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# Learning Module 2

Horticulture



# EQF Definition

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## Knowledge

- Understanding what Horticulture means and get to know the different components included in horticultural production, economic aspects, and horticultural supply chains.

## Skills

- Identifying the employment opportunities in horticulture, and the different opportunities to get into horticulture.

## Competences

- Understanding that horticulture is not just about fruits and vegetables, but includes many other important aspects.

# What is Horticulture? (1)

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The American Society for Horticultural Science defines horticulture as follows:

*„Horticulture is the science and art of producing, improving, marketing, and using fruits, vegetables, flowers, and ornamental plants. It differs from botany and other plant sciences in that horticulture incorporates both science and aesthetics. „<sup>1</sup>*

# What is Horticulture? (2)

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Horticulture is an important economic sector that helps to feed the world.

In 2017, horticultural enterprises have produced:

- 1.094 billion tonnes of vegetables;
- 865,6 million tonnes of fruits;
- 887,3 million tonnes of roots and tubers.<sup>2</sup>

The enterprises are as different as the products they produce. The range goes from very small farms, mainly run to feed the farmers and their families, up to very large commercial enterprises running high tech greenhouses or huge orchards.<sup>3</sup>

# What is Horticulture? (3)

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Horticulture is not just about mushrooms, flowers, fruits, vegetables, or essential oils.

Horticulture means also parks, public gardens, sports fields, turf grasses, trees, vegetables and flowers in cities, home gardens for food and beauty.

Such facilities have aesthetic, sociological, and psychological benefits for humankind.<sup>3</sup>

**In other words: Horticulture makes World a better place.**

# What is Horticulture? (4)

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There is even more to discover:

- Plant breeding to create new varieties or improve existing ones;
- Nursery production and tissue culture for propagation make it possible to create countless plants out of one, or even out of a tiny plant part.<sup>3</sup>



## In-vitro culture

Source: FA Geisenheim, Martin Bahman. Use under GNU Free Documentation Licence

# What is Horticulture? (5)

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- Horticulture uses smart technologies for the control of pests to reduce the use of pesticides and, thus, protect consumers and environment at the same time.
- Innovative greenhouse production uses modern ways of production, e.g. soilless production systems like aeroponics.<sup>3</sup>



Greenhouse

Source:[https://upload.wikimedia.org/wikipedia/commons/8/8b/103\\_2934.JPG](https://upload.wikimedia.org/wikipedia/commons/8/8b/103_2934.JPG), Licence: Pd-self

# What is Horticulture? (6)

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Still more:

- Aquaponics makes it even possible to combine the production of fresh fish and vegetables, e.g. tilapia and tomato production can be combined.<sup>4</sup>

These propagation and production methods have very little to do with what we know as “gardening”. Many times, they are super high-tech and include laboratories and specific technical equipment and knowledge.



# Making Money (1)

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The volume of fruit and vegetables exported and imported worldwide is close to US\$ 180 billion.

One estimate is that 93% of fruit and vegetables are produced and consumed locally.

The worldwide export volume of flowers (fresh or dried), live plants, foliage, bulbs, tubers, and corms adds up to US\$ 17.2 billion.<sup>3</sup>



Source: <http://www.hd.org>

# Making Money (2)

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Horticultural industries generate wealth for producers, suppliers, local communities and countries. In many countries, horticultural production defines whole regions that become internationally known for the quality and value of the products. Examples:

- The Salinas Valley in California, USA, for vegetable production;
- New Zealand for kiwifruit;
- Bordeaux, France, for wines.

In some countries, the wealth production by horticultural activities has a big impact on the gross domestic income of the country. For example, in Spain, where around 10 million tonnes of fruit and vegetables are exported annually, with a total value of about € 8 billion.<sup>3</sup>

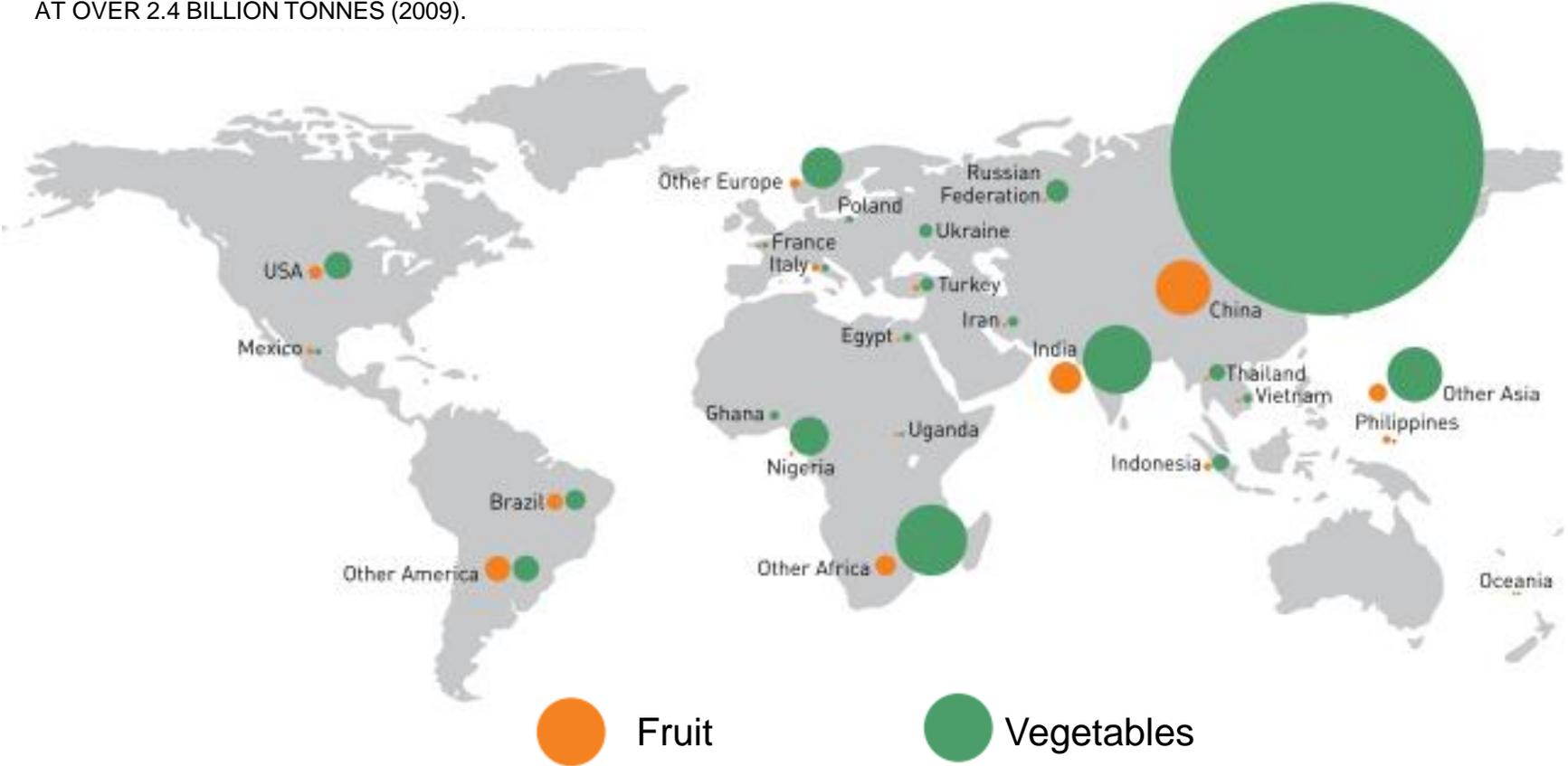
# The World (1)

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Horticulture is practiced all over the planet wherever the climatic and infrastructural conditions allow it<sup>3</sup> and it has been practiced by humans for over 10 000 years.<sup>5</sup>

# The World (2)

TOTAL PRODUCTION OF WORLD FRUIT AND VEGETABLES IS CALCULATED AT OVER 2.4 BILLION TONNES (2009).



Source: International Society for Horticultural Science (2012)

# The World (3)

Production of millions of tonnes (2009)	Fruit	Vegetable	Total
Production in millions of tonnes (2009)	Fruit	vegetables	Total
China	118	683	801
-India	71	152	223
-Nigeria	10	85	95
-USA	29	61	90
-Brazil	37	43	80
-Indonesia	17	35	52
-Russian Federation	3	48	51
-Turkey	15	32	47
-Thailand	9	34	43

The above nine countries produce 51% of the world's fruit and 65% of the world's vegetable crops.  
 The above nine countries between them produce 51% of the world's fruit and 65% of the world's vegetable crops.

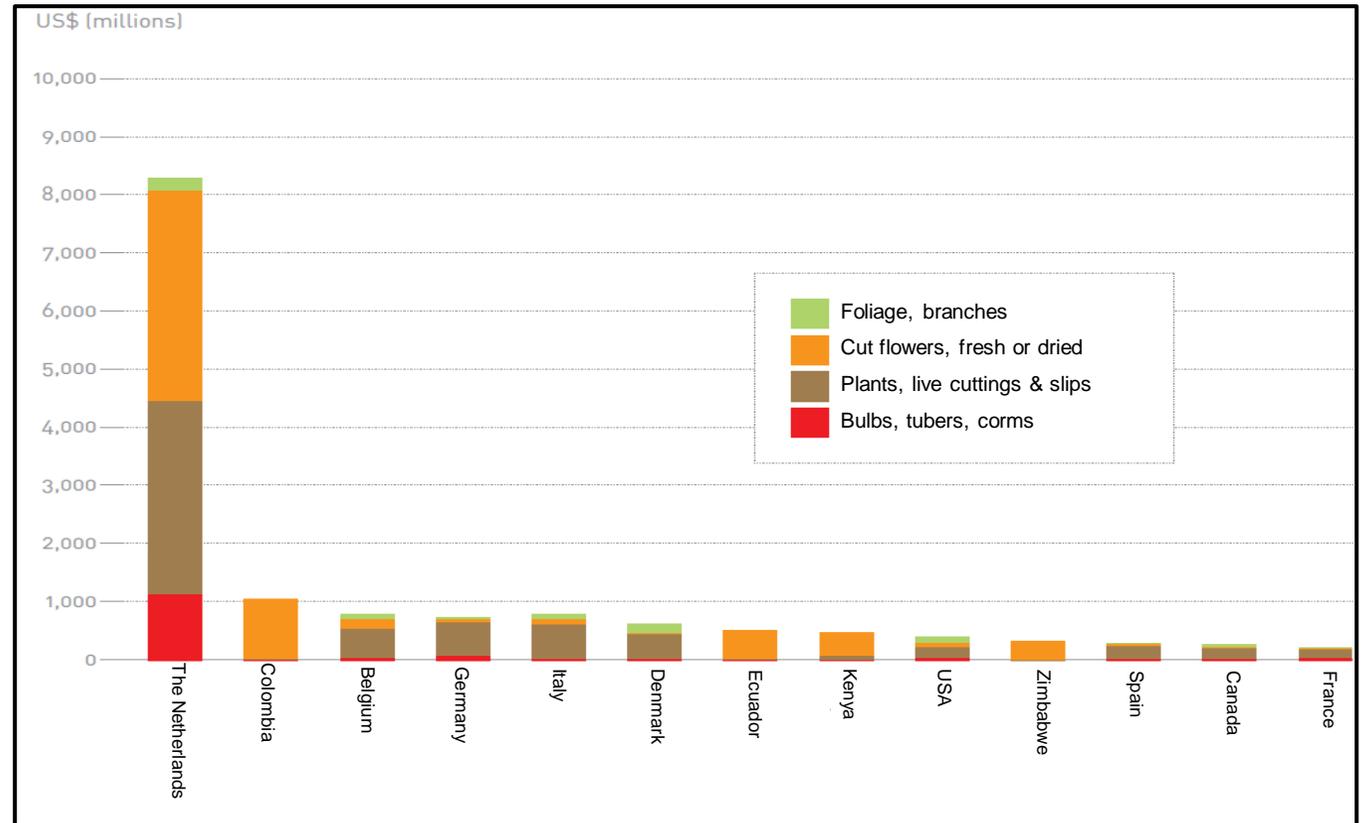
Fruit and vegetable production of nine selected countries that produce 51% of the worlds fruit and 65% of the worlds vegetables

Source: International Society for Horticultural Science (2012)

# The World (4)

Modern production of flowers, foliage, bulbs, and live plants is concentrated in a few countries, for example the Netherlands, Columbia, or Ecuador.

The majority of the consumers of these products are located in Germany, United Kingdom, the USA, the Netherlands, or France.<sup>3</sup>

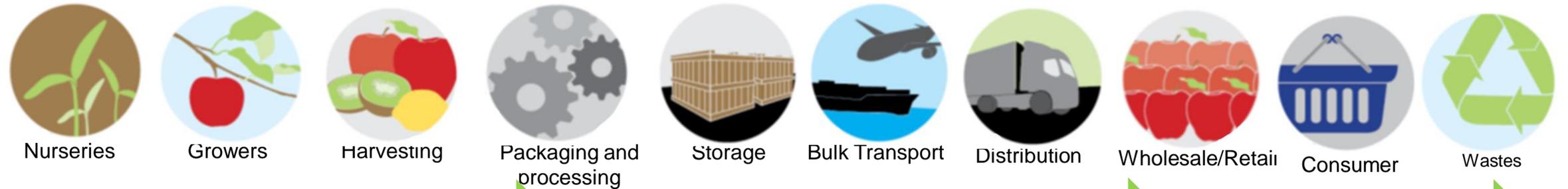


Total world exports of foliage, branches, cut flowers, plants, live cuttings & slips, bulbs, tubers, and corms by countries, in 2009.

Source: International Society for Horticultural Science (2012)

# Supply Chain (1)

Fruit supply chain as an example for supply chains in horticulture:



**Production and Harvest**

- Supply of fruit from global orchards (or sources) for global markets
- Environmentally friendly pest and disease control systems

**Handling and Distribution**

- Knowledge of the properties of fruits
- Consumer science
- New efficient post-harvest and processing technologies

**Consumption**

- Storage, packaging, transportation, and distribution technologies
- Food and beverage safety and quality
- Consumer lifestyles and health
- Human behavior and consumer preferences

Source: International Society for Horticultural Science (2012)

## Supply Chain (2)

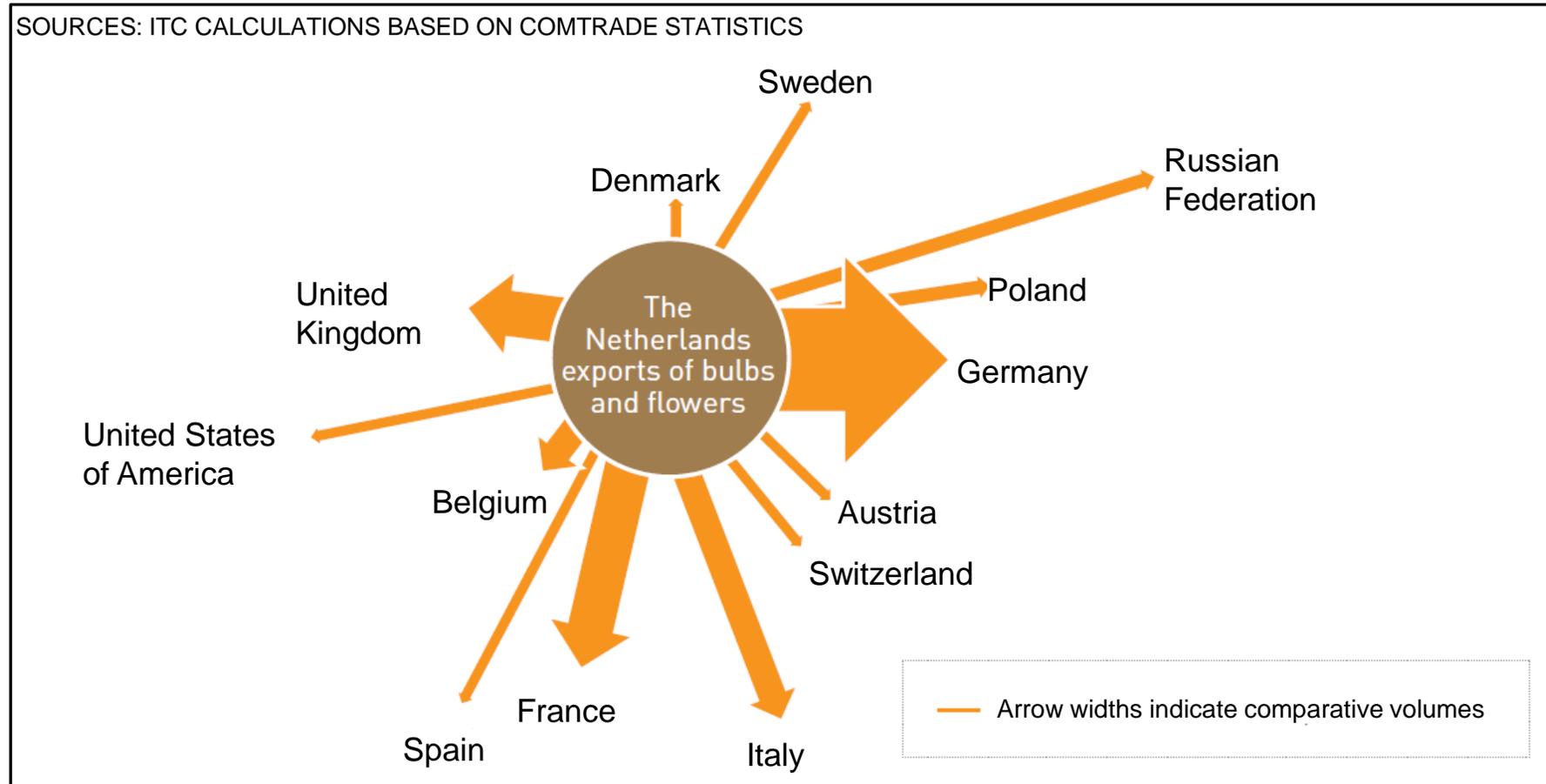
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Additionally to the stages of the supply chain, we just showed you there is a whole industry involved before the actual production starts. How should production work without all the things needed for the production itself ?

This includes:

- Seeds and their production;
- The various types of fertilizers, microorganisms, and other specialized nutrients;
- Agrochemicals such as Herbicides, Fungicides and Pesticides;
- Farm equipment from easy tools to high-tech machinery;
- Irrigation equipment.

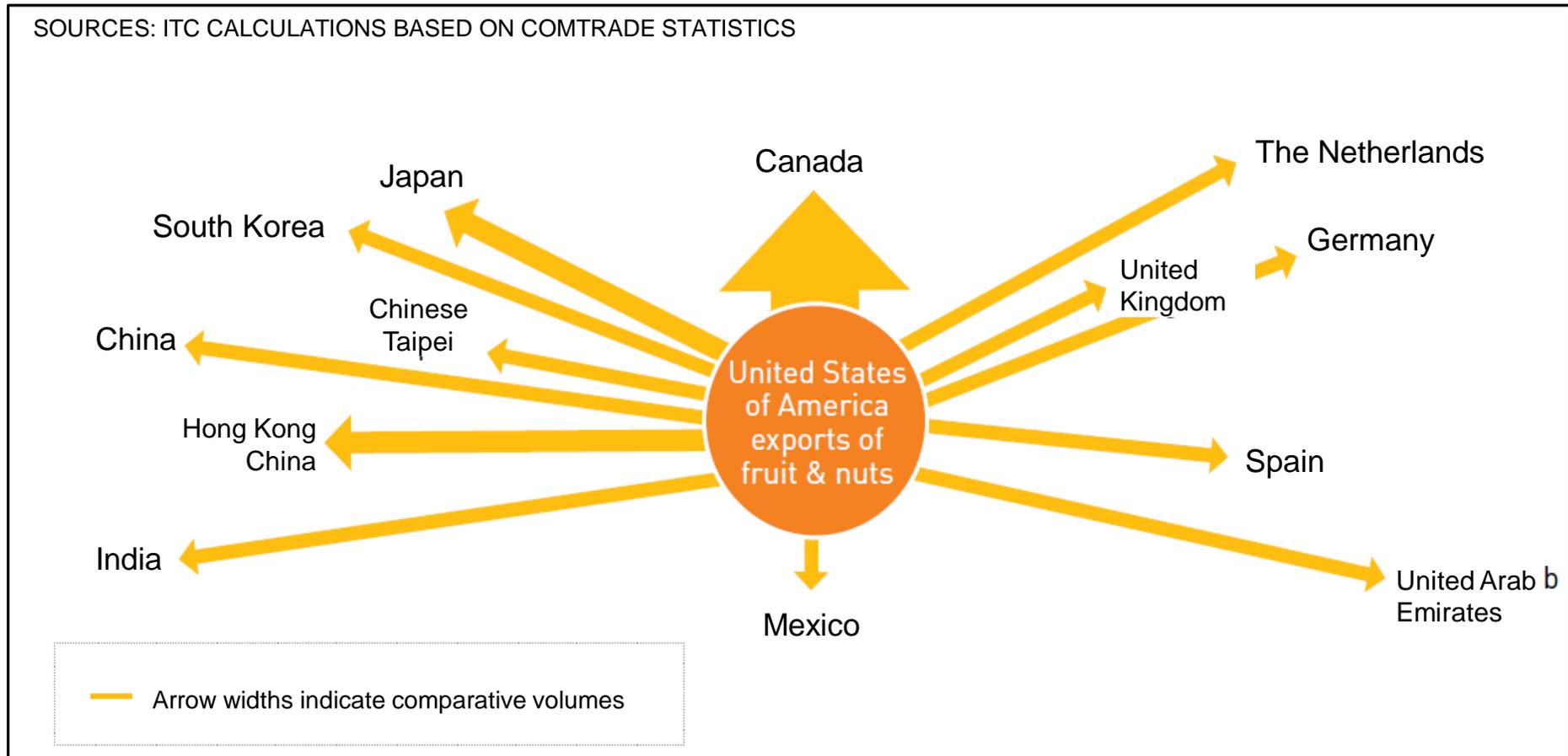
# Products Move Around the World (1)



Trade flows of bulbs and flowers from the Netherlands to importing countries.

Source: International Society for Horticultural Science (2012)

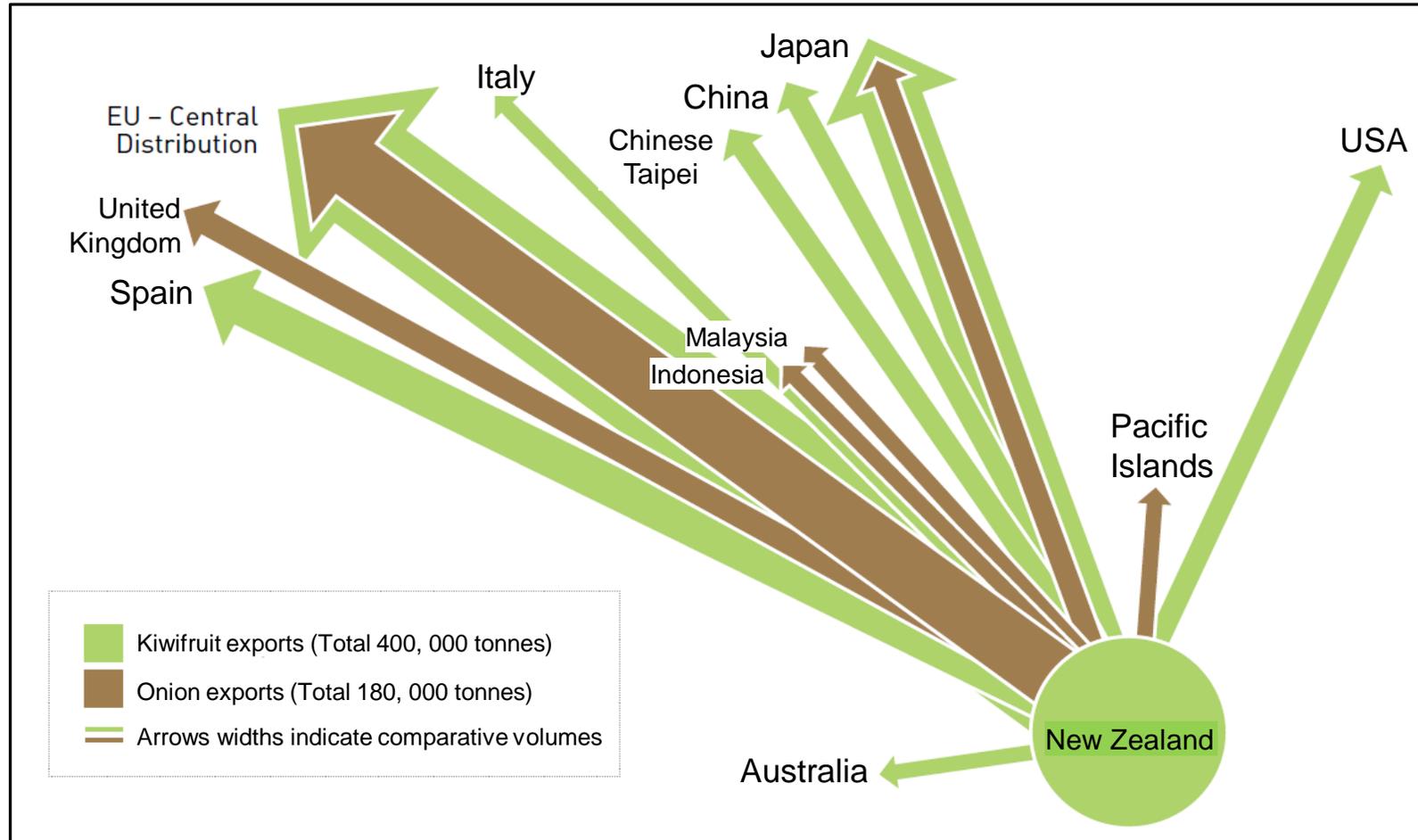
# Products Move Around the World (2)



Trade flows of fruits and nuts from the USA to importing countries.

Source: International Society for Horticultural Science (2012)

# Products Move Around the World (3)



Trade flows of kiwifruits and onions from New Zealand to importing countries.

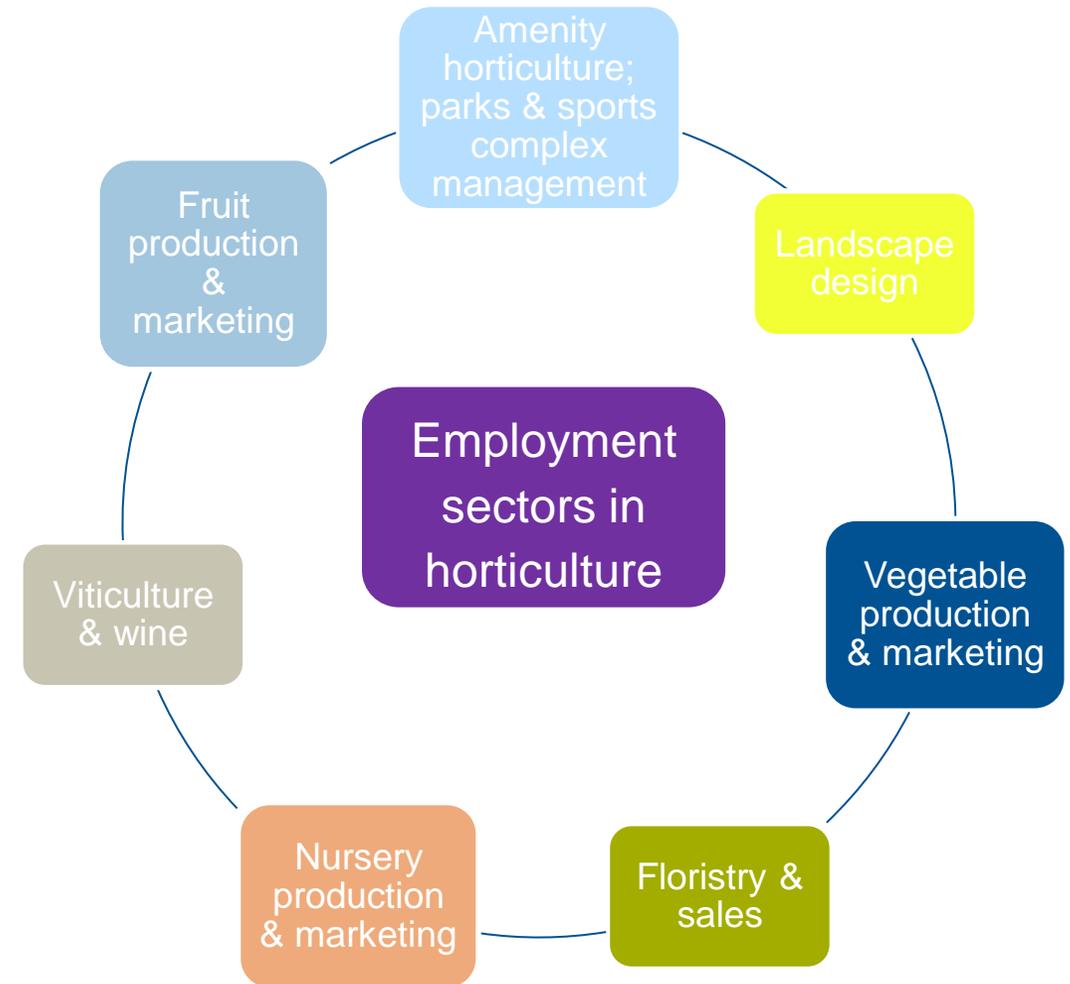
Source: International Society for Horticultural Science (2012)

# Employment Opportunities (1)

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Horticulture offers a wide variety of different job opportunities. But, in respect to the wide field of horticulture, this is probably not a big surprise.

The jobs can be located at any stage of the supply chain, starting at the very beginning, where the means of production are located, and ending at the end, where waste might be processed to generate soil or energy.<sup>3</sup>



Source: International Society for Horticultural Science (2012)

# Employment Opportunities (2)

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Among the more production-orientated jobs, there are gardeners for:

- Ornamental plants;
- Fruits;
- Vegetables;
- Perennials;
- Trees;
- Tree care;
- Graveyards;
- Public parks;
- Landscaping;
- Green keeping.<sup>6</sup>



Source: unsplash.com

# Employment Opportunities (3)

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Also, for individuals with a certain creative strike, there are job possibilities to be found with the horticultural sector. This includes professions like:

- Florist;
- Floral designer;
- Interior designer.



Source: picabay.com

# Employment Opportunities (4)

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Even for people who are not that much interested in plants there, are opportunities to find a job in horticulture. Due to the fact that many production methods rely on machines or other technical equipment, there are various professions to be discovered. For example:

- Mechanic for agricultural machines;
- Mechanic for greenhouses;
- Electrician for greenhouse technologies.



Source: International Society for Horticultural Science (2012)

# Employment Opportunities (5)

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For highly motivated people, a university degree is necessary. This might be an opportunity if you have worked in horticulture for some time to gain experience and to find out what you really want to do. Among these jobs are, for example:

- Plant pathologist;
- Plant propagator;
- Plant breeder;
- Soil specialist;
- Chemist;
- Biologist;
- Food scientist;
- Landscape architect;
- And many more.<sup>8</sup>



Source: unsplash.com

# Employment Opportunities (6)

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Seasonal work as access opportunity into horticulture!

Seasonal work might give you the chance to see what it is like to work in the horticultural sector and earn some money at the same time. You get to know companies and get the opportunity to talk to experienced professionals. This can help you to really understand what it means to work in the production branch of the sector. And, if you do well on a seasonal job, this can be the starting point for a future career in horticulture. Seasonal jobs can be:

- Fruit picking and packing;
- Vegetable picking and packing;
- Tree planting;
- Tree care;
- Harvesting in general, e.g. flowers.



Source: unsplash.com

# Be an Entrepreneur

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Especially when it is “hard to find” a job, it is an interesting idea to create your own job. By doing so, you can help yourself and others to improve the situation.

This might not be the perfect starting point, unless you already have an idea in your mind and the necessary knowledge and motivation to put this into practice.

But, after you have gained professional experience in horticultural work, this can be a very interesting opportunity. You need to be growth-oriented, risk-taking, innovative, and optimistic to become a successful entrepreneur.

**Being an entrepreneur means hard work and countless opportunities at the same time!**

# Advantages of Horticultural Jobs

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- You have countless possibilities in the horticultural sector.
- You can help to feed the world.
- You can help to make the world a better and prettier place.
- You can help to find solutions to sustainability issues in production and/or along the supply chain.
- You can personally benefit from working outdoors and with plants.
- You can create jobs in the area you come from and, by doing so, help not only yourself, but other as well.

**Basically, you really do a job that makes sense to you and others!!!**

# References

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- <sup>1</sup> American Society of Horticulture (n.d.): *What is horticulture*. Retrieved from: <https://ashs.org/page/Horticulture>, 22.01.2020.
- <sup>2</sup> Food and Agricultural Organization of the United Nations (2019): *FAOSTAT*. Retrieved from: <http://www.fao.org/faostat/en/#data/QC>, 22.01.2020.
- <sup>3</sup> International Society for Horticultural Science (2012): *Harvesting the Sun. A Profile of World Horticulture*.
- <sup>4</sup> Bundesministerium für Bildung und Forschung: *Der Tomatenfisch*. Retrieved from: <https://www.wissenschaftsjahr.de/2012/mitmachen/weitere-wettbewerbe-und-aktionen/der-tomatenfisch.html#4>, 22.01.2020.
- <sup>5</sup> Janick J. (2007): The Origins of Horticultural Technology and Science. In: *Proc. XXVII IHC on Global Hort.: Diversity and Harmony 2007*. Retrieved from: <https://hort.purdue.edu/newcrop/originhorttech.pdf>
- <sup>6</sup> Ausbildung.de (n.d): *Ausbildung zum Gärtner/in*. Retrieved from <https://www.ausbildung.de/berufe/gaertner/>, 22.01.2020.
- <sup>7</sup> Seed your future (n.d.): *Horticultural Careers*. Retrieved from <https://www.seedyourfuture.org/careers>, 22.01.2020

