

## Management Practices on Australian Vegetable Farms

The vegetable industry has contracted through Horticulture Australia Limited (HAL) to have the Australian Bureau of Agriculture and Resource Economics (ABARE) undertake annual surveys of the financial performance of Australian vegetable farms. These surveys are conducted after the filing of tax returns for the previous financial year. In this survey of financial performance a number of supplementary questions are asked to give further insight into the operation of Australian vegetable farms. These questions were devised by industry in consultation with ABARE. This paper analyses responses to questions about certain management practices asked of vegetable growers by ABARE in 2008 and 2009 covering the financial years 2006/07 and 2007/08 and the plans vegetable growers have to change them over coming years.

### Water Management

Water is a key preoccupation of management on Australian vegetable farms. The ABARE surveys reveal that irrigation is used on 90% of vegetable farms. There was little change between the two surveys. All crops rely heavily on irrigation water, with at least 77% of growers using irrigation for all vegetables. The average yield from irrigated vegetable crops was 28 tonnes per hectare in 2007-08, significantly higher than yields from non-irrigated farms of 21 tonnes per hectare.

Water is gathered from a number of sources although the sources vary depending on geographic location. The ABARE Surveys show that water management is flexible within geographic constraints and that growers varied their uptake of water from different sources between the two years.

#### *Source of irrigation water in 2007-08*

*Average per farm*

	NSW	Vic	Qld	SA	WA	Tas	NT	Aust
<b>Irrigation scheme</b>	40	32	43	15	3	4	0	<b>27</b>
<b>Groundwater bore</b>	8	46	39	74	67	1	100	<b>41</b>
<b>Diversion from river/stream</b>	37	5	9	0	3	9	0	<b>9</b>
<b>Town water (mains supply)</b>	1	0	0	0	1	7	0	<b>1</b>
<b>Farm storage dam</b>	6	8	7	2	27	58	0	<b>15</b>
<b>Treated/reclaimed water</b>	2	6	0	6	0	0	0	<b>3</b>
<b>Other</b>	7	3	2	3	0	21	0	<b>5</b>
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

*Source: ABARE*

Groundwater bores provided 41% of irrigation water on Australian vegetable farms in 2007-08, little changed from 2006-07. Groundwater bores are the sole source of irrigation water in the Northern Territory and is the dominant source in Western Australia and South Australia. This source is also important in Victoria and Queensland. Groundwater bores are much less important in New South Wales and Tasmania, with shares of 8% and 1% respectively in 2007-08.

Ground water bores appear to be the default option for growers when other sources of water are under stress. There were some pronounced changes in the importance of groundwater bores in some States between the two years. In South Australia the share of irrigation water provided by bores rose significantly in 2007-08 to 74% up from 49% in 2006-07, and there were also increases in Western Australia from 55% in 2006-07 to 67% in 2007-08, and Victoria from 43% to 46% over the same period. These changed management practices most likely reflect changed climatic conditions and lower availability of water from other sources across southern mainland Australia. The importance of groundwater bores declined in the other three states.

Irrigation schemes were major sources of irrigation water in Queensland, New South Wales and Victoria, with shares of 43%, 40% and 32% respectively in 2007-08. Irrigation schemes were a much less important source of water in Western Australia and Tasmania, with 3-4% shares of total irrigation water. Queensland growers increased their use of irrigation schemes significantly in 2007-08 up from 10% in 2006-07 while growers in South Australia raised the proportion of water accessed from 10% to 15%. There were significant declines in the importance of irrigation schemes in Western Australia, from shares of 17% in 2006-07 to just 3% in 2007-08, and Tasmania, down from 9% to 4% over the same period.

Farm storage dams are the third most important source of irrigation water for vegetable farms in Australia, accounting for almost 15% of the total in 2007-08, up from 12% in 2006-07. This is the main source of irrigation water in Tasmania, with a share of 58% in 2007-08, and the second most important source in Western Australia, accounting for 27% of the total.

Groundwater bores, irrigation schemes, and farm storage dams accounted for 82% of irrigation water used on Australian vegetable farms in 2007-08, up from 79% in 2006-07. By individual state, the importance of these three leading sources in 2007-08 ranges from 54% in New South Wales to 96% in Western Australia.

Water diverted from rivers or streams accounted for 9% of irrigation water used on vegetable farms in 2007-08, down from over 15% in the previous year. Rivers and streams were most important in New South Wales where they accounted for 37% of the total. The impact of low rainfall was evident, most dramatically in South Australia where rivers and streams provided no irrigation water for vegetable farms in 2007-08 after accounting for almost a quarter of total irrigation waters in 2006-07.

In looking for additional supplies of water the surveys reveal that vegetable farm managers favoured increasing on farm storage particularly in Victoria and Tasmania. The purchase of water entitlements is the second most popular source of additional water in Australia with particular support in Tasmania and South Australia. There was little evidence of growers planning to access treated water with only about 3% of growers in Australia planning to do so.

## **Chemical Management**

The vegetable industry operates under strict guidelines in terms of chemical use and the industry has assumed a leadership role in phasing out chemicals which are deemed to be environmentally unfriendly. Safe and limited use of chemicals is a major management concern. The Surveys reveal that managers of vegetable farms are moving beyond their legal obligations and devoting considerable manager time to testing a range of both inputs and outputs and taking account of broader environmental considerations. Two-thirds of growers in Australia tested produce for chemical residues in 2007-08. Over 80% of farms in Western Australia and Queensland

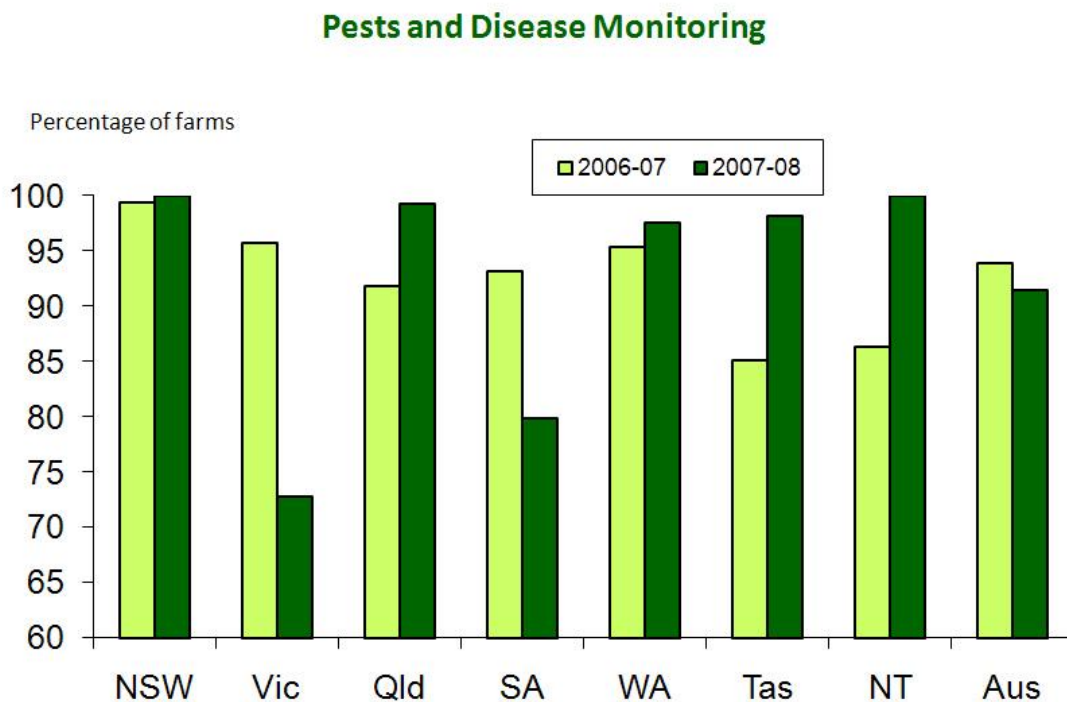
conducted such tests. A similar pattern is revealed in the attitude of farm management to food safety programs. 60% of Australian vegetable farms had a food safety program in place in 2007-08, but the figures reached 91% in Western Australia and 80% in Queensland.

There is a growing participation, in an environmental management program enhanced by the Enviroveg program conducted by AUSVEG. Across Australia, 45% of vegetable farms were involved or planning to be involved in such a program, an increase from 38% in 2006-07. The proportion participating, or considering participation, in an environmental management program in 2007-08 ranged from 37% in Tasmania to 56% in New South Wales.

Management time dedication to these issues increases with the size of the farm. Over 60% of farms of more than 70 hectares have conducted safety assessments of their water source, almost double the proportion of farms smaller than 5 hectares. 96% of large farms test produce for chemical residues compared with 55% of farms of less than 5 hectares who did so. The proportions with food safety programs in place ranged from 52% of small farms to 88% of large ones, and from 39% to 63% in relation to participation, or possible participation, in an environmental management program.

### Pests and Disease Management

Management of pests and diseases is universal on Australian vegetable farms. Over 90% of vegetable growers follow a set pest and disease monitoring program.



Source: ABARE

Although nationally the proportion of farms undertaking a set pest and disease monitoring program in 2007-08 was little changed from the previous year, there were some significant shifts in the proportion of farms implementing such programs in particular States. Participation rates in set pest and disease management programs rose in most States but fell to 73% in Victoria and

80% in South Australia compared to participation rates of 96% and 93% respectively achieved by those states in 2006-07.

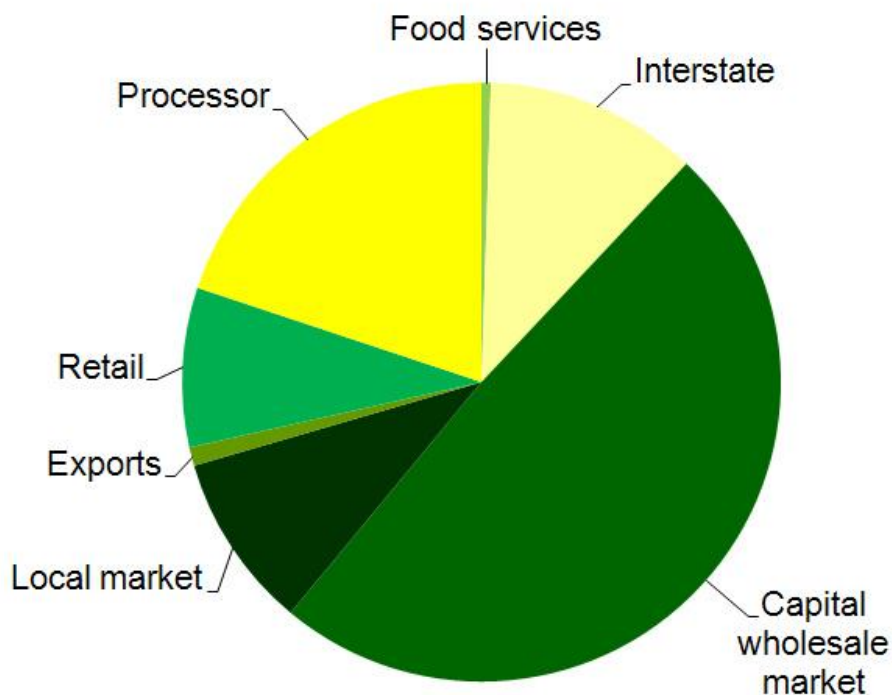
About 80% of vegetable growers in Australia support the idea of a growers levy, matched by government funding, to meet the costs of eradication in the event of an exotic pest or disease outbreak. Most growers in favour of such a levy also support compensation for growers who lose income if crops are destroyed as part of the eradication effort.

## Distribution Management

The ABARE surveys show that most vegetable growers continue to generate most of their revenue through sales of their produce to the wholesale vegetable market in their State capital city. 61% of vegetable growers in Australia sold to their capital city wholesale market in 2007-08, with around 80% of growers in Western Australia and New South Wales doing so. Nationally, 49% of revenue from sales of vegetables was generated by sales to the local capital wholesale market in 2007-08, a significant increase on the 36% proportion from this source of sales recorded in 2006-07.

Nationally, 19% of growers sold to other local markets, but such outlets were less remunerative with revenue accounting for just 9% of the total. Sales of vegetables directly to the retail market were made by 15% of growers in Australia, generating 9% of national revenue. Few growers have developed relationships directly with food services outlets with only 3% in Australia doing so.

### Source of Vegetable Sales Revenue in 2007-08



Source: ABARE

The proportion of growers with selling relationships directly with food processors fell to 23% in 2007-08, a significant decline from 32% in the previous year, but the impact on revenue was not as pronounced with a decline from 26% to 20% over this period. These changes reflected some change in sourcing policies of the processors and an increase in contract prices. More than 90% of farms in Tasmania sold directly to processors in 2007-08, which was the source of 86% of their revenue from vegetable sales. Farms selling directly to processors ranged from 10-19% in the other states and the proportion of revenue generated from 6-15%.

Vegetables were sold interstate by 22% of growers nationally in 2007-08, with such sales of particular importance to farmers in Queensland and South Australia with about 35% of farms selling interstate. The importance of the interstate market in terms of revenue was 11% in 2007-08 across Australia, with growers in South Australia and Queensland generating 24% and 19% respectively of their vegetable revenue through such sales.

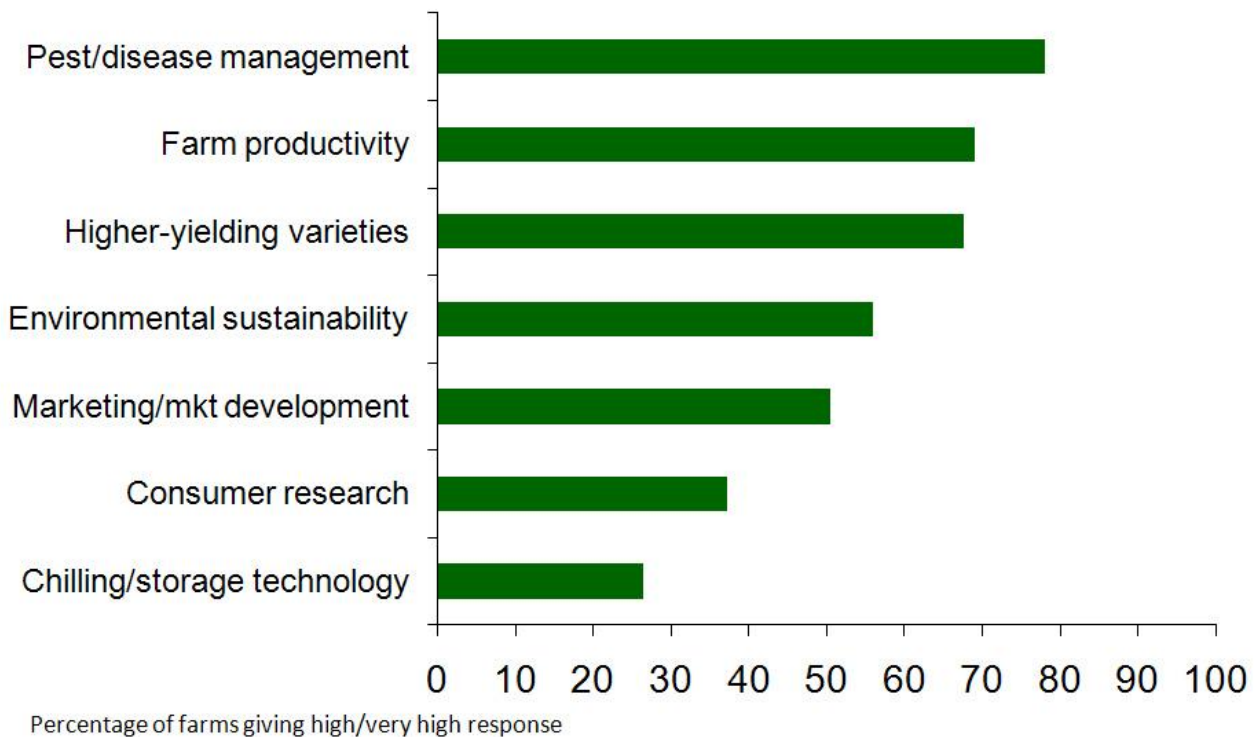
Export markets were less important nationally in 2007-08 with only 4% of vegetable farms selling overseas, down from 7% in the previous year. Unsurprisingly, larger growers are more likely to make the marketing efforts necessary to build such relationships than smaller ones.

### **Management research and development priorities**

Vegetable businesses have identified a diverse range of priorities for research and development. The main priority is pest and disease management with 78% of farms in Australia considering this area a high or very high priority for further research and development. High priorities were also accorded to farm productivity and the development of higher-yielding varieties, which attracted high or very high responses from almost 70% of farms.

Environmental sustainability, and marketing and market development, also attracted significant support with more than half of vegetable businesses identifying these areas as priorities, while consumer research, and chilling and storage technology, were ranked lower in the order of research and development priorities.

## Research and Development Priorities in 2007-08



Source: ABARE

### Management take up of information technology

Computers are now used widely throughout the agricultural sector with more than 80% of vegetable businesses using them for a wide and diverse range of applications in running their businesses. Among the first uses for computers in farming was to gather weather information and to aid and sharpen financial management and, according to the survey, these are the two most widely-used applications in the sector. Two-thirds of vegetable businesses in Australia use computers for weather information and 64% for managing their financial affairs.

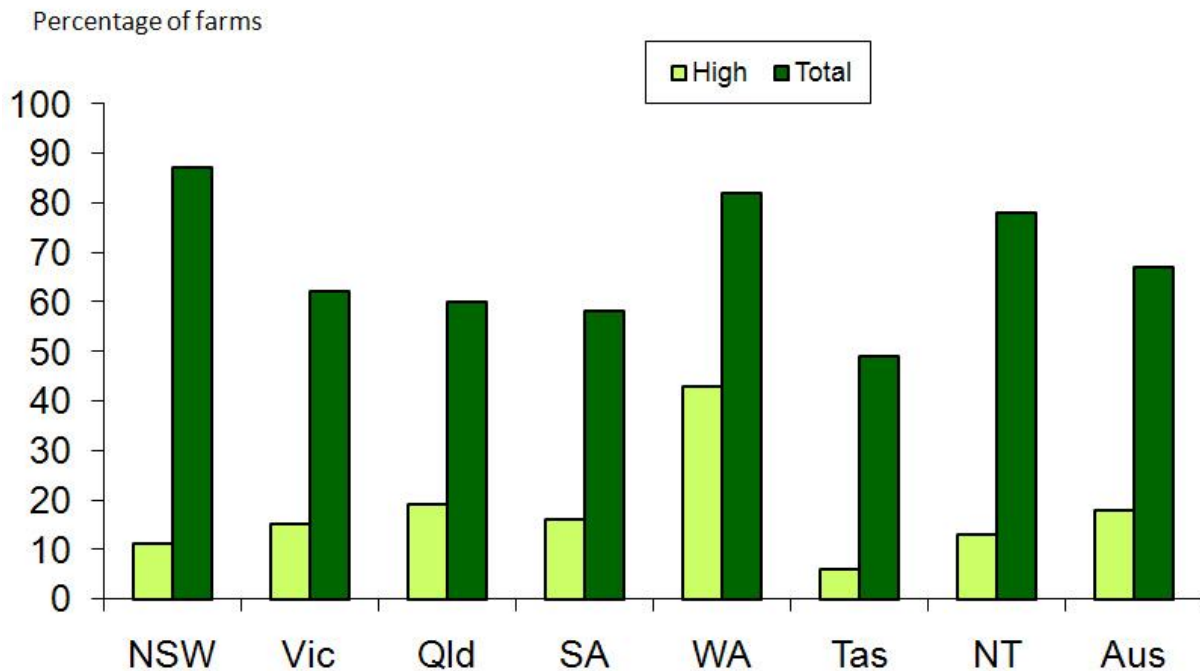
Almost 40% of vegetable businesses in Australia also use computers as a means of maintaining and developing links within the industry and for obtaining market information. Other uses of computers include accessing educational resources and purchasing farm inputs.

The scale of computer use among vegetable growers is above the national average in Tasmania, Victoria, and Western Australia, with use in New South Wales the lowest of the individual states. Large vegetable businesses are more likely to use computers than small vegetable growers with 97% of growers on farms larger than 70 hectares using a computer compared to 80% of growers with less than 5 hectares. It is interesting, however, that the use of computers by the smallest category of farm exceeds the next category with only 72% of farms in the 5-20 hectare bracket using computers. The use of global positioning systems (GPS) during crop production is strongly influenced by farm size. Almost 50% of the largest farms use GPS systems compared to 14% of farms of 5-20 hectares.

## Management attitudes to value adding

Management is aware of potential increased returns by value adding on farm and also the need to cater for the changing demands of the customer base. Two-thirds of all vegetable businesses in Australia are engaged in some form of value adding and almost 25% expecting to do more in future.

### Commitment to Value Adding in 2007-08



Source: ABARE

The proportion of businesses who regard the scale of the value adding they pursue as high or very high averages 18% across Australia, with significant variations between states (see table above). Growers in Western Australia have a strong commitment, with over 80% pursuing some level of value adding and 43% judging the level of their value adding to be high or very high. 87% of businesses in New South Wales are involved in value adding, but most of this is low level with only 11% of businesses engaging in high or very high value adding.

Tasmania is at the other end of the spectrum, with only about half of vegetable growers involved in value adding and only 6% at the high or very high level. This reflects the higher proportion of vegetable growing for the processing sector in that State. However, over 30% of growers in Tasmania expect to do more value adding in future, an expectation exceeded only by businesses in Queensland and South Australia where 36-38% of businesses envisage increasing their value-adding activities. This contrasts with Victoria where only about 12% of businesses plan to do more value adding.

## Management assessment of future directions for their business

### ***Longevity***

Across Australia, 72% of vegetable businesses expect to be engaged in the same line of business in five years' time, which indicates an improvement in optimism from the previous year when only 64% expected to be involved in five year. 16% are planning to leave agriculture altogether with, unsurprisingly, older-than-average growers and those with smaller-than-average land holdings more likely to make such a move. The proportion expecting to remain in the vegetable growing business is at its lowest in New South Wales, where only 62% of businesses expect to be involved in this sector in five years' time, with 24% expecting to shift to other agricultural production and the remainder expecting to leave agriculture.

### ***Production***

31% of vegetable growers expect to raise vegetable production in the next 3-5 years, with the proportion of businesses planning to do so ranging from about 24% in South Australia and Western Australia (and less than 20% in the Northern Territory) to approximately 38% in Queensland. More than half of vegetable businesses that are planning to increase production intend to use existing land more intensively, with 80% of vegetable businesses in Queensland favoring this method of boosting production. A third of businesses in Australia will expand the area devoted to vegetable growing within their existing farm, with growers in Victoria, South Australia, Tasmania, and the Northern Territory much more attracted to this method of raising production than growers in the other states. The main changes compared with the previous year's survey is that the proportion of farms planning to use land more intensively has risen significantly, while the perceived scope for expanding vegetable area has diminished. Approximately 30% of businesses in Australia will purchase more land and another 27% intend to lease more land. Share farming arrangements are not favoured as a means of boosting vegetable production, except in Tasmania and Western Australia where 29% and 7% respectively expect to do so.

### ***Lifting productivity***

The ABARE surveys reveal significant differences between states in the management practices that vegetable growers intend to adopt to raise the productivity of their farms. In the latest survey, the introduction of higher-yielding varieties is the most popular means of raising productivity with 54% of vegetable businesses in Australia planning to do so, ranging from high proportions of 73-74% of businesses in South Australia and Western Australia to much smaller proportions of 20% and 30% respectively in the Northern Territory and Victoria. Across Australia, 41% of vegetable businesses plan to introduce or expand technology use, with this proportion at it highest in Tasmania at 64%. 38% of Australian businesses plan to expand mechanization, with 52% of growers in Victoria intending to do so. A quarter of Australian businesses will boost farm productivity by increasing the scale of their operations. Less-favoured means of bolstering productivity are the introduction of genetically modified vegetables and improved financial management. 20% of vegetable growers in Australia do not consider that they have any scope to raise productivity, up from 15% in the earlier survey.

Larger farms are more likely than smaller ones to be planning to increase productivity. This is evident across all management practices that have been identified, with the exception of introducing genetically modified vegetables where no clear correlation related to the size of the farm operation is evident.

### ***Growth Opportunities***

The most popular growth opportunities for Australia's vegetable growers are the production of high quality vegetables and selling directly to retailers, favoured by 57% and 40% of growers respectively. Over a quarter of growers in Australia identify the cultivation of niche products as



a means of expansion and this is particularly popular in Western Australia and Tasmania where 43% and 49% of growers consider niche products a growth opportunity. Just under a quarter of growers see growth opportunities through value adding on the farm.

Exports are identified as a growth opportunity by 19% of vegetable businesses in Australia, but this proportion reaches 37% in Victoria. Exporting is considered too hard of time-consuming by over 60% of Australian vegetable growers, while 45% consider that prices are not high enough. Other impediments include shipping costs and inadequate farm infrastructure.

Less popular opportunities for vegetable growers to expand their businesses include selling direct to food service operators, identified by 14% of growers nationally, under protective cropping (11%), and hydroponics (6%).

### ***Constraints on future business viability.***

The surveys reveal that growers face significant constraints to changing their crop mix. In the latest survey, 43% of businesses identify water availability as a constraint, a proportion that exceeded 80% in Victoria, up sharply from 18% in the 2006-07 survey, while 21% of vegetable businesses believe that they are facing climatic constraints, up from 15% in the previous year. Increased farm input costs are a major concern for management with over 85% of businesses identifying this as an impediment in both Survey years. Increased marketing costs and low prices because of imports or for other reasons are viewed by management significant impediments with each of concern to about 60% of Australian vegetable businesses. In the 2007-08 Survey access to and the cost of labour and urban expansion were impediments reported by about a quarter of vegetable growers.

## **Future Analysis**

Continual monitoring of these and other issues identified in these Farm Surveys is envisaged. The survey for financial year 2008-09 will be conducted in April/May 2010. The Survey is conducted at this time to correspond to the cut off date for taxation returns. Correlation of the data collected and its analysis will be available in October 2010.