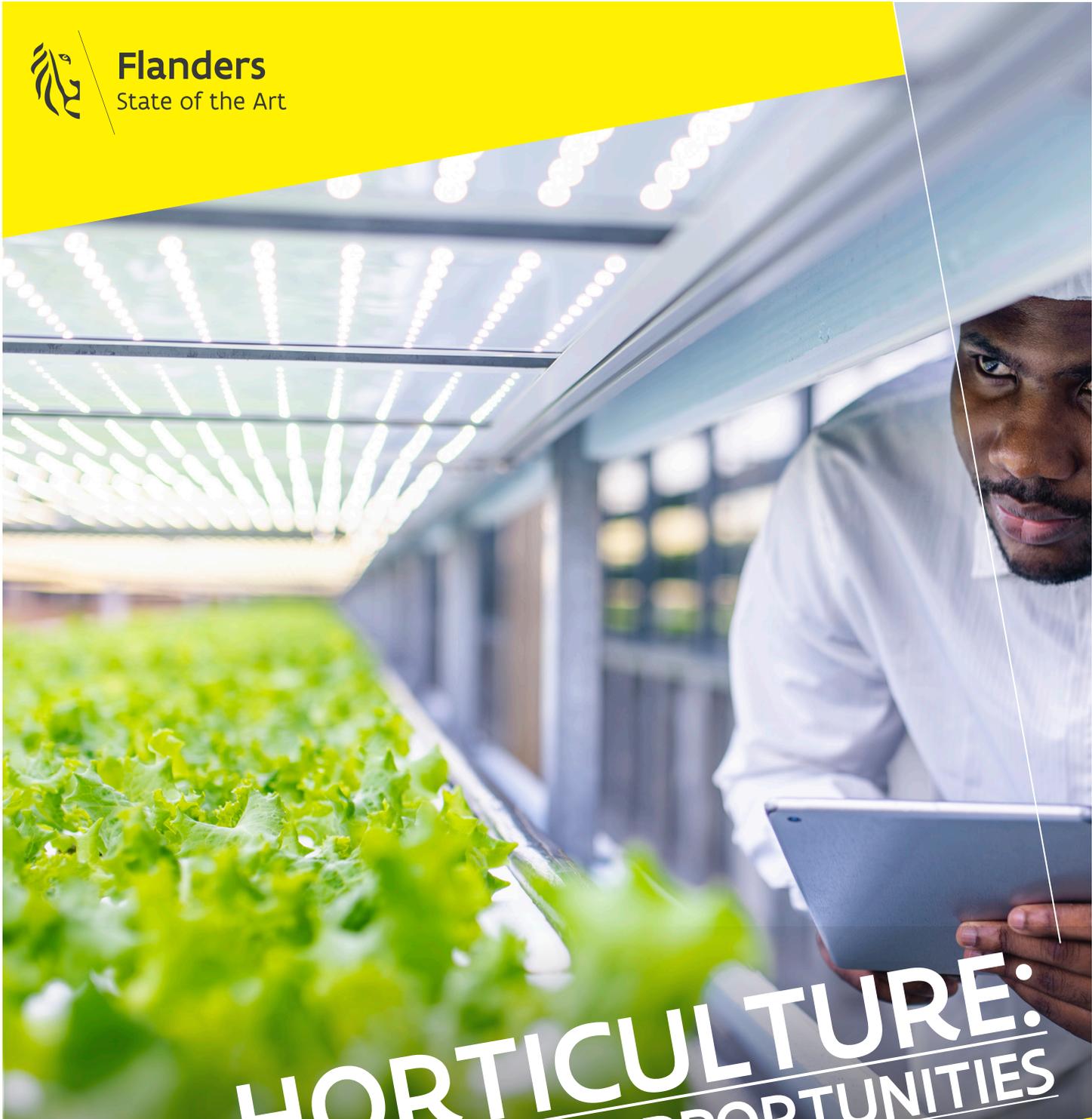




**Flanders**  
State of the Art



# **HORTICULTURE:** **CHALLENGES AND OPPORTUNITIES**

# **IN THE USA**

**FLANDERS INVESTMENT & TRADE MARKET SURVEY**





# 1. INTRODUCTION

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## Definition

Horticulture is a sector within the agricultural industry. This industry can be divided into several sectors:

- arable farming,
- horticulture,
- forestry,
- animal husbandry,
- and aquaculture.

The horticultural sector can be divided into three main sub-sectors: vegetable growing, fruit growing, and floriculture.

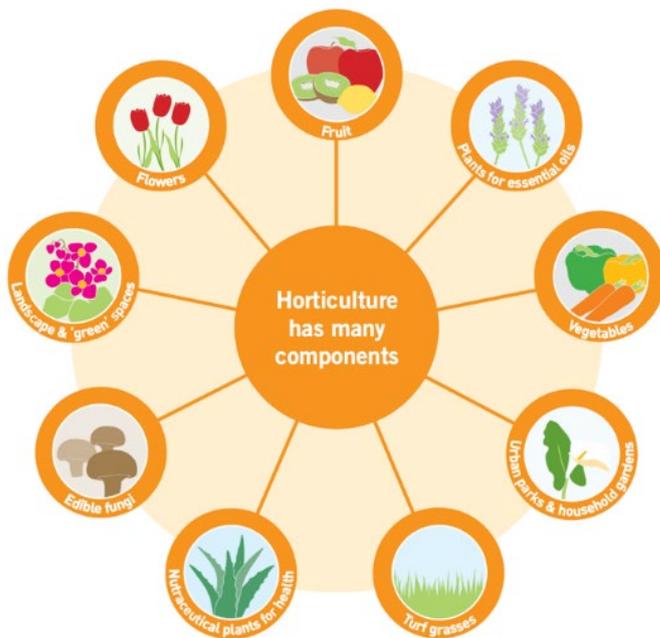


Figure 1: Components Horticulture

As seen in Figure 1, horticulture has several subdivisions as well.<sup>1</sup> The term horticulture is very similar to arable farming, however, there are some differences between the two sectors. Arable farming includes growing crops, such as potatoes, grains, corn, etc. in open ground, while horticulture entails growing

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<sup>1</sup> Consulted on (ISHS, International Society for Horticultural Science, 2012)







## 2.2 ECONOMICAL FACTORS

### Market size



Figure 2: Top 10 States Horticulture

Figure 2 displays the top ten states in horticultural sales for 2019.<sup>11</sup> These ten states accounted for 66% of the horticultural sales in 2019. The three states with the highest contribution are California (\$2.6 billion), Florida (\$1.93 billion), and Oregon (\$1.02 billion).

The top commodities in U.S. horticulture sales in 2019, and compared to 2014, were:<sup>12</sup>

- Nursery stock, \$4.55 billion, 7% increase
- Annual bedding/garden plants, \$2.24 billion, 13% decrease
- Sod, sprigs, and plugs, \$1.27 billion, 12% increase
- Potted flowering plants, \$1.2 billion, 11% increase
- Potted herbaceous perennials, \$923 million, 2% decrease

<sup>11</sup> Consulted on (Top 10 states in horticulture sales, 2019, 2020)

<sup>12</sup> Consulted on (U.S. horticulture operations report \$13.8 billion in sales, 2020)



Similar to the international trade of vegetables, the export of fruit is significantly less than the import. In 2018, the US exported fruit for a total worth of 6.6 billion US dollars, while the import costs were valued at 15.2 billion US dollars. The types of fruit with the highest import value were bananas and avocados, with a value of 2.6 billion and 2.4 billion US dollars respectively. These fruit products were mainly coming from Mexico (38.7%), Chile (13%), and Guatemala (6.9%).<sup>17</sup>

### Floriculture in the USA

Lastly, the total sales value of floricultural products, produced in 2018, is estimated at 4.63 billion US dollars. This value has increased by 15.75% in comparison to 2009 and has continued to show a positive trend over the last ten years. The biggest share of the total products were bedding/garden plants with a share of 47%. These products were mainly produced in the states of California, Michigan, Florida, North Carolina, and Texas.<sup>18</sup>

### Import and export in the USA and Belgium

In 2018, Belgium imported products from the US within the category of “live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage” worth 169,719 euro, whereas the Belgian export of these products to the USA were worth 127,580 euro. These values are remarkably lower in comparison to the neighboring countries, which can be seen in Table 4.<sup>19</sup>

<i>Live trees and other plants; bulbs, roots, and the like; cut flowers and ornamental foliage</i>	Import value from the USA to EU (in euro)	Export value from EU to USA (in euro)	Trade balance EU (in euro)
<b>Belgium</b>	169.719	127.580	- 42.139
<b>The Netherlands</b>	63.183.611	232.924.522	169.740.911
<b>France</b>	263.763	2.106.972	1.843.209
<b>Germany</b>	923.953	1.074.822	150.869

TABLE 1: TRADE FLORICULTURE USA AND EU<sup>20</sup>

<sup>17</sup> Consulted on (Workman, 2019) (NASS, 2017 Census of Agriculture, 2019)

<sup>18</sup> Consulted on (USDA, Floriculture crops 2018 summary, 2019)

<sup>19</sup> Consulted on (European Commission, Statistics, 2020)

<sup>20</sup> Consulted on (European Commission, Statistics, 2020)



## 2.3 SOCIAL FACTORS

### Education

Since horticulture is a niche sector, it is interesting to mention that almost every state offers horticultural majors in local colleges. The following ten colleges are recognized as the best horticultural colleges in the U.S. for 2021:<sup>21</sup>

- Cornell University
- University of California-Davis
- Pennsylvania State University-Main Campus
- University of Florida
- The University of Illinois at Urbana-Champaign
- University of Connecticut
- North Carolina State University at Raleigh
- Clemson University
- California Polytechnic State University-San Luis Obispo
- University of Georgia

### Seasonal Workers

To tackle the barriers when it comes down to finding the right number of seasonal workers, the United States offers a temporary H2A. The H2A temporary agricultural worker program permits employers in the US to bring individuals from other countries to the country to fill the seasonal agricultural jobs.

## 2.4 TECHNOLOGICAL FACTORS

Both the agricultural and the horticultural industries have experienced a remarkable evolution with the help of technology. Three main elements that had a big impact on this industry are the following: "the tractor, the greenhouse, and biotechnology".<sup>22</sup> These innovations helped create higher efficiency and productivity within the industry.<sup>23</sup>

The innovations have not stopped there. The industry is constantly searching for new ways to improve its production processes. A clear example of this is vertical farming. By growing crops on multiple layers, farmers can increase their production without having to buy more land. Experts believe that with the right amount of investment this innovation may become the perfect solution to increase demand and a shortage of fertile land.<sup>24</sup>

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<sup>21</sup> Consulted on (Best Horticulture Colleges in the U.S., n.d.)

<sup>22</sup> Consulted on (Smallman, 2018)

<sup>23</sup> Consulted on (Smallman, 2018)

<sup>24</sup> Consulted on (Haggerty, 2019) (Calderone, 2017)



"Other innovations include, for example, technologies that harvest crops such as strawberries, peppers, etc independently; sensors that can identify pests and other diseases in horticultural crops; robots that can predict the number of harvests per plant; cameras that monitor plant health; etc."<sup>25</sup>

With the help of technology, farmers can adapt to these new climate conditions. However, sustainable farming is not as easy as one might think. Alongside environmental challenges, US farmers are also experiencing financial challenges. This means that even though farmers feel constant pressure to innovate to increase production, this is not always possible due to limited capital and strict governmental regulations.<sup>26</sup>

Consequently, due to the challenges this industry encounters, the National Institute of Food and Agriculture (NIFTA) offers opportunities as well. NIFTA supports the advances within agricultural technology and aids farmers by offering basic research and development in physical sciences, engineering, and computer sciences, followed by the development of agricultural devices, sensors, and systems. Thirdly, the organization also provides applied research that assesses how to employ technologies economically and with minimal disruption to existing practices. Additionally, NIFTA offers assistance and instruction to farmers on how to use new technologies.<sup>27</sup>

## 2.5 ENVIRONMENTAL FACTORS

### Climate change

According to National Geographic, climate change can be defined as "A long-term shift in global or regional climate patterns".<sup>28</sup> Climate change is often associated with an increase in temperature due to CO<sub>2</sub> emissions. This phenomenon has a very big impact on various industries but is especially hard on the agricultural and horticultural industry.<sup>29</sup>

In a study that was published by the Institute of Crop Science and Resource Conservation, it was revealed that a temperature change often hurts the development of plants. For example, tomatoes often become smaller, and broccoli may develop irregular heads when exposed to temperatures higher than 25°C<sup>30</sup>.

Furthermore, climate change also has as a result that the temperature is not as low during winter. This harms the development of certain horticultural products, such as cauliflower, asparagus, apples, and other fruits.<sup>31</sup> Alongside an increase in overall temperatures, there is also an increase in extreme weather events,

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<sup>25</sup> Consulted on (AHDB, 2018)

<sup>26</sup> Consulted on (Bisbis, Gruda, & Blanke, 2019) (Temple, 2019) (Riensch & Vir Jakhar, 2019) (Reiley, 2019)

<sup>27</sup> Consulted on (Agriculture Technology, n.d.)

<sup>28</sup> Consulted on (National Geographic Society, 2019)

<sup>29</sup> Consulted on (National Geographic Society, 2019) (Bisbis, Gruda, & Blanke, 2019).

<sup>30</sup> Consulted on (Bisbis, Gruda, & Blanke, 2019)

<sup>31</sup> Consulted on (Bisbis, Gruda, & Blanke, 2019)













## 4. USEFUL ADDRESSES

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### 4.1 PUBLIC ACTORS

#### U.S. Department of Agriculture

- <https://www.usda.gov>
- <https://www.nal.usda.gov/topics/commercial-horticulture>

#### National Association of State Departments of Agriculture

- <https://www.nasda.org/states/state-directory>

### 4.2 EVENTS

The biggest event “Cultivate”, organized by AmericanHort attracts around 10,000 industry professionals and visitors from all 50 states and over 30 countries. It is an annual event organized in July in Columbus, Ohio. More information can be found on the following link: <https://www.cultivateevent.org>

A full list of horticulture events in the USA can be found here: <https://www.hortcalendar.com>

## 5. OPPORTUNITIES FOR HORTICULTURE IN THE USA

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Sustainable food supply is under immense pressure due to population growth, climate change, and limited resources. Besides this, new uncertainties rose because of the COVID-19 crisis, such as the disruption in the food supply chain that made prices rise significantly. As a consequence of the uncertainty in these times, opportunities within horticulture have emerged.

#### Urban Horticulture

Trends towards sustainability and green energy have been increasing more and more in recent years across the country. One of the upcoming trends, “urban horticulture”, boomed during the pandemic, which brings several opportunities with it. “Urban horticulture” is a viable concept to provide sufficient fresh and safe food to cities, to achieve a sustainable food supply and food security. The trend is focused on the cultivation of fruits, vegetables, mushrooms, herbs, and aromatic and ornamental plants that can grow easily in a city and its surroundings.<sup>55</sup>

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<sup>55</sup> Consulted on (Urban farming flourishes in coronavirus lockdowns, 2020)



In the U.S., urban farms are sprouting in abandoned factories, on high-rise rooftops, and within shipping containers, adopting the “farm-anywhere” approach to bring local produce to a growing population of city-dwellers.<sup>56</sup>

Furthermore, metropolitan city budgets across the country are making room for the larger mission of bringing healthy foods to its residents. One example is the metropolitan area of Atlanta. The city is fulfilling its mission of bringing sustainable foods within half a mile of 85% of its 500,000 residents by cultivating the largest free food forest in the nation.<sup>57</sup> These movements across the nation are causing a shift towards opportunities within this sector.

### **Greenhouse Horticulture**

The value of the North America Greenhouse Horticulture market is expected to increase further by the end of 2023 with a compound annual growth rate (CAGR) of 11.3% during the foreseen period of 2020 to 2025. As the demand for both local and protected crop cultivation is growing across the country, the market value is expected to increase even more throughout the next five years.<sup>58</sup> Soon, greenhouse owners will find the need to invest time and resources toward developing innovative greenhouse technology for stimulating crop production.<sup>59</sup>

### **Lighting industry**

The worldwide horticulture lighting industry is projected to grow to \$6 billion by 2025. This is mainly due to the rising penetration of led lights in indoor farming due to their long lifespan, spectrum adjustability, and energy efficiency. Followed by the fact that fruits and vegetables are estimated to hold the largest share of the market during the forecast period.<sup>60</sup>

### **Technology**

Not solemnly for these specific trends, but also within other subsectors of horticulture there is a need to integrate information technology tools. These tools could help in maintaining consistent product supply, as well as make agriculture more sustainable. Therefore, this market is open for new opportunities regarding new technologies with a focus on being eco-friendly and energy-saving.<sup>61</sup>

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<sup>56</sup> Consulted on (4 Trends in high-tech horticulture, n.d.)

<sup>57</sup> Consulted on (Carly, 2021)

<sup>58</sup> Consulted on (North America Greenhouse Horticulture Market, 2020)

<sup>59</sup> Consulted on (Global Greenhouse Horticulture Market Size Study with COVID-19 impact, by Covering Material, by Application and Regional Forecast 2020-2027, 2021)

<sup>60</sup> Consulted on (The Worldwide Horticulture Lighting Industry is Projected to Grow to \$6 Billion by 2025, 2020)

<sup>61</sup> Consulted on (Mumataz, et al., 2020)



















