

## Literature Review of Documented Health and Environmental Benefits Derived from Ornamental Horticulture Products

**FINAL REPORT**

**Prepared for:** Agriculture and Agri-Food Canada Markets and Trade

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# EXECUTIVE SUMMARY

The Canadian ornamental horticulture1 industry, with a 2005 farm gate production of approximately $2.2 billion, is one of Canada’s best kept agricultural secrets and success stories (Watson, 2006).

However, the domestic market for ornamentals has remained relatively flat, despite the increased interest in gardening and landscaping over the past two decades, because flowers, indoor plants and landscaping have to compete with many other luxury items for the Canadian consumer dollar. The recent slowdown in the Canadian industry has been mirrored around the globe as a result of higher energy and labour costs, increased competition and depressed consumer spending. To survive, the industry has to sell more plants or flowers and obtain higher prices. The four ways to increase ornamental sales are:

* Increase the number of purchasing households and younger customers
* Increase the frequency of purchases by existing buyers
* Increase the transaction value per buying occasion
* Create a popular culture of personal use and enjoyment of ornamentals

All of these require new and collaborative marketing schemes that promote ornamental flowers and plants in different ways than have been used in the past.

The purpose of the project was to provide the Ornamental Working Group of the Horticulture Value Chain Round Table, through its secretariat in Agriculture and Agri- Food Canada, with a summary of the current state of scientific knowledge related to the benefits from plants and flowers in one’s daily life.

A review of the literature demonstrated that ornamental horticulture has a wider suite of benefits than expected. Plants can provide multiple benefits in terms of the economy, environment and human lifestyles. Many of these benefits, however, are not well known or understood within the general population. As a result, there is a considerable opportunity for the ornamental horticulture industry to sell more products based on the benefits identified throughout this literature review. The following is a summary of the benefits as outlined in the literature review:

*Economic:*

* Reduce energy costs (heating and cooling)
* Improve property values (residential and business)
* Enhance beauty of buildings and communities
  + Aesthetic contribution
  + Improved privacy and security
* Assist municipalities in reducing maintenance costs and deriving new economic benefits including economic spin-offs from parks, sporting facilities and increased tourism

1 The Canadian floriculture and nursery industries together are often referred to as ‘ornamentals’ or ‘the ornamental industry’. The phrase ‘ornamental horticulture’ also includes the sod and Christmas tree industries.

*Environmental:*

* Moderate urban climate extremes
* Mitigate urban heat islands
* Produce oxygen
* Sequester carbon
* Ameliorate pollution:
  + Improve air quality (indoor and outdoor)
  + Remove contaminants from soil (phytoremediation)
  + Improve water quality
  + Treat sewage and wastewater
* Improve water management (flood control) and erosion control
* Reduce impacts of weather through windbreaks and shelterbelts
* Reduce noise pollution
* Control urban glare and reflection
* Attract birds and other wildlife

*Lifestyle:*

* Reduce stress and improve productivity (workplace, schools)
* Introduce calming effects and reduced discomforts
* Quicker recovery (hospitals)
* Practice horticultural therapy to improve mind, body and spirit
  + Long term care facilities
  + Prisons
* Increase human health (e.g., use in medicine)
* Improve life satisfaction and well-being:
  + Increase positive emotions
  + Improve general quality of life in urban settings
  + Create pride in community through community gardens and allotment gardens
  + Attention and concentration improvements for children
* Reduce aggression and violence
* Provide space for recreation
  + Enhance sport field safety
  + Encourage healthy active and passive lifestyle pursuits

To enhance sales, marketing efforts may be connected with the benefits from the literature as well as key wordings and marketing and sales opportunities identified in this study.

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# Introduction and Background

Scientists have, for decades, been trying to bring to the attention of people and their governments the importance of maintaining the biodiversity of planet Earth and of carrying out our daily lives in a fashion that ensures our offspring will inherit a cleaner, greener, more ecologically sustainable world. Governments everywhere, aside from sponsoring some minimally resourced initiatives, have been slow to catapult these issues ahead of things like health care, education, transportation, international trade, infrastructure development and human resources. Only very recently have policy makers realized the interconnectedness of human effort with the natural world, and that measures that not only protect but enhance the environment will be supported and demanded by the voting public and their children. Therefore, it is highly appropriate, in supporting the issues identified by the Horticultural Value Chain Round Table, that government (through Agriculture and Agri-Food Canada) begin to shift their historical emphasis on food agriculture to examining the value of the Canadian ornamental horticultural industry in the new policy context of ecological goods and services to which it can contribute significant quantifiable importance to Canada’s future.

Early civilizations found plants that furnished foods, medicines, clothing and shelter. Ancient Chinese documented the many uses of plants. Plant collecting was an important activity on Egyptian military and commercial expeditions and Egypt became a breeding ground for plant magic. The Greeks excelled in their inventiveness of plant superstitions. Christian priests in Europe used plants and flowers as teaching tools, and missionaries brought back far flung plants to church herbal gardens. Those who preserved plant lore and achieved both good and bad with plants during the Renaissance were called witches or herb women. Victorian times saw the wealthy in several countries using flowers and plants for ornamental uses, sometimes paying enormous sums to collect and house their prizes. As more people gravitated toward cities during the Industrial Revolution they began to use plants as decoration, likely as reminders of their rural heritage and to improve the look and feel of their surroundings. In Canada, after both World Wars, the surge in immigrants with backgrounds in cultivation of plants, coupled with improvements in transportation, government disseminated production information, growing methodologies and technologies, and breeding of new varieties all encouraged the development of greenhouse and nursery facilities for growing ornamental plants.

The Canadian floriculture and nursery industries together are often referred to as ‘ornamentals’ or ‘the ornamental industry’ or ‘non-food agriculture’. The phrase ‘ornamental horticulture’ also includes the sod and Christmas tree industries.

* + - Floriculture farmers produce about 6,000 species of
      * cut flowers, potted flowering plants, houseplants, cut foliage, bedding plants, bulbs, cuttings for propagation, food and medicinal plants in greenhouses and outdoor-grown cut flowers (Watson, 2006).
    - Nursery farmers produce about 9,000 species of
      * annual and perennial plants, woody shrubs, deciduous and coniferous trees, roses, outdoor garden flowers, Christmas trees and sod.

The Canadian ornamental horticulture industry, with a 2005 farm gate production of approximately $2.2 billion, is one of Canada’s best kept agricultural secrets and success

stories (Watson, 2006). Flowers represent 66% of the total production; nursery 26%; sod and Christmas trees the remainder (AAFC, 2005a). Ornamentals account for 42% of the total horticultural farm cash receipts and 6% of all of agriculture (AAFC, 2005b).

Statistics Canada (2006) shows 3,425 greenhouses covering 20 million m2, and employing 42,620 people with a gross yearly payroll of $517 million and a capital investment of $3.3 billion (Statistics Canada, 2006). Floriculture represents 55% of these numbers, the rest being greenhouse vegetable production. Sod and nursery producers number 1,187, using 44,167 hectares of land, with 7,370 full-time and 7,465 part-time employees and a payroll of $216 million. The 3,000 Christmas tree farms cultivate approximately 40,000 hectares (AAFC, 2005b).

Floriculture and nursery production is concentrated in Ontario (51%) and British Columbia (23%), followed by Quebec (8.5%), with the remainder scattered across the Atlantic Provinces and the prairies. Ontario and B.C. ornamental farms showed higher net operating incomes and operating margins than other provinces because of the concentration of large operations (Statistics Canada, 2006).

A recent study of the Ontario greenhouse industry (TOGA, 2006) found it exhibited an economic output multiplier of almost 3.0 which, if extrapolated, suggests that the ornamental industry contributes almost $7 billion annually to the Canadian economy.

Federally, ornamental horticulture is the only agricultural commodity whose products are subject to the Goods and Services Tax (GST) upon sale to the consumer. The Ontario Greenhouse Alliance reports GST based on sales at the farm gate from floriculture sales in Ontario of approximately $50 million annually from 2002 to 2005 (TOGA, 2006). This does not include the value of mark-up between retail and wholesale, nor the value added components. When these are included, the Canadian Nursery Landscape Association estimates a contribution to GST of almost $500 million annually by the ornamental sector (CNLA, 2006).

The sector has shown a positive balance of trade since 1997, but the once lucrative export market ($453 million against $359 million imports in 2004, AAFCb) is in jeopardy due to the current exchange rate and increased security and plant health complications at the border. About 97% of ornamental exports go to the United States (U.S.). Growth opportunities are significant, given the quality of Canadian plants and flowers and the expansion plans of U.S. mass merchandisers to open new garden centres and retail floral shops.

The industry thrives on free trade and has no supply management, production subsidies or production quotas.

Flowers and plants are Canada’s third largest crop after wheat and canola. Canada’s per capita consumption of flowers ($47) lags several-fold behind most European countries but we buy 2-3 times more nursery products (AIPH, 2004). In Europe, flowers and plants are considered staple and lifestyle purchases like milk and bread. However, the domestic market has remained relatively flat, despite the increased interest in gardening and landscaping over the past two decades, because flowers, indoor plants and landscaping have to compete with many other luxury items for the Canadian consumer dollar. The recent slowdown in the Canadian industry has been mirrored around the

globe as a result of higher energy and labour costs, increased competition and depressed consumer spending.

The plant development, production, distribution and sales activities and the value chains of the ornamental industry are extremely complex, and vary with the different types of crops.

While the sector has recently experienced some consolidation, resulting in fewer but larger farms, the backbone of the industry is comprised of fiercely independent entrepreneurs who collaborate as an industry primarily when their livelihood is threatened. The need to expand ornamental markets is one of those threats.

Ornamental producers have not organized to lobby governments or get their messages out in the media as effectively as other commodities.

Ornamental production costs are rising dramatically but selling prices depend on a world market that has many supply/demand imbalances during the year. To survive, the industry has to sell more plants or flowers and obtain higher prices. The four ways to increase ornamental sales are:

* Increase the number of purchasing households and younger customers
* Increase the frequency of purchases by existing buyers
* Increase the transaction value per buying occasion
* Create a popular culture of personal use and enjoyment of ornamentals

All of these require new and collaborative marketing schemes that promote ornamental flowers and plants in different ways than have been used in the past. Many recent attempts at such schemes have failed because of politics, failure to integrate all segments of the industry, too much emphasis on special occasion use, and variable product quality in the hands of the ultimate consumer. Successful examples for increasing the demand for cut flowers are the export marketing campaigns of South America, the United Kingdom’s slogan of “buy some flowers for yourself” coupled with strict quality control, and Australia’s development of markets for their commercialized wildflowers after the Olympics.

### Purpose and Objectives

The purpose of the project was to provide the Ornamental Working Group of the Horticulture Value Chain Round Table, through its secretariat in Agriculture and Agri- Food Canada, with a summary of the current state of scientific knowledge related to the benefits from plants and flowers in one’s daily life.

The specific objectives of the project were to:

1. Review the published literature from the biological, medical and social sciences to determine whether there were quantifiable physical and psychological benefits to human health, and to the indoor and outdoor environments, that could be linked to the purchase and use of ornamental horticulture products.
2. Recommend wording and/or strategies based on proven science that could form the basis for unique approaches to marketing ornamental

plants based on improving lifestyle, health, and the world in which people live, work and play.

1. Identify new opportunities for export and domestic marketing and increased sales of ornamentals beyond the traditional concepts of beautification of the indoor and outdoor environments.
2. Identify opportunities for further investigation into potential but, as yet, unidentified or unquantified benefits.
3. Provide a functional bibliography of sources of further information that could be quoted to justify any future marketing claims if necessary.

### Report Outline

To meet the objectives outlined above, the report was divided into six sections. Section

1.0 above, provided an introduction to the report. Sections 2.0 through 4.0 provide a summary of the biological, medical and social science literature as it pertains to economic, environmental and lifestyle benefits from ornamental horticulture. Section 5.0, presents key trends in the industry, a summary of past and current marketing efforts, presents ‘key wording’ opportunities and suggests domestic and export marketing and sales opportunities based on the benefits found in the literature. Section

6.0 is a summary of the primary benefits provided by ornamental horticulture, as outlined in sections 2.0 through 4.0 and presents the conclusions and recommendations from the literature, and identifies opportunities for future research.