

## CHAPTER SIX

# Health and Wellbeing

Horticultural products are essential for human life and fundamental to the wellbeing of communities. Without horticultural products human life would cease. The human body is designed to utilise the energy stored in plants and nutrients that are not available from any other source.

Good health stems from wellbeing and horticulture contributes to wellbeing in a number of ways, not all of them apparent at first glance.

### Horticulture is all around us

They could be called segments or subsets of the horticulture industry. They are in reality the 'cradles of creation' where the wants and horticultural needs of communities are satisfied by horticulture and the ingenuity of its entrepreneurs and farmers.

These cradles of creation range from large turf farms to gardening centres and from plant and landscape growers to botanic gardens. They include small holdings next to cities, major large-

scale vegetable and fruit farms and orchards, hydroponic growers of tomatoes and flowers, and the sack gardens of high density towns in poor communities.

Many people take the benefits of amenity and ornamental horticulture for granted, but the benefits can be seen in office blocks and holiday resorts, zoos, urban buildings and offices. In every part of the world the harvest of horticulture is on display in the home gardens of those who understand and value the beautifying aspects of growing things. Even the rooftops in some cities have sprouted the greenness of gardens. The beautification of parks and streets, the green foliage on freeways and the ornamental plants that are the essence of urban landscapes are all part of horticulture's bounty.

This huge diversity is collectively the mosaic of the world of horticulture.

## Lifestyle/Amenity horticulture

Lifestyle horticulture, sometimes called environmental, amenity or urban horticulture, largely involves public and commercial entities involved in the production, management and servicing of urban green spaces for environmental, social, economic and health benefits.

The lifestyle horticulture sector includes products, commodities and services that range from ornamental

plants, fruit and forestry plants to cut flowers and the design and maintenance associated with arboriculture, parks, gardens, golf courses, sports grounds and indoor plantings.

It includes turf grass production, nursery and landscape establishment and the services provided by those that supply technical horticultural advice, information dissemination and project management.

### Queensland turf growers

Turf farming makes a significant contribution to the Queensland, Australia state economy. The gross value of production of lifestyle horticulture in Queensland (pop. 4.4 million) from nursery, turf and cut flowers has been forecast at AU\$898 million for 2009/2010. The return per hectare ranges from AU\$30,000 to AU\$60,000.

In 2007 it was estimated that Queensland had 217 turf farms producing just under 5,000 hectares of sod. Farm gate sales had increased to AU\$235.7 million per annum employing 857 full-time, 348 part-time and 116 seasonal workers with total wages and benefits paid to workers amounting to AU\$108.4 million. Most turf farms

in Queensland operate as vertically integrated operations with larger businesses contracting out various processes.

The largest sales segments are homeowners (35%), landscape installation and maintenance firms (20%), commercial or residential developers (18%), with the retail sales via garden centres, golf and sports field venues and brokers making up the balance.

Sales are usually made close to producers, with only 22% of growers selling product out-of-state or to international markets. Export sales only accounted for 11% of total sales value.

## Pennsylvania

Lifestyle/amenity horticulture such as the provision of parks, plants and open green spaces sometimes looks like it is all cost, and a luxury exercise to provide a more visually pleasing environment. Tangible economic benefits are not immediately apparent.

In the south-eastern region of the State of Pennsylvania, amenity landscape has been shown to account for millions of dollars each year in value-adding improvements, in savings, in earnings and in avoided costs.

Homes in the region are on average each worth US\$10,000 more because of access to open space or other horticultural enhancements. This adds a gain of more than US\$16.3 billion to the capital values of property in the State.

Protected open space generates US\$240 million annually in property tax in addition to US\$30 million per year in state and local tax revenue.

If the trees, fields, and forests that filter the water, clean the air, control flooding, and provide other environmental services were to be developed afresh, it would cost more than US\$132.5 million

per year to do what preserved lands already do. The health-related cost savings resulting from physical activity on protected open space amount to US\$1.3 billion per year including avoided workers' compensation costs and avoided productivity losses and reduced risks of cardiovascular disease, diabetes, certain cancers, and obesity. Direct medical costs saved were US\$795 million.

Nearly US\$577 million in benefits accrued annually to residents who participate in recreational activities on protected open space within south-eastern Pennsylvania.

Parks, trails and farms are destinations that attracted visitors who spent millions of dollars in the regional economy that helped to create and sustain jobs in both the public and private sectors.

Regionally, preserved open space accounted for approximately 6,900 jobs annually in industries including agriculture, tourism, hospitality, recreation, and open space management and preservation.



Green spaces enrich our lives in many diverse ways. (Upper left) rugby, New Zealand, (upper right) tennis, Wimbledon, UK. Lower photos: private and public landscaping, New Zealand.

## Quality-of-life interactions with plants

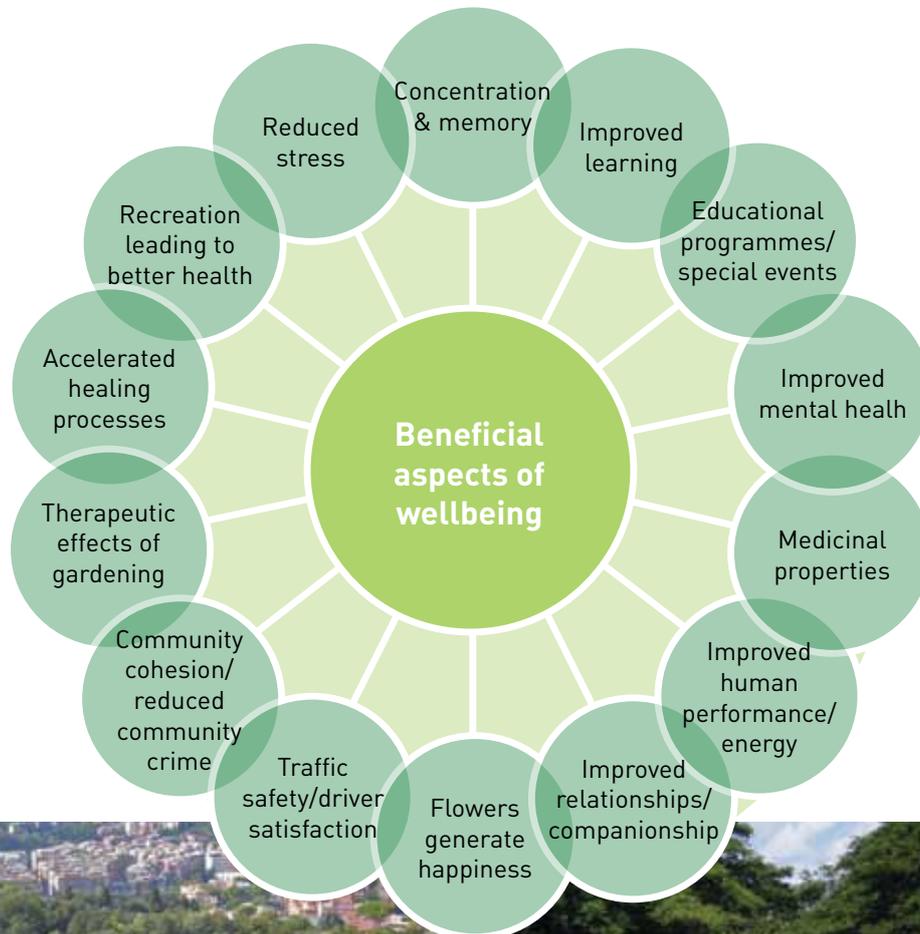
Scientists have developed an integrated model of quality of life and wellbeing, consisting of six major life domains:

- social wellbeing
- physical wellbeing
- psychological wellbeing
- cognitive wellbeing
- spiritual wellbeing
- environmental wellbeing.

The interactions between people and plants intersect each of the six quality-of-life domains.

Who benefits economically?

- Nursery plant and turf growers
- Horticultural service firms providing landscape and urban forestry
- Wholesale distribution firms including importers
- Services such as landscape design, installation, and maintenance
- Home improvement centres and mass merchandisers or other chain stores
- Brokers, transporters and retail operations
- Florists and independent garden centres.

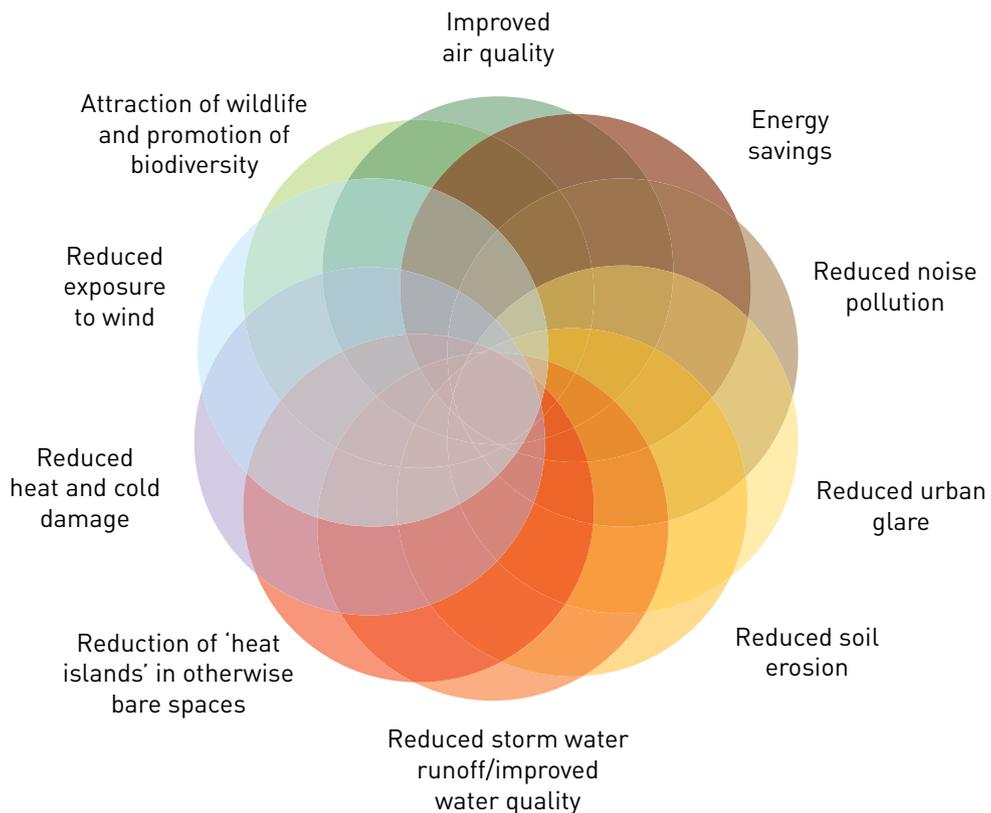


(Left) Papal Gardens, The Vatican, Rome, Italy; (right) Golf course, Apia, Samoa.

## Economic benefits from amenity horticulture



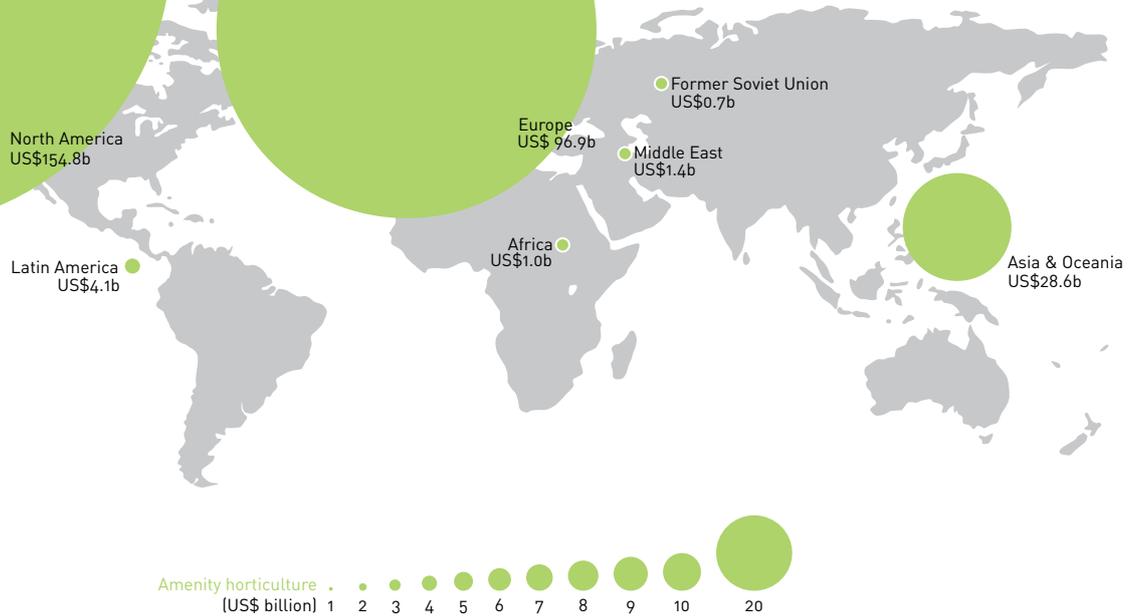
## Environmental benefits from amenity horticulture



### Lifestyle horticulture has significant economic value in developed countries

Total assessed value of regions identified is US\$287.7 billion

SOURCE: HYADU, HALL & HODGES, UNIVERSITY OF FLORIDA & TEXAS A&M, 2008



### World amenity horticulture assessed at almost US\$290 billion value

Parks and open spaces, the pot plants in your buildings and the turfed lawns of suburbia may look purely decorative but in reality they are life-style/amenity horticultural economic powerhouses and critical components of productive work environments and healthy communities.

Using a benchmark study as the start point, and adjusting the relative economic value of other

regions of the world, a 2008 study estimated that the economic impact of amenity/lifestyle horticulture was close to US\$290 billion. The study used reference points such as the value of a property beside or close to a park, versus a property that had no connection to a park or reserve. The world map above shows the makeup of the global estimate of the value of amenity horticulture.



Public parks and horticultural exhibitions enrich human lives and experiences.



Landscaping and the use of green spaces can enhance quality of life and human wellbeing.

## Horticulture for improved health

The World Health Organisation recommends a minimum of 400 grams of fruit and vegetables per day, excluding potatoes and other starchy tubers. This serves for the prevention of chronic diseases such as heart disease, cancer, diabetes and obesity, as well as for the prevention and alleviation of several micronutrient deficiencies.

Diets low in fruit and vegetables are typically deficient in a range of nutrients, vitamins and phytonutrients essential for human health.

It has been estimated that insufficient intake of fruit and vegetables around the world causes around 14% of gastrointestinal cancer deaths, about 11% of ischaemic heart disease deaths and about 9% of stroke deaths globally.

A measure of the potential life lost due to premature mortality and the years of productive life lost due to disability is known as a Disability Adjusted Life Year (DALY). By this measure approximately 16.0 million (1.0%) DALYs and 1.7 million (2.8%) of deaths worldwide are attributable to inadequate or low fruit and vegetable consumption.

Micronutrient deficiencies, which affect more than two billion people worldwide, increase disease susceptibility in all populations and compromise the development of cognitive capacity in children. It is well established that healthy diets improve the learning capacity of children and the productivity of workers.

Obesity, epidemic in the developed world and rapidly gaining in the developing world, is best combated by shifting consumption from processed starch-based foods towards consumption of fresh horticultural crops.

The recognition that greater consumption of fruit and vegetables has beneficial health outcomes is becoming increasingly widespread in the developed world and underscores the likelihood of increased demand.

In contrast, micronutrient-deficient diets lead to reduced mental and physical development, poor performance in school, loss of productivity in the workplace, and the likelihood of poverty in future generations.

### A mix of fruit and vegetables add value to daily health

A balanced diet that includes deeply coloured fruit and vegetables that provide vitamins, minerals, fibre and phytochemicals, is needed to maintain good health, protect against the effects of ageing and reduce the risks of cancer and heart disease.

Eating plenty of fruit and vegetables can help you ward off heart disease and stroke, control blood

pressure, reduce risks from some cancers, avoid a painful intestinal ailment called diverticulitis, and guard against cataract and macular degeneration, two common causes of vision loss.

The colour of fruit and vegetables is important.

## 5+ A DAY

'5+ A DAY' is the name of a number of programmes in countries such as Australia, France, Germany, United Kingdom, and the USA to encourage the consumption of at least five portions of fruit and vegetables each day. These programmes follow requests by the World Health Organization to consume at least 400 grams of vegetables daily.



### Red

Contain phytochemicals such as lycopene and anthocyanins with potential health-promoting properties.

*Includes:* red apples, cherries, cranberries, red grapes, pink/red grapefruit, red pears, raspberries, strawberries, watermelons, beets, red peppers, radishes, red onions, red potatoes, rhubarb, tomatoes.



### Orange and yellow



Contain varying amounts of antioxidants such as vitamin C as well as carotenoids and bioflavonoids, which have health promoting potential.

*Includes:* yellow apples, apricots, cantaloupes, grapefruit, gold kiwifruit, lemons, mangoes, nectarines, oranges, peaches, yellow pears, persimmons, pineapples, tangerines, melons, butternut squash, carrots, yellow peppers, potatoes (yellow fleshed), pumpkin, sweetcorn, sweet potatoes, yellow squash.

### White, tan, and brown

Contain varying amounts of phytochemicals, eg. allicin, found in the onion family.

*Includes:* bananas, brown pears, dates, white nectarines, white peaches, cauliflower, garlic, ginger, Jerusalem artichoke, kohlrabi, mushrooms, onions, parsnips, potatoes (white fleshed), shallots, turnips, white corn.



### Green



Contain phytochemicals such as lutein and indoles, which have potential antioxidant, and health-promoting benefits.

*Includes:* avocados, green apples, green grapes, honeydew melons, kiwifruit, green pears, artichokes, asparagus, broccoli, brussel sprouts, cabbage, beans, celery, cucumbers, endive, leafy greens, leeks, lettuce, green onions, okra, peas, green pepper, spinach, watercress, zucchini.

### Blue/purple

Contain phytochemicals such as anthocyanins and phenolics, which have potential antioxidant and anti-ageing benefits.

*Includes:* blackberries, blueberries, blackcurrants, purple grapes, plums, prunes, raisins, purple cabbage, eggplant, purple Belgian endive, purple peppers, potatoes (purple fleshed).



## Food and drug industries converge

Some horticultural crops are grown for their health benefits alone. This new genre of products are called 'Nutraceuticals'. These are aimed at slowing or preventing illnesses and include a number of foodstuffs recommended by doctors.

Nutraceuticals began with energy drinks and probiotic yoghurts and have now attracted the attention of food and beverage giants such as Nestlé, Danone and Pepsi. On the horizon is the research-backed development of plant-based health products to help combat diabetes, heart problems and Alzheimer's disease.

According to Euromonitor, the nutraceutical market is expected to be worth US\$175 billion worldwide. Their development has put products derived from horticulture in the same market as pharmaceuticals.

This will provide a different market channel for horticultural products with sales more often than not driven by a doctor's prescription. Nutraceuticals have better profit margins by about 20 to 25%. Sales to hospitals instead of retailers could mean that margins might be larger. In some health systems, insurers will reimburse payment for many products perhaps resulting in consumers being less conscious of the actual price of products marketed through the medical channel.

Food companies may prosper in the area of health plants when they are closer to the customer and understand their needs. Charles Mills, of Credit Suisse, said, "*The drug industry has very strong R&D but the food companies have the marketing skills.*"

## Science is targeting vegetables with high health benefits

Vital Vegetables® is a joint research programme between the New Zealand and Australian horticultural industries to develop new vegetable cultivars with increased levels of healthy compounds such as antioxidants.

The first of these products, Booster Broccoli™, contains significantly higher levels of the antioxidant sulforaphane (often abbreviated to SF) than other varieties of broccoli, giving it 40 percent more active antioxidants than regular broccoli varieties. SF is a long-lasting antioxidant that may enhance good health and wellbeing including protecting the body against DNA damage which may prevent tumour formation and development.

These vegetables are grown using traditional growing and farming techniques that employ sustainable farming practices, including minimal fertiliser and water use.

Research is continuing on other antioxidant-rich vegetables including tomatoes, corn, capsicum, cauliflower and lettuce. Genetic engineering has not been used in the development of these exciting new products.



Broccoli PHOTO: NZ INSTITUTE FOR PLANT & FOOD RESEARCH LTD

## Thought Challenge #10

Consumers have become dependent on the year-round supply of many fresh fruit and vegetables, for example lettuces, strawberries and pineapples.

*Q. Are consumers aware of the diverse origins of the fresh produce that they may be consuming?*