

# Internship topics (20 Sep. 2020)

## Horticulture and Product Physiology group (HPP)



### Students....

Students are welcome to do their BSc- and MSc-thesis research with one of the staff members, postdocs and/or PhD students of the chair group Horticulture and Product Physiology group (HPP) of Wageningen University (read the requirements you have to meet, which are presented on the HPP-webpage: <http://www.wur.eu/hpp> >> Education >> MSc- and BSc-thesis subjects HPP and Internships at HPP).

The BSc- and MSc-thesis topics of HPP are spread over themes encompassing pre-harvest environmental plant physiology to post-harvest product physiology, and are connected to horticultural production worldwide. The emphasis is on, *but not restricted to*, modern glasshouse production.

Yearly, many students participate via BSc- and MSc-thesis's. During their research period MSc-thesis students enroll a community of students and staff (known as STAIR [**ST**udents **A**ctive **I**n **R**esearch]), which facilitates the development of important research related skills such as proposal writing and presenting, progress presentations and research discussions.

### Topics are *example* topics....

In this document you will find a list of possible actual topics. The list gives you an impression of the subjects we are working on. The actual definition of subjects is always affected by interests of students, equipment and facilities available and other students already working on the same project. If you have some ideas or proposals by yourself we can always discuss them.

### For BSc- and MSc-students.....

Most proposed topics in the list are primarily described as MSc-thesis topic. In general, parts of many of the described topics can also be done as BSc-thesis.

### Interested? Always contact the coordinator....

If you want to participate in a student-research-proposal at HPP, **always** contact the coordinator of the student-research-projects (Dr. Ep Heuvelink).

 [ep.heuvelink@wur.nl](mailto:ep.heuvelink@wur.nl)

 tel. 4 83679



#### Make sure you do this in time:

Many of the listed topics require some preparation and certainly early planning from the student and researchers involved. This also takes time and may cause study delays if not initiated in time.

Although this document contains an extensive list of topics, it is not complete and may continuously be subject to changes.

For the latest version check our website: <http://www.wur.eu/hpp> >> Education



## Table of Contents

Maximize tomato production in high tech greenhouse in Querétaro, Mexico.....	1
Internship “Crop Data Science” .....	2
Internship in vertical farming, at INFARM (Berlin Germany) .....	3
Internship or MSc - thesis: Controlling flowering and morphology of Lily cut flowers with light .....	4
Vertical farming traineeship proposals - Signify Research (Philips Lighting).....	5
Signify Research (Philips Lighting) Eindhoven .....	5
Internships at Ter Laak Orchids (location Wateringen).....	8
Internship: Experiment with LED lighting at a tomato company in Italy.....	9
Internship: research on crop production (including fruit bearing crops) in growth chambers at Certhon Innovation Centre (CIC).....	10
Internship topics Post - harvest quality of fruits, flowers and vegetables .....	11
Internships: Viscon Group/ViVi, Varied topics on plant cultivation in a controlled environment .....	12
Internship Molecular Strawberry Breeding.....	14
Introduction of research on bean sprouts physiology for Internship at Evers Specials .....	15
Research Assistant Internship at OneFarm .....	16
Greenhouse Horticulture Research Intern @ Microsoft Research (USA) .....	17

---



# Internship topics

---

## **Maximize tomato production in high tech greenhouse in Querétaro, Mexico**

### **Supervisor(s):**

*External supervisor: Marieke Vanthoor (United Farms Mexico)*

*Contact HPP: Ep Heuvelink*

### **Description:**

In Querétaro an Agropark is located with 112 Ha of greenhouses. In total there are 12 companies in the Agropark. Finka is one of the companies present and it offers students to do their internship or thesis within the company. Finka has high technology greenhouses where tomato and cucumbers are produced.

Aim of the project is to maximize tomato production within the greenhouse. Therefore we are looking for students that will evaluate all data obtained with the HortiMax climate control computer and relate real data with theoretical data. The climate control computer gathers many data that are at this moment not optimally used. The overview of amount of kilos produced related to all variable parameters such as CO<sub>2</sub> input, nutrient concentration, light availability etc. needs to be reviewed in depth. Moreover in one of the greenhouse diffuse glass is placed and a good comparison of yield increase or decrease due to the diffuse glass is not done at the moment.

We are looking for motivated, independent and positive students with a study background in Agrotechnology or Plant sciences.

For further information please contact Marieke Vanthoor at [mvanthoor@unitedfarms.mx](mailto:mvanthoor@unitedfarms.mx) or the contact for internships at HPP Ep Heuvelink.

### **Internship and ECTS:**

Internship credits: 24 ECTS

### **Location:**

Querétaro is located in central Mexico, 2 hours north of Mexico city. It is one of the most beautiful and safe cities in Mexico.

### **Planning:**

To be arranged in consultation with the supervisors.

## Internship “Crop Data Science”



### Supervisor(s):

External supervisor(s): **Aad van den Berg**, Klaas van Egmond

Contact HPP: Leo Marcellis

### Description:

At this moment, Delphy has different simple grow and plan models available for cultivation, which support during the cultivation of crops. The current models are “lacking” due to the fact that they are mainly based on light availability for a crop.

The goal is to develop plant/growth models with a clear relation between the climate and development of the crop. For this reason, Delphy has already developed a photosynthesis model which incorporates the prediction of the growth of chrysanthemums. This model (build by an intern of the WUR) has been calibrated and validated. During the validation of the model, a couple of recommendations came forward. The goal in the end is to complete the model and improve the calibration, to make sure that the validation of the model is precise enough for all the cultivations of chrysanthemums (5 cultivations per year).

The questions/assignment(s) that we need to be answered during this (or more) internship(s) are as follows :

- Which data can be used to improve the model (for chrysanthemum) and which parameters in the model are being under or over estimated.
- The photosynthesis model can be used for the development of a “Crop Profiler” for cucumber and tomato.
- Contributing (e.g. with the photosynthesis model) to the preparations of the “[Autonomous Greenhouse](#)” challenge of WUR/Tencent.

This internship does not only require knowledge about crops but also from data sciences and programming knowledge. After all calibration of a model is relatively simple, however understanding the model and making sure that the model will work for more datasets will be a challenge.

### Internship and ECTS:

Internship credits up to 24-30 ECTS

### Location:

Bleiswijk - Team Research Horticulture ([Delphy Improvement Centre Bleiswijk](#)). Primary contact: Aad van de Berg ([a.vandenberg@delphy.nl](mailto:a.vandenberg@delphy.nl))

### Planning:

To be arranged in consultation with the supervisor(s)

## Internship in vertical farming, at INFARM (Berlin Germany)

### Supervisor(s):

External supervisor(s) INFARM: Dr. Viviana Correa-Galvis, Pavlos Kalaitzoglou

Supervisor HPP: Dr. Elias Kaiser (1<sup>st</sup> contact)

### Description – possible topics:

- 1. How low can we go? Understanding light harvesting abilities of herbs and leafy greens.** In order to optimize light use for photosynthesis in vertical farming we would like to explore the maximum light use of various herb and lettuce cultivars. Our objective is to determine the light intensity range at which light harvesting overcomes photoprotection without compromising biomass accumulation or growth and further effects of light intensities in plant architecture.
- 2. Predicting what we see: Validation of growth and functional models upon changes in environmental factors** In this project we would like to 1) Adapt our current growth and functional models to various plant species and 2) Validate the model predictions by experimentally generating scenarios where plant growth and architecture are affected by plant density, temperature, and changes on pH and EC of hydroponic solutions.
- 3. What are we looking at? Implementation of imaging phenotyping technologies in indoor farming.** In this project we would like to define calibration values for leaf light reflectance through multispectral imaging, which can be used to detect plant responses to environmental changes. To do so, we will subject plants to a series of controlled stress experiments and do multispectral imaging to determine value ranges for NDVI and NIR data sets that can be used as proxies for early detection of plant responses to changes in the environment.
- 4. Every Breath you take: Understanding Water and CO<sub>2</sub> consumption in closed canopy systems.** Closed vertical farming systems are designed to control irrigation, temperature, humidity and CO<sub>2</sub> input, however water input needs to be regulated according to the plants' water use efficiency. This project aims to define a strategy to measure canopy CO<sub>2</sub> exchange and transpiration in our Acre system. A plant growth system is capable of growing up to 1200 plants per bench.
- 5. Preparing for the crowd: Inducing adaptive responses to temperatures that lead to plant compactness.** When growing plants in vertical farms, compactness is a desirable trait. Compactness can be triggered by modifying Light/night temperatures. In this project we will like to explore temperature regimes and its effect on plant compactness.

### Internship and ECTS:

Internship credits up to 24-36 ECTS

### Location:

Berlin (info INFARM: <https://www.infarm.de/> )

### Planning:

To be arranged in consultation with the supervisor(s)

## Internship or MSc-thesis: Controlling flowering and morphology of Lily cut flowers with light

### Supervisor(s):

External supervisor: Sander Hogewoning ([info@plantlighting.nl](mailto:info@plantlighting.nl))

Contact HPP: Wim van Ieperen



### Description:

Plant Lighting B.V. (Bunnik, the Netherlands) is looking for a student to participate in a research project starting in October 2019. Both MSc-thesis or internship is possible.

The project is about controlling flowering and morphology (length, leaf orientation) of cut Lily flowers. Being a quantitative long-day plant, lily flower development time is sensitive to the photoperiod and light spectrum. This is controlled by the photoreceptors in the plant. The aim is to unravel which photoreceptors are involved in flowering response, and by which lighting strategy the ideal plant response is realized (ideal light intensity, spectrum and photoperiod).

The growth-experiments under different lighting conditions are performed in the state-of-the-art facilities of Plant Lighting in Bunnik. Responses of the lilies in climate chambers are compared with the plant response of control plants in the greenhouse. The results are being used by growers for optimization of greenhouse production and possibly switching to production in multiple layers (vertical farm).

The student is expected to participate in most aspects of the research: Setting up the experiment (lighting etc), plant measurements and communication with growers. The project takes ~6 months (a bit shorter or longer is possible, also 3 or 4 days per week). Preference for a Dutch speaking student for communication with growers. Possibility for a research position (job) after graduation.

Plant Lighting staff has a scientific background in plant physiology and will supervise the student together with the supervisor from WUR. Check [www.plantlighting.nl](http://www.plantlighting.nl) for more info on the company.

In case of an Internship you can contact Sander Hogewoning directly at [info@plantlighting.nl](mailto:info@plantlighting.nl) - for a MSc-thesis you should contact Wim van Ieperen first at [wim.vanieperen@wur.nl](mailto:wim.vanieperen@wur.nl).



### Internship and ECTS:

Internship credits up to 24 ECTS; for MSc-thesis 24 or 36 ECTS

**Location:** Bunnik, the Netherlands

### Planning:

Starting in October 2019 - to be arranged in consultation with the supervisor(s)

## Vertical farming traineeship proposals - Signify Research (Philips Lighting)

### Supervisor(s):

External supervisor: Dr. C.C.S. Nicole (Signify) - Contact HPP: Leo Marcelis

### Internship and ECTS:

Internship credits: 24-36 ECTS

### Location:

Eindhoven

### Planning:

Period 2019-2020 – starting date to be arranged in consultation with the supervisors

## Signify Research (Philips Lighting) Eindhoven

### Vertical farming traineeship proposals (6 months)

Contact : Dr. C.C.S. Nicole : [celine.nicole@signify.com](mailto:celine.nicole@signify.com)

### General information

Plant grown under fully control environment with LED lighting as sole source of light are subject to research focused on yield and post-harvest quality. It is demonstrated that production and quality of fruits and vegetables could be significantly enhanced. At Philips Lighting (Signify), GrowWise research center is dedicated to exploring new plant growth strategy for the horticulture business.



Under LED lighting, plant growth is subject to new opportunities as the traditional way of using climate settings, light and irrigation strategy is being challenged. The absence of external perturbations, like UV, sudden changes in light and temperature and humidity, changes in air flow makes the plant growth more predictable and gives the possibility to refined the growth conditions. In addition, recent research has shown that light quality can manipulate the nutrient content of the plant in a well determined way (Nicole 2016, Nicole 2017). Additional post-harvest quality such as taste or shelf life can be manipulated by light as well. In order to quantify the effect on quality, a number of plant physiology aspects need to be measured in a quantitative way.

Light quality has a significant impact on growth and development in many plant species. Recently, the intensity and spectral composition of wavelengths of LEDs have been shown to impact mineral uptake, nutrient composition, pigment development and the rate of growth and development of several plant species.

In our research center, we are conducting trials under different light recipes and different pre-harvest light and growth conditions. Plant are harvested and various standard parameters are measured such as yield



(fresh and dry matter content). In addition, other parameters could be measured during the growth or after harvest which could characterize plant physiology traits. In most traineeships, the student would take part of all the pre- and post-harvest analysis aspects and adapt existing methods to the crop we need to assess (usually a leafy vegetable). The traineeship would include always a literature search on the focused topic of the research.



In our laboratory, the student has possibility to measure several plant physiology aspects using optical, mechanical or chemical tools. We are regularly measuring parameters such as stomatal conductance, stomatal imprint, ion leakage technic, OVQ (overall visual quality), nutrient content. Using optical tools, we can measure chlorophyll, flavonols, anthocyanin index and brix index (total soluble solids). Leaf area and leaf thickness are also measured sometimes along with other morphology parameters using image analysis. Chemical sample preparation is possible if student has access to HPLC or Gas/Ion chromatograph at University/School. Those apparatus are required for a more quantitative estimation of chemicals and mineral content of plants.

External commercial laboratories offer standard analysis which sometimes is not always satisfactory for research as samples size might be limited or error in manipulating samples occurs. Most research in this area is done with university because of the reliable and traceable analysis process.

The following topics are proposed in 2019-2020 for a traineeship of 6 months in the team:

### 1 - Post-harvest quality assessment of vegetables grown in a plant factory under different light conditions

The quality of fresh-cut produce is still unpredictable and the shelf life of fresh vegetables limited. When grown under fully control environment the growth conditions can be controlled such that the shelf life is well known. This also allows to optimize and extend shelf life by tuning growth parameters (such as light). This traineeship focuses on assessing the shelf life of crops grown in a plant factory as a function of different growth parameters.

### 2 – Improving taste and smell of horticultural crops (herbs as mint, basil)

Plants grown in vertical farming can be growing very fast with an extremely high yield. However, herbs like mint or basilicum may suffer in their organoleptic characteristics from this fast growth. Using dynamic lighting recipes, with interaction with climate settings, we explore in this project how to boost taste and smell without decreasing yield in commercial growth conditions.

### 3 – Increasing yield of arugula grown in vertical farming using dynamic lighting

Rocket salad (Arugula) is a crop producing lower yield per m<sup>2</sup> but highly valued as a leafy green. For its success in vertical farming the crop has to improve its yield during growth while keeping high quality. The students will explore several opportunities by examining prior work and new hypothesis combining lighting parameters with other growth parameters.

#### 4 – Chrysanthemum (or others) cuttings and flowering optimization

Flower cuttings are studied in this project as potential first phase growth in indoor farming. Rooting will be studied and flower speed and quality of several species as a function of LED lighting intensity, DLI, spectrum, schedule within certain growth parameters range (climate, substrate).



©2018 Signify. All rights reserved. [www.signify.com](http://www.signify.com)

Legal entity only if required by law, Visiting address, Postal address, Country.  
Chamber of Commerce and VAT number if required.

## **Internshipsat Ter Laak Orchids (location Wateringen)**

### **Supervisor(s):**

*External supervisor: Ewald de Koning (Ter Laak Orchids) Contact HPP: Ep Heuvelink*

### **Description:**

Ter Laak Orchids is one of the leading nurseries of Phalaenopsis potplant in Europe. We are located in Wateringen, in the west of Holland in the Westland area. With our 140 employees, we grow yearly more than 6 million Phalaenopsis plants. We have 125,000 m<sup>2</sup> production area spread over two modern, sustainable sites. We sell our plants to wholesalers, garden centres and retailers, who in turn ensure that consumers around the world can enjoy our Phalaenopsis orchids.

The potplant nursery is the epitome of sustainability. We also employ the latest cultivation techniques and use a high degree of automation. It matches perfectly the organisation's deep-seated ambition to improve continuously. We believe our new nursery is the key to a more efficient cultivation of orchids. In everything we do, we are guided by our core values: demonstrating ambition, respect for people and the environment and doing business in straightforward way.

Last but not least, we have our Daylight Greenhouse. Covering 4,000 m<sup>2</sup>, it collects solar energy in an innovative way and releases the heat at a later stage to warm the greenhouse, enabling us to cultivate in a very energy-efficient way. We have 3 research greenhouses state of the art equipped for modern Phalaenopsis cultivation including artificial light, mist, cooling.

In 2016 we started a new nursery in Guatemala, Ter Laak Americas, to serve the American market. We make preparations to build a new greenhouse on our site in Wateringen, most likely of the innovative Daylight Greenhouse type.

On our site [www.orchidee.nl](http://www.orchidee.nl) you will find more information including links to you-tube movies.

Ter Laak gives excellent students the opportunity to do an internship at our site in Wateringen.

This can be on one of these fields:

- Climate control: efficient temperature cooling, humidity regulation, monitoring
- Other ways of irrigation than on top of the plants
- Efficient way of artificial lighting
- Improve hygiene
- Biological pest control e.g. against Enchytraeid
- Resistance to diseases
- Influencing number of branches, flowers and length.
- Investigate the risks and propose solutions to reduce risks
- Better grading techniques of the plants
- Initiatives of the student

For further information please contact the internships coordinator at HPP:

Ep Heuvelink ([ep.heuvelink@wur.nl](mailto:ep.heuvelink@wur.nl)).

### **Internship and ECTS:**

Internship credits up to 24 ECTS

### **Location:**

Wateringen (Westland area)

### **Planning:**

To be arranged in consultation with the supervisors.

## **Internship: Experiment with LED lighting at a tomato company in Italy**

### **Supervisor(s):**

External supervisor: Matthias Scheuber ([www.freshguru.it](http://www.freshguru.it))

Contact HPP: Leo Marcelis

### **Description:**

HPP has a cooperation with a large innovative tomato grower in Italy. They want to install LEDs in a large new greenhouse. Before they start with the large scale lighting, they want to do experiments with LEDs this fall. There will be four different LED lighting treatments.

They are looking for a student who can conduct the experiment in their greenhouses in Italy; preferably starting in August or September.

The internship student will be involved in conducting the experiment, with guidance of Leo Marcelis (by regular Skype talks).

Measurements include (amongst others):

Light intensity, distribution, spectrum, other climate conditions, power consumption, growth, development, quality and yield of the tomato crop.

For further information please contact Leo Marcelis ([leo.marcelis@wur.nl](mailto:leo.marcelis@wur.nl)):

### **Internship and ECTS:**

Internship credits up to 24 ECTS

### **Location:**

Ostellato (Italy)

### **Planning:**

To be arranged in consultation with the supervisors – preferably start in August-September.

**Reminder: make sure that a HPP staff member has agreed to act as supervisor for this Internship (see also instructions on the front-page in section 'About arranging a supervisor and signing a HPP-contract ....')**

## Internship: research on crop production (including fruit bearing crops) in growth chambers at Certhon Innovation Centre (CIC)

### Supervisor(s):

External supervisor: Jeroen van Lent ([www.certhon.com](http://www.certhon.com))

Contact HPP: Leo Marcelis

**CERTHON**



### Description:

Certhon is a family business that is building turnkey projects for the international horticulture business. We build advanced custom made greenhouses and indoor farms. All disciplines concerning the design and construction are in house. Among which greenhouse construction, cooling and heating, electrical engineering, assimilation lighting, irrigation, automation and software development for climate computers.

The last decade there is an increased interest and demand for growth chambers which allow for yearround full control of the climate and where plants are grown without the use of daylight. Certhon already build a lot of facilities for plant breeders, educational institutes and research oriented companies. Flexibility of the climate and the installed equipment were the main drivers in the design of these chambers.

More recently there is a growing attention for production oriented growth chambers. Some of the drivers for this interest are: climate change, pesticide free cultivation, food supply in mega cities, year round constant food production and availability. Because of the other user purpose the design is more focused on economic profitable crop production and less on flexibility.

Certhon foresees good opportunities in the market for production orientated chambers and expects to build more indoor farming projects and besides that, a growing focus on fruit bearing crops with longer cultivation periods then "leafy greens".

To facilitate this expectations Certhon build in 2018 the Certhon Innovation Centre (CIC). The main objectives here are: to do research on crop production in growth chambers, to support the sale of these systems, to convince the market and potential prospects that it's possible, to minimize cultivation problems, to be able to provide basic cultivation support, to get reference data and input for ROI calculations and of course to improve system design.

For more information about vacancies, the CIC and Certhon visit our website [www.certhon.com](http://www.certhon.com).

Applications or requests can be send to [vacature@certhon.com](mailto:vacature@certhon.com)

Key words: horticulture, greenhouse, indoor farming, growth chamber, biosystems engineering, plant sciences, climate control, LED lighting.

### Internship and ECTS:

Internship credits up to 24 ECTS

### Location:

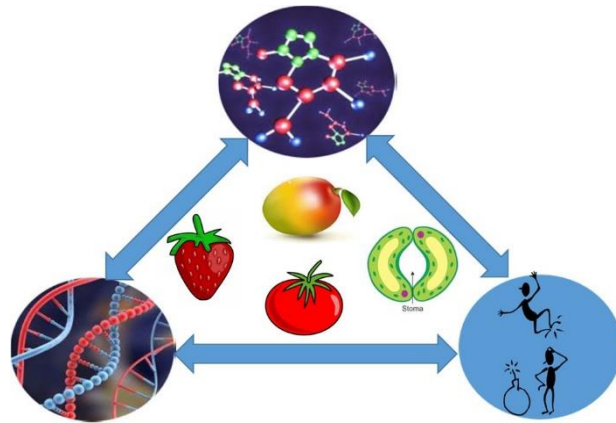
Poeldijk (ABC Westland 555 - 2685 ZH Poeldijk - The Netherlands)

### Planning:

To be arranged in consultation with the supervisor(s)

**Reminder: make sure that a HPP staff member has agreed to act as supervisor for this Internship (see also instructions on the front-page in section 'About arranging a supervisor and signing a HPP-contract ....')**

## Internship topics Post-harvest quality of fruits, flowers and vegetables



### □ Influence of preharvest conditions

Chilling injury, LED lighting, vase-life, tree factor

### □ Postharvest Physiology & Biotechnology techniques

Colour, firmness, HPLC, qPCR, GC-MS, CRISPR-Cas9, modelling

### Supervisor(s):

*Dr Rob Schouten, Dr Julian Verdonk, and Prof Dr Ernst Woltering*

### Potted plants (internships)

- Transport conditions reduce quality. Possible topics to study is the effect of darkness, ethylene, cold and mechanic damage. Effect of growing conditions (preharvest) on quality. Petunia, Chrysanthemum topics available. In collaboration with Syngenta, Dümen Orange, etc.
- Postharvest problems with transport of cuttings. Transport in plastic bags, cold and wet, some cultivars have problems rooting and show other quality problems afterwards. Poinsettia, Geranium topics available.

### Alternative topics

- We are always interested to talk about other possibilities you might want to explore. Other species, or topics should be possible, lets discuss!

### Internship and ECTS:

Internship credits up to 24 ECTS

### Planning:

Flexible starting time.

**Reminder:** make sure that a HPP staff member has agreed to act as supervisor for this Internship (see also instructions on the front-page in section 'About arranging a supervisor and signing a HPP-contract ....')

## Internships: Viscon Group/ViVi, Varied topics on plant cultivation in a controlled environment

### Supervisor(s):

External supervisor(s): Su Zhang, Damian Lopez, Femke Gouweleeuw

Contact HPP: Ep Heuvelink

### Description:

The Viscon Group is passionate about creating innovative, solid and smart logistic solutions for all handling processes in Food and Agro businesses. The Viscon DNA consists of asking many questions, learning every day and developing new business in new sectors and markets: constantly generating ideas in every aspect. Now we are active in Horticulture, Fresh Produce, Poultry and Food Industries. One of our main strengths now, originated in our history, is the focus on several industry sectors. We take ideas from one sector and bring them into the next. These constant crossovers bring innovation and inspiration to our people and the people we work with, everywhere we go.

ViVi is a company within the Viscon Group. We develop smart solutions and automations for the future of agriculture. We deliver fully controlled growing systems for young plants and finished products. We are active in the areas of indoor multilayer plant production, automated hydroponic and aeroponic systems, and smart tissue culture/somatic embryo production solutions. We are a smart solution provider with a "green heart".

We are looking for candidates in the following topics:

1. Multilayer Cultivation/City farms (Focused crops: leafy vegetables, ornamentals, fruit and vegetable seedlings)

- Young plant production in a controlled environment
- Finished crops in a multilayer set up
- Plant nutrition and irrigation management

2. Hydroponics/Aeroponics ( Focused crops: lettuce, Asian leafy vegetables)

- Improving existing systems in our test greenhouse
- Improving yields, taste and nutrition of the hydroponic crops

3. Tissue Culture/Somatic Embryos ( Focused crops: medicinal cannabis, fruits, tropical economic crops)

- Creating new media recipes and improving current protocols
- LED research
- Rooting methods research

What we offer:

You will be working with a group of young, dynamic and international researchers. Depending on the topic you choose, you might be working in one of our international locations or at our clients' locations. We also provide free housing near the company for students doing internships at our Dutch headquarters. Students with excellent performance during the internship have the chance to receive a working contract within our team.

For further information please contact: Su Zhang [s.zhang@viscon.eu](mailto:s.zhang@viscon.eu) or Damian Lopez [d.lopezsalazar@viscon.eu](mailto:d.lopezsalazar@viscon.eu)

Websites: [viscongroup.eu](http://viscongroup.eu) and [vivi.nu](http://vivi.nu)

### **Internship and ECTS:**

Internship credits up to 24 ECTS

**Location:** 's-Gravendeel, The Netherlands

**Planning:** To be arranged in consultation with the supervisors.

Reminder:

Make sure that a HPP staff member has agreed to act as supervisor for this.





## Internship Molecular Strawberry Breeding

---

### Who we are

Fresh Forward is a strawberry Breeding company Located in Eck en Wiel, Betuwe, The Netherlands. Our breeding program started in 1943 at one of the institutes of Wageningen University. Famous varieties derived from this program include Gorella, Korona, Elsanta, Sonata and Rumba. We currently have three breeding programmes in strawberry: Northern Europe, Southern Europe and Day-Neutral varieties.

### The project

In this project we want to evaluate a number of important plant and fruit characteristics in a very interesting mapping population. After the phenotypic evaluations, a QTL analysis will be performed using SNP array derived marker data.

### Your Tasks:

- Set up a set of characteristics to be measured and perform the phenotyping
- Analyze the phenotypic results
- Perform QTL mapping
- General support of the breeding program when available.

### Who You Are

- Following a Master studies in Plant Sciences (preferably Plant Breeding)
- A practical and analytical mind
- Available for at least 5 months, preferably 6. **Starting at end of April-Early May 2017** (due to trials already being planted).
- Capable of working in a team (on-season), as well as indepently (off-season).
- Fluent in Dutch (preferred) or English.

### What's in it for you?

- You will gain insight into a practical breeding program, as well as QTL mapping.
- A good work environment in a small scale company, with experienced personnel.
- Compensation for travelling as well as a monthly Fee.
- Free strawberries..

Please send your motivation and C.V. to Dr. Thijs van Dijk ([thijs.vandijk@fresh-forward.nl](mailto:thijs.vandijk@fresh-forward.nl)). Who is also available for more information and a regular visitor of Radix East.

**Reminder: make sure that a HPP staff member has agreed to act as supervisor for this Internship (see also instructions on the front-page in section 'About arranging a supervisor and signing a HPP-contract ....')**

# Introduction of research on bean sprouts physiology for Internship at Evers Specials

## Supervisor(s):

*External supervisor: Ruxin Hé (Evers Specials)*

*Contact HPP: Leo Marcelis*

## Description:

Evers Specials is the biggest mung bean sprouts producer in Europe. We specialize in growing mung bean sprouts and our market is mainly in Europe. Therefore, as main product, bean sprouts quality is utmost important for us. However, bean sprouts are relatively “small” vegetable from an economical point of view compared with other “big” vegetable. Therefore, there are little research performed on how to improve the quality of bean sprouts by universities and institutes.

Based on years of experiments and experience, we manage to produce stable and good quality bean sprouts. Nevertheless, the knowledge of bean sprouts physiology is still not enough, so more fundamental research on bean sprouts physiology and post-harvest quality have to be performed by ourselves.

Currently, we are working on several interesting projects to try to understand how sprouts will react on different growing situations (affected by water, air temperature, sprouts temperature and gas composition etc.). And most importantly of course, is to see how sprouts quality will be affected by these different growing patterns.

We are looking for enthusiastic and details-oriented people who are interested in discovering the secrets of bean sprouts and performing scientific research. He or she should also be able to work independently and think proactively about the results and improvements. If there are some interesting topics that come up in your mind, you are also welcomed to discuss with us. The period and content of internship will be determined after discussion based on the master program planning of the candidates.

## Internship and ECTS:

Internship credits: 24 ECTS

## Location:

Nijmegen

## Planning:

To be arranged in consultation with the supervisors.

[www.eversspecials.nl](http://www.eversspecials.nl)



**Reminder: make sure that a HPP staff member has agreed to act as supervisor for this Internship (see also instructions on the front-page in section 'About arranging a supervisor and signing a HPP-contract ....')**

## Research Assistant Internship at OneFarm

### Supervisor(s):

Contact at HPP: Prof. Dr. Leo Marcelis – external supervisor: Chief technology Officer of OneFarm



### Summary and Description:

OneFarm is looking for a research assistant interested in sustainable agriculture and research. The research intern will primarily support OneFarm by performing research and analysis regarding Controlled Environment Agriculture (CEA). The intern will report to the Chief Technology Officer and will be motivated by OneFarm's mission to provide affordable fresh healthy food for all.

As OneFarm's research intern, your primary focus will be to contribute to the company's development by creating compelling and analytical knowledge assets. You will work closely with our management team to compile extensive knowledge on the CEA's industry (such as stakeholder mapping, network analysis, etc.), technology (product life cycle analysis, data collection from A-Lab Vertical Farm, applications of the CEA technology in different locations and settings, etc.) which ultimately enable the start-up to grow. You must be highly motivated with proven analytical and organization skills. You will be responsible for providing high-quality enquiries in a timely manner and supporting the delivery of the findings to different audiences (internal or external).

This internship program will provide you with exceptional experience, extensive knowledge and access to the international network in this fast-growing field, and potential employment prospect at OneFarm. A small monthly remuneration will be available.

### Requirements

Required Qualifications

- Research and analytical skills
- Excellent writing and speaking skills in English;
- Advanced abilities to work with Microsoft Office programs
- Proactive attitude. Ability to learn and be curious, share knowledge and be open to feedback;
- Ability to handle multiple tasks and work on precise timelines
- Excellent attention to detail;

**Internship and ECTS:** Internship credits up to 24 ECTS

**Location:** Amsterdam, The Netherlands

**Planning:** A.S.A.P for a minimum of 4 months – 32h to 40hrs p/w.

### About OneFarm:

OneFarm's purpose is to provide affordable fresh healthy food and plant pharmaceuticals to local communities on a global scale to mitigate the upcoming food crisis. To that end OneFarm implements large scale vertical farms together with local partners to ensure food security for all parts of the population. We believe community relationships are key to providing long term sustainable food security. OneFarm combines knowledge about food and plant pharma, technology, infrastructure and data to enable local communities with their own secure food supply.

**Application Process:** If you think you are the perfect candidate and you are looking to contribute to OneFarm's project, send your resume, application letter to [info@onefarm.io](mailto:info@onefarm.io)

## Greenhouse Horticulture Research Intern @ Microsoft Research (USA)

### Supervisor(s):

Contact at HPP: Prof. Dr. Leo Marcelis - contact Microsoft Research: Kenneth Tran ([ktran@microsoft.com](mailto:ktran@microsoft.com))

### Summary and Description:

Microsoft Research (MSR) provides a dynamic environment for research careers with a network of world-class research labs led by globally-recognized scientists and engineers. Our researchers and engineers pursue innovation in a range of scientific and technical disciplines, to help solve complex challenges in diverse fields, including computing, healthcare, economics, and the environment.

Interns put inquiry and theory into practice. Alongside fellow doctoral candidates and some of the world's best researchers and product development teams, interns learn, collaborate, and network for life. Interns not only advance their own careers, but they also contribute to exciting research and development strides. During the 16 week internship, students are paired with mentors and expected to collaborate with other interns and researchers, present findings, and contribute to the vibrant life of the community. Horticulture interns will work with a team of researchers and engineers on an autonomous greenhouse/vertical farm project.

### Qualifications

#### Required Qualifications:

Must be currently enrolled in a PhD or Master program in Controlled Environment Agriculture, Greenhouse Horticulture, or a related field.

#### Preferred Qualifications:

- Multiple years of experience growing in greenhouses with supplemental light; bonus for experience growing cucumbers
- Experience in systems design and working with sensors
- Experience in data analysis or machine learning
- Demonstrated ability to conduct high quality research
- Excellent interpersonal skills, cross-disciplinary and cross-culture collaboration
- Ability to think unconventionally to derive creative and innovative solutions

Microsoft is an equal opportunity employer. All qualified applicants will receive consideration for employment without regard to age, ancestry, color, family or medical care leave, gender identity or expression, genetic information, marital status, medical condition, national origin, physical or mental disability, political affiliation, protected veteran status, race, religion, sex (including pregnancy), sexual orientation, or any other characteristic protected by applicable laws, regulations and ordinances. We also consider qualified applicants regardless of criminal histories, consistent with legal requirements. If you need assistance and/or a reasonable accommodation due to a disability during the application or the recruiting process, please send a request via the Accommodation request form.

Benefits/perks listed below may vary depending on the nature of your employment with Microsoft and the country where you work. Benefits and Perks

- Industry leading healthcare
- Opportunities to network and connect
- Giving programs
- Discounts on products and services

**ECTS:** Internship credits up to 24 ECTS

**Location:** Redmond WA, USA

**Planning:** consult supervisors