# Economic Impact of Climate Change on the Victorian Horticulture Industry

Horticulture is the second-largest and the fastest growing industry in agriculture; with some 30,000 businesses nationally, and a farm gate value of $9 billion in 2008. Horticulture is a diverse industry, spread across the continent in a wide array of climates and production systems.


Horticulture industries include vegetables, fruit, grapes (dried, fresh and wine grapes), nuts, mushrooms, nursery, turf, cut flowers and extractive crops (hops, pyrethrum and essential oils).

Victoria's horticulture industry has a farm-gate value of $2.4 billion per annum and accounts for 44 per cent of Australia's horticulture exports. The major growing regions in Victoria include the Goulburn Valley, the Sunraysia district (incorporating NSW), Swan Hill and peri-urban Melbourne.

During 2000-01 to 2009-10, the main constraints on the industry's productive capacity were climate variability and the impact of two severe droughts in quick succession which drastically reduced water availability from both natural rainfall and regulated irrigation systems.

## Impacts of climate change

Horticulture production involves the use of soil, water, fertiliser, chemicals, fuel and electricity inputs. Further to farm production is cold storage, packing, processing and transport.

Projected climate change is expected to reduce rainfall (resulting in reduced runoff for irrigation), cause more extreme weather including extreme temperatures (leading to increased evaporation and increased potential crop damage) and increase the incidence of some pests, such as fruit fly, which could have detrimental impacts.

Production costs are expected to increase as growers develop production systems to adapt to and mitigate the biophysical effects of climate change. In addition, there is also expected to be economic effects through the introduction of a carbon price across the economy.

State Government Victoria

DEPARTMENT OF PRIMARY INDUSTRIES

# General economic impacts to industry

## Water

Changes in water availability is likely to have direct flow-on economic impacts on horticultural enterprises and regional economies in Victoria. Garnaut predicts that by mid century, without effective global mitigation, there would be major declines in agricultural production across much of the country. Irrigated agriculture in the Murray-Darling Basin (MDB) would be likely to lose half of its annual output. This would lead to changes in the capacity to export food and a growing reliance on food imports, with associated shifts from export parity to import parity pricing.

Modelling the economic impacts of water scarcity under a moderate climate scenario, has found that irrigated farm profit would shrink by around 5.5 per cent across the MDB in the medium term. This was determined under a moderate climate scenario.

## Heat

Economic modelling for the impacts of heat on Australian horticulture is limited but anecdotal evidence is available. The February 2009 heat wave caused extensive crop losses including sun burn of fruit, grapes and vegetables as well as bush fire destruction of crops and smoke taint of wine grapes. Heat damage on wine grapes was surveyed by the University of Melbourne in ten regions after the February 2009 heatwave. Nine out of the ten regions experienced at least 20 per cent damage with almost 50 per cent of grapes in the Mornington Peninsula suffering 80 per cent damage.

The November 2009 heatwave also caused crop losses of fruit, vegetables and grapes. The Sunraysia table grape crop was decimated by this spring heatwave and exports were reduced by 54 per cent from $187 million in 2008-09 to $86 million in 2009-2010.

## Carbon Price

The Australian Government is expected to introduce an emissions trading scheme to achieve its long term target of 60 per cent reduction in greenhouse gas emissions by 2050 from the volume produced in 2000. Agriculture is expected to be initially excluded from the scheme, in that it will not be liable for the greenhouse gas emissions that it produces.

Horticulture is not an emissions-intensive industry but will be impacted indirectly by a carbon price through expected increase in the costs of inputs such as fuel and electricity which are fossil fuel intensive. A Rural Industries Research and Development Corporation (RIRDC) report in 2009 predicts significant increases in the cost of these inputs as a result of a price on carbon (Table 1). These costs represent about 17 per cent of total costs for a typical horticulture enterprise in the Murray or Goulburn Valley regions of Victoria.

**Table 1: Expected increase in input costs under carbon price**

| Input | Percentage increase in prices (based on carbon price of $25/t$CO_2$e) |
|---|---|
| Electricity | 10.80% |
| Fuel, oil and grease | 3.80% |
| Crop protection chemicals | 2.85% |
| Fertiliser | 2.85% |

The RIRDC report also suggests that because it is difficult for Australian farmers to pass increased production costs on to their customers, all horticulture farm incomes will fall. Consequently horticulture production is predicted to decrease by up to one per cent by 2020. Some horticulture producers will experience declining gross value of production (GVP) (kiwifruit, citrus) whilst others are likely to benefit with increasing GVP through product price rises due to the so called substitution effect (where a product with an increasing cost causes a consumer to purchase more of a lower price alternative).

## Conclusion

The biophysical and economic responses to climate change will have significant impact on the horticulture industry in Victoria into the future. In some areas more economic modelling is required to fully understand the cost consequences of climate change impacts on horticulture industries.

This summary was produced from work undertaken in the Postgraduate Certificate in Climate Change for Primary Industries

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