

## **Australian Horticulture**

### **AUSTRALIA**

Australian is a large, relatively flat island continent situated between the South Pacific and Indian Oceans with a land mass of 7.68 million square kilometres. It is located between latitude 10° 41'S (Cape York, Queensland) and 43° 39'S (South East Cape, Tasmania) and the longitudes 113° 09'E (Steep Point, Western Australia) and 153° 39'E (Cape Byron, New South Wales).

The land area is nearly the same as mainland United States and maximum distances from east to west (Brisbane in Queensland to Carnarvon in Western Australia) and from north to south (Cape York in Queensland to Hobart in Tasmania) are very similar at nearly 4,000 kilometres.

In spite of its large land mass, Australia has a small population of about 20 million and yet the country is one of the most urbanised in the world. Around 85% of Australians live within a 100 kilometre-wide strip extending inland around the eastern and southern coasts between Brisbane and Adelaide. Forty five to fifty per cent (45% - 50%) of Australia's population live in the major metropolitan conglomerates of Sydney and Melbourne.

### **CLIMATE AND CROP DIVERSITY:**

Australia's size and latitudinal range provide climatic diversity which enables an extensive range of horticultural crops to be grown. These extend from tropical species in Far North Queensland, the Northern Territory and northern Western Australia to temperate crops in southern Victoria, Tasmania and the south west of Western Australia.

Midsummer daily maximum temperatures exceed 35°C over much of the interior and 40°C days are not unusual. Summer temperatures in the 35°C- 40°C range occur in many of the mainland horticultural production regions throughout Australia. Tasmania usually experiences milder summers.

In contrast, Australian daily minimum temperatures are not as low as those occurring on other continents, because of the absence of extensive mountainous regions. The highest July (midwinter) minima (18°C – 20°C) occur along the northern coastal fringe and fall to 0°C – 3°C in the eastern highlands and Tasmania. Much of the south-eastern and southern sector of the continent exhibits mean July temperatures of less than 13°C, particularly in the highlands where frequent frosts and occasional snowfalls occur. Temperatures in the eastern and southern coastal fringes are modified by the proximity of the surrounding ocean.

The overwhelming feature of the Australian rainfall is the marked variability of seasonal and annual totals. Australia is a dry continent and the recent trend toward extended periods of drought makes irrigation essential for most horticultural production.

Traditionally, northern Australia, southern Queensland and northern New South Wales have a wet summer – dry winter rainfall pattern while the southern regions,

south western Western Australia and Tasmania, have the more typical temperature pattern of wet winters and dry summers.

Average rainfall totals vary greatly from virtually nothing in the desert regions of central Australia to more than six metres in the tropical rain forest regions of Far North Queensland.

### **GEOGRAPHY:**

Australia comprises six states (New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia) and two territories (Northern Territory and Australian Capital Territory). Each has its own State or Territory government. Overall is the Federal government which operates from the national capital, Canberra, in the Australian Capital Territory.

Western Australia covers the largest area with just over 2.5 million square kilometres, approximately a third of the whole of Australia. Queensland (1.7 million square kilometres) and Northern Territory (1.3 million square kilometres) are the next largest areas. Victoria 230,000 square kilometres), the island state of Tasmania (68,000 square kilometres) and the Australian Capital Territory (2,5000 square kilometres) are the smallest divisions.

Much of Australia is quite flat, with the highest mountain - Mt Kosciusko, in the Snowy Mountains of southern New South Wales, being only 2228 metres. A mountainous spine, the Great Dividing Range, extends almost continuously 50 – 300 kilometres inland from Far North Queensland to Victoria.

Australian soils, with few exceptions have developed from much weathered and highly leached parent materials, exposed on ancient land surfaces. Consequently, the soils are usually inherently deficient in some of the major and minor nutrients required for plant growth. In addition, many of the soils are low in organic matter, due to the nature of the natural vegetation. The structure of surface soils is often poor, sometimes causing difficulties with seedling establishment, water infiltration and stability of soils against erosion losses.

Allowing for the fact that deserts and semi-arid zones account for more than 60% of Australia's total areas, and skeletal soils on mountainous country for 14%, there is only a small percentage of inherently fertile soil occurring in areas where good rainfall may be expected or irrigation provided.

### **HORTICULTURE:**

Horticulture is Australia's second largest rural production industry after wheat, with fruit and nuts comprising 52%, vegetables 31% and nursery/ ornamental crops 17% of the gross value of production (GVP).

The majority of products are grown for fresh or processing outlets within Australia although horticultural exports make up approximately 13% of total value of production. Australia has a competitive advantage of being relatively close to populous and developing markets in Asia, and also gains by being a counter-seasonal supplier for northern hemisphere markets.

Fruits dominate horticultural exports with oranges, table grapes and apples being the most important. Asparagus is the major vegetable exported followed by carrots and cauliflowers. Macadamias – the only Australian native plant to be commercialised as an international food crop – dominate nut exports. There are significant exports of Australian native cut flowers, especially to Japan.

The Australian wine industry has expanded dramatically over the last 15 years and now exports wines valued in excess of \$AUS 2 billion.

- **tropical and sub-tropical fruits:**

Avocados, bananas, citrus, macadamias and mangoes are the major crops. However there are significant plantings of custard apples, lychees, papaya, passion fruit and pineapples as well as more recent developments involving exotic tropicals such as rambutan, mangosteen, durian and other fruits of Asian origin.

Citrus crops are grown commercially in all Australian states apart from Tasmania. The main production areas are along the River Murray in South Australia, Victoria and New South Wales, the Riverina region of New South Wales, and the central Burnett region of Queensland. Oranges dominate but mandarins, lemons, limes grapefruit and tangelos are also important.

Production of most other tropical and sub-tropical fruits is mainly concentrated in Queensland. Bananas are now mainly grown around Innisfail and Tully in Far North Queensland, although subtropical varieties are grown further south in south east Queensland and northern New South Wales. Bananas are also grown around Darwin and Katherine in the Northern Territory, at Kununurra on the Ord River and at Carnarvon in Western Australia.

Avocados and mangoes are grown in similar areas to bananas.

- **temperate fruits:**

Apples and pears, table grapes, peaches, nectarines, plums, cherries and berries are the most important temperate fruits grown but nashi, kiwifruit and nuts (almonds, chestnuts, pecans, pistachios, walnuts, etc.) are also of significance in some areas.

Some 1500 growers utilise around 25,000 hectares to produce apples and pears. The main growing regions are the outer areas of Melbourne and the Goulburn Valley in Victoria, the Batlow and Orange areas of New South Wales, around Donnybrook and Manjimup in Western Australia, the Adelaide Hills in South Australia and around Stanthorpe in southern Queensland.

Production is increasingly of new varieties, such as Pink Lady, Sundowner, Fuji and Gala. Pink Lady and Sundowner are products from the national breeding program based in Western Australia. Pink Lady in particular, is widely planted in all growing regions of the world and is recognised internationally as a premium quality apple.

Exports constitute about 10% of production with major sendings to Asia and the United Kingdom. Apples are not currently imported into Australia although there are regular applications for entry.

Grape vines were established in the Sydney area soon after the beginning of European settlement in 1788. Today, table grapes are produced commercially in most Australian states and territories, with 80% grown in Victoria (60%) and New South Wales (20%). Export markets are a major feature with Hong Kong, Singapore and Malaysia being the most important markets.

Peaches (fresh market and processing), nectarines, apricots (fresh market and processing), plums and cherries are the major stone fruits grown. More than 75% of peach production is used for processing with Victoria and New South Wales being the major production states. These states also dominate nectarine production with 75% of national production. Nearly half of Australia's apricot area produces crops for processing, with South Australia and Victoria producing more than 90% of the total. Around 40% of the national plum production is exported, mainly to Hong Kong, Singapore, Malaysia and Taiwan. Cherries are mainly grown in New South Wales – where production at Young constitutes around 40% of the Australian crop – Victoria, South Australia and Tasmania.

- **vegetables:**

A very wide range of vegetables is grown in Australia, from asparagus to zucchini squash. Potatoes (fresh and processing), tomatoes (fresh and processing), carrots, mushrooms, onions and lettuce are the major crops constituting around 75% of the total vegetable gross value of production.

The range of climatic conditions and growing regions make it possible for many vegetables to be available fresh throughout the year. For instance, fresh market potatoes are harvested successionaly from the Atherton Tablelands in Far North Queensland to the major production areas of southern Victoria. Some regions, such as the Riverina in New South Wales, are able to grow two crops per year.

There is increasing production of greenhouse vegetables, particularly premium quality fruiting vegetables (tomatoes, capsicums, and cucumbers) grown in soilless systems.

Most vegetables are grown for fresh or processing markets in Australia, with only small quantities exported.

- **ornamental horticulture:**

The cut flower and nursery industries mainly supply domestic markets although cut flowers of Australian natives and South African Proteaceae are exported, especially to Japan, the United States and Western Europe.

Australians spend relatively little on cut flowers with annual per capita expenditure being only approximately 70% and 40% respectively of spending in the United States and the Netherlands.

With the cultivation of more varieties of native, traditional flowers under intensive breeding, selection and commercialisation programs, Australian flower exports have expanded in recent years. Western Australia is the main exporting state followed by Victoria and New South Wales. World production of Australian native flowers is estimated at \$AUS 500 million, of which only about 20% is grown in Australia.

The Australian nursery industry has wide base covering production, wholesale, landscape, retail, plant hire and allied trades. Plant production is greatest in the more populous states of New South Wales and Victoria , with a combined total of more than 60% of the national value.

The value of nursery exports has declined in recent years whereas the value of imported products has increased, especially from countries such as the Netherlands.

## **RESEARCH ACTIVITIES**

The organisation of horticultural research and development in Australia is a partnership between industry, government and research agencies. Since 1988, Federal government support has been provided by matching funds collected by industry for R & D (up to 0.5% of the gross value of production of horticulture). This arrangement is managed by an industry-owned company - Horticulture Australia Ltd. (HAL) which also manages industry promotion programs.

Research agencies, notably the Departments of Agriculture in each state, the CSIRO (Commonwealth Scientific and Industry Research Organisation) and, to a lesser extent universities, provide the bulk of technical expertise in horticulture and are co-investors with industry and the Federal government.

Funding for new and emerging horticultural crops is provided through the Federally funded Rural Industries R & D Corporation (RIRDC), until these crops are well enough established to develop their own funding arrangements through HAL.

Australia's important wine industry makes it own R & D arrangements through the Grape and Wine R & D Corporation (GWRDC) which also operates on a matching funds basis.

Another important supporter of horticultural R & D is the Australian Centre for International Agricultural Research (ACIAR), which operates as part of Australia's overseas aid program and is focussed on assisting development of horticultural expertise by developing countries, particularly those in Asia.

### **Major research agencies and contacts:**

**Federal:** Commonwealth Scientific and Industry Research Organisation (CSIRO)  
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**State:** New South Wales Department of Primary Industries  
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Northern Territory Department of Business, Industry & Resources Development (Horticulture Division)  
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Queensland Department of Primary Industries and Fisheries  
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**Other:** Rural Industries Research & Development Corporation  
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Australian Centre for International Agricultural Research  
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Horticulture Australian Ltd.  
<www.horticulture.com.au>

### **UNIVERSITIES:**

Several universities have some undergraduate programs in horticultural subjects but only a few offer first degrees in Horticultural Science, Horticulture or related disciplines.

Postgraduate study opportunities are also available at many universities.

Skills training and further education is also provided at local institutions in all states.

### **Major universities and contacts:**

University of Adelaide (South Australia)  
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