not have the resources to compete with MIS in the long run. This may lead to a consolidation within the horticultural industry, which involves a move away from the traditional market structure of many small producers, and towards a smaller number of large producers.

One aspect of MIS that has raised concern within the horticultural industry is that the current tax status granted to MIS growers may create incentive to over-invest in horticultural production. Because MIS growers are able to deduct their non-capital costs from their total taxable income (including income earned elsewhere), MIS have the potential to attract investment even if the underlying business does not generate a return on capital that is comparable to a market rate. This feature of MIS may create an incentive for MIS owners to continue investing beyond the point at which the real marginal benefit of growing is equal to the marginal cost (i.e. the deductions made by growers acts as a subsidy that may distort incentives).

As such, MIS have the potential to generate a supply of commodities in excess of local demand. The likely result would be to put a downward pressure on commodity prices in those markets that are supplied primarily by local producers, in which prices are not set subject to international trade. On the other hand, in those horticultural markets with an export potential, increased supply by Australian producers would be unlikely to substantially affect local prices. This is because prices would be set by global demand and supply, of which Australian producers would make a small part.

8.3.2 The Key Attributes of MIS

The key attributes of MIS projects, that distinguish them from other horticultural enterprises, can be grouped under three main headings:

- the size of their resources and economies of scale;
- their corporate style of management; and

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[116] Alston, J.M., Chan-Kang, C., Marra, M.C., Pardey, P.G. and Wyatt, T.J. (2000) *"A Meta-Analysis of Rates of Return to Agricultural R&D"*, *International Food Policy Research Institute*, Research Report 113, Washington, D.C.

[117] Timbercorp Limited, *"An Assessment of the Role of MIS and Corporate Farms in Australian Agriculture – A Policy Context"*, McKinna *et al* Pty Ltd Strategic Insights.

- the relationship between the owners of an MIS and the running of the business.

The following sub sections will look at the impact that these attributes have had in the industries in which the MIS projects operate. As discussed above, because MIS involvement in horticulture is generally only at a preliminary stage, many of the expected impacts of MIS projects have not, as yet, been realised in practice. As such, there is very little information currently available that measures the full attributes and impacts of MIS. Thus, the discussion in the following sub-section will be based largely on personal interviews and surveys conducted with industry representatives, and both MIS and non-MIS farm managers.

Because this discussion is survey based, it may be subject to bias by personal opinion. Further, because of the very limited sample size of the survey, it should be noted that this discussion can only provide broad indications of the impacts that MIS have had on the horticultural industry.

Larger Resources & Economies of Scale

One of the most important practical attributes of MIS projects is the depth of resources they have access to, which allows them to operate on a very large scale.

A number of horticultural industries have begun to experience the impacts of MIS operating large scale projects. In particular, the almond and olive industries have benefited from the entry of MIS, which have allowed those industries to achieve the 'critical mass' necessary to attract attention in international market places and to achieve economies of scale on an industry wide basis. For example, production in the almond industry has grown from 7,000 tonnes in 1998 to around 20,000 at present[118]. This growth in the almond industry has facilitated the development of protocols with Plant Health Australia, paved the way for the use of marketing consultants and allowed Australia to become more competitive in the international market for almonds[119].

The olive industry has also been able to achieve critical mass with the entry of MIS projects increasing production to a point necessary for export markets[120]. Furthermore, it is believed that MIS entry has also been very influential in raising the profile of Australian olive oil and building brand awareness in both domestic and foreign markets[121]. The MIS projects in the olive industry have also been able to invest in state of the art production units that smaller boutique growers are individually unable to afford, which has benefited the industry as a whole by providing greater access to technology[122].

It is important to note that cooperation between non-MIS and MIS growers has been greater in the olive industry than in others. This is because the olive industry itself is a relatively new industry and boutique growers are able to position their product in a different way to MIS growers, leading to less conflict.

MIS projects have also had an impact through greater investment in R&D, which has had a flow on effect in some industries. For example, in the almond industry, MIS projects have

[118] Survey of Industry Bodies, 2007 (see Attachment A)
[119] ibid.
[120] ibid.
[121] Interview with non-MIS olive grower, 2007 (see Attachments B and C)
[122] ibid.

facilitated a transfer of knowledge by holding training programs for non-MIS farmers that aim to increase productivity[123].

Further, in other horticulture industries, MIS scale and ability to invest in technology have lead to greater efficiency and productivity. For example, MIS in the citrus industry account for roughly 7 per cent of the industry in terms of hectares planted, but make up roughly 10 per cent of the industry by production[124]. The greater productivity of citrus MIS projects is based on the capital intensive farm model that is typically used by MIS. This model requires setting up a lot of capital infrastructure in a short time, which is something traditional farmers generally lack the resources to do[125]. Further, MIS have generally been shown to be more efficient users of water in most industries[126], and this has been achieved by the use of more efficient irrigation technology.

It is believed that one of the other areas that MIS have had an impact on horticultural industries is in building relationships with suppliers and customers. This has been achieved through increased marketing efforts. As mentioned previously, MIS have been responsible for raising the international profile of both almonds and olives. As another example, MIS have employed a customer service focus in the mango industry, and have developed close relationships with retailers in an effort to create a "pull through" marketing effect in consumer markets[127].

While MIS have made positive contributions to many horticulture industries, some traditional farmers believe that they have had negative impacts in others. In particular, it is believed that MIS have had an impact on the prices of inputs, such as water, capital and services. The likely effect of this is extra pressure on smaller producers who compete with MIS for these resources. For example, according to a non-MIS almond grower, the almond industry is currently experiencing a shortage of seedlings as the result of MIS developing large new almond growing areas over the last few years[128].

Any increase in competition for resources may put pressure on some small farmers. Media sources have reported that both horticultural and other agricultural farmers are being forced to sell their farms in the face of rising water costs, which these media sources have directly attributed to MIS activity in water markets[129]. However, it is important to note that prices in the water market are also being strongly driven on the supply side by drought.

The other major impact that MIS are said to have had on some horticultural industries is the lowering of quality standards through mass production. In labour intensive industries such as the table grape industry, it is thought that MIS production methods have led to a lower quality of fruit which has affected the market positioning of Australian table grapes and is expected to drive down prices[130]. However, it should be noted that actual price data analysis has been inconclusive in this area.

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[123] Interview with MIS almond grower, 2007(see Attachments B and C)
[124] Survey of Industry Bodies, 2007 (see Attachment A)
[125] ibid.
[126] AGRI MIS (Non Forestry), *"AIMA Fact Sheet"*, September 2006.
[127] Interview with MIS mango grower, 2007(see Attachments B and C)
[128] Interview with non-MIS almond grower, 2007(see Attachments B and C)
[129] D. Buttler, J. Metlikovec, 13 December 2006, *"Farms Dying in War for Water: Firms Grab Rights"*, Herald Sun, First Edition, pp36.
[130] Survey of Industry Bodies, 2007 (see Attachment A)

Corporate Management Structure

The corporate management structure of MIS is another important attribute that distinguishes MIS projects from traditional farmers. This attribute has led to some practical, and other less quantifiable, impacts within the horticultural industry.

Although both MIS and non-MIS managers have essentially the same goals, it has been speculated in a number of the interviews conducted in this study that MIS managers have a greater focus on costs and efficiency, and are more market driven than their traditional farming counterparts. This is said to be because the MIS managers overriding objective is based on bottom line financial performance, as opposed to the maintenance of a lifestyle. MIS managers may also have more highly developed management skills than a traditional owner/operator, and may benefit from the marketing expertise and business networks available through MIS parent companies. Although it is difficult to say whether or not MIS management has been more efficient, MIS commitment to marketing and networking in most of the industries they have entered has been evident (as mentioned in the previous subsection).

Some industries have benefited more than others from the corporate style of MIS management. The olive industry, in particular, has been receptive to the MIS style of management. In this industry, the MIS projects are seen to be leading the way in terms of best industry practice, and defining the quality attributes necessary for commercial success. According to some traditional farmers, olive MIS are seen to be the best managed and productive growers, and have guided other growers to a higher standard of operation and production[131].

The corporate governance of MIS does create a more rigorous decision making process for MIS managers, who are required to document all elements of the business to a high standard. Indeed, there is generally a higher standard of accountability for all participants in an MIS operation than a family owned business and this, in theory, should lead to better business outcomes. Whether or not this has had any positive impacts on the industry as a whole is unclear at this stage, although general economic theory would suggest that a greater level of transparency in business operations will lead to more efficient market outcomes in the long run.

According to one MIS mango grower, another important impact that MIS management has had on horticultural industries is to develop a network of growers across product groups. This type of network allows greater access to market information[132].

One of the most important impacts that MIS management has had on the horticultural industry is the alienation of a large proportion of traditional growers. Sentiment varies across industries (the almond and olive industries have generally accepted MIS), but it is fair to say that most traditional farmers have at least some concerns about the operations MIS and many openly oppose MIS. There appears to be a strong sentiment against the corporate farming model, and a feeling that large investment companies, and the participating MIS owners, have less of a right to land and other resources than traditional farmers.

[131] Interview with non-MIS olive grower, 2007 (see Attachments B and C)
[132] Interview with MIS mango grower, 2007(see Attachments B and C)

Ownership & Incentives

The final attribute that distinguishes MIS from non-MIS producers is the relationship between production and ownership. This relationship is very different for MIS, particularly in the incentives that this relationship creates in terms of production volume and outcomes.

The ability of MIS to raise capital is strongly related to the tax treatment of MIS owners as primary producers, and to the fact that MIS owners can invest a small amount of capital into a horticultural enterprise. This means that they do not need to shoulder the risk of investing the majority of their assets like a traditional grower would.

This has had a positive impact on the horticultural industry, by stimulating growth through investment. As mentioned previously, MIS have been the main driver in production growth for both the almond and olive industry. This production has grown, and is continuing to grow, to a stage where the industries can compete in a global market.

Increased investment in MIS has also contributed strongly to regional development, pouring money into rural areas, contributing to the growth of infrastructure and creating jobs[133]. The investment that has been stimulated in MIS has also had a positive impact in some industries by giving traditional growers the option of selling out to MIS, essentially providing a market exit option that would otherwise be unavailable to most growers. For example, large mango growers, who would be unable to find buyers without the presence of MIS, now have the option of leaving the industry and recovering their investment[134].

On the other hand, the tax status granted to MIS growers, compared to other investment, may distort incentives. This is in the sense that MIS companies are able to market their projects on the attribute of tax deferral as well as the underlying return on capital that the enterprise is expected to generate. Almost all of the non-MIS growers interviewed for this report believed that MIS projects do not actually have to make a return on investment to continue attracting capital, and they were worried that this would lead to oversupply in the market.

There is a concern that this, in turn, would lead to a glut in production. Whether or not MIS activity will actually result in a glut in production is yet to be seen, although it is highly likely that the Western Australian mango industry will be a test case in this issue. The Rewards MIS mango project in Kununurra almost doubled the plantings in WA, and will begin to mature over the next few years[135].

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[133] Fleur Anderson, 13 October 2006, *"Nats' move may ignite tax spat"*, Australian Financial Review, First Edition, pp7
[134] Interview with non-MIS mango grower, 2007 (see Attachments B and C)
[135] Survey of Industry Bodies, 2007 (see Attachment A)

9. Conclusions

The information presented in this report suggests that MIS have had important positive impacts on the horticulture industries in which they participate and on the Australian economy as a whole. These benefits include, but are not limited to, the creation of jobs, the provision of greater access to technology, larger investments in R&D and innovation, more sustainable farm practices, skills development and knowledge transfer. Furthermore, this study shows that the full contribution of the MIS Horticulture Economy to the economy was about $148 million in GDP (or just under 2 per cent of the Horticulture Economy's contribution) in 2005/06 and the creation of around 2.2 thousand jobs in the same year.

MIS growers differ to traditional farmers in three key areas, which have implications for the way in which they are expected to impact on the horticultural industry. These are:

- the size of their resources and economies of scale;
- their corporate style of management; and
- the relationship between the owners of an MIS and the running of the business.

Whether or not these attributes of MIS will ultimately be of benefit to the industry is the subject of some debate, as discussed in the body of the report. What is clear is that the resources and management style of MIS do give them an advantage over smaller farming enterprises, in the sense that they can achieve greater economies of scale and have access to highly skilled financial managers and business networks through relationships with their parent companies. MIS also have the ability to raise capital in a style similar to public companies, which allows for the sharing of risk across a number of individuals and facilitates greater investment in the horticultural industry.

Because of their larger size, MIS horticulture projects are expected to benefit the industry by allowing for a more efficient approach to most aspects of the business. They are also expected to facilitate a higher level of investment in R&D, marketing and labour saving technology. As well as further lowering the costs of production, increased R&D development is likely to have positive flow on effects for the industry as a whole.

However, the impact of MIS projects on resources and commodity prices has often been raised as a concern. Most MIS projects are relatively new and, as such, data constraints mean that it is difficult to definitively comment on their impacts.

Another issue associated with MIS projects is related to their taxation treatment. However, technically speaking, MIS do not have any tax advantage over other forms of farming enterprise. At present, both MIS and traditional farmers can deduct non capital expenses from their taxable income and are subject to the same rules under the Income Tax Assessment Act. As such, the real commercial advantage that MIS have over traditional farmers is their ability to attract capital and the depth of resources that are available to them.

If the tax treatment for MIS growers is changed in line with the Federal Government announcement, this is likely to lead to a substantial decline in the level of new MIS investment in horticulture. However, since these changes would not affect existing MIS, traditional sole trader and partnership based farmers will still compete with current horticultural MIS for resources.

Attachment A – Survey for Industry Bodies

Telephone Survey Protocol

BACKGROUND INFORMATION

Respondent Background

Respondent's Name:

Address:

Contact Phone No:

Contact Fax No:

Contact Email:

Industry/ies familiar with:

Role in industry (*may have more than one*):

Can you describe the structure of your industry?

Locations and industry output

Traditional Farming Enterprises

Changes in the industry structure over time

When and where did MIS become a factor within your industry?

What is your estimate of the size of MIS investments in terms of total industry output, is it concentrated within particular regions?

Positive and Negative Impacts of MIS on the industry

	1) Industry as a whole	**2)** Region	**3)** Traditional operators	**3)** Exports	**4)** Technology	**5)** Nat Resource Use
Has MIS investment been positive or negative						

Why?	
Example/s that illustrate the impact	

MIS integration in Industry Bodies and Programs

a) Are MIS well represented at the industry level?

Under represented **Well represented** **Over represented**

b) How well are MIS, or representatives of MIS, accepted by the industry at large?

Not Well **Unsure /Couldn't comment** **Well**

Why do you think this is the case?

____
____
____

c) Are there, or could you expect there to be, any issues associated with access to government extension services, coordinated assistance (disease outbreaks, trade issues etc) or lobby of government, where MIS is part of the industry?

Yes **No** **Unsure**

Comment/why do you think this might be the case?_______________________
____
____
____

How have MIS performed* compared to non-MIS with respect to the following….	**Well below**	**Below**	**Neither above or below non-MIS**	**Above**	**Well above**	**Unsure**
1) Contribution to general Industry development	1	2	3	4	5	?
2) Contribution to regional economies	1	2	3	4	5	?
3) Development of exports	1	2	3	4	5	?
4) Adoption of new technology	1	2	3	4	5	?
5) R&D	1	2	3	4	5	?
6) Contribution to development of Industry expertise/training	1	2	3	4	5	?

** or can they be expected to perform in the future*

Impact of MIS in terms of product advancement

a) i) Are there examples of MIS who have developed *new products, or product advances*?

If yes, please briefly describe____

ii) To whom have these advances provided a market advantage? *(pls tick one)*

Only the MIS ☐ **The MIS & industry** ☐ **The MIS followed by the industry** ☐

b) i) Are there examples of MIS who have developed *new ways of operating*?

If yes, please briefly describe____

ii) To whom have these developments provided a market advantage? *(pls tick one)*

Only the MIS ☐ **The MIS & industry** ☐ **The MIS followed by the industry** ☐

Key Attributes of MIS Investments as a summary.

Further Information

a) Can you provide any further information or contacts that we should talk to regarding wider impacts of MIS on your industry

Attachment B – Case Studies Questionnaires

Questionnaire for MIS operators

Respondent's Name:

Contact Phone No:

Industry

Name and Location of the project

Responsible entity for the project (e.g. Timbercorp, Great Southern, Macquarie, etc)

Day to day manager of the project –i.e. company responsible for the day-to day horticultural operations- (e.g. Select Harvests)

Before asking the following questions, it is essential to clarify with the respondent that we would like him/her to respond the questions thinking about what generally happens in a typical year and under normal climatic conditions. Furthermore, it is essential to clarify that these questions relate only to 'X' crop (e.g. almonds, olives, etc).

1. What is the extension of the project land (in hectares)?

---

2. In a typical year and under normal climatic conditions, how much do you produce (volume)?

---

3. In a typical year, how many people work full time in the production of the 'X' crop (e.g. olives, mangos, etc)? How many people work part time?

---

4. In a typical year and under normal climatic conditions, how much water would you use for the production of the 'X' crop (megalitres)?

---

5. We would like to get an idea of how much you spend in the production of the 'X' crop (almonds, mangoes, etc) in a typical year. Essentially, we would like to know how much do you spend in three main areas: labour, other recurrent expenses, and capital (e.g. vehicles, buildings, etc – assets that depreciate-).

	Amount spent in a typical year in the production of 'X' crop
Labour	
Other recurrent	
Capital	

6. Do you provide training to your employees? If yes, what sort of training? On average, how much does this cost you in a typical year?

---

7. How much money do you invest in new equipment (technology) and product/process innovation in a typical year?

---

8. Do you invest in research and development? If so, how much do you spend in a typical year?

---

9. Briefly describe your approach to ensure/check the quality of your product.

---

   a. to what extent is your quality assurance system documented?

---

   b. to what extent is the quality assurance system a part of day-to-day management?

---

10. Does the business have a written management plan? If yes, does the plan include strategies in relation to:

- Farm production objectives?	Y	N
- Protection and development of natural resource assets?	Y	N
- Training and professional development?	Y	N
- Product marketing and sales?	Y	N

11. Over the last 12 months, to what extent have you changed your production management by integrating new ideas/techniques in the following areas:

- Land preparation and use?	Extensively	somewhat	not at all
- Water use efficiency?	Extensively	somewhat	not at all
- Transport and storage?	Extensively	somewhat	not at all
- Chemical/nutrient selection and use?	Extensively	somewhat	not at all
- Weed/pest/disease control?	Extensively	somewhat	not at all

12. For marketing your product:

   a. to what extent do you use:

- a specialist adviser?	Extensively	somewhat	not at all
- peer advice?	Extensively	somewhat	not at all

   b. overall, how adequate is the currently available information about customer requirements?

Very	somewhat	not very	not at all

13. With respect to the MIS in your industry, what do you think have been the main positive and negative impacts? What do you think it is in particular about MIS that have caused these impacts? *Note for the interviewer: The idea behind this question is to identify key attributes (or lack of attributes) from MIS projects that have had positive and/or negative in the 'X' industry.*

Questionnaire for traditional farm (NON-MIS) operators

Respondent's Name:

Contact Phone No:

Industry

Location of the farm

Before asking the following questions, it is essential to clarify with the respondent that we would like him/her to respond the questions thinking about what generally happens in a typical year and under normal climatic conditions. Furthermore, it is essential to clarify that these questions relate only to 'X' crop (e.g. almonds, olives, etc).

2. In a typical year, how many hectares of 'X' crop (e.g. almonds, olives, etc) would you have?

---

3. In a typical year and under normal climatic conditions, how much do you produce (volume) of 'X' crop?

---

4. In a typical year, how many people work full time at your farm (including family members)? How many people work part time (including family members)?

---

5. In a typical year and under normal climatic conditions, how much water would you use for growing your 'X' crop (megalitres)?

---

6. We would like to get an idea of how much you spend in the production of the 'X' crop (almonds, mangoes, etc) in a typical year. Essentially, we would like to know how much do you spend in three main areas: labour, other recurrent expenses, and capital (e.g. vehicles, buildings, etc – assets that depreciate-). *Note for the interviewer: The respondent might need further explanation about how to differentiate these three types of expenses. If so, please provide examples and/or further explanation about each type of expense.*

	Amount spent in a typical year in the production of 'X' crop
Labour	
Other recurrent	
Capital	

7. Do you provide training to your employees? If yes, what sort of training? On average, how much does this cost you in a typical year?

---

8. How much money do you invest in new equipment (technology) and product/process innovation in a typical year?

---

9. Do you invest in research and development? If so, how much do you spend in a typical year?

---

10. Briefly describe your approach to ensure/check the quality of your product.

---

    a. to what extent is your quality assurance system documented?

---

    b. to what extent is the quality assurance system a part of day-to-day management?

---

11. Does the business have a written management plan? If yes, does the plan include strategies in relation to:

- Farm production objectives?	Y	N
- Protection and development of natural resource assets?	Y	N
- Training and professional development?	Y	N
- Product marketing and sales?	Y	N

12. Over the last 12 months, to what extent have you changed your production management by integrating new ideas/techniques in the following areas:

- Land preparation and use?	Extensively	somewhat	not at all
- Water use efficiency?	Extensively	somewhat	not at all
- Transport and storage?	Extensively	somewhat	not at all
- Chemical/nutrient selection and use?	Extensively	somewhat	not at all
- Weed/pest/disease control?	Extensively	somewhat	not at all

13. For marketing your product:

    A. to what extent do you use:

a. a specialist adviser?	Extensively	somewhat	not at all
b. peer advice?	Extensively	somewhat	not at all

    B. overall, how adequate is the currently available information about customer requirements?

Very	somewhat	not very	not at all

With respect to the MIS in your industry, what do you think have been the main positive and negative impacts? What do you think it is in particular about MIS that have caused these impacts? *Note for the interviewer: The idea behind this question is to identify key attributes (or lack of attributes) from MIS projects that have had positive and/or negative in the 'X' industry.*

Attachment C – Case Studies (Interview Responses)

OLIVE INDUSTRY

MIS Case Studies- Interview answers

	MIS project 1	**MIS project 2**
Location of project	Boort, Victoria	Boort, Victoria
Hectares	511	654
Annual production (tonnes)	1.2 – 1.5 million tonnes	2007 forecast is 4211 tonnes (758,000 litres)
Labour (# people)		
Full Time	5	wage staff – 19, salaried staff 21
Part Time	5 + 20 casuals during pruning/harvest	casual staff – 2, 66 contractors, 35 other contractors and 4 casuals (note, these staff are for the entire grove which is 2777ha)
Water use (ML)	1,800 ML (to rise at 2,600 ML at maturity)	06/07 – 42mgs/ha
Annual costs (dollars)		
Labour	$520,000 on labour and $100,000 on subcontractors	Total op costs yr ended 30.6.06 was 11.3m, including 2.6m harvest costs. Op costs forecast for FY07 is 12m.
Other recurrent	$508,000	
Capital	Initial outlay in 2007 $1,050,000 depreciation $432, 000	Capital is FY06 $2.4m, FY 07 budgeted $ 4.5m
Employee training	▪ Activity based training for employees. ▪ Operation training for contractors.	OH&S training, HR, soil and irrigation, and management.
Annual cost of employee training	$5,000	$100,000
Annual investment in new technology and product/process innovation	$800,000	4 new harvests = $3.2m. Other plant and equipment $700,000. Product processing – new olive management system software – $120,000, new harvesting technology

	MIS project 1	**MIS project 2**
		$500,000
Annual Investment in R&D	Included in new technology figure above ($800,000)	$2m
Quality assurance system	ISO9000 quality assurance system and HASSAP food quality program	WQA system (Woolworths system) HACCP, Quality of product – 2 on site labs and NATA accredit lab at HO
Business management plan		
Includes strategies in relation to farm production strategies (Y/N)	Y	Y
Includes strategies in relation to protection of natural resources (Y/N)	Y	Y
Includes strategies in relation to training & professional development (Y/N)	Y	Y
Includes strategies in relation to product marketing and sales (Y/N)	Y	Y
Production management & innovation		
Business integrated new ideas/techniques in land preparation & use in the last year	Somewhat	Somewhat
Business integrated new ideas/techniques in water use efficiency in the last year	Extensively	Extensively
Business integrated new ideas/techniques in transport & storage in the last year	Not at all	Somewhat
Business integrated new ideas/techniques in chemical/nutrient selection & use in the last year	Somewhat	Somewhat
Business integrated new ideas/techniques in weed/pest/disease control in the last year	Somewhat	Somewhat
Business uses a specialist adviser to market its product	Somewhat	Extensively
Business uses peer advice to market its product	Somewhat	Not at all

Traditional Farms Case Studies- Interview answers

	Farm 1	**Farm 2**	**Farm 3**
Location of the farm	Cobram, Northern Victoria	Murray Valley Hwy, Yarrawonga	Redbank, 1hr NW of Ballarat. Central West Victoria
Hectares	85 Ha	130 Ha	8 ha- 6 fruiting, 2 planted
Annual production (tonnes)	120 tonnes	700 tonnes	0.5 tonne of fruit pressed to make 80L of oil + 200 kg of table fruit.
Labour (# people) Full Time Part Time	 2 5 part time over 10 weeks	 3 12	 0 2 (family members- not formally paid)
Water use (ML)	200 ML	3 ML per HA (2100 total)	1 ML/ha/yr
Annual costs (dollars)			
Labour	$180,000	$250,000	$7,500 on a contractor to spray the crop with pesticide
Other recurrent	$50,000	$200,000	Less than $500
Capital	$100,000	$30,000	No new capital since initial outlay of roughly $150,000
Employee training	Management Training and food processing training	Fork lift licence, chemical usage courses, O,H & S certificates and first aid certificates.	None
Annual cost of employee training	$10,000	$2,000 pa	N/A
Annual investment in new technology and product/process innovation	$100,000- same as capital	$4,000 pa	$2,000 on product processing when they started making oil.
Annual Investment in R&D	Will spend $35,000 this year but on average would only be $5,000	$25,000 pa	None
Quality assurance system	HASSAP Approval (food preparation accreditation)	We have state of the art processing facilities that meet	After harvest a sample of oil and table fruit is sent to be

	Farm 1	**Farm 2**	**Farm 3**
		all HACCP criteria. We send samples of all commercial product to an IOOC accredited laboratory for analysis and verification.	tested in a lab for quality.
Business management plan			
Includes strategies in relation to farm production strategies (Y/N)	Y	Y	Y
Includes strategies in relation to protection of natural resources (Y/N)	Y	Y	Y
Includes strategies in relation to training & professional development (Y/N)	Y	Y	N
Includes strategies in relation to product marketing and sales (Y/N)	Y	Y	N
Production management & innovation			
Farm integrated new ideas/techniques in land preparation & use in the last year	Not at all	Not at all	Not at all
Farm integrated new ideas/techniques in water use efficiency in the last year	Not at all	Somewhat	Not at all
Farm integrated new ideas/techniques in transport & storage in the last year	Not at all	Somewhat	Not at all
Farm integrated new ideas/techniques in chemical/nutrient selection & use in the last year	Extensively	Somewhat	Not at all
Farm integrated new ideas/techniques in weed/pest/disease control in the last year	Extensively	Somewhat	Not at all
Farm uses a specialist adviser to market its product	Not at all	Not at all	Not at all
Farm uses peer advice to market its product	Somewhat	Somewhat	Somewhat

ALMOND INDUSTRY

MIS Case Studies- Interview answers

	MIS project 1	**MIS project 2**
Location of project	Murray River, 40 kms from Swan Hill, NW Victoria.	Robinvale
Hectares	700 HA	1004 Ha (including all other plantings = 7868Ha)
Annual production (tonnes)	Their first project to produce in March approximately 35 tonnes. Approximate production when orchard is mature 2.5 thousand tonnes.	2007 forecast 2948028kg
Labour (# people) Full Time Part Time	 8 2 + part time contractors that can range from 1 to 45.	Project Manager has: 297 131 pt, 114 casual and more contractors during harvest
Water use (ML)	Young orchard 4,000 ML. Mature 8,750 ML	7ml/ha
Annual costs (dollars)		
Labour	Approx. $500 per acre (or $500 per 0.4047 ha)	This project: actual costs FY 06 6.5m. 07 Forecast 11m. Total orchards costs 41m.
Other recurrent	Approx. $1,850 per acre (operating cost) – Approx. $3.3 million across whole orchard.	
Capital	No capital expense on an ongoing basis. All capital expenses are done at the beginning of the project. Note: Total cost of the project: $37 million (including water, land, trees, infrastructure and irrigation). Duration of the project is 30 years.	FY06 – 150,000.

	MIS project 1	**MIS project 2**
	Water, land, trees and infrastructure - $22 Million Irrigation- $15 Million	
Employee training	▪ Horticulture certificate courses (TAFE) ▪ Training of employees through they suppliers of machinery/equipment ▪ On the job training ▪ They engage consultants to provide training. ▪ Compulsory training on health and safety	Training in irrigation, chemical use, first aid, OH&S, agronomy
Annual cost of employee training	They have 3 people on average each year doing certificate courses. Cost in total $5,000. Additionally, the cost opportunity for this training (time used to train when they're not working) is approximately $7,500 per year in wages (assumes 1 hr training per week).	$250,000
Annual investment in new technology and product/process innovation	Not very much. Innovation occurs with the initial capital investment.	New equip- $4.3m pa
Annual Investment in R&D	The orchard manager is part of the advisory committee to the almond board. He spends approximately 2 hours per week in research projects- so, opportunity cost of this R&D is approx $20,000-$30,000 per year (assumes a daily wage of manage of $1,000).	$350,000
Quality assurance system	They have a quality assurance program in place (Hazard Analysis and Critical Control Points –HACCP-) that is audited	WQA system (Woolworths system) HACCP, QA process- screening and laboratory

	MIS project 1	**MIS project 2**
	by an external body for compliance to ensure that farm practices are in accordance with safe operations and to ensure that the food safety system is in line with international practices.	analysis
Business management plan		
Includes strategies in relation to farm production strategies (Y/N)	Y	Y
Includes strategies in relation to protection of natural resources (Y/N)	Y	Y
Includes strategies in relation to training & professional development (Y/N)	Y	Y
Includes strategies in relation to product marketing and sales (Y/N)	Y	Y
Production management & innovation		
Business integrated new ideas/techniques in land preparation & use in the last year	Extensively	Somewhat
Business integrated new ideas/techniques in water use efficiency in the last year	Extensively	Extensively
Business integrated new ideas/techniques in transport & storage in the last year	Somewhat	Somewhat
Business integrated new ideas/techniques in chemical/nutrient selection & use in the last year	Extensively	Somewhat
Business integrated new ideas/techniques in weed/pest/disease control in the last year	Somewhat	Somewhat
Business uses a specialist adviser to market its product	Extensively	Extensively
Business uses peer advice to market its product	Not at all	Not at all

Traditional Farms Case Studies- Interview answers

	Farm 1	**Farm 2**	**Farm 3**	**Farm 4**
Location of the farm	Renmark	Merbein Victoria	Loxton, SA	Mildura Road, Lyrup. Riverland.
Hectares	200 Ha.	17 Ha.	450 Ha	450 Ha planted, varying in age.
Annual production (tonnes)	600 Tonnes	40 tonnes	1,300 tonnes	700 tonnes
Labour (# people)				
Full Time	5	3	11	25
Part Time	5	2	8	7-8 + casuals (not estimate given)
Water use (ML)	3,000 ML	221 ML	15 ML per Ha (6,750 total)	4,000 ML
Annual costs (dollars)				
Labour	$350,000	$5,000	Not provided	$1,000,000
Other recurrent	$850,000	$40,000	Not provided	$1,000,000
Capital	$150,000	$25,000	Not provided	$350,000
Employee training	Yes (TAFE, courses, etc)	Yes	Training on standard operating procedures for tasks. Also employs a contractor to teach management staff diplomas in horticultural management	OH&S, machinery use and activity specific training
Annual cost of employee training	$20,000	$2,000	$5,000	Approx $50,000
Annual investment in new technology and product/process innovation	$30,000	Varies from year to year on average say between $10,000 - $ 40,000	Not sure	Can't break this apart from capital costs – they are continually upgrading machinery, so roughly $350,000 pa.

	Farm 1	**Farm 2**	**Farm 3**	**Farm 4**
Annual Investment in R&D	$25,000	It varies but around $5000	Yes, industry levy – 2c per kilo – also employs a part time technical officer that undertakes trials	Respondent said that everything he does is R&D – they continually replant, and trial new methods and new techniques that they have researched. This would cost around $200,000 a year.
Quality assurance system	HACCP accreditation	Have a third party audited QA system	They use the West Australian SQF2000 QA system and also report to their marketer with whom they have a strong relationship	Have extensive quality assurance systems in place. There are systems to monitor the crop and also outside contractors are used such as pest & disease specialist and agronomic scientists.
Business management plan				
Includes strategies in relation to farm production strategies (Y/N)	Y	Y	Farm doesn't have a business mgmt plan.	Y
Includes strategies in relation to protection of natural resources (Y/N)	Y	Y	Farm doesn't have a business mgmt plan.	Y
Includes strategies in relation to training & professional development (Y/N)	Y	Y	Farm doesn't have a business mgmt plan.	Y
Includes strategies in relation to product marketing and sales (Y/N)	N	N	Farm doesn't have a business mgmt plan.	Y
Production management & innovation				
Farm integrated new ideas/techniques in land preparation & use in the last year	Extensively	Somewhat	Not at all	Not at all
Farm integrated new ideas/techniques in water use efficiency in the last year	Extensively	Somewhat	Extensively	Somewhat

	Farm 1	**Farm 2**	**Farm 3**	**Farm 4**
Farm integrated new ideas/techniques in transport & storage in the last year	Not at all	Extensively	Not at all	Not at all
Farm integrated new ideas/techniques in chemical/nutrient selection & use in the last year	Extensively	Extensively	Extensively	Somewhat
Farm integrated new ideas/techniques in weed/pest/disease control in the last year	Somewhat	Somewhat	Not at all	Somewhat
Farm uses a specialist adviser to market its product	Not at all	Not at all	Extensively	Extensively
Farm uses peer advice to market its product	Not at all	Somewhat	Not at all	Somewhat

CITRUS INDUSTRY

MIS Case Studies- Interview answers

	MIS project 1
Location of project	Kangara - Renmark, SA
Hectares	450 Ha – planted area (an additional 150 ha is being planted on this property, however, this work is not complete or in production.
Annual production (tonnes)	21,720 tonnes
Labour (# people) Full Time Part Time	 120 persons full time 350 persons casual
Water use (ML)	3600 Ml at maturity, a factor of 8ML per hectare per year
Annual costs (dollars)	
Labour	$ 493 000 (Labour and management cost)
Other recurrent	$ 309 000 Direct Costs $466 000 Indirect Cost excluding harvest
Capital	$150 000 not including infrastructural improvements
Employee training	We provide a range of training not limited to but ranging from job specific training (e.g. Chemcert), certification, prescribed Occupational Health and Safety and legal compliance training (eg Working at Heights, Working in confined spaces etc). We have a number of staff that have attend Certificate level II and III in Horticulture and Irrigation Management. We participate in a state supported LMA Leadership Management and Frontline training. More-senior staff attend career development and skills enhancement programmes run by training institutes, RTA's, TAFE and Universities in Leadership, Time Management, Negotiation skills, Project Management, Risk analysis and Finance for non-Financial Managers. Finally, we do sponsor a select group of high potential staff in Graduate studies at University and College. We are active in promoting and sponsorship of a state secondary school / Horticultural Australia limited initiative – Growsmart - which is aimed at encouraging high school students to study maths and science to a tertiary level.
Annual cost of employee training	
Annual investment in new technology and product/process innovation	$ 300 000

	MIS project 1
Annual Investment in R&D	$ 300 000 including a dedicated R&D Manager
Quality assurance system	Our parent company, as an ASX listed company, is driven and managed according to ASX Corporate governance requirements. run an ISO 9000 series compliant Integrated Management System. This system covers the critical business areas and cross certification in HACCP, Eurep GAP, AS 4801 compliant Safety map equivalent OH&S system. We are in the process of developing a more robust Environmental management system to those elements required in EurepGap.
Business management plan	
Includes strategies in relation to farm production strategies (Y/N)	Y
Includes strategies in relation to protection of natural resources (Y/N)	Y
Includes strategies in relation to training & professional development (Y/N)	Y
Includes strategies in relation to product marketing and sales (Y/N)	Y
Production management & innovation	
Business integrated new ideas/techniques in land preparation & use in the last year	Extensively
Business integrated new ideas/techniques in water use efficiency in the last year	Extensively
Business integrated new ideas/techniques in transport & storage in the last year	Somewhat
Business integrated new ideas/techniques in chemical/nutrient selection & use in the last year	Somewhat
Business integrated new ideas/techniques in weed/pest/disease control in the last year	Somewhat
Business uses a specialist adviser to market its product	Extensively
Business uses peer advice to market its product	Not at all

Traditional Farms Case Studies- Interview answers

	Farm 1	**Farm 2**
Location of the farm	Berri, SA. Riverland	Pike River, SA
Hectares	2.5 Ha.	30 Ha
Annual production (tonnes)	70 tonnes	780-870 tonnes
Labour (# people)		
Full Time	0	2
Part Time	2	Up to 5 during picking
Water use (ML)	30 ML (12/Ha)	8.5-9 ML per Ha.
Annual costs (dollars)		
Labour	$20,000	$80,000
Other recurrent	$5,000	$80,000
Capital	$2,000	Nothing at present, can't afford. Upgraded last 3-4 years and spent around $45,000-$50,000
Employee training	Yes	Employ experienced people
Annual cost of employee training	$30,000 pa	N/A
Annual investment in new technology and product/process innovation	$20,000 pa	Depends on year, around $50,000
Annual Investment in R&D	Pay R&D levy + do own trials.	Trough levy. Also do farm trials.
Quality assurance system	HACCP	Inspection on a daily basis during harvest. Apart from food safety aspects, not documented.
Business management plan		
Includes strategies in relation to farm production strategies (Y/N)	Farm doesn't have a business mgmt plan.	Farm doesn't have a business mgmt plan.
Includes strategies in relation to protection of natural resources (Y/N)	Farm doesn't have a business mgmt plan.	Farm doesn't have a business mgmt plan.
Includes strategies in relation to training & professional development (Y/N)	Farm doesn't have a business mgmt plan.	Farm doesn't have a business mgmt plan.
Includes strategies in relation to product marketing	Farm doesn't have a business mgmt	Farm doesn't have a business mgmt plan.

and sales (Y/N)	plan.	
Production management & innovation		
Farm integrated new ideas/techniques in land preparation & use in the last year	Not at all	Not at all
Farm integrated new ideas/techniques in water use efficiency in the last year	Not at all	Somewhat
Farm integrated new ideas/techniques in transport & storage in the last year	Not at all	Not at all
Farm integrated new ideas/techniques in chemical/nutrient selection & use in the last year	Not at all	Extensively
Farm integrated new ideas/techniques in weed/pest/disease control in the last year	Not at all	Somewhat
Farm uses a specialist adviser to market its product	Extensively	Somewhat
Farm uses peer advice to market its product	Somewhat	Not at all

MANGO INDUSTRY

MIS Case Studies- Interview answers

	MIS project 1
Location of project	Katherine, NT
Hectares	135 Ha planted (total area of the project is 362.25 Ha)
Annual production (tonnes)	Nov 06 crop- 488,971 kgs. Long term expected yield is 1,100,000 kgs
Labour (# people) Full Time Part Time	 3-4 Casual employment for season 2006/07 is 30, expected to increase to 120 for long term production.
Water use (ML)	244.5 ML during 2005/06 financial year. Long term expected requirement is 1,080 ML
Annual costs (dollars)	
Labour	$270,000
Other recurrent	$625,000
Capital	$125,000
Employee training	Examples: OH&S courses, irrigation management training, equipment use tickets and pest identification training.
Annual cost of employee training	N/A
Annual investment in new technology and product/process innovation	Farm has been established (3 yrs ago(with a sophisticated modern irrigation system to ensure water efficient use and state of the art fertigation equipment. This was a one off cost. As more efficient technology becomes available, it is incorporated to improve operational efficiency. This value is hard to quantify.
Annual Investment in R&D	$500,000 pa has been invested over the past couple of years. Lower cost operational trials are also run.
Quality assurance system	3 certifications: HACCP, SQF2000, and Freshcare.
Business management plan	
Includes strategies in relation to farm production strategies (Y/N)	Y

Includes strategies in relation to protection of natural resources (Y/N)	Y
Includes strategies in relation to training & professional development (Y/N)	Y
Includes strategies in relation to product marketing and sales (Y/N)	Y
Production management & innovation	
Business integrated new ideas/techniques in land preparation & use in the last year	Somewhat
Business integrated new ideas/techniques in water use efficiency in the last year	Somewhat
Business integrated new ideas/techniques in transport & storage in the last year	Somewhat
Business integrated new ideas/techniques in chemical/nutrient selection & use in the last year	Extensively
Business integrated new ideas/techniques in weed/pest/disease control in the last year	Extensively
Business uses a specialist adviser to market its product	Extensively
Business uses peer advice to market its product	Not at all

Traditional Farms Case Studies- Interview answers

	Farm 10	**Farm 2**
Location of the farm	Berry Springs, Darwin	Katherine
Hectares	323 Ha	156 Ha
Annual production (tonnes)	2,000 tonnes	750- 1250 Tonnes from 88 ha depending on season.
Labour (# people)		
Full Time	6	4-5
Part Time	1	2-4 throughout the year, 60 during

	Seasonal now 100, but will increase to 180.	harvest.
Water use (ML)	2.6 ML/Ha/yr	500 ML, up to 800 ML
Annual costs (dollars)		
Labour	$600,000- $700,000	Not provided
Other recurrent	$500,000- $600,000	Not provided
Capital	$250,000 last year but expanding business.	Not provided
Employee training	Yes	Full time employees have been trained (TAFE). For casuals they employ a HR person for inductio process.
Annual cost of employee training	N/A	$5,000-$50,000
Annual investment in new technology and product/process innovation	N/A	Heavy investment, last 5 yrs approx $1.5 million
Annual Investment in R&D	On farm trials are daily process + levies dor R&D	Include in figure above
Quality assurance system	SQF 2000 system, HACCP approach.	HACCP approach
Business management plan		
Includes strategies in relation to farm production strategies (Y/N)	Farm doesn't have a business mgmt plan.	Y
Includes strategies in relation to protection of natural resources (Y/N)	Farm doesn't have a business mgmt plan.	Y
Includes strategies in relation to training & professional development (Y/N)	Farm doesn't have a business mgmt plan.	
Includes strategies in relation to product marketing and sales (Y/N)	Farm doesn't have a business mgmt plan.	
Production management & innovation		
Farm integrated new ideas/techniques in land preparation & use in the last year	Somewhat	Somewhat
Farm integrated new ideas/techniques in water use	Somewhat	Somewhat

efficiency in the last year		
Farm integrated new ideas/techniques in transport & storage in the last year	Somewhat	Somewhat
Farm integrated new ideas/techniques in chemical/nutrient selection & use in the last year	Somewhat	Somewhat
Farm integrated new ideas/techniques in weed/pest/disease control in the last year	Somewhat	Somewhat
Farm uses a specialist adviser to market its product	Not at all	Extensively
Farm uses peer advice to market its product	Not at all	Somewhat

Attachment D – References

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- The Australian Olive Association
- Australian Citrus Growers Inc.
- Australian Mango Industry Association Inc.
- Avocados Australia Limited.
- The Almond Board of Australia